

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

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RECEIVED

JAN NAOE SULLIVAN
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1999/SMA-60 (ASK)
1999/SV-12 (ASK)

UFC. S. 11.1
October 18, 1999 QUALITY CONTROL

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
State of Hawaii
State Office Tower, Room 702
235 South Beretania Street
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

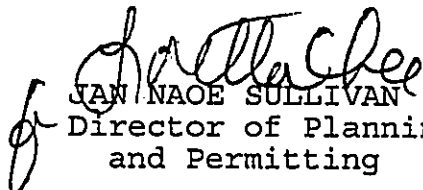
CHAPTER, 343 HRS
Environmental Assessment (EA)/Determination
Finding of No Significant Impact

Owner/Applicant: GTE Hawaiian Tel International, Inc.
Agent : R.M. Towill Corporation
Location : Kahe Point, Oahu
Tax Map Keys : 9-2-3: por. 2, 9, and 11
Requests : Special Management Area Use Permit and
Shoreline Setback Variance
Proposal : Fiber optic cable landing facility
Determination : A Finding of No Significant Impact is
Issued

Attached and incorporated by reference is the Final EA prepared by the applicant for the project. Based on the significance criteria outlined in Title 11, Chapter 200, Hawaii Administrative Rules, we have determined that preparation of an Environmental Impact Statement is not required.

We have enclosed a completed OEQC Bulletin Publication Form and four copies of the Final EA. If you have any questions, please contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,


JAN NAOE SULLIVAN
Director of Planning
and Permitting

JNS:am
Encls.
posse doc no. 11293

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1999/CLOG-6831

FILE COPY

Prepared in accordance with Chapter 343, Hawaii Revised Statutes

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FINAL ENVIRONMENTAL ASSESSMENT

1999-11-08-0A-FEA-Kahe Beach Fiber Optic Cable Landing

DEPT OF PLANNING
and PERMITTING
CITY & COUNTY OF HONOLULU

SOUTHERN CROSS CABLE NETWORK

**SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU**

October 1999

GTE Hawaiian Tel International, Inc.
1177 Bishop Street
Honolulu, Hawaii 96813

R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

99 OCT 18 PM 3:37

FINAL ENVIRONMENTAL ASSESSMENT for DEPT OF PLANNING
and PERMITTING
CITY & COUNTY OF HONOLULU

Southern Cross Cable Network
Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

October 1999

Prepared for:
GTE Hawaiian Tel International Inc.
1177 Bishop Street
Honolulu, Hawaii 96813

Prepared by:
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

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- I. CONSTRUCTION DRAWINGS, GTE HAWAIIAN TEL OAHU CABLE STATION AT KAHE POINT, PHASE 2, Honouliuli, Oahu, Hawaii, September 1999.
- II. CONSTRUCTION DRAWINGS, GTE HAWAIIAN TEL OAHU CABLE STATION AT KAHE POINT, Honouliuli, Oahu, Hawaii, June 1999 (approved plans for terminal building).
- III. NORTH KAHE BEACH CABLE ROUTE RECONNAISSANCE, Kahe Point, Oahu, Hawaii, Sea Engineering, Inc., September 1998.
- IV. NORTH KAHE BEACH CABLE ROUTE SURVEY, Kahe Point, Oahu, Hawaii, Sea Engineering, Inc., September 1999.
- V. LETTER FROM STATE HISTORIC PRESERVATION DIVISION, DLNR, dated March 25, 1999.

PROJECT SUMMARY

Project: GTE HAWAIIAN TEL INTERNATIONAL, Inc.
SOUTHERN CROSS CABLE NETWORK

Applicant: GTE Hawaiian Tel International Inc.
P.O. Box 2200
Honolulu, Hawaii 96841
Contact: Mr. Dennis Kwock
Phone: (808) 546-8971

Accepting Authority: Department of Planning and Permitting
City and County of Honolulu

Location: Kahe Point, Oahu, Hawaii

Project Size: Installation of four (4) fiber optic cables in submerged lands with combined area of less than 1-acre. Land portion of project involves installation of fiber optic cable infrastructure on overall land area of approximately 4.11 acres.

Land Owners (TMK): Portions of the following parcels:
9-2-03: 02 & 09-GTE Hawaiian Tel Intl. Inc. (lessee)
9-2-03: 11-State of Hawaii, Department of Transportation

Agent: R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941
Contact: Brian Takeda Phone: (808) 842-1133

Existing Land Uses: Beachfront area used for fishing and related recreational uses, and vacant lands mauka of Farrington Highway.

Flood Insurance Rate Map Zone: Zone D

State Land Use District: Submerged Lands - Conservation District
TMK: 9-2-03: 02, 09 & 11-Agricultural District
TMK: 9-2-03: 11-Agricultural District

County Zoning: TMK: 9-2-03: 02 - AG-2
TMK: 9-2-03: 09 & 11 - P-2

DP Land Use Designation: Waianae DP - Agriculture, Parks, and Golf Courses

Chapter 1
INTRODUCTION

1.1 PROJECT PURPOSE AND OBJECTIVES

This environmental assessment (EA) is prepared pursuant to the requirements of Chapter 343, Hawaii Revised Statutes (HRS), and assesses the potential for adverse environmental impacts due to installation of transpacific and interisland submarine fiber optic cables and related infrastructure at Kahe Beach, Oahu.

GTE Hawaiian Tel International Inc., proposes to install a transpacific submarine fiber optic telecommunications cable system that will connect Australia and New Zealand with the U.S. states, Hawaii and California. The Hawaii portion of this system will provide for cable landings at two locations: Spencer Beach Park, Big Island; and, Kahe Beach, Oahu. A project EA has been prepared for the Spencer Beach portion of this project and notice of a Finding of No Significant Impact (FONSI) was published in the Office of Environmental Quality Control (OEQC) Bulletin on March 23, 1999. This EA describes the Kahe Beach portion of the Southern Cross System.

Supplemental information contained in this EA is taken from earlier reports prepared for the GTE Hawaiian Tel, Hawaii Interisland Cable System (HICS), and GST Telecom Hawaii, Inc., Hawaii Island Fiber Network (HIFN).

The proposed Kahe Beach segment of the system will require the installation of three submarine fiber optic cables into a Terminal Building (TB) constructed by GTE Hawaiian Tel International, Inc.. Two of the cables will be transpacific, originating from Belrose, Australia, and Monterrey Bay, California; and, the third cable will originate from Spencer Beach Park, Big Island, Hawaii (Figure 1-1 and Figure 1-2).

The proposed project is intended to fulfill the following objectives:

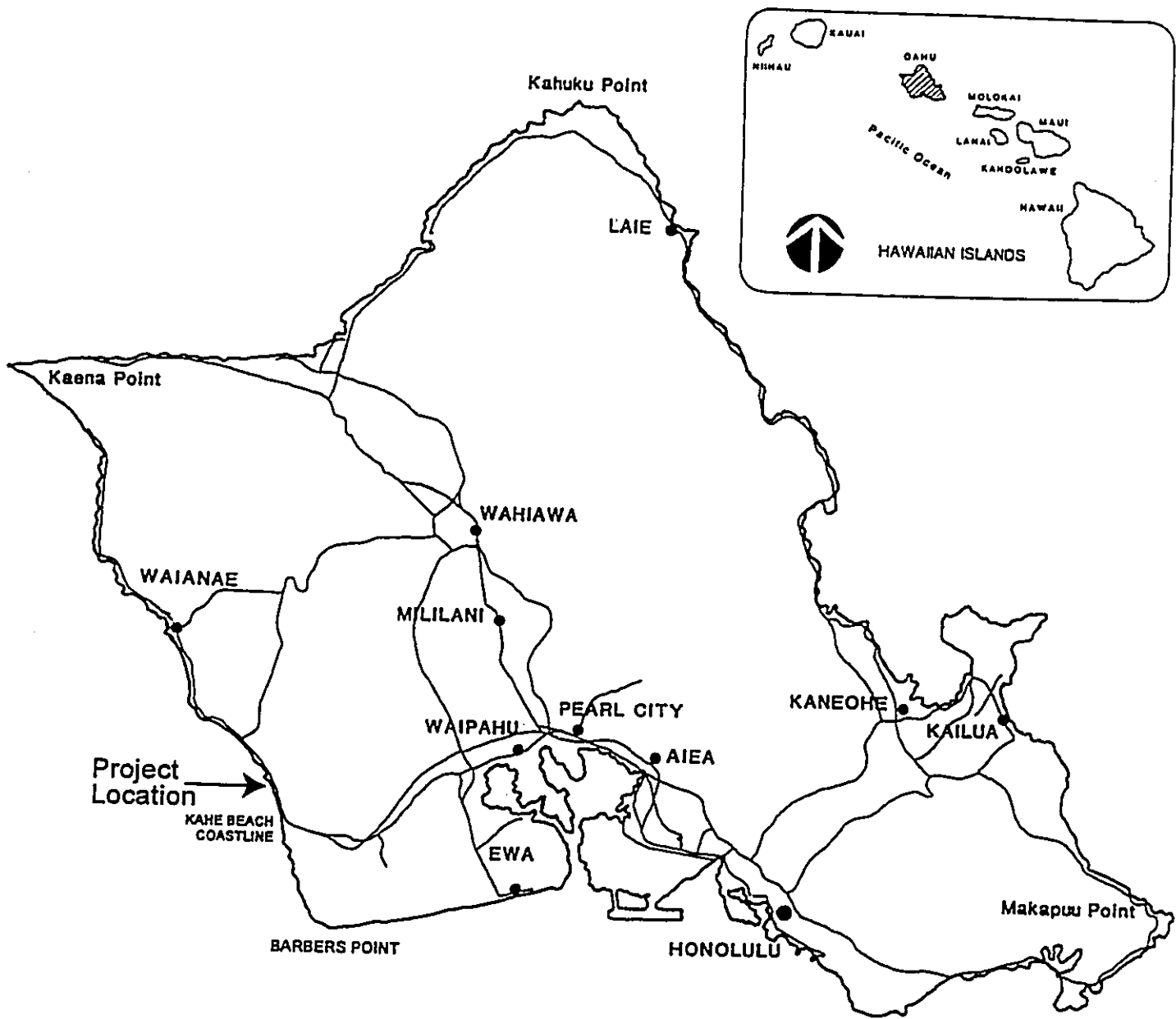
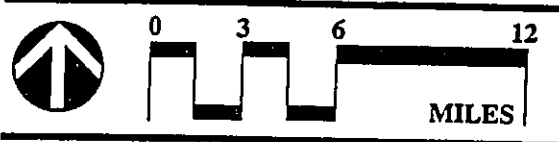


Figure 1-1
Project Location



Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
 GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
 March 1999

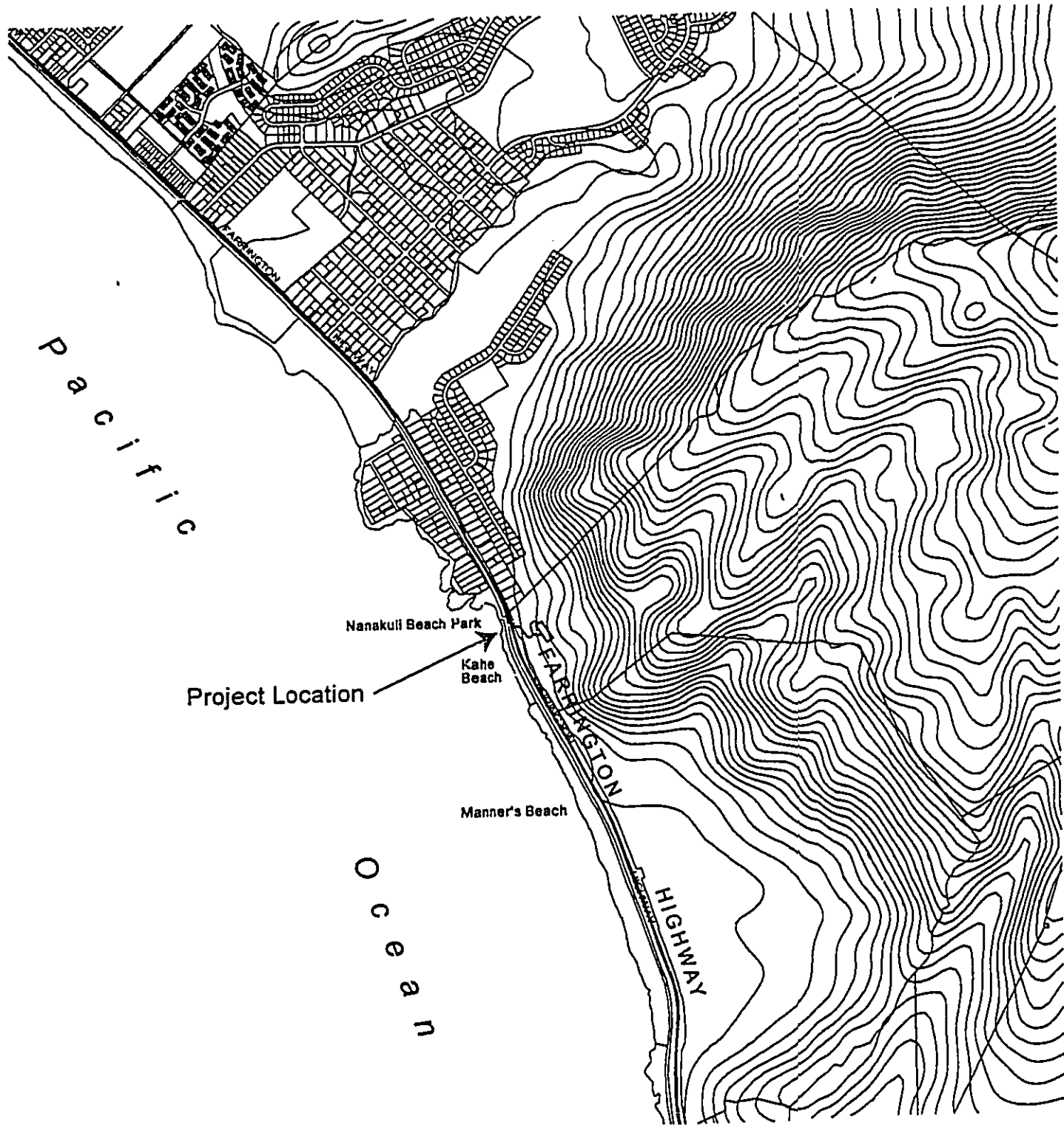


Figure 1-2
Project Vicinity



NO SCALE

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
March 1999

- Provide reliable telecommunications service between Australia and New Zealand, with the U.S.;
- Enhance service now provided through analog cable systems which have limited bandwidth capacity. The proposed Southern Cross cable system will have high operating bandwidth enabling the use of high technology services such as telemedicine and real time videotrafficing; and,
- Provide an alternative to the existing interisland fiber optic cable system between the islands of Oahu and the Big Island in the event of system failure or damage.

1.2 PROJECT LOCATION

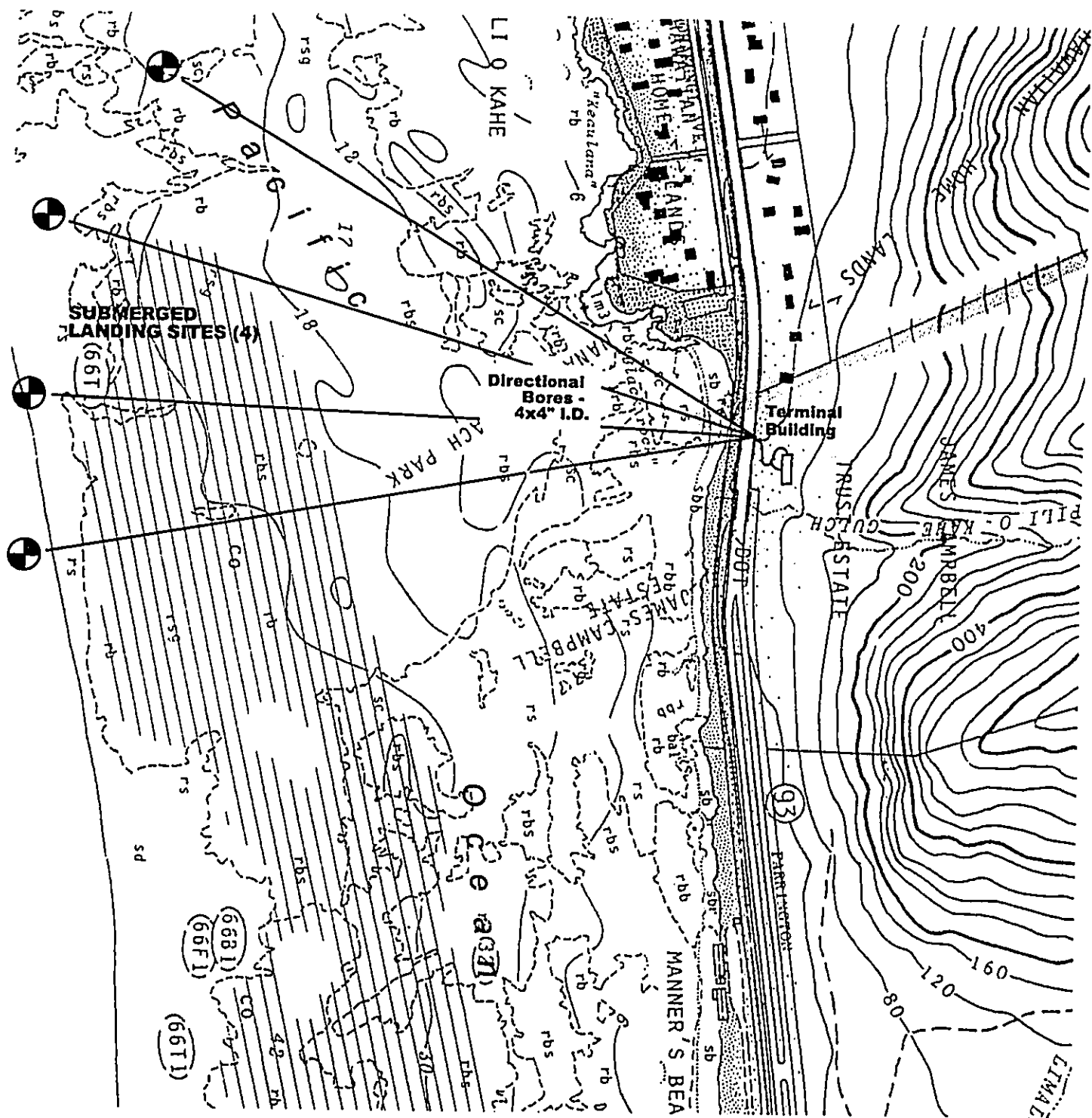
The submerged nearshore fronting Kahe Beach is the proposed landing site for the Australia, California, and Spencer Beach Park cables. The Kahe Beach shoreline is located along the southwest coast of Oahu, to the north of Barbers Point. The shoreline in this area is rocky and interspersed with patches of sandy shoreline at various locations. The rocky portions of shoreline consist of low limestone sea cliffs approximately ± 15 feet high.

The cables once landed, will be routed to the TB. The method for landing the cables will involve use of directional boring originating from the TB to four submerged locations, approximately $\pm 2,500$ linear feet from shore (Figure 1-3).

The State Land Use classification of the proposed landing area is in the Agricultural District and Urban District. Zoning is Ag-2 and P-2. A small portion of land zoned R-5 will also be involved. Submerged lands surrounding the Hawaiian Islands are in the Conservation District to the three (3) mile territorial limit. All necessary State, Federal, and City and County of Honolulu permits will be obtained prior to start of construction.

1.2.1 DIRECTIONAL BORING SITE

Directional boring equipment will be staged at the Terminal Building site to facilitate installation of four, 4 inch conduits from the TB to the submerged nearshore cable "landing" sites. Three conduits will be used to accept cable from Australia, California, and Spencer Beach Park. The fourth conduit



BOTTOM TYPE LEGEND

- rb Hard bottom
- rbs Hard bottom with sand pockets <60% area
- rs Hard bottom with sand >60% area
- rbb Basalt boulders
- sd Sand deposit
- sc Sand channel
- sbr Sand and rubble beach
- sb Sand beach
- sbb Boulder beach

Note: Bore exit locations are approximate, refer to Appendix - Sea Engineering, "North Kahe Beach Southern Cross Cable Route Survey", September 1999.

Figure 1-3
Submerged "Landing" Sites



Southern Cross Cable Network
**SUBMARINE FIBER OPTIC CABLE
 LANDING AT KAHE BEACH, OAHU**
 GTE Hawaiian Tel International

R. M. TOWILL CORPORATION

Oct 1999

Source: Sea Engineering, Inc., 1998, and Coastal Atlas, Map 66,
 Kahe, Oahu, 1981

will be installed to serve as a spare to be used during an emergency or for future upgrades to the system. The directional boring equipment will be set up in a pit and positioned to ensure proper direction to each of the four submerged "landing" sites.

1.2.2 SUBMERGED LANDING SITES

Four submerged locations within the Kahe Point nearshore will serve as the cable landing points (Figure 1-3). Each landing point will be approximately $\pm 2,500$ linear feet from shore (approximately $\pm 2,800$ linear feet from the TB), with a minimum separation of approximately ± 300 feet from each cable landing site. This separation is designed to provide safety and security to the cables from manmade and natural disasters (e.g., ships anchors, undersea seismic activity, or storm generated debris, etc.).

1.2.3 SUPPORT INFRASTRUCTURE

The project site will require construction of support infrastructure to permit connection between the TB and the Southern Cross fiber optic cables. The following will be required (Figure 1-4):

A new manhole approximately 12 feet by 12 feet will be constructed to accept the fiber optic cables and provide connection with the TB. Ductlines between the TB and the manhole will also be installed;

The new manhole will be constructed adjacent to a proposed new access road which will replace an existing unpaved access road. The new road will be constructed in a "Y" configuration to provide access to the terminal building and will be built over portions of the existing unpaved access road.

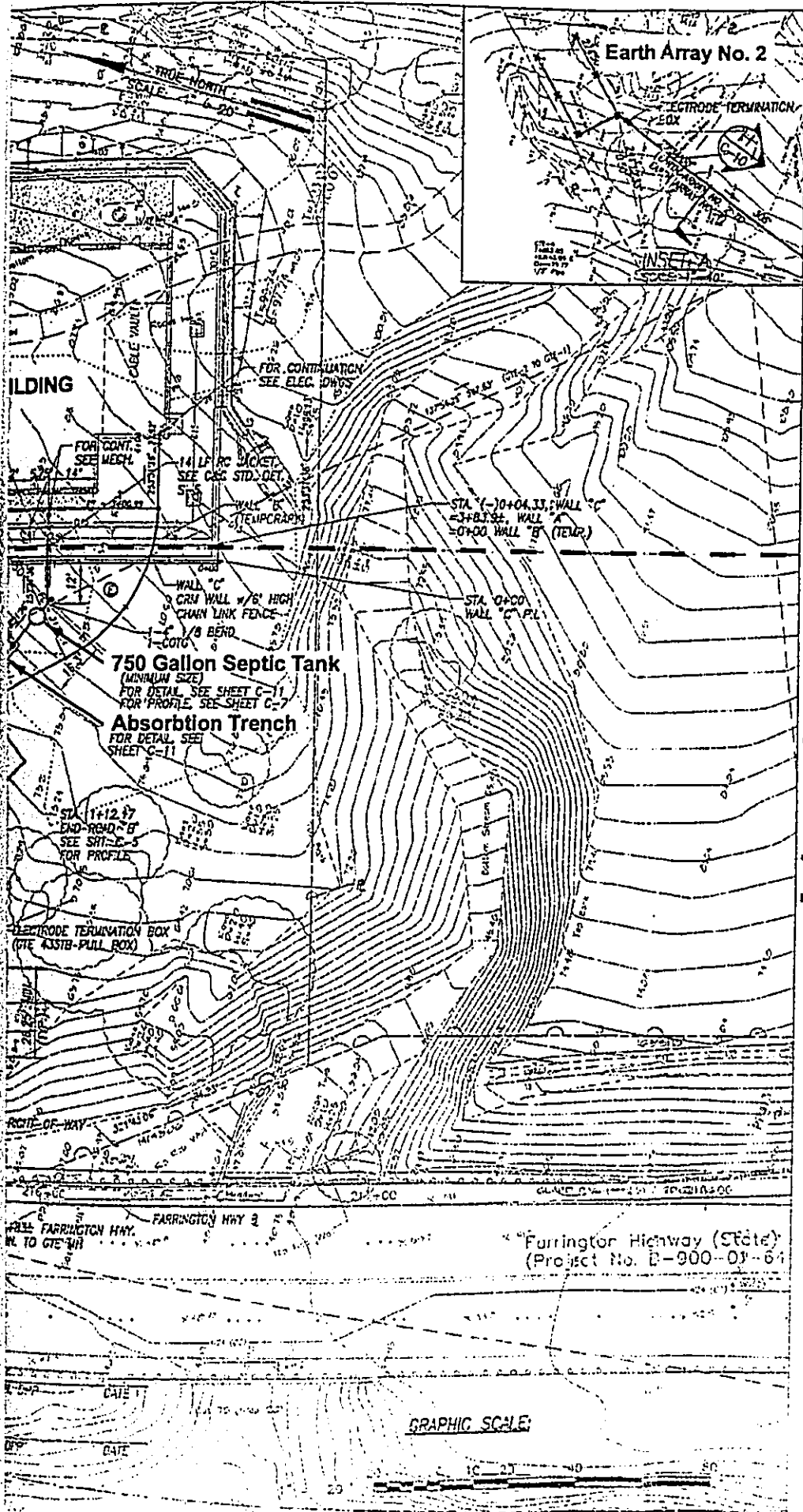


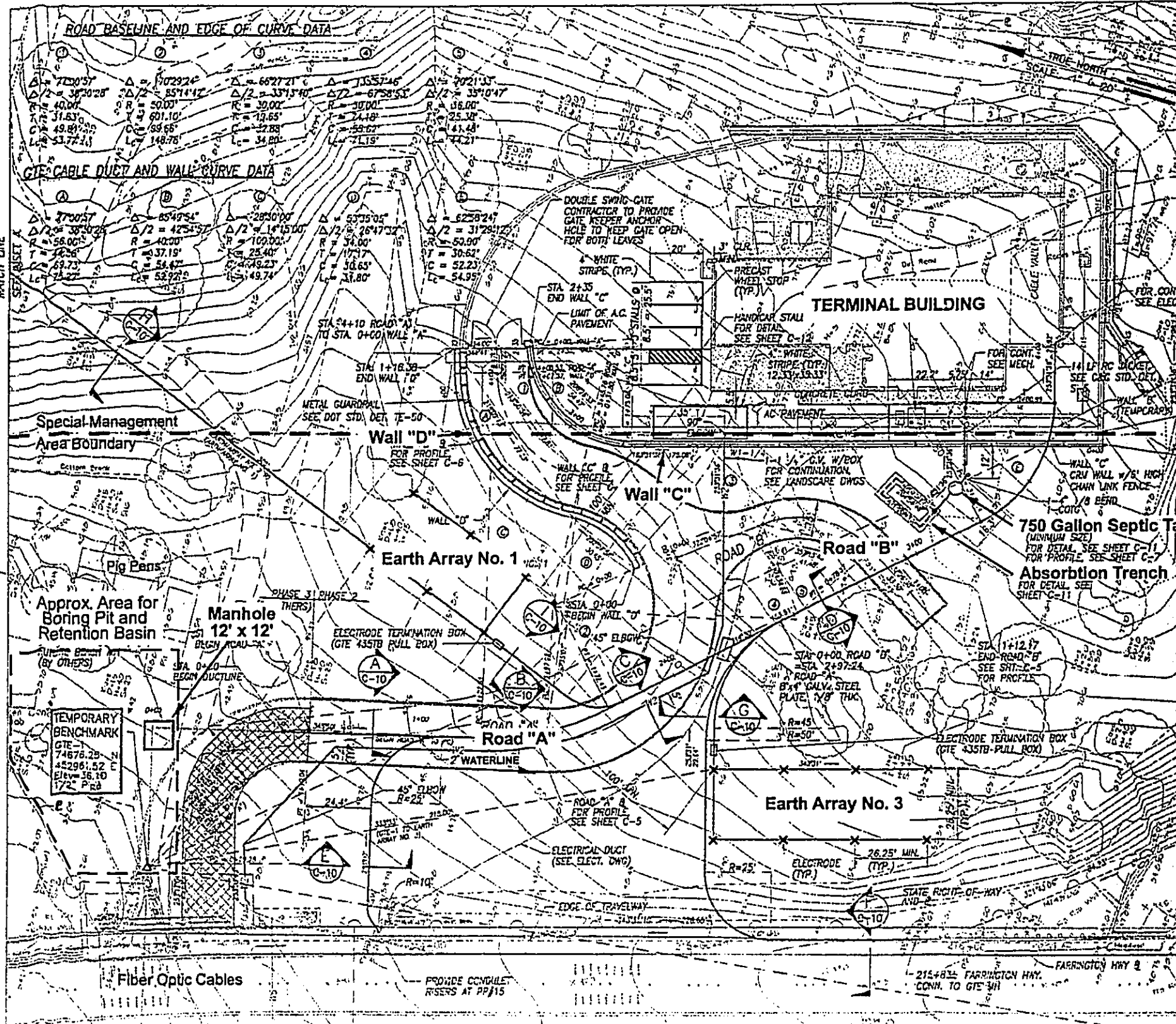
Figure 1-4
Related Support Infrastructure



Reduced Size Drawing
Use Graphic Scale

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
Oct 1999



SITE PLAN

SCALE: 1" = 20'

APPROVED:

CHIEF, CIVIL ENGINEERING BRANCH, SPP

CHIEF, TRAFFIC DESIGN BRANCH, C-2

DATE

DATE

Two retaining walls will be constructed to stabilize the Road "A" portion of the road. Retaining walls will not be required for Road "B". Retaining wall "D" will be located on the north side of Road "A", and retaining wall "C" will be located on the south side of Road "A".

Three earth arrays will be installed at various locations within the project site. The earth arrays will serve to ground each of the three fiber optic cables. Each array will contain 6 to 8 electrodes. Each electrode will be comprised of approximately 3 foot long sections of steel tubing placed into the ground in a rectangular configuration. The purpose of the arrays will be to provide grounding to protect sensitive telecommunications equipment contained in the building. No power will be required for the arrays.

A separate waste water treatment system will be required due to absence of municipal sewer mains in the vicinity of the project. The proposed wastewater treatment system will utilize an absorption trench and septic tank design. Anticipated flows will be 135 gallons per day.

Additional water and electrical lines will also be installed.

The overall area including both the support infrastructure and terminal building sites is ± 4.7 acres. Excavation involving the support infrastructure will require grading of 2,108 cubic yards, and embankment of 1,258 cubic yards. The area required for grading of the support infrastructure will be 0.75 acres. No grading will be required beyond (makai) Farrington Highway (refer to Appendix for construction documents delineating the separate support infrastructure and terminal building sites).

Chapter 2
DESCRIPTION OF PROPOSED ACTION

2.1 OVERVIEW AND PROJECT PHASING

The Southern Cross Cable System will be connected to the Terminal Building (TB) constructed by GTE Hawaiian Tel International, Inc., by use of a manhole and subsurface ductlines. One set of ductlines will emanate from the TB to the manhole, while another set of ductlines, based on use of drill pipe, will provide connection from the manhole to the submarine originating cables. Construction activities to accommodate landing and installation of the cables will involve the following:

Segment 1: Make-Ready Work - will involve drilling of four, 4-inch bores to accommodate ductlines leading from the TB to the four nearshore submerged "landing" sites; and, construction of a new manhole and related infrastructure.

Segment 2: Cable Landing and Installation - will involve landing and installation of three cables into the submerged landing sites. The fourth landing site will be sealed and retained for future use as a spare. Placement of temporary cable ship positioning targets may also be needed as an optional requirement. Once the proposed installation is complete all equipment no longer necessary to the site will be demobilized.

2.1.1 SEGMENT 1: MAKE-READY WORK

The first segment of work will involve "make ready" work in anticipation of the cable landings. All support infrastructure involving the manhole, access road, and utilities, are expected to be completed during this segment.

The TB will receive the telecommunications signals from the three (3) submarine fiber optic cables. A fourth boring hole will also be prepared to serve as a spare. Each of the cables will be double armored and energized by use of electronic amplification devices (repeaters) to repeat the light

signals carried over transpacific distances. Use of repeaters will result in no electromagnetic fields which could cause harm to marine or terrestrial flora or fauna. The generation of light pulses within the cable is limited and of relatively low output. An equivalent lumen output is expected to be less than that from a small diver's flashlight. In the event of cable failure terminal building equipment monitoring the cable would also automatically initiate a shut down to protect sensitive equipment.

The proposed cable will contain approximately 8 fiber optic strands and will be housed in a plastic and steel casing no more than approximately 2 inches in diameter (Figure 2-1). Plastic, steel, and other protective materials will be added for strength.

The proposed area of the new manhole will be excavated into a pit to accommodate use of the directional boring rig. The directional boring rig will be set into an excavated pit with dimensions of ± 5 feet deep by ± 20 feet wide by ± 50 feet long. Four boring holes will be started from the pit, one at a time, and directed beneath the surface to each of the four target locations in approximately -50 to -60 feet of water MSL (mean sea level) (Figure 1-3). The relative distance from the shoreline to the target locations in the submerged bottom is anticipated to be approximately $\pm 2,500$ linear feet. During construction, which is projected for 1-2 months, the open pit and work area mauka of Farrington Highway, adjacent to the 12 foot by 12 foot manhole will be barricaded from the public. A security guard will be used at night and on weekends to maintain safety and security of the site.

The drill rig will be powered by an internal combustion engine and directionally guided by use of radio transceivers located in the head-end of the drill. Once drilling progresses beneath the submerged portion of the route, drill operators located in boats above the drill will guide the drill in sequence, to each of four submerged landing sites.

Operation of the drill will involve use of a lubricant such as bentonite, to facilitate passage of the drill through the substratum. The actual lubricant selected will be based on need to maintain safety and environmental protection of the water quality of the area. (See also Section 3.1.11-Water Quality). Discharges of unused lubricant will be to a retention basin located adjacent to the boring pit (see Figure 1-4 for approximate location).

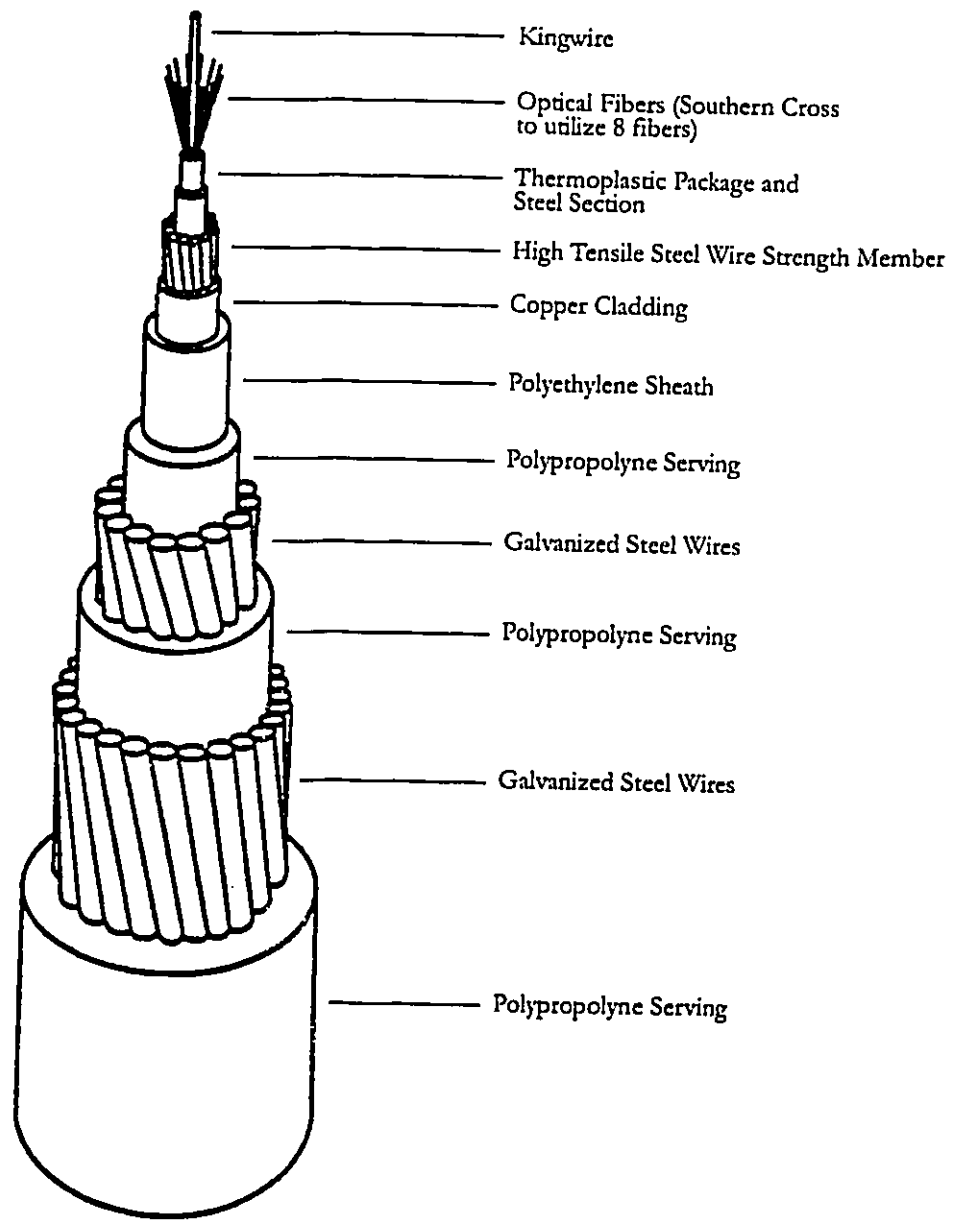


Figure 2-1
Typical Double Armored Fiber Optic Cable

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
 GTE Hawaiian Tel International

R. M. TOWILL CORPORATION

Oct 1999

Source: GTE Hawaiian Tel, Inc.

As the directional drill bit approaches each of the four submerged targets the drill bit speed will be adjusted to the minimum necessary to ensure a clean bore. Once the drill bit and attached drill pipe has cleared each of the four submerged holes, the drill apparatus will be pulled back into the bored hole through the drill pipe. The remaining drill pipe will be used as conduit and fitted to the 12 foot x 12 foot manhole to provide connection to the ocean end.

At the shore-end, once all directional boring is completed the boring equipment will be removed from the pit. Pull rope placed in the conduits (drill pipe) following the drilling operation will facilitate installation of the fiber optic cable on the day of the cable pull.

Description of Related Infrastructure

Installation of related infrastructure will be required to support the proposed Southern Cross cables. This will include (Figure 1-4):

A new manhole approximately 12 feet by 12 feet will be constructed to accept the fiber optic cables and provide connection with the TB. Ductlines between the TB and the manhole will also be installed.

Three earth arrays will be installed at three locations within the project site. The earth arrays will serve to ground each of the three fiber optic cables. No power will be required. Each array will contain 6 to 8 electrodes. Each electrode will be comprised of approximately 3 foot long sections of steel tubing placed vertically into the ground below grade in a rectangular configuration of approximately 5 feet by 10 feet. The purpose of the arrays will be to provide grounding to protect sensitive electronic equipment contained in the building.

The new manhole will be constructed adjacent to a proposed new access road which will replace an existing unpaved access road. The new road will be constructed in a "Y" configuration to provide access to the terminal building and will be built over portions of the existing unpaved access road. The long portion of the "Y" configured

road (Road "A") will be approximately 400 feet long and 24 feet in width. The short portion of the road (Road "B") will be approximately 100 feet long and 15 feet wide. The road will be constructed to standards of the City and County of Honolulu, and State of Hawaii.

Two retaining walls will be constructed to stabilize the Road "A" portion of the road. Retaining walls will not be required for Road "B":

- A) Retaining wall "D" located on the north side of Road "A", is approximately 116 feet long and 6 inches in height from the road surface and will be constructed at the mauka-most end of the road. A guard rail will be placed onto the wall for vehicle safety.
- B) Retaining wall "C" located on the south side of Road "A", is approximately 235 feet long and 6 inches in height from the road surface, and will be constructed along the west end of the terminal building between the building accessway and the access road. A 6 foot high chain link fence will be placed onto the wall for security.

A separate waste water treatment system will be required due to absence of municipal sewer mains in the vicinity of the project. The proposed wastewater treatment system will utilize an absorption trench and septic tank design. The absorption trench will be approximately 11 feet by 22 feet connected by a 750 gallon septic tank. Design flows will be 135 gallons per day. All design specifications and operational requirements shall be submitted to appropriate State and City and County of Honolulu agencies for review and approval.

Additional water and electrical lines will also be installed. Flow requirements for water are anticipated at 540 gallons per day (GPD) for domestic consumption and 2,450 GPD for landscape irrigation. All requirements including fire flow needs will be

coordinated with the Honolulu Board of Water Supply and Honolulu Fire Department. Electrical requirements will be coordinated with Hawaiian Electric Company.

2.1.2 SEGMENT 2: CABLE LANDING AND INSTALLATION

A cable laying ship provided by the cable vendor will lay the fiber optic cable. During the cable laying procedure it may be necessary to utilize two portable range targets to serve as optional alignment markers for the cable laying ship. The optional range targets would provide backup to the global position system (GPS) used on the ship for alignment purposes. The range targets will be comprised of two signpost mounted symbols, 6 to 10 feet high, which are typically a circle and triangle spaced ± 6 feet apart. The portable targets, if required, will be placed at the shoulder of Farrington Highway where it is not expected to disrupt traffic movement. The targets will be removed following the cable lay.

The following procedures describe the activities involved at each submerged landing site during the cable landing operations.

The cable ship will approach the landing site using a satellite based global positioning system (GPS). Once the ship arrives in the vicinity of the submerged landing site, it will fix its position using tugboats, side-thrusters, or other means. As the ship fixes its position, it will begin laying out cable.

The ship will lay cable while personnel attach suspension floats at regular intervals to the cable. As the cable is lowered to the water, it will float, allowing it to be pulled toward each of the cable landing sites using a small motor boat or other mechanical means. Divers will feed the cable to the open submerged conduit. As the cable is being fed, the pull rope previously placed in the conduit will be attached to the cable. The cable will then be pulled toward the manhole and TB by a winch. Divers monitoring the progress of the cable pull will successively cut the suspension floats as the cable is fed into the conduit.

Each of the submerged landing sites was selected to make use of off-shore sand deposits. A cable route reconnaissance and subsequent survey undertaken by Sea Engineering, Inc., was completed in

September 1998 and September 1999, and has confirmed that it is possible to daylight each of the four directional bores in sandy ocean bottom in approximately 50 to 60 feet of water. It is desirable to locate the boring exits in sand to minimize potential for environmental impacts associated with anchoring, armoring, or trenching through rock or coral to secure the cable. The presence of extensive sand deposits on the ocean bottom, will permit the cable to eventually bury itself into the sand, providing maximum protection against wave forces. Each site was also designed to ensure separate cable alignments to maintain route diversity and security.

Split pipe armor protection may be required to further protect the cable and to ensure settlement into the sand bottom. The split armor pipe will consist of two pieces of split pipe joined by use of bolts and nuts. Each half of the split pipe will be placed over the cable and bolted together by a diver. A bell shaped housing at the end of the pipe will enable the pipe section to articulate. Typical dimensions will be approximately 18 to 20 inches long by approximately 3 inches in diameter, with the bell housing approximately 5 inches in diameter and 3 inches in length. The length of the bell housing is included in the overall 18 to 20 inch length of the split armor pipe (Figure 2-2). Only a small portion of the cable, approximately ± 50 feet, will be encased from the end of the submerged conduit seaward.

During the cable lay it is also possible that scattered corals may be discovered seaward of the submerged landings. It is expected that potential for damage to these corals can be avoided by careful placement of the cable/articulated split pipe between or around any formations. This avoidance of coral was successfully applied during prior cable landings at Kahe Point, Oahu, and other locations by GTE Hawaiian Tel for the Hawaii Interisland Cable System (HICS), and GST Telecom Hawaii, for the Hawaiian Island Fiber Network (HIFN).

Following this action, the cable ship will continue cable laying operations to the next landing site. The ship will follow a prescribed survey route until it reaches each landing site where the end of the cable can be similarly connected.

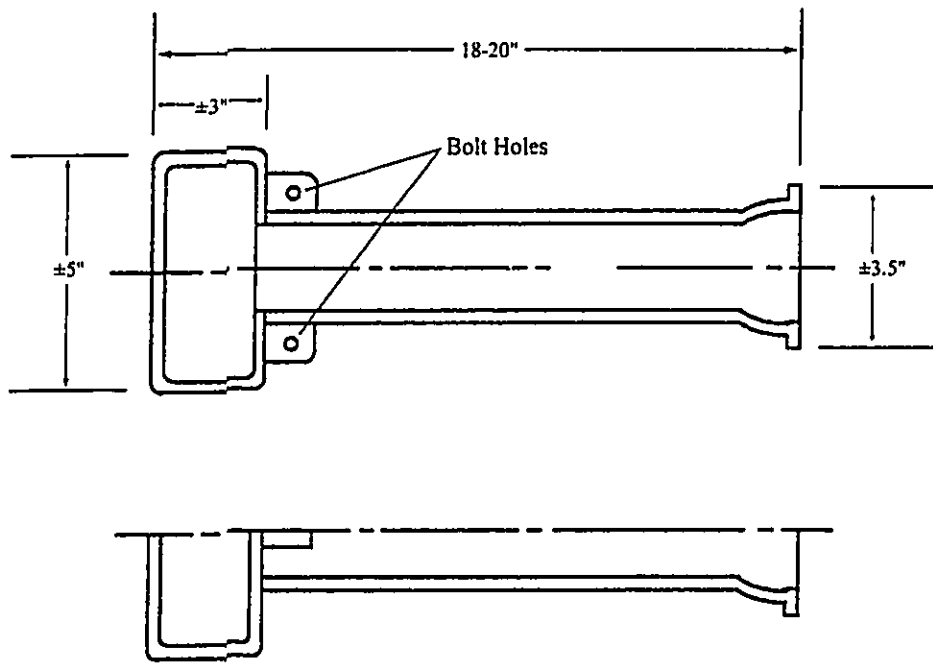


Figure 2-2
Split Pipe Armor Protection

Not to Scale

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
Oct 1999

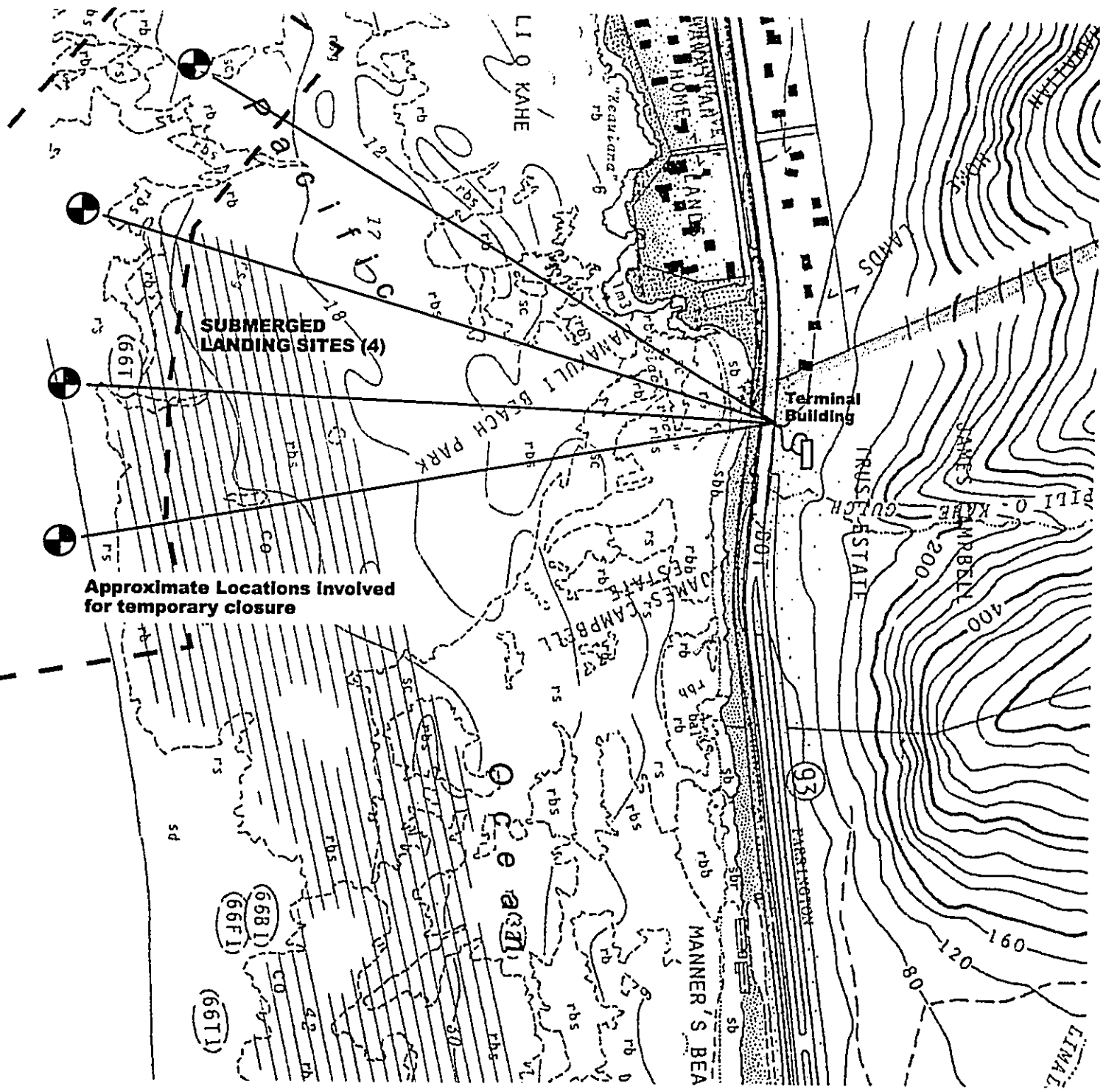
2.2 SAFETY CONSIDERATIONS

The work area on land located mauka of Farrington Highway will be barricaded from public entry during the construction phase involving directional boring. A security guard may be posted at night and on weekends to ensure public safety and security of the job site. Kahe Beach itself is not expected to require closure.

Nearshore ocean waters may need to be closed to ocean activities (surfing, diving, boating, swimming) to ensure safety to ocean users during the cable laying process (approximately 10-12 hours depending on weather conditions). The total area anticipated to be closed will be approximately 750 feet wide by approximately 2,500 feet long (Figure 2-3). The actual areas involved however, will be less since only one landing site at a time will need to be closed to maintain safety to area users. The period when the waters will be closed is not expected to be more than one day, weather permitting, for each of three cable laying operations (three total days closure). This short-term "closure" of nearshore water areas will be achieved by publishing a notice to advise mariners to avoid the area. Further, during the cable laying process, project personnel will advise beach users to avoid nearshore ocean waters via small powered water crafts.

