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HISTORIC PRESERVATION PROGRAM
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT

June 18, 1981

MEMORANDUM

TO: CISSY
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: DON HORIUCHI
OFFICE OF CONSERVATION AND ENVIRONMENTAL AFFAIRS

SUBJECT: HAWAII STATE VETERAN'S CEMETERY

I am sending you 4 copies of the Conservation District Use Application persuant to my discussion with Anna of M & E Pacific. A negative declaration (attached) was issued by this Department on May 4, 1989 and the application was approved on August 25, 1989.

If you have any questions on the matter, please call me at 548-7837.

Don Horiuchi

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1991-06-23-OA-FEA

PRELIMINARY ENVIRONMENTAL ASSESSMENT
For
CONSTRUCTION OF HAWAII VETERANS MEMORIAL CEMETERY
At
KANEOHE, OAHU

A. APPLICANT

Department of Defense, STATE OF HAWAII

B. APPROVING AGENCY

Department of Land and Natural Resources, State of Hawaii

C. AGENCIES CONSULTED

Federal:
Veterans Administration, Department of Memorial Affairs

State of Hawaii:
Department of Transportation, Highways Division

City and County of Honolulu:
Board of Water Supply
Department of Public Works, Wastewater Management Division
Department of Land Utilization, Land Use Controls Division

D. GENERAL DESCRIPTION OF THE ACTION'S CHARACTERISTICS

The proposed action is for the construction of a new veterans cemetery on Oahu that will provide interment facilities for veterans after the closing of the National Memorial Cemetery of the Pacific at Punchbowl to body burials. The proponent agency is the State Department of Defense. The proposed cemetery is on State owned land situated to the north (rear) of the Hawaiian Memorial Park Cemetery (HMPC). The parcel is approximately 90 acres in size. Another parcel owned by HMPC, approximately 33 acres in size north of the State property is being considered as an addition to the cemetery, but no agreements have been completed concerning its use at this time. The accompanying preliminary masterplan shows the proposed use of this parcel in addition to the State-owned parcel.

The State parcel land use will consist of burial grounds and columbaria, administrative and maintenance facilities, and ceremonial and memorial facilities. At this time it is planned to have approximately 40 acres available for body burials (with an additional 10 acres of burial area from the HMPC parcel). To provide sufficient moisture to maintain the turf quality covering these areas, it is planned to provide landscape irrigation during the summer months. Approximately 730,000 gallons would be required every three days per application (estimated at once every three days). To provide the least expensive water service to this development, an offsite water main along Hawaiian Memorial Park Cemetery road to the existing 12-inch water main along Kamehameha Highway must be constructed. The Board of Water Supply's approval of this hookup is required to provide domestic, fireflow demand, and irrigation water. Plan review coordination has been initiated with the Board of Water Supply.

An existing 8-inch sewer line runs parallel to Kawa Stream and terminates at the southerly end of Parkway subdivision adjoining the HMPC parcel. An offsite sewer line connection to this existing main is required, and requires a sewer easement through land belonging to Parkway PD-H Community Association.

Complete underground electric, telephone and street lighting systems are proposed. The new utilities will tie into the existing electric and telephone systems on Kamehameha Highway through new conduits buried along the existing cemetery road.

Access to the site will be through the existing Hawaiian Memorial Park property as shown on the accompanying site analysis drawing. The road right-of-way on Hawaiian Memorial Park to the State parcel has a 44 feet right-of-way. Discussions with Hawaiian Memorial Park personnel indicated it would be difficult to widen this road because of the close proximity of the existing graves to the edge of the right-of-way. These are approximately 5 feet from the edge of the road. A 44 feet right-of- way could allow for two-way traffic with a 4 feet shoulder, 8 feet parking lane, and 10 feet traffic lane in each direction. For purposes of concept plan preparation, it has been assumed that new streets will conform to the City and County of Honolulu Subdivision Rules and Regulations. In accordance with this regulation, the following standards have been observed:

a) street intersections shall be as near right angles as possible, jogs and acute angles shall be kept to a minimum, and T-intersections shall be separated by at least 300 feet;

b) gradients for secondary (circulation) streets shall be less than 10 percent and for minor (overlook and maintenance vehicle) roads less than 15 percent;

c) roadway curve radii shall be a minimum of 20 feet for secondary (circulation) streets and 30 feet for primary access streets;

d) secondary circulation street right-of-way widths are 44 feet, including 4 feet shoulders on each side, and 36 feet right-of-ways, including 8 feet single-side parking lane are assumed for minor streets with burial areas primarily on one side of the street; dead-end streets, for example to overlooks and maintenance facilities, have 32 feet right-of-ways including 6 feet shoulders;

e) future access by Hawaiian Memorial Park has been reserved by providing a 60 feet primary right-of-way along the western boundary of the State's parcel.

Two-way traffic has been assumed on all streets, and double sided parking assumed on secondary circulation streets during burial ceremonies and visits by relatives and friends to graves. No parking should be permitted on minor streets. Graves should not be closer than 10 feet from the edge of the street and 20 feet from the edge of the property. The maximum distance from any gravesite to the street should be 275 feet.

Underground drainage systems will be needed to provide storm water collection and disposal. Roadside gutters, drop inlets, and storm drain pipes will be used to collect runoff from turf and paved/hardened surfaces. Sheetflow from burial and natural catchment areas will be conveyed by drainage swales to the most convenient inlet. No development will be permitted within the boundaries of the 100-year floodplain for Kawa Stream except for roadway culverts necessary for traffic circulation. Such culverts or bridge structures will be designed to avoid flooding of upstream and downstream facilities which may be sited adjoining the floodplain.

A double criteria is recommended for the design of on-site drainage facilities. The primary drainage way, Kawa Stream should be retained where possible as a floodway. The 100-year floodplain has been identified as discussed previously for the purposes of complying with VA site development standards concerning development in flood hazard areas. Where this would severely limit or threaten the site development, drainage structures should be designed to convey an equivalent 100-year peak discharge. A secondary drainage system consisting of grassed swales, curbs and gutters, and underground storm drains should deliver surface runoff from the cemetery to the primary drainage way. The design storm for the secondary drainage structures will be a 10-year storm, consistent with City and County of Honolulu drainage standards for areas less than 100 acres in size. Surface inlets should be provided at intervals not to exceed 300 feet along streets and lawn areas to prevent excessive accumulation of surface runoff and possible erosion in burial areas along the alignment of the primary drainage line. Surface runoff that exceeds the capacity of the secondary drainage lines will be intercepted by grassed swales and drop inlets and conveyed in the primary drainage line thereby permitting an increase in the size of burial areas.

E. SUMMARY OF AFFECTED ENVIRONMENT

1. Relation to Existing and Proposed Land Use

The Kaneohe site for the Veterans Cemetery on Oahu was selected from among four candidate sites that were described in a report to the State Legislature in 1987. It is in the Koolaupoko District within the City and County of Honolulu. The site, shown on site analysis drawing, adjoins the Hawaiian Memorial Park which is situated to the west of the site. To the south and east, the H-3 and Kapaa Quarry, respectively, are separated from the site by a high ridge (peak elevation 870 feet). To the north is located the Parkway subdivision and an existing State Department of Transportation base yard (maintenance facility). The Hawaiian place name is Kawaewae.

The site selected for the cemetery consists of two parcels of land identified by tax map key as 4-5-33:2 and a portion of 4-5-33:1. The former is owned by the State of Hawaii and is presently being leased on a monthly basis; the lessee is using the land primarily for livestock grazing. The State's parcel is approximately 89.5 acres in size. The other parcel is approximately 33.5 acres, and thus the total potential area available is 123 acres.

