

BENJAMIN J. CAYETANO
GOVERNOR



Burmeister Overpass

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
JERRY M. MATSUDA
GLENN M. OKIMOTO

RECEIVED

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

NOV -8 11:14
OFFICE OF ENVIRONMENTAL
QUALITY CONTROL

IN REPLY REFER TO:

HWY-RM
3.71401

November 4, 1996

TO: MR. GARY GILL, DIRECTOR
OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: KAZU HAYASHIDA, DIRECTOR OF TRANSPORTATION *K.H.*

SUBJECT: FINDING OF NO SIGNIFICANT IMPACT AND FINAL EA FOR A
COMMUNICATION SITE, BURMEISTER OVERPASS, LIKELIKE
HIGHWAY, FASP NO. S-0630 (1)

We have reviewed the comments received during the 30-day public comment period which began on August 23, 1996. We have determined that this project will have no significant environmental impact and request that you publish this FONSI and the Final EA in your next OEQC Bulletin.

We enclose a completed OEQC Bulletin Publication Form and four copies of the Final Environmental Assessment. If you have any questions, please call Michael Amuro at 587-2023.

Enclosures

139

1996-11-23-0A-~~By~~ FEA-BURMEISTER OVERPASS ^{NOV 20} 1996

FILE COPY

BURMEISTER OVERPASS
FINAL ENVIRONMENTAL ASSESSMENT



PHONE (BUS): (808) 536-5695
PHONE (RES): (808) 732-7261
FAX: (808) 536-5720

ANALYTICAL PLANNING CONSULTANTS, INC.
84 N. KING STREET • HONOLULU, HI 96817

October 9, 1996

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

Dear Mr Hayashida

PrimeCo Personal Communications LP, Pocket Communications Inc., Western PCS II Inc., Honolulu Cellular Telephone Co., GTE Moblenet, and Hawaii Wireless Inc., are applying to the State Department of Transportation for permission to co-locate a transmitter/receiver site for cellular PCS telephone and paging services on the Likelike Highway Burmeister Overpass. The proposed installation is on state land therefore Chapter 343 HRS requires that an Environmental Assessment (EA) must be submitted for publication in the OEQC Bulletin. Accordingly, a draft EA was submitted to the Department of Transportation and published in the August 23, 1996 OEQC Bulletin.

One response was received from the Kalihi Neighborhood Board recommending that the DOT issue a "conditional use permit". The final EA is being submitted at this time. The applicants are requesting the Department of Transportation to issue a negative declaration and to submit the final EA for publication in the OEQC Bulletin.

If there are any questions please contact me at 536-5695.

Sincerely,

Donald Clegg
President

FINAL ENVIRONMENTAL ASSESSMENT FOR A COMMUNICATIONS SITE
ON THE LIKELIKE HIGHWAY BURMEISTER OVERPASS

BACKGROUND

The applicants are PrimeCo Personal Communications L.P., Pocket Communications Inc., Western PCS II Inc., Honolulu Cellular Telephone Co., GTE Mobilenet, and Hawaii Wireless Inc. They are proposing to construct a transmitter/receiver installation on the Likelike Highway Burmeister Overpass. The installation will be used to facilitate wireless telephone communications and paging on Likelike Hwy.

The applicants had approached the State Department of Transportation (DOT) individually for permission to locate their sites to serve this area. It was decided, jointly with the DOT, that a single application should be made that included all the companies involved. This approach would better minimize any environmental and visual aesthetic impacts that might be caused by the installation. The companies have been meeting with the DOT for several months and are proposing the design which is the subject of this Environmental Assessment (EA).

DESCRIPTION OF THE PROPOSED PROJECT

The antennas will be located on the bridge overpass in the Likelike Highway right of way. Twelve antennas panels will be located on each side of the bridge. The panels are approximately 2 feet long and 8 inches wide and will be mounted on two inch diameter pipes attached to the bridge at intervals of approximately four feet, for a total of 24 antenna panels. The antennas will not protrude above or below the bridge structure and the bottom of the antennas will be no less than 22 feet above Likelike Highway.

