



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

P. O. BOX 621  
HONOLULU, HAWAII 96809

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

File No.: HA-2691

APR 12 1994

U.H. Institute for Astronomy  
2680 Woodlawn Drive  
Honolulu, Hawaii 96822  
Attn: Robert McClaren

Dear Dr. McClaren,

Subject: Conservation District Use Permit for Gemini Northern 8-Meter Telescope  
at Mauna Kea, Hawaii

The Board of Land and Natural Resources approve this application for the Gemini 8-Meter Telescope and appurtenant facilities at the Mauna Kea Summit subject to the following conditions.

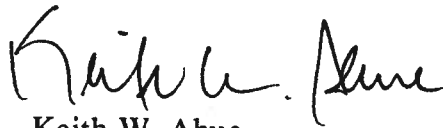
1. The applicant shall comply with all applicable statutes, ordinances, rules and regulations of the Federal, State and County governments, and applicable parts of Section 13-2-21, Administrative Rules, as amended.
2. The applicant, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit.
3. The applicant shall comply with all applicable Department of Health Administrative Rules.
4. 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.

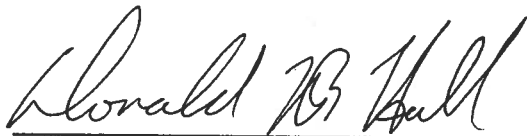
5. Any work or construction to be done on the land shall be initiated within two (2) year of the approval of such use and all work and construction must be completed within seven (7) years of the approval of such use.
6. All mitigative measures proposed in the Environmental Impact Statement that included description of this project shall be incorporated as conditions of approval.
7. Failure to comply with any of these conditions shall render this Conservation District Use Permit null and void.
8. If any information or data provided by the applicant 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.
9. Other terms and conditions as prescribed by the Chairperson.

Please contact the Office of Conservation and Environmental Affairs if there is any question on the conditions. Please acknowledge receipt of this permit by signing in the space provided below and returning a copy to us.

Very truly yours,

  
Keith W. Ahue

Receipt acknowledged:



Donald N. B. Hall, Director  
Institute for Astronomy

6/14/94  
Date

c: LM/Docare

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

FILE NO.: HA-2691  
180-DAY EXP. DATE: 6/20/94

April 8, 1994

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

Conservation District Use Application for  
Gemini Northern 8-Meter Telescope  
at Mauna Kea, Hawaii

APPLICANT: U.H. Institute for Astronomy  
2680 Woodlawn Drive  
Honolulu, Hawaii 96822

LANDOWNER: State of Hawaii (under lease to UHIA)

LOCATION: Mauna Kea Summit, Hawaii; tmk 4-4-15: 9

AREA OF USE: Approximately 2 acres

SUBZONE: Resource

BACKGROUND:

In 1968, the Board of Land and Natural Resources approved a 65-year lease to the University of Hawaii for the Mauna Kea Science Reserve. The lease includes most of the area above the 12,000 feet elevation level.

In early 1980, the UH Institute for Astronomy prepared a "Research Development Plan for the Mauna Kea Science Reserve and Related Facilities." The Plan serves as the programmatic master plan for the continued development of the Science Reserve and related astronomy facilities on Mauna Kea. It projected that there would be thirteen telescopes in the Science Reserve by the year 2000.

In 1983, the "Mauna Kea Science Reserve Complex Development Plan" was adopted by the UH Board of Regents. This Plan incorporates the policies and criteria set forth in the Research Development Plan and provides the physical planning framework necessary

to implement the Research Development Plan. It also presents a management plan for public use of the resources within the Science Reserve.

In 1985, the "Mauna Kea Science Reserve Complex Development Plan was amended to include a construction camp at Hale Pohaku expandable to a maximum of 140 workers at one time.

#### DESCRIPTION OF AREA:

The proposed project site is located on the summit of Mauna Kea at an approximate elevation of 13,700 feet. The area is a relatively flat plateau (10% slope) between subpeaks on the summit. Soil development at this high elevation has been retarded and the ground remains basically a'a lava and cinders. Rainfall at this elevation is sparse and consequently there is little evidence of erosion.