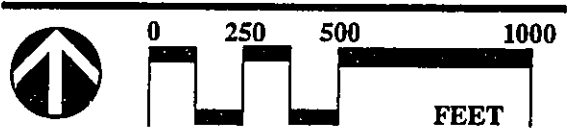
2.3 PROJECT SCHEDULE AND ESTIMATED COST

Segment 1 of the project as well as the terminal building is tentatively scheduled for completion during the 3rd and 4th quarter of 1999. Segment 2 is scheduled for spring 2000. Cost for the total project is estimated to be in excess of +\$10,000,000.



Approximate Locations Involved for temporary closure

Figure 2-3
Areas for Temporary Closure



Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION

Oct 1999

Source: Sea Engineering, Inc., 1998, and Coastal Atlas, Map 66,
Kahe, Oahu, 1981

Chapter 3
ENVIRONMENTAL SETTING, POTENTIAL IMPACTS, AND MITIGATION

3.1 PHYSICAL ENVIRONMENT

3.1.1 CLIMATE

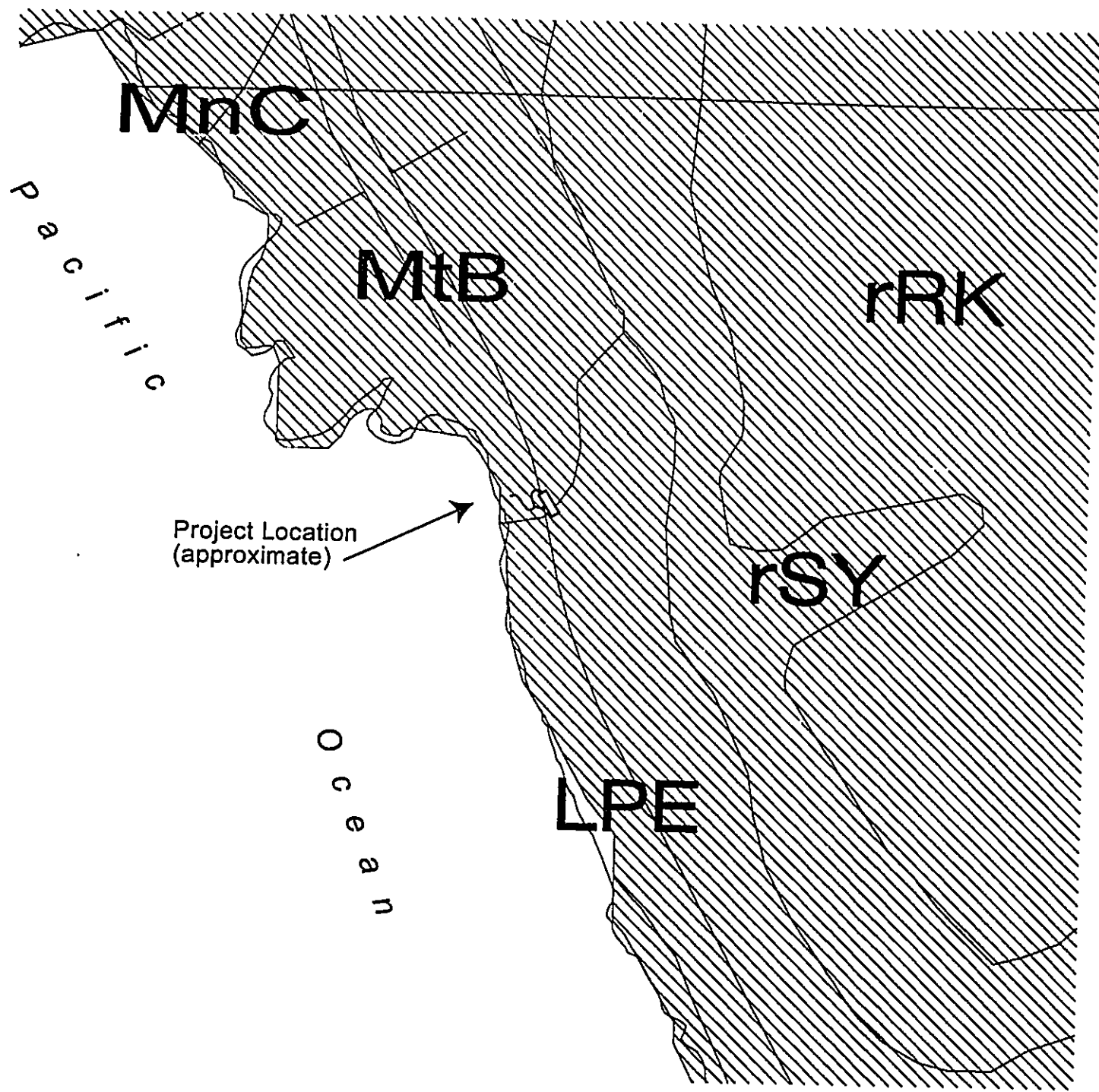
The project site and surrounding area is located on the southwest coastline of Oahu which is generally warm and dry. Mean annual temperatures range between approximately 70 and 90 degrees Fahrenheit, with higher temperatures experienced during the summer months. Annual rainfall averages about 20 inches, most of it occurring during the winter months. The prevailing winds are tradewinds blowing from a northeasterly direction. Winds from a southeasterly direction (Kona winds) may be expected 5-8 percent of the time (Atlas of Hawaii, 1983).

3.1.2 TOPOGRAPHY, GEOLOGY, AND SOILS

The project site lies at the base of the Waianae mountain range which is approximately 22 miles in length. The range is rough, mountainous, and has narrow ridges with very steep slopes. The highest point on the range rises to 4,025 feet, which is the highest point on Oahu.

The land type on which the project site is situated is characterized as the Lualualei-Fill land-Ewa Association. According to the Soil Conservation Service (SCS) publication, "Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii," this association consists of well-drained, fine textured and moderately fine textured soils on fans and in drainageways on the southern and western coastal plains. Soils found in this association are nearly level to moderately sloping. This association makes up about 14 percent of the land area of Oahu (U.S. Department of Agriculture, Soil Conservation Service, August 1972).

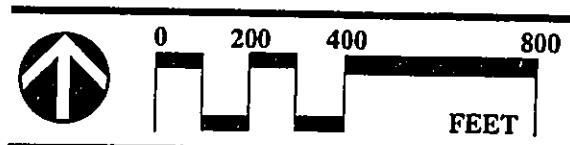
There are two primary soil types for the project area (Figure 3-1):



SOILS LEGEND

- MnC - Mamala stony silty clay loam, 0-12 percent slopes
- MtB - Mokuleia clay
- rRK - Rock land
- rSY - Stony steep land
- LPE - Lualualai extremely stony clay, 3-35 percent slopes

Figure 3-1
Soils Map



Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
 LANDING AT KAHE BEACH, OAHU
 GTE Hawaiian Tel International

R. M. TOWILL CORPORATION

March 1999

- Mokuleia clay (MtB) - These soils are nearly level. Permeability is slow in the surface layer and workability is difficult because of the sticky plastic nature of the clay. This soil is used for sugarcane and pasture; and,
- Lualualei extremely stony clay, 3 to 35 percent slopes (LPE). There are many stones on the surface and in the profile of this soil. It is impractical to cultivate this soil unless the stones are removed. Runoff is medium to rapid, and the erosion hazard is moderate to severe. This soil is primarily used for pasture.

In addition to MtB and LPE, there is limited amounts of Beach Sand (BS) found in pockets along the shoreline and further south of the project site at Kahe Beach Park. According to SCS,

- BS occurs as sandy, gravelly, or cobbly areas on all the Hawaiian Islands. They are washed and of light colored sands derived from coral and seashells. Beaches have no value for farming. Where accessible and free of cobblestones and stones, they are highly suitable for recreational uses and resort development.

IMPACTS AND MITIGATION MEASURES

No long term adverse impacts are anticipated to the area topography, geology or soils. Work at the site will involve installation of support infrastructure and directional boring on a portion of the Terminal Building (TB) site. Potential for impacts involving soils stability or erosion will be addressed by use of applicable State, Federal, and City and County of Honolulu guidelines governing development.

Upon completion of construction activity, all equipment no longer necessary to the site will be removed and the ground returned, as much as practicable, to existing preconstruction contours.

3.1.3 HYDROLOGY

There are no perennial streams in the project area. The major drainage feature immediately adjacent to the site is Pili O Kahe Gulch (Figure 3-2). This major drainageway is normally dry except during sporadic temporary periods, during the rainy season, when the gulch conveys stormflows along the Kahe coastline.

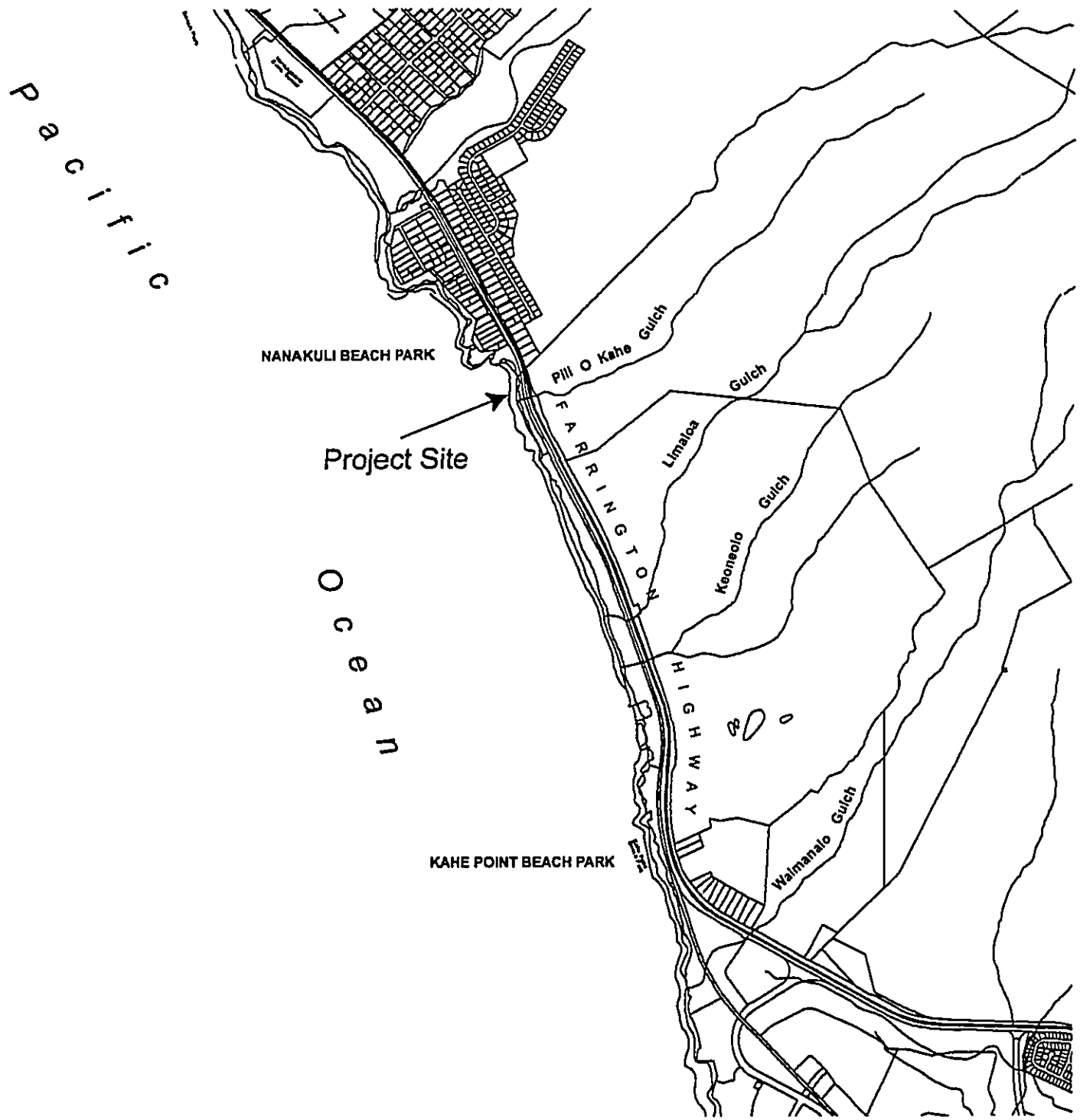
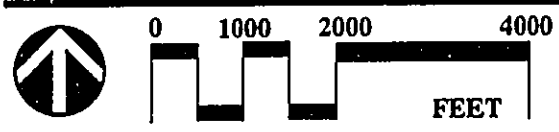


Figure 3-2
Hydrology



Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
 LANDING AT KAHE BEACH, OAHU
 GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
 March 1999

Groundwater for the area is brackish and is not a source for domestic use (Atlas of Hawaii, 1983).

IMPACTS AND MITIGATION MEASURES

No adverse impacts are anticipated on surface water or groundwater since the project will not significantly alter existing surface or groundwater drainage patterns, nor have any adverse long term water requirements. In accordance with State and City and County of Honolulu regulations governing construction, grading, drainage and erosion control plans shall be submitted for review and approval prior to construction.

3.1.4 TERRESTRIAL FLORA AND FAUNA

Terrestrial flora within the project area is classified as lowland dry shrub and typically contain species such as kiawe, koa haole, bristly foxtail, uhaloa, milo, and fingergrass. Homesites, military installations, and pastures are the most common uses for this type of plant environment. Existing land uses primarily consist of previously cleared, undeveloped land and land that is currently in use for a pig farm. No rare or endangered plant species are known to inhabit the site.

The predominant fauna at the site are domestic pigs and leashed dogs. The area surrounding the site is sparsely vegetated due to lack of water and provides little to no habitat for some of the avifauna observed which included: Common Indian Mynah, Barred or Lace-Necked Dove, and sparrows. These species are probably from nearby areas or home lots which could provide more likely sources of water and resting shade. No rare or endangered fauna are known to inhabit the site. This would probably be due to the dry climate and lack of vegetation suitable for habitat for rare animals.

IMPACTS AND MITIGATION MEASURES

No impacts to area flora or fauna are anticipated due to the relatively small scope and scale of the proposed project. As part of the proposed development, the exposed areas within the project site will be replanted as required.

3.1.5 MARINE FLORA AND FAUNA

A qualitative marine environmental reconnaissance of the Kahe Point Beach area was carried out on June 21, 1991, and again on September 8, 1998, by Sea Engineering Inc. (see Appendix). The 1991 reconnaissance was undertaken as part of the environmental review of the area for the GTE Hawaiian Tel, Hawaii Interisland Cable System (HICS), Hawaii's first interisland submarine fiber optic cable telecommunications system. The 1998 reconnaissance was completed as part of the current Southern Cross fiber optic cable project.

The following information is from the 1991 reconnaissance and would apply to the marine environmental conditions of the site:

- An overall perspective of the study area was obtained by slowly towing divers behind a skiff over most of the study area from shore seaward to at least the 80 foot contour. During the course of field work notes were taken on the number, size and location of any green sea turtles and other threatened or endangered species seen within or near the study area.
- Benthic communities in the vicinity of the project site are situated on hard shore substratum. While coral coverage may locally (over areas up to 10m²) exceed 75 percent; mean coverage is about 15 percent (Sea Engineering, January 1992). Diversity and abundance of fish in the area is also high due to the plentitude of coral and the warm water outfall from the Hawaiian Electric Power Plant. Invertebrate species richness and abundance is similarly high. The intertidal bench supports normal tidal zone marine life, including starfish, crabs, small fishes, algae, and sea urchins.
- The biological survey did not find any rare or unusual species or communities. There were no sightings of green sea turtles in the area. To the south of [Kahe] beach park (i.e., offshore of Paradise Cove and WEST Beach) are known concentrations of green sea turtles. Some shelter (caves, ledges and undercuts) at sizes and scales appropriate for green sea turtle resting areas were seen in the region

adjacent to shore and macroalgal species were encountered both subtidally and intertidally which are known forage for green turtles. No information was discovered to suggest that nesting of sea turtles in the vicinity of Kahe Point Beach Park has occurred in historical times. Another protected species, the humpback whale, also was not seen offshore of the study area (Sea Engineering, January 1992). As noted by Herman (1979), humpback whales tend to be found in regions remote from human activities and the proposed Kahe Point cable alignment is in relatively close proximity to the Barbers Point Harbor which is becoming an important commercial port for Oahu.

IMPACTS AND MITIGATION MEASURES

The potential for impact to the shallow marine communities will probably be greatest with the construction phase of the project. This will primarily involve installation of four near-shore submerged ductlines in water ranging from -50 to -60 feet deep (MSL). It is anticipated that some impacts could occur as the drill bit emerges from the submerged bottom. This activity could temporarily generate increased levels of turbidity which would affect surrounding benthic communities. Potential for release of bentonite or other lubricant during this process is planned to be addressed by the following:

- As the drill bit nears each of the submerged targets, the drill speed will be adjusted to the minimum necessary to ensure a clean bore, while minimizing potential for release of lubricant.
- The specific lubricant planned to be used will be formulated to resist dispersal in the water column to permit it to be readily suctioned off as the drill begins to emerge at the submerged nearshore bottom.
- Should an unintentional lubricant release occur, the spill is planned to be collected by use of hydraulic or air lifts attached by flexible hose to a prepared filtration apparatus aboard overhead support boats. The filtration system will be designed to entrain the anticipated lubricant and sediment particles, while permitting release of filtrated seawater. The filtrated seawater will be monitored to ensure consistency with

requirements of Hawaii Administrative Rules (HAR), Chapter 11-54, Water Quality Standards, State Department of Health.

- Potential for release of lubricant remaining in the bored hole will be further mitigated by suctioning off excess lubricant at the drill rig end once the drill bit daylight. Excess lubricant remaining in the bored hole will be suctioned off and directed to a retention basin for settling and drying before disposal. No dewatering from the retention basin will be permitted to waters of the State.

The proposed use of this system is expected to be an improvement over a more conventional approach requiring construction trenching directly within the nearshore cable alignment. Although directional boring would require daylighting at the ocean end, the potential for increased turbidity generated by the drill bit can be more readily controlled at a specific, localized point. Construction of a trench from land to the nearshore submerged bottom, a distance of up to 1,000 feet, would probably provide greater opportunity for increased turbidity and release of sediments into the water column.

It is expected that most of the organisms encountered adjacent to each of the four submerged landings will be motile. This would present little chance of negative impact to resident species because they would move out of the way as the cable is installed. Some less mobile species including corals, sea anemones, and starfish, would be unable to relocate and therefore could be negatively impacted. However, the proposed installation is expected to be of short duration, and of limited scale. It is most likely that following installation of the cable, that the area could quickly recover to pre-existing levels since no further disturbances are proposed or required. Precautions will be made to ensure that the submerged landing sites will avoid, as much as possible, locations with coral colonies that may be disturbed.

In the shallower areas leading to shore, no disturbance to the area will be required.

Impacts to threatened green sea turtles, endangered humpback whales and Hawaiian monk seals, are not anticipated. This is based on documented experience during prior cable projects including the GTE Hawaiian Tel Hawaiian Interisland Cable System, and GST Telecom Hawaii, Hawaiian Island

Fiber Network. During both projects there were no instances where disturbances to green sea turtles, whales, or Hawaiian monk seals had occurred.

Once the cable is anchored to the bottom conduit, the cable will be laid along the ocean bottom to deeper ocean waters. As required, articulated split armor pipe may be employed to further protect the cable by anchoring it to hard substrate (rock) along the ocean bottom by use of mechanically or hydraulically installed bolts.

3.1.6 SCENIC AND VISUAL RESOURCES

The vicinity of the project site includes the Kahe Point Beach Park and Hawaiian Electric Kahe Power Plant to the south. The predominant structures in the area include the power plant exhaust stack, beach park pavilion, and power poles along Farrington Highway. Immediately adjacent to the project site the area is relatively undeveloped. Small portions of this area have been partially cleared for a small pig farm. Views of the site from Farrington Highway are of a hillside overgrown with koa haole, kiawe trees, and various weeds.

IMPACTS AND MITIGATION MEASURES

During construction involving installation of support infrastructure and fiber optic cable, there will be a temporary impact on coastal views due to construction equipment, a cable ship and smaller support vessels in the water. There will be a temporary impact on views mauka of Farrington Highway due to use of a directional boring rig. However, the rig will be partially obscured from view since it will be situated within a boring pit approximately 5 feet below grade, within the project site. Once construction is completed all equipment no longer necessary to the site will be removed with no further disturbance to the scenic resources of the area.

Infrastructure necessary for the project will either be buried or, in the case of the access road and retaining walls, will be at or near grade. The proposed fiber optic cable, similarly, is not expected to result in potential for adverse visual impacts. The cable will be buried and therefore, will not constitute a potential source of impact.

Potential for visual impacts associated with construction of the TB have been addressed by the project architect. The TB, located approximately 200 feet above Farrington Highway, will be

partially visible to motorists. Existing vegetation and new landscaping will be used to enhance views of the access road and building. The TB will be painted Burmese beige which is consistent with the earth tones of the surrounding site. The roof will be painted dark green to blend in with the surrounding canopy of existing trees. The portion of the site below the TB has previously been used for the dumping of old appliances, tires, and related urban garbage. Much of this garbage within the site will be removed in conjunction with clearing of brush and koa haole to accommodate the new road and cable infrastructure. Although some of the scrub vegetation will be removed, it will be replaced with new landscaping and irrigation. Landscape vegetation shall consist of beach naupaka (*scaevola futescens var. sericea*), milo (*tespesia populnea*), pohinahina (*vitex rotundifolia*), and carissa (*carissa grandiflora*). All vegetation shall be provided with sufficient irrigation to ensure long term establishment.

3.1.7 HISTORIC/ARCHAEOLOGICAL RESOURCES

The potential for discovery of archaeological resources would normally be expected within the proposed area of the construction site. The proposed project location, however, contains no known archaeological burials or remains. The project area has already been heavily modified for land uses including a small pig farm and there is evidence of previous clearing in the surrounding area.

The major project activity will involve use of directional boring which is not anticipated to result in potential for adverse impacts. This is because the directional boring operation will involve drilling of four relatively narrow ± 4 inch diameter bores from approximately +40 feet above mean sea level (MSL), to below sea level, in order for each of the bored holes to "daylight" at the ocean bottom. The depth of boring will be relatively deep, while the work will be relatively small and limited in scale.

IMPACTS AND MITIGATION MEASURES

No potential adverse impacts to archaeological or cultural resources are expected. However, the State Department of Land and Natural Resources (DLNR), Historic Preservation Division, was contacted to coordinate the proposed use of the site (see Appendix). In the event that any unidentified archaeological or cultural remains are uncovered during earthwork, work in the

immediate area is to cease and the State Historic Preservation Officer (SHPO) contacted at DLNR for instructions.

3.1.8 BEACH EROSION AND SAND TRANSPORT

The shoreline in the Kahe Point area is rocky, consisting of low limestone sea cliffs approximately 15 to 20 feet high, alternating with sections of shallow sloping foreshore scattered with wave washed boulders. The shoreline fronting the project area is primarily devoid of sand and does not appear to be subject to the typical processes of coastal erosion and accretion. The limestone cliff areas, to the north and south of the project site, however, appear to be erodible, and there are large pieces of fallen limestone at the base of the cliffs.

The nearshore ocean bottom surrounding the project area, is irregular, with sections of hard bottom alternating with patches and small channels of sand. Further offshore, a sandy bottom can be found in deeper ocean water.

IMPACTS AND MITIGATION MEASURES

No work will be undertaken at the immediate shoreline which could affect sand transport or result in increased shoreline erosion.

Work at the submerged nearshore will be limited to each of the four submerged landing sites. Each of these sites will involve work which will be limited to: boring of a hole approximately 4 inches in diameter, and installation of fiber optic cable with possible use of split pipe armor protection (approximately 3 inch diameter split pipe installed in two halves and secured with bolts). The split pipe armor would be attached to hard substrate (rock) if required. Only three of the four bored holes are planned to contain fiber optic cable, while the fourth bored hole will be capped and retained as a spare. The limited scope and scale of this work is not expected to result in potential for adverse impacts to sand transport. Similarly, because the work will be within the submerged nearshore, no increase in shoreline erosion is expected.

3.1.9 NOISE FROM CONSTRUCTION ACTIVITY

During the construction phase of this project, excavation, boring, and cable laying equipment will be used which will be sources of increased noise. The majority of this noise is expected to come from use of heavy machinery, e.g., bulldozers, directional boring rig.

Potential for impacts associated with the construction and cable landing phase of work will be temporary and expected to last approximately 1-2 months for directional boring; and, approximately 3 to 4 total days for landing and installation of fiber optic cables.

IMPACTS AND MITIGATION MEASURES

Noise generated from machinery can be mitigated to some degree by requiring contractors to adhere to State and County noise regulations. This will include use of properly muffled internal combustion equipment and limiting the hours of construction and heavy equipment use between 9:00 am and 4:00 pm. Other work required at night is expected to involve cable splicing, equipment installation, and related activities which would not generate high levels of noise.

A cable landing ship and support boats (small work boats) will be temporarily required during the cable landing process. The temporary noise impact from use of this equipment cannot be mitigated. However, this is expected to occur only during daylight hours when sufficient visibility is required for safety. The overall timeframe for the cable landing will be approximately 3-4 total days (1 day required per cable landing). Upon completion of work the cable landing ship and support boats will depart the area.

3.1.10 AIR QUALITY

Air quality in the project area is good due to low industrial uses (with the exception of the nearby HECO power plant which is regulated by DOH and EPA for air quality) and the almost continual presence of tradewinds and on-shore breezes. The major factor affecting air quality will be use of construction equipment and vehicular traffic from Farrington Highway.

IMPACTS AND MITIGATION MEASURES

During construction loose dirt and dust may be cast into the air by the wind. The release of airborne dirt and dust can be prevented by requiring the contractor to periodically water down the work area. Areas that may be used for optional placement of range targets will also be exposed during the construction period. Sites used for range targets should be similarly wetted to control fugitive dust. As required by State and County regulations, upon completion of work the project site will be regrassed and revegetated to control erosion and release of dust by the wind.

Operation of internal combustion powered equipment and work vehicles will also contribute to airborne pollutants in the project vicinity. Control of air pollution from these sources will be regulated by the construction contractor who will be required to operate all machinery in accordance with State and County regulations governing air quality.

3.1.11 WATER QUALITY

The coastal waters surrounding Kahe Point are rated Class "A" by the State Department of Health, Clean Water Branch. The offshore water condition is generally very clear with excellent underwater visibility over reef slopes. Water temperature and salinity are normal for ocean water with evidence of fresh water inflow along the shore.

IMPACTS AND MITIGATION MEASURES

Work activities with potential for adverse impacts to water quality will primarily involve operation of the directional drill bit at the submerged ocean end; and, cable laying activities to install fiber optic cable into the submerged conduits.

Directional Boring and Use of Drill Pipe for Conduit

Operation of the drill will involve use of a lubricant such as bentonite to facilitate passage of the drill bit through the substratum. The directional boring contractor will be directed to avoid lubricant discharges, as much as is practicable, at the ocean end. Precautions to mitigate the potential for releases will include: 1) As the directional drill bit approaches each of the four submerged target sites the drill bit speed will be adjusted to the minimum necessary to ensure a clean bore while minimizing the need for release of lubricant; 2) Lubricant will be siphoned from the drilling rig end

once the drill bit daylights at the ocean bottom. This will further reduce potential for discharges; and, 3) Should lubricant be unintentionally released, the formula will have been specially prepared to resist dispersal in the water column by the addition of non-toxic polymers.

It is expected that any unintentional releases will remain in a congealed state at the ocean bottom where it can be suctioned off by waiting divers observing the drill bit as it daylights. The divers will be supported by overhead boats. Hydraulic or air lifts are planned to be used for this process which will further reduce the potential for nearshore currents to disperse the lubricant. The lubricant suctioned at the bottom will be directed through flexible hoses to the overhead boats containing a prepared filtration apparatus which will separate the lubricant from sea water. A sufficient number of support boats will be used to ensure adequate collection. The remaining filtered sea water will be tested for compliance with Hawaii Administrative Rules (HAR), Chapter 11-54, Water Quality Standards. Once the filtered water quality is determined to be consistent with applicable regulations governing Class "A" water quality standards, it will be returned to the ocean.

Support boats collecting the lubricant will be directed to shore in the vicinity of the project site. A tanker truck located on the shoulder of Farrington Highway will employ a pump and flexible hose to siphon lubricant from the support boats. A work crew will be stationed at the shore end to facilitate transfer of hose from the tanker truck to the boats. It is anticipated that only one tanker truck will be required to transport lubricant from the shore-end to a retention basin located at the project site. Upon completion of work the collected lubricant will be allowed to dry in the retention basin where it can later be collected and disposed of in accordance with applicable State and City and County of Honolulu regulations.

During drilling operations drill pipe will be advanced through the bored hole along with the drill bit. Once the drill bit and attached drill pipe clears each of the four submerged holes, the drill bit will be removed and the drill apparatus pulled back through the drill pipe. The remaining drill pipe will be capped at the ocean end and used as conduit on the day of the cable pull. As noted in Section 3.1.5., the remaining lubricant contained in the bored hole will be suctioned off at the drill rig end and directed to the retention basin for settling and drying before disposal. No dewatering from the retention basin will be permitted to waters of the State.

Cable Laying Activities

Cable laying activities will primarily involve installation of fiber optic cable into each of three prepared conduits at the ocean bottom. No further excavation, trenching, or turbidity generating activities are therefore planned which would result in potential for adverse impacts to water quality.

During the installation of fiber optic cable, articulated split pipe may be placed around the cable from the open conduit to deeper ocean waters for additional protection. Portions of the split pipe are planned to be secured with the use of mechanically driven bolts into the ocean substrate (rock bottom). This activity is not expected to result in release or generation of additional sediments into the water column. This operation has been applied to previous submarine fiber optic cable projects, and is similarly not expected to result in potential for adverse impacts to water quality.

3.1.12 FLOOD ZONE

The proposed project site is located above Farrington Highway in area "D", an area in which flood hazards are undetermined (Figure 3-3).

IMPACTS AND MITIGATION MEASURES

No adverse impacts to the project site due to potential flooding are anticipated. The proposed project will be constructed in accordance with telecommunications and utility industry standards to reasonably maintain service in the event of hurricanes, major wind and rainstorms, and related natural disasters.

3.2 SOCIOECONOMIC ENVIRONMENT AND DEMOGRAPHICS

The resident population of the Waianae region of Oahu numbered 37,966 persons in 1995. This represents approximately 4 percent of the Oahu resident population of 870,761 (State of Hawaii Data Book, 1996). The proposed project is expected to have no adverse impact on the existing population of Waianae. Some employment will be required during construction activities. However, all employment associated with the cable installation will be short term and will only last until completion of the project.

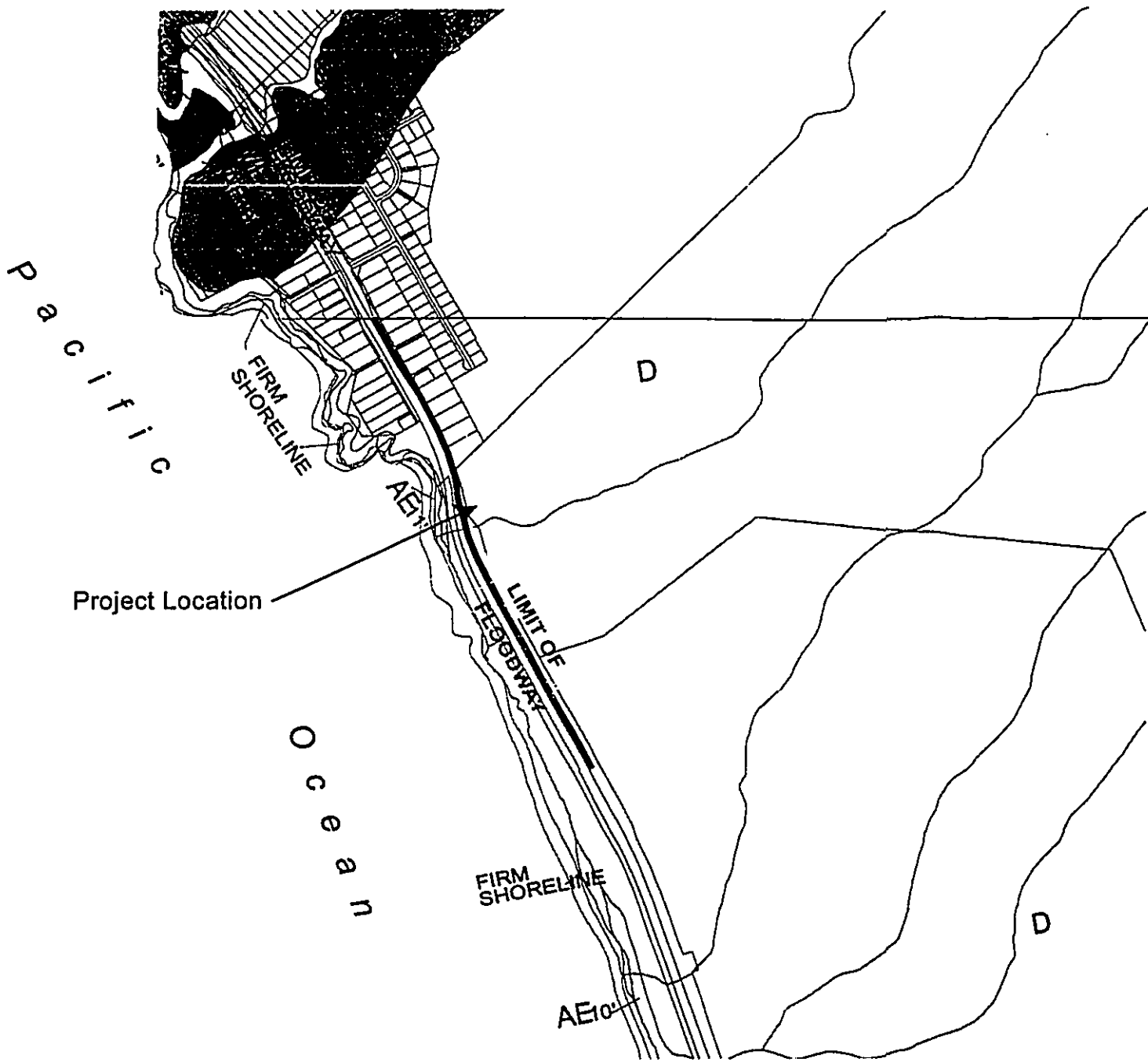


Figure 3-3
Flood Map



NO SCALE

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
March 1999

Source: FEMA Flood Map

IMPACTS AND MITIGATION MEASURES

No adverse impacts to the socioeconomic environment are anticipated. This is because of the relatively benign nature of the proposed project, and the limited scope of action. Some employment will be generated through new construction. However, this increase in employment is expected to be only temporary. Longer term employment associated with operation and maintenance of the fiber optic cables will be limited, although increased trade, commerce, and exchange of information provided by the cable system is expected to provide long term benefits to the State and Hawaii business community.

3.3 PUBLIC FACILITIES AND SERVICES

3.3.1 TRANSPORTATION FACILITIES

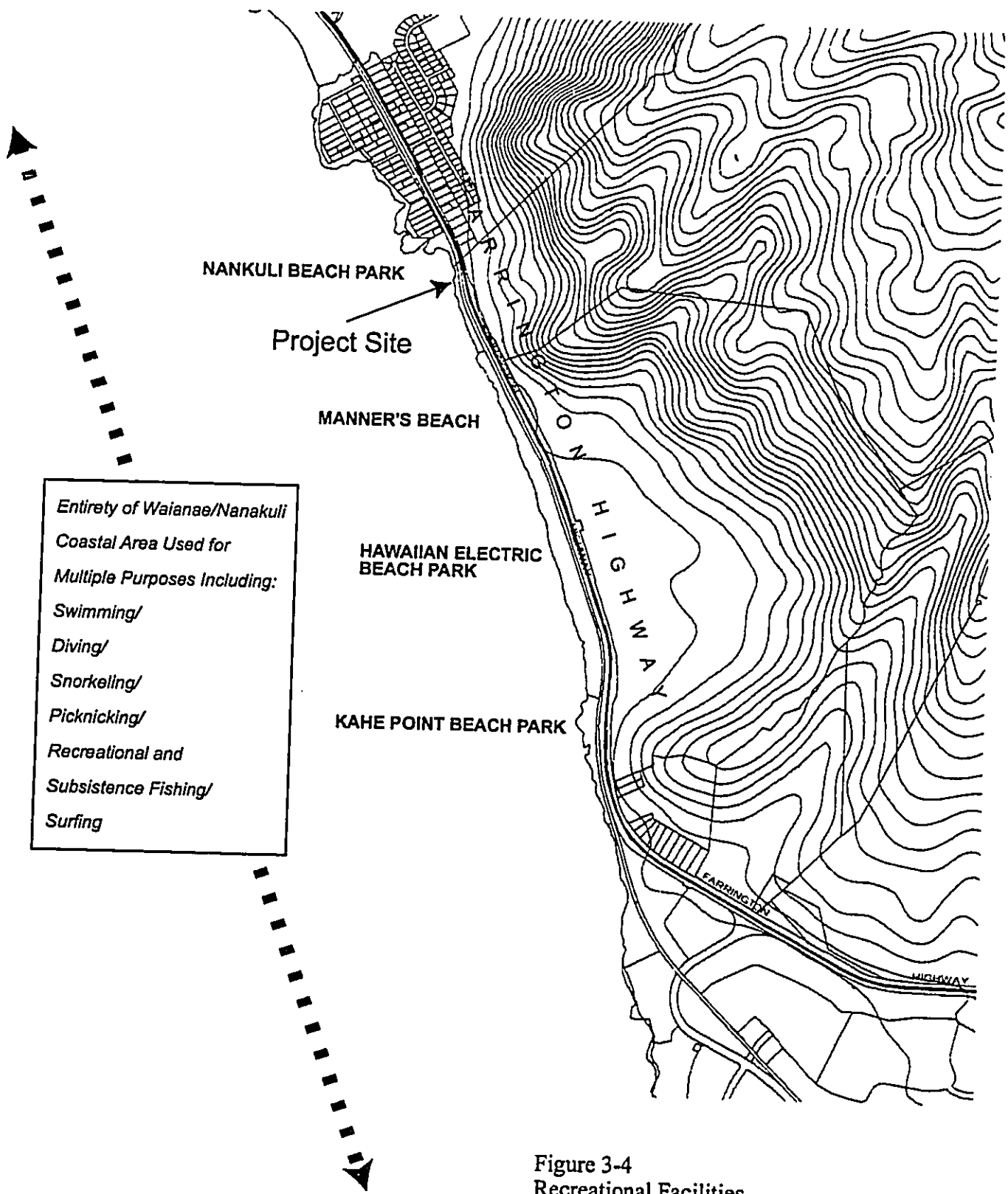
The project site is currently served by an unpaved access driveway along Farrington Highway. Construction activities with potential to impact traffic include the temporary installation of portable range targets to aid in aligning the cable laying ship during installation of fiber optic cable from the nearshore ocean bottom to the TB.

IMPACTS AND MITIGATION MEASURES

The proposed optional use of range targets is not expected to impact traffic since the targets will be placed in areas not subject to disruption of traffic flows. The length of time required for use of the range targets is expected to be approximately 4 total days (± 1 day would be required for each of the 3 cable landings).

3.3.2 RECREATIONAL FACILITIES

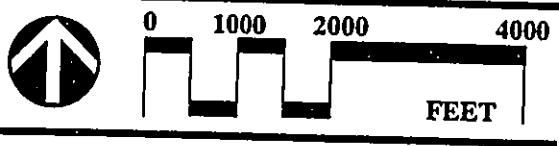
Recreational facilities in the vicinity of the project site primarily consist of shoreline resources such as Nanakuli Beach Park, located to the north, approximately 500 feet from the project site; Manner's Beach, located approximately 2,000 feet south of the project site; and, Kahe Point Beach Park, located approximately 1 mile further south, adjacent to the Hawaiian Electric Kahe Point Electrical Generating Station (Figure 3-4).



Entirety of Waianae/Nanakuli Coastal Area Used for Multiple Purposes Including:

- Swimming/
- Diving/
- Snorkeling/
- Picknicking/
- Recreational and Subsistence Fishing/
- Surfing

Figure 3-4
Recreational Facilities



Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION
March 1999

IMPACTS AND MITIGATION MEASURES

No adverse impacts to beach and shoreline resources are anticipated. This is because the use of directional boring will permit installation of the cable within a pre-installed conduit with no disturbance to the surface.

Some disruption to ocean users in the water, however, may occur when the directional drilling bit daylights at the ocean end and during installation of fiber optic cable by the cable ship. During daylighting of the bores there will be support boats and divers in the water. Although it is anticipated that during daylighting the area surrounding the cable work site should remain open, the area surrounding the ocean end of the installed bores will have to be closed off to the public during cable installation.

Ocean closure of the area will be to ensure safety of the public and is expected to include each of the 4 submerged landing sites with a total area of approximately 750 feet by approximately 2,500 feet (Figure 2-3). Closure of nearshore waters will be accomplished by publishing a notice advising mariners to temporarily avoid the area on days when the ship will lay cable.

The period of time involving closure of the nearshore waters is expected to be temporary and will last only for the duration of cable laying activities, approximately 3-4 total days. Should it become necessary to further temporarily close the ocean area during daylighting activities, sufficient notice to mariners will also be provided. It is expected that closure of the area surrounding the boring operation will be similarly temporary lasting only approximately 3 total days. Once the cable is installed, there will be no further disruption to the area's recreational resources.

3.3.3 WASTEWATER AND SOLID WASTE

There are no existing municipal sewer mains providing service along Farrington Highway in the vicinity of the proposed project. A separate waste water treatment system will therefore be required. The proposed system has been designed to incorporate a 750 gallon septic tank with absorption trench in accordance with requirements of Hawaii Administrative Rules (HAR), Chapter 11-62, Wastewater Systems. The waste water treatment system was reviewed and approved by the

Department of Health (DOH), Wastewater Branch, as part of the building permit application for the TB.

Solid waste will be generated during construction and operation of the site for telecommunications purposes.

IMPACTS AND MITIGATION MEASURES

No adverse impacts are anticipated from construction and operation of the separate waste water treatment system. The design and operation of the system has been in accordance with applicable rules and regulations of the State and City and County of Honolulu. The proposed design of the system has also been approved by DOH, Wastewater Branch.

Solid waste generated during construction activities will be in accordance with applicable rules and regulations governing solid waste disposal. During the operational phase of the terminal building, disposal of solid waste will be handled by a garbage collection and disposal service. Sizing of garbage dumpsters will be based on need. However, it is expected that the garbage generated from the facility would be similar to that from a small commercial business. This type of garbage would primarily include paper products, plastics from used containers such as soda bottles, parts boxes, and take out lunches. No hazardous wastes are anticipated to be generated from operation of the terminal building. Disposal of used or spent telecommunications equipment will be handled in accordance with applicable Federal, State, and City and County of Honolulu rules and regulations.

Chapter 4

RELATIONSHIP TO LAND USE DESIGNATIONS AND CONTROLS

4.1 HAWAII STATE PLAN

The Hawaii State Plan, Chapter 226, HRS, serves as a written guide for the future long range development of the State. The Plan identifies goals, objectives, policies, and priorities to serve as guidelines for the growth and development of the State. The proposed project is generally consistent with the State Plan in the following areas:

Section 226-10.5: Economy-Information Industry

The proposed project serves to assist in the State's objective of positioning Hawaii as the leader in information services in the Pacific Rim. The project will continue development and expansion of Hawaii's telecommunications infrastructure and will facilitate future growth in the information industry.

Section 226-14: Facility Systems-In General

The proposed project supports the State's goals for achieving telecommunications systems necessary for Statewide social, economic, and physical objectives.

Section 226-18: Facility Systems-Energy/Telecommunications

The proposed project will help to ensure adequate and dependable telecommunications services for Hawaii by promoting installation of new fiber optic cables to the South Pacific and U.S. Mainland.

4.2 STATE FUNCTIONAL PLANS

The Hawaii State Functional Plans (Chapter 226) provides a management program that allows for use of Hawaii's natural resources to improve current conditions and attend to various societal issues and trends. The following objectives of the Functional Plans are relevant to the proposed project:

Education Implementing Action A(4)(c):

The proposed project will facilitate expanded access to telecommunications services necessary for Hawaii's schools. This will primarily be from South Pacific nations including Australia, New Zealand, and Fiji, which will be directly connected with the cable system.

Education Implementing Action B(3)(d):

The proposed project serves to promote and expand the appropriate use of telecommunications to deliver distance education as well as enhance the learning process and communication competencies of students.

Education Implementing Action (3)(e):

The proposed project enables school library media centers to effectively manage and provide access to information and knowledge through telecommunications.

4.3 STATE LAND USE LAW

The State Land Use District classification for the project site is Agricultural, while the submerged portion of the project is classified Conservation (Figure 4-1). Because the project involves installation of utility infrastructure, no land use district change is necessary. In addition to the Conservation District Use Permit (CDUP) required for the submerged portion of the project, further coordination with the State Department of Transportation (DOT), Harbors Division, and the U.S. Coast Guard will be required to advise mariners of the proposed action.

4.3.1 STATE AGRICULTURAL DISTRICT

The purpose of the State Agricultural District is to maintain a strong agricultural economic base and to prevent unnecessary conflicts among incompatible uses. The accommodation of utilities is one of various identified uses within this district. According to Chapter 205, HRS:

“Section 4.5 - Permissible uses within the agricultural district

- (a)(7) Public, private, and quasi-public utility lines and roadways, transformer stations, communications equipment building, solid waste transfer stations, major water storage tanks, and appurtenant small buildings such as booster pumping stations, but not including offices or yards for equipment, material, vehicle storage, repair or maintenance, or treatment plants, or corporations yards, or other like structures.”

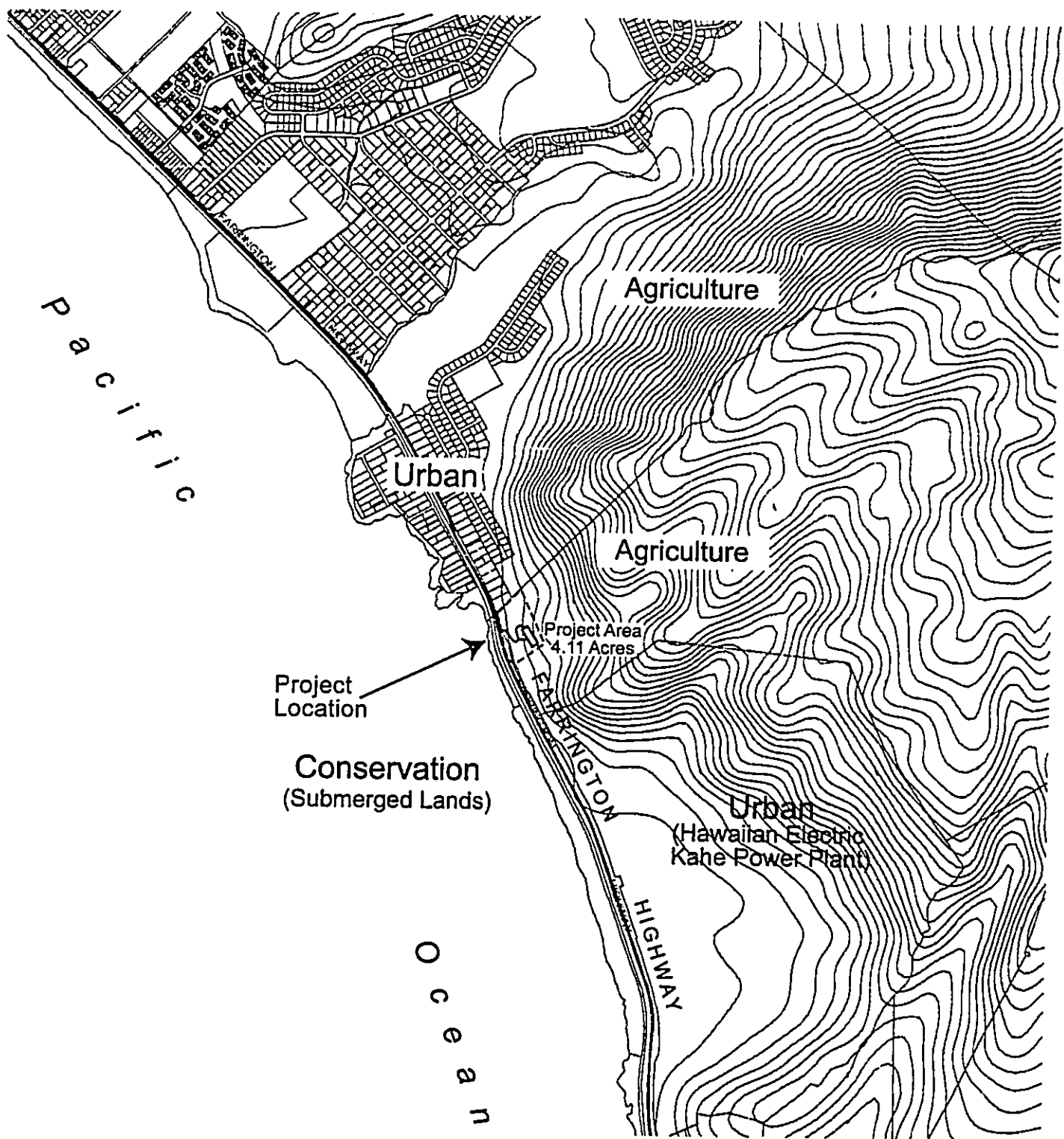


Figure 4-1
State Land Use District Map



NO SCALE

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

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March 1999

According to the above the proposed installation of the fiber optic cable would fall within the definition of a public utility line. Because this is consistent with uses identified above for public purposes, no further Land Use Law related permit from the State is required.

4.3.2 STATE CONSERVATION DISTRICT

The submerged portion of the project is designated within the State Conservation District, General Subzone (Figure 4-1), and will require filing of a Conservation District Use Permit (CDUP) Application. The Conservation District is generally intended to protect and preserve lands with natural resource and other values necessary to the future welfare of the State. This would include lands on which the fiber optic cable would be placed having an elevation below the shoreline such as marine waters, fish ponds, and tidepools of the State.

According to Chapter 13-5, Section 22, HAR, which governs uses in the State Conservation District, public purpose uses may be permitted as identified by the letter "D". Public purpose uses may require a Board of Land and Natural Resources (BLNR) permit, and where indicated a management plan. According to Chapter 13-5, Section 22, HAR:

"P-6 Public Purpose Uses

(D-1) Land uses undertaken by the State of Hawaii or the counties to fulfill a mandated governmental function, activity, or service for public benefit and in accordance with public policy and the purpose of the conservation district. Such land uses may include transportation systems, water systems, communications systems, and recreational facilities."

