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STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
P.O. BOX 621

HONOLULU, HAWAII 96809

WILLIAM W. PATY, CHAIRPERSON BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

JOHN P. KEPPELER. II DONA L. HANAIKE

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND
ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

FILE NO.: HA-11/8/91-2509

180-Day Exp. Date: 5/6/92

DOCUMENT NO.: 602

Dr. Donald Hall, Director Institute for Astronomy (IFA) University of Hawaii 2680 Woodlawn Drive

2680 Woodlawn Drive Honolulu, Hawaii 96822

Dear Dr. Hall:

Subject: Conservation District Use Application for the Keck II Telescope and Appurtenant Development (Relocation) of a Concrete Batching Plant, Mauna Kea, Hawaii

We are pleased to inform you that your Conservation District Use Application for a Telescope and Appurtenant Development was approved on April 10, 1992 subject to the following conditions:

ADD 29 1992

- 1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended;
- 2. The applicant, shall comply with all applicable Department of Health Administrative Rule;
- That the applicant coordinate and finalize the design for wastewater treatment with the State Department of Health.
- The applicant shall ensure that all proposed activities are consistent with pertinent state leases and assignment;
- 5. Before proceeding with any work authorized by the Board, the applicant shall submit four (4) copies of the construction plans and specifications to the Chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three (3) of the copies will be returned to the applicant. Plan approval by the Chairperson does not infer approval required of other agencies. Compliance with Condition 1 remains the responsibility of the applicant;

(

- 6. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, and all work and construction must be completed within five (5) years of the approval of such use;
- 7. That in issuing this permit, the Department and Board has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;
- 8. That all representation relative to mitigation set forth in the accepted Environmental Impact Statement and the Mauna Kea Science Reserve Complex Development (Management) Plan for this proposed use are hereby incorporated as conditions of this approval;
- 9. The applicant shall establish a batching plant at the identified alternative site location as specified in Board approval of HA-2462 (JNLT.) The batching plant, when not utilized during construction activity, will be restored to a condition acceptable to the Department;
- 10. That the applicant obliterate the old skier's parking lot (within the NAR) and restore it to a natural state, as practicable (to be determined by the Department).
- 11. That the applicant maintain that the old skier's parking lot access be closed with a continuous barrier;
- 12. That the applicant continue to coordinate specific activities related to the old skier's parking lot with the Natural Area Reserve Commission.
- 13. That the applicant shall be held responsible for the removal of all litter from the project and surrounding areas generated from the construction and maintenance of the project;
- 14. That the applicant notify the Department in writing when construction activity is initiated and when it is completed;
- 15. That failure to comply with any of these conditions shall render this Conservation District Land Use application null and void;
- 16. Other terms and conditions as prescribed by the Chairperson; and

17. A portion of the abandoned generator site will be set aside for overflow public parking. This area will not be paved.

Please acknowledge receipt of this permit, with the above noted conditions, in the space provided below. Please sign two copies. Retain one and return the other to the department within thirty (30) days.

Should you have any questions on any of these conditions, please feel free to contact our Office of Conservation and Environmental Affairs staff at 587-0377.

very truly yours,

WILL TAM W. PA

Receipt acknowledged

Applicant's Signature

Date 5/8/9

cc: Hawaii Board Member

Hawaii Land Agent

Hawaii County Planning Department

DOH/OHA/OSP



STATE OF HAWAII DEPARTMENT OF LAND AND NATURAL RESOURCES

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AQUACULTURE DEVELOPMENT PROGRAM AQUATIC RESOURCES CONSERVATION AND ENVIRONMENTAL AFFAIRS CONSERVATION AND RESOURCES ENFORCEMENT CONVEYANCES FORESTRY AND WILDLIFE LAND MANAGEMENT VATER AND LAND DEVELOPMENT

FILE NO.: HA-11/8/91-2509 180-Day Exp. Date: 5/6/92 DOC. ID.: 416

April 10, 1992

Board of Land and Natural Resources State of Hawaii Honolulu, Hawaii

> Conservation District Use Application for the Keck II Telescope and Appurtenant Development (Relocation) of a Concrete Batching Plant, Mauna Kea, Hawaii

APPLICANT:

Dr. Donald Hall, Director

Institute for Astronomy (IFA) University of Hawaii

2680 Woodlawn Drive Honolulu, Hawaii 96822

LANDOWNER:

State of Hawaii G.L. S-4191

LOCATION/

Mauna Kea Science Reserve

TMK:

4-4-15: 09

LOT SIZE/

11,214 ± acres

USE:

16,850 sq. ft. (Keck II Telescope)
2 ± acres (Relocated Batch Plant)

SUBZONE:

Resource

DESCRIPTION OF AREA/CURRENT USE:

The subject area is located within the Mauna Kea Science Reserve, Hawaii (Exhibit A). The property is identified as TMK: 4-4-15: 09 (Exhibit B). The project is situated within the State Conservation District, Resource Subzone (Exhibit C).

As identified by the applicant, the proposed Keck II telescope is an expansion of the soon-to-be completed W. M. Keck Observatory (CDUA HA-1646) located within the Mauna Kea Science Reserve. Currently, ten telescopes are either in operation or under construction within the Science Reserve (Exhibit D). These include five major optical/infrared submillimeter-wavelength telescopes; and the VLBA Antenna Facility below the summit area at the 12,200-foot elevation. Recently, the Board approved CDUA HA-2462 for construction and operation of the JNLT (Japan National Large Telescope within the summit area.

Elevations in the summit area of the Mauna Kea Science Reserve range from about 13,000 to 13,796 feet. The area includes a number of cinder cones of varying sizes and shapes along the rift zones that descend from the summit. Slopes in the area vary from flat plateaus to close to vertical slopes on the cinder cones. The proposed concrete batching plant site is essentially flat.

There are no officially designated endangered or threatened plant species in the summit area.

The Hawaii Dark-rumped Petrel or 'Ua'u (<u>Pterodroma phaeopygia sandwichensis</u>) is the only endangered endemic subspecies known to be present in the high altitudes of Mauna Kea. However, there have been no reported sightings in the Science Reserve. No Petrels were found at the 12,200-foot elevation of the Science Reserve during a field survey conducted by M. S. Kjargaard in 1988. The survey was performed at night during the height of the breeding season in May, 1988 and at a period of the lunar cycle where calling is maximized.

Access to the upper elevations of Mauna Kea from Hilo or Waimea is via the Saddle Road (Route 200) to Pu'u Huluhulu and from there via a 6-mile-long, 20-foot-wide paved portion of the Mauna Kea Access Road to Hale Pohaku, at the 9,200-foot elevation of the mountain. From there, the Access Road continues 8.3 miles to the summit. It is paved from the summit down to approximately the 11,800-foot elevation.

Within the summit area, access to the telescope site will be along an existing paved road.