Three telescopes exist in the general project area. They are the UH 88-inch Telescope, the Canada-France-Hawaii Telescope, and the UH 24-inch Planetary Patrol Telescope. These telescopes were approved under CDUP HA-954 in 1977.

Access to the project site is via the Mauna Kea Access Road. The Mauna Kea Access Road is approximately 14.3 miles long from the intersection with Saddle Road to the summit. The Access Road is partially paved and partially compacted gravel. A spur road leads from the Access Road to the project site.

Potable water is trucked to the telescopes in the Science Reserve from Hilo. Each telescope facility has its own on-site water storage and distribution system. Sewage disposal at the telescope sites is by means of on-site cesspools or septic tanks with leaching fields. Electric power is provided by an underground distribution system.

No vegetation exists at the site. Although the endangered bird specie, the Hawaiian Dark-rumped Petrel, is found on the upper slopes of Mauna Kea, a survey found no evidence of the bird at this site.

As of December 1993, there were a total of nine telescope facilities in operation on the Mauna Kea summit and two more under construction: Japan National Large Telescope and Keck II.

An area of approximately two acres at 13,250 feet elevation is currently being used as a concrete batching plant, construction staging area, and temporary stockpile area. The site is being used in conjunction with construction of Japan National Large Telescope and Keck II.

#### PROPOSED USE:

The applicant proposes to remove the existing UH 24-inch Planetary Patrol Telescope and to construct a larger telescope facility at the 30,000 square feet site. The larger

facility will be named Gemini Northern 8-Meter Telescope and will work together with another 8-meter telescope located in Chile in a joint international effort. The U.S. National Science Foundation is the sponsor for the project and has asked the U.H. Institute for Astronomy for permission to locate the telescope within Mauna Kea Science Reserve. The UH Institute for Astronomy will be guaranteed a share of observation time from the Telescope.

The National Science Foundation expects to enter into a sublease agreement with UH for the telescope site. UH will submit the sublease to the Board of Land and Natural Resources for approval.

The Gemini installation will consist of an 8-meter telescope, a rotating enclosure with supporting facilities in its base (Exhibit ). The existing road to the site and underground utility alignment will be realigned slightly to accommodate the larger area needed for the Telescope.

The Telescope will be housed in a spherical enclosure with a dome diameter of 122 feet. The total height of the enclosure will be 132 feet. Adjacent to the dome-shaped telescope building will be a two-story support facility. The support facility will house the mechanical plant room, instrument work space, and equipment storage area on the first floor and computer room, telescope operations room, offices, electronics lab, crew room, and restroom on the second floor.

During construction, the two acre site currently used as a concrete batching site, staging area, and stockpiling site for construction of the Japan National Large Telescope, and Keck II will be used for the same purpose for this project. Construction of the Gemini telescope facilities is expected to take approximately four years with an additional year for telescope commissioning (testing).

Approximately 3,000 cubic yards of ground material is expected to be excavated from the site during construction. This material will be stockpiled and subsequently used to construct the roadbed of the relocated access road and as backfill material to cover concrete foundation walls. Cut and fill slopes will not be steeper than 24.5%. Excess excavated material will be used to upgrade and maintain the gravel roads on the mountain.

A trailer will be situated at the telescope site to serve as a construction field office. When construction activities are completed, the trailer will be removed from the site.

A maximum of 24 construction workers is expected during the construction period on any given day. Some construction workers will commute daily to the site. Others will occupy a portion of the existing construction camp housing at Hale Pohaku. Once the telescope is operational, previously approved astronomer dormitories and common space at the Hale Pohaku Mid-Level Facilities will be used by Gemini staff personnel.

Complexities involving conditions imposed by funding agencies (i.e., money cannot be released until permit requirements are met), the scale and technical complexity of this new generation of giant telescopes, the added requirements of an international collaboration, and the unique conditions encountered when undertaking high-altitude construction may delay initiation of construction by more than one year and completion of construction by more than three years.