4.4 CITY AND COUNTY OF HONOLULU LAND USE DESIGNATIONS AND CONTROLS

4.4.1 ZONING AND SURROUNDING LAND USES

According to the City and County of Honolulu, Development Plan Public Facilities Map, the project site is in the AG-2, General Agriculture District and P-2, General Preservation District on the City's Zoning Map (Figure 4-2). The project site including the terminal building and support

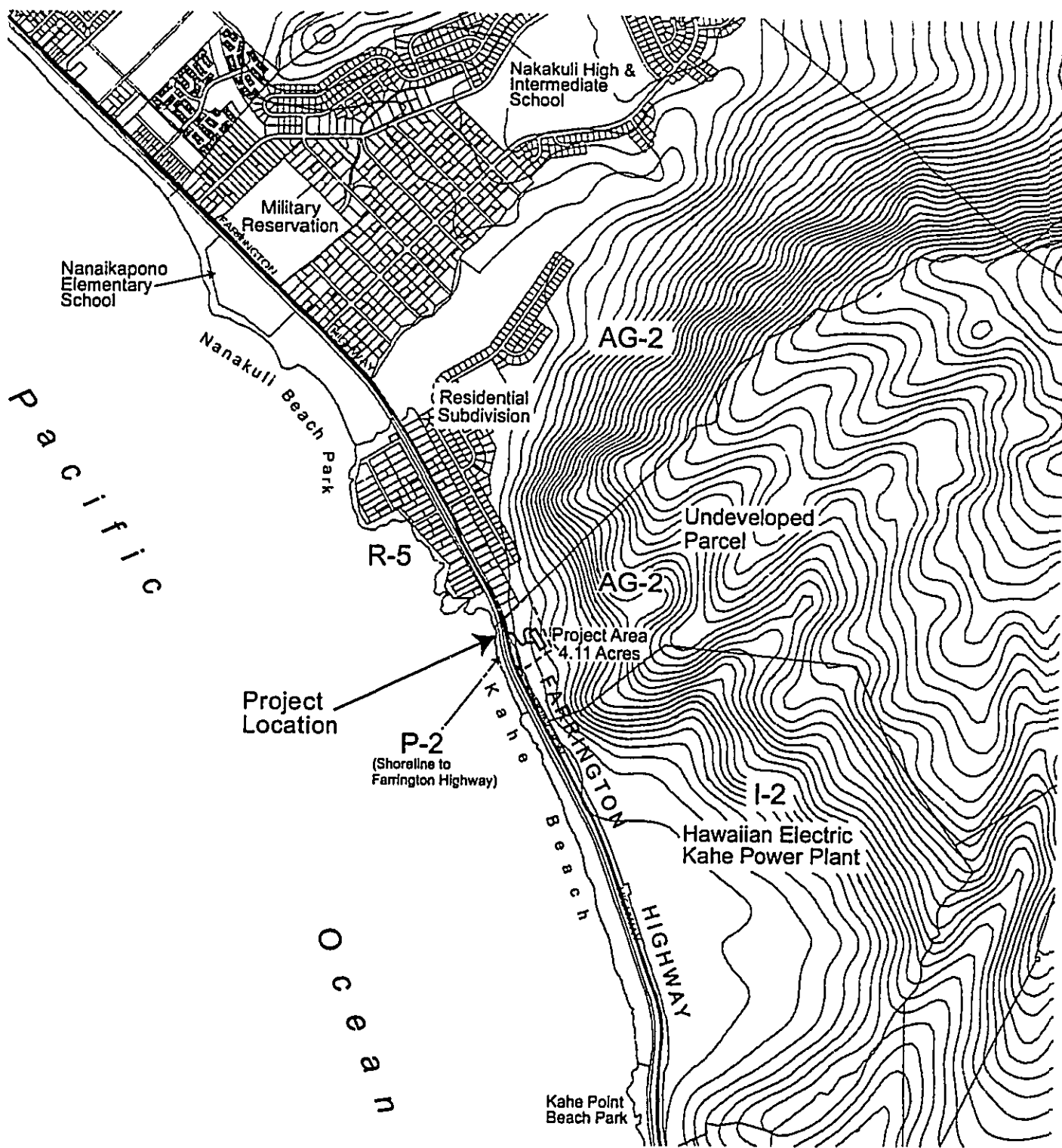


Figure 4-2
 City and County of Honolulu Zoning
 and Surrounding Land Uses



NO SCALE

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 SUBMARINE FIBER OPTIC CABLE
 LANDING AT KAHE BEACH, OAHU
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infrastructure is on land zoned AG-2. The portion of the project involving the directionally bored holes below Farrington Highway and beneath Kahe Beach are zoned P-2.

Surrounding land uses include the Hawaiian Electric Kahe Power Plant, zoned I-2, located immediately southeast of the project site. To the north is the Nanakuli Beach Park, zoned P-2, and residential homes which are zoned R-5. Further north is the Nanaikapono Elementary School and the Nanakuli High and Intermediate School. A military reservation parcel is located between these schools, situated adjacent to Farrington Highway among single family residences.

The proposed use of the site within the AG-2 zoning district would be consistent with the City's Land Use Ordinance (LUO) which identifies the project as a Utility Installation, Type A. This is a permitted use in the AG-2 zoning district. According to the LUO:

"Type A utility installations are those with minor impact on adjacent land uses and typically include: 46 kilovolt transmission substations, vaults, water wells and tanks and distribution equipment, sewage pump stations, telecommunications antennas (except as provided in the paragraph below on Type B utility installations), and other similar uses" (LUO, Ordinance No. 99-12, City and County of Honolulu, May 10, 1999).

The use of the site would be within the definition of distribution equipment necessary to receive, interpret, and transmit fiber optic telecommunications related voice and digital signals.

The proposed directional boring activity within the P-2 zoning district would similarly be consistent with the LUO which identifies a Utility Installation, Type A, as a permitted use subject to standards of Article 5 - Specific Use Development Standards. No zoning change or further zoning restriction for the proposed use, therefore, is required.

4.4.2 GENERAL PLAN

The General Plan of the City and County of Honolulu provides a statement of long range social, economic, environmental, and design objectives for the Island of Oahu and State of policies necessary to meet these objectives. A specific objective of the General Plan relating to the proposed

project is the maintenance and expansion of existing utilities systems. The proposed project is generally in conformance with the goals and objectives of the City and County General Plan.

4.4.3 SPECIAL MANAGEMENT AND SHORELINE SETBACK AREA

The City and County of Honolulu has designated the shoreline and certain inland areas of Oahu as within the Special Management Area (SMA). SMA areas are felt to have a sensitive environment and are to be protected in accordance with the State's coastal zone management policies. A portion of the project site involving construction of support infrastructure is within the SMA boundary as defined by the City and County of Honolulu (Figure 4-3 and Figure 1-4). An SMA permit for work involving installation of the fiber optic cable and related infrastructure will be required from the City.

The proposed project will also be subject to provisions of the Shoreline Setback Rules and Regulations of the City and County of Honolulu. The portion of the project subject to the shoreline setback variance permit will involve all land 40 feet inland of the certified shoreline. Application for certification of the shoreline (certified shoreline map) was published on August 4, 1999, in the Office of Environmental Quality Control (OEQC) Bulletin, Case No. OA-729. Certification of the shoreline map was since published on September 28, 1999, in the OEQC Bulletin. Work between the certified shoreline and the shoreline setback will be limited to directional boring of four (4), four inch bores located subsurface at an approximate depth of -20 feet below grade.

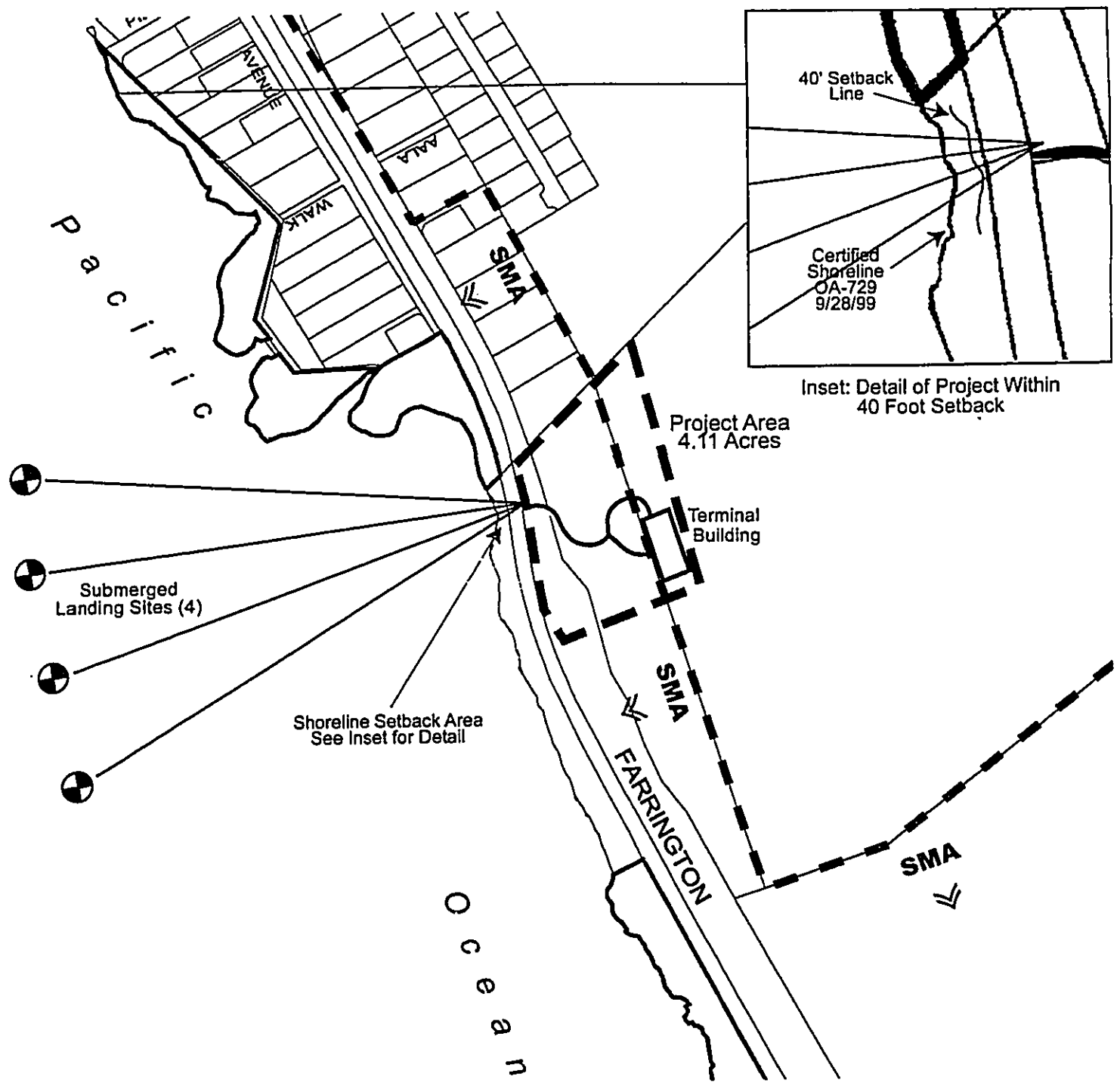


Figure 4-3
Special Management/Shoreline
Setback Area



NO SCALE

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SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

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March 1999

Chapter 5
ALTERNATIVES TO THE PROPOSED ACTION

5.1 NO ACTION

The no action alternative is not considered a viable alternative because it would not fulfill accomplishment of the proposed Southern Cross fiber optic cable network. The proposed project is part of a long range plan to permit fiber optic telecommunications linkages between the South Pacific nations of Australia, New Zealand, and Fiji, with the Western U.S. via Hawaii. The Hawaii portion of this linkage would provide Hawaii with direct, advanced high speed international data and voice communications. The Hawaii portion of the route would further permit redundancy since failure of the Southern Cross network can be temporarily rerouted through other existing international cables providing limited service between the South Pacific and Hawaii, and between Hawaii and the U.S. mainland. Similarly, the improved telecommunications capabilities of Southern Cross could be used in the event of international cable failures between the South Pacific and the U.S. mainland.

5.2 DELAYED ACTION

The delayed action alternative is also considered unacceptable because it would mean continued reliance on existing but aging cables providing service between Hawaii and the South Pacific/U.S. These cable systems include: COMPAC (a copper wire cable system installed in 1963); ANZCAN (a fiber optic system installed in 1984); and, PacRimEast (a fiber optic system installed in 1993). Only two of these systems, ANZCAN and PacRimEast are fiber optic capable, but are based on older technology fiber systems with capabilities that are being exceeded by increasing demands for speed and data bandwidth (the amount of data that can be sent within a signal at a given point in time).

Failure of these existing cable systems would involve loss of telecommunications continuity and therefore, commerce, trade, and cultural exchange between Hawaii, the South Pacific, and the mainland U.S.

5.3 ALTERNATIVE CABLE LANDING SITES

The area considered for landing fiber optic cable along the leeward coastline extended from Barbers Point to Pokai Bay, a distance of approximately 14 miles.

Existing factors which limit the selection of cable routes include cooling water intakes and discharges for the Hawaiian Electric Company, Kahe Point Generating Station; a U.S. Navy underwater testing range; an ocean outfall for treated domestic sewage; and, a small boat harbor. The coastal area south of Kahe Point was excluded from further consideration due to extensive resort, commercial shipping, industrial, and military use. Activities in the area include a major resort development, the Barbers Point Deep Draft Harbor, and offshore oil moorings and associated underwater pipelines. These uses would preclude the installation of a cable within the nearshore between Kahe Point and Ewa Beach.

Other factors limiting the landing of fiber optic cable include nearshore and deep ocean bottom characteristics, and proximity to a fiber optic cable terminal building. Based on these requirements, two alternative sites were considered: Pokai Bay, and Kahe Beach.

5.3.1 POKAI BAY

Pokai Bay is a heavily used recreational area located approximately 6.5 miles north of the TB. The north half of the beach is restricted to military personnel, and there are three surf sites off the military beach. Waters in the south half of the bay are calm due to the protection offered by the breakwater. According to AECOS (1978), Pokai Bay Beach Park has the best protected and most stable sand beach along the Waianae Coastline. Activities include swimming, wading, and canoe paddling. The heavy recreational use of the bay has resulted in past conflicts between swimmers and boaters. State boating regulations now separate the two activities.

A sand channel off the beach park is present adjacent to the mouth of Ulehawa Stream. Inshore, the sand channel is winding and irregular, with a typical width of 150 - 200 feet. The sand channel terminates approximately 300 feet offshore (Sea Engineering, January 1990). Once off the sand channel toward deeper ocean waters to about the 40 foot depth, the bottom zone consists of an

irregular surface with ridges and surge channels. This zone would probably require cable protection out to the 40 foot water depth, 2,000 feet from shore. Trenching and use of anchored split pipe would be necessary to protect the cable as it transitions from the nearshore (approximately 1,300 feet from shore), to deeper ocean waters.

Because of problems associated with intensive recreational use and need for potentially extensive cable trenching in nearshore ocean waters, Pokai Bay has been discounted from further consideration.

5.3.2 KAHE BEACH

The Kahe Beach area extends from the Kahe Point Beach Park to the Nanakuli Beach Park area, a distance of approximately 7,000 feet. Kahe Point Beach Park, located at the southern end of this area is already in use for the GTE Hawaiian Tel, Hawaii Interisland Cable System (HICS).

Recreational uses at Kahe Beach are similar to those for Pokai Bay, although some uses are limited by low limestone sea cliffs, pieces of fallen limestone, and lack of a sandy shoreline.

The nearshore region contains hard bottom interspersed with patches of coral, rock outcrops, and sand with limited sand channels. In deeper ocean waters, a sandy ocean bottom predominates which would facilitate the burial of fiber optic cable. Although there are some patches of rock and coral outcrops in various locations, it is expected that any proposed boring for a fiber optic cable would be targeted to avoid the active outcrops of live corals. Cable protection from each of the anticipated landing sites would be required until either a sandy bottom is reached, or the water depth exceeds approximately -50 to -60 feet MSL.

Use of the Kahe Point Beach Park was initially considered, but was discounted from consideration because it would not facilitate use of directional boring to each of the four proposed "landing" sites. The proposed work will involve drilling of four (4) bores approximately $\pm 2,500$ linear feet to offshore waters where three (3) submarine fiber optic cables will be placed into conduit (placed in the bores), pulled and connected into the terminal building. The fourth bore will be capped, sealed, and will serve as a spare.

Use of the beach park for a landing site would require that one of two options be considered; directional boring to waters offshore of Kahe Point Beach Park, or use of a conventional cable landing and installation procedure. The first option of directional boring to waters offshore of Kahe Point would require a bore length in excess of one-mile. In addition to major technology limitations of existing boring equipment, costs associated with the length of the bores would be cost prohibitive. This is due to both the length needed as well as the requirement that four (4) bores be drilled.

The second option of installing fiber optic cables using conventional trenching would require trenching through low limestone outcrops and sea cliffs at the shore to establish a landing site. Anchoring or trenching of the cable within the submerged nearshore would also be required to ensure sufficient protection of the cable until approximately 50 to 60 feet of water is reached. The alignment of the cable through submerged water would also need to be selected to minimize damage to coral reefs and outcrops. A suitable alignment would need to be found for each of the three (3) cables planned to be installed. Where a suitable alignment through sandy or rocky substrate cannot be found, corals may need to be trenched or removed to accommodate the cable.

Once the cable has been landed it will need to be installed along the Farrington Highway right of way fronting the Kahe Power Plant. Trenching would be required along the highway to install conduits and manholes for a distance of over one mile. In addition, the specific fiber optic cable planned to be used is subject to disruption from electromagnetic fields (EMF). The individual light transmitting fibers will not be affected, however, EMF fields generated from the power plant could induce interference within a carrier wire contained in the fiber optic cable that would be picked up at the terminal building end. The EMF induced interference would be interpreted as a line break or failure resulting in a shutdown.

Although the level of shielding necessary to protect the cable from EMF fronting the power plant is not known, it may be possible to construct grounding devices using steel conduits or plates to protect the cable. This practice has been successfully applied at Spencer Beach Park,

where a similar type of cable was installed within a common trench being shared by an underground power line.

If the cable can be successfully shielded, costs for trenching at the beach park and along Farrington Highway are expected to be high due to distance and need for grounding. Potential for traffic impacts would also occur during construction resulting in potential delays and disruption of traffic.

Because of limitations associated with existing boring technology, EMF, cost constraints, and potential for greater environmental impacts, Kahe Point Beach Park was discounted from further consideration.

5.3.3 OTHER ALTERNATIVE SITES

Also considered are two existing fiber optic telecommunications facilities located further north, which both contain existing landed fiber optic cables as well as terminal buildings to which new cables could be routed. The Keawaula and Makaha Beach Cable Stations, however, were discounted from consideration due to problems associated with market competition between the Southern Cross Cable System and AT&T, lack of available space, and need to maintain route diversity.

5.4 ALTERNATIVE TECHNOLOGY

Use of additional new or existing telecommunications satellites are not a viable alternative based on the level of demand projected for the proposed Southern Cross system as well as satellite limitations including:

- Transmission delays due to technical and atmospheric limitations involving the use of radio transmissions through the atmosphere;
- Visual and aesthetic intrusion caused by the need for ground stations and radio antennas which would need to be constructed to accept satellite transmissions; and

- Difficulties associated with "double hops" which occur when data must be retransmitted to establish a secure voice or data circuit.

In comparison with satellites, fiber optic technology is the only means of providing the capacity needed for digital communications without transmission delays and major visual and aesthetic problems.

Chapter 6

RELATIONSHIP BETWEEN LOCAL SHORT-TERM
USES OF THE ENVIRONMENT AND MAINTENANCE AND
ENHANCEMENT OF LONG-TERM PRODUCTIVITY

Development of the proposed project will commit the necessary construction materials, human effort, and fiscal resources. Short-term construction activities will increase job opportunities as well as improve public telecommunications facilities in the area.

Long-term gains resulting from development of the proposed project include provision of more effective State telecommunications capabilities (by means of transmission from fiber optic cables). The proposed project will maintain and enhance economic productivity by increasing telecommunications service between the State and international (South Pacific nations) and domestic (west coast and mainland U.S.) locations.

Chapter 7
IRREVERSIBLE AND IRRETRIEVABLE
COMMITMENT OF RESOURCES BY THE PROPOSED ACTION

Development of the proposed project will involve the irretrievable loss of certain environmental and fiscal resources. However, the costs associated with the use of these resources should be evaluated in light of benefits to the residents of the State and the City and County of Honolulu.

It is anticipated that the construction of the proposed project will commit the necessary construction materials and human resources (in the form of planning, engineering, construction and labor). Reuse for much of these resources is not practicable. Although labor is compensated during the various stages of development, labor expended for project development is non-retrievable.

Chapter 8
NECESSARY PERMITS AND APPROVALS

8.1 FEDERAL GOVERNMENT

U.S. Army Corps of Engineers

Section 404/10 Department of the Army Permit

8.2 STATE OF HAWAII

Department of Land and Natural Resources

Conservation District Use Permit (CDUP)

Right of Entry and Establishment of Offshore Easement

Department of Business, Economic Development & Tourism (DBEDT)

Coastal Zone Management Federal Consistency Review

Department of Health

Section 401 Water Quality Certification (as determined by U.S. Army Corps of Engineers,
pursuant to Section 404/10 Department of the Army Permit)

Separate Waste Water Treatment System Design (reviewed as part of Building Permit by
City and County of Honolulu, DPP)

8.3 CITY AND COUNTY OF HONOLULU

Department of Planning and Permitting (DPP)

Shoreline Management Area (SMA) Permit

Shoreline Setback Variance (SSV) Permit

Building Permit

Chapter 9
FINDINGS AND REASONS SUPPORTING DETERMINATION

In accordance with the provisions set forth in Chapter 343, Hawaii Revised Statutes, and the significance criteria of Section 11-200-12, Title 11, Chapter 200, it is anticipated that this project will have no significant adverse impact to water quality, air quality, existing utilities, noise, cultural and archaeological sites, or wildlife habitat. According to the significance criteria:

1. *Irrevocable commitment to loss or destruction of natural or cultural resources -*

The proposed project is not anticipated to adversely impact natural or cultural resources. An investigation of site conditions indicates no known natural or cultural resources which would be adversely impacted by the proposed development. Installation of support infrastructure and use of directional boring from the shore-end to the submerged nearshore will result in a relatively unobtrusive project, with no major trenching required along the proposed alignment. When completed there will be little to no evidence of work at the shore-end. Ground disturbed in the general area will be returned to pre-existing contours or replanted to ensure protection against erosion.

2. *Curtailment of the range of beneficial uses of the environment -*

The proposed project will have no adverse impacts on continued use of the nearshore and shoreline environment. The fiber optic cable in the nearshore will emerge from three submerged locations. The materials used will be environmentally benign and have no adverse impact on the environment.

The fiber optic cable at the land shore-end will be installed below grade by directional boring. The terminus of the cable will be the TB. The location of the fiber optic cable and supporting infrastructure will preclude use of the site for other purposes.

3. *Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions, or executive orders -*

The proposed project is consistent with the environmental policies, goals and guidelines in Chapter 343, HRS, and the National Environmental Policy Act. Potential sources of adverse impacts have been identified and appropriate measures developed to mitigate or minimize impacts to negligible levels.

4. *Substantially affects the economic or social welfare of the community or state -*

The proposed project is intended to improve the long-distance transmission of domestic and international fiber optic signals which will facilitate the future economic growth of the State. The anticipated entry of new capacity by Southern Cross will also promote competitive pressure on the cost of telecommunications services. This expected downward pressure on pricing can be expected to increase accessibility and use of telecommuting for business, commerce and cultural exchange.

5. *Substantially affects public health -*

The proposed project will be developed in accordance with federal, state, and City and County of Honolulu, rules and regulations governing public safety and health. The fiber optic cable and accompanying light signals do not constitute a public health or safety hazard. The cable is constructed of steel, glass fibers, and plastics. Light signals transmitted through the cable will be self contained, of low power, and are not expected to escape. Should a cable break occur, the resulting loss of signal would require a shutdown of the system until repairs can be made. The primary health concerns, therefore, involve air, water, noise, and traffic impacts during construction. It is expected that potential for impacts due to construction will be minimized or brought to negligible levels by use of the mitigation measures described in this document.

6. *Involves substantial secondary impacts, such as population changes or effects on public facilities -*

The proposed project is limited to installation of support infrastructure and directional boring of four cable ductlines, and landing of three, submarine fiber optic cables. Although the Southern

Cross fiber optic cable system will serve the present and future population of Hawaii, the project itself, will not generate new population growth.

7. *Involves substantial degradation of environmental quality -*

The proposed project will be developed in accordance with the environmental polices of Chapter 343, HRS, and the National Environmental Policy Act. The project site is on land which has been previously disturbed for use as a pig farm. The proposed project can be considered to be less obtrusive than this previous activity since it will only involve installation of infrastructure and directional boring to the nearshore submerged bottom.

8. *Is individually limited but cumulatively has considerable effect on the environment, or involves a commitment for larger actions -*

The proposed project is intended to improve telecommunications capabilities between New Zealand, Australia, and the South Pacific, with western U.S. states including California, Seattle, Oregon, etc. The project itself, is not expected to adversely impact the environment, generate future population growth, or create major new demands for development.

9. *Substantially affects a rare, threatened or endangered species or its habitat -*

There are no endangered flora or fauna species within the project site. Potential for adverse impacts to oceanic fauna including humpback whales, sea turtles, and monk seals, have been described and discussed with appropriate mitigation measures in Chapter 3.

10. *Detrimentially affects air or water quality or ambient noise levels*

No adverse impacts to air or water quality are anticipated. No noise or atmospheric discharges are associated with operation of the fiber optic cable system. However, construction will be required to install support infrastructure and the cable. All proposed construction activity is expected to occur in accordance with applicable laws and regulations governing the safe operation and use of construction machinery. Any potential impacts to air, water quality, or noise levels will be addressed by use of appropriate measures described in this document.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive area, such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, freshwater, or coastal waters*

The proposed project is located in an area appropriate for installation of a submarine fiber optic cable. The project site does not contain any especially sensitive environmental characteristics which would detract from this activity.

12. *Substantially affects scenic vistas and view planes identified in county or state plans or studies*

The proposed project involves installation of support infrastructure and submarine fiber optic cable. Although there will be potential for impacts during construction, it is expected to be of short duration and of limited scope. Upon completion all construction equipment will be removed from the site. Support infrastructure necessary to the project will involve a paved access road, manhole, retaining walls, and utilities. These features are not expected to impact the existing scenic vistas or view planes of the area.

13. *Requires substantial energy consumption*

Sufficient energy will be used to install the fiber optic cable system. Energy will also be used during the transport of construction equipment, machinery, and personnel to the project site. None of these activities are expected to result in use of energy significantly greater than similar fiber optic cable construction projects.

Based on analysis and review of the above factors, it is expected that an Environmental Impact Statement (EIS) will not be required. By issuance of this Final Environmental Assessment, a Finding of No Significant Impact (FONSI) will be issued for this project.

Chapter 10

ORGANIZATIONS AND AGENCIES CONSULTED IN
THE PREPARATION OF THE ENVIRONMENTAL ASSESSMENT

The following organizations and agencies were contacted during preparation of the environmental assessment:

10.1 FEDERAL AGENCIES

U.S. Army Corps of Engineers
U.S. Coast Guard

10.2 STATE AGENCIES

Office of the Governor
Department of Land and Natural Resources (DLNR)
Department of Health (DOH)
Department of Business, Economic Development & Tourism (DBEDT)
Department of Transportation (DOT)

10.3 CITY AND COUNTY OF HONOLULU

Department of Planning and Permitting

10.4 PRIVATE AND COMMUNITY ORGANIZATIONS,
AND ELECTED OFFICIALS

Honolulu City Council
Honolulu City Councilmember John DeSoto
Waianae Neighborhood Board No. 24
State Senator Colleen Hanabusa
State House Representative Michael P. Kahikina

Chapter 11
COMMENTS AND RESPONSES TO THE DRAFT
ENVIRONMENTAL ASSESSMENT PREPARATION

This section contains the Draft EA comments received and responses to comments:

OCT- 1-99 MON 15:45

PLANNING & PERMITTING

FAX NO. 8085276743

P. 02

1999/0106-1121



DEPARTMENT OF THE ARMY
U. S. ARMY ENGINEER DISTRICT, HONOLULU
FT. SHAFTER, HAWAII 96858-5440

REPLY TO
ATTENTION OF

September 2, 1999

99 SEP -3 PM 1:30
COPY TO: [illegible]

Regulatory Branch

Ms. Jan Naoe Sullivan
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

This responds to your letter requesting review comments on the Environmental Assessment for the proposed Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu.

We are presently processing a Department of the Army (DA) permit application for the proposed project. File No. 990000437 has been established for this application.

If you have any questions regarding DA permit requirements, please contact Mr. Peter Galloway of my staff at 438-8416.

Sincerely,

George P. Young, P.E.
Chief, Regulatory Branch

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



R. M. TOWILL CORPORATION
SINCE 1930

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Environmental Services
Photogrammetry
Surveying
Construction Management

October 9, 1999

Mr. George P. Young, P.E.
Chief, Regulatory Branch
Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Dear Mr. Young:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated September 2, 1999, regarding the proposed project. We acknowledge your concurrent processing of DA Permit File No. 990000437, and appreciate the efforts of your staff, Mr. Peter Galloway, with the coordination of governmental agency reviews for this project.

Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

LAMIN J. CAYETANO
GOVERNOR



ESTHER UEDA
EXECUTIVE OFFICER

STATE OF HAWAII
DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM
LAND USE COMMISSION

P.O. Box 2359
Honolulu, HI 96804-2359
Telephone: 808-587-3822
Fax: 808-587-3827

September 7, 1999

99 SEP -9 11:18:16

Ms. Jan Naoe Sullivan, Director
Department of Planning and
Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment (DEA) for the
Submarine Fiber Optic Cable Landing at Kahe Beach,
Oahu, TMK 9-2-03: 2, 9, 11

We have reviewed the DEA for the subject project forwarded by your letter dated August 26, 1999, and confirm that the project location, as represented on Figure 4-1, is designated within the State Land Use Conservation and Agricultural Districts. We note that throughout the DEA, the latter district is incorrectly referred to as the "Agriculture" District.

We have no further comments to offer at this time. We appreciate the opportunity to comment on the subject DEA.

Should you have any questions, please feel free to call me or Bert Saruwatari of our office at 587-3822.

Sincerely,

ESTHER UEDA
Executive Officer

EU:aa

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



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Surveying
Construction Management

October 9, 1999

Ms. Esther Ueda, Executive Officer
Land Use Commission
State of Hawaii
Department of Business, Economic Development & Tourism
P.O. Box 2359
Honolulu, Hawaii 96804

Dear Ms. Ueda:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your letter dated September 7, 1999. We acknowledge the identification of the Agricultural District and will provide this correction in our forthcoming Final Environmental Assessment.

We appreciate your review of the Draft Environmental Assessment. Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

OCT- 4-99 MON 15:50

PLANNING & PERMITTING

FAX NO. 8085276743

P. 10

DEPARTMENT OF ENVIRONMENTAL SERVICES
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 3RD FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 527-6863 • FAX: (808) 527-5675 • Website: www.cc.honolulu.hi.us



JEREMY HARRIS
Mayor

KENNETH E. SPRAGUE, P.E., Ph.D.
Director

BARRY FUKUNAGA
Deputy Director


ENV 99-101

SEP - 9 1999

MEMORANDUM

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

ATTENTION: ADDIS SHAW-KIM

FROM:  KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

SUBJECT: ENVIRONMENTAL ASSESSMENT (EA)
SUBMARINE FIBER OPTIC CABLE LANDING AND SUPPORT
INFRASTRUCTURE AT KAHE POINT
TMK: 9-2-3: 2, 9 AND 11

DIR.
SEP 10 1999
99 SEP 10 PM 12:29

We have reviewed the subject EA and have no comments to offer at this time.

Should you have any questions, please contact Alex Ho at extension 4150.

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



R. M. TOWILL CORPORATION
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Photogrammetry
Surveying
Construction Management

October 9, 1999

Mr. Kenneth E. Sprague, Director
Department of Environmental Services
City and County of Honolulu
650 South King Street, 3rd Floor
Honolulu, Hawaii 96813

Dear Mr. Sprague:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your memorandum dated September 9, 1999. We acknowledge that you have no comments to offer concerning the proposed project.

We appreciate your review of the Draft Environmental Assessment. Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

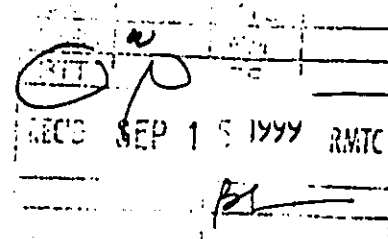
BENJAMIN J. CAYETANO
GOVERNOR



GENEVIEVE SALMONSON
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4186
FACSIMILE (808) 586-4188



September 14, 1999

Jan Sullivan, Director
Department of Planning and Permitting
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

Attn: Ardis Shaw-Kim

Dear Ms. Sullivan:

Subject: Draft Environmental Assessment (EA) for GTE Hawaiian Tel Fiber Optic
Cable Landing at Kahe Beach, Waianae

We have the following comments to offer:

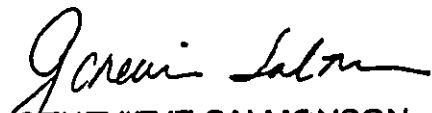
1. Two-sided pages: In order to reduce bulk and conserve paper, we recommend printing on both sides of the pages in the final document.
2. Cumulative Impacts: The Environmental Impact Statement law requires that full disclosure of cumulative impacts be made on geographically-related projects. Provide a full analysis and discussion of this and all cable projects along the Waianae coast.
3. Service road: The EA mentions a 400-foot service road, and a terminal building which will be located 900 feet mauka of Farrington Highway. If the purpose of the service road is to access the terminal building, will the existing unpaved road link the new road and the building? In the final EA provide a fuller discussion of the new road, including the proposed retaining walls alongside the road.
4. Alternative Construction Methodology: Section 5.5 in the Alternatives chapter lists trenching as an alternative construction method. A discussion of alternatives that were considered but rejected is required in Chapter 343 reviews. If trenching is an active alternative for this project, a much more thorough

Jan Sullivan
September 14, 1999
Page 2

discussion and analysis of impacts and mitigation measures must be provided, along with the original discussion on the use of boring, in a revised draft EA. This EA would have to go through a full review, comment, and finalization period before project implementation.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,


GENEVIEVE SALMONSON
Director

c: Powell Onishi, GTE Hawaiian Tel
Brian Taketa, RM Towill

CORRECTION

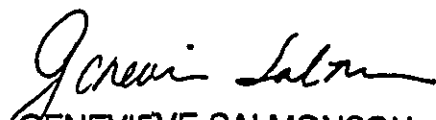
THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING

Jan Sullivan
September 14, 1999
Page 2

discussion and analysis of impacts and mitigation measures must be provided, along with the original discussion on the use of boring, in a revised draft EA. This EA would have to go through a full review, comment, and finalization period before project implementation.

If you have any questions call Nancy Heinrich at 586-4185.

Sincerely,


GENEVIEVE SALMONSON
Director

c: Powell Onishi, GTE Hawaiian Tel
Brian Taketa, RM Towill

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



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October 8, 1999

Genevieve Salmonson, Director
Office of Environmental Quality Control (OEQC)
235 South King Street, Suite 702
Honolulu, Hawaii 96813

Dear Ms. Salmonson:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated September 14, 1999, regarding the proposed project. We have prepared the following response to your comments:

1. The Final Environmental Assessment (EA) will be printed on two sided paper.
2. Cumulative Impact of Cable Projects Along Waianae Coastline:

TELECOMMUNICATIONS CABLES ALONG WAIANAE

Telecommunications cables have been installed at various locations along the Waianae coastline. Cables we are aware of which are in use by year of installation and name are as follows:

- 1984 ANZCAN - Transpacific (Keawaula Beach)
- 1989 HAW 4 - Transpacific (Makaha Keawaula Beach)
- 1989 TPC 3 - Transpacific (Makaha Beach)
- 1993 PACRIMEAST - Transpacific (Keawaula Beach)
- 1993 HAW 5 - Transpacific (Keawaula Beach)
- 1994 Hawaii Island Cable System - Interisland (Kahe Point Beach Park)
- 1995 TPC 5 - Transpacific (Keawaula Beach)
- 1996 Hawaiian Island Fiber Network - Interisland (Makaha Beach and Keawaula Beach)

Ms. Genevieve Salmonson

Page 2

October 8, 1999

In addition to the above there is the proposed Japan-U.S. Cable System which will involve installation of fiber optic cable from Japan to a landing site at Makaha Beach. This cable project is planned to be installed during the fourth quarter of 1999.

Installation of military cables are not normally disclosed to the public, although the U.S. Navy utilizes a FORACS system of undersea cables in the vicinity of Nanakuli Beach for naval purposes.

CUMULATIVE AND FUTURE POTENTIAL FOR IMPACTS

The first known use of a submarine cable in the State was the transpacific San Francisco-Honolulu cable which was laid in 1903. Since then, use of submarine telecommunications cables have been limited by the capacity available from copper and coaxial cables. The more recent introduction of fiber optics have dramatically increased data bandwidth and the transfer rate of data used for voice, computing, banking, commerce, and related activities. Growing use of the internet has further increased the demand for bandwidth made possible by fiber optics.

To date there have been no reports of adverse environmental impacts due to installation and use of fiber optic cables along the Waianae coastline. As noted in prior Hawaii Revised Statutes (HAR), Chapter 343, EAs, involving the installation and use of individual fiber optic cables, potential for adverse environmental impacts were not anticipated and since installation, have not occurred.

The cumulative or combined presence of cables along Waianae, as well as islandwide and statewide, have similarly not resulted in potential or actual adverse impacts. This may be due in part to the physical attributes of fiber optic cable and the requirements for installation which have been demonstrated to be of limited scope and scale:

- A) The cable itself is of small size, approximately 1.5 to 2 inches in diameter;
- B) Installation of cable from a cable laying ship can usually be completed within the course of less than 1-day. This minimizes the potential for impacts to ocean users surrounding the landing site;
- C) Upon completion of cable laying, the cable will be installed subsurface, out of interference with surface activities; and,
- D) Submerged cable is usually installed within alignments containing extensive sand deposits. Upon completion of cable laying the portion of

Ms. Genevieve Salmonson

Page 3

October 8, 1999

cable crossing the sand usually becomes buried where it is further removed from potential problems with shoreline users and activities.

Fiber optic cables further utilize light pulses which are contained within fiber strands which are protected by plastic and steel cross members. The laser generated light pulses will result in no electromagnetic fields which could cause harm to marine or terrestrial flora or fauna. The generation of light pulses within the cable is also limited and of relatively low output powered by direct current repeaters. An equivalent lumen output is expected to be less than that from a small diver's flashlight. In the event of a cable failure terminal building equipment monitoring the cable would automatically initiate a shut down.

3. New Access Road

The proposed paved access road will be constructed in a "Y" configuration to provide access to the terminal building and will be built over portions of the existing unpaved access road (See Attached Figure). The long portion of the "Y" configured road (Road "A") will be approximately 400 feet long and 24 feet in width. The short portion of the road (Road "B") will be approximately 100 feet long and 15 feet wide. The road will be constructed to standards of the City and County of Honolulu, and State of Hawaii.

Two retaining walls will be constructed to stabilize the Road "A" portion of the road. Retaining walls will not be required for Road "B":

- A) Retaining wall "D" located on the north side of Road "A", is approximately 116 feet long and 6 inches in height from the road surface and will be constructed at the mauka-most end of the road. A guard rail will be placed onto the wall for vehicle safety.
- B) Retaining wall "C" located on the south side of Road "A", is approximately 235 feet long and 6 inches in height from the road surface, and will be constructed along the west end of the terminal building between the building accessway and the access road. A 6 foot high chain link fence will be placed onto the wall for security.

4. The proposed use of directional boring remains the preferred alternative for installation of submarine fiber optic cable. We acknowledge your comment regarding potential use of trenching.

Ms. Genevieve Salmonson
Page 4
October 8, 1999

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,



Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

OCT- 4-99 MON 15:49

PLANNING & PERMITTING

FAX NO. 8085276743

P. 09

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU

3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869



IFRCHY HARRIS
MAYOR

ATTILIO K. LEONARDI
FIRE CHIEF
JOHN CLARK
DEPUTY FIRE CHIEF

SEP 15 11 11 36
CITY & COUNTY OF HONOLULU
FIRE DEPARTMENT

September 14, 1999

TO: JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: ATTILIO K. LEONARDI, FIRE CHIEF

SUBJECT: ENVIRONMENTAL ASSESSMENT, CHAPTER 343, HRS
PROJECTS WITHIN THE SHORELINE SETBACK AND
SPECIAL MANAGEMENT AREA
TAX MAP KEY: 9-2-003: 002, 9-2-003: 009, AND 9-2-003: 011

Project Name : Submarine Fiber Optic Cable Landing and
Support Infrastructure at Kahe Point
Location : 92-200 Farrington Highway, Waianae, Oahu
Tax Map Key : 9-2-3: 2, 9, and 11
Staff Planner : Ardis Shaw-Kim Phone: 527-5349

We have no objection to this project and do not foresee a significant impact with the fire services that we provide.

Should you have any questions, please call Acting Battalion Chief Alan Chong of our Fire Prevention Bureau at 831-7778.

Attilio K. Leonard
ATTILIO K. LEONARDI
Fire Chief

AKL/AC:bh

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



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October 9, 1999

Mr. Attilio K. Leonardi, Fire Chief
Fire Department
City and County of Honolulu
3375 Koapaka Street, Suite H425
Honolulu, Hawaii 96819

Dear Mr. Leonardi:

**SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu**

Thank you for your comments dated September 14, 1999. We acknowledge that you have no objection to the proposed project.

We appreciate your review of the subject DEA. Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

OCT- 4-99 MON 15:47

PLANNING & PERMITTING

FAX NO. 8085276743

P. 06

BENJAMIN J. CAYETANO
GOVERNOR



STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

RECEIVED

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAII
GLENN M. OKIMOTO

'99 SEP 20 AM 8:36

IN REPLY REFER TO:

DEPT. OF PLANNING
& PERMITTING
C & C OF HONOLULU 9248

September 14, 1999

Ms. Jan Naoe Sullivan
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Submarine Fiber Optic Cable Landing and
Support Infrastructure at Kahe Point
Environmental Assessment (EA) for Shoreline Setback and
Special Management Area (SMA)
TMK: 9-2-3: 2, 9, and 11

Thank you for your transmittal requesting our review of the subject project.

Construction plans for all work within the State highway right-of-way must be submitted for our review and approval.

We appreciate the opportunity to provide comments.

Very truly yours,

A handwritten signature in cursive script, appearing to read "Kazu Hayashida".

KAZU HAYASHIDA
Director of Transportation

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



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Construction Management

October 9, 1999

Mr. Kazu Hayashida, Director
State of Hawaii
Department of Transportation
869 Punchbowl Street
Honolulu, Hawaii 96813-5097

Dear Mr. Hayashida:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated September 14, 1999, regarding the proposed project.

We acknowledge that construction plans for the GTE Hawaiian Tel International, Inc., project within the State right-of-way will need to be submitted to DOT for review and approval.

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

JAMIN J. CAYETANO
GOVERNOR OF HAWAII

99 SEP 21 PM 1:16



STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 3378
HONOLULU, HAWAII 96801

BRUCE S. ANDERSON, Ph.D., M.P.H.
DIRECTOR OF HEALTH

In reply, please refer to:
File:

September 16, 1999

99-191/epo

Ms. Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Dear Ms. Sullivan:

Subject: Environmental Assessment (EA)
Projects Within The Shoreline Setback and Special
Management Area
Project Name: Submarine Fiber Optic Cable Land and
Support Infrastructure at Kahe Point
Location: Kahe Point, Oahu, Hawaii
TMK: 9-2-3: 2, 9 and 11

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

Clean Water

The Clean Water Branch (CWB) staff has contacted Mr. Brian Takeda of the R. M. Towill Corporation (RMTC) and was given the following additional information on the subject project.

Ms. Jan Naoe Sullivan
September 16, 1999
Page 2

99-191/epo

1. The elevation of the proposed pit for the directional boring rig and manhole is approximate 40 feet above mean sea level (MSL). This pit will be located mauka of Farrington Highway.
2. The location of the detention basin for settling and drying the lubricant will be next to the pit. The detention basin will not be lined because there are no ground water contamination concerns at the site.

The following are our comments based on the additional information received above:

1. The applicant should consult the U. S. Army Corps of Engineers, Honolulu Engineer District, regarding the Department of the Army (DA) permit requirements.
2. We recommend avoiding any discharge of the lubricant.
3. The proposed construction activity must not cause any violations to the conditions and limitations contained in the National Pollutant Discharge Elimination System Permit (NPDES File No. HI 0000019) and Zone of Mixing (ZOM File No. ZM-21) issued to Hawaiian Electric Company, Inc. We recommend that the GTE Hawaiian Tel International, Inc. and/or the R. M. Towill Corp. consult with the Hawaiian Electric Company, Inc. before construction begins.

Should you have any questions on these comments, please contact Mr. Ed Chen of the Clean Water Branch at 586-4309.

Noise Concerns

Activities associated with the construction phase of the project must comply with the Department of Health's Administrative Rules, Chapter 11-46, "Community Noise Control."

Ms. Jan Naoe Sullivan
September 16, 1999
Page 3

99-191/epo

- a. The contractor must obtain a noise permit if the noise levels from the construction activities are expected to exceed the allowable levels of the rules as stated in Section 11-46-6(a).
- b. Construction equipment and on-site vehicles requiring an exhaust of gas or air must be equipped with mufflers as stated in Section 11-46-6(b)(1)(A).
- c. The contractor must comply with the requirements pertaining to construction activities as specified in the rules and the conditions issued with the permit as stated in Section 11-46-7(d)(4).

Should there be any questions on this matter, please call Mr. Jerry Haruno, Environmental Health Program Manager of the Noise, Radiation and Indoor Air Quality Branch at 586-4701.

Sincerely,



GARY GILL
Deputy Director for
Environmental Health

c: CWB
NR&IAQB

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



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Construction Management

October 9, 1999

Mr. Gary Gill
Deputy Director for Environmental Health
State of Hawaii
Department of Health
P.O. Box 3378
Honolulu, Hawaii 96801

Dear Mr. Gill:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated September 16, 1999, regarding the proposed project. We have prepared the following response to your comments:

Clean Water Branch

1. We have consulted with the U.S. Army Corps of Engineers for the proposed project and have been assigned Department of the Army Permit File No. 990000437.
2. Every reasonable effort will be taken to prevent discharge of directional drilling lubricant to waters of the State of Hawaii.
3. We acknowledge the need to coordinate the proposed project construction to ensure conditions and limitations of National Pollutant Discharge Elimination System (NPDES) Permit File No. HI 0000019 and Zone of Mixing Permit File No. ZM-21, issued to Hawaiian Electric Company, Inc., are met.

Noise Concerns

1. The construction contractor will be notified that a noise permit will be required if noise levels are expected to exceed allowable levels as stated in Hawaii Administrative Rules (HAR), Section 11-46-6(a).
2. Construction equipment and on-site vehicles shall be required to be equipped with mufflers as stated in HAR, Section 11-46-6(b)(1)(a).

Mr. Gary Gill
October 9, 1999
Page 2

3. The contractor will be notified that they must comply with rules and conditions associated with the issuance of a noise permit per HAR, Section 11-46-7(d)(4).

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,



Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

OCT- 8-99 FRI 15:42

PLANNING & PERMITTING

FAX NO. 8085276743

P. 01

1999/006-6547



99 OCT -6 PH 1:22

DEPT OF PLANNING
and PERMITTING
CITY & COUNTY OF HONOLULU

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
P.O. BOX 621
HONOLULU, HAWAII 96809

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

OCT 5 1999

File No.: Cдуа OA-2945

Ref.:PB:THE

SUSPENSE DATE: 21 Days after date
stamped on letter

Ms. Jan Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 S. King St., 7th Floor
Honolulu, Hawaii 96813

Dear Ms. Sullivan,

**SUBJECT: CONSERVATION DISTRICT USE APPLICATION (Board Permit) for Submarine Fiber Optic
Cable Landing, Kahe Beach, Oahu by GTE Hawaiian Tel, International**

Attached please find Conservation District Use Application (CDUA) No. OA-2945, and our Department's "Notice of Acceptance." We would appreciate your review and comment on this CDUA by the suspense date noted above.

We understand your agency will be the Accepting Authority for the project's Environmental Assessment (EA). As such, the comment that we would like addressed in the project's final EA is: Please include a more robust discussion (including a map) of the various existing and potential alternative cable landing sites along the west Oahu shoreline, and the realistic constraints and opportunities for co-locating the Southern Cross cable landing site with these other sites.

Finally, to expedite the processing of our necessary permits for this project, we would appreciate being notified when the final EA has been accepted, and when the SMA Use Permit application has been acted upon.

Should you have questions, please call Tom Eisen of our Planning Branch at 587-0439. If no response is received by the suspense date, we will assume there are no comments.

Sincerely,

Dean Y. Uchida, Administrator
Land Division

Attachments

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



R. M. TOWILL CORPORATION
SINCE 1930

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Construction Management

October 9, 1999

Mr. Dean Y. Uchida, Administrator
Land Division
State of Hawaii
Department of Land and Natural Resources
P.O. Box 621
Honolulu, Hawaii 96809

Dear Mr. Uchida:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu.

Thank you for your comments dated October 5, 1999, regarding the proposed project. We have prepared the following in response:

1. Location of various existing and potential alternative cable landing sites along West Oahu

Existing Cable Landing Sites - Telecommunications cables have been installed at various locations along the Waianae coastline. Cables we are aware of which are in use by year of installation and name are as follows (see attached figure):

- 1984 ANZCAN - Transpacific (Keawaula Beach)
- 1989 HAW 4 - Transpacific (Makaha Keawaula Beach)
- 1989 TPC 3 - Transpacific (Makaha Beach)
- 1993 PACRIMEAST - Transpacific (Keawaula Beach)
- 1993 HAW 5 - Transpacific (Keawaula Beach)
- 1994 Hawaii Island Cable System - Interisland (Kahe Point Beach Park)
- 1995 TPC 5 - Transpacific (Keawaula Beach)
- 1996 Hawaiian Island Fiber Network - Interisland (Makaha Beach and Keawaula Beach)

Mr. Dean Uchida
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In addition to the above there is the proposed Japan-U.S. Cable System which will involve installation of fiber optic cable from Japan to a landing site at Makaha Beach. This cable project is planned to be installed during November 1999.