Equipment cabinets for five of the companies will be mounted on a concrete pad on the Kalihi side of Likelike Hwy on property adjacent to the overpass owned by the Board of Water Supply. One company will locate their cabinets on Burmeister property next to the access road above the highway embankment. An eight foot chain link fence with three strands of barbed wire on top will enclose the Board of Water Supply area which measures approximately 36 feet by 48 feet. The property is within the Urban boundary. The equipment cabinets located across the overpass on Burmeister property are in the Conservation District. A separate approval for this site has been obtained from the Department of Land and Natural Resources.

(2)

The equipment areas will be screened from view from motorists on Likelike Hwy by trees and foliage and by virtue of their location above the highway embankment.

Coax cables from the antennas to the equipment cabinets will be located under the edge of the bridge structure. They will be secured every four feet to the bridge and will blend in as a part of the bridge structure. Access to the installation will be provided by the Burmeister property access road that connects the overpass with Kalihi Street. The Burmeister access road is a private road with restricted public access on both sides of Likelike Highway.

AFFECTED ENVIRONMENT

The areas affected are the exterior side faces of the bridge overpass and the enclosed equipment cabinet areas on both sides of Likelike Highway.

IMPACTS AND ALTERNATIVES CONSIDERED

a. Impacts

The primary impact of the installation will be the visual impact of the panel antennas. Visual impact will be minimized by painting the antenna panels to blend with the bridge structure. Visual impact will be further minimized by virtue of the fact that the antenna panels will not extend above or below the bridge structure.

The equipment cabinet location area is generally flat, however some grubbing and leveling will be needed to accommodate the cement slab on which the equipment cabinets will be placed. There will be no visual impact as the cabinets will be completely hidden by existing trees and foliage above the Likelike Highway embankment.

There have been concerns expressed about the effects of the electromagnetic radiation from the antennas. There is no impact as the maximum radiation exclusion distance for the panel antennas is 9.5 feet. This contour is well above the height of any vehicles utilizing Likelike Highway. Traffic on the overpass will be likewise unaffected as the contour extends only from the face of the antenna panels (which will be facing outward from the bridge) not behind them.

(3)

b. Alternatives

Other possible sites for the antenna installation along the side of the highway were reviewed. They were rejected in favor of the proposed site for the following reasons:

1. They were in the conservation district outside of the highway right of way.
2. They were in the right of way but would have been more visually intrusive, requiring antenna poles several hundred feet high.
3. Electrical power was not readily available.
4. A land line telephone connection into the Hawaiian Telephone system was not readily available.
5. None of the other locations provided the opportunity for all the companies to co-locate, thereby minimizing the cumulative impact of multiple installations.

If the project is not constructed it will not be possible for the six applicant companies to supply continuous communications coverage as users transition from Windward Oahu to Honolulu and from Honolulu to Windward Oahu on the Honolulu approach to the Wilson Tunnel.

The telephone systems involved serve a community function as public utilities by supplying needed portable communications for public use. In addition to assisting the general public and businesses the systems will provide essential communications in the event of disaster.

The ability for real time portable communications for occupants of cars traveling over Likelike will assist greatly in providing a safe environment for the residents of Oahu. Traveling over the Likelike highway at night can be frightening and dangerous in the event of a breakdown. The ability to call for assistance immediately without leaving the car will contribute to the physical and mental well being of those who must travel this road at night.

(4)

MITIGATION MEASURES

The antennas are of a reduced height design to prevent any part of the antenna from protruding above or below the bridge structure, thereby eliminating any impact on the natural skyline. The antennas will be painted to match the bridge to further blend with the existing structure. The equipment area will be completely screened from view of occupants of automobiles Kaneohe or Honolulu bound by existing trees and foliage and by virtue of its placement above the highway embankment.

All construction will be done utilizing "best management practices". This means that there will be no runoff from the small amount of grubbing and grading that will be required to prepare the site for the pad for the equipment cabinets.

The existing structure consists of a tri-trestle bridge supporting an inclined roadway crossing over Likelike Highway. There is also a guardrail on the bridge which projects above the roadway and runs the length of the bridge on both sides. The addition of the structures described in this EA, which are designed to blend in with the existing facility, will not materially impact the current visual impression of the bridge overpass.

The installation itself will be secured from the public and will only be accessible to maintenance personnel.