#### SUMMARY OF COMMENTS:

This application was referred to the following agencies for their review and comment. The Department of Health, Office of State Planning, Office of Hawaiian Affairs, Department of Land and Natural Resources' Divisions of: Land Management, Historic Preservation, Forestry and Wildlife, and Natural Area Reserve System, and the County of Hawaii Planning Department. Substantive comments received are as follows.

##### Historic Preservation Division

No historic sites have been found in any of the subject parcels which have been surveyed by archaeologist on several different occasions. Construction of the proposed Gemini Northern 8-Meter Telescope will have "no effect" on historic sites.

On page 16 of the application there is reference to the preparation of an Historic Preservation Management Plan for the UH Management Area on Mauna Kea, which concludes with the statement that our office is currently refining the scope of work for this plan. For your information, the revised scope of work was sent to the Institute for Astronomy on July 2, 1993 for their approval. We are still waiting a response, which we trust will be forthcoming shortly since approval of future projects is contingent on completion of the Management Plan.

#### ANALYSIS:

Following review and acceptance of the application for processing, the applicant, by letter dated February 24, 1994, was notified that:

1. The proposed use is a conditional use in the Resource Subzone of the Conservation District according to Title 13, Chapter 2, Administrative Rules, as amended.
2. A public hearing pursuant to Chapter 183-41, Hawaii Revised Statutes, as amended, is not required.
3. The requirements of Chapter 343, Hawaii Revised Statutes, have been fulfilled by previous EIS.

The project site is not in the County of Hawaii's Special Management (Coastal Zone) Area.

Section 13-2-21(b)(1) of the Department's administrative rules requires all applications be reviewed in such a manner that the objective of the subzone is given primary consideration.

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

The most widely recognized and perhaps most important natural asset or resource of the Mauna Kea summit is its superb qualification as an astronomical observatory site. The summit offers astronomers excellent image sharpness, atmospheric transparency, and low infrared background. It is the best astronomical site in the northern hemisphere and, in recognition of this fact, was designated by Governor's Proclamation as the Mauna Kea Science Reserve. The proposed Telescope, therefore, is consistent with the objective of the Resource subzone.

Telescopes (observatories) have been constructed within the Science Reserve since the 1970's. Most of the social and environmental problems associated with these projects have been resolved. This may be the reason for the dearth of responses to our request for comments. Moreover, this project is being constructed in accordance with University's master plan, the Mauna Kea Science Reserve Complex Development Plan. With the elimination of the U.H. 24-inch Planetary Patrol Telescope, this project will be eleventh of thirteen planned telescopes.

Both the project site and batching plant site are formerly disturbed areas. No long-term adverse impact is expected by this project.

Successful completion of this project will enhance the State's international reputation for astronomical studies and add to the critical mass of astronomy "industry" in the State.

Deviation from the Department's standard one-year initiation and three-year completion of work is allowed under Section 13-2-21 (c), HAR, when written justification is provided. Reasonable written justification has been provided for this project.

Staff, therefore, recommends that

#### RECOMMENDATION

The Board of Land and Natural Resources approve this application for the Gemini 8-Meter Telescope and appurtenant facilities at the Mauna Kea Summit 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, its successors and assigns, shall indemnify and hold the State of Hawaii harmless from and against any loss, liability, claim or demand for property damage, personal injury and death arising out of any act or omission of the applicant, its successors, assigns, officers, employees, contractors and agents under this permit or relating to or connected with the granting of this permit.
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9. Other terms and conditions as prescribed by the Chairperson.