Installation of military cables are not normally disclosed to the public, although the U.S. Navy utilizes a FORACS system of undersea cables in the vicinity of Nanakuli Beach for naval purposes.

Potential Cable Landing Sites - We are not aware at this time of proposed new cable landing sites that may be considered by prospective telecommunications carriers.

2. Realistic constraints and opportunities for co-locating the Southern Cross Cable landing site with other sites

There are two potential alternatives for landing of the Southern Cross Cable Network: 1) selection of a new cable landing site, which is the subject of the project DEA; and, 2) use of an existing landing site. The major advantage of using an existing landing site is that it already fulfills many of the minimum criteria necessary for the landing of fiber optic cable. These criteria involve the following ("Environmental Assessment for the GTE Hawaiian Tel Interisland Fiber Optic Cable System, January 1993"):

- Rapid Erosion - The greatest danger to fiber optic cables is the submarine portion of the alignment. The geologically young age of the Hawaiian Islands result in extremely high erosion rates. The resulting high erosion places large volumes of unconsolidated sediment into the shallow waters surrounding the islands. These sediment deposits move rapidly down the steep island slopes when they become unstable. The down slope sediment movement can be started by earthquakes, storm runoff, and storm generated waves. Installation of cables on steep, sediment covered slopes should therefore be avoided, if it is possible. When these steep slopes cannot be avoided, the cable should traverse as directly up the slope as possible.
- Giant Landslides - A series of large landslides, documented by the U.S. Geological Survey, have been discovered surrounding the Hawaiian Islands. The primary danger to submarine cables lies in the extremely rough landslide surfaces which are known to be littered with huge volcanic boulders. These boulders have been observed from

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submersibles to often be the size of a house. Landslide surfaces pose a serious threat by producing unacceptable cable spans when the cable is draped over individual blocks, as well as the possibility of having the cable becoming tangled if it had to be retrieved for repair.

- Drowned Coral Reefs - A series of drowned coral reefs are known to surround the Hawaiian islands. These deep ocean reefs frequently result in the creation of gaps if a cable is spanned over it. These gaps or spans will allow the cable to be subjected to strong ocean bottom currents which are capable of causing damage to the internal integrity of the cable.
- Seismic Activity - The greatest danger to the cable from earthquakes is not the actual fault displacement, but the possibility that the displacement will initiate the movement of unstable sediments along the slopes of the Hawaiian Islands. The general criteria for considering placement of cable is to avoid epicentral locations of earthquakes of a magnitude 3 or greater. The primary location for these types of earthquakes are surrounding the Island of Hawaii.
- Dumping Areas - A large, presently inactive, explosive dumping site is located west of Oahu. Although naval authorities maintain that the area has not been actively used since after World War II, they advise against laying cables through the area.
- Ship and Airplane Wrecks - A number of ships and aircraft lost at sea in the Hawaiian Islands have never been located. These wrecks could pose a serious threat to submarine cables becoming entangled or otherwise wrapped around the wreckage. Side scanning sonar surveys taken along proposed submarine cable routes are generally used to ensure the alignment is free of these hazards.

In addition to the above, the following must also be considered:

- Shoreline/Nearshore Conditions - The depth of water from the landing site towards the ocean must be deep enough to protect the cable. Under ideal conditions, 50 to 60 feet of water is required before wave forces diminish to levels where wave action does not affect the cable. Areas with extensive shallow water far from shore (approximately +4,000 linear feet) are considered difficult in providing protection during storms and high wave conditions.

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Composition of bottom materials also pose a constraint to selection of a landing site. Sandy ocean bottom is preferred to minimize potential for environmental impacts associated with anchoring, armoring, or trenching through rock or coral to securely fasten the cable. The presence of extensive sand deposits on the ocean bottom, especially adjacent to the shoreline will also permit the cable to eventually bury itself into the sand, providing maximum protection against wave forces.

- **Public Use Considerations** - It is anticipated that impacts to public recreational areas will be minimal given the short term and relatively minor requirements for installing the proposed cable system. However, because of potential for disruption to beach/ocean users, landing sites in areas of major public use are considered a constraint to selection. Areas of potential historical and archaeological significance in close proximity to cable landing sites are also considered a constraint to selection if there is the possibility of damaging or destroying a historic site.
- **Environmental/Natural Resource Considerations** - Potential landing sites should not be within close proximity to rare or endangered species or their habitats to avoid disturbing them.

Impacts to shoreline and ocean water quality should also be minimized as much as practicable. Sites which would require extensive ocean anchoring and cable protection work (ocean dredging), or on-shore excavation in ground conditions which promote soil erosion should be avoided.

Existing landing sites which fulfill the criteria described above include: 1) Kahe Point Beach Park; 2) Makaha Beach; and, 3) Keawaula Beach.

Kahe Point Beach Park

Kahe Point Beach Park is currently in use as a landing site for the GTE Hawaiian Tel, Hawaiian Island Cable System (HICS). Although it may be possible to use this site for co-location, there would be greater potential environmental and economic impacts.

The proposed Southern Cross cables are planned to be installed into a terminal building by use of directional boring. The proposed work will involve drilling of four (4) bores approximately $\pm 2,500$ linear feet to offshore waters where three (3) submarine fiber optic cables will be placed into conduit (placed in the

Mr. Dean Uchida
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bores), pulled and connected into the terminal building. The fourth bore will be capped, sealed, and will serve as a spare.

Kahe Point Beach Park is located approximately 7,000 linear feet from the terminal building. Use of the beach park for a landing site would require that one of two options be considered; directional boring to waters offshore of Kahe Point Beach Park, or use of a conventional cable landing and installation procedure. The first option of directional boring to waters offshore of Kahe Point would require a bore length in excess of one-mile. In addition to major technology limitations of existing boring equipment, costs associated with the length of the bores would be cost prohibitive. This is due to both the length needed as well as the requirement that four (4) bores be drilled.

The second option of installing fiber optic cables using conventional trenching would require trenching through low limestone outcrops and sea cliffs at the shore to establish a landing site. Anchoring or trenching of the cable within the submerged nearshore would also be required to ensure sufficient protection of the cable until approximately 50 to 60 feet of water is reached. The alignment of the cable through submerged water would also need to be selected to minimize damage to coral reefs and outcrops. A suitable alignment would need to be found for each of the three (3) cables planned to be installed. Where a suitable alignment through sandy or rocky substrate cannot be found, corals may need to be trenched or removed to accommodate the cable.

Once the cable has been landed it will need to be installed along the Farrington Highway right of way fronting the Kahe Power Generating Station. Trenching would be required along the highway to install conduits and manholes for a distance of over one mile. In addition, the specific fiber optic cable planned to be used is subject to disruption from electromagnetic fields (EMF). The individual light transmitting fibers will not be affected, however, EMF fields generated from the power plant could induce interference within a carrier wire contained in the fiber optic cable that would be picked up at the terminal building end. The EMF induced interference would be interpreted as a line break or failure resulting in a shutdown.

Although the level of shielding necessary to protect the cable from EMF fronting the power plant is not known, it may be possible to construct grounding devices using steel conduits or plates to protect the cable. This practice has been successfully applied at Spencer Beach Park, where a similar type of cable was installed within a common trench being shared by an underground power line.

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October 9, 1999
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If the cable can be successfully shielded, costs for trenching at the beach park and along Farrington Highway are expected to be high due to distance and need for grounding. Potential for traffic impacts would also occur during construction resulting in potential delays and disruption of traffic.

Because of limitations associated with existing boring technology, EMF, cost constraints, and potential for greater environmental impacts, Kahe Point Beach Park was discounted from further consideration.

Makaha Beach and Keawaula Beach

Both Makaha Beach and Keawaula Beach are used as landing sites for transpacific and interisland fiber optic cables. Makaha Beach is located approximately +9.5 miles from the Kahe terminal building, and Keawaula Beach is located approximately +15 miles from the Kahe terminal building.

The decision to use Kahe Beach for the Southern Cross cable landing site was based on: 1) market competition; 2) lack of available space; and 3) need to maintain route diversity.

Market Competition

AT&T owns and operates fiber optic cables which have been landed at both Makaha and Keawaula Beach. Recent technological advances and growth of the internet have resulted in increased demand for data bandwidth and transmission speed, as well as need for fiber optic cable facilities designed to provide connectivity with telecommunications networks. Both AT&T and Southern Cross will be competitors for the provision of this service between the South Pacific, Hawaii, the U.S. mainland, and Asia. Competition for the provision of these services, therefore, becomes a factor when decisions are made whether to lease facilities from a competitor (irrespective of availability), or to construct new facilities.

Lack of Available Space

The current demand for facilities, however, has also created limited telecommunications conduit and manhole space along the Farrington Highway corridor. It is anticipated that if Southern Cross were to utilize the Makaha or Keawaula landing sites, that a cable corridor within Farrington Highway would still need to be constructed to accommodate connectivity with the Kahe terminal building. The installation of new conduit and manholes would be required for a distance of approximately 9.5 miles from Makaha Beach, and approximately 15 miles from Keawaula Beach. In addition to high costs of design and construction of either of these corridors, there will be potential for

Mr. Dean Uchida
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environmental impacts associated with archaeological site and burials, and traffic related disruption and delays. The installation of new conduit and manholes from either Makaha or Keawaula Beach, therefore, is not considered a practical alternative.

Route Diversity

Route diversity involves the need for backup capacity in the event of a catastrophic occurrence involving severing or loss of capacity from cables installed within a given alignment. During a catastrophic event such as a major hurricane, ship grounding, or earthquake, it is expected that cables laid within a common alignment and which share a common landing site, would be subject to failure. If there is route diversity, telecommunications corridors established in other locations would be protected. A new electronic route could be established over these existing systems to temporarily restore loss of the transmission corridor. The new network would provide some assurance of redundancy until the damaged system can be repaired.

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

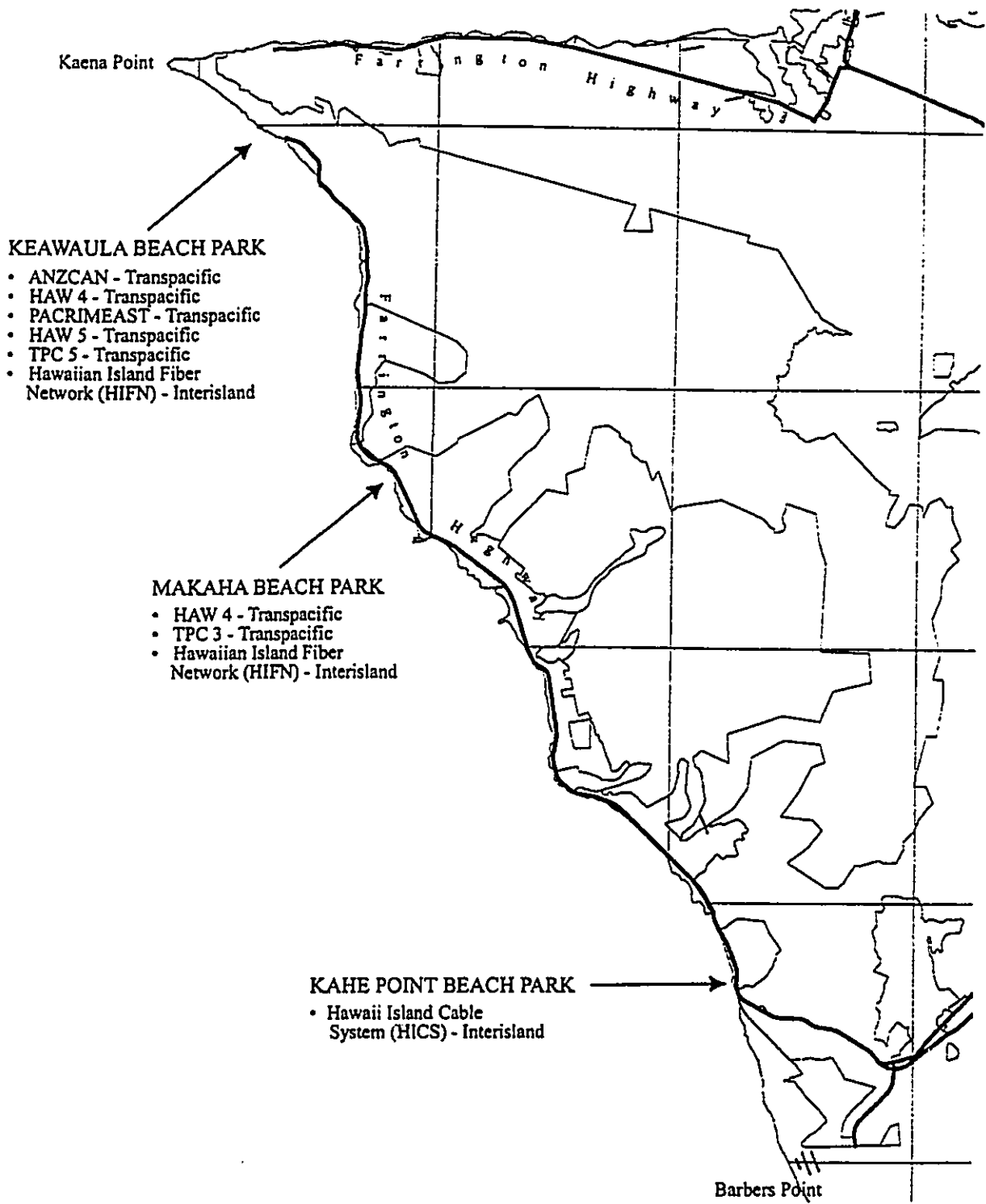
Very truly yours,



Brian Takeda
Senior Planner

ATTACHMENT
BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC



Locations of Known Fiber Optic Cables
Waianae Coast, Oahu, Hawaii



NO SCALE

Southern Cross Cable Network
SUBMARINE FIBER OPTIC CABLE
LANDING AT KAHE BEACH, OAHU
GTE Hawaiian Tel International

R. M. TOWILL CORPORATION

Oct 1999



SIERRA CLUB, HAWAII CHAPTER

P.O. Box 2577
Honolulu, HI 96803
tel: 538.6616

Director: Jeffrey Mikulina
jeff.mikulina@sierraclub.org
fax: 537.9019

Mālama i ka Honua

6 October 1999

GTE Hawaiian Tel International Inc.
Attn: Dennis Kwock
P.O. Box 2200
Honolulu, HI 96841

R.M. Towill Corporation
Attn: Brian Taketa
420 Waiakamilo Rd, Suite 411
Honolulu, HI 96817-4941

City and County of Honolulu
Attn: Ardis Shaw-Kim
Department of Planning and Permitting
650 S. King St
Honolulu, HI 96813

The Sierra Club, Oahu Group is concerned with the Kahe Beach Submarine Fiber Optic Cable landing facility at Kahe Point.

Issues that we would like addressed:

1. All permits must be obtained before construction can begin. It appears that the applicant has begun work on this project before obtaining the necessary permits or even completing the Chapter 343 process.
2. The applicant should use existing manholes and ductlines for this project. It is inappropriate to add new handholes and ductlines in the shoreline area—particularly when existing ones already exist.
3. Native vegetation should be planted in all areas that are disturbed through this activity. The applicant should be required to irrigate these plantings for a minimum of six months to ensure their long-term viability. This requirement will not only restore the natural beauty of an area, but it will also reduce erosion, thereby protecting water quality.
4. Sand dunes should be restored to their original formation. If heavy equipment compacts the sand, the sand should be turned over to eliminate artificial compaction.
5. We would also request that any work at Kahe Beach be closely documented and monitored. A number of years back, a telecommunication line was placed through Ka'ena Point. Unfortunately, the activity greatly disturbed the area. The contractor enhanced vehicular access to an area that is supposed to be off limits to vehicles. The telecommunications firm also failed to re-vegetate the area. We are quite concerned about the long-term impact of this work on the fragile eco-system.

6. All impacts to the reef ecosystem by any trenching or boring work must be fully disclosed.

The Sierra Club, Oahu Group, requests that we be included on your mailing list to receive any future correspondence with regards to this project.

We appreciate the opportunity to offer these comments and look forward to your response.

Sincerely,



Jeff Mikulina
Director, Sierra Club, Hawai'i Chapter

cc: OEQC

420 Waiakamilo Road
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Telephone 808 842 1133
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R. M. TOWILL CORPORATION
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Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

October 11, 1999

Mr. Jeff Mikulina, Director
Sierra Club, Hawaii Chapter
P.O. Box 2577
Honolulu, Hawaii 96803

Dear Mr. Mikulina:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated October 6, 1999, regarding the proposed project. We have prepared the following response to your comments:

1. All necessary permits for the proposed project involving installation of submarine fiber optic cable will be obtained prior to construction. This will include the review process prescribed under Chapter 343, Hawaii Revised Statutes (HRS).

State and County permits for construction of the terminal building, situated outside of the City and County of Honolulu, Special Management Area (SMA) boundary were obtained prior to start of construction. The terminal building, constructed by GTE Hawaiian Tel International Inc., will be used for related telecommunications purposes and will provide connection to the Southern Cross cables.
2. There is insufficient capacity within existing ductlines and manholes. Installation of new facilities is required to accommodate the proposed project.
3. Use of native vegetation will be considered for soil stabilization. Erosion control will be further provided by adherence to existing regulations of the State and City and County of Honolulu. Irrigation will also be provided to ensure that vegetation used for ground cover becomes established.
4. There are no sand dunes in the project vicinity.
5. The project is not intended to have potential adverse impacts on the nearshore and shoreline. The planned use of directional boring will be started from a boring pit mauka of Farrington Highway, directed subsurface for a distance of

Mr. Jeff Mikulina
October 11, 1999
Page 2

approximately $\pm 2,500$ linear feet. There will be four (4) bore exits in submerged waters which are planned to occur in sandy ocean bottom in approximately 50 to 60 feet of water. The alignment for each of the directional bores will be beneath the surface of Farrington Highway, Kahe Beach, and submerged land. No disruption or disturbance to the surface at grade, therefore, is planned or proposed.

6. Potential for adverse impacts to the reef ecosystem will be monitored in accordance with various environmental permits required for this project. A list of authorizations required have been provided in the project DEA and will be included in the Final EA.

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,



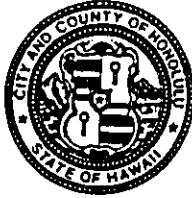
Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTc

DEPARTMENT OF PLANNING AND PERMITTING
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JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

October 11, 1999

1999/CLOG-5236 (ASK)
1999/SMA-60

Mr. Brian Takeda
R.M. Towill corporation
410 Waikamilo Road
Honolulu, Hawaii 96817-4941

Dear Mr. Taketa

Draft Environmental Assessment (Draft EA) for the
Southern Cross Cable Network
Application for a Special Management Area Use Permit
(SMP) and Shoreline Setback Variance (SV)
Tax Map Keys 9-2-3: 2, 9 and 11

We are forwarding copies of comments we received, as well as our comments, relating to the Draft Environmental Assessment (EA) for the proposed Submarine Fiber Optic Cable Landing Facility near Kahe Beach. In accordance with the provisions of Chapter 343, Hawaii Revised Statutes (HRS), you must respond to these comments and any others which were received during the 30-day public comment period. The Final EA must include these comments and responses, as well as revised text and exhibits, if appropriate.

We understand that you intend to consolidate application information for the SV and the SMP into the Final EA. Accordingly, our comments include requests for application information as well as information called for under the requirements of Chapter 343, HRS.

Once Chapter 343, HRS requirements have been satisfied, and we have determined the application to be complete, we can initiate processing of the permit request. A public hearing will be scheduled within 21 and 60 days after acceptance. Our written report and recommendation will be transmitted to the City Council within 10 working days of the close of the public hearing.

Please refer to our letter of August 9, 1999 and address comments that were not included in the revised Draft EA.

Mr. Brian Takeda
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Our additional comments are as follows:

1. Shoreline Area

- a. A current certified shoreline survey must be included in the Final EA.
- b. The Final EA should specifically identify the activities and structures that will be located within the 40-foot shoreline setback area.
- c. The shoreline variance application should explain how the proposal is consistent with Section 23-1.8 , Revised Ordinances of Honolulu, "Criteria for granting a variance."

2. Project Description

- a. If trenching is being considered as a construction method, the Final EA must contain a description of potential impacts and construction methods and duration. The selection of trenching over directional boring should be justified as it will likely result in greater impacts to water quality.
- b. The Final EA should describe the cables and conduits in terms of dimensions and materials. A cross section diagram would be instructive. Will the four conduits join into one larger one? If so, at what location will this occur? What is the depth of the underground cable? A profile drawing showing existing elevations, landmarks such as the shoreline and Farrington Highway and the proposed cable should be included in the Final EA.
- c. Site plans showing the proposed improvements, including utilities, buildings, retaining walls, grading and embankment, landscaping and location of construction activities should be provided in the Final EA. Page 1-6 states that "the new manhole will be constructed adjacent to the proposed new access road", mauka of the Farrington Highway on privately owned land. Pages 2-2, 2-5 and 3-18 refer to disruption to beach users on shore and the need to barricade the public from entry and post a security guard, suggesting that the manhole and cable pull work area may be located on the public beach. Page 2-4 refers to a "shore end manhole". Is

Mr. Brian Takeda
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this the same one adjacent to the proposed access road?
This should be clarified.

- d. Page 2-1 "Overview and Project Phasing", should indicate when the building will be constructed.
- e. Page 2-1 of the Draft EA refers to an "energized" cable. The Final EA should explain this term.
- f. Surrounding existing land uses should be identified on the site plan.
- g. The Final EA should identify the location and provide a description and explanation of the planned earth array.

3. Waste Water

The Final EA should disclose the volumes of waste water that will be generated during the operational phase of the project.

4. Solid Waste Disposal

- a. Treatment and disposal of the lubricant should be more fully discussed in the Final EA. Movement of the lubricant from the collector boats to the land based drying area should be described. The location of the drying area should be shown on the site plan. The volume and location of the disposal site should also be identified.
- b. The Final EA should describe the type, volume, and disposal of solid waste that will be generated during the operational phase of the cable station.
- c. In their September 16, 1999 comment letter (attached), the Department of Health recommended that discharge of the lubricant be avoided. If this recommendation cannot be achieved, the Final EA should explain and discuss the best alternatives for minimizing lubricant discharge and discharge impacts.

5. Topography and Drainage

- a. The Final EA should describe existing drainage patterns and volumes and explain if and how the project will alter either. Where does storm water runoff from the equipment building and access road area ultimately

Mr. Brian Takeda
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drain? In reviewing grading plans for the project we note that drainage infrastructure was placed within the SMA. These structures and their locations should be described in the Final EA and shown on the proposed site plan.

- b. The location, volumes and duration of grading work should be described in the Final EA. Erosion control measures should be discussed.

6. Recreational Activities and Public Access

- a. The Draft EA indicates (page 2-5) that public access on shore and ocean areas will be limited during construction activities. The Final EA should provide a map indicating the location of these restricted areas. The estimated duration of the closures should be reported. Authorization for beach and ocean closure, rules and procedures, including those for public notification should be identified.
- b. The Final EA should explain how the "use of two range targets" is an option for pull ropes for cable line installation as indicated on page 2-3 of the Draft EA.

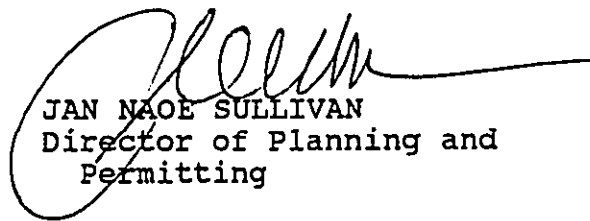
7. Visual Impacts

- a. We are concerned that the project will result in negative visual impacts. Mitigation measures to maintain the existing character of the area must be discussed in the Final EA.
- b. Although most of the equipment building will be located beyond and mauka of the SMA boundary, it is a significant component of the overall project and will likely impact the visual character of the site. The Final EA should include a description of the building. Visual impacts should be addressed. Proposed mitigation such as landscape screening and building materials and exterior colors should be discussed.
- c. Removal of vegetation, if proposed could also result in negative visual impacts. These impacts and mitigation measures should be discussed in the Final EA.

Mr. Brian Takeda
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October 11, 1999

Should you have questions regarding the above, you may contact
Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,


JAN NAOE SULLIVAN
Director of Planning and
Permitting

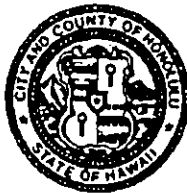
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Enclosures

DN 10222

DEPARTMENT OF PLANNING AND PERMITTING
CITY AND COUNTY OF HONOLULU

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JEREMY HARRIS
MAYOR



| | | |
|------------------------|-------------|------|
| REC'D | AUG 10 1999 | RMTC |
| [Handwritten initials] | | |

IAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

August 9, 1999

1999/CLOG-5004(ASK)
1999/ED-7

Mr. Brian Takeda
R.M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817-4941

Dear Mr. Takeda:

Draft Environmental Assessment (EA)
Applications for a Special Management Area Use Permit (SMP) and
Shoreline Setback Variance (SV) For
Southern Cross Cable Network
Tax Map Keys: 9-2-3: 2, 9 and 11

We have reviewed the above document and are returning it as it is incomplete. We offer the following comments:

Accepting Authority

Page iii of the Draft EA should be amended to indicate that the Department of Planning and Permitting will be the accepting authority for the required environmental documents.

Project Location - Tax Map Key (TMK)

1. Based on the information provided, the project appears to occupy portions of parcels 9-2-3: 2, 9 and 11. The EA should identify and describe all of these parcels.
2. We note that the Draft Shoreline Certification Map (Figure 5 in the Special Management Area/Shoreline Setback Variance Permit Application) lists TMK "8-9-03: portion 1." The property identified by this TMK is landward of the area shown on the map. We believe that the TMK should be "8-9-06: portion 1."

Mr. Brian Takeda
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August 9, 1999

Required Permits

Will an easement be created for the portion of the cable that will cross the State-owned parcel 11 and Farrington Highway? If so, this approval should be listed under the Table labeled "Necessary Permits and Approvals" found on page 8-1 of the Draft EA.

Project Description

1. Page 2-1 of the Draft EA indicates that temporary landing targets may be needed. The Draft EA should provide a more detailed description of these structures.
2. If the bentonite is to be used as a lubricant for the underground boring, the Draft EA should explain how it is able to leak onto the ocean floor.

Project Information

1. We understand that the EA is intended to meet the assessment requirements of Chapter 343, HRS and Chapter 25, ROH. As such, the following information should be included in the Draft EA:
 - a. A description of the construction activities that will occur within the shoreline setback area and the special management area (SMA). This description should identify the location, type and magnitude of the work, including grading areas and volumes. Where will the drill be located? Describe the dewatering activities.
 - b. A description of structures and activities that will be placed in the SMA. Roadways, retaining walls, septic systems and other structures should be itemized in the text of the application. Plans showing elevations and cross-sections should be provided if possible. Plans for work within the shoreline setback area should identify the location of the certified shoreline. Plans for work within the SMA should identify the SMA boundary.
 - c. If the septic tank system is to be located within the SMA, application material should describe how this will function, its impacts, if any, on water resources and identify the required approvals and permits for establishing such a facility. Is it possible to connect wastewater facilities to the municipal sewer?

Mr. Brian Takeda
Page 3
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- d. The Draft EA should explain why it is desirable to locate the landing sites near sand deposits as stated on page 2-4 of the Draft EA.
- e. Dewatering activities noted on pages 3-8 and 3-11 of the Draft EA should be described in greater detail. What type of structure and method will be used to dewater excavated material?
- f. A description and diagram for an "articulated split armor pipe" (page 3-8 of the Draft EA) should be provided.
- g. Visual impacts of proposed structures should be described. Will the project alter the character of the area? The visibility of the new equipment building should be described in the Draft EA. Although not within the SMA, we recommend that mitigation measures to screen the building as well as the other structures within the SMA be considered and discussed in the Draft EA.

Land Ownership

Real Property Tax information indicates that parcel 11 as well as Farrington Highway are under control of the State. This information should be disclosed in the EA. Applications for the SMP and SV should include application authorization from the fee owners.

Should you have any questions regarding the above, you may contact Ardis Shaw-Kim of our staff at 527-5349.

Very truly yours,


JAN NAOE SULLIVAN
Director of Planning and Permitting

JNS:am

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Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

October 9, 1999

Ms. Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96803

Dear Ms. Sullivan:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated October 8, 1999 and August 9, 1999, regarding the proposed project. We have prepared the following in response:

1. **Accepting Authority** - Page iii of the DEA has been amended to indicate that the Department of Planning and Permitting (DPP) will be the accepting authority for the project EA.
2. **Project Location and Shoreline Area**
 - **Description of Parcels** - Parcels affected by the proposed project include TMKs 8-9-6: portion 1, 9-2-03: portions 2, 9, and 11. A description of affected portions of these parcels will be delineated in the forthcoming Final EA.
 - **Shoreline Certification** - Application for certification of the shoreline survey for the subject parcels was filed on August 4, 1999, in the Office of Environmental Quality Control (OEQC) Bulletin, Case No. OA-729. Certification of the shoreline map was obtained on September 28, 1999. The shoreline certification map will be amended to indicate the correct TMK parcel as 8-9-6: portion 1.
 - **Project activities within the 40 foot shoreline setback** will involve installation of four (4) bored holes containing 4 inch diameter ductlines. Because directional boring is planned to be used within the setback, no disturbance to the surface of the ground is expected to occur.

Ms. Jan Naoe Sullivan
October 9, 1999
Page 2

- A discussion of consistency with Section 23-1.8, Revised Ordinances of Honolulu, "Criteria for granting a variance" has been provided in the application for Special Management Area/Shoreline Setback Variance. In addition to information provided in the subject application:

Section 23-1.8(a) - The proposed project does not involve the cultivation of crops or aquaculture. Landscaping will be provided accessory to the project terminal building which is located outside of both the Special Management Area and Shoreline setback. The project will also not involve the moving of sand from locations seaward of the shoreline. Beach processes and the existing size of Kahe Beach will not be affected.

Section 23-1.8(b)(1) - Shoreline-dependent Facility Standard. The planned use of directional boring at the project site remains the preferred alternative to installation of fiber optic cable. However, although conventional trenching is not proposed at this time, it remains a viable option given that sufficient mitigation measures can be developed to minimize or reduce potential for environmental impacts. Directional boring will maintain consistency with Section 23-1.8(b), which stipulates that structures and activities are prohibited within the shoreline area, with the following exceptions:

- + Directional boring and installation of ducts beneath the 40 foot shoreline setback will not affect beach processes or artificially fix the shoreline. Public access, public views and open space along the shoreline will similarly not be affected.
- + The project does not involve agriculture or aquaculture.
- + Boating, maritime, and ocean sports activities are not part of the subject application.

Section 23-1.8(b)(2) - Public Interest Standard. The proposed project will be constructed by GTE Hawaiian Tel International, Inc., which is a public utility regulated under HRS Chapter 269, for the purpose of installing fiber optic telecommunications cables which will be used for public, governmental, private, commercial, business, and educational uses. Use of these services are expected to be within the public interest through increased opportunities for commerce, trade, and cultural exchange. Furthermore, the proposed use of directional boring for installation of the cable remains the most practicable alternative for construction of the project.

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October 9, 1999
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Section 23-1.8(b)(3)(A)(i) - Hardship Standard. The only feasible means of installing fiber optic cable will require the physical location within the shoreline setback. If the applicant, GTE Hawaiian Tel International Inc., is deprived of consideration for a shoreline setback variance, loss of the Kahe beach landing site could effectively prevent or sufficiently delay the Southern Cross cable system from establishing a point of presence on Oahu. As noted in the subject application, major funds already expended for research, survey, and engineering to provide connectivity on Oahu, will be lost. Loss of the Kahe Beach landing site would further require that the proposed project be redeployed for a cable alignment that would bypass Oahu. This would result in the lost opportunity to develop and provide telecommunication markets serving the island. The loss of connectivity would also result in the loss of opportunity to further reduce consumer costs for long distance telecommuting.

Section 23-1.8(b)(3)(A)(ii) - Hardship Standard. The proposed project is due to unique circumstances involving the siting of the project within the shoreline setback and does not draw into question the reasonableness of the shoreline setback rules and Chapter 23, establishing the shoreline setback.

Section 23-1.8(b)(3)(A)(iii) - Hardship Standard. The proposed project is the best practicable alternative to installation of submarine fiber optic cable given the unique physical attributes of the project site. Because the cable will be installed subsurface, beneath the shoreline setback, the provisions and intent of the shoreline setback rules will be preserved.

Section 23-1.8(b)(3)(B) - Hardship Standard. The determination of reasonableness of use of the land has been fully considered in the project EA. Factors including shoreline conditions, potential for erosion, surf and flood conditions, and geography of the affected parcel have been examined and described.

Section 23-1.8(b)(3)(C) - Hardship Standard. No structures or activities will be employed which will artificially fix the shoreline.

Section 23-1.8(b)(3)(D) - Hardship Standard. The determination of hardship for the proposed project is not based on the result of a zone change, plan review use approval, subdivision approval, cluster housing approval, planned development housing approval, conditional use

Ms. Jan Naoe Sullivan
October 9, 1999
Page 4

permit, or any other discretionary land use permit granted after June 16, 1989.

3. Required Permits - Section 8-1 of the EA will be revised to indicate that an easement for the portion of cable crossing parcel TMK: 8-9-6:11, will be sought from the State of Hawaii. The portion of cable crossing Farrington Highway is planned to be completed under the GTE Hawaiian Tel franchise license agreement governing selected public utilities licensed to operate in the State of Hawaii.
4. Project Information
 - A description of construction activities that will occur within the shoreline setback and special management area has been provided in the DEA. Additional information involving location, grading, drilling, and potential for dewatering will be described in the forthcoming Final EA.
 - It is desirable to locate the directional boring exits in sandy bottom to minimize potential for environmental impacts associated with anchoring, armoring, or trenching through rock or coral to secure the cable. The presence of extensive sand deposits on the ocean bottom, will permit the cable to eventually bury itself into the sand, providing maximum protection against wave forces.
 - Dewatering activities refer to the retrieval of unused lubricant which will be recovered at the drilling rig. This unused lubricant will be directed to a detention basin for settling and drying. The lubricant will be delivered to the detention basin by use of flexible dewatering hose or similar apparatus. Sizing of the detention basin will be determined by the drilling rig operator. As noted in the project DEA, no discharges will be permitted from the detention basin to waters of the State.
 - The split armor pipe will consist of two pieces of split pipe joined by use of bolts and nuts. Each half of the split pipe will be placed over the cable and bolted together by a diver. A bell shaped housing at the end of the pipe will enable the pipe section to articulate. Typical dimensions will be approximately 18 to 20 inches long by approximately 3 inches in diameter, with the bell housing approximately 5 inches in diameter and 3 inches in length. The length of the bell housing is included in the overall 18 to 20 inch length of the split armor pipe. A figure will be provided in the Final EA.

- No permanent visual impacts associated with installation of the fiber optic cable are anticipated as the cable will be located below surface. During construction activities to install the cable there will be a temporary impact on coastal views due to construction at the directional boring site mauka of Farrington Highway. It is anticipated that the directional boring rig, however, will be partially obscured from view since it will be situated within a boring pit approximately +5 feet below grade.

The terminal building, located approximately 200 feet from Farrington Highway, will be partially visible to motorists. The building architects will utilize existing vegetation for cover and will provide for additional landscaping to enhance views of the access road and building site. A further description of landscaping will be provided in the forthcoming Final EA.

5. Project Description

- Directional boring remains the preferred construction method and is intended to be used at the project site.
- A detailed description of cables, conduits, and relationship to landmarks will be provided in the Final EA. Descriptions of construction activities to further clarify the project will also be provided.
- Page 2-1, Overview and Project Phasing, will include the terminal building in the construction schedule.
- Energized cable refers to the use of repeaters. Repeaters are electronic amplification devices which are used to repeat the light pulses carried over transpacific crossing cables. Use of a repeater requires direct current (DC) power for operation.
- A figure to facilitate the description of surrounding land uses will be provided in Chapter 1 - Introduction.
- The location of all proposed facilities, including the earth arrays will be provided in the Final EA.

6. Waste Water - The volume of waste water anticipated to be generated will be 135 gallons per day. A description of the septic tank system which will be used

Ms. Jan Naoe Sullivan
October 9, 1999
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to process waste water flows, including function, potential for impacts on water resources, and required approvals will be described. Access to the municipal sewer system is not available because of the location of the project within the Kahe Beach area of Nanakuli.

7. Solid Waste Disposal

- The directional boring contractor will be directed to avoid discharges of lubricant at the ocean end. However, in the event that release of lubricant cannot be avoided, support boats employing divers with an air hose or similar suction device will be used for collection. The boats will be directed to shore in the vicinity of the project site. A tanker truck located on the shoulder of Farrington Highway will employ pumps and flexible hoses to siphon lubricant from the support boats. A work crew will be stationed at the shore end to facilitate transfer of the hose from the tanker truck to the boats. It is anticipated that because of the relatively low volumes, that only one tanker truck will be required to transport lubricant from the shore-end to a detention basin located at the project site.
- During the operational phase of the terminal building, disposal of solid waste will be handled by a garbage collection and disposal service. Sizing of garbage dumpsters will be based on need. However, it is expected that the garbage generated from the facility would be similar to that from a small commercial business. This type of garbage would primarily include paper products, plastics from used containers such as soda bottles, parts boxes, and take out lunch containers. No hazardous wastes are anticipated to be generated from operation of the terminal building. Disposal of used or spent telecommunications equipment will be handled in accordance with applicable Federal, State, and City and County of Honolulu rules and regulations.
- We have received and responded to the Department of Health comment letter dated September 16, 1999. The directional boring contractor will be directed to avoid discharges of lubricant at the ocean end. Minimizing lubricant discharges are discussed in the project DEA, Section 2.1.1-Segment 1: Make Ready Work. Per our description, as the directional drill bit approaches each of the four submerged targets the drill bit speed will be adjusted to the minimum necessary to ensure a clean bore, while minimizing the potential for release of the bentonite based lubricant. To reduce potential for turbidity, the lubricant formula will be specially

Ms. Jan Naoe Sullivan
October 9, 1999
Page 7

prepared to resist dispersal in the water column. A precautionary measure will involve use of divers waiting in the water, at the moment that the drill bit daylight at the ocean bottom. The divers will be prepared to remove any excess lubricant that may escape from the drill bit. At the same time, the directional drilling operator will introduce negative pressure at the shore based drill end to remove any lubricant that remains within the bore.

8. Topography and Drainage - The Final EA will provide a description of drainage and erosion controls as well as existing and finished runoff conditions. The location, volume, duration of grading work and erosion controls will also be described.
9. Recreational Activities and Public Access
 - The Final EA will provide additional information on location and whether a beach closure will be required. Appropriate methods of notification will also be described.
 - The use of temporary, portable range targets are not an option for pull ropes to install the fiber optic cable. The possible use of range targets will be to serve as a backup alignment marker to help position the cable laying ship on the day of the cable installation.
10. Visual Impacts
 - Additional description of the terminal building and proposed landscaping surrounding the project site will be provided in the Final EA.
 - Removal of vegetation within the project site is required for construction of both the terminal building and related cable infrastructure. The portion of the project site involving the subject EA, has previously been used for the dumping of old appliances, tires, and related urban garbage. Much of this garbage within the site will be removed in conjunction with clearing of brush and koa haole to accommodate the new road and cable infrastructure. It is expected that although some of the scrub vegetation will be removed, that it will be replaced with new landscaping.

Ms. Jan Naoe Sullivan
October 9, 1999
Page 8

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,



Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
150 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843

99 OCT -6 PM 2:11



DEPT OF LANDS
AND PERMITTING
CITY & COUNTY OF HONOLULU

October 1, 1999


JEREMY HARRIS, Mayor

EDDIE FLORES, JR., Chairman
CHARLES A. STED, Vice Chairman
JAN M.L.Y. AMI
HERBERT S.K. KAOPUA, SR.
BARBARA KIM STANTON

KAZU HAYASHIDA, Ex-Officio
ROSS S. SASAMURA, Ex-Officio

CLIFFORD S. JAMILE
Manager and Chief Engineer

TO: MS. JAN NAOE SULLIVAN, DIRECTOR
DEPARTMENT OF PLANNING AND PERMITTING

FROM: 
CLIFFORD S. JAMILE

SUBJECT: YOUR MEMORANDUM OF AUGUST 26, 1999 REGARDING THE
ENVIRONMENTAL ASSESSMENT FOR THE PROPOSED SUBMARINE
FIBER OPTIC CABLE LANDING AND SUPPORT INFRASTRUCTURE AT
KAHE POINT, WAIANAE, OAHU, TMK: 9-2-03: 2, 9, AND 11

Thank you for the opportunity to review and comment on the Environmental Assessment for the proposed Submarine Fiber Optic Cable Landing and Support Infrastructure Improvements.

We have the following comments:

1. The existing water system cannot provide adequate fire protection to the proposed terminal building. The applicant will be required to install a fire hydrant in the vicinity of the proposed development.
2. There are no existing services to the project site. However, there is a pending service, Premise ID 1158305, scheduled to be installed to TMK: 9-2-3: 02 with GTE Hawaiian Telephone's Oahu Cable Station at Kahe Point Project.
3. The availability of water will be confirmed when the building permit application is submitted for our review and approval. When water is made available, the applicant will be required to pay our Water System Facilities Charges for transmission and daily storage.
4. The on-site fire protection requirements should be coordinated with the Fire Prevention Bureau of the Honolulu Fire Department.

Ms. Jan Naoe Sullivan
October 1, 1999
Page 2

5. The new conduits installed by directional boring shall be kept at a minimum of 5-foot clearance vertically and horizontally to existing waterlines to provide adequate clearance to this trenchless installation work, and to facilitate repair during main breaks. Because of the high cost to repair the fiber optic cables, the clearance will also minimize damages to these cables should there be a major main break on our transmission mains.
6. The proposed project should be coordinated with our 24-inch water main project along Farrington Highway in the vicinity of the new fiber optic cable. This water main project is currently under design by our consultant, Community Planning, Inc. and construction is expected to begin in 2001.
7. The construction plans for the fiber optic cable project shall be submitted for review and approval.
8. Board of Water Supply approved reduced pressure principle backflow prevention assemblies will be required to be installed after all domestic water meters serving the project site.

If you have any questions, please contact Barry Usagawa at 527-5235.

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



R. M. TOWILL CORPORATION
SINCE 1930

Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

October 12, 1999

Mr. Clifford S. Jamile
Manager and Chief Engineer
Board of Water Supply
City and County of Honolulu
630 South Beretania Street
Honolulu, Hawaii 96843

Dear Mr. Jamile:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your comments dated October 1, 1999, regarding the proposed project. We have prepared the following in response:

1. We acknowledge your requirement for installation of a fire hydrant in the vicinity of the proposed development and the pending installation of service to Premise ID 1158305.
2. The building permit application for water service will be submitted for review and approval. Water System Facilities Charges will also be paid for by the applicant GTE Hawaiian Tel International Inc./Southern Cross Cable Network.
3. On-site fire protection requirements will be coordinated with the Fire Prevention Bureau, Honolulu Fire Department.
4. BWS will require that new conduits installed by directional boring shall be kept a minimum of 5 feet, vertical and horizontal clearance, from existing water lines.
5. We will coordinate installation of the project with your proposed 24 inch water main along Farrington Highway, in the vicinity of the new fiberoptic cables.
6. Construction plans for the proposed project shall be submitted to BWS for review and approval.

Mr. Clifford S. Jamile
October 12, 1999
Page 2

7. GTE Hawaiian Tel International Inc./Southern Cross Cable Network will install approved reduced pressure principle backflow prevention assemblies after all domestic water meters serving the project site have been installed.

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,



Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



99 OCT -4 AM 8:12

STATE OF HAWAII

DEPT OF PLANNING
and PERMITTING
CITY & COUNTY OF HONOLULU

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhikawa Building, Room 555
601 Kamehale Boulevard
Kapolei, Hawaii 96707

TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KAWELO

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

September 17, 1999

Jan Naoe Sullivan, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street, 7th Floor
Honolulu, Hawaii 96813

LOG NO: 24118
DOC NO: 9909EJ06


Dear Ms. Sullivan:

SUBJECT: Chapter 6E-42 Historic Preservation Review -- Draft
Environmental Assessment for GTE Hawaiian Tel
International Inc.: Submarine Fiber Optic Cable Landing
Honouliuli, 'Ewa, O'ahu
TMX: 9-2-03: 2, 9 and 11

We commented to RM Towill in March, 1999 on the support infrastructure and submarine fiber optic cable landings project at Kahe Point. Our comments have been incorporated in section 3.1.7 although they are not provided in the Appendix as stated. Our previous comments were provided for the installation of a single fiber optic cable landing. The current project proposes installing four (4) submarine fiber optic cable landings through directional drilling. Our previous comments are attached, and although the number of cable landings has increased, we still believe that this project will have "no effect" on historic sites for the reasons cited previously.

If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

Aloha


DON HIBBARD, Administrator
State Historic Preservation Division

EJ:lm

c: D. Uchida, Administrator, Land Division, DLNR

420 Waiakamilo Road
Suite 411
Honolulu Hawaii 96817-4941
Telephone 808 842 1133
Fax 808 842 1937
eMail rmtowill@i-one.com



R. M. TOWILL CORPORATION
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Planning
Engineering
Environmental Services
Photogrammetry
Surveying
Construction Management

October 12, 1999

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
Kakuhihewa Building, Room 555
601 Kamokila Boulevard
Kapolei Hawaii 96707

Dear Mr. Hibbard:

SUBJECT: Draft Environmental Assessment (DEA) for Southern Cross Cable
Network, Submarine Fiber Optic Cable Landing at Kahe Beach, Oahu

Thank you for your letter dated September 17, 1999, regarding the proposed project.

We acknowledge your finding of "no effect" on historic sites and will provide your prior letter dated March 25, 1999, in the subject Final Environmental Assessment.

We appreciate your review of the Draft Environmental Assessment and providing us this opportunity to respond. Should you have any additional comments please contact us at 842-1133.

Very truly yours,

Brian Takeda
Senior Planner

BT/bt

cc: Dennis Kwock, GTE Hawaiian Tel International Inc.
CTK RMTC

Chapter 12

REFERENCES

(Listed in Chronological Order)

North Kahe Beach Southern Cross Cable Route Survey, Sea Engineering, Inc, for R.M. Towill Corporation, September 1999.

Draft Environmental Assessment for the Hawaiian Island Fiber Network (HI FiberNet) Submarine Fiber Optic Cable Landings for State of Hawaii, R.M. Towill Corporation, May 1996.

The State of Hawaii Data Book 1995: A Statistical Abstract, Department of Planning and Economic Development. State of Hawaii 1995.

The State of Hawaii Data Book 1993-94: A Statistical Abstract, Department of Planning and Economic Development. State of Hawaii 1994.

Final Environmental Assessment for the GTE Hawaiian Tel Interisland Fiber Optic Cable System, R.M. Towill Corporation, January 1993.

GTE Hawaiian Tel Interisland Fiber Optic Cable System: Marine Environmental Analysis of Selected Landing Sites, Sea Engineering, Inc., and Environmental Assessment Co., January 1992.

The Hawaii State Plan, Office of State Planning, Office of the Governor, State of Hawaii, 1989.

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The Behavior of Humpback Whales in Hawaii and Modifications of Behavior Induced by Human Interventions, Ph.D. Dissertation, University of Hawaii, Honolulu, G.B. Bauer, 1986.

Effects of Vessel Traffic on the Behavior of Humpback Whales in Hawaii, Prepared for National Marine Fisheries Service, Honolulu Laboratory, by G.B. Bauer and L.M. Herman, 1986.

Humpback Whales in Hawaiian Waters: A Study in Historical Ecology, L.M. Herman, 1979.

Sites of Oahu, Elspeth P. Sterling and Catherine C. Summers, Department of Anthropology, B.P. Bishop Museum, Honolulu, 1978.

Atlas of Hawaii, Department of Geography, University of Hawaii, University of Hawaii Press, 1973.

Soil Survey of Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawaii, Soil Conservation Service, U.S. Department of Agriculture, August 1972.