Each individual telescope has its own on-site cesspool or septic tank with leaching field. These methods of sewage disposal have been approved by the State Department of Health (DOH).

Water is trucked from Hilo to the Science Reserve in a 5,000-gallon water tanker. Each telescope has its own on-site water storage and distribution system.

PROPOSED USE:

As identified by the applicant, the California Association for Research in Astronomy (CARA) — a not for profit corporation whose members are the California Institute of Technology (Caltech) and the University of California (UC) — plans to expand the W. M. Keck Observatory by constructing a second ten-meter optical/infrared telescope (Keck II) adjacent to the existing Keck Telescope facility (Keck I), within its subleased area in the summit area of the Mauna Kea Science Reserve. When completed, Keck I and Keck II will share a common expanded support building between the two telescopes and their domes. The two telescopes will be separated by approximately 280 feet (85 m.) The second facility will be virtually identical to the Keck I telescope and dome (Exhibit E).

The common facilities already in place which will be shared include: machine shops, aluminizing rooms, electronics labs, lounge, library, power distribution, visitor facilities, receiving room and instrument labs. The building expansion for the new telescope will include: a control room,

computer room, electrical/mechanical room and a small lounge. The existing underground tunnel will be extended to allow the optical connection of the two telescopes. A basement area will also be added to house the interferometric instruments that will be installed to combine and analyze the light from the two telescopes.

Keck I is the largest optical/infrared telescope in the world. The addition of Keck II will double the collecting area of the W. M. Keck Observatory. Furthermore, it will be possible to combine the light beams from the two Keck telescopes so that they can be used in tandem. In this interferometric mode, they will provide the angular detail of a telescope nearly 100 meters in diameter. Observing time on both Keck I and Keck II will be allocated to astronomers from UH, Caltech, UC and possibly others throughout the U.S. national astronomical community.

The Keck II project on Mauna Kea is scheduled to begin in mid 1992, if all permits can be obtained, and is expected to take about three years plus approximately a one-year adjustment period after the telescope is installed. Regular observations are scheduled to begin in April 1996.

It is planned that telescope personnel will occupy ten rooms at the Hale Pohaku Mid-Level Facilities; probably in the new Dorm E dormitory which was approved as part of CDUA HA-2462 for the JNLT (Exhibit F). Construction workers will occupy the existing 24 - 29 person construction camp dormitory. CARA also intends to use the approved staging area for pre-assembly of dome components and material storage (Exhibit G).

Thus, this project specifically will include the following items:

- a) Construction and operation of a second, ten-meter optical/infrared telescope (Keck II) within the boundaries of the area currently subleased for the W. M. Keck Observatory approximately 280 feet (85 m) from the existing dome (Keck I), between the 13,588-foot and 13,603-foot elevations of the Pu'u Hau Oki cinder cone (Exhibit H).
- b) Extension of the existing control building by 7,300 square feet; construction of a basement under the extension to connect the coude tunnel of the existing telescope to the new telescope; addition of a new 8,000 gallon water storage tank; and, relocation of the existing 150 kVA stand-by generator to the new building (Exhibits I and J).
- Use of approximately two acres of a previously-disturbed 7.2-acre site, at about the 13,250-foot elevation of the summit area, for a concrete batching plant. The 7.2-acre area, originally the site of a 850 kVA generator, was used for approved stockpiling and rock-crushing activities in connection with the recently completed access road improvements (Exhibit K).

Specific Items

Keck II Telescope:

The telescope enclosure will consist of a circular concrete structure, 120 feet in diameter (36.5 m), and a spherical steel dome. The telescope is mounted on a circular concrete pier in the center of the enclosure. The enclosure also houses mechanical equipment necessary to cool and ventilate the air space.

The base of the telescope is mounted about 12 feet (3.6 m) above ground level on a circular concrete pier and the upper section of the telescope rises over 90 feet (27 m) above ground level. The two major parts of the telescope structure are the tube and the yoke. The yoke is mounted on four leg hydrostatic bearings to allow smooth precise rotation in azimuth. The tube is supported by the yoke on two hydrostatic elevation bearings which allow the telescope to move from zenith to horizon. The primary mirror consists of 36 hexagonal segments mounted on a space frame structure supported by the telescope lower tube. The primary mirror is controlled by an active control system to precisely position each mirror segment to form a single surface accurate to a few millionths of an inch.

A single-story, 7,300-square-foot extension to the existing control building will be built connecting the two facilities. When completed, the combined building will look like a single building. The extended building will provide a new computer room, control room, lounge, and mechanical/electrical equipment room for the second telescope.

A basement under the new extension will be constructed connecting the coude tunnel of the existing telescope to the new telescope. A buried steel corrugated heat exhaust duct and outlet will extend northeast of the control building, venting at an elevation of approximately 13,588 feet.

Concrete Batching Area:

Although some of the concrete used in construction will be transported from Hilo by truck as dry mix and mixed with water at the site, on the occasions when three or more large continuous pours are required, a temporary concrete batching plant will be required. A site at the 12,700-foot elevation ("skiers' parking lot") was designated for that purpose in the SRCDP, however, since a portion of the area is within the Mauna Kea Ice Age Natural Area Reserve, UH would prefer to relocate the batching activities to a less sensitive area. A two-acre portion of the former stockpiling and rock-crushing area, located within the summit area at about 13,250-foot elevation, is proposed as the new location for this use.

Field Office:

A temporary construction field office trailer will be brought to the site for use by supervisory personnel. It will be removed at the end of the construction period.

Construction Costs

Construction costs for the telescope facility are estimated at \$93 million dollars (in 1991 dollars). Local construction expenditures are expected to be in the range of \$15 to \$20 million.

SUMMARY OF COMMENTS:

The application was referred to the following agencies for their review and comment: the State Department of Health, the Department of Transportation, the Office of State Planning, the Office of Hawaiian Affairs, the Department of Land and Natural Resources, Divisions of Aquatic Resources, Forestry and Wildlife, State Parks, Historic Preservation, Conservation and Resources Enforcement, Land Management, Water Resource Management and the Natural Area Reserves System; and the County of Hawaii, Department of Planning. Comments received include:

STATE OF HAWAII:

Department of Health

Thank you for allowing us to review and comment on the subject request. We have the following comments to offer:

<u>Wastewater</u>

The subject area is located within a critical wastewater disposal area with a five (5) acre lot exception, as determined by the Hawaii County Wastewater Advisory Committee. Consequently, no new cesspools will be allowed in the area and the five (5) acre lot exception is not applicable as Department of Health Administrative Rules, Chapter 11-62, "Wastewater Systems", Section 11-62-31.1(d) does not allow public buildings to utilize cesspools.