Respectfully submitted,



DON HORIUCHI  
Staff Planner

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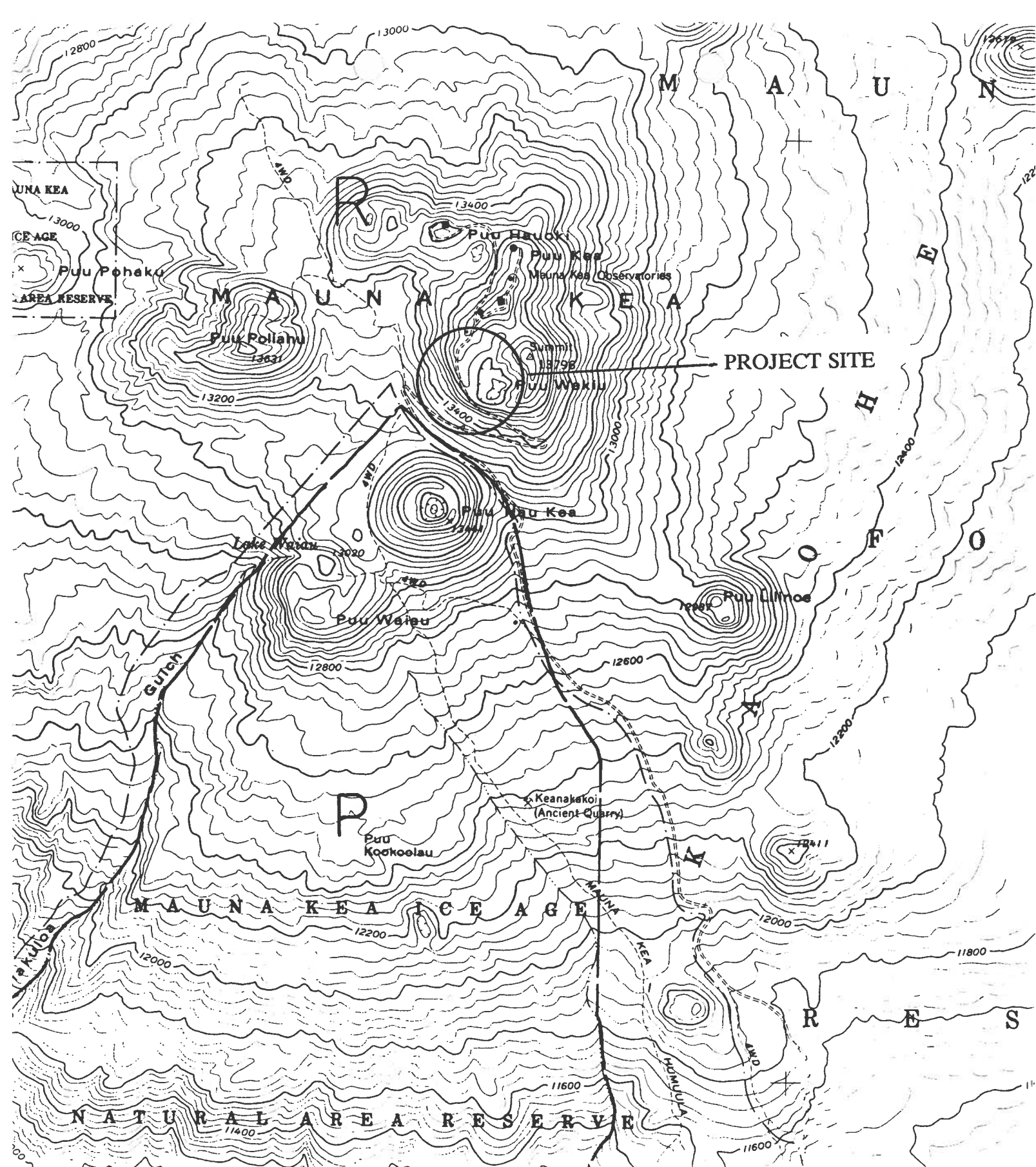
Attachments

Approved for Submittal:



KEITH W. AHUE





CDUA HA-2691  
Conservation District Map



CANADA  
FRANCE  
HAWAII  
TELESCOPE

ACCESS ROAD TO  
NASA IRTF and  
KECK OBSERVATORY

RETAINING  
WALLS

MIRROR WASH  
HOLDING TANK

SEEPAGE BED

SEPTIC TANK

EXISTING  
ACCESS ROAD

CFHT SUBLEASE BOUNDARY

PARKING/UNLOADING  
INTO ENCLOSURE

RETAINING WALL

GEMINI SUBLEASE BOUNDARY

GEMINI 8m TELESCOPE  
SUPPORT FACILITY

AIR EXHAUST DUCT

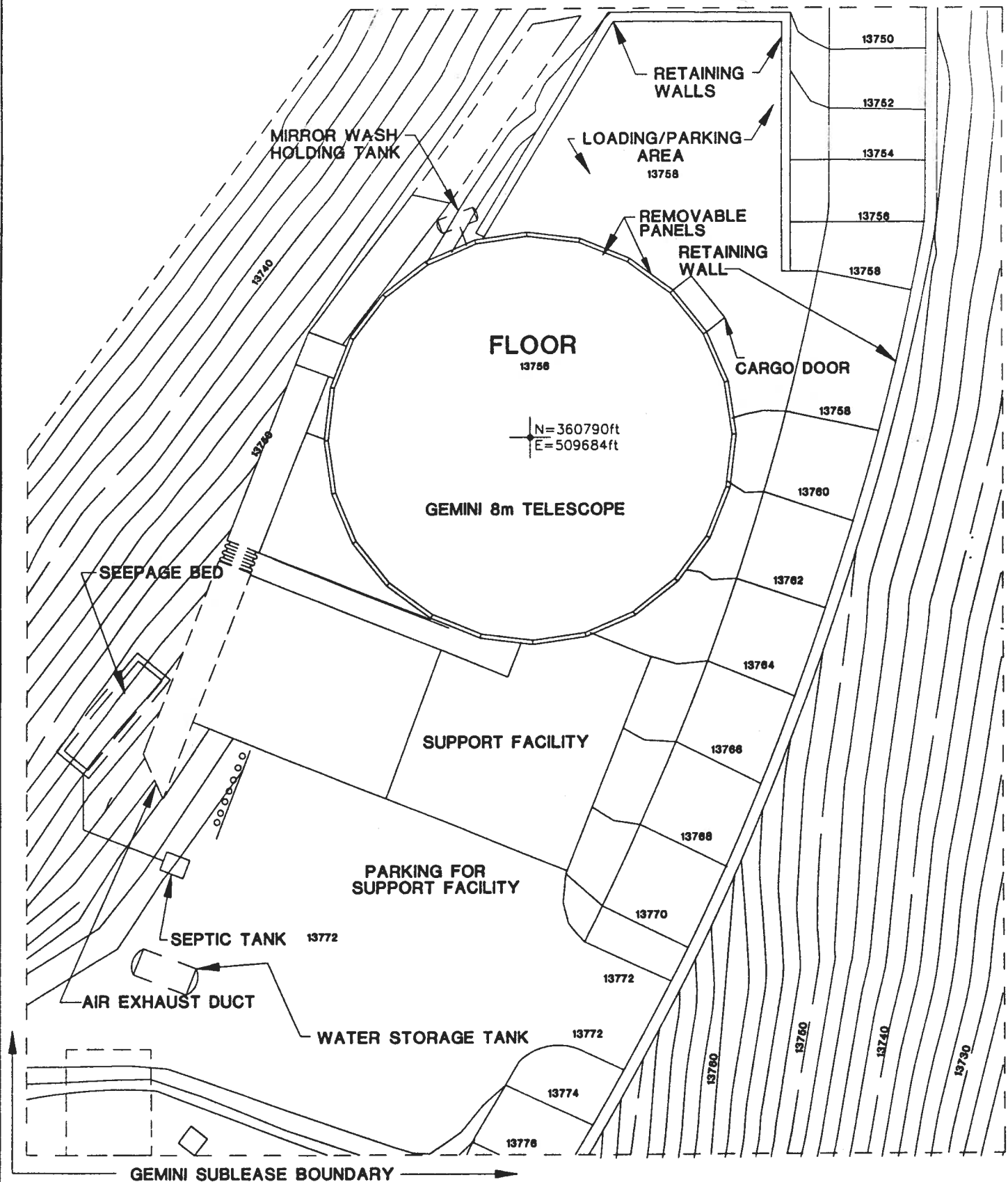
PARKING FOR  
SUPPORT FACILITY

WATER STORAGE TANK

ROAD ALIGNMENT  
UNCHANGED TO SOUTH  
UH-88 Inch TELESCOPE

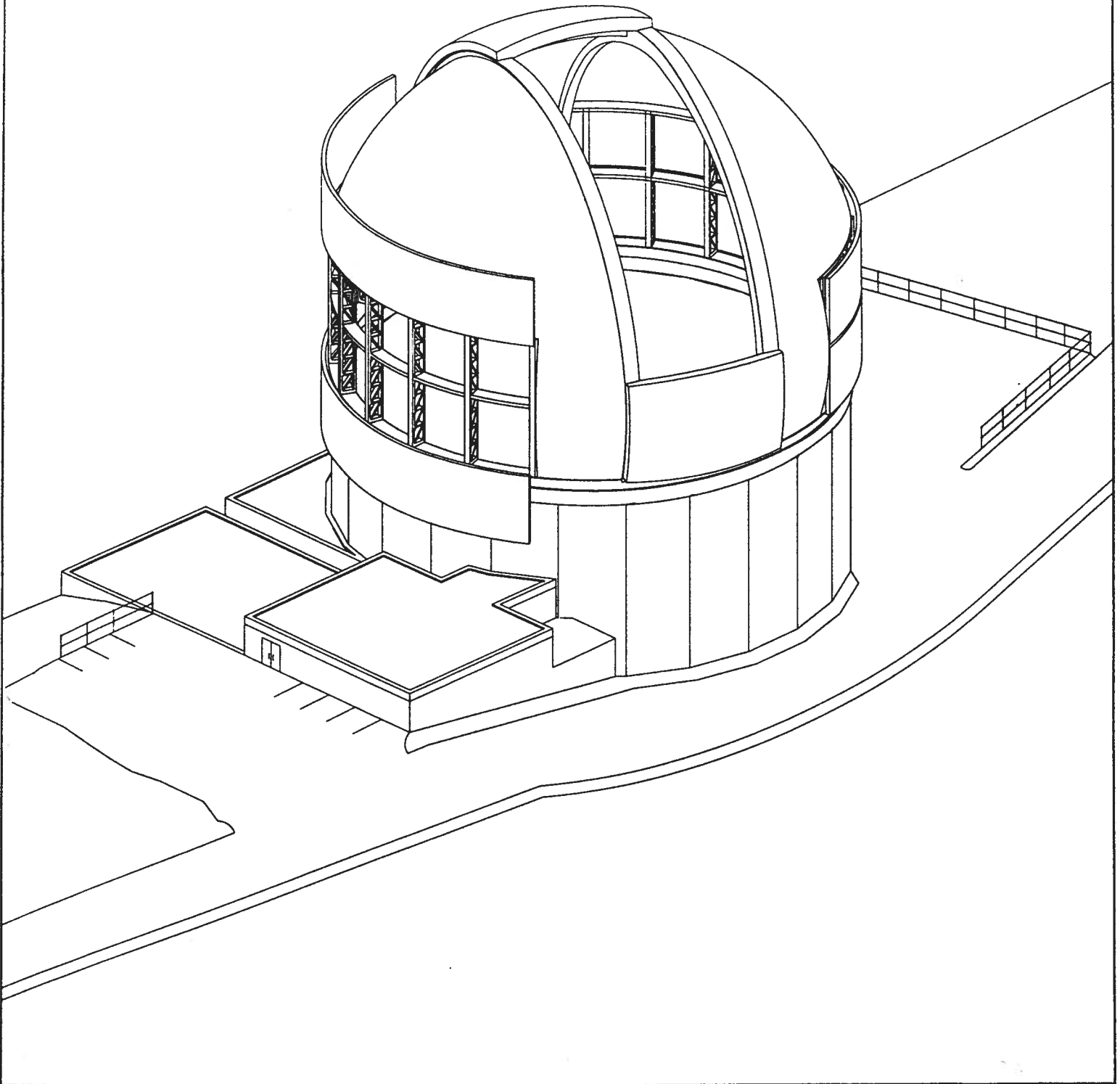
CDUA HA-2691  
Project Site Plan

Exhibit 4



CDUA HA-2691  
Project Plan

Exhibit 5



CDUA HA-2691  
Building Perspective