APPENDIX I

Construction Drawings
GTE Hawaiian Tel Oahu Cable Station at Kahe Point, Phase 2
Honouliuli, Oahu, Hawaii
September 1999

Kahe Point Cable Station Phase - 2

KAHE POINT, OAHU, HAWAII

DATE: 02-02-03

Prepared by:



HILL CORPORATION

SINCE 1930

Services • Photography • Surveying • Construction Management

DRAWING INDEX

APPROVALS

DESCRIPTION

TITLE SHEET
 NOTES - 1
 NOTES - 2
 DEMOLITION, GRADING & EROSION CONTROL PLAN
 SITE PLAN
 PROFILES - 1
 PROFILES - 2
 PROFILES - 3
 CROSS SECTIONS
 TYPICAL SECTIONS - 1
 TYPICAL SECTIONS - 2
 SEWER DETAILS
 MISCELLANEOUS DETAILS - 1
 MISCELLANEOUS DETAILS - 2
 TRAFFIC CONTROL PLAN

 DIRECTOR, DEPARTMENT OF PLANNING & PERMITTING
 CITY & COUNTY OF HONOLULU
 (FOR SITE GRADING ONLY)

 DATE

 ADMINISTRATOR, HIGHWAYS DIVISION, STATE DEPARTMENT OF TRANSPORTATION (APPROVAL
 GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY. ID NO. _____

 DATE

LETTER OF APPROVAL NO. HWY-TO _____ DATED _____



VICINITY MAP

5 0 5 10
 FEET

9/14/99 Phase II TRONG

OAHU CABLE STATION AT KAHE POINT PHASE - 2

GTE Hawaiian Telephone OAHU CABLE STATION AT KAHE POINT PHASE - 2

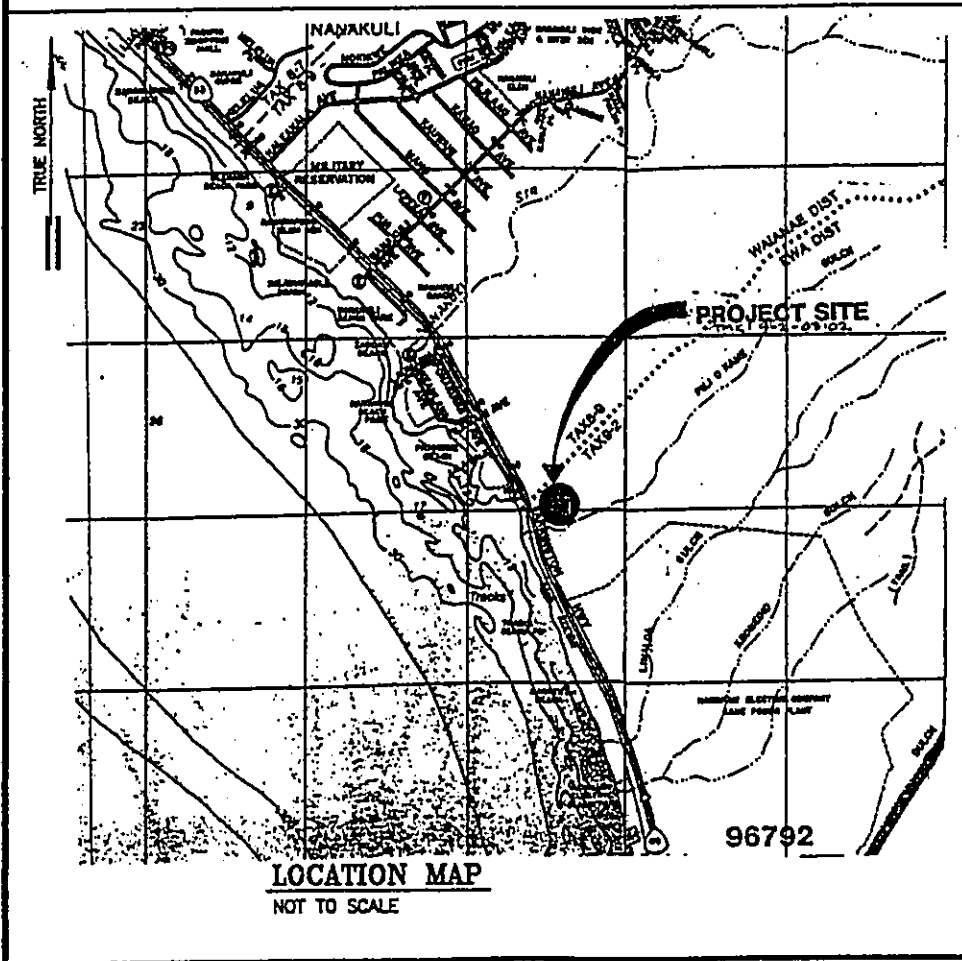
HONOLULU, OAHU, HAWAII
T.M.E. 9-2-02 02

Prepared by:



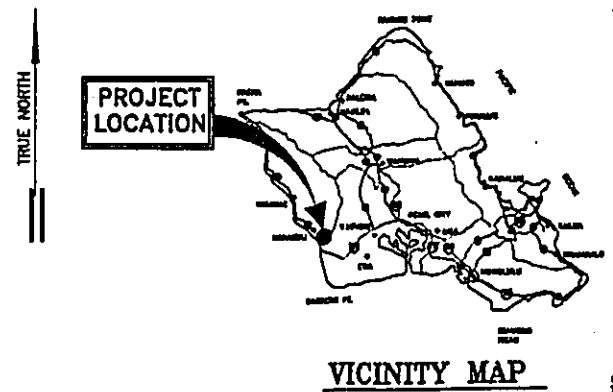
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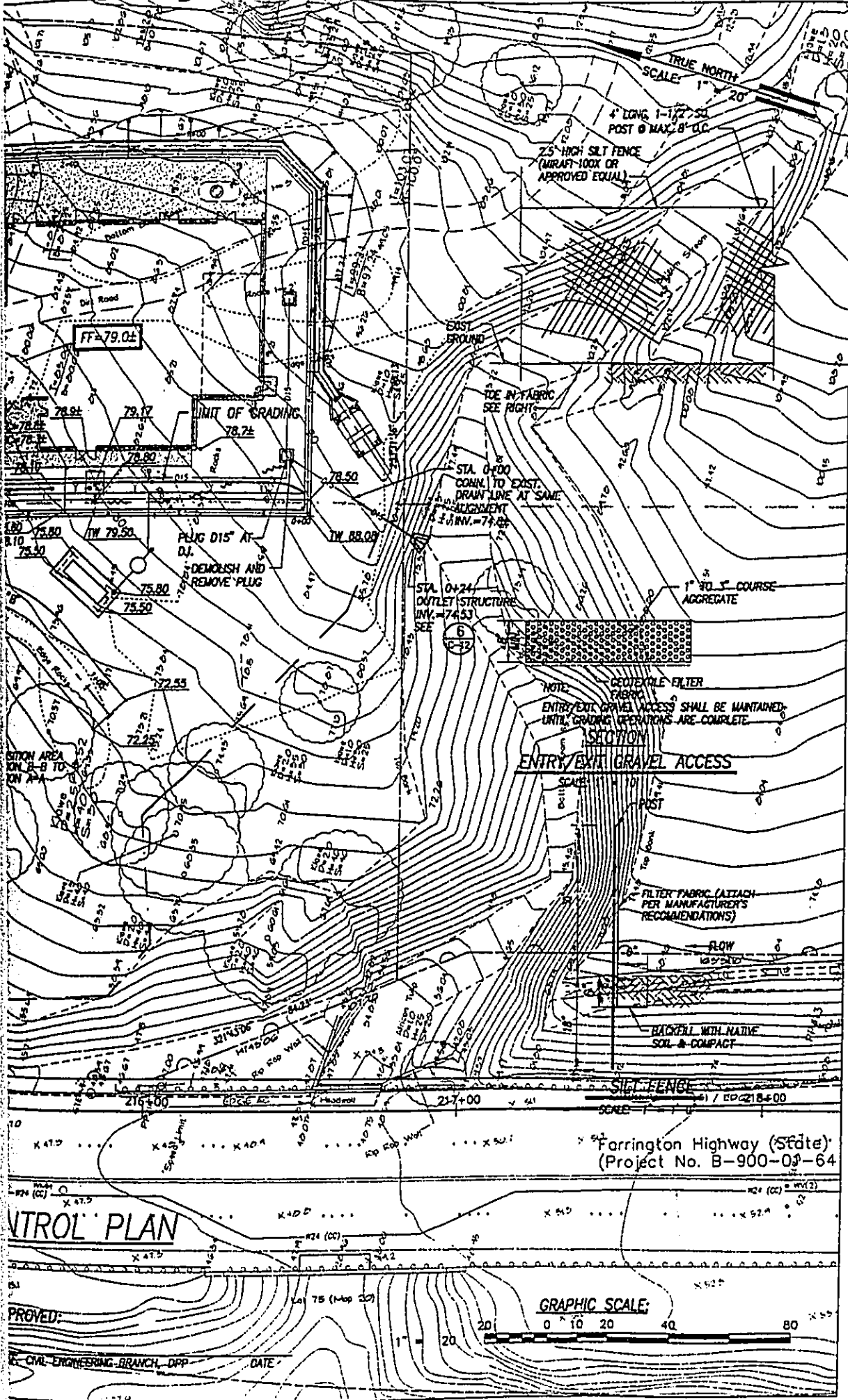
Planning • Engineering • Environmental Services • Photogrammetry • Surveying • Construction Management



DRAWING INDEX

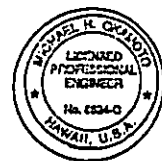
| SHEET NO. | DRAWING NO. | DESCRIPTION |
|-----------|-------------|---------------------------------------|
| 1 | T-1 | TITLE SHEET |
| 2 | C-1 | NOTES - 1 |
| 3 | C-2 | NOTES - 2 |
| 4 | C-3 | DEMOLITION, GRADING & EROSION CONTROL |
| 5 | C-4 | SITE PLAN |
| 6 | C-5 | PROFILES - 1 |
| 7 | C-6 | PROFILES - 2 |
| 8 | C-7 | PROFILES - 3 |
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| 13 | C-12 | MISCELLANEOUS DETAILS - 1 |
| 14 | C-13 | MISCELLANEOUS DETAILS - 2 |
| 15 | C-14 | TRAFFIC CONTROL PLAN |





**KAJIOKA
YAMACHI**
ARCHITECTS

224 Punchbowl Street, Honolulu, Hawaii 96802
Telephone: (808) 548-7770 Fax: (808) 548-8234



This work was prepared by me or under my supervision and construction of this project will be under my supervision. (Observation of construction shall be as defined in Chapter 111, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Subchapter 1, Section 111-1.1, Definitions, effective 3/28/94.)

Michael H. Chambliss 9/14/99

PROJECT

GTE Hawaiian Tel

OAHU CABLE STATION
AT
KAHE POINT
PHASE - 2

HONOLULU, OAHU,
HAWAII

TMK: 9-2-03: Portion of 2

| REVISIONS | |
|-----------|--------------------------|
| △ | 9/14/99 PHASE II PRICING |
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|---------------|-------------------|
| DRAWN BY: MHO | CHECKED BY: KTS |
| DATE: 8/10/99 | EVENT: PERMIT SET |
| | |

SHEET TITLE:
**DEMOLITION, GRADING &
EROSION CONTROL PLAN**

| | |
|--------------|--------------|
| SHEET NO.: | SHEET TOTAL: |
| 4 OF 15 | C-3 |
| PROJECT NO.: | |
| 98053 | |

BEST MANAGEMENT PRACTICE NOTES

INSTALL STABILIZED CONSTRUCTION ENTRY/EXIT GRAVEL ACCESS AND MAINTAIN FOR GRADING.
INSTALL SILT FENCE (SEE DETAIL THIS SHEET) AND MAINTAIN FOR GRADING.

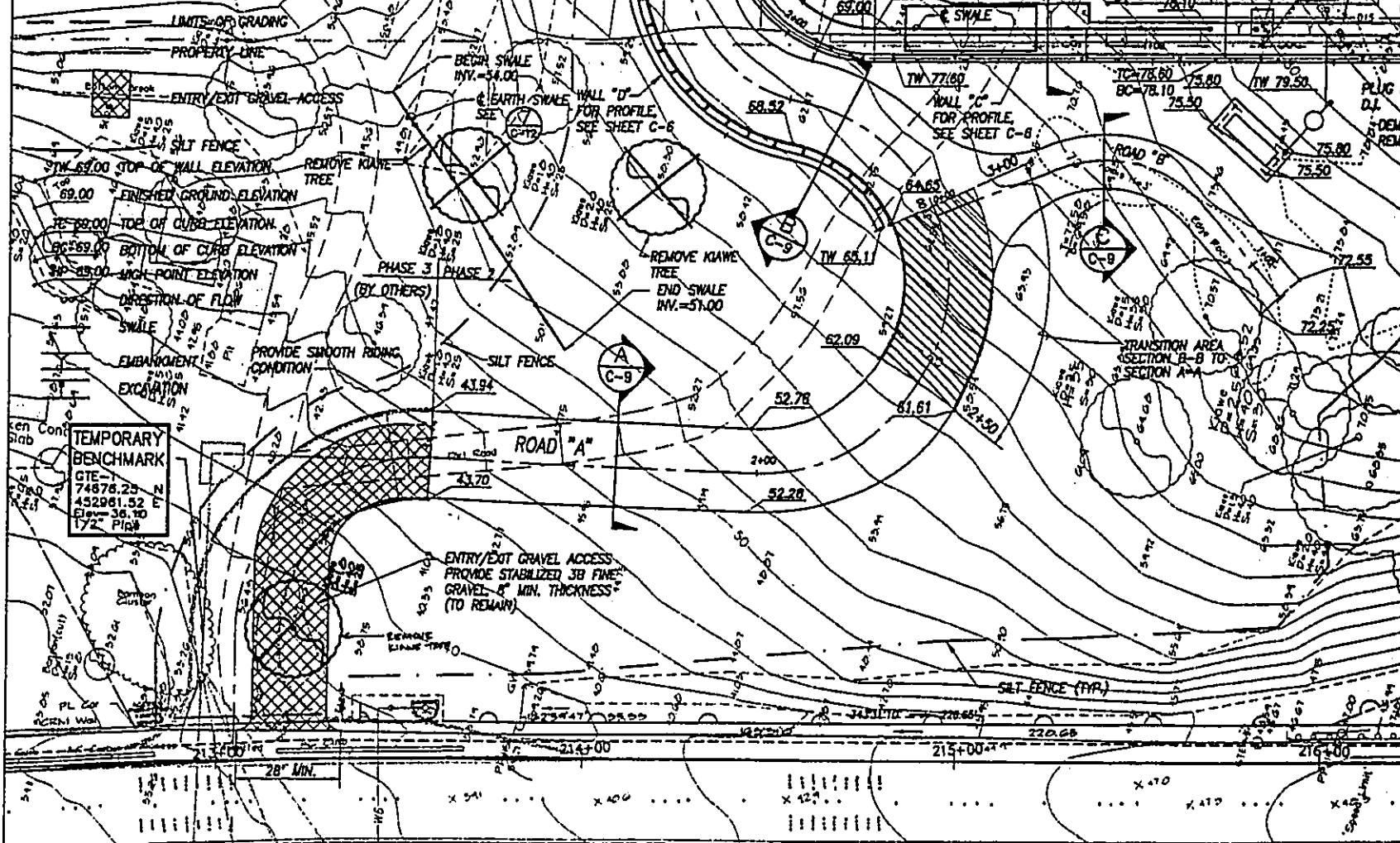
TEMPORARY EROSION CONTROL NOTES

1. FOLLOW SEQUENCE OF OPERATIONS AS RECOMMENDED BY THE "SOIL EROSION STANDARDS AND GUIDELINES" - DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, NOVEMBER, 1975.
2. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF LAND TO BE EXPOSED AT ANY ONE TIME.
3. GRADED AREAS THAT ARE NOT AT FINAL GRADE AND ARE EXPECTED TO BE EXPOSED FOR MORE THAN 30 DAYS SHALL BE MULCHED (AT THE RATE OF 45 CUBIC FEET PER 1,000 SQUARE FEET) IN ORDER TO PREVENT EROSION AND SILT RUNOFF.
4. THE ABOVE PROCEDURE FOR EROSION AND SEDIMENT CONTROL MAY BE REVISED BY THE CONTRACTOR TO CONFORM TO HIS GRADING OPERATION PROCEDURE. HOWEVER, ANY REVISIONS TO THE ABOVE SHALL BE SUBMITTED TO THE DIRECTOR, DEPT. FOR APPROVAL BY THE CONTRACTOR.

EARTHWORK NOTES:

1. THE EARTHWORK QUANTITIES SHOWN ARE APPROXIMATE AND ARE SHOWN FOR PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION AND VERIFY THESE FIGURES.
2. THE BELOW QUANTITIES ARE COMPUTED TO FINISH GRADE AS SHOWN ON THE PLAN AND HAVE NOT BEEN ADJUSTED TO EXCLUDE PAVEMENT AND WALKWAYS. NO ADJUSTMENTS HAVE BEEN MADE FOR TOP SOIL, IF REQUIRED, OR FOR BACKFILL MATERIAL FOR TREES AND PLANTS.
3. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION FOR IMPORTED BORROW MATERIAL REQUIRED.

LEGEND & ABBREVIATIONS



EARTHWORK SUMMARY

| | |
|-------------|---------|
| EXCAVATION | 100 CY |
| EMBANKMENT | 170 CY |
| GRADED AREA | 0.08 AC |

DEMOLITION, GRADING & EROSION CONTROL PLAN

SCALE: 1" = 20'

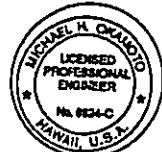
APPROVED:

GRE, CIVIL ENGINEERING BRANCH, DPP



KAJIOKA
YAMACHI
ARCHITECTS

834 Punchbowl Street, Honolulu, Hawaii 96813
Telephone (808) 548-7778 • Fax (808) 548-8334



This work was prepared by me or under my supervision and construction of this project is by me or under my supervision. (Observation of construction) shall be as defined in Chapter 111, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Subchapter 1, Section 111-112-2, Definitions, effective 1/20/94.

Michael H. Okamoto 7/14/99

PROJECT: OAHU CABLE STATION AT KAHE POINT PHASE - 2

GTE Hawaiian Tel

OAHU CABLE STATION
AT
KAHE POINT
PHASE - 2

HONOLULU, OAHU,
HAWAII

TMK: 9-2-03 Portion of 2

| REVISIONS | DATE | DESCRIPTION |
|-----------|---------|------------------|
| △ | 8/14/99 | PHASE II PRICING |
| △ | | |
| △ | | |
| △ | | |
| △ | | |
| △ | | |

| | |
|------------------|-------------------|
| DRAWN BY: DK/WHO | CHECKED BY: KTS |
| DATE: 9/14/99 | EVENT: PERMIT SET |
| | |

SHEET TITLE: **SITE PLAN**

| | |
|---------------------------|-------------------|
| SHEET: 5 OF 15 | SHEET: C-4 |
| PROJECT NO.: 98053 | |

PROJECT NO. 22
98053
SHEET 13 OF 15
C-12

MISCELLANEOUS
DETAILS - 1

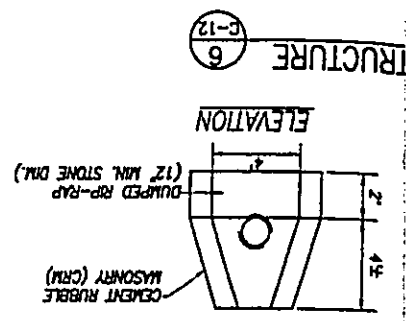
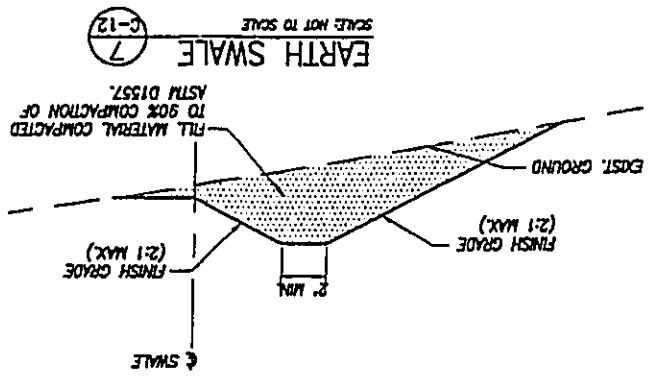
DATE: 8/20/99
CHECKED BY: DK/MHO
EVENT: PERMIT SET

| NO. | DATE | DESCRIPTION |
|-----|------|-----------------------|
| 1 | | ISSUED FOR PERMIT SET |

PROJECT: OAHU CABLE STATION AT KAHE POINT PHASE - 2 HONOLULU OAHU HAWAII
 TITLE: 9-2-03 Portion of 2
 GTE Hawaiian Tel

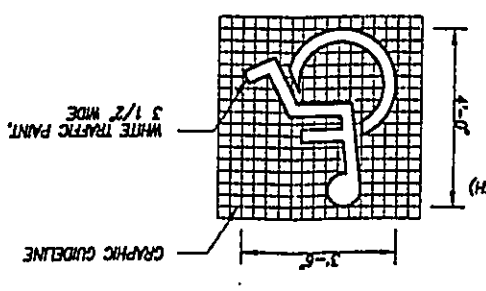
REGISTERED PROFESSIONAL ENGINEER
 MICHAEL H. OHLSEN
 LICENSE NO. 11111
 STATE OF HAWAII

ARCHITECTS
 KAJIOKA YAMACHI

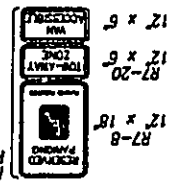
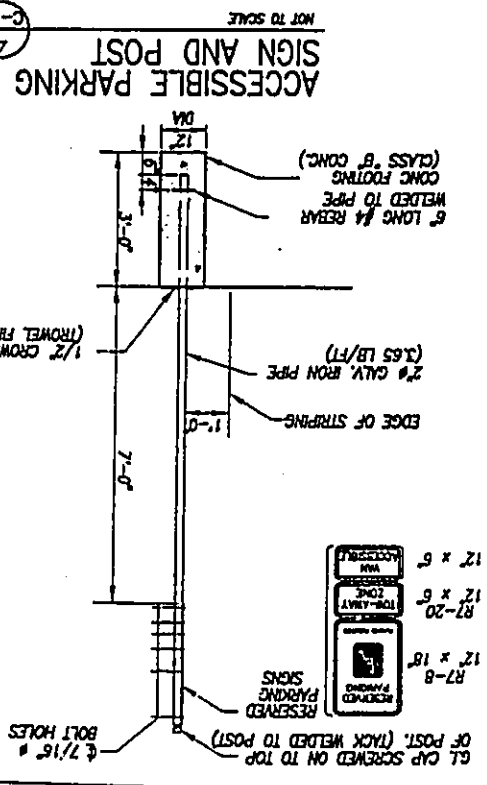
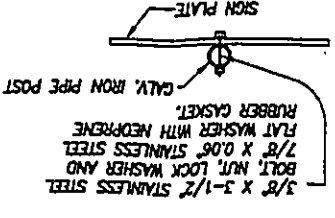


- EARTH ARRAY NOTES:**
1. RESISTANCE TO GROUND OF THE SYSTEM SHALL NOT EXCEED 3 OHMS.
 2. MINIMUM SEPARATION BETWEEN EARTH ARRAYS AND CABLE STATION, FUTURE BENCH MARKS AND OTHER EARTH ARRAYS SHALL BE 100'.
 3. ELECTRODE TAILS SHALL BE JOINED IN THE ELECTRODE TERMINATION BOX AND CONNECTED TO THE SYSTEM POWER FEED WITH SCREENED TWO-CORE 18MM CABLE.
 4. EARTH ELECTRODES SHALL CONSIST OF A CENTRAL SILICON RIBBON SURROUNDED BY A CENTRAL CARBONIFEROUS BACKFILL.

ACCESSIBLE PARKING SYMBOL OF ACCESSIBILITY



ACCESSIBLE SIGN MOUNTING



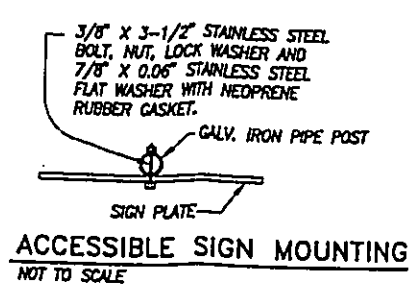
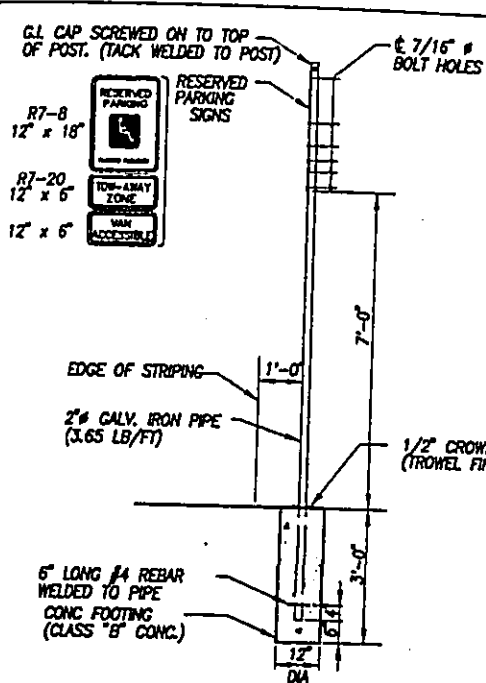
C-12
6

C-12
5

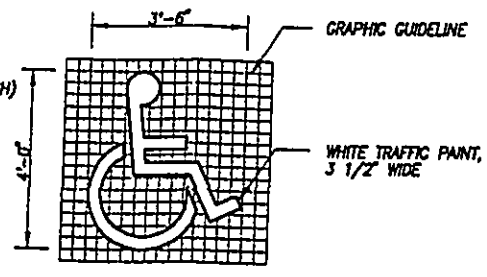
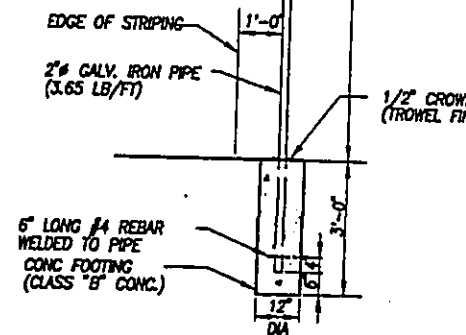
C-12
4

CORRECTION

THE PRECEDING DOCUMENT(S) HAS
BEEN REPHOTOGRAPHED TO ASSURE
LEGIBILITY
SEE FRAME(S)
IMMEDIATELY FOLLOWING



ACCESSIBLE SIGN MOUNTING
NOT TO SCALE



SYMBOL OF ACCESSIBILITY
NOT TO SCALE

ACCESSIBLE PARKING SIGN AND POST
NOT TO SCALE

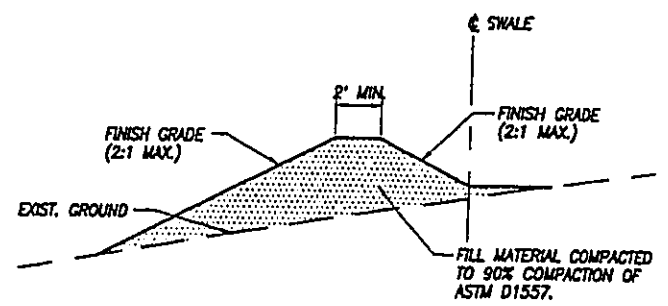
EARTH ARRAY NOTES:

1. RESISTANCE TO GROUND OF THE SYSTEM SHALL NOT EXCEED 3 OHMS.
2. MINIMUM SEPARATION BETWEEN EARTH ARRAYS AND CABLE STATION, FUTURE BEACH MANHOLE AND OTHER EARTH ARRAYS SHALL BE 100'.
3. ELECTRODE TAILS SHALL BE JOINED IN THE ELECTRODE TERMINATION BOX AND CONNECTED TO THE SYSTEM POWER FEED WITH SCREENED, TWO-CORE 16MM CABLE.
4. EARTH ELECTRODES SHALL CONSIST OF A CENTRAL SILICON IRON ANODE SURROUNDED BY CARBONIFEROUS BACKFILL.

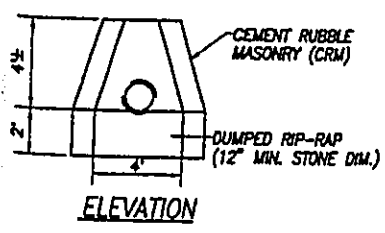
PVC DUCT

CARBON/BERTORITE BACKFILL

ELECTRODE



EARTH SWALE
SCALE: NOT TO SCALE



ELEVATION

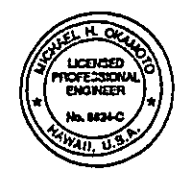
STRUCTURE
SCALE: NOT TO SCALE

**KAJIOKA
YAMACHI**



ARCHITECTS

224 Punchbowl Street, Honolulu, Hawaii 96822
Telephone (808) 949-7770 Fax (808) 949-9224



This work was prepared by me or under my supervision and approval of this project was by order of completion (Observation of construction) and has no further to do with 110, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Chapter 1, Section 12-110-2, Effective 4/24/84.

Michael H. Okamoto 8/20/99

PROJECT

GTE Hawaiian Tel

**OAHU CABLE STATION
AT
KAHE POINT
PHASE - 2**

**HONOLULU, OAHU,
HAWAII**

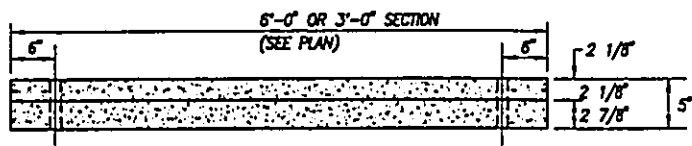
TMK: 9-2-03: Portion of 2

| REVISIONS | DATE | DESCRIPTION |
|-----------|---------|------------------|
| 1 | 8/20/99 | PHASE II PRICING |
| 2 | | |
| 3 | | |
| 4 | | |
| 5 | | |
| 6 | | |

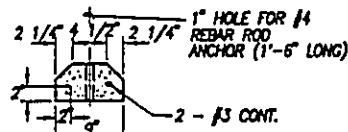
| | |
|------------------|-------------------|
| DRAWN BY: DK/MHO | CHECKED BY: KTS |
| DATE: 8/20/99 | EVENT: PERMIT SET |

SHEET TITLE:
**MISCELLANEOUS
DETAILS - 1**

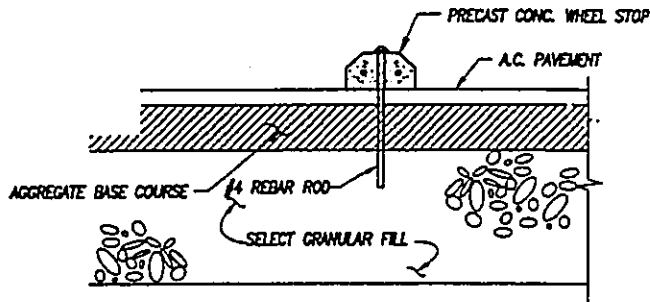
| | |
|-------------------------------|---------------------------|
| SHEET NO.: 13 of 15 | SHEET NO.: C-12 |
| PROJECT NO.: 98053 | |



ELEVATION
SCALE: 1" = 1'

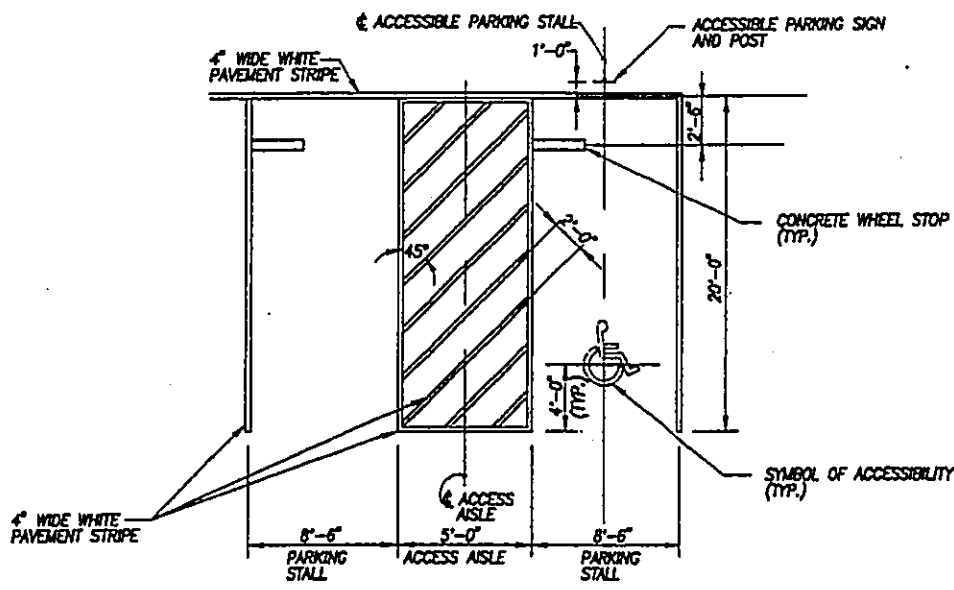


SECTION
SCALE: 1" = 1'

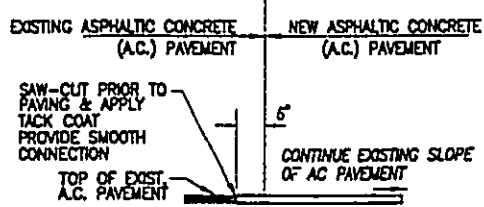


WHEEL STOP LOCATION
Scale: 1" = 1'

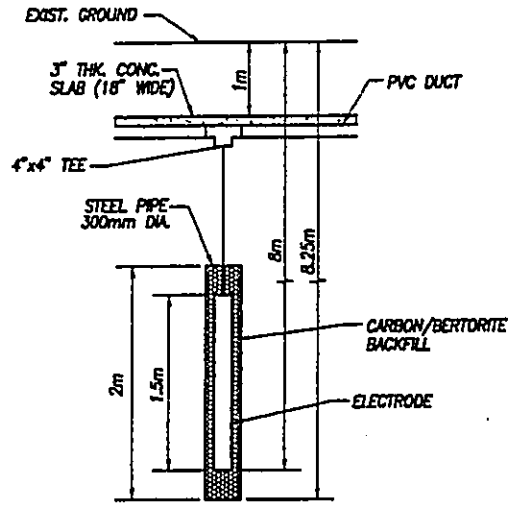
PRECAST WHEEL STOP (1)
SCALE: AS SHOWN (C-12)



ACCESSIBLE PARKING STALL (2)
SCALE: 3/16" = 1'-0" (C-12)



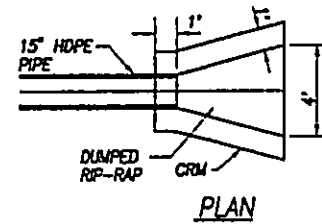
AC PAVEMENT CONNECTION (3)
NOT TO SCALE (C-12)



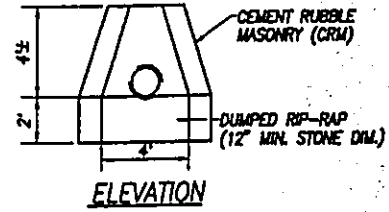
EARTH ELECTRODE (5)
SCALE: NOT TO SCALE (C-12)

EARTH ARRAY NOTES:

1. RESISTANCE TO GROUND OF NOT EXCEED 3 OHMS.
2. MINIMUM SEPARATION BETWEEN CABLE STATION, FUTURE BE OTHER EARTH ARRAYS SHALL
3. ELECTRODE TAILS SHALL BE ELECTRODE TERMINATION BC TO THE SYSTEM POWER FEED TWO-CORE 16MM CABLE.
4. EARTH ELECTRODES SHALL SILICON IRON ANODE SURR CARBONIFEROUS BACKFILL.



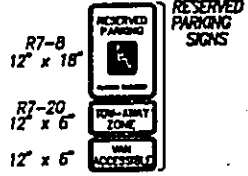
PLAN



ELEVATION

CRM OUTLET STRUCTURE (6)
SCALE: 1"=4" (C-12)

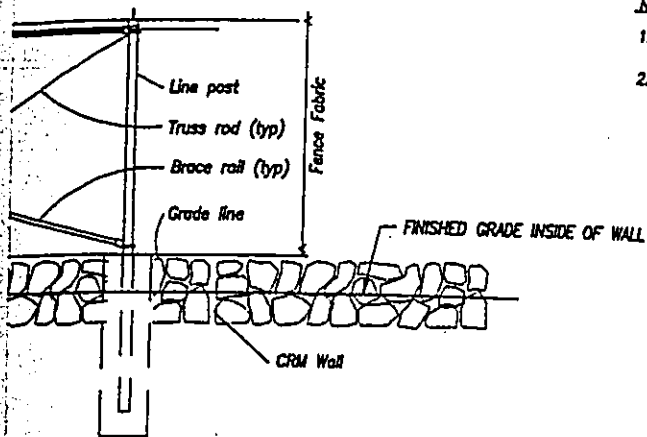
G.I. CAP SCREWED ON TO TOP OF POST. (TACK WELDED TO POST)



EDGE OF STRIPING
2" GALV. IRON PIPE (3.65 LB/FT)

6" LONG #4 REBAR WELDED TO PIPE CONG FOOTING (CLASS "B" CONG.)

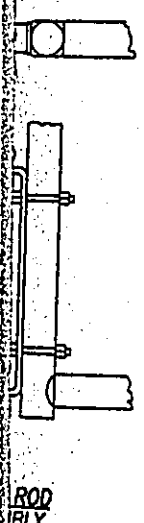
ACCESSIBLE SIGN AND
NOT TO SCALE



NOTES:

1. Swing Gates shall be constructed with drop rods, padlocks, latch assembly and gate keepers except as noted.
2. All gate frames shall be a minimum 1.50" nominal (round) or 2.00" nominal (square). Gate frames shall be of welded construction or shall be assembled using heavy fittings. At Contractor's option a welded horizontal brace may be used in lieu of truss rods to brace all welded gate frames. The Contractor shall be responsible for the proper rigid construction of all gates supplied.

| GATE POST SCHEDULE | |
|---------------------------|-----------------------------|
| GATE LEAF WIDTH (NOMINAL) | OUTSIDE DIMENSION (NOMINAL) |
| 6" or less | 3.875" OD 2.5" SO |
| More than 6" to 13" | 4.0" OD |
| More than 13" to 18" | 6.625" OD |
| More than 18" | 8.825" OD |



**KAJIOKA
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Telephone (808) 949-7779 Fax (808) 949-8824



This work was prepared by me or under my supervision and construction of this project will be under my observation. (Characterization of construction) shall be as defined in Chapter 116, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, November 1, 1990 (19-116-5, Subsection, Section 6, 2/24/94)

Michael H. Grandjean 9/24/99

PROJECT
GTE Hawaiian Tel

**OAHU CABLE STATION
AT
KAHE POINT
PHASE - 2**

**HONOLULU, OAHU,
HAWAII**

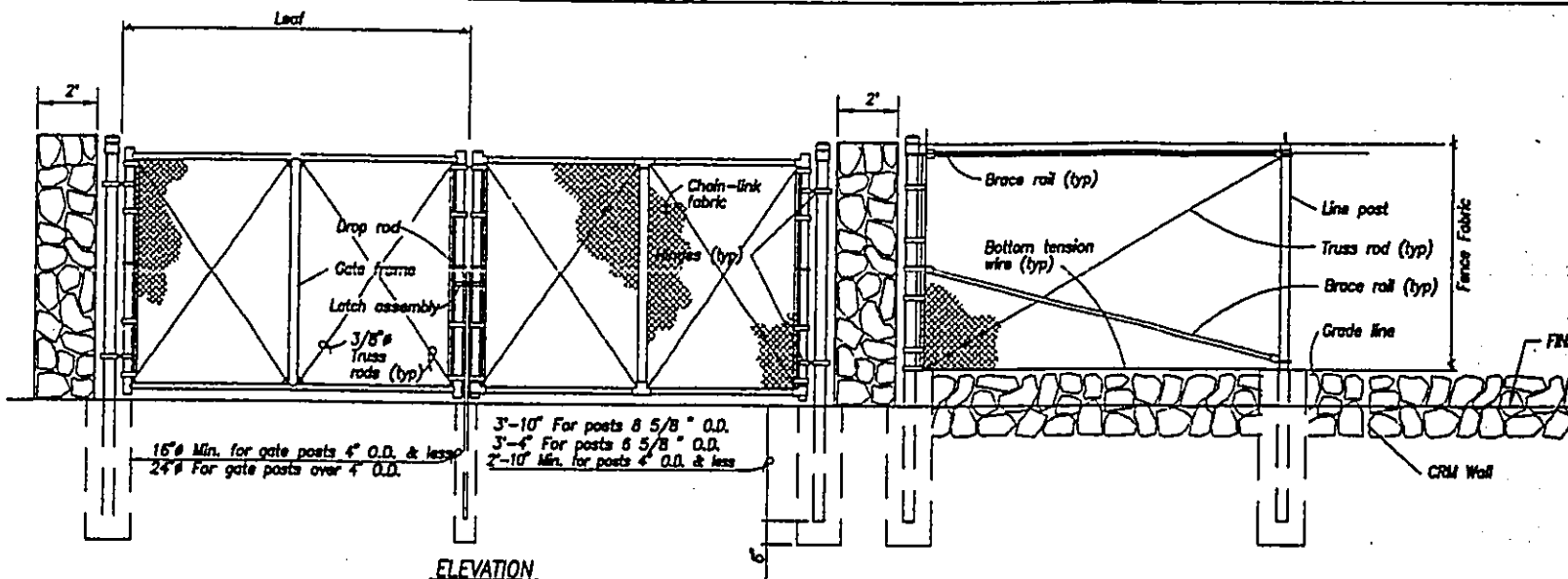
TMK: 9-2-03 Portion of 2

| REVISIONS | DATE | DESCRIPTION |
|-----------|---------|------------------|
| △ | 8/20/99 | PHASE II PENDING |
| △ | | |
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| DRAWN BY: DK/WHO | CHECKED BY: KTS |
| DATE: 8/20/99 | EVENT: PERMIT SET |
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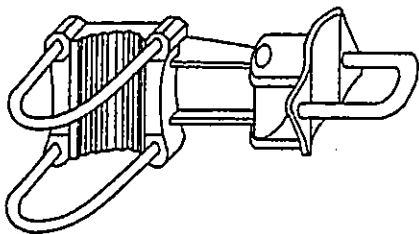
SHEET TITLE
**MISCELLANEOUS
DETAILS - 2**

| | |
|-----------------------------|----------------------|
| SHEET 14 of 15 | SHEET C-13 |
| PROJECT NO. 98053 | |

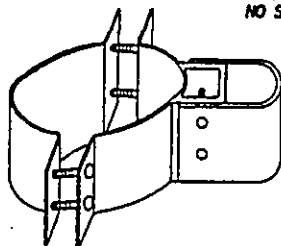


ELEVATION

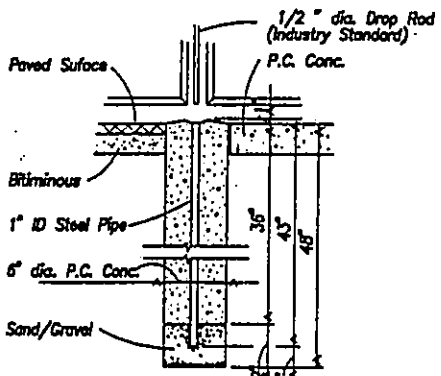
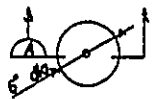
DOUBLE SWING GATE
NO SCALE



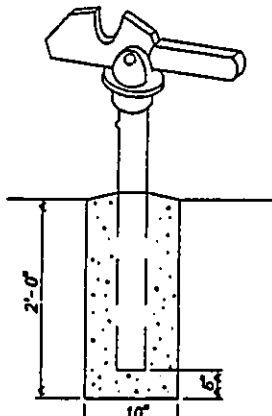
OFFSET HINGE



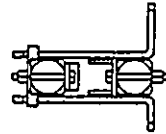
STANDARD HINGE



DROP ROD FOUNDATION



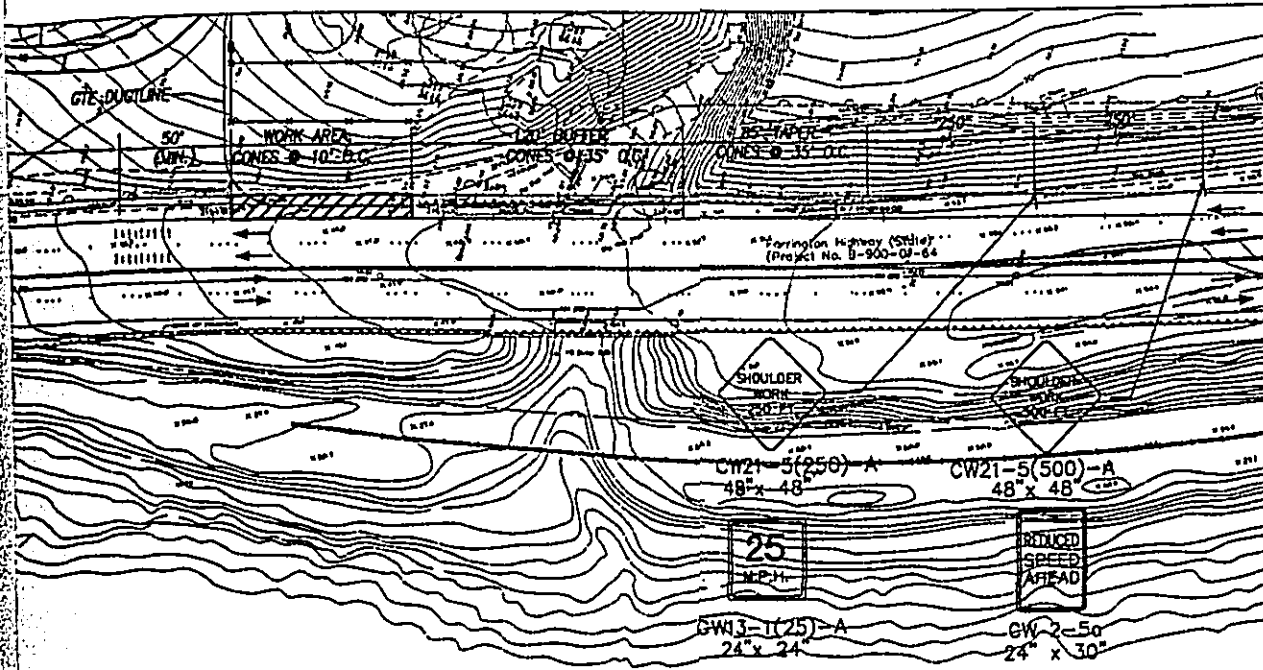
GATE KEEPER
(TO HOLD GATE OPEN)
SWING GATE DETAILS
NO SCALE



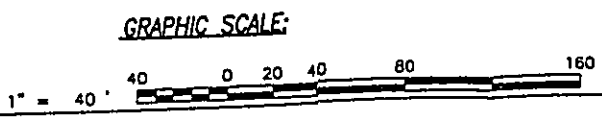
LATCH
ASSEMBLY



DROP ROD
ASSEMBLY



CONTROL PLAN
 SPEED LIMIT = 35 MPH



**KAJIOKA
 YAMACHI**

ARCHITECTS

604 Punchbowl Street, Honolulu, Hawaii 96805
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This work was prepared by me or under my supervision and construction of this project will be under my direction. (Certificate of Practice) and to be sealed by chapter 118, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Subchapter 1, Section 118-112-2, Subsection, Subsection 1/25/94.

Michael H. Okamoto 9/17/99

PROJECT

GTE Hawaiian Tel

OAHU CABLE STATION
 AT
 KAHE POINT
 PHASE - 2

HONOLULU, OAHU,
 HAWAII

TMK: 9-2-03: Portion of 2

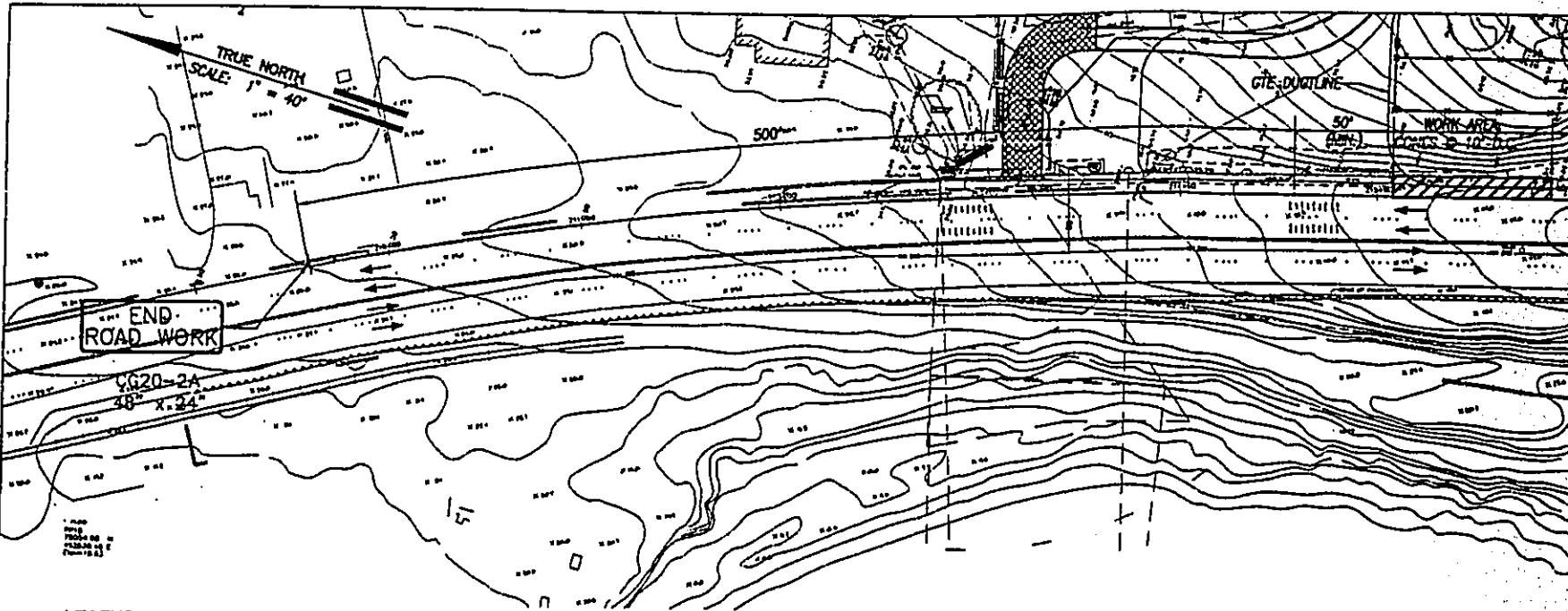
| REVISIONS | |
|-----------|-----------------|
| DATE | DESCRIPTION |
| 9/14/99 | PHASE II PAVING |
| △ | |
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| DRAWN BY: MHO | CHECKED BY: KTS |
| DATE: 9/7/99 | EVDR: PERMIT SET |
| | |
| | |

SHEET TITLE

TRAFFIC CONTROL PLAN

| | |
|-------------------|-------|
| SHEET | SHEET |
| 15 of 15 | C-14 |
| PROJECT NO. 98053 | |



LEGEND

- DELINEATOR OR CONE
- SIGN
- DIRECTION OF TRAFFIC FLOW

NOTE:

SEE SHEET C-2 FOR TRAFFIC CONTROL NOTES.