Of the two parcels, the State-owned parcel is more readily developable because of more favorable slopes, access, and better drainage. Excluding these unfavorable areas, there is approximately 51 acres of readily developable land on the State-owned portion and 10 acres on the other parcel.

Both parcels consist of mixed land use designations. These are shown below:

Parcel	Classification	Source	Acreage
2	Conservation	State Land Use Plan	30
	Urban	State Land Use Plan	60
	Agriculture	C&C General Plan	63
	Preservation	C&C General Plan	27
	Zone Ag-1	C&C Land Use Ord.	63
	Zone P-1	C&C Land Use Ord.	27
1	Conservation	State Land Use Plan	15
	Urban	State Land Use Plan	14
	Agriculture	C&C General Plan	13
	Preservation	C&C General Plan	16
	Zone Ag-1	C&C Land Use Ord.	19
	Zone P-1	C&C Land Use Ord.	10

Relative to the State conservation district designation, the land under this classification is within the General subzone. "The objective of this subzone is to designate open space where specific conservation uses may not be defined, but where urban use would be premature." This subzone is the least restrictive and includes uses permitted under the (P), (L), and (R) subzones; the latter (resource) subzone permitting "lands necessary for providing future parkland and lands presently used for national, state, county, or private parks."

2. Relation to Publicly Owned Land and Other Natural Resources

The site is presently accessible only from an unimproved road near the entrance to the DOT base yard. Elevations on the site range from 250 feet to 870 feet, mean sea level (all elevations in this assessment use msl as datum). The relief may be characterized as between the extremes of moderate rolling terrain to steep rugged terrain. The site analysis shows the areas which have slopes in excess of 25 percent. This slope was selected as a practical upper limit that would not require extensive grading to avoid operation and maintenance equipment difficulties. The VA site development standard for slopes is between 2 to 15 percent. Local experience of Hawaiian Memorial Park shows slopes are generally 20 percent or less. Areas where the slopes presently exceed 15 percent will require grading. At this time, areas exceeding 25 percent slope should not be considered for body burial areas as they would require extensive grading to be suitable for cemetery use. In the future, if expansion of the cemetery is required, one option would be to provide terraces consistent with the existing ground contours.

The site is dissected at the northern boundary by Kawa Stream where it is enclosed by a deep gulch approximately 50 feet deep. Two intermittent streams originating in the headwaters confluence approximately 1000 feet from the northern boundary. These streams divide the site into three portions. One of these portions contains most of the land within parcel 1; the tributary stream closely parallels the property boundary. The other tributary stream roughly dissects parcel 2. These stream courses are prone to flash floods, poor drainage, and high water tables; conditions undesirable from the cemetery development standpoint.

The flood hazard has not been officially identified on Federal Emergency Management Administration (FEMA) flood plain hazard maps. However, for the purposes of complying with Federal regulations concerning the development of Federally (assisted) projects within floodplains, the 100-year floodplain has been identified on the site analysis drawing. The basis for this analysis is based upon a water surface profile of the existing stream. The impact of the flood zone is to limit the potential development of the stream valleys to narrow linear strips, suitable only for roads and perhaps base yard facilities.

The soils on the site may be characterized on the basis of the soil survey prepared by the U.S. Department of Agriculture Soil Conservation Service. Three predominate soil types have been mapped on the site as follows:

Soil Type	Water Table (ft.)	Drainage (in/hr)
Lolekaa silty clay/loam	Greater than 5	2.0 - 6.3
Kaneohe silty clay/loam	Greater than 5	2.0 - 6.3
Hanalei silty clay	Zero to 5	0.6 - 2.0

The Lolekaa silty clay is generally found on the moderate rolling slopes presently being used for pasture. The Kaneohe silty clay is generally found on the steeply sloping ridges and stream valley terraces. The Hanalei silty clay is found in the stream valley bottoms. The latter soil type is unsuitable for cemetery development, and is poorly suited for use as topsoil, roadways and roadway fill. The Lolekaa and Kaneohe formations are suitable for use as top soil, roadway fill, and roadways except where steep slopes exceeding 60 percent are encountered. The soil map was used for the preparation of a preliminary soil erosion control plan for the project.