COMMENTS RECEIVED ON THE DRAFT ENVIRONMENTAL ASSESSMENT

The draft EA was published in the August 23, 1996 OEQC Bulletin. Copies of the EA were submitted for review and comment to the State Department of Transportation, and the State Department of Health. One comment was received from the Kalihi Neighborhood Board # 16.

The Kalihi Neighborhood Board unanimously recommended that the Department of Transportation issue a "conditional use permit" for the antennas. While the DOT does not issue conditional use permits we will assume that they are recommending in favor of the Burmeister Overpass installation. The board states that should the antennas negatively impact the environment or the residents they would be removed. *response*

The Board also requests that the antenna built in the Kalaepaa Drive neighborhood be removed. The removal of this antenna is not a part of this EA, however GTE will be informed of the Board's request. They are concerned about the proliferation of antenna sites in the Kalihi Valley. *response*

DETERMINATION AND REASONS SUPPORTING THE DETERMINATION

The proposed project would not have a significant effect on the environment and therefore preparation of an environmental impact statement is not required. The "significance criteria," Section 12 of Hawaii Administrative Rules Title 11, Chapter 200, "Environmental impact Statement Rules," were reviewed and analyzed. Based on the analysis, the following were concluded:

1. No irrevocable commitment to loss or destruction of any natural or cultural resource would result.

All construction is located in previously disturbed land and no natural or cultural resources are present.

2. The action would not curtail the range of beneficial uses of the environment.

The project will occupy only a very small area of land, and the exterior surface of the overpass, neither of which are currently in any significant environmental use.

3. The proposed action does not conflict with the state's long term environmental goals and guidelines.

Conservation of natural resources and enhancement of the quality of life are the two broad policies of the "State Environmental Policy" in Chapter 344 of the Hawaii Revised Statutes. The proposed project does not consume any natural resources. It will enhance the quality of life by enabling residents to communicate by telephone while transiting the Koolau's via Likelike Highway. The system will provide essential communications in the event of disaster and provide for emergency communications for stranded motorists. The ability to call for assistance will contribute to the safety, and the physical and mental well being of those who must travel over Likelike Highway, especially at night.

4. The economic or social welfare of the community or state would not be substantially affected.

The economic and social well being of the community will be enhanced by the increase in communication services that will be provided by these systems.

5. The proposed action does not substantially affect public health.

(6)

There is no public health impact caused by these systems. The radiated power for the antenna systems will range between 60 to 100 watts. This is equivalent to the radiation emitted by standard household electric light bulbs. The exclusion distance for the Land Use Ordinance allowable power for human contact of 0.1 milliwatts per square centimeter is 7.2 feet. No automobiles will be within 7.2 feet of a transmitting antenna. Further, the Federal standards for human radiation tolerance is 0.5 milliwatts per square centimeter which is five times that allowed by the LUO.

6. No substantial secondary impacts, such as population changes or effects on public facilities, are anticipated.

Provision of the communication services made possible by this installation will have no impact on population changes or public facilities.

7. No substantial degradation of environmental quality is anticipated.

No degradation of the environment is anticipated. The project area has already been extensively altered during construction of the highway and the overpass.

8. The proposed action does not involve a commitment to larger actions, nor would cumulative impacts result in considerable impacts on the environment.

The project is self contained and independent of any other installations. Provision is being made as a part of this project review for the possible inclusion of other communications facilities.

9. No rare, threatened or endangered species or their habitats would be affected.

The area involved with this project is very small and previously has been extensively altered. There are no endangered or threatened species or their habitats on the property.

10. Air quality, water quality, or ambient noise levels would not be detrimentally affected.

In operation this is a passive facility. It does not impact air quality, does not use water, and does not generate any noise.

(7)

11. The project would not affect environmentally sensitive areas, such as flood plains, tsunami zones, erosion-prone areas, geologically hazardous lands, estuaries, fresh waters or coastal waters.

The project area is not on or near any of the above areas of concern.