TRAFFIC CONTROL PLAN

SCALE: 1" = 40' POSTED SPEED LIMIT = 35 MPH

APPENDIX II

Construction Drawings
GTE Hawaiian Tel Oahu Cable Station at Kahe Point
Honouliuli, Oahu, Hawaii
June 1999

Mauiian Tel

ABLE STATION IE POINT

LI, OAHU, HAWAII

REV: 9-9-08: 02



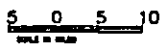
HILL CORPORATION
SINCE 1930

DRAWING INDEX

| DESCRIPTION |
|--|
| TITLE SHEET |
| NOTES - 1 |
| NOTES - 2 |
| DEMOLITION & EROSION CONTROL PLAN |
| SITE PLAN |
| GRADING, DRAINAGE & EROSION CONTROL PLAN |
| PROFILES - 1 |
| PROFILES - 2, TYPICAL SECTIONS |
| SECTIONS |
| MISCELLANEOUS DETAILS - 1 |
| MISCELLANEOUS DETAILS - 2 |
| TRAFFIC CONTROL PLAN |



ICINITY MAP



APPROVALS

| | |
|---|---------|
| <i>[Signature]</i> | 7/12/99 |
| _____ DIRECTOR, DEPARTMENT OF PLANNING & PERMITTING CITY & COUNTY OF HONOLULU (FOR SITE GRADING ONLY) | DATE |
| <i>[Signature]</i> | 8/17/99 |
| _____ ADMINISTRATOR, HIGHWAYS DIVISION, STATE DEPARTMENT OF TRANSPORTATION (APPROVAL GRANTED FOR WORK WITHIN STATE RIGHT-OF-WAY ONLY. ID NO. 0-99-2 LETTER OF APPROVAL NO. HWY-TO 2.4316 DATED 6/22/99 | DATE |

OAHU CABLE STATION AT KAHE POINT

GTE Hawaiian Telephone

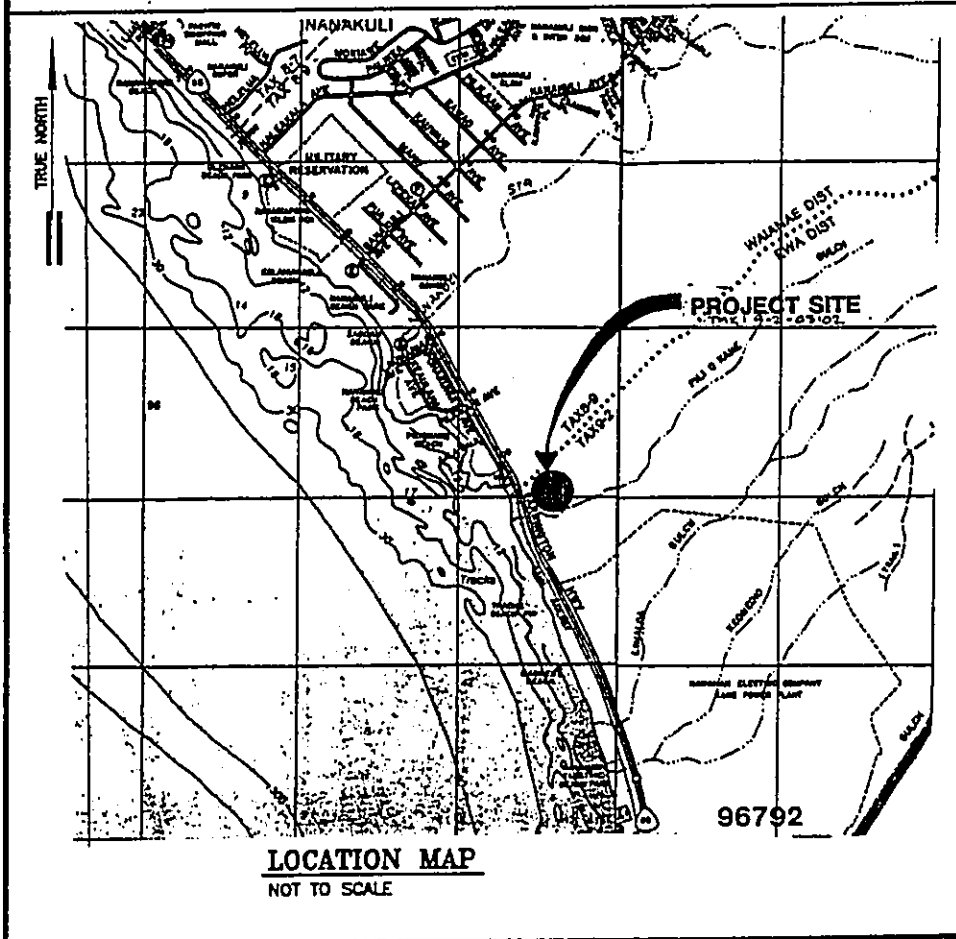
OAHU CABLE STATION AT KAHE POINT

HONOLULU, OAHU, HAWAII

TRK: 9-908 03



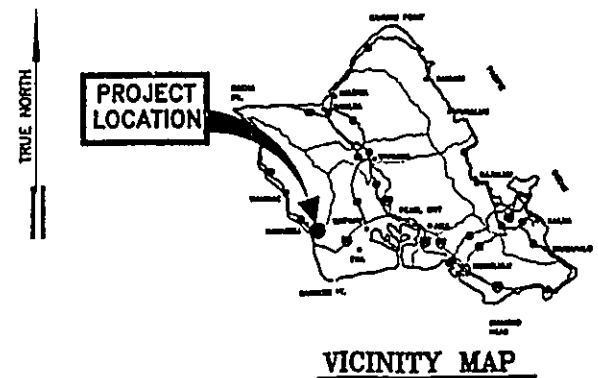
R. M. TOWILL CORPORATION
SINCE 1930



LOCATION MAP
NOT TO SCALE

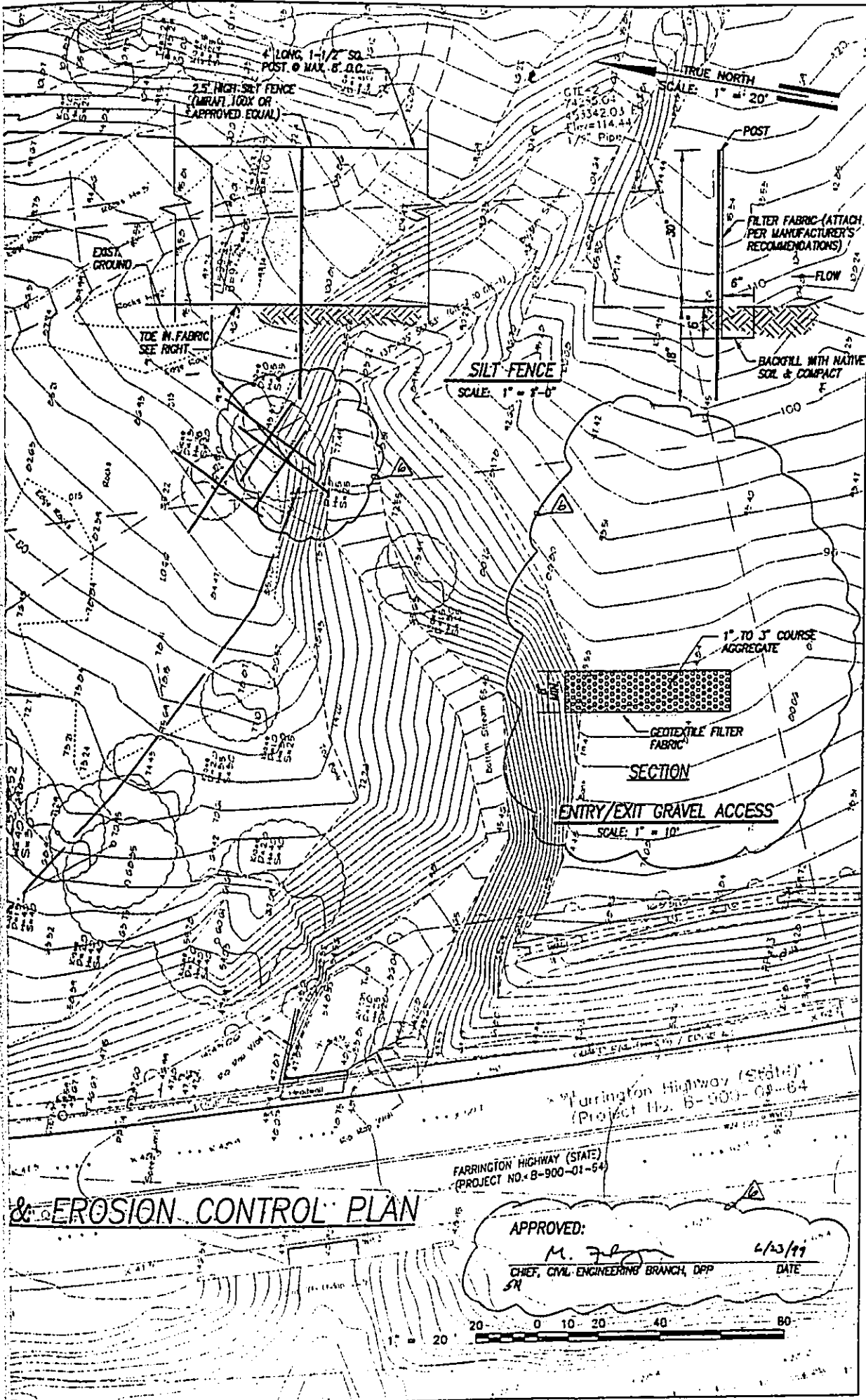
DRAWING INDEX

| SHEET NO. | DRAWING NO. | DESCRIPTION |
|-----------|-------------|-------------------------------------|
| 1 | T-1 | TITLE SHEET |
| 2 | C-1 | NOTES - 1 |
| 3 | C-2 | NOTES - 2 |
| 4 | C-3 | DEMOLITION & EROSION CONTROL PLAN |
| 5 | C-4 | SITE PLAN |
| 6 | C-5 | GRADING, DRAINAGE & EROSION CONTROL |
| 7 | C-6 | PROFILES - 1 |
| 8 | C-7 | PROFILES - 2, TYPICAL SECTIONS |
| 9 | C-8 | SECTIONS |
| 10 | C-9 | MISCELLANEOUS DETAILS - 1 |
| 11 | C-10 | MISCELLANEOUS DETAILS - 2 |
| 12 | C-11 | TRAFFIC CONTROL PLAN |



VICINITY MAP

5 0 5 10
SCALE IN FEET



**KAJIOKA
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Telephone (808) 948-7770 • Fax (808) 948-0524



This work was prepared by me or under my supervision and representation of the project will be under my supervision. (Observation of an inspection shall be as defined in chapter 115, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, Board of Hawaii, September 1, 1991, Section 115-112-5, Effective September 1, 1991, Section 115-112-5, Effective 6/23/94.)

Michael H. Okamoto 6/21/99

PROJECT

GTE Hawaiian Tel

**OAHU CABLE STATION
AT
KAHE POINT**

**HONOLULU, OAHU,
HAWAII**

TMK: 9-2-03 Portion of 2

REVISIONS

| | |
|--------|--|
| △ 1/19 | APPROVED SIGNATURE. REVISIONS NOTED DIFFERENT DATE PERMITTED ENGINEER DATE DATED 6/21/99 (6/19) |
| △ | |
| △ | |
| △ | |
| △ | |
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|------------------------|--------------------------|
| DRAWN BY: DK/MO | CHECKED BY: KTS |
| DATE: 6/21/99 | EVENT: PERMIT SET |
| | |

SHEET TITLE

**DEMOLITION &
EROSION CONTROL PLAN**

| | |
|---------------------|--------------|
| SHEET | SHEET |
| 4 of 12 | C-3 |
| PROJECT NO.: | |
| 98053 | |

APPROVED:

M. J. [Signature] 6/23/99

DATE

CHIEF, CIVIL ENGINEERING BRANCH, DPP



DEMOLITION & EROSION CONTROL PLAN

Farrington Highway (State)
(Project No. B-900-01-64)

FARRINGTON HIGHWAY (STATE)
(PROJECT NO. B-900-01-64)

BEST MANAGEMENT PRACTICE NOTES

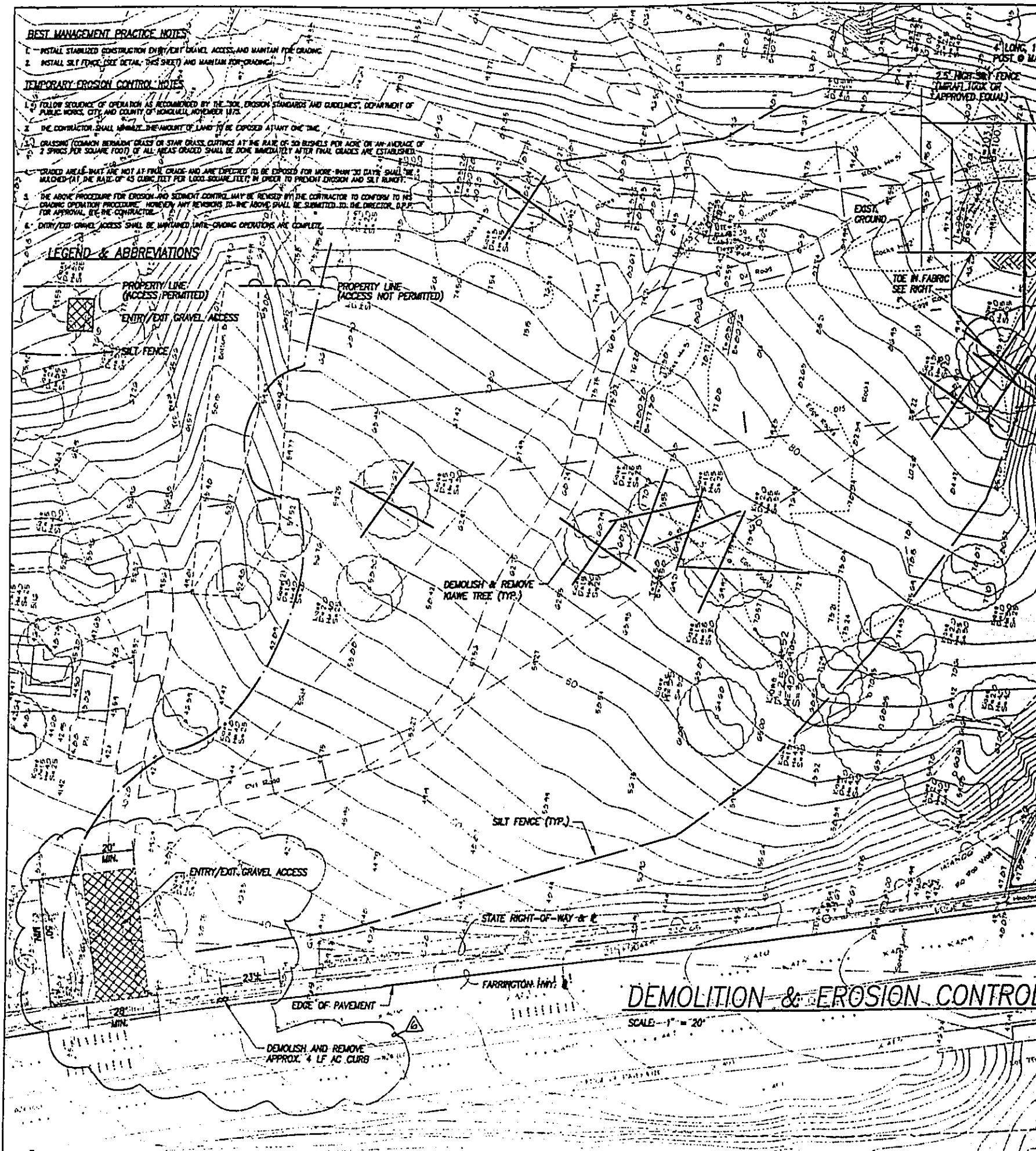
1. INSTALL STABILIZED CONSTRUCTION ENTRY/EXIT GRAVEL ACCESS, AND MAINTAIN FOR GRADING.
2. INSTALL SILT FENCE (SEE DETAIL - THIS SHEET) AND MAINTAIN FOR GRADING.

TEMPORARY EROSION CONTROL NOTES

1. FOLLOW SEQUENCE OF OPERATION AS RECOMMENDED BY THE SOIL EROSION STANDARDS AND GUIDELINES, DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, NOVEMBER 1975.
2. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF LAND TO BE EXPOSED AT ANY ONE TIME.
3. GRASSING (COMMON BERBERIS GRASS OR STAM GRASS CUTTINGS AT THE RATE OF 50 BUSHELS PER ACRE OR AN AVERAGE OF 2 SPRINGS PER SQUARE FOOT) OF ALL AREAS GRADED SHALL BE DONE IMMEDIATELY AFTER FINAL GRADES ARE ESTABLISHED.
4. GRADED AREAS THAT ARE NOT AT FINAL GRADE AND ARE EXPECTED TO BE EXPOSED FOR MORE THAN 30 DAYS SHALL BE MULCHED (AT THE RATE OF 45 CUBIC FEET PER 1000 SQUARE FEET) IN ORDER TO PREVENT EROSION AND SILT RUNOFF.
5. THE ABOVE PROCEDURE FOR EROSION AND SEDIMENT CONTROL MAY BE REVISED BY THE CONTRACTOR TO CONFORM TO HIS GRADING OPERATION PROCEDURE. HOWEVER, ANY REVISIONS TO THE ABOVE SHALL BE SUBMITTED TO THE DIRECTOR, D.P.P. FOR APPROVAL BY THE CONTRACTOR.
6. ENTRY/EXIT GRAVEL ACCESS SHALL BE MAINTAINED UNTIL GRADING OPERATIONS ARE COMPLETE.

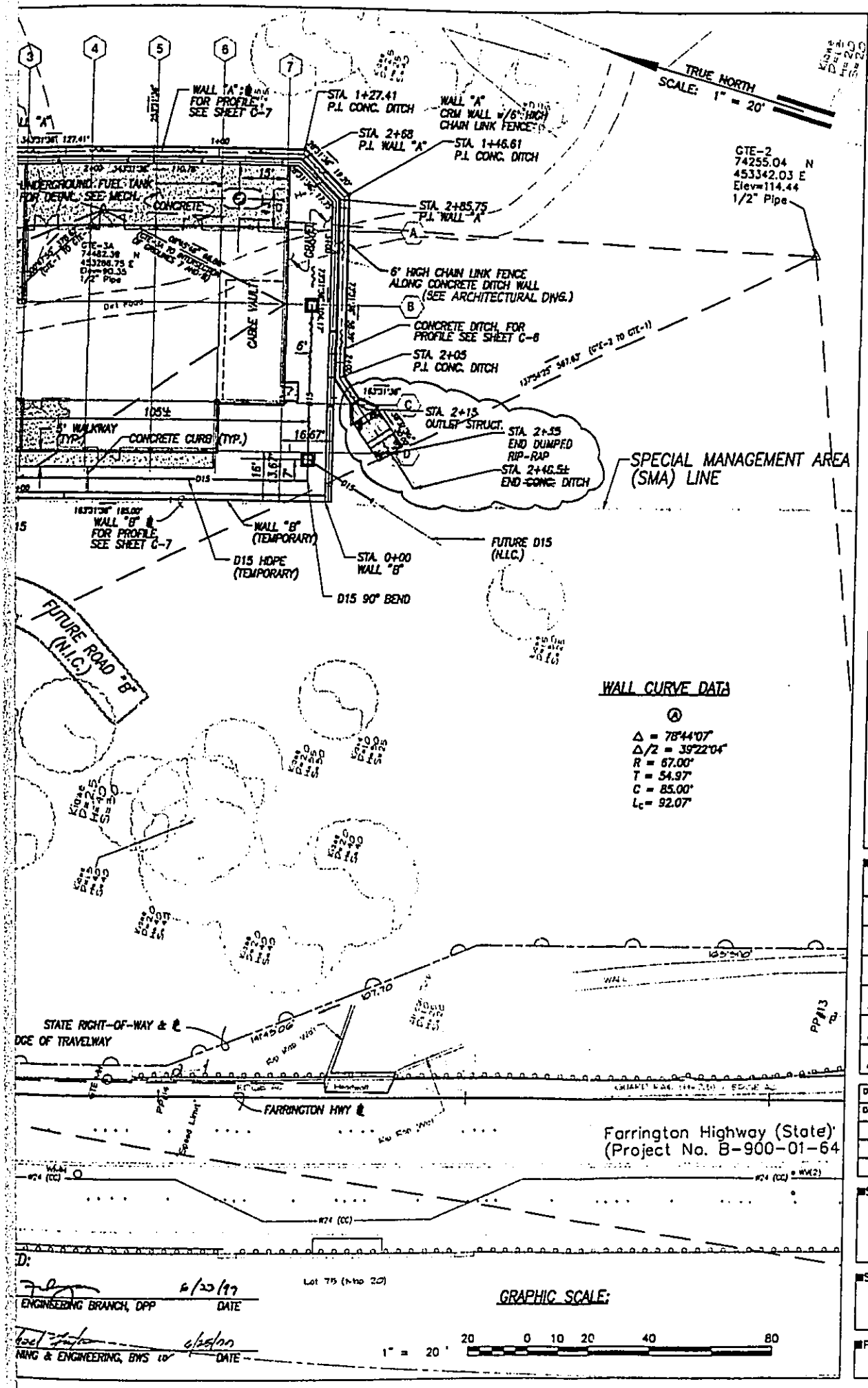
LEGEND & ABBREVIATIONS

- PROPERTY LINE (ACCESS PERMITTED)
- PROPERTY LINE (ACCESS NOT PERMITTED)
- ENTRY/EXIT GRAVEL ACCESS
- SILT FENCE



DEMOLITION & EROSION CONTROL

SCALE - 1" = 20'

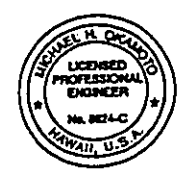


**KAJIOKA
YAMACHI**



ARCHITECTS

264 Punchbowl Street, Honolulu, Hawaii 96808
Telephone (808) 948-1778 • Fax (808) 948-0024



This work was prepared by me or under my supervision and construction of this project will be under my supervision. (Observation of construction) shall be as indicated in greater detail.

11A, Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Subchapter 1, Section 11A-115-2, Definitions, Paragraph (b), Section 1/21/94.

PROJECT

GDB Hawaiian Tel

**OAHU CABLE STATION
AT
KAHE POINT**

**HONOLULU, OAHU,
HAWAII**

TMK: 9-2-03 Portion of 2

REVISIONS

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| DATE: 6/21/99 | EVENT: PERMIT SET |
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SHEET TITLE

SITE PLAN

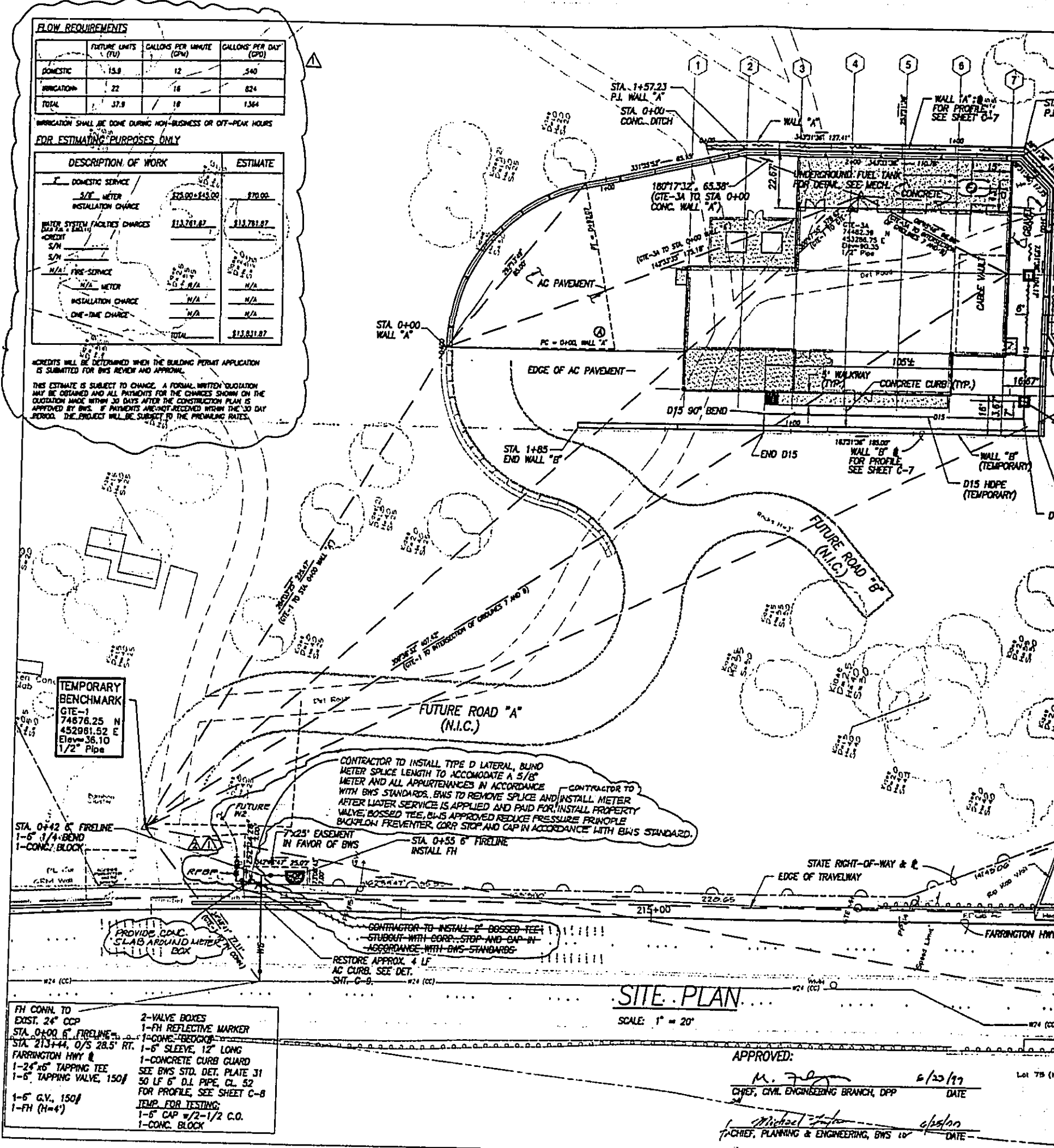
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| SHEET | SHEET |
| 5 of 12 | C-4 |
| PROJECT NO. 98053 | |

| FLOW REQUIREMENTS | | | |
|-------------------|-------------------|--------------------------|-----------------------|
| | FUTURE UNITS (FU) | GALLONS PER MINUTE (GPM) | GALLONS PER DAY (GPD) |
| DOMESTIC | 15.8 | 12 | 540 |
| IRRIGATION | 22 | 18 | 824 |
| TOTAL | 37.8 | 30 | 1364 |

IRRIGATION SHALL BE DONE DURING NON-BUSINESS OR OFF-PEAK HOURS
FOR ESTIMATING PURPOSES ONLY

| DESCRIPTION OF WORK | ESTIMATE |
|---------------------------------|-------------|
| DOMESTIC SERVICE | |
| 3/8" METER | \$70.00 |
| INSTALLATION CHARGE | |
| WATER SYSTEM FACILITIES CHARGES | \$13,781.87 |
| CREDIT | |
| S/N | |
| S/N | |
| N/A FIRE SERVICE | |
| METER | |
| INSTALLATION CHARGE | |
| ONE-TIME CHARGE | |
| TOTAL | \$13,851.87 |

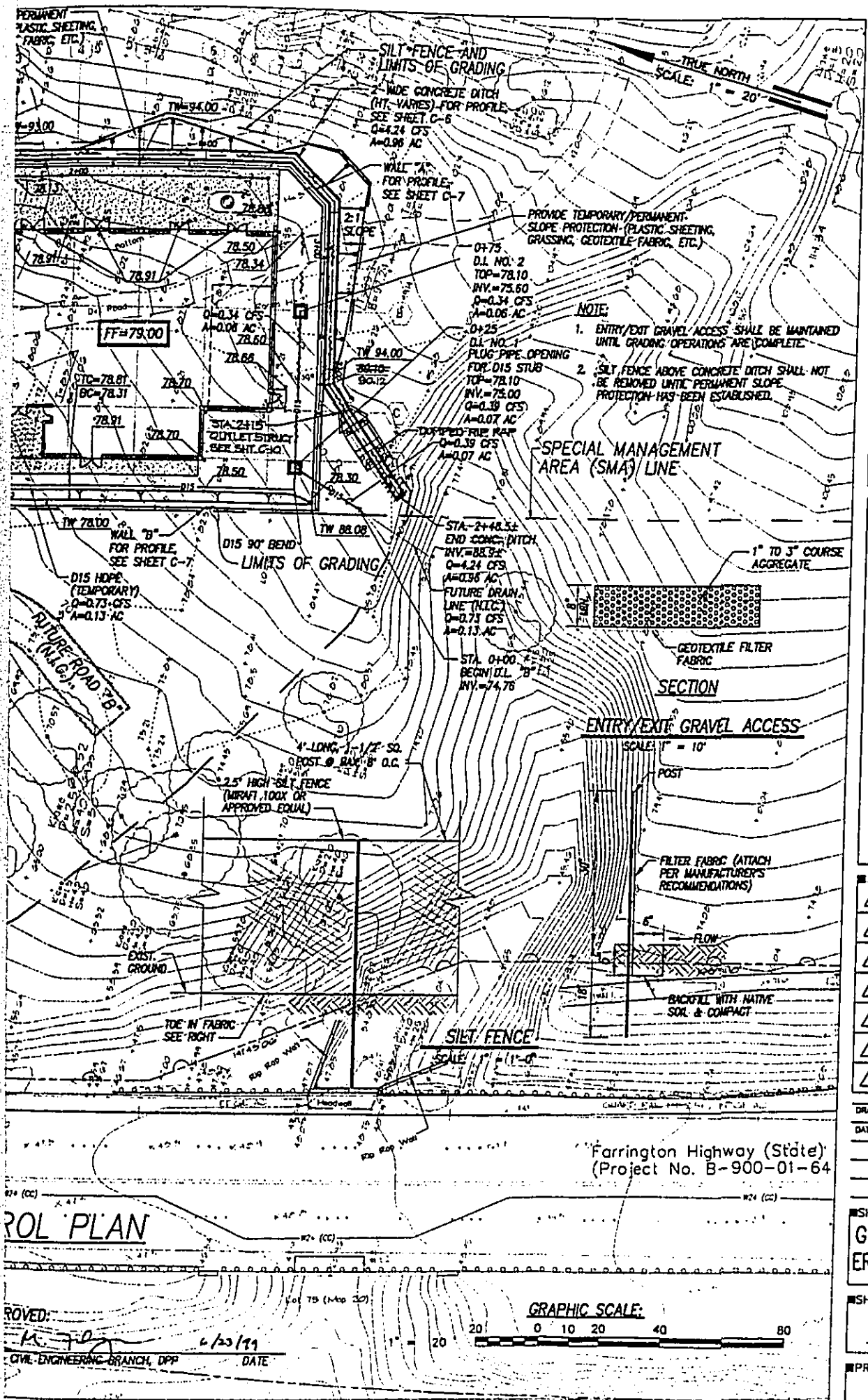
CREDITS WILL BE DETERMINED WHEN THE BUILDING PERMIT APPLICATION IS SUBMITTED FOR BWS REVIEW AND APPROVAL.
THIS ESTIMATE IS SUBJECT TO CHANGE. A FORMAL WRITTEN QUOTATION MAY BE OBTAINED AND ALL PAYMENTS FOR THE CHANGES SHOWN ON THE QUOTATION MADE WITHIN 30 DAYS AFTER THE CONSTRUCTION PLAN IS APPROVED BY BWS. IF PAYMENTS ARE NOT RECEIVED WITHIN THE 30 DAY PERIOD, THE PROJECT WILL BE SUBJECT TO THE PREVAILING RATES.



- FH CONN. TO EXIST. 24" CCP
- 2-VALVE BOXES
- 1-FH REFLECTIVE MARKER
- 1-CONC. BEDDING
- 1-5" SLEEVE, 12" LONG
- 1-CONCRETE CURB CLARD
- SEE BWS STD. DET. PLATE J1
- 50 LF 6" D.I. PIPE, CL. 52
- FOR PROFILE, SEE SHEET C-8
- TEMP. FOR TESTING:
- 1-5" CAP w/2-1/2 C.O.
- 1-CONC. BLOCK

SITE PLAN
SCALE: 1" = 20'

APPROVED:
M. J. [Signature] 6/20/97
CHIEF, CIVIL ENGINEERING BRANCH, DPP DATE
Michael [Signature] djs/lan
CHIEF, PLANNING & ENGINEERING, BWS 10 DATE



KAJIOKA
YAMACHI



ARCHITECTS

864 Pennsylvania Street, Honolulu, Hawaii 96806
Telephone (808) 948-7770 Fax (808) 948-0284



This work was prepared by me or under my supervision and construction of this project is to order of approval (Observation of construction) shall be as defined in chapter 115, Hawaii Administrative Rules for Professional Engineers, Architects, Engineers and Landscapers, State of Hawaii, Subchapter 1, Section 115-114.5, Definition, Effective 6/23/94.

PROJECT

GTE Hawaiian Tel

OAHU CABLE STATION
AT
KAHE POINT

HONOLULU, OAHU,
HAWAII

TMK: 9-2-03 Portion of 2

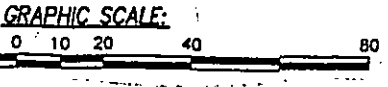
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| DATE: 6/21/99 | EVOM: PERMIT SET |
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SHEET TITLE
**GRADING, DRAINAGE &
EROSION CONTROL PLAN**

| | |
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| SHEET | SHEET |
| 6 of 12 | C-5 |
| PROJECT NO. 98053 | |

APPROVED:
M. J. J.
CIVIL ENGINEERING BRANCH, DPP
DATE: 6/23/99



BEST MANAGEMENT PRACTICE NOTES

1. INSTALL STABILIZED CONSTRUCTION DRIVE/EXIT GRAVEL ACCESS AND MAINTAIN FOR GRADING.
2. INSTALL SILT FENCE (SEE DETAIL THIS SHEET) AND MAINTAIN FOR GRADING.

TEMPORARY EROSION CONTROL NOTES

1. FOLLOW SCHEDULE OF OPERATIONS RECOMMENDED BY THE "SOIL EROSION STANDARDS AND GUIDELINES" - DEPARTMENT OF PUBLIC WORKS, CITY AND COUNTY OF HONOLULU, NOVEMBER 1973.
2. THE CONTRACTOR SHALL MINIMIZE THE AMOUNT OF LAND TO BE EXPOSED AT ANY ONE TIME.
3. GRADED AREAS THAT ARE NOT AT FINAL GRADE AND ARE EXPECTED TO BE EXPOSED FOR MORE THAN 30 DAYS, SHALL BE MULCHED (AT THE RATE OF 45 CUBIC FEET PER 1,000 SQUARE FEET) IN ORDER TO PREVENT EROSION AND SILT RUNOFF.
4. THE ABOVE PROCEDURE FOR EROSION AND SEDIMENT CONTROL MAY BE REVISED BY THE CONTRACTOR TO CONFORM TO HIS OWNING AGENCY PROCEDURE; HOWEVER, ANY REVISIONS TO THE ABOVE SHALL BE SUBMITTED TO THE DIRECTOR, O.P.A. FOR APPROVAL BY THE CONTRACTOR.

EARTHWORK NOTES

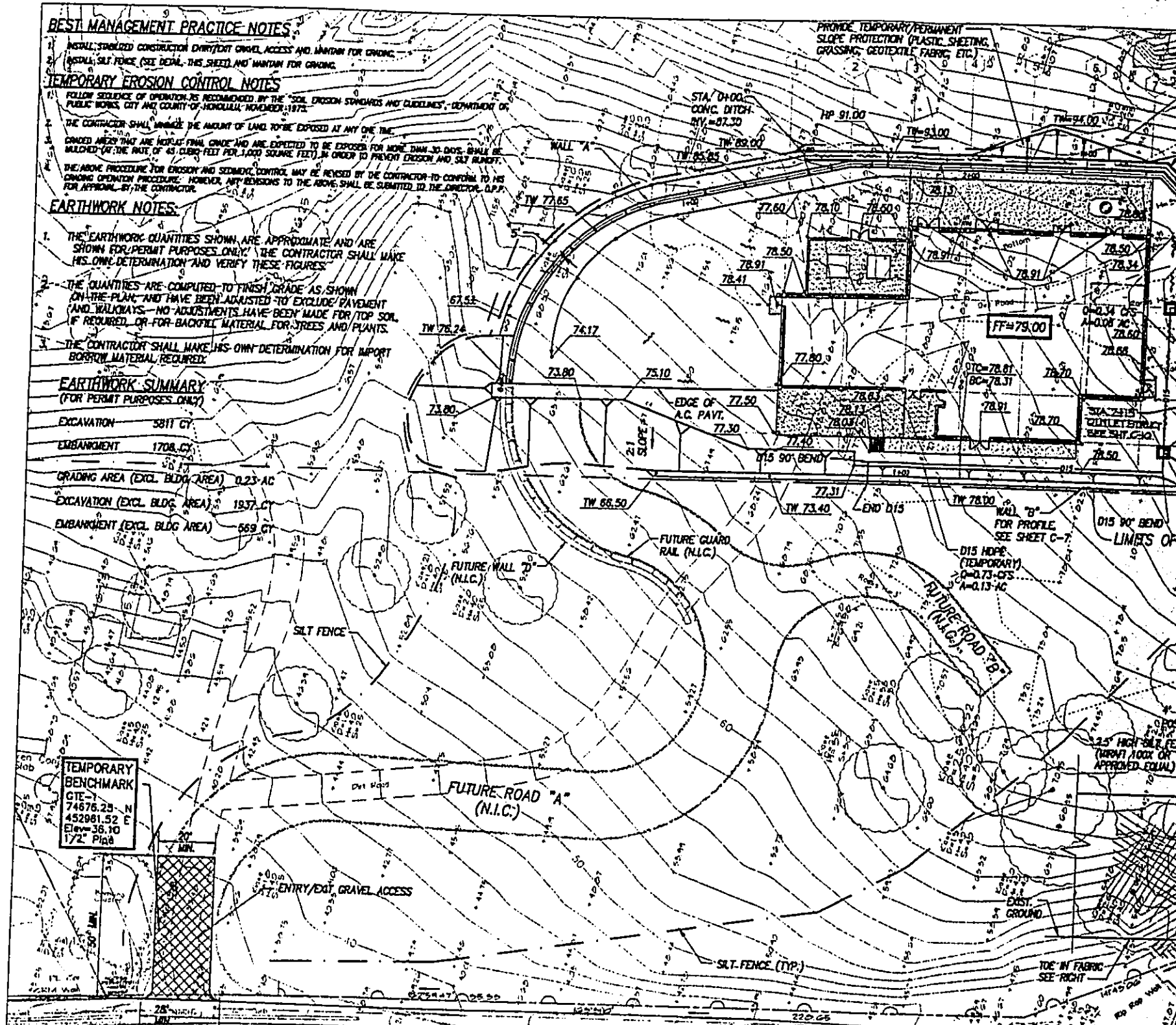
1. THE EARTHWORK QUANTITIES SHOWN ARE APPROXIMATE AND ARE SHOWN FOR PERMIT PURPOSES ONLY. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION AND VERIFY THESE FIGURES.
2. THE QUANTITIES ARE COMPUTED TO FINISH GRADE AS SHOWN ON THE PLAN AND HAVE BEEN ADJUSTED TO EXCLUDE PAVEMENT AND WALKWAYS. NO ADJUSTMENTS HAVE BEEN MADE FOR TOP SOIL IF REQUIRED OR FOR BACKFILL MATERIAL FOR TREES AND PLANTS.
3. THE CONTRACTOR SHALL MAKE HIS OWN DETERMINATION FOR IMPORT BORROW MATERIAL REQUIRED.

EARTHWORK SUMMARY

(FOR PERMIT PURPOSES ONLY)

| | |
|---------------------------------|---------|
| EXCAVATION | 5811 CY |
| EMBANKMENT | 1708 CY |
| GRADING AREA (EXCL. BLDG. AREA) | 0.23 AC |
| EXCAVATION (EXCL. BLDG. AREA) | 1937 CY |
| EMBANKMENT (EXCL. BLDG. AREA) | 569 CY |

TEMPORARY BENCHMARK
 GTE-1
 74576.23 N
 452961.52 E
 Elev. 36.10
 172' Pipe



LEGEND & ABBREVIATIONS

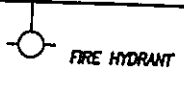
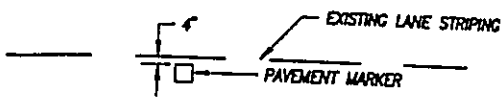
- LIMITS OF GRADING
- PROPERTY LINE
- ENTRY/EXIT GRAVEL ACCESS
- SILT FENCE
- TW 69.00 TOP OF WALL ELEVATION
- 69.00 FINISHED GROUND ELEVATION
- TC 69.00 TOP OF CURB ELEVATION
- BC 69.00 BOTTOM OF CURB ELEVATION
- HP 69.00 HIGH POINT ELEVATION

- DIRECTION OF FLOW
- SWALE
- EMBANKMENT
- EXCAVATION

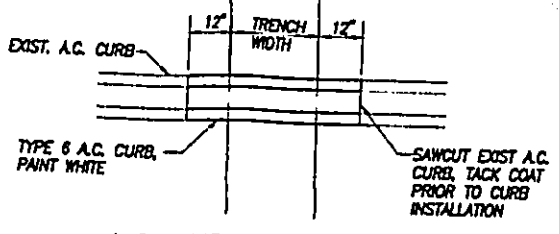
GRADING, DRAINAGE & EROSION CONTROL PLAN

SCALE: 1" = 20'

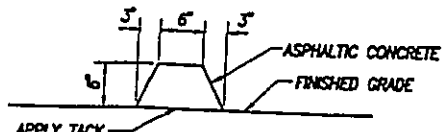
APPROVED: *[Signature]*
 CHIEF, CIVIL ENGINEERING BRANCH, DPP
 DATE: 6/23/79



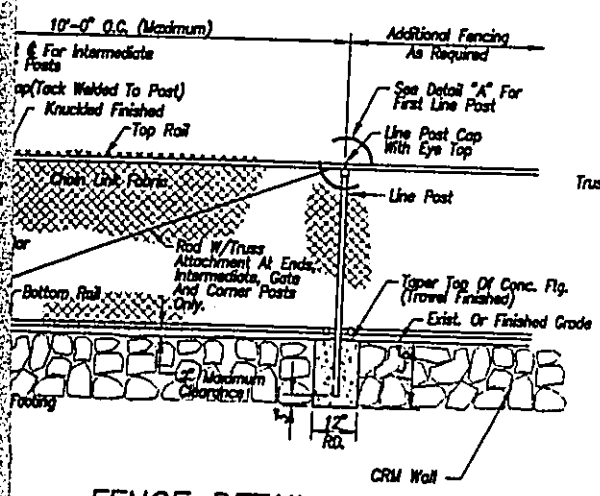
FH REFLECTIVE MARKER LOCATION
NOT TO SCALE



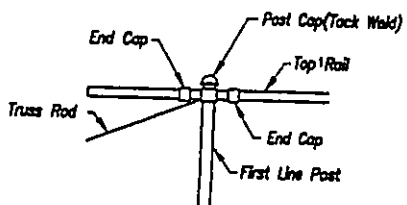
A.C. CURB RESTORATION
SCALE: 1/2" = 1'-0"



SCALE: 1" = 1'-0"



FENCE DETAIL
NOT TO SCALE



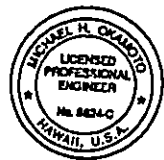
DETAIL "A"
Not to Scale

**KAJIOKA
YAMACHI**



ARCHITECTS

224 Pehoho Street, Honolulu, Hawaii 96808
Telephone (808) 948-7770 • Fax (808) 948-8884



This work was prepared by me or under my supervision and construction of this project will be under my supervision. (Signature of professional) shall be an offense to create 118. Hawaii Administrative Rules for Professional Engineers, Architects, Surveyors and Landscape Architects, State of Hawaii, Subchapter 1, Section 118-110.2, Definition, (Revised 8/28/94)

Michael H. Okamoto 5/10/99

PROJECT

GTE Hawaiian Tel

**OAHU CABLE STATION
AT
KAHE POINT**

**HONOLULU, OAHU,
HAWAII**

TMK: 9-2-03: Portion of 2

| REVISIONS | DATE | APPROVED SIGNATURE | REVISION NOTED (BY DATE) |
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| △ | 7/1/99 | | PERMIT SET (KTS) |
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| DATE: 5/7/99 | EVENT: PERMIT SET |

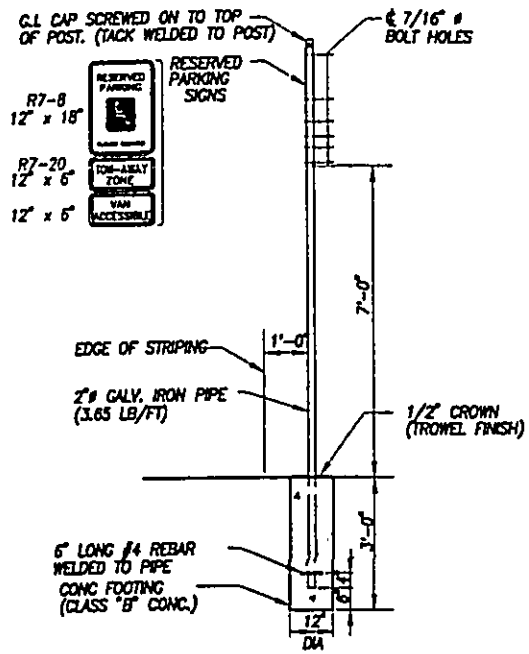
SHEET TITLE
**MISCELLANEOUS
DETAILS - 1**

SHEET
10 OF 12

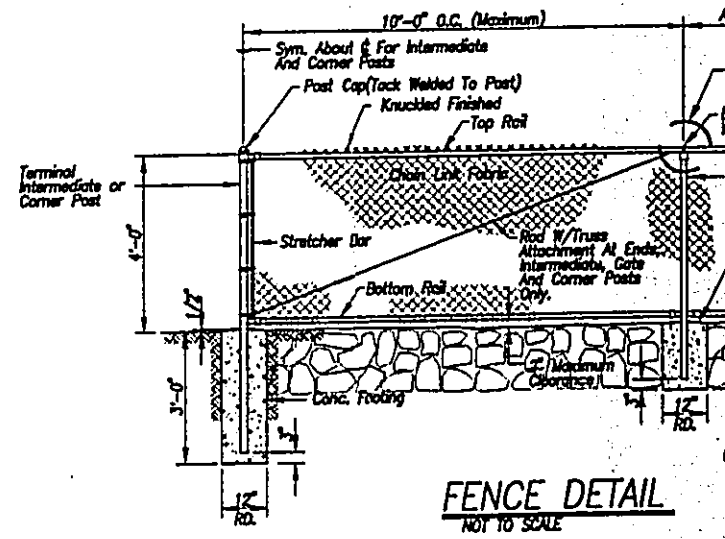
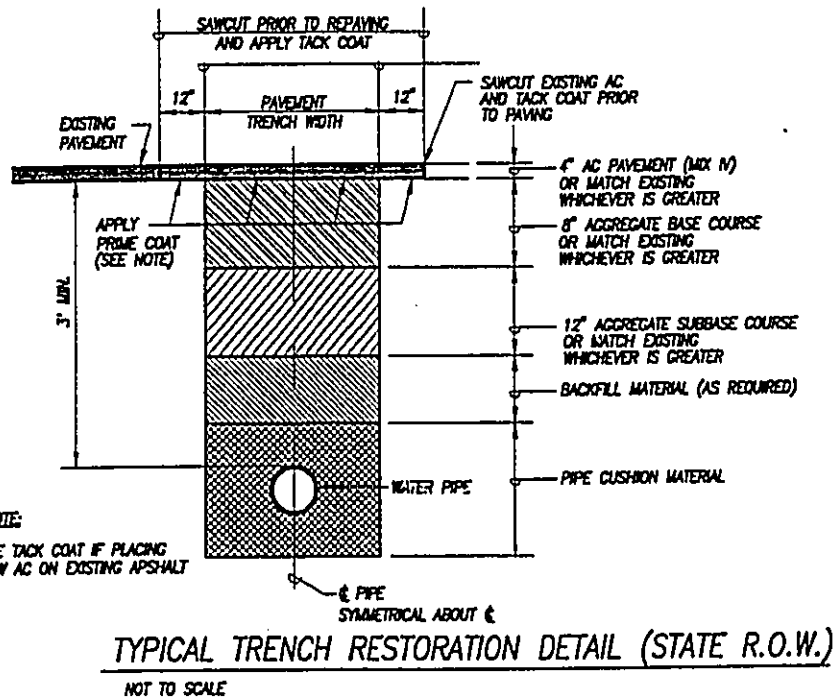
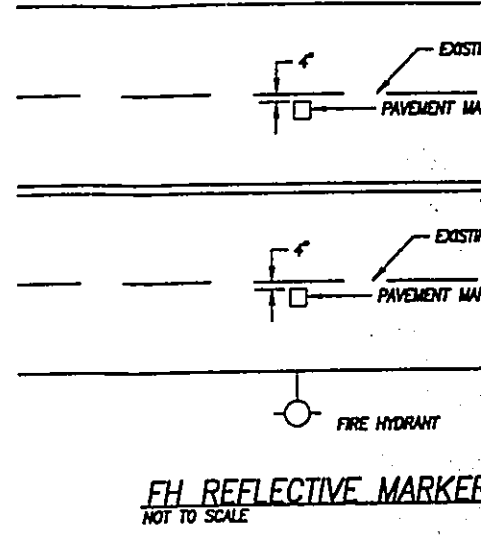
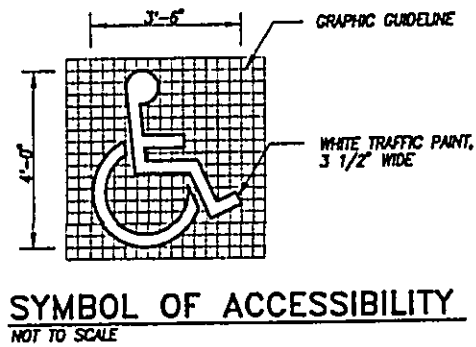
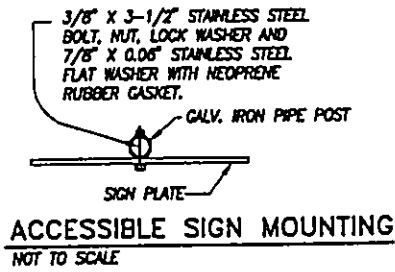
SHEET
C-9

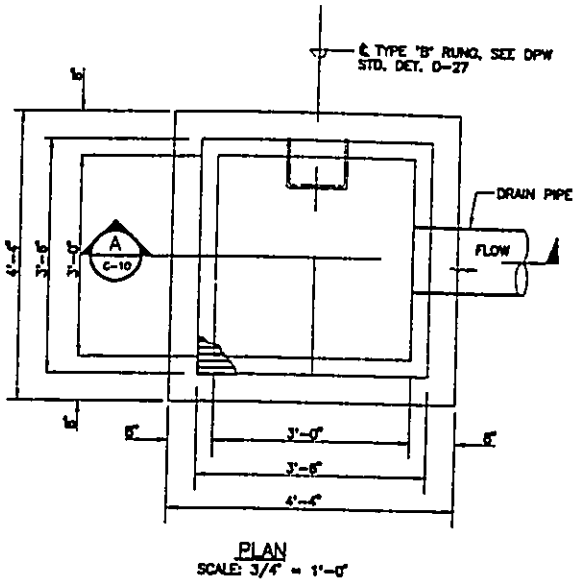
PROJECT NO.
98053

APPROVED:
Michael J. [Signature]
CHIEF, PLANNING & ENGINEERING, BWS
DATE: 5/10/99

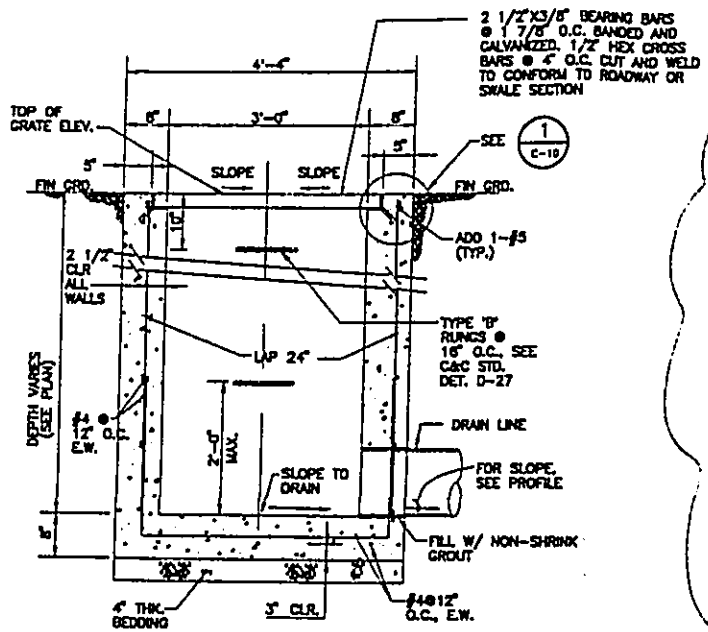


ACCESSIBLE PARKING SIGN AND POST
NOT TO SCALE

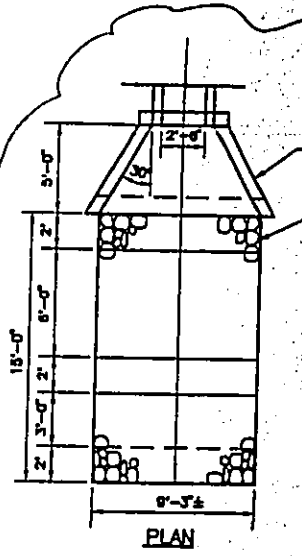




PLAN
SCALE: 3/4" = 1'-0"

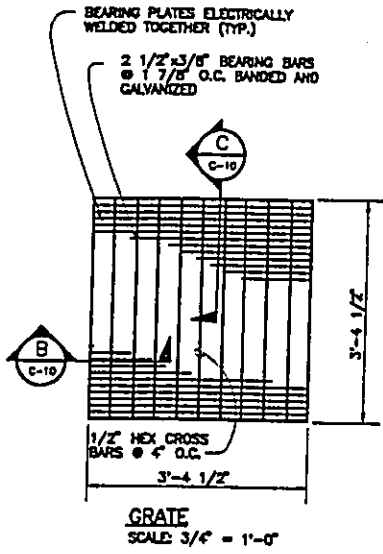


A SECTION
SCALE: 3/4" = 1'-0"

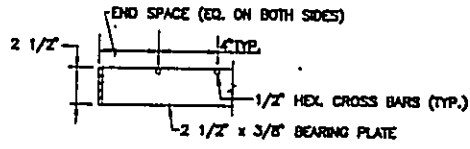


PLAN

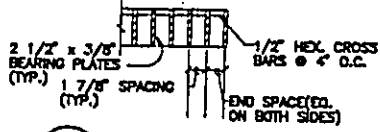
DUMPER
SCALE 1" = 1'-0"



GRATE
SCALE: 3/4" = 1'-0"



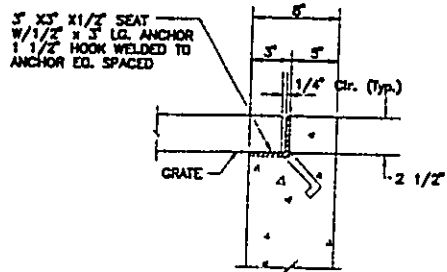
B SECTION
SCALE: NOT TO SCALE



C SECTION
SCALE: NOT TO SCALE

NOTES:

1. ALL STEEL SHALL BE STRUCTURAL GRADE.
2. GRATE, FRAME ANGLES AND RUNGS SHALL BE HOT-DIPPED GALVANIZED AFTER FABRICATION.
3. ALL WELDS 5/16"
4. GRATE SHALL BE PLACED SO THAT BARS PARALLEL PRINCIPLE SURFACE FLOW.