Natural vegetation in the site is grassland, shrubland, and bottomland forest. Flora typical of these areas include pangola and kikuyu or buffalo grass; Christmas berry, silk, oak, haole koa, and guava, *mango, ohia*, and java *plum*; and *monkeypod*, hau, and eucalyptus. Large vertebrate wildlife reported on the site by Hawaiian Memorial Park personnel include mongoose, pig, feral cats, and wild dog. Probably over 25 years ago, the moderate slopes up to the 400 feet elevation were cleared for grazing cattle. A few mature trees exist (e.g. plum and Christmas Berry) but not a significant quantity. The grass type is course and good to feed cattle but not for lawn turf.

3. Relation To Coastal and Mountain Views

A site inspection was made for the purpose of determining the orientation of views at the site. The results are summarized on the site analysis drawing. Spectacular views of the Koolau Range are offered from nearly all locations on the interior of the site except for the stream valleys. From the ridgeline at the southern and eastern boundaries of the site, the views would include, however, the traffic on the H-3 and the quarry operations. Thus the ridgeline provides a visual barrier to less desirable views to the south. At the northern portion of the site, the central and bounding ridgelines also provide views of Kaneohe Bay in addition to the Koolau Range.

4. Relation To Receiving Waters and Ground Water

The prevailing tradewinds from the northeast and easterly directions insure moderation of subtropical temperatures all year and being on the windward side of the Island of Oahu, plentiful rainfall, except in the summer months. Annual soil temperature is 70 degrees to 73 degrees F. Mean annual rainfall is 65 inches which varies from a mean monthly high of 8.7 inches in January to a mean monthly low of 2.0 inches in June. Annual pan evaporation is estimated to be 50 inches.

Kawa Stream is intermittent and subject to only miscellaneous stream flow measurements. One such measurement near the project site in June, 1959 indicated an average flow of 0.019 mgd.

The site is underlain by the Honolulu Volcanic Series of lava flows, cinders, and tuff. This is relatively minor aquifer in the region. Beneath this series is the older Koolau Volcanic Series. The latter is the principal aquifer in the region. The dikes that make up this complex control the occurrence of groundwater. Wells in the dike complex range from 1 to 11 gallons per minute (gpm) per foot of well drawdown. In contrast wells in the Honolulu Volcanic Series located in Haiku Stream Valley were reported to have specific capacities ranging from 2 to 40 gpm of drawdown.

Areas identified for burial are generally on slopes that at present are less than 25 percent. Surface grading of lawn areas will provide slopes between 2 to 15 percent to conform to Veterans Administration criteria. In areas where cut/fill must be accomplished to meet maximum street gradient requirements, roadway embankments and cuts are presently planned to be 33 percent grade or less; this slope criteria will be verified during the design phase of the project, however.

5. Relation To Historic, Cultural, and Archaeological Resources

Based on a review of archaeological and historical sites on Oahu by Sterling and Summers, no significant sites were identified as indigenous to the cemetery site.[1] The Kawa'ewa'e Heiau is located on Parcel 4-5-33:1, however, not on the portion being considered for the cemetery development.

Two non-archaeological/destroyed sites were identified by Sterling and Summers. One, at an elevation of approximately 200 feet was a *holua slide*. This was a long narrow depression which was used by Hawaiians in a game of chance. The other site, the Puumakani Heiau, at an approximate elevation of 400 feet, was destroyed when the stones were removed and used for building a cattle corral farther down the slope. A field reconnaissance by staff of reviewing agencies has been recommended which could attempt to identify these locations, confirm their conditions, and recommend any appropriate investigation and salvage measures prior to and during construction.