As the existing wastewater system is an on-site cesspool, the Department of Health (DOH) will require that the cesspool be replaced with a non-cesspool individual wastewater system. We are also concerned with non-domestic wastewater. Conventional treatment works and individual wastewater systems may not be appropriate for such wastes. Detailed plans for both domestic and non-domestic wastewater must be submitted to and approved by the Department. The plans must conform to applicable requirements of the Department of Health Administrative Rules, Chapter 11-62, "Wastewater Systems."

Solid Waste

As this is a fairly small project in an isolated area, enactment of a program meeting the State's waste diversion goals would be difficult. We would recommend, however, that the facility examine alternatives available to current disposal practices. For example, transportation of solid waste off the mountain may not be an issue; most trucks will be coming up loaded and returning empty. It would not be difficult for you to program for easily recyclable materials (aluminum cans, office paper, cardboard).

In addition, as the construction facility (rock crusher, batch plant) looks to be an expanding project, we would recommend that the use of recycled material (old asphalt, concrete and possibly crushed glass) be implemented whenever possible. A crusher to take glass bottles down to a sand consistency could be purchased for under \$15,000.

The Department of Land and Natural Resources

The <u>Divisions of Aquatic Resources</u>, <u>State Parks</u>, and <u>Water and Land</u> <u>Development</u> have no objections or adverse comments on the subject project.

Division of Forestry and Wildlife

We have reviewed CDUA File No. HA-2509 and have the following comments:

- 1) We concur with the location of the newly proposed cement batching site.
- 2) The old cement batching site (skier's parking lot) should be abandoned and be put back in its original state.

- 3) A guard rail should be placed along the edge of the road fronting the old batching site and connect with the existing guard rail.
- 4) Public parking should be provided at the newly proposed cement batching site.
- 5) We highly recommend that the NARS Commission be notified before any actions are taken by the applicant.

Division of Conservation and Resources Enforcement

A field inspection was conducted on December 9, 1991. No site work was observed.

Division of Land Management

Land Management has reviewed the above CDUA and has no strong objections to the activities proposed, subject to consideration of the following:

- 1. The batching plant be temporary in nature with a time period imposed, say for two (2) years, at which time the area be restored to condition acceptable by the Department of Land and Natural Resources; and,
- 2. The University of Hawai'i be required to design the buildings to not infringe on the skyline and silhouette, as viewed from the lowlands. Receding buildings or berming should be considered.

Historic Preservation Division

We agree that the project will have "no effect" on significant historic sites directly, and our recent agreement with the UH Institute of Astronomy on broader planning meets any indirect effect concerns.

Natural Area Reserves System

We would like to comment on the proposal to batch concrete at the former $7.2-acre\ 850\ kVA$ generator site instead of at the "skier's parking lot".

We strongly support the proposal to move concrete batching activities from the "skier's parking lot" in the Mauna Kea Ice Age Natural Area Reserve to the former generator site situated outside of the NAR. The Commission has been concerned about batching activity in the skier's lot expanding outward because of the spreading piles of trucked rock material and the rock-crushing work and equipment.

Related to the relocation of concrete batching to the former generator site, we have these recommendations:

1. That a portion of the 7.2 acres of the abandoned generator site be set aside for public parking. The parking capacity should be sufficient to accommodate vehicular traffic at its peak seasonal level, which is probably during the winter months for snow-play. Parking at this near-summit elevation would be in addition to the new 22-car paved lot opposite the "skier's parking lot".

2. That the skier's lot be obliterated and roughened so that it blends in with the adjacent natural landscape. Use of this are for parking is no longer needed with the new paved lot across the road and the proposed greatly increased parking capacity at the former generator site.

Removal of the skier's lot will effectively remove the ongoing problem of off-road vehicle violations that develop from it. The nature of the terrain is such that access to the skier's lot provides an easy opening for 4-wheel-drive vehicles to illegally traverse and scar the mountain side.

3. That upon removal of the skier's lot, its access from the paved summit road--provided by a break in the vertical shoulder barrier of the road--be closed with a reconstructed, continuous shoulder barrier.

County of Hawaii

Planning Department

This is to acknowledge receipt of your December 4, 1991 letter, regarding the above-subject project. Please be informed that the subject property is situated outside the Special Management Area (SMA) boundaries; and as such, the proposal is not subject to SMA requirements.

ANALYSIS:

Following review and acceptance of the application for processing, the applicant, by letter dated November 29, 1991 was notified that:

- 1. The proposed use is a conditional use within the Resource Subzone of the Conservation District according to <u>Administrative Rules</u>, Title 13, Chapter 2, as amended;
- 2. A public hearing pursuant to Section 183-41, <u>Hawaii Revised Statutes</u> (HRS), as amended, is not required; and
- 3. In conformance with Title 11, Chapter 200, of the <u>Administrative</u> <u>Rules</u>, the Office of Environmental Quality Control has determined that the proposed projects have been adequately discussed in a previously accepted Environmental Impact Statement.

The County of Hawaii has affirmed that the project site is situated outside of the Special Management area.

The objective of the Resource subzone is to develop, with proper management, areas to ensure sustained use of the natural resources of those areas.

Section 13-2-21(b)(1) relating to standards requires all applications be reviewed in such a manner that the objective of the subzone is given primary consideration.

Staff has reviewed submittal agency comments and notes those concerns expressed by the State Department of Health, the Division of Land Management, the Division of Forestry and Wildlife and the Natural Area Reserves System. The applicant has submitted a written response to address some of these items (Exhibit L).

Staff has been in consultation with the State Department of Health and notes that the UH/IFA is cooperating with them on final design plans for wastewater treatment. The UH identifies that in regards to the Division of Land Management concerns, the proposed relocated concrete batching plant will be required to service various projects to the end of the decade. However, UH/IFA does agree to clean up and restore the area to the extent practicable, between the intervals when it is used for batching activities.

With regard to comments submitted by the Natural Area Reserves System, the abandoned generator site can be set aside for additional public parking. Attention will also be given to restore the old skier's parking lot to a natural state, as possible. Four-wheel drive vehicles will also be blocked to restrict illegal access.

As requested by the applicant, the normative timeframe to initiate and complete construction has been modified to allow a more flexible consideration.