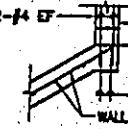


1 DETAIL 'A'
SCALE: NOT TO SCALE

INLET BOX
SCALE: AS SHOWN



PLAN - BOT



APPENDIX III

North Kahe Beach Cable Route Reconnaissance
Kahe Point, Oahu, Hawaii
Sea Engineering, Inc.
September 1998

NORTH KAHE BEACH CABLE ROUTE RECONNAISSANCE

1. INTRODUCTION

A diving reconnaissance of the nearshore waters off north Kahe Beach was conducted on September 8, 1998. The objective was to locate the two most feasible fiber optic cable corridors in the area and to select a third route terminating at the small beach park just north of Kahe Beach. The work was conducted from the shoreline to water depths of approximately 50 feet. Two feasible cable corridors were located, although neither is ideal. The corridors are described in detail later in this report.

The pre-defined search area extended from a point 1,000 feet north of the Kahe Generating Station intake jetties to the small beach park located just north of Kahe Beach. The bottom conditions throughout much of this 4,200 foot long coastal sector were similar. No great obstacles to cable placement were noted, but conversely, no ideal routes were found.

2. SIGNIFICANT BOTTOM FEATURES

There is a large sand deposit located offshore, starting in approximately the 50 foot water depth, and the corridors were selected primarily with the objective of reaching this deposit while crossing a minimum distance of high relief hard bottom material.

Figure 1, taken from a report by AECOS, Inc. shows typical bottom types through the area. This figure was developed from an inspection of aerial photographs, supplemented by limited diving observations. The figure provides a good overall representation of the nearshore bottom conditions, although there are more localized variations than shown. It can be seen from Figure 1 that the main body of the sand deposit is approximately 1,800 feet offshore in the southern two-thirds of the area, and 2,250 feet offshore in the northern third. This is in contrast to the existing cable route south of the Kahe Generating Station, where the inshore boundary of the sand deposit lies only 500 to 600 feet offshore.

Another common feature throughout the area is a narrow band of hard bottom material just seaward of the shoreline. While this band cannot be completely avoided, it varies in both width and in vertical relief. There are a few areas where small sand channels indent this hard band, and these areas were selected as possible starting points for the cable corridors.

3. SURVEY APPROACH

Preliminary work included evaluation of an vertical color aerial photograph and the AECOS figure. Possible corridors were selected from the aerial photo, checked against the AECOS figure and then the latitude and longitude of the corridors determined.

Given a potential starting point, the goal was to select a route which crossed the maximum

amount of sand bottom between the inshore hard band and the offshore sand deposit. In the field, the area was first scouted by an observer on the mast of the boat (20 feet above sea level). Some areas were eliminated immediately, while others were buoyed off for closer inspection. The water visibility was approximately 50 feet on the morning of the survey, allowing easy discrimination between hard bottom and sandy areas. This proved to be an effective way to cover a large area quickly. Potential routes were then scouted in more detail by towing a swimmer behind the boat, with final inspection conducted by SCUBA diving.

4. RESULTS

Two suitable corridors were found, as shown on Figure 1. The recommended route within each corridor is also shown. Route 3, also shown on Figure 1, is the optimum route from the beach. The routes are described below.

Route 1

The recommended shore landing for Route 1 is located 1,500 feet north of the intake for the generating station. Figure 2 is a schematic diagram of Route 1. Zone 6 is the offshore sand deposit shown on Figure 1. This deposit extends inshore to the 40 foot water depth. Zone 5 is a 200 foot wide band of limestone and coral bottom, which has some scattered areas of sand veneer. Vertical relief is on the order of 2 feet. Although the bottom is irregular, there are no steep ledges. Photos 1 and 2 show typical views of this zone. Zone 5 conditions extend along the inshore border of the sand deposit through this entire coastal sector and routes were selected where the width of this zone was a minimum.

Zone 4 is a 350 foot wide area of flat limestone bottom mixed with scattered sand pockets. Vertical relief is on the order of 1 to 2 feet. Zone 3, 750 foot wide, consists almost entirely of sandy bottom. Zone 2 is a 200 foot wide band of flat limestone, with low relief.

Zone 1 extends from the 8 foot depth to the shoreline. The bottom is scoured limestone, with surge channels and a few scattered coral heads. This 350 foot wide zone, which cannot be avoided, has the most irregular bottom encountered along the route. Vertical relief is up to 3 to 4 feet. Photos 3, 4 and 5 illustrate typical conditions in this zone. Split pipe armor protector is recommended through Zone 1. The pipe will protect the cable and the added weight of the pipe will ensure that the cable conforms to the irregular bottom.

Route 1 is the southernmost feasible cable route in the search sector. The bottom south of Route 1 has higher relief, less sand area and more coral coverage, and is much less suitable as a landing site. The corridor shown takes advantage of a narrow Zone 1 and the extensive sand coverage in Zone 3. Both these advantages disappear north of the corridor shown.

Route 2

The inshore termination of Route 2 is located approximately 1,800 feet north of Route 1. Route 2 takes advantage of the same type of features as Route 1: a relatively narrow inshore band of irregular bottom, and extensive sand in the middle portions of the route.

Figure 3 is a schematic diagram of the route. The inshore boundary of the sand deposit, Zone 5, is approximately 2,000 feet offshore in 48 feet of water. Zone 4 is a 250 foot wide band of the limestone/coral formation located just inshore of the sand deposit. Photo 6, which shows a bottom very similar to that in photos 1 and 2, is a typical view of this zone. The limestone has a thin veneer of sand in some areas. The vertical relief is approximately 1 foot. Zone 3, which is 700 feet wide, consists of a sand bottom. The sand continues into Zone 2, which has scattered limestone formations interspersed with the sand. Photos 7, 8 and 9 were taken in approximately 20 feet of water and show typical conditions in the middle of Zone 2. The vertical relief of the outcrops increases toward shore, with a maximum relief of approximately 4 feet. The distance between formations is great enough so that, with a little work by divers during the installation, the cable could be placed to avoid most of the high relief formations in this zone. This would require sufficient slack in the cable to adjust the location as required. Zone 1, approximately 200 feet wide, is the typical inshore band of irregular limestone, with some scattered large basalt boulders present. Photos 10, 11 and 12 show typical conditions in this zone. Split pipe protection will probably be required at least through this zone.

The route corridor shown defines the approximate boundaries of the zonation described for Route 2. The bottom conditions are more irregular, with less sand, both north and south of this corridor. It would be possible to bring the cable ashore another few hundred feet to the north of the point shown and, by orienting the cable correctly, take advantage of the conditions described for Zones 2 and 3. However, if this route were chosen Zone 1 would be wider and more irregular. The route selected takes advantage of the narrowest sector of Zone 1 in the immediate area.

Route 3

Route 3 is the optimum route off the small beach at the north end of the search sector, but it is not nearly as suitable as the two routes described above. Bottom conditions limit the options for a cable landing at this beach. The bottom north of the inshore portion of Route 3 consists of a shallow reef with a relatively high vertical relief, therefore orienting the route more to the north does not appear to be feasible.

Figure 4 is a schematic diagram of Route 3. The offshore sand deposit gives way to the band of limestone and coral (Zone 4) in approximately 50 feet of water. Along this route, this band is approximately 750 feet wide, much wider than along the other routes. Typical conditions in this zone are shown in Photo 13. Vertical relief is approximately 2 feet. Zone 3, approximately 900 feet wide, is sandy bottom. Zone 2, 400 feet wide, extends from the 12 foot water depth to approximately the 4 foot water depth, and consists primarily of hard limestone bottom. The bottom in this zone is irregular, with vertical relief up to 4 feet.

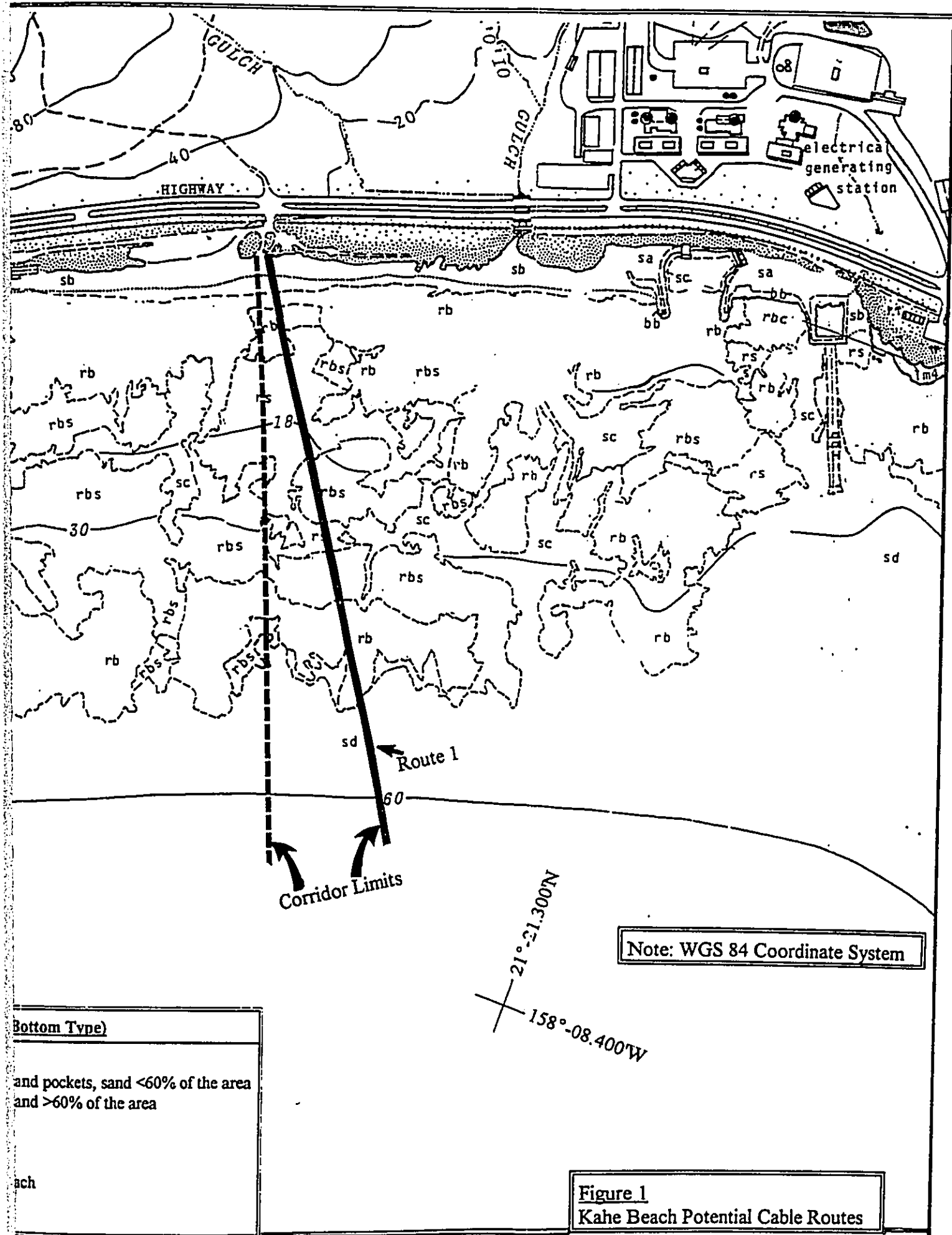
Photos 14, 15 and 16 were taken while swimming shoreward from the outer boundary of Zone 2, and show typical conditions within the zone. Zone 1 is a band of basalt boulders which extends from the 4 foot water depth to the backshore of the beach. Sand was completely scoured from this beach during either Hurricane Iwa or Iniki, and the beach now consists entirely of basalt boulders. Photo 17 shows a typical view of the bottom in this zone.

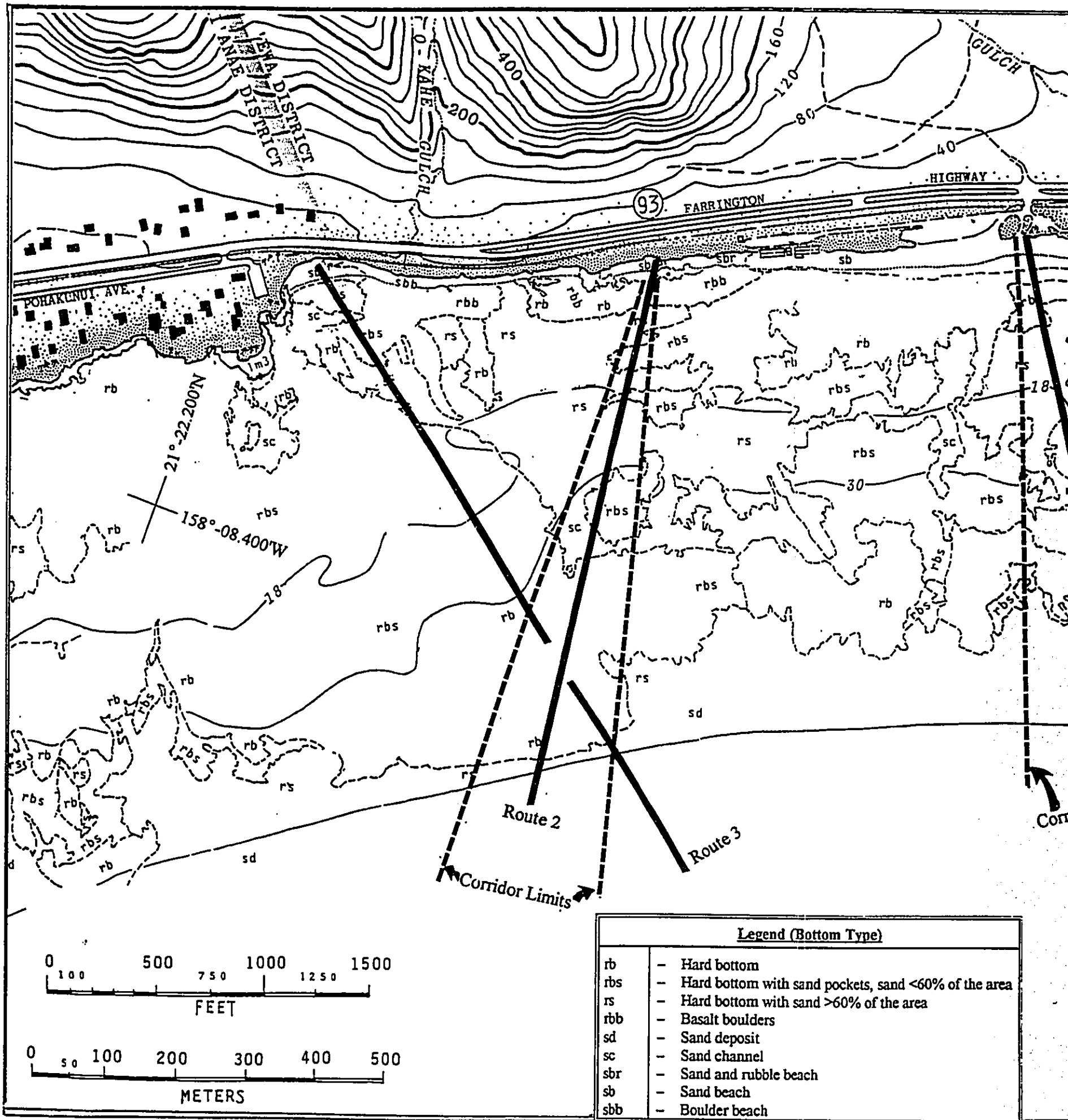
Although this route is not ideal, the following steps can be taken to make a cable installation feasible:

1. Install split pipe protection across the boulder beach and at least for the 150 to 200 foot width of Zone 1, the boulder bottom.
2. In Zone 2, the limestone reef bottom, either pin the cable to the bottom using cable clamps and bolts epoxied into the bottom, or continue the split pipe protection through the 400 foot wide zone.

5. REFERENCES

AECOS, Inc. 1981. Oahu Coastal Zone Atlas. Prepared for the U.S. Army Corps of Engineers, Pacific Ocean Division.





Legend (Bottom Type)

| | |
|-----|--|
| rb | - Hard bottom |
| rbs | - Hard bottom with sand pockets, sand <60% of the area |
| rs | - Hard bottom with sand >60% of the area |
| rbb | - Basalt boulders |
| sd | - Sand deposit |
| sc | - Sand channel |
| sbr | - Sand and rubble beach |
| sb | - Sand beach |
| sbb | - Boulder beach |

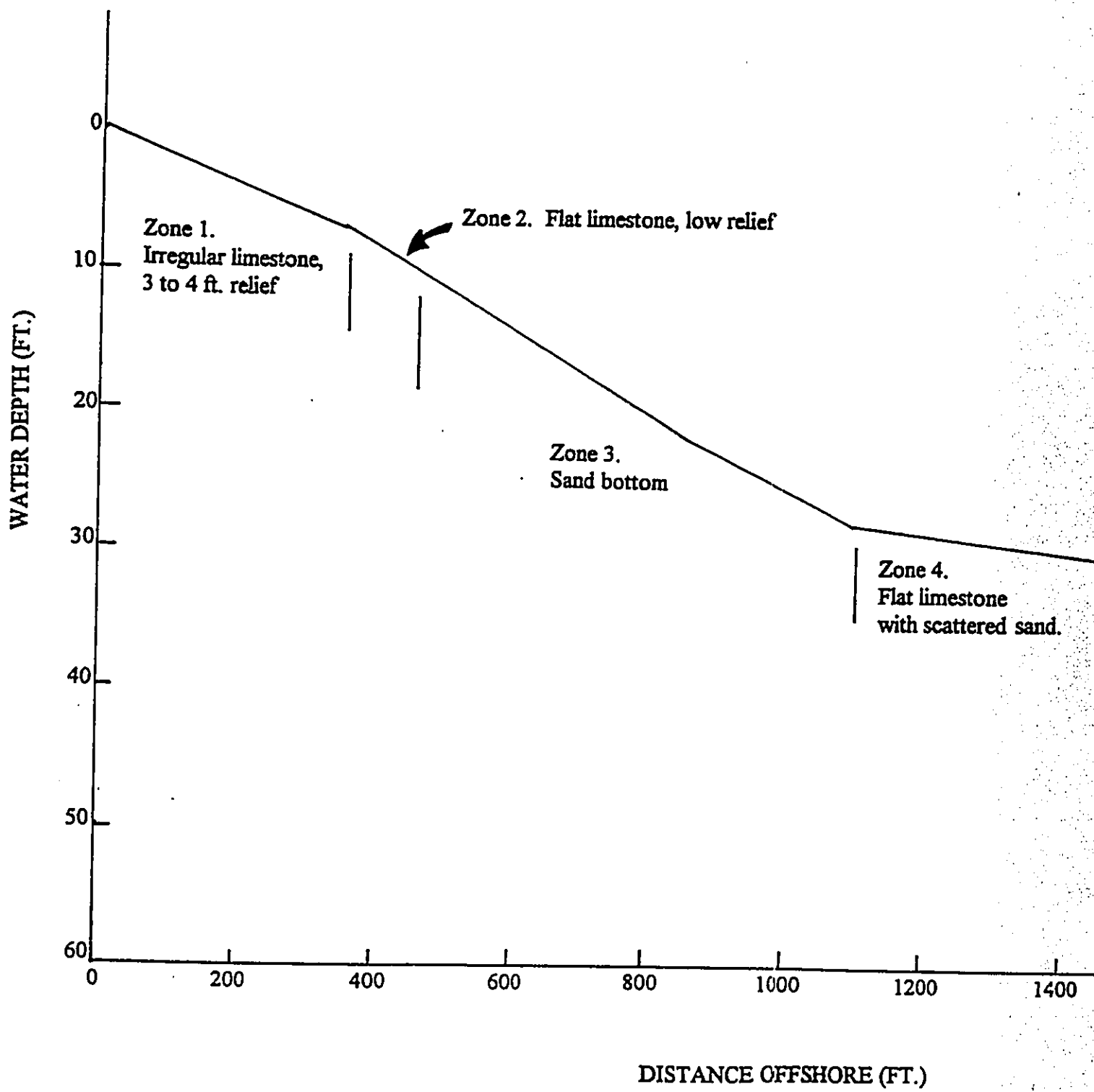
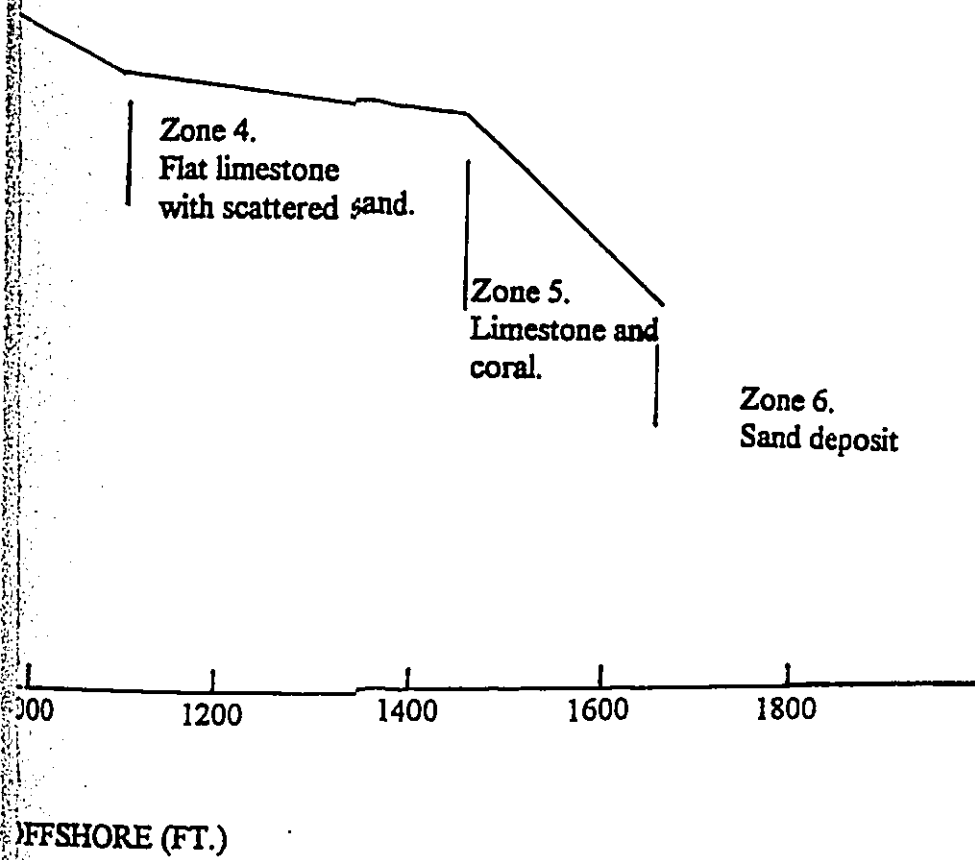


FIGURE 2
Route 1



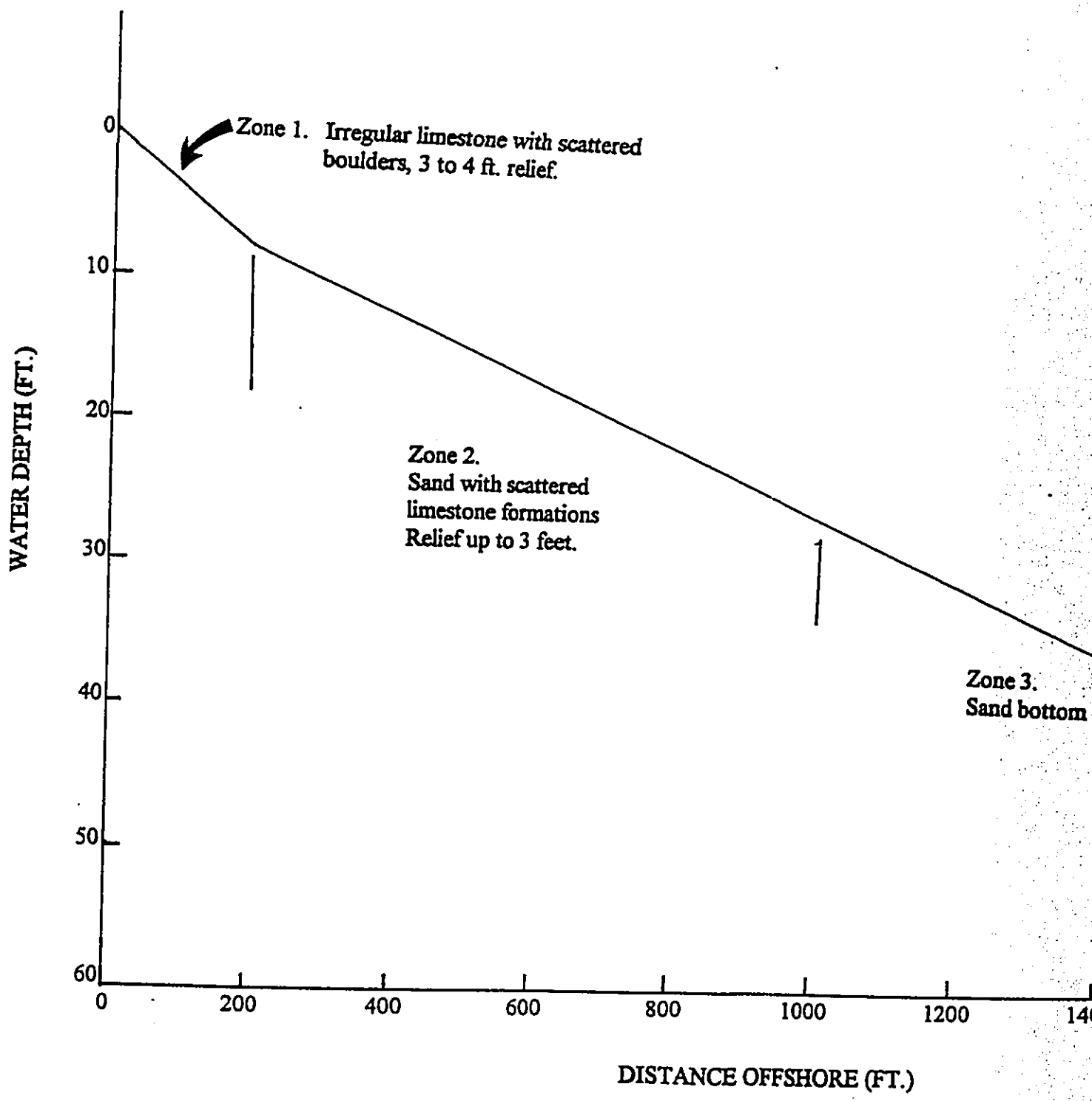
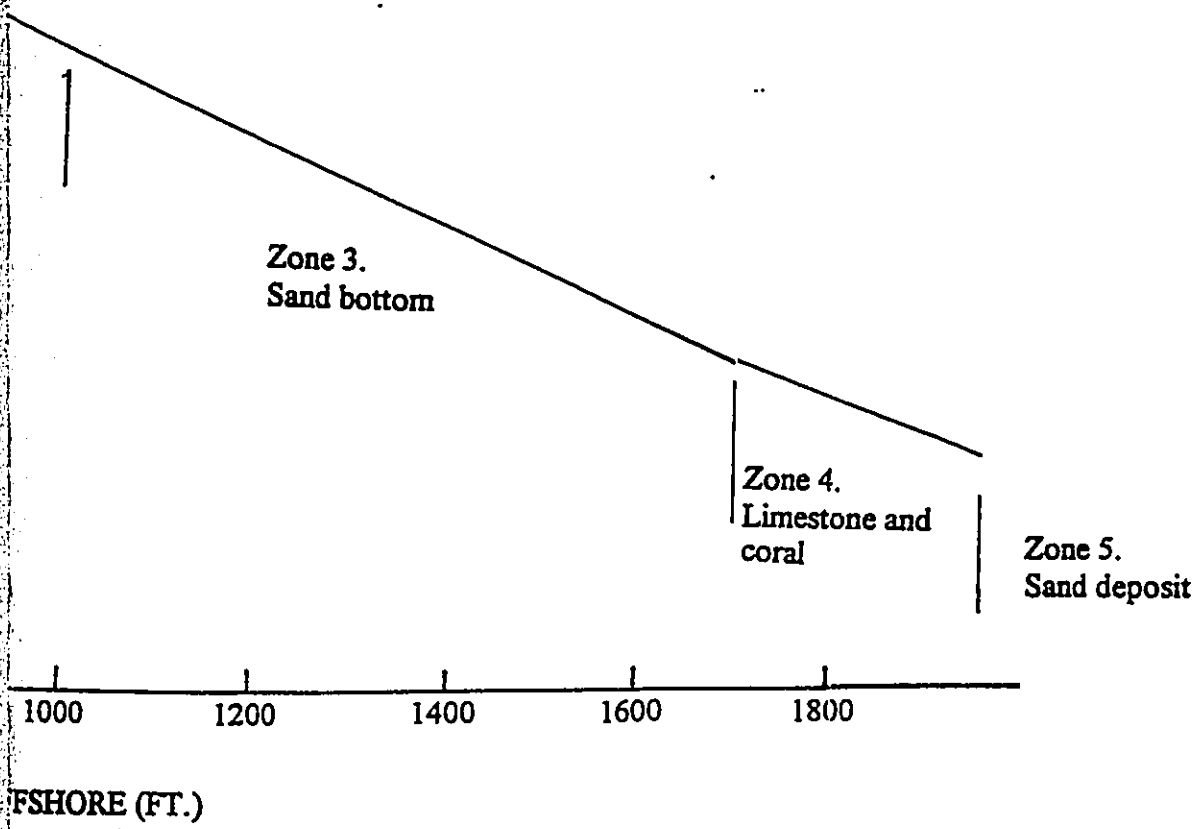


FIGURE 3

Route 2



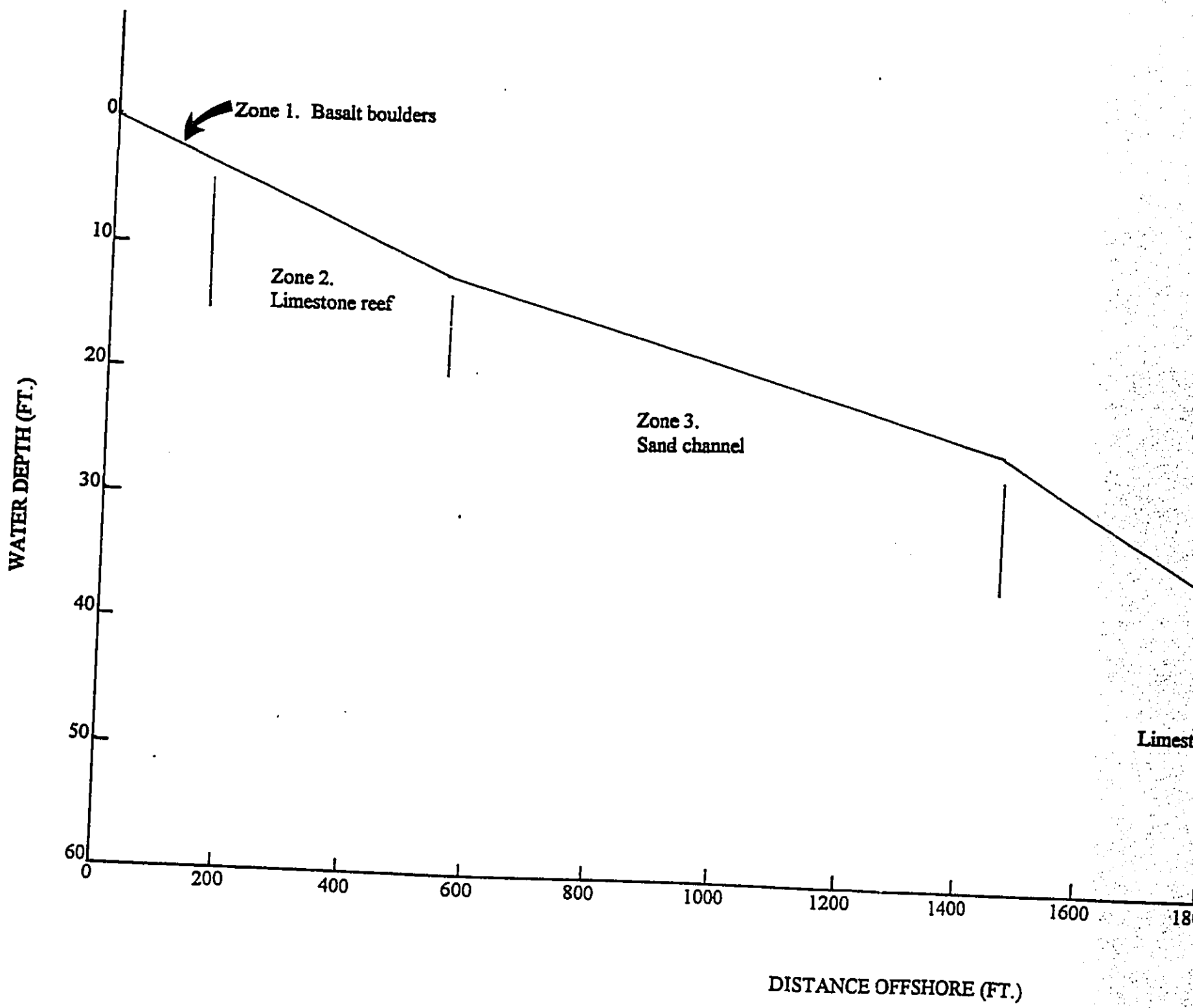


FIGURE 4
Route 3

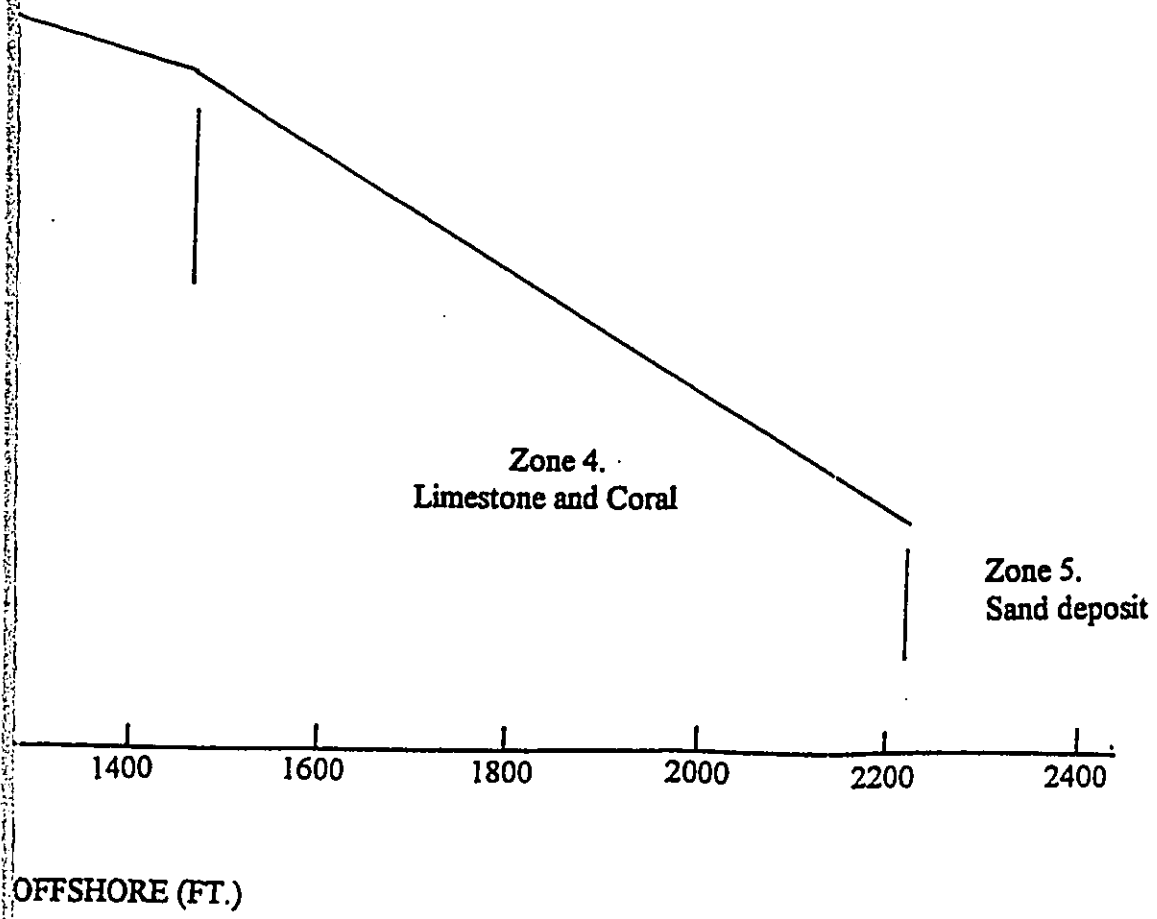


PHOTO LOG



Photo 1. Route 1, Zone 5: Coral/limestone bottom with scattered areas of thin sand veneer.

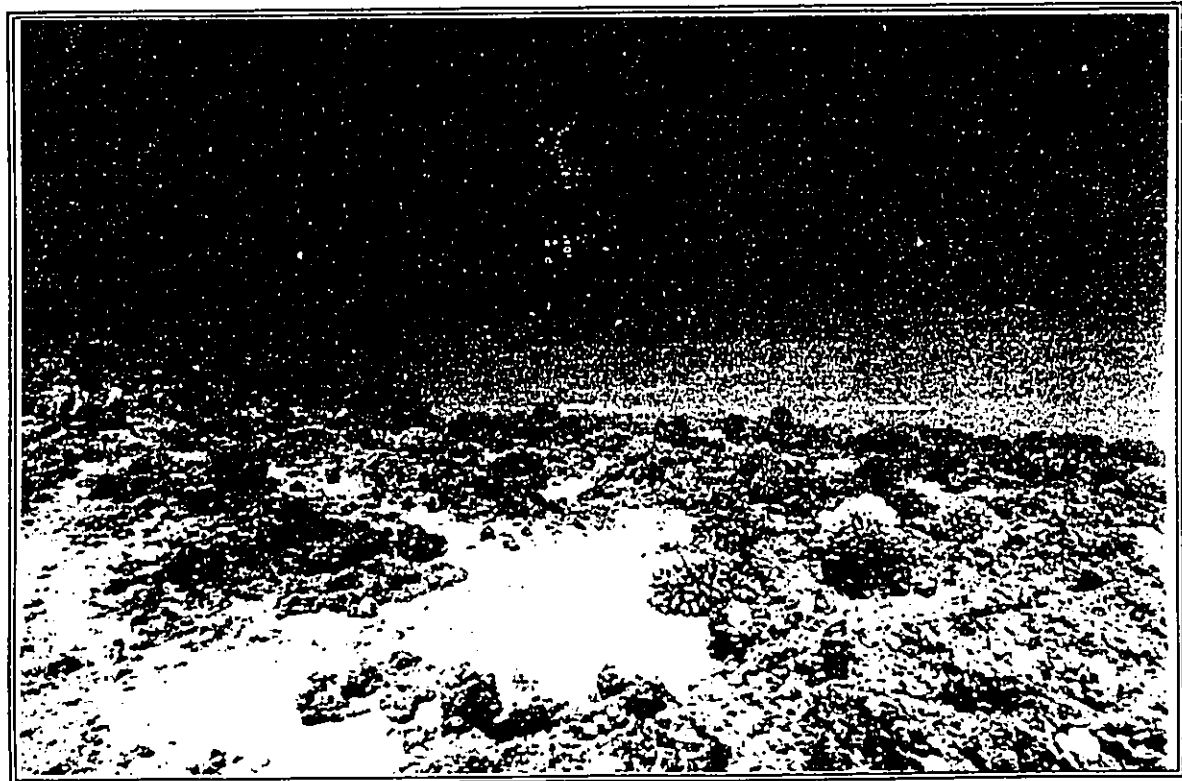


Photo 2. Route 1, same area as Photo 1.

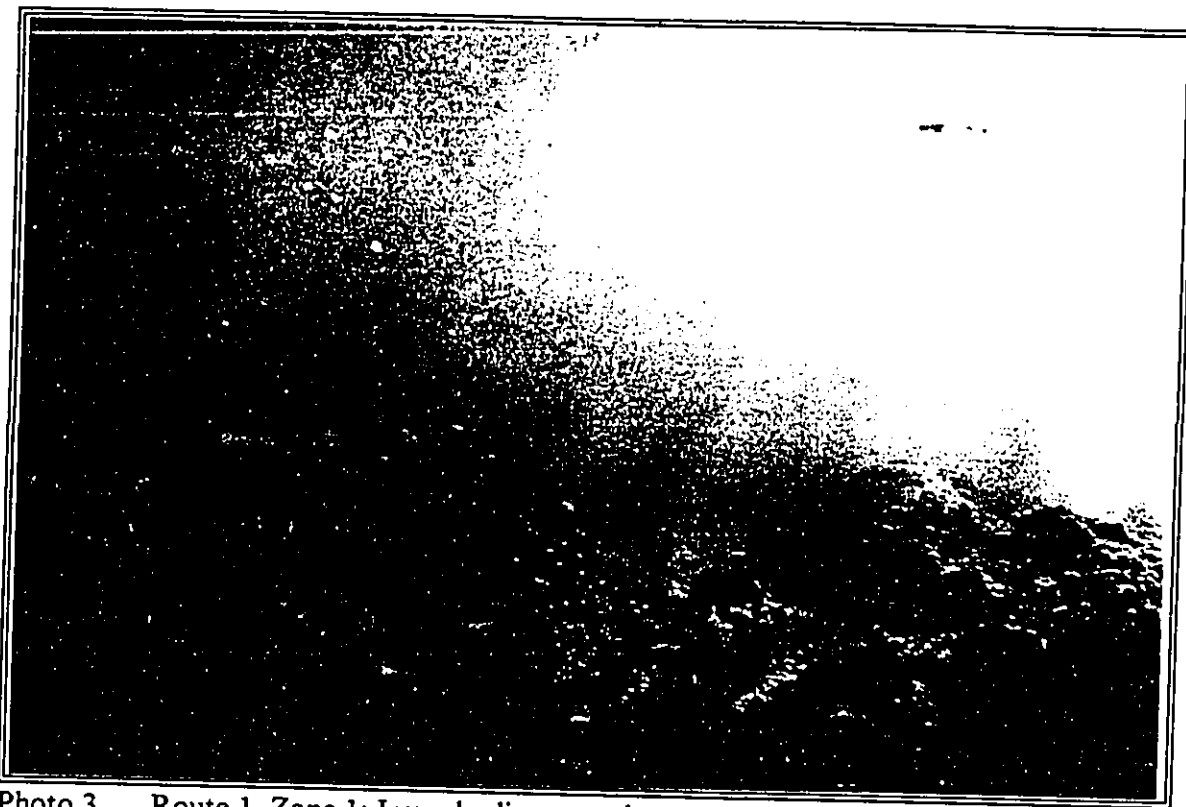


Photo 3. Route 1, Zone 1: Irregular limestone bottom.



Photo 4. Route 1, same area as Photo 3.



Photo 5. Route 1, same area as Photo 4.

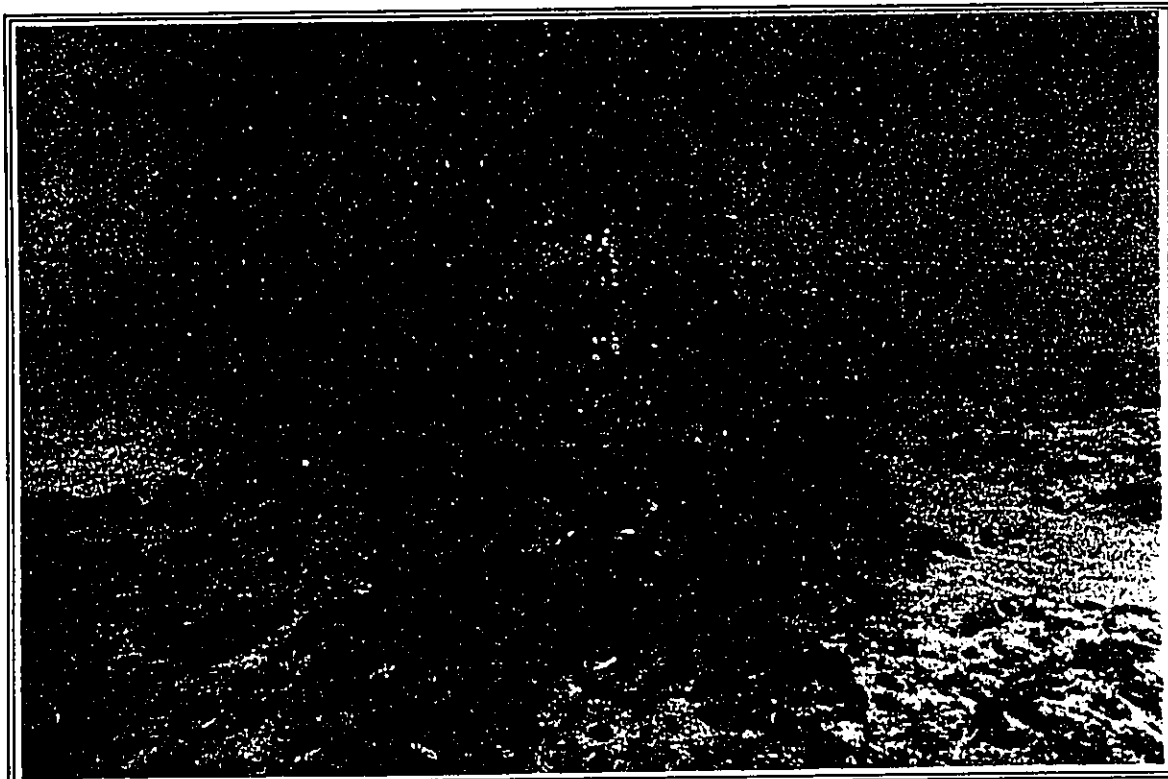


Photo 6. Route 2, Zone 4: Coral/limestone bottom with scattered areas of thin sand veneer.



Photo 7. Route 2, Zone 2: Scattered limestone formations.



Photo 8. Route 2, same area as Photo 7.



Photo 9. Route 2, same area as Photo 7.



Photo 10. Route 2, Zone 1: Irregular limestone bottom.



Photo 11. Route 2, same area as Photo 10.



Photo 12. Route 2, Zone 1: Scattered basalt boulders.