F. SUMMARY OF MAJOR IMPACTS

The main entrance road to Hawaiian Memorial Park Cemetery is approximately 1200 feet from the H-3 exit ramp entering Kamehameha Highway. Funeral processionals entering the cemetery will be crossing the flow of traffic exiting from H-3. Traffic will be backed up on the exit ramp unless it is permitted to merge with the funeral procession.

During construction, soil erosion and dust control will be a critical aspect of the project due to the extent of development downstream and downwind, and the size of the area requiring mass grading.

Present availability of the water resources in the windward area will be impacted by the project during the summer months when irrigation is contemplated. Other utility loads are believed to be relatively small and not a significant impact upon the existing systems. One of the headwater tributaries of Kawa Stream will be filled to improve the slope in the burial areas for operation and maintenance. The fill material will be a combination of reworked material from other portions of the site and material imported from off-site. Depending upon the magnitude that will be brought using the Hawaiian Memorial Park entrance traffic construction noise, and deterioration of roadways could also be impacts of the project.

G. SUMMARY OF MITIGATION MEASURES

Consideration will be given to means to facilitate traffic flow from the exit ramp from H-3 in order to avoid congestion on the ramp. In addition, measures to reduce the potential congestion problem at the entrance to the Hawaiian Memorial Park when a large number of vehicles exit, e.g. after a memorial service will be coordinated with the State Department of Transportation during the design phase of the project. Options that could be considered include the construction of a traffic or police activated traffic signal at the entrance to facilitate traffic exiting the cemeteries, and lengthening the exit lane

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1. Elspeth P. Sterling and Catherine C. Summers, Sites of Oahu, Bishop Museum Press, Honolulu, 1978

to permit additional time for merging or adequate sight distance for stopping cars while the processional passes.

By thoroughly planning out the Soil Erosion Control Plan, required by the City and County of Honolulu, erosion control may be accomplished in a manner to reduce the potential impacts. In general, construction of the main road will be required as an initial work item to provide a dam for a sedimentation basin. The primary storm drain which is to provide the drainage outlet for the cemetery's watershed will be fitted with a vertical elbow which can be removed at a later date when the complete drain line is installed. Other aspects of the erosion control plan will specify a phasing of the clearing and grubbing and the cut and fill operations in such a manner as to provide "green belts" of natural grasslands to help trap sediments during periods of high runoff. At all times, at least one-half of the site will be seeded to further control the runoff, as well as, sedimentation traps, mulching, silt screens, and other such control systems will be required as needed.

Control of dust during construction will be a more costly item. As a minimum, constant sprinkling of mass grading areas will be required at all times and, in addition, a large dust screen could be required in large grading areas to prevent excessive dust from blowing into the neighboring Hawaii Memorial Park Cemetery. The phasing of the project has been developed (see masterplan) with the dust control problem as an important consideration. Generally, the mass grading would proceed from the most windward part of the site and proceed leeward. The time and area of exposure adjacent to Hawaiian Memorial Park will be minimized by this phasing.