As such, Staff recommends as follows:

RECOMMENDATION:

That the Board approve the Keck II telescope land use, including the relocation of a concrete batching plant, subject to the following conditions:

- 1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended;
- 2. The applicant shall comply with all applicable Department of Health Administrative Rules;
- 3. That the applicant coordinate and finalize the design for wastewater treatment with the State Department of Health.
- 4. The applicant will coordinate all proposed activities with the Division of Land Management to ensure that they are consistent to pertinent state leases and assignments.
- 5. Before proceeding with any work authorized by the Board, the applicant shall submit four (4) copies of the construction plans and specifications to the Chairperson or his authorized representative for approval for consistency with the conditions of the permit and the declarations set forth in the permit application. Three (3) of the copies will be returned to the applicant. Plan approval by the Chairperson does not infer approval required of other agencies. Compliance with Condition 1 remains the responsibility of the applicant;
- 6. Any work or construction to be done on the land shall be initiated within one (1) year of the approval of such use, and all work and construction must be completed within five (5) years of the approval of such use;

- 7. That in issuing this permit, the Department and Board has relied on the information and data which the permittee has provided in connection with his permit application. If, subsequent to the issuance of this permit, such information and data prove to be false, incomplete or inaccurate, this permit may be modified, suspended or revoked, in whole or in part, and/or the Department may, in addition, institute appropriate legal proceedings;
- 8. That all representation relative to mitigation set forth in the accepted Environmental Impact Statement and the Mauna Kea Science Reserve Complex Development (Management) Plan for this proposed use are hereby incorporated as conditions of this approval;
- 9. The applicant shall establish a batching plant at the identified alternative site location as specified in Board approval of HA-2462 (JNLT). The batching plant, when not utilized during construction activity, will be restored to a condition acceptable to the Department;
- 10. That the applicant obliterate the old skier's parking lot (within the NAR) and restore it to a natural state, as practicable (to be determined by the Department).
- 11. That the applicant maintain that the old skier's parking lot access be closed with a continuous barrier;
- 12. That the applicant continue to coordinate specific activities related to the old skier's parking lot with the Natural Area Reserve Commission.
- 13. That the applicant shall be held responsible for the removal of all litter from the project and surrounding areas generated from the construction and maintenance of the project;
- 14. That the applicant notify the Department in writing when construction activity is initiated and when it is completed;
- 15. That failure to comply with any of these conditions shall render this Conservation District Land Use application null and void: and
- 16. Other terms and conditions as prescribed by the Chairperson.

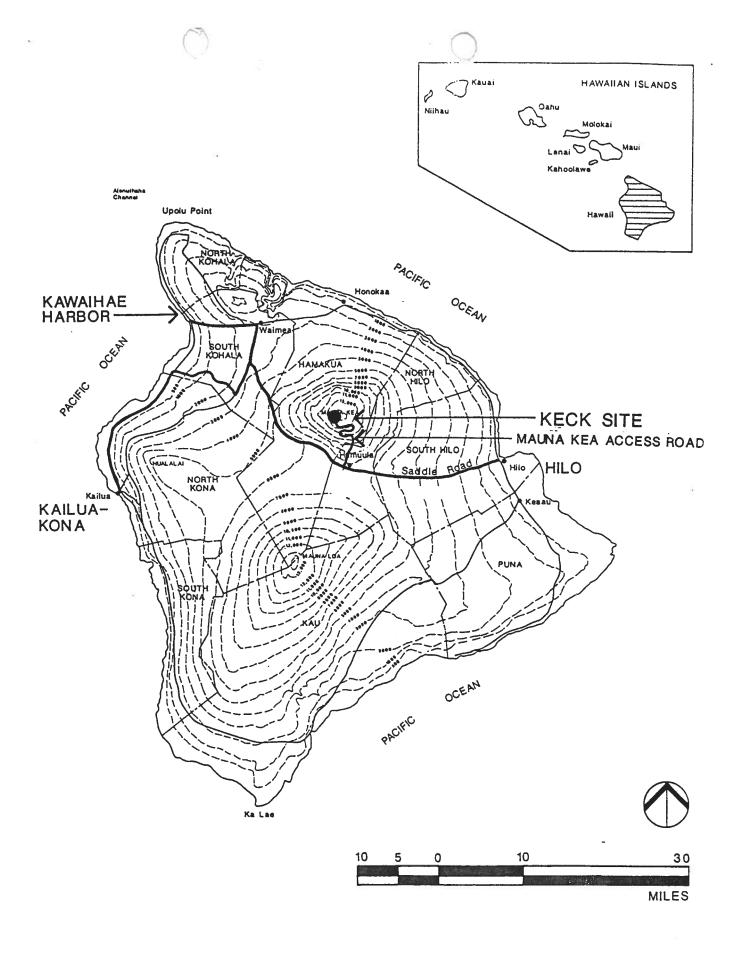
Respectfully submitted,

EDWARD E. HENRY Staff Planner

Attachment(s)

Approved for Submittal:

WILLIAM W. PATY



MAUNA KEA ACCESS

EXHIBIT A



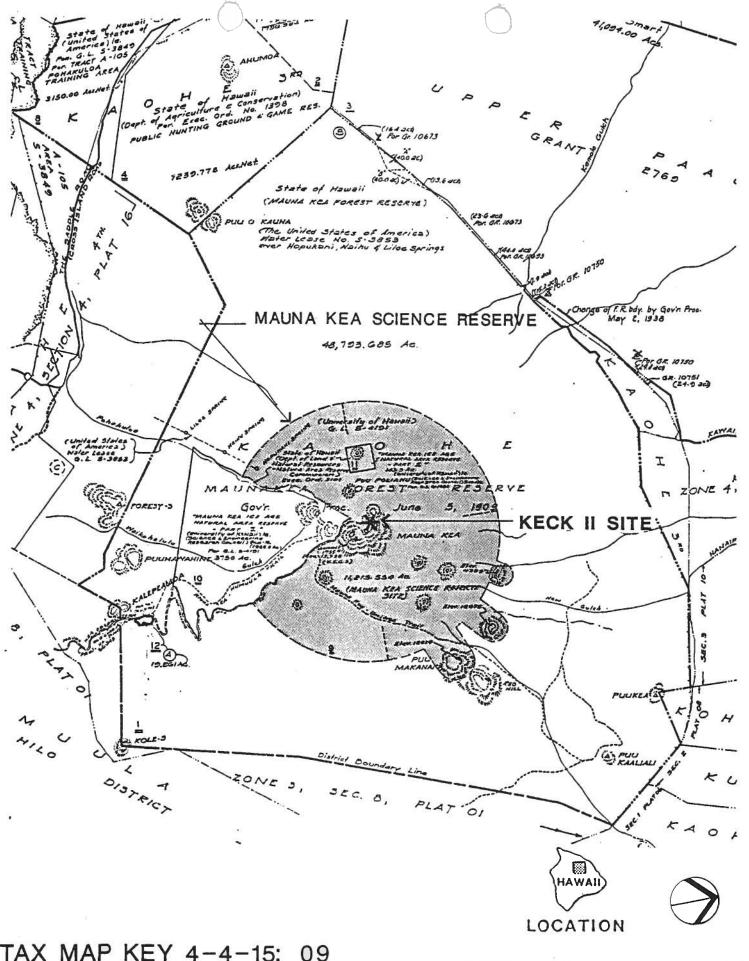
CDUA NO. HA-11/8/91-2509

APPLICANT UH-Institute of Astronomy

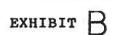
AGENT Dr. Donald Hall

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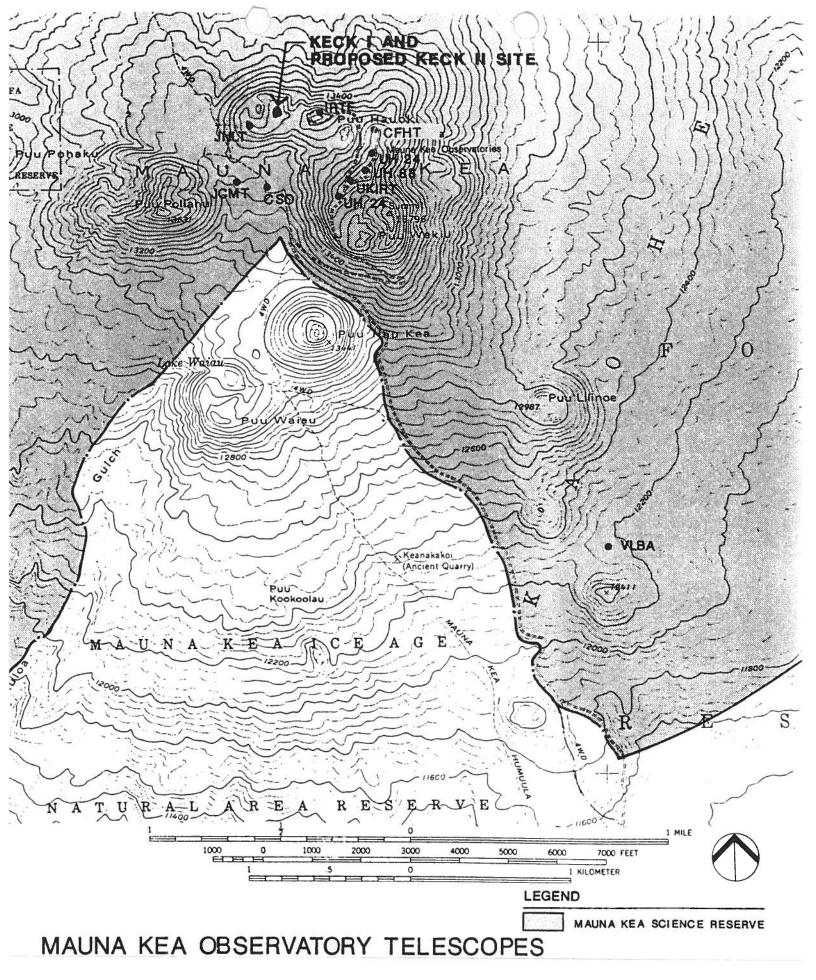


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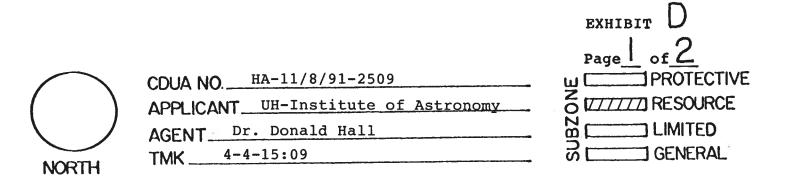


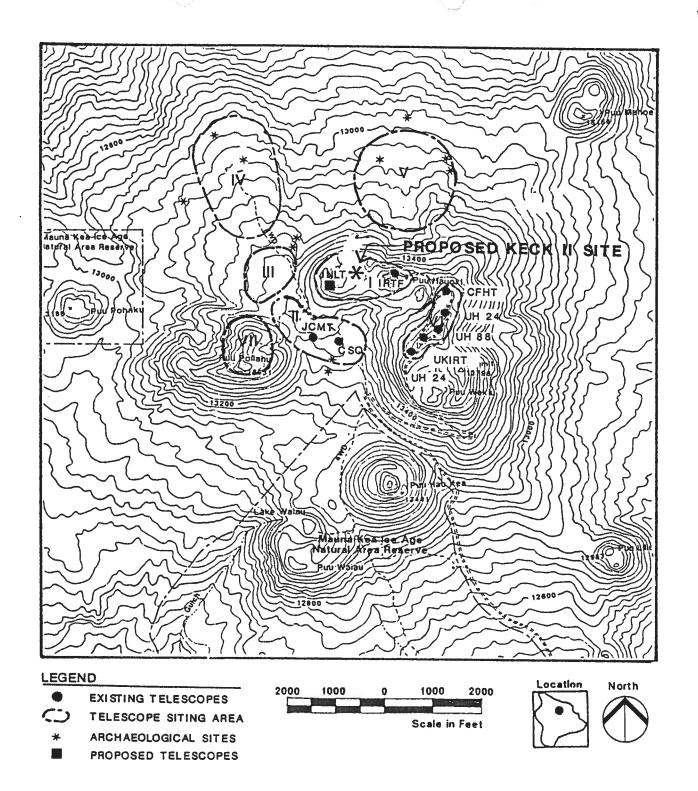
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Table I: TELESCOPES ON MAUNA KEA BY YEAR OPERATIONAL

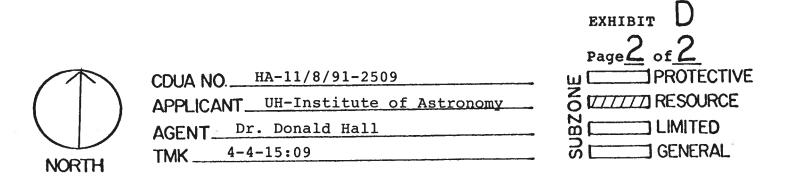
Telescope	Year Operational
Summit Ridge .	
UH 24-inch Telescope #1	1968
UH 24-inch Telescope #2	1969
UH 88-inch Telescope	1970
NASA Infrared Telescope (IRTF)	1979
Canada-France-Hawaii Telescope (CFHT)	1979
United Kingdom Infrared Telescope (UKIRT)	1979
W. M. Keck Observatory (Keck I)	1991*
Japan National Large Telescope (JNLT)	1999
Millimeter Valley	
Caltech Submillimeter Observatory (CSO)	1987
James Clerk Maxwell Telescope (JCMT)	1987
12,220-Foot Elevation	
VLBA Antenna Facility (VLBA)	1991*