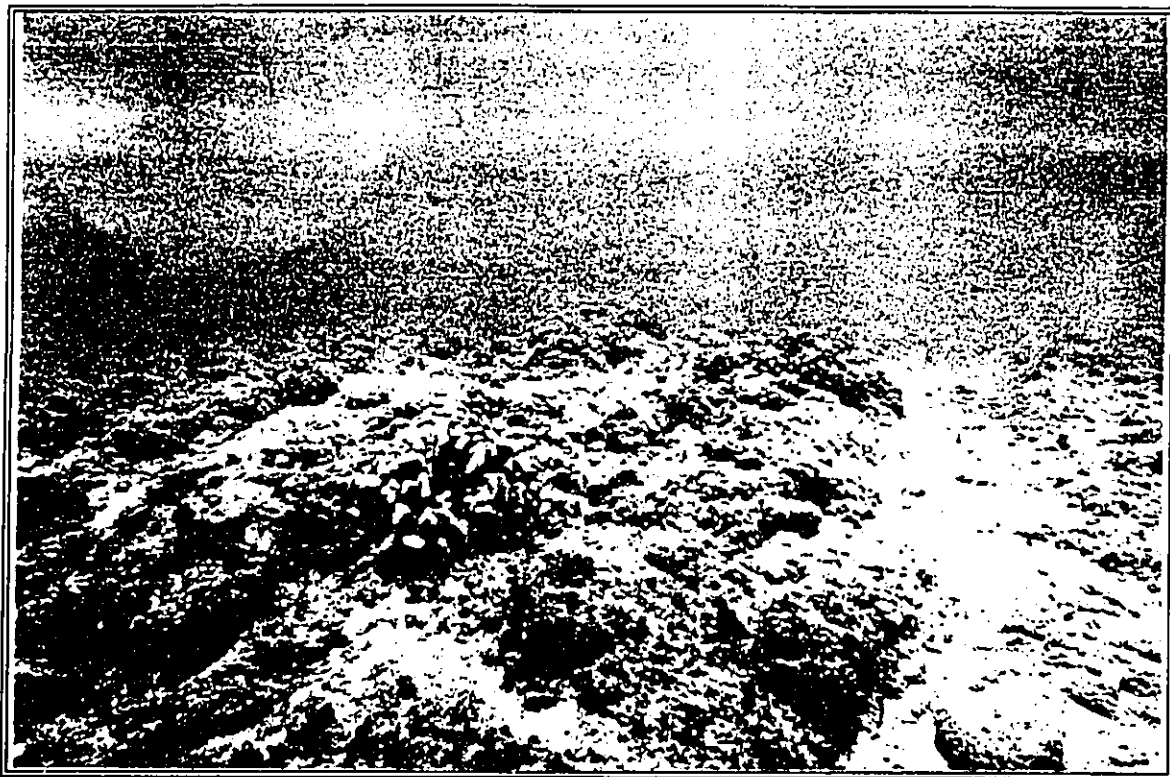


Photo 13. Route 3, Zone 4: Typical reef conditions.



Photo 14. Route 3, Zone 2: Conditions near the outer boundary of Zone 2.

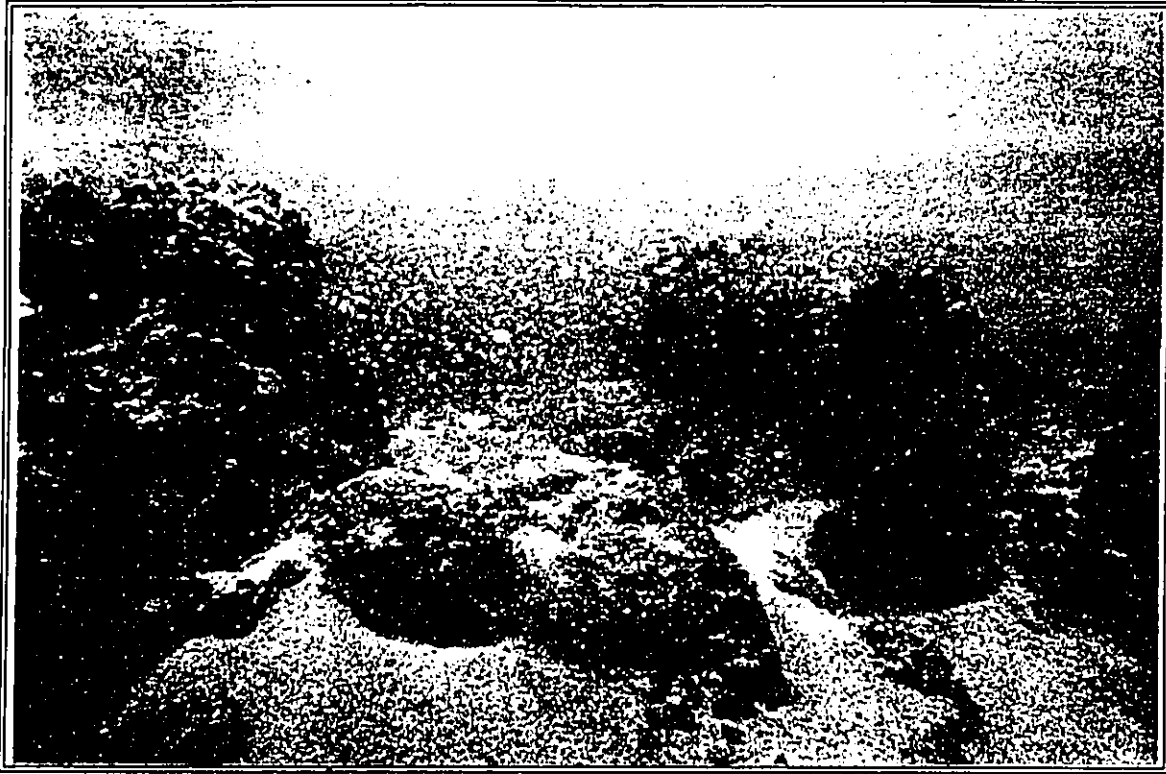


Photo 15. Route 3, Zone 2: Typical conditions.



Photo 16. Route 3, Zone 2: Typical conditions.



Photo 17. Route 3, Zone 1: Basalt boulder bottom.

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APPENDIX IV

North Kahe Beach Cable Route Survey
Kahe Point, Oahu, Hawaii
Sea Engineering, Inc.
September 1999

**NORTH KAHE BEACH
SOUTHERN CROSS
CABLE ROUTE SURVEY**

Prepared for:
R M Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

Submitted by:
Sea Engineering, Inc
Makai Research Pier
41-202 Kalia Road Highway, Suite 8
Waipahu, Hawaii 96795

September 16, 1999

North Kahe Beach Southern Cross Cable Route Reconnaissance

1 Introduction

On June 10, 1999, a bathymetric and dive reconnaissance survey was conducted along the nearshore waters at North Kahe Beach. The survey objective was to determine bottom type and water depth along four possible fiber optic cable corridors extending into the beach.

The survey area extended from the shoreline to the inshore edge of a large sand deposit located between Stations 22+00 to 25+00 at a water depth of 50 to 60 feet. The cable routes were labeled as Segments F, G1, and I. A spare route is located between routes F and G1. The bathymetry survey was conducted using differential GPS positioning and a digital fathometer. Bathymetry data was collected about every 7 feet along the survey line, from the sand deposit to approximately Station 3+00. Inshore of this, the water depths were too shallow for the survey vessel.

Bottom types along each route were mapped by towing a diver alongside the survey vessel, and locating boundaries with differential GPS. Representative photographs were also taken of each of the various bottom types.

2 Seafloor Classification

After initial inspection of the survey site, a system for bottom classification was determined. The seafloor along each route can be classified into five distinct categories. The following list describes each of these classifications.

S - Sand. The seaward limit of the survey area is defined by a large sand deposit. Subbottom surveys completed previously indicate that the sand is relatively thin (1 to 2m) throughout much of this deposit. The inshore margin of the sand deposit ranges in location from Station 25+40 along route F to Station 21+87 along route I. Figure 1 illustrates the sand deposit, while Figure 2 shows the transition from the sand to low relief coral and limestone. There is also a small sand deposit about 100 feet wide located near the shoreline along routes G1 and I. Sand in this deposit is less than 1 foot thick.

SI RC - Sand mixed with low relief coral. This bottom type consists of low relief coral and limestone with a thin veneer of sand covering depressions and grooves in the hard bottom. The sand cover is generally greater than 50%. The relief in the coral is typically 1 to 3 feet. The coral occasionally forms small ridges with sand filled grooves in between. Figure 3 presents representative photographs of this bottom type.

L.RCS - Low relief coral mixed with sand. This bottom type consists of low relief coral and limestone with scattered sand. Sand coverage is less than 50%, and typically is only 10 to 30%. Relief is typically 1 to 3 feet. This is the predominant bottom type within the survey area. Several small coral shelves or ledges with vertical relief of up to 3 feet were mapped within this bottom type. These small ledges are shown in Figure 8. The coral occasionally forms small ridges with sand filled grooves in-between. Figure 4 shows representative photographs of this bottom type. Figure 4b shows an example of the small coral ridges and sand filled grooves. Widely scattered large coral heads (up to 3 feet in diameter) were also found in some areas within this bottom type (Figure 9).

LRC - Low relief coral, no sand. This bottom type is similar to that described above, except that there is no sand. Typical relief is 1 to 3 feet, and there are widely scattered large coral heads in some locations. Figure 5 presents examples of the low relief coral bottom with no sand.

RCK - Basalt boulders and cobbles. This bottom type is located next to the shoreline, and is the nearshore extension of the boulder and cobble beach. The cobbles and boulders are rounded and range in size from 0.5 to 2 feet in diameter. Figures 6 and 7 present photographs of the boulder and cobble seafloor and beach.

3. Survey Results

The results of the survey are presented in the photographs in Figures 1 to 9 and the bottom profiles illustrated in Figures 10 to 13. The different seafloor types described above are mapped on the bottom profiles. The main seafloor features along the proposed cable routes include the following:

- Hard bottom extends from the shoreline to the large sand deposit beginning at the 50 to 60 foot water depth. The sand deposit begins at about Station 22+00 along routes I and G1, and about Station 25+00 along routes F and Spate. Inshore of the sand deposit, the bottom is predominantly low relief coral and limestone with scattered thin pockets of sand (L.RCS), in some areas, the sand is not present (LRC), in other areas, a thin veneer of sand covers more than 50% of the bottom (SLRC). Typical relief is 1 to 3 feet. There are some small ledges and narrow bands with widely scattered large coral heads (3 feet in diameter). A small sand deposit about 100 feet wide is located at about the 15 foot water depth along routes I (Sta. 9+00) and G1 (Sta. 7+00). Sand is less than 1 foot thick in this deposit.
- Rounded basalt boulders and cobbles (0.5 to 2 feet in diameter) (RCK) cover the seafloor from the beach to Station 3+00 along route F and Station 5+00 along route I (Figures 6 and 7).

- The bathymetry is flat to very gently sloping to about the 20 foot water depth, located at approximately Station 17+00. Seaward of this, the seafloor slopes moderately (1V 20H) to the sand deposit. Along route F, the reef bottom slopes steeply (1V 5H) to the sand deposit.
- A large sand deposit is located seaward of the 50 to 60 foot water depth. The inshore margin of the sand deposit ranges in location from Station 25+80 along route F to Station 21+87 along route I. Subbottom surveys completed previously indicate that the sand is relatively thin (1 to 2m) throughout much of this deposit.

The locations of bottom features along each route is presented below.

Segment b (Figure 10)

- 25+80 - Inshore edge of sand deposit, beginning of low relief coral (LRC) (Depth 55')
- 23+82 - Small shelf was observed (Depth 37')
- 23+45 - Transition from low relief coral to low relief coral with sand (LRCS) (Depth 14')
- 19+23 - Small shelf was observed (Depth 24')
- 15+32 - Transition to sand mixed with low relief coral sand (SLRC) (Depth 18')
- 12+54 - Bottom returns to mostly coral with scattered sand (LRCS) (Depth 14')
- 06+34 - Low relief coral (LRC) (Depth 10')
- 04+26 - Low relief coral with sand (LRCS) (Depth 10')
- 03+12 - Basalt boulders and cobbles (RCK) (Depth 7')

Segment Spare (Figure 11)

- 25+00 - Inshore edge of sand deposit, beginning of sand mixed with low relief coral (SLRC) (Depth 60')
- 22+08 - Low relief coral with sand (LRCS) (Depth 49')
- 20+02 - Small shelf was observed (Depth 41')
- 14+75 - Sand mixed with low relief coral (LRC) (Depth 19')
- 12+45 - Low relief coral with scattered sand (LRCS) (Depth 15')
- 10+50 - Low relief coral (LRC) (Depth 13')
- 03+00 - Basalt boulders and cobbles (RCK) (Depth 7')

Segment c (Figure 12)

- 22+08 - Inshore edge of sand deposit, beginning of low relief coral with sand (LRCS) (Depth 49')
- 21+10 - Small shelf was observed (Depth 41')
- 09+54 - Low relief coral (LRC) (Depth 12')
- 07+58 - Small sand deposit (Depth 15')
- 06+81 - Low relief coral with scattered sand (LRCS) (Depth 14')
- 04+08 - Basalt boulders and cobbles (RCK) (Depth 7')

Segment I (Figure 13)

- 21:57 - Inshore edge of sand deposit, beginning of low relief coral with sand (LRC'S) (Depth 49')
- 19:58 - Small shelf was observed (Depth 37')
- 12:30 - Low relief coral (LRC) (Depth 16')
- 09:45 - Small sand deposit (Depth 17')
- 08:50 - Sand mixed with low relief coral (SLRC) (Depth 16')
- 07:01 - Low relief coral with sand (Depth 13')
- 04:18 - Basalt boulders and cobbles (RCK) (Depth 8')

Figure 1. (a) and (b) are the same as in Figure 1.

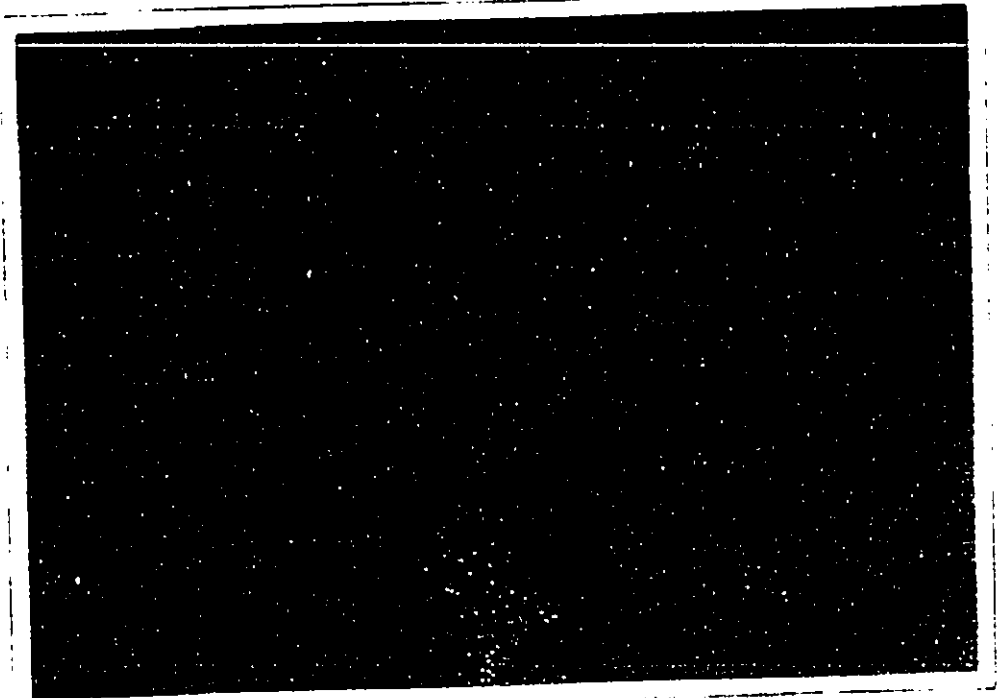


Figure 1(a)

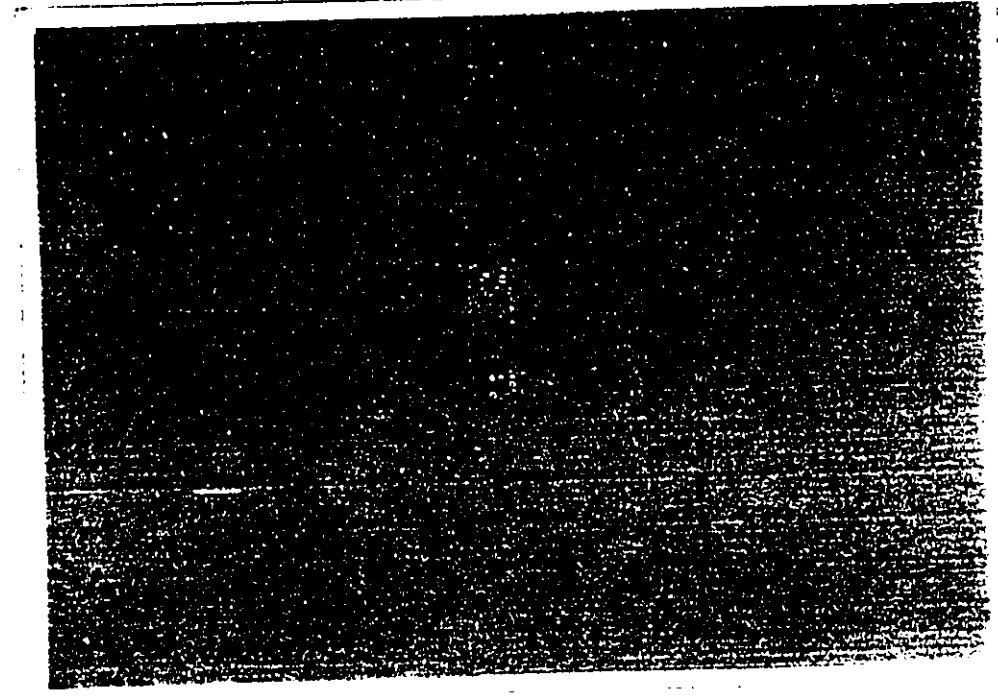


Figure 1(b)

Sample 1000 meters from site S-15, 1000 meters from site S-15



Photo A



PLATE I. (continued) Plate I. (continued)

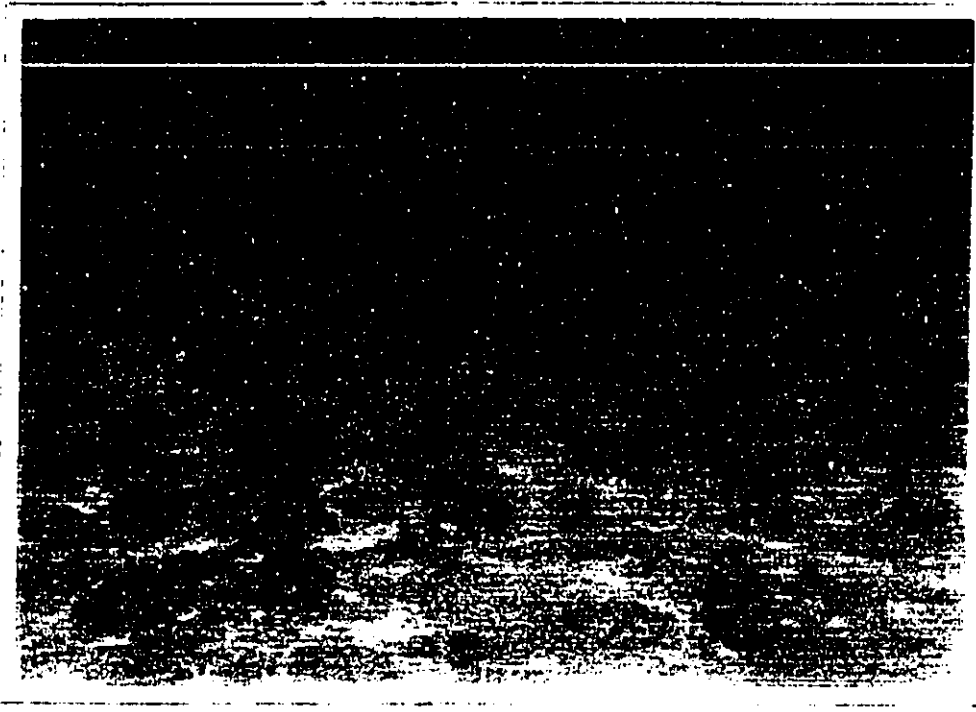


PLATE I. A



Figure 4. Example of low relief corals with scattered sand (RCS)

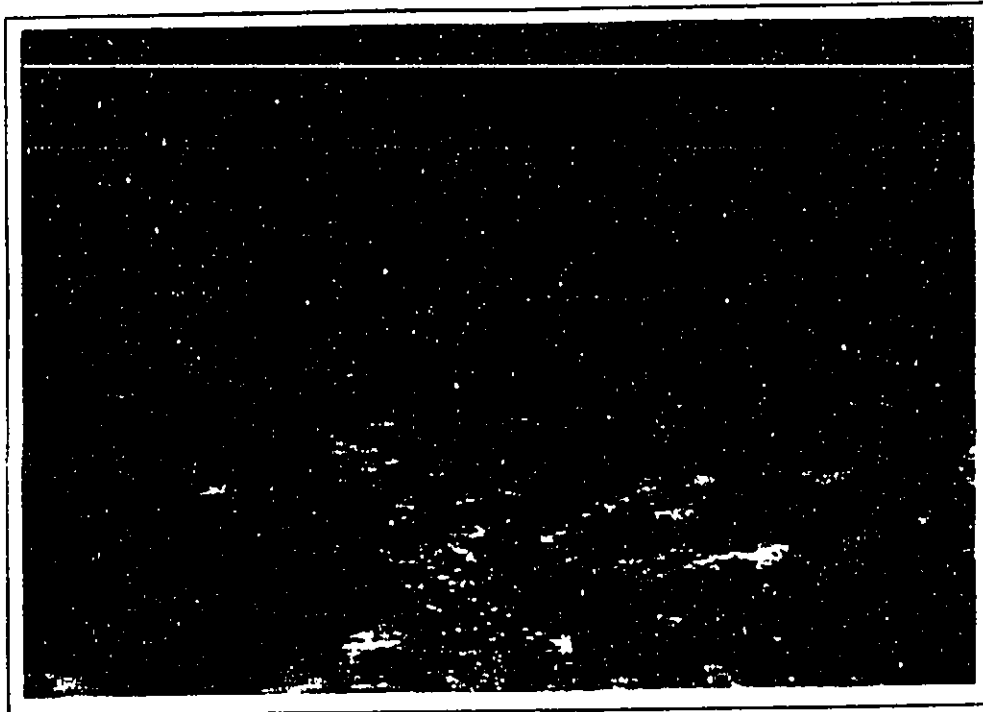


Photo A



Photo B

Figure 8 Example of low relief coral (LRC)

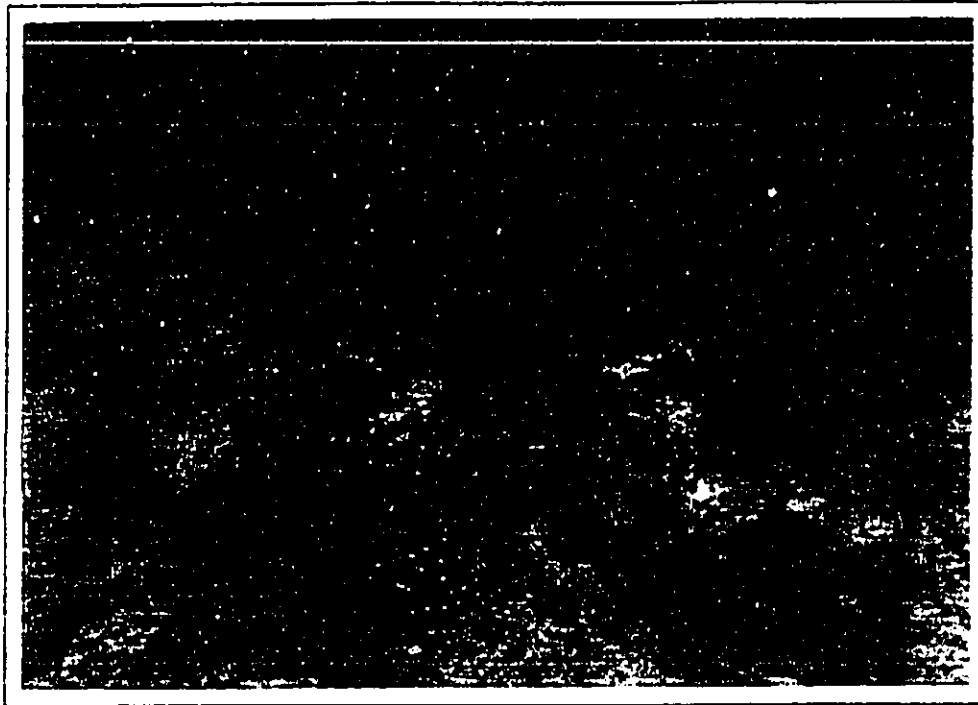


Photo A

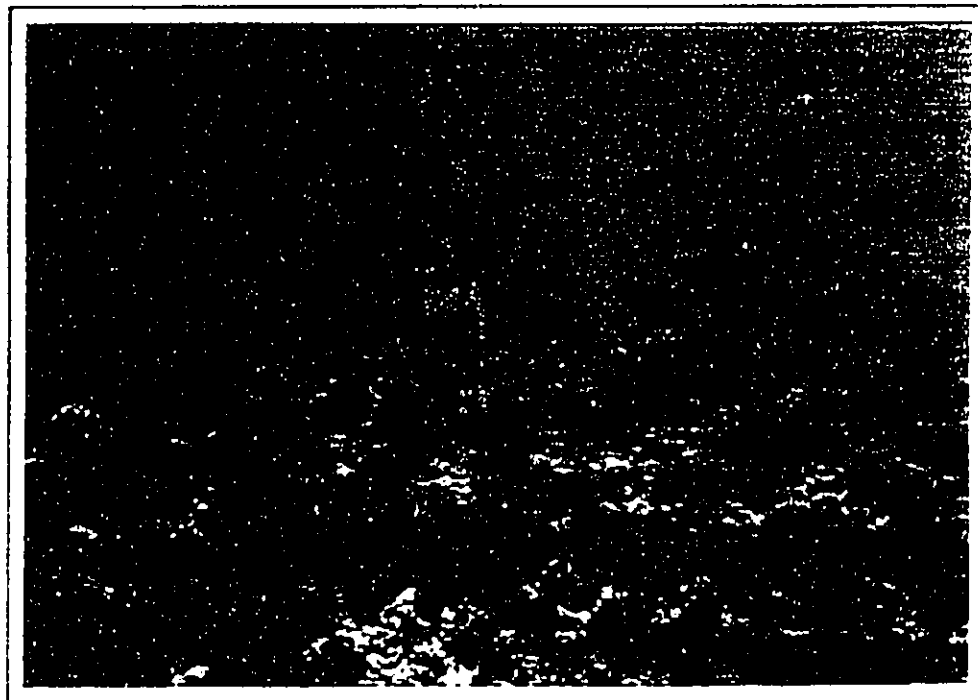


Photo B

Figure 6. Example of basalt boulders and cobbles (RCK)

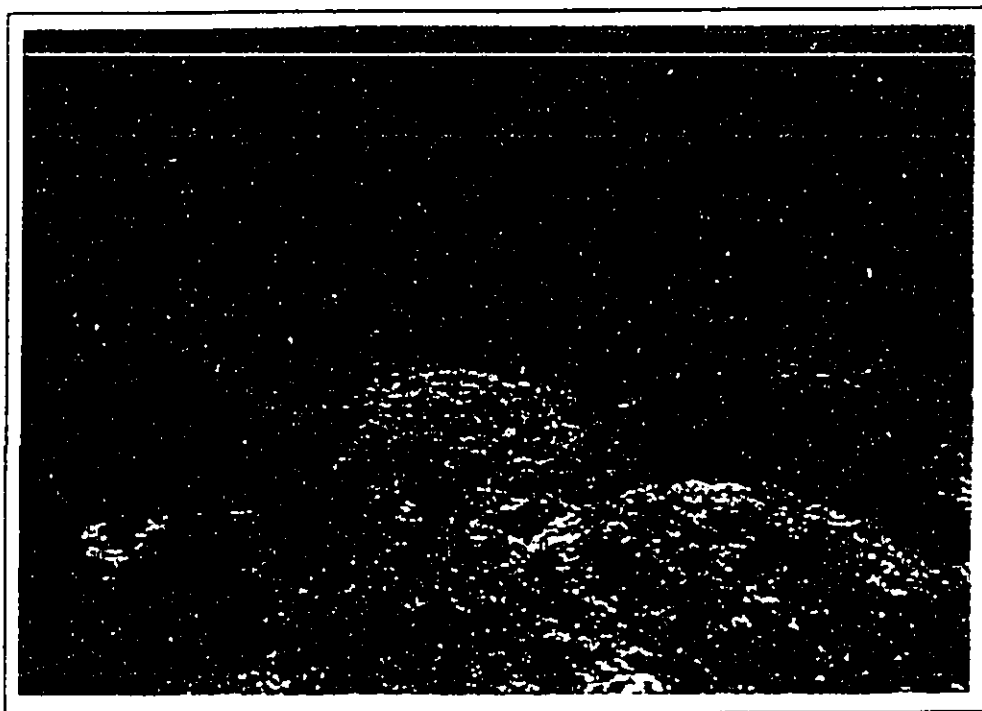


Photo A



Photo B

Figure 7 Example of shoreline.

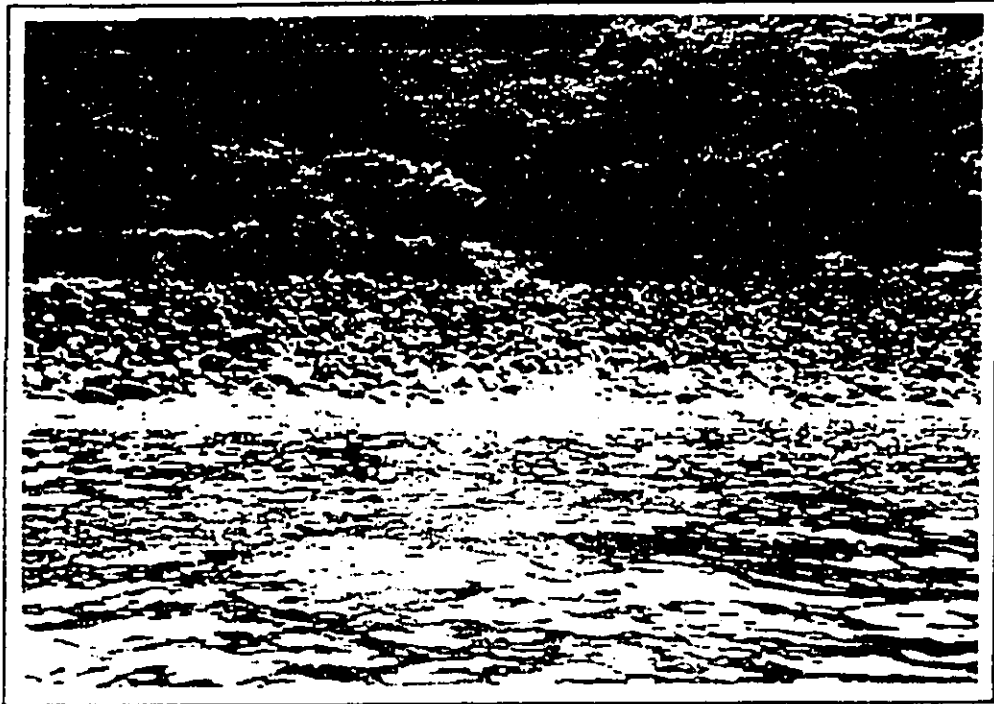


Photo A

Figure 8 Example of low shell

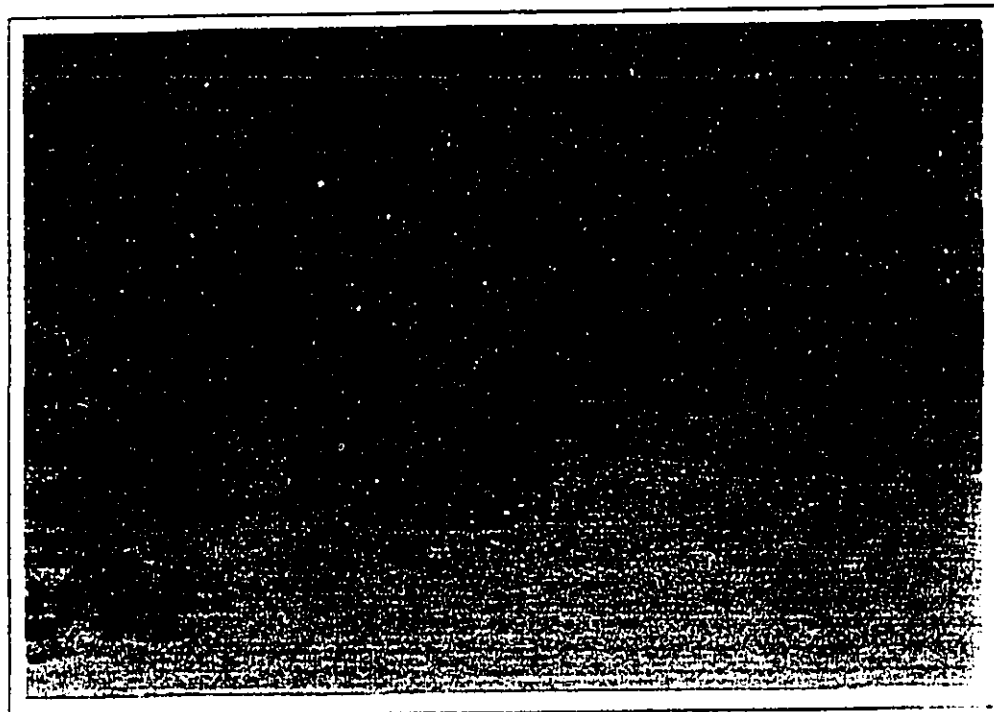


Photo A

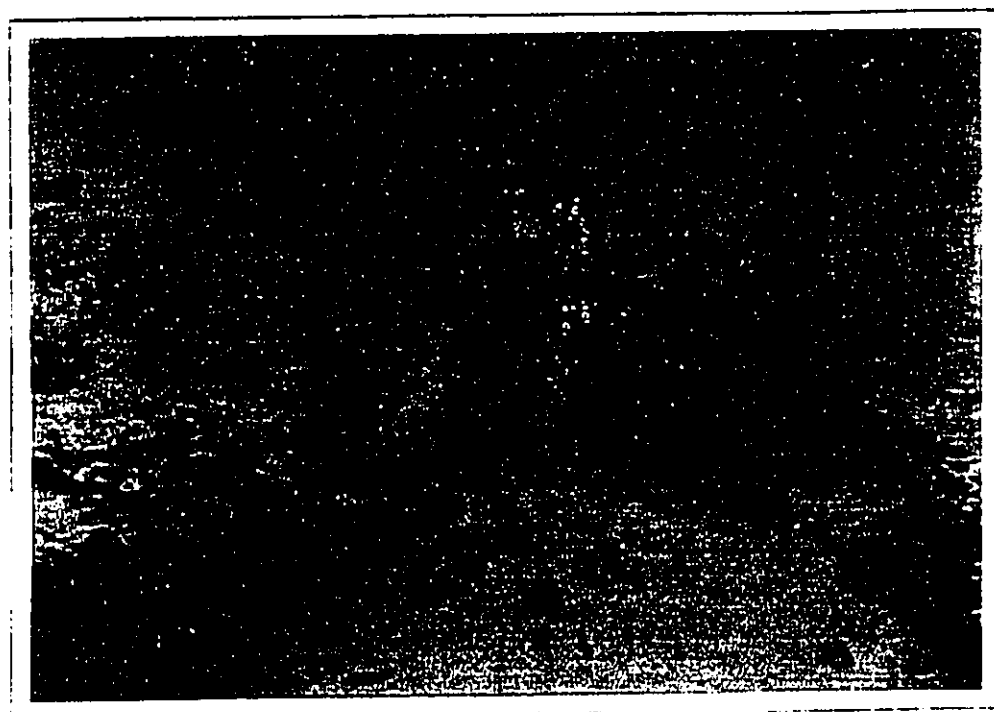


Photo B

Figure 9 Example of scattered large coral heads



Photo A

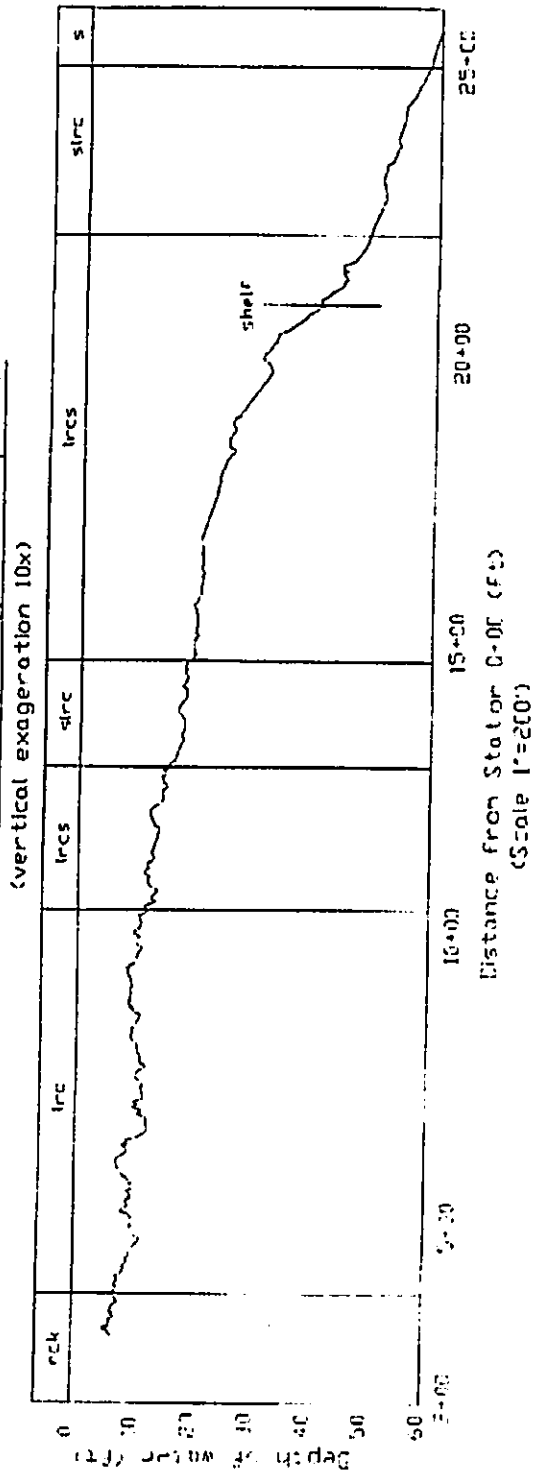


Photo B

| | |
|------|----------------------------|
| S | Sand Deposit |
| SLRC | Sand with Low Relief Coral |
| LRC | Low Relief Coral with Sand |
| LRC | Low Relief Coral |
| RCK | Boulders and Cobbles |

Figure #11

Depth Profile of Segment Spore



| | |
|------|----------------------------|
| S | Sand Deposit |
| SLR | Sand with Low Relief Coral |
| LRCS | Low Relief Coral with Sand |
| LC | Low Relief Coral |
| ROC | Boulders and Cobbles |

Figure #12

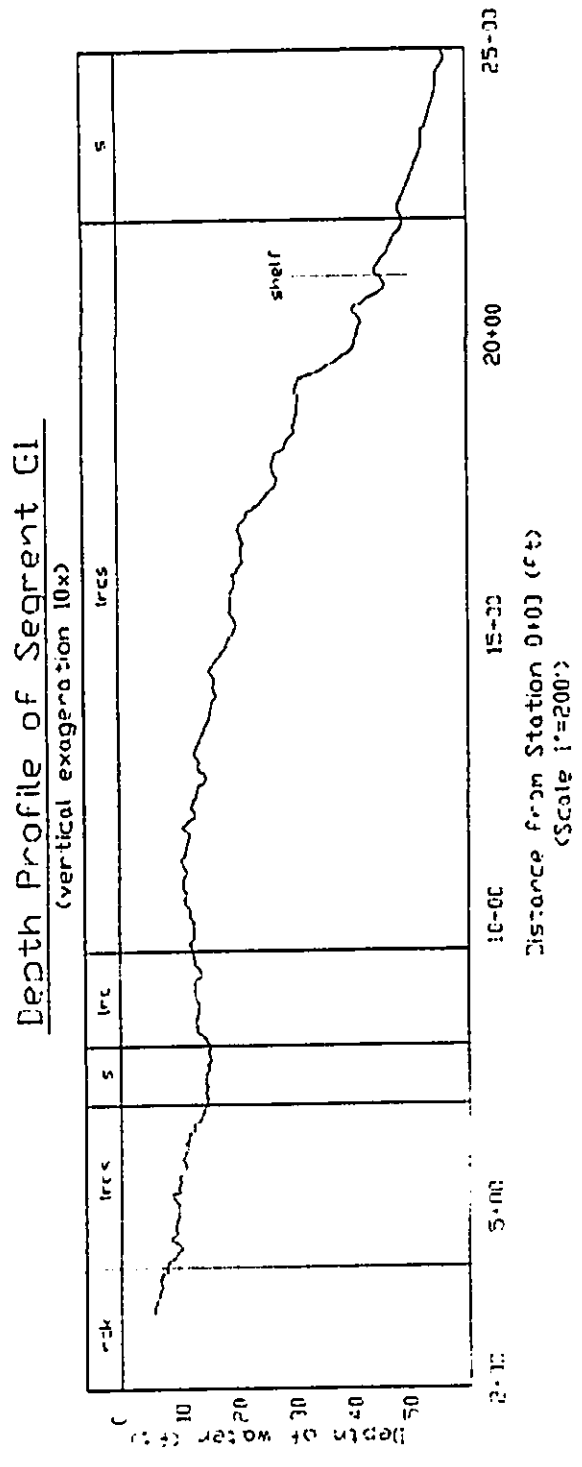
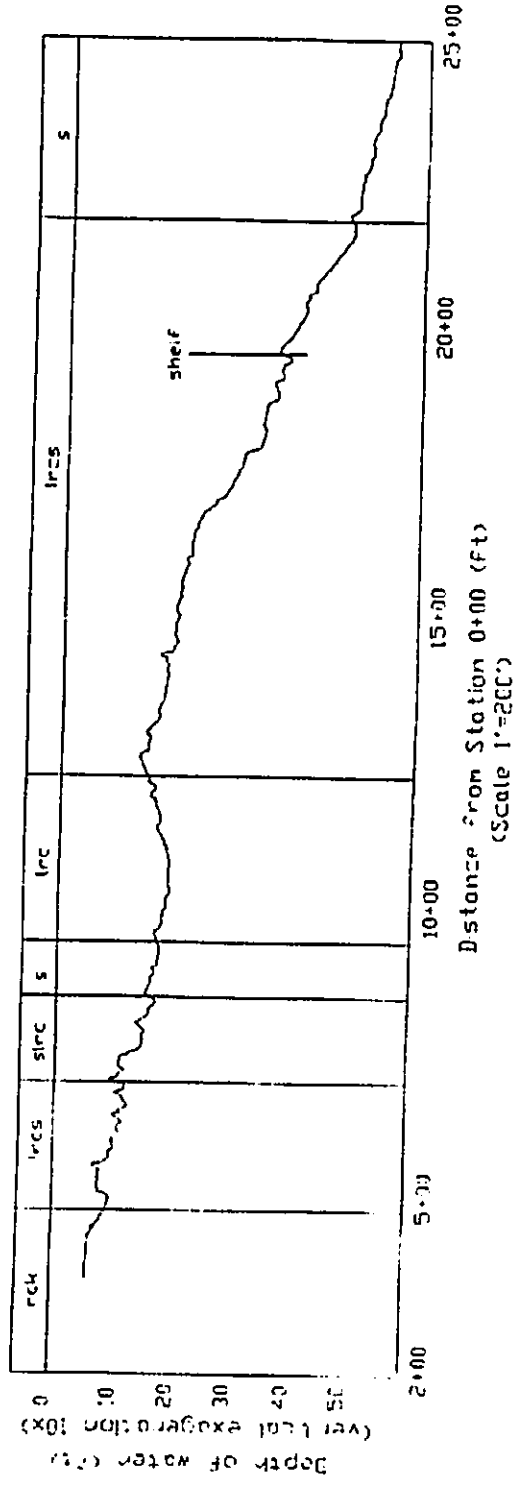


Figure #13

| S | Sand Deposit |
|------|----------------------------|
| SL&C | Sand with Low Relief Coral |
| LR&S | Low Relief Coral with Sand |
| LR | Low Relief Coral |
| RCC | Boulders and Cobbles |

Depth Profile of Segment I



APPENDIX V

Letter from State Historic Preservation Division,
Department of Land and Natural Resources,
March 25, 1999

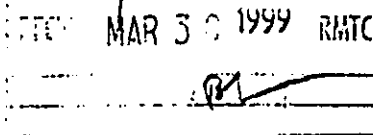
BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII



STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

HISTORIC PRESERVATION DIVISION
Kakuhihewa Building, Room 555
801 Kamehale Boulevard
Honolulu, Hawaii 96817



TIMOTHY E. JOHNS, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES
JANET E. KAWELO

AQUATIC RESOURCES
BOATING AND OCEAN RECREATION
CONSERVATION AND RESOURCES
ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND
STATE PARKS
WATER RESOURCE MANAGEMENT

March 25, 1999

Mr. Brian Takeda, Senior Planner
R. M. Towill Corporation
420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817

LOG NO: 23137 ✓
DOC NO: 9903EJ23

Dear Mr. Takeda:

SUBJECT: Chapter 6E-42 Historic Preservation Review -- Proposed
Telecommunications Terminal Building and installation of
Subground Fiber Optic Cable.
Honouliuli, 'Ewa, O'ahu
TMK: 9-2-03: 2 por.

Thank you for the opportunity to review this project which proposes the construction of a telecommunications terminal building (approximately 7,000 sq. ft.) and the installation of a subground fiber optic cable. The cable will be installed using a directional drilling method initiating from the terminal building site and extending under Farrington highway to the shore.

A review of our records shows that there are no known historic sites at the project location. This area has been extensively altered (existing use consists of dwelling and pig farm), and it is unlikely that historic sites would be found. The directional drilling method will also negate the ability for finding subsurface archaeological sites, which is considered unlikely along this rocky coastline. Thus, we believe that this project will have "no effect" on historic sites.

If you have any questions please call Sara Collins at 692-8026 or Elaine Jourdane at 692-8027.

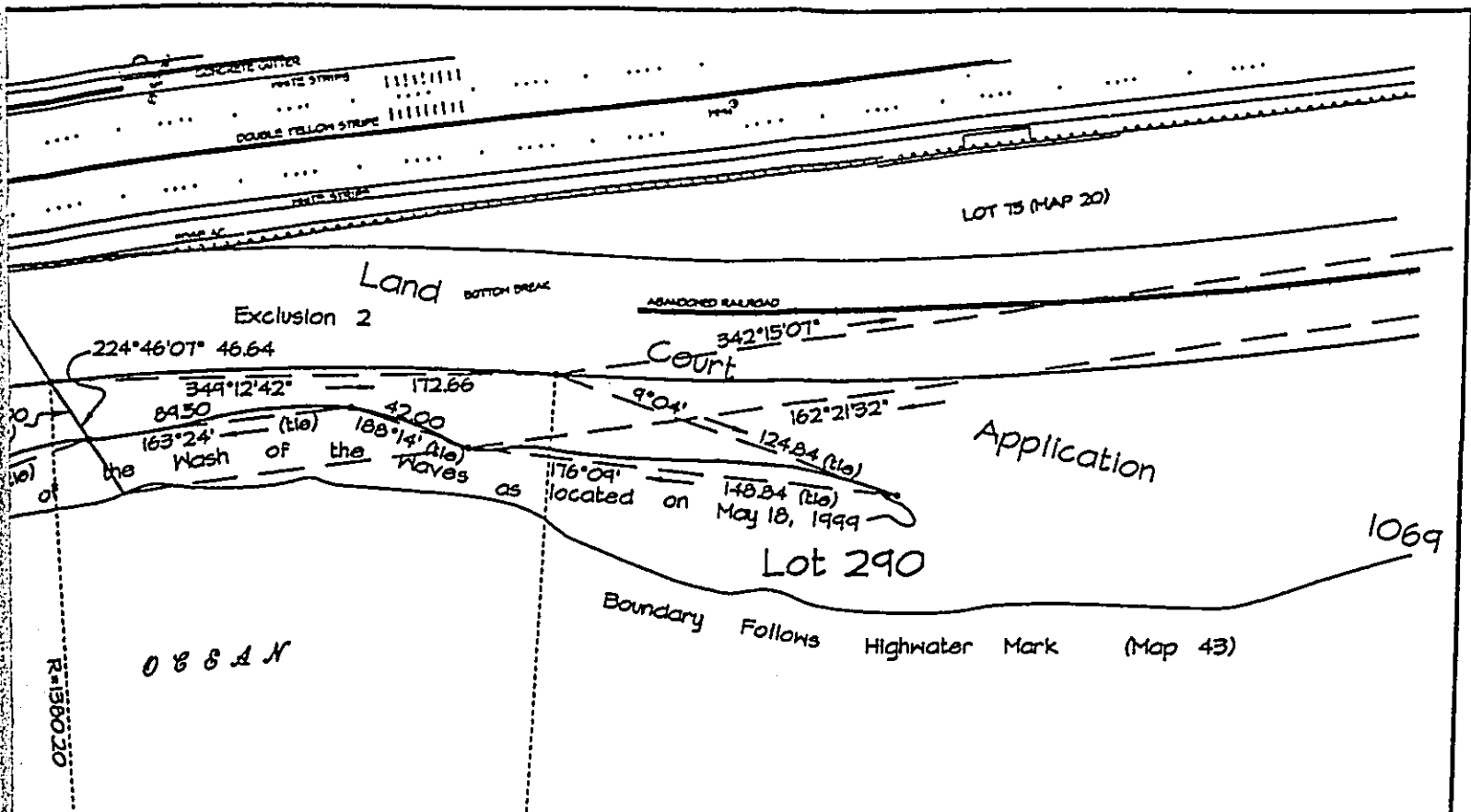
Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

EJ:amk

APPENDIX VI

Shoreline Survey of Project Site
(Approved on September 28, 1999, Case No. OA 729)



Shoreline Survey of
Portions of Lot 290 of
Land Court Application 1069 (Map 43) and
Nanakuli Beach Park
(Executive Order 104)

At Honolulu and Nanakuli, Oahu, Hawaii

Tax Map Key: 8-9-03: portion 1 and 9-2-03: portion 9

Address: 89-403 Farrington Highway
Nalanae, Hawaii 96792

Owners : T.M.K. 8-9-06: portion 01
State of Hawaii
Honolulu, Hawaii 96813

T.M.K. 9-2-03: portion 09
Estate of James Campbell
1001 Kamokila Boulevard
Kapolei, Hawaii 96707

This work was prepared by me or
under my direct supervision

Russell Figueiroa
Licensed Professional Land Surveyor
Certificate Number 4729



R. M. TOWILL CORPORATION
SINCE 1930

420 Waiakamilo Road, Suite 411
Honolulu, Hawaii 96817
May 21, 1999