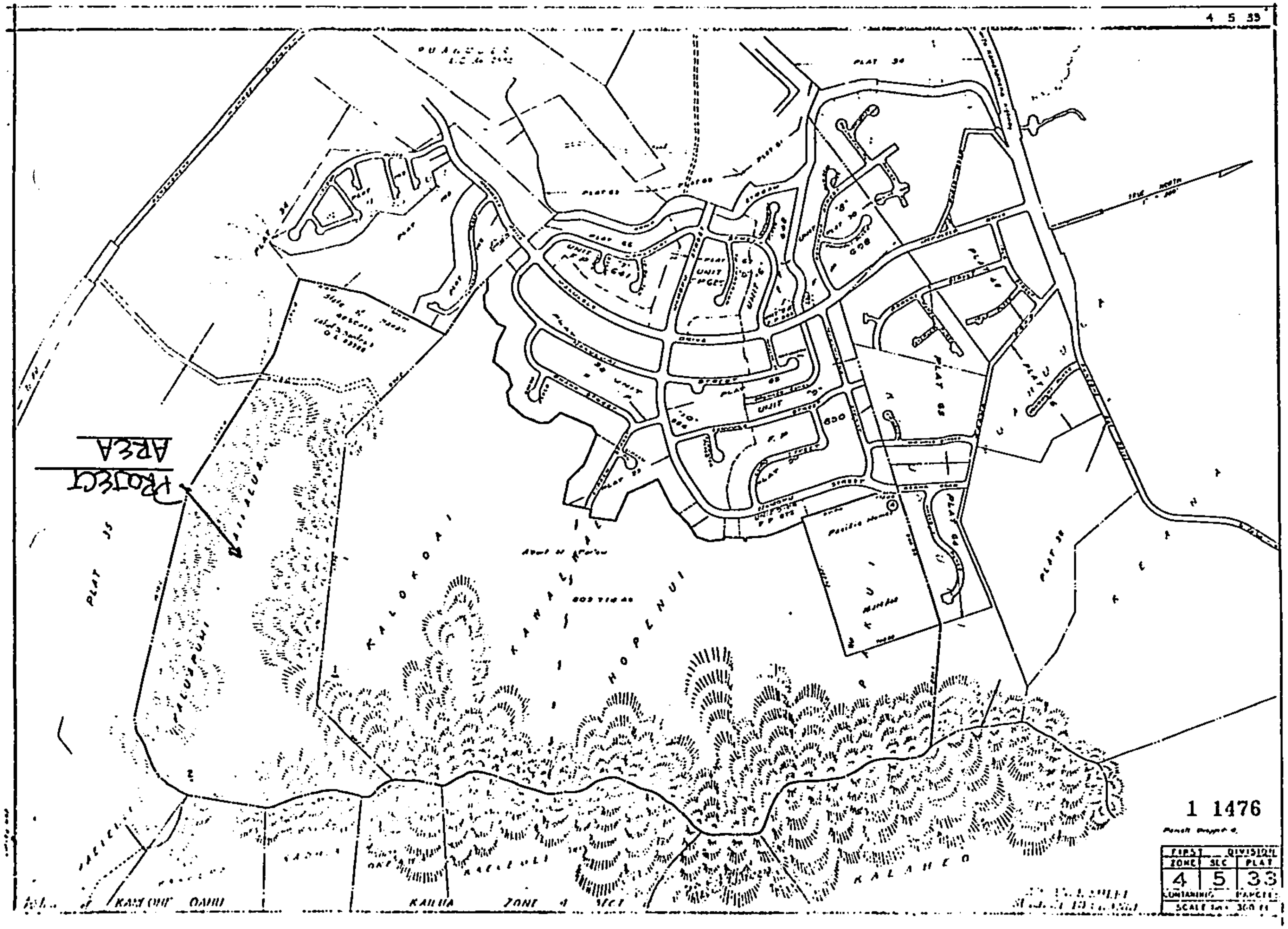
The development of additional water resources may be required (either on or off the site) to provide for adequate water supply. The requirement for this is under review at present by the Board of Water Supply.

The location of sufficient quantities of suitable material during the design phase will be critical to minimizing off-site impacts. Among options to be reviewed include future construction projects in the area which will produce large amounts of potential fill material, borrow sites on the HMPC adjacent parcel and reducing the fill requirement by optimizing the fill versus terraced construction opportunities at the site.

H. DETERMINATION

In conformance with Title II, Chapter 200, Environmental Impact Statement Rules, this early assessment has characterized the technical and environmental nature of the project, identified potential impacts, evaluated the potential significance of these impacts, and provided for detailed study of the major impacts during the design phase of the project.

After an appropriate period of consultation with interested agencies and affected parties, a final environmental assessment of the proposed action shall be prepared.



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