SITE AGREEMENT

APPROVALS :

SITE DESCRIPTION

SITE NAME : BURMEISTER OVERPASS

SITUATED IN THE CITY OF HONOLULU

COUNTY OF HONOLULU

STATE OF HAWAII

WESTERN PCS II DATE

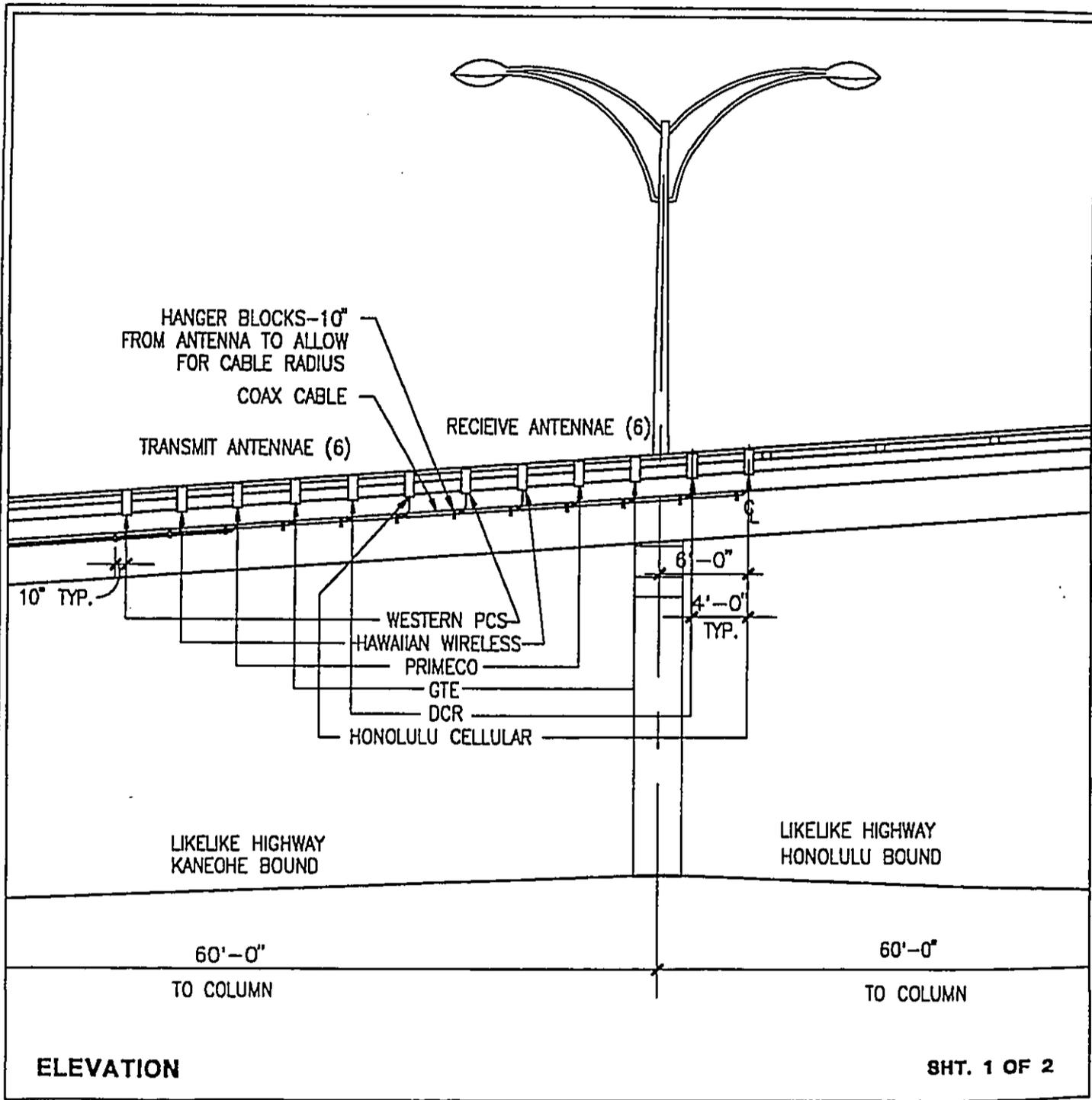
HAWAIIAN WIRELESS DATE

PRIMECO DATE

GTE DATE

DCR DATE

HONOLULU CELLULAR DATE



C:\WWW\BURMEISTER\SIGNOFF 8-5-96 1:42:56 pm EST

SITE AGREEMENT

APPROVALS :