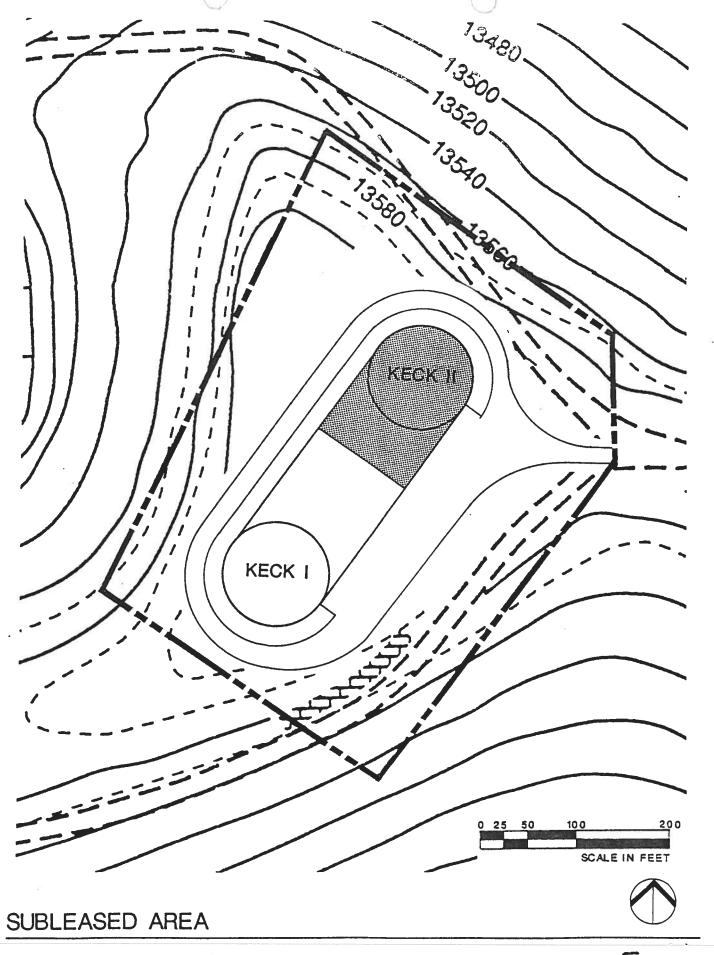
^{*} Under Construction





SRCDP: TELESCOPE SITING AREAS





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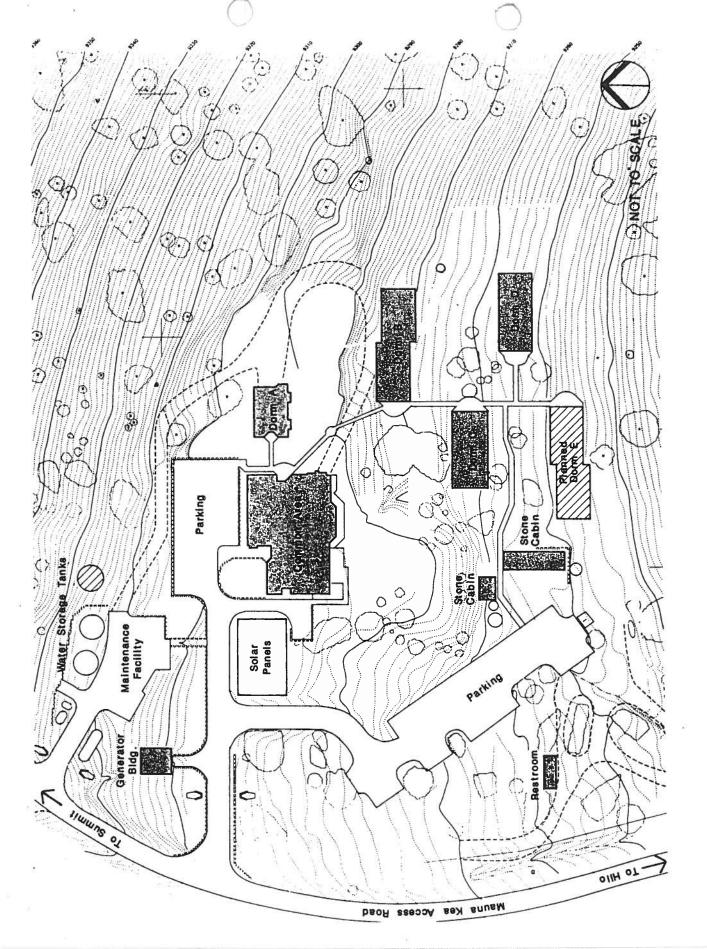
CDUA NO. HA-11/8/91-2509

APPLICANT UH-Institute of Astronomy

AGENT Dr. Donald Hall

TMK 4-4-15:09

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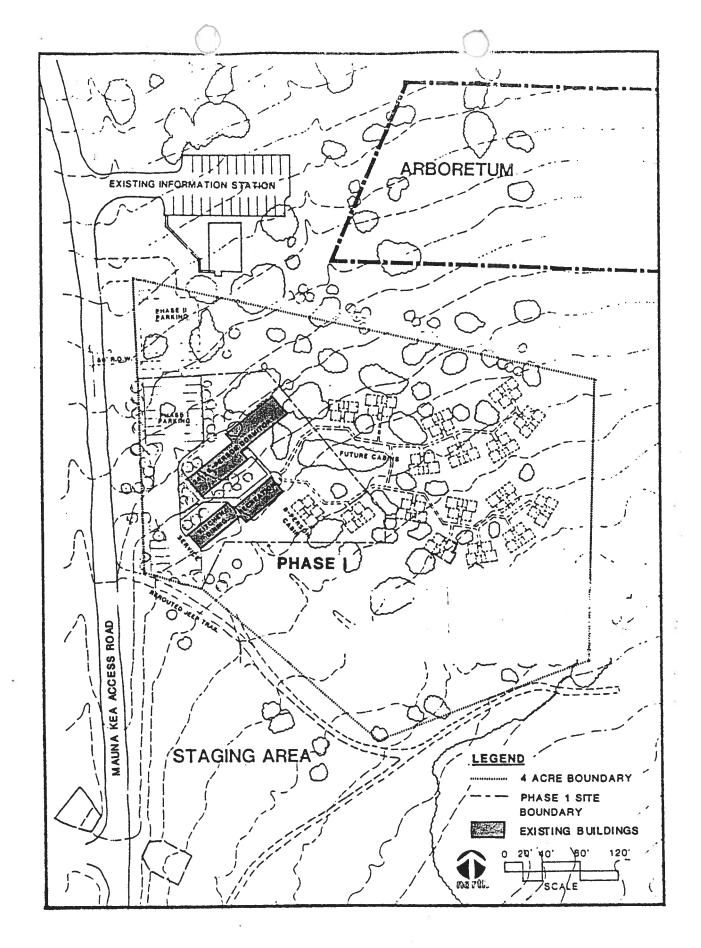


HALE POHAKU: ASTRONOMERS' MID-LEVEL FACILITIES

EXHIBIT F



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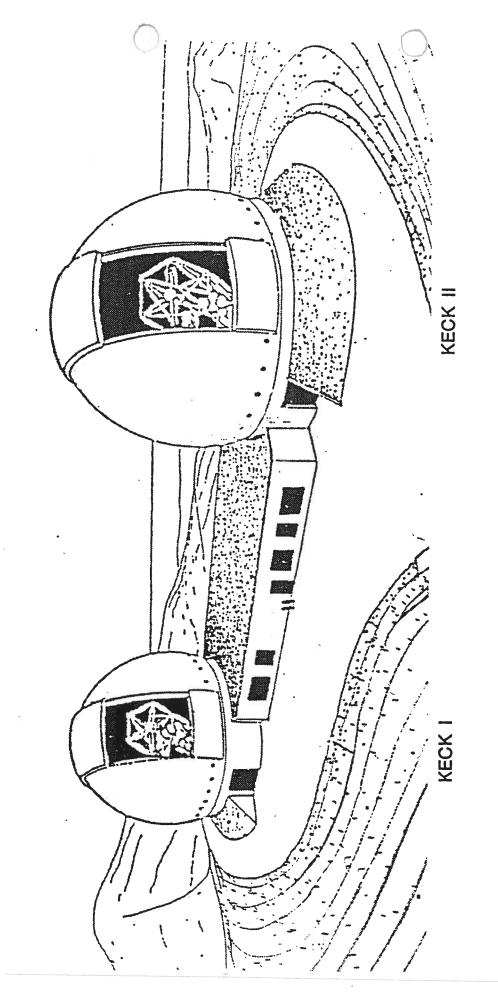


CONSTRUCTION CAMP MASTER PLAN (1985)

$\mathtt{exhibit}\, G$



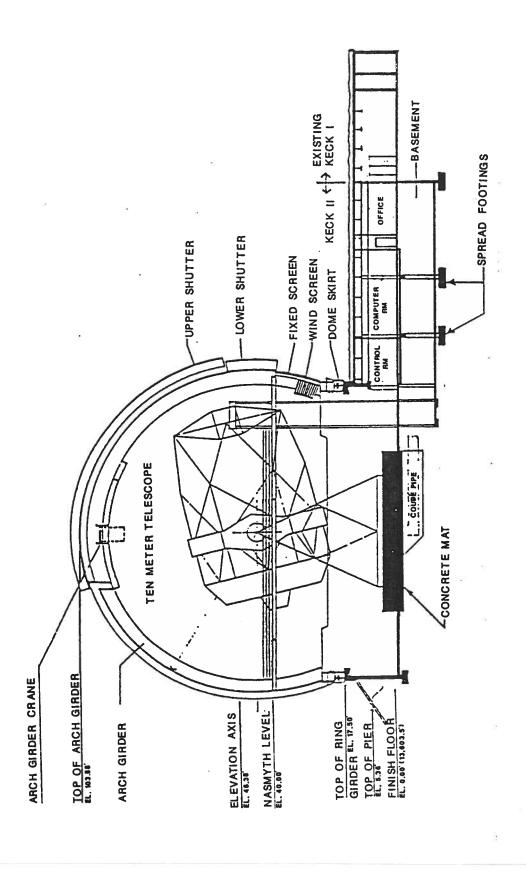
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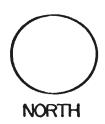
PERSPECTIVE - W. M. KECK OBSERVATORY

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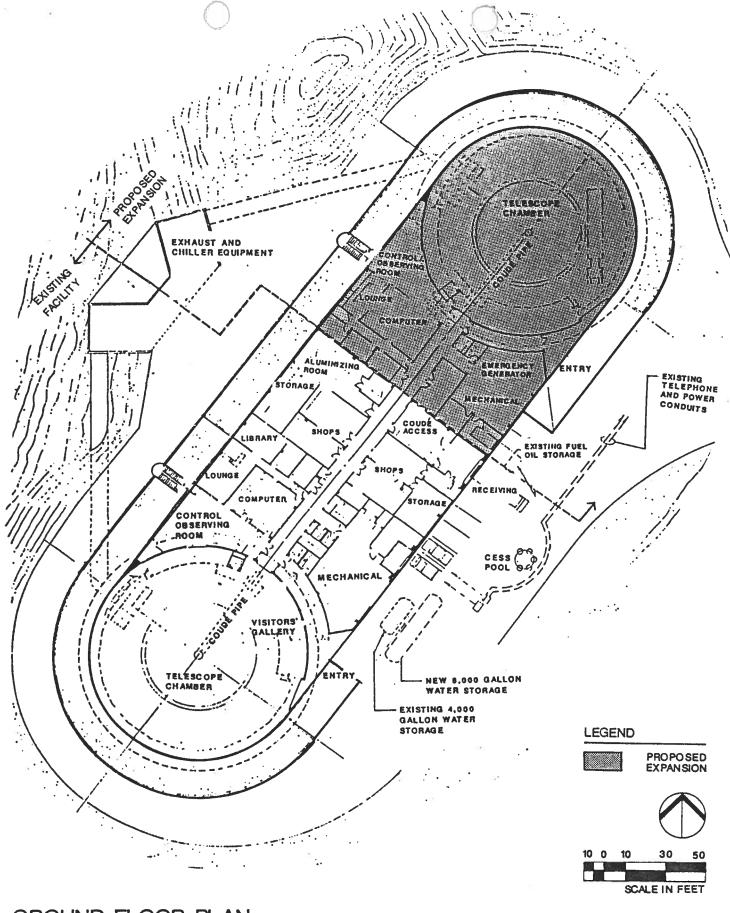


TELESCOPE ENCLOSURE & CONTROL BUILDING CROSS-SECTION B:



CDUA NO	HA-11/8/91-2509
APPLICANT_	UH-Institute of Astronomy
AGENT DI	r. Donald Hall
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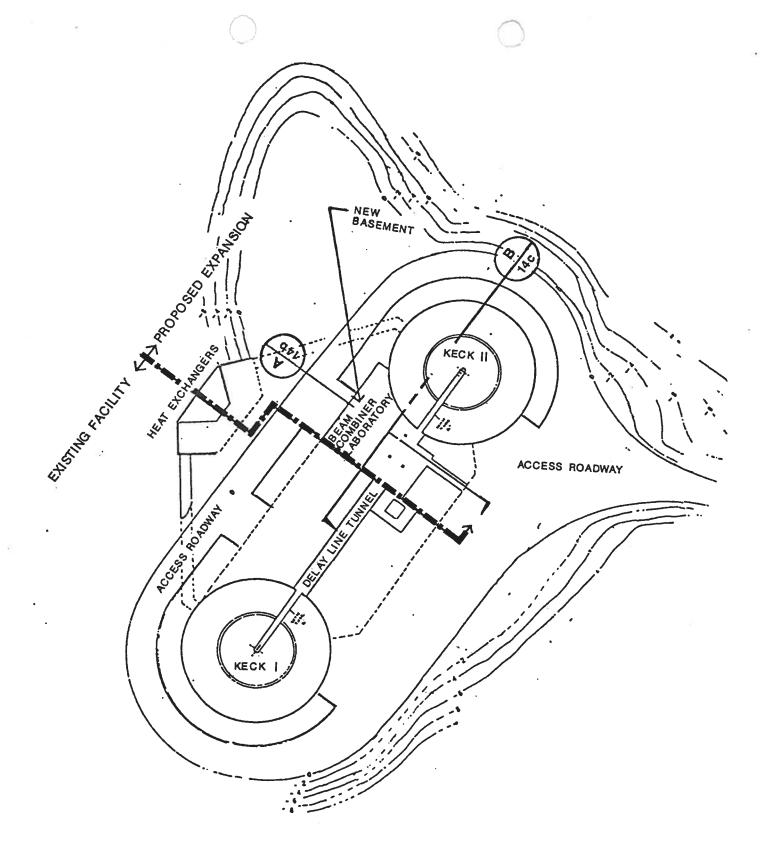