SITE DESCRIPTION

SITE NAME : BURMEISTER OVERPASS

SITUATED IN THE CITY OF HONOLULU

COUNTY OF HONOLULU

STATE OF HAWAII

WESTERN PCS II DATE

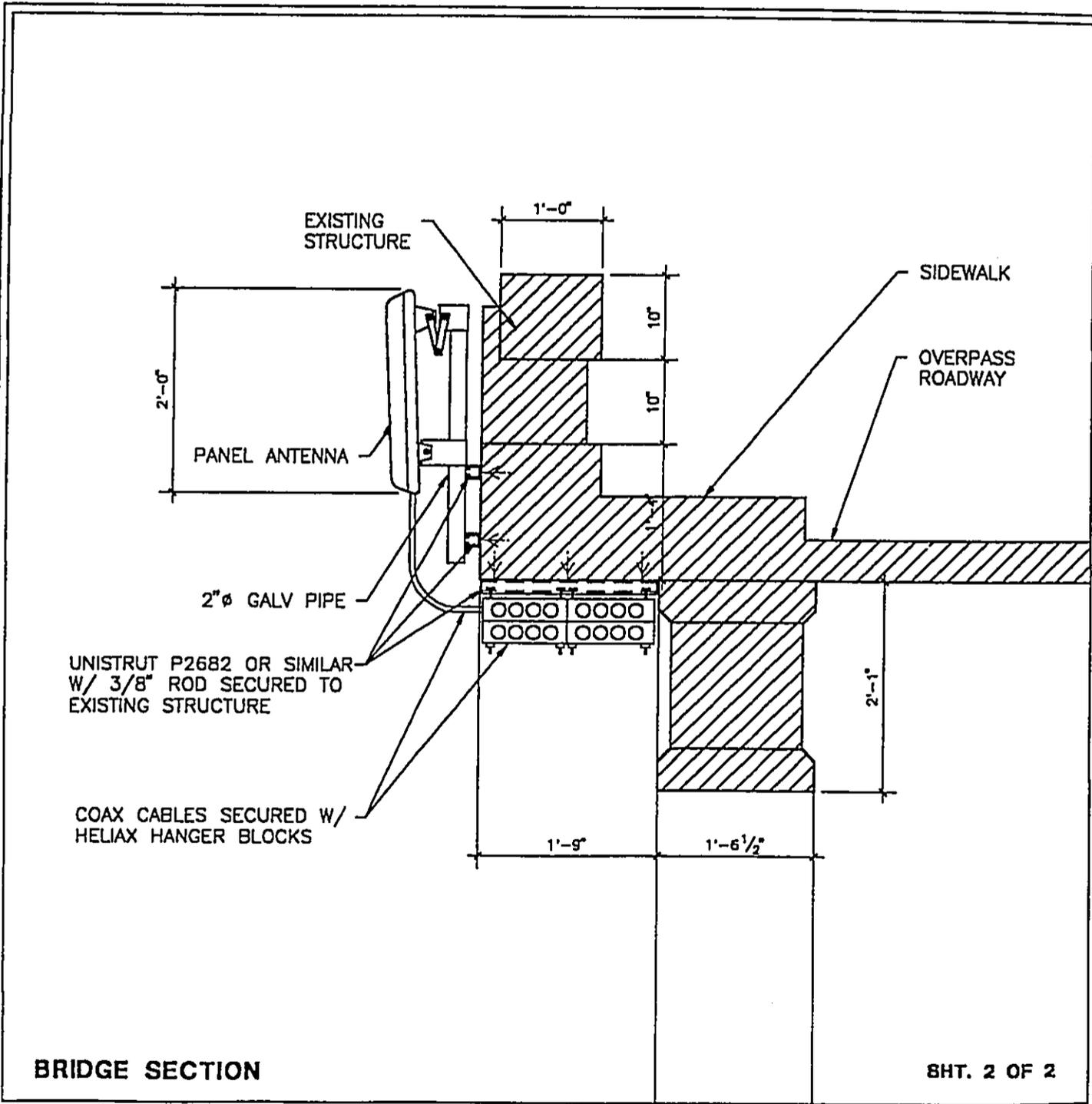
HAWAIIAN WIRELESS DATE

PRIMECO DATE