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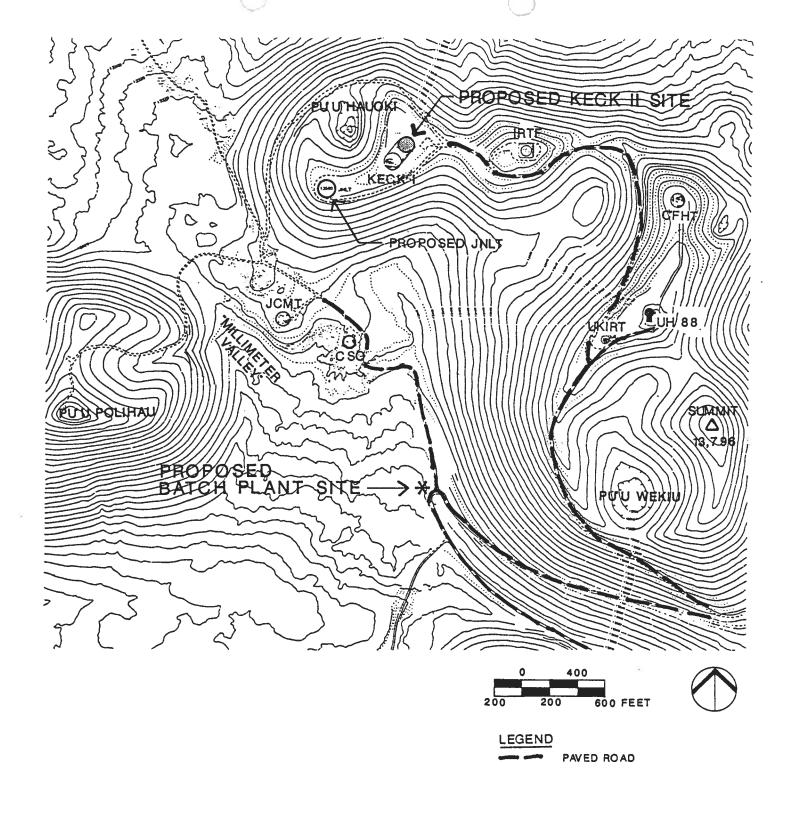
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MAUNA KEA SUMMIT TELESCOPES AND PROJECT AREAS

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University of Hawaii at Manoa

Institute for Astronomy
2680 Woodlawn Drive • Honolulu, Hawaii 96822
Telex: 723-8459 • UHAST HR

Office of the Director

March 20, 1992

Mr. William W. Paty, Chairperson Board of Land and Natural Resources Kalanimoku Building 1151 Punchbowl Street, Room 131 Honolulu, HI 96813

Dear Mr. Paty:

Subject: CDUA HA-2509, Second Keck Telescope Response to Comments Received

Your staff has apprised us of the comments received on the subject CDUA. We wish to respond as follows:

Department of Health

Enclosed please find a copy of a letter from Keck II Construction Manager, Jim Faull, explaining that the project has engaged an engineering consulting firm, Aqua/Waste Engineers, to design their individual wastewater system (IWS) and to process the associated permit application. The firm will also address the issue of non-domestic wastewater, which is raised in the January 15, 1992 letter from DoH.

Aqua/Waste is already in contact with DoH regarding this permit application. The present status can be confirmed by calling:

Mr. Harold Yee Department of Health Wastewater Branch Planning & Design Section Phone: 586-4286.

Natural Area Reserves System

1) Additional Parking

If additional parking is needed beyond that already available, we will try to provide it at the old generator site, as suggested. It must be understood, however, that after a snowfall, for reasons of health and safety, clearing of the access road must get priority over clearing of parking lots.

AN EQUAL OPPORTUNITY EMPLOYER

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Mr. William W. Paty, Chairperson (Warch 20, 1992) Page 2

2) Disposition of Skiers' Parking Lot

Subject to Board approval, we are ready to work with NARS to restore the "skiers' parking lot" to its natural state, as recommended. We will also make permanent the barrier which prevents vehicular access to this area from the paved road.

Division of Land Management

1) Batching Plant

Each of the new telescope projects will require the use of the batching plant for a certain period during its construction program. In accordance with the projections in the Complex Development Plan, this activity is expected to continue until approximately the end of the decade. Hence, a time limit of two years for this use is not appropriate. Nonetheless, we can agree to clear up and restore the area, to the extent practicable, between the intervals when it is used for batching activities.

2) Building Visibility

The requirement to function as an astronomical observatory, and in particular to do so in a way which benefits from Mauna Kea's unique advantages, puts strong constraints on building design and specifications. Designers have relatively little flexibility without seriously compromising the performance of the facility. The design of Keck II must be essentially the same as that of Keck I, and consequently the visual impact will be similar.

Robert A. McLaren Associate Director Mauna Kea Division

Enc. RAM/vg

cc:

G. Smith M. Metz

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March 13, 1992

Dr. Robert A. McLaren Institute for Astronomy 2680 Woodlawn Drive Honolulu, HI 96822

Subject: DOH Comments on Keck II CDUA

Dear Bob:

In response to the DOH memo dated January 15, 1992 CARA has engaged the services of Aqua/Waste Engineers of Kailua-Kona to design a non-cesspool individual wastewater system (IWS) to serve both the existing Phase I and the new Phase II projects. Aqua/Waste will also process an IWS permit application on our behalf.

Furthermore, Aqua/Waste will perform an Industrial Pretreatment Study to determine if there is a need to handle non-domestic wastewater in any special manner to be in compliance with the DOH Administrative Rules.

Very truly yours,

Yarnes E. Faull, P.E. Construction Manager

EXHIBIT L

cc: G. M. Smith, CARA
Dennis M. Reid, P.E., Aqua/Waste
File 11.1.15

P.O. Box 220, Kamuela, HI 96743 (808) 985-7887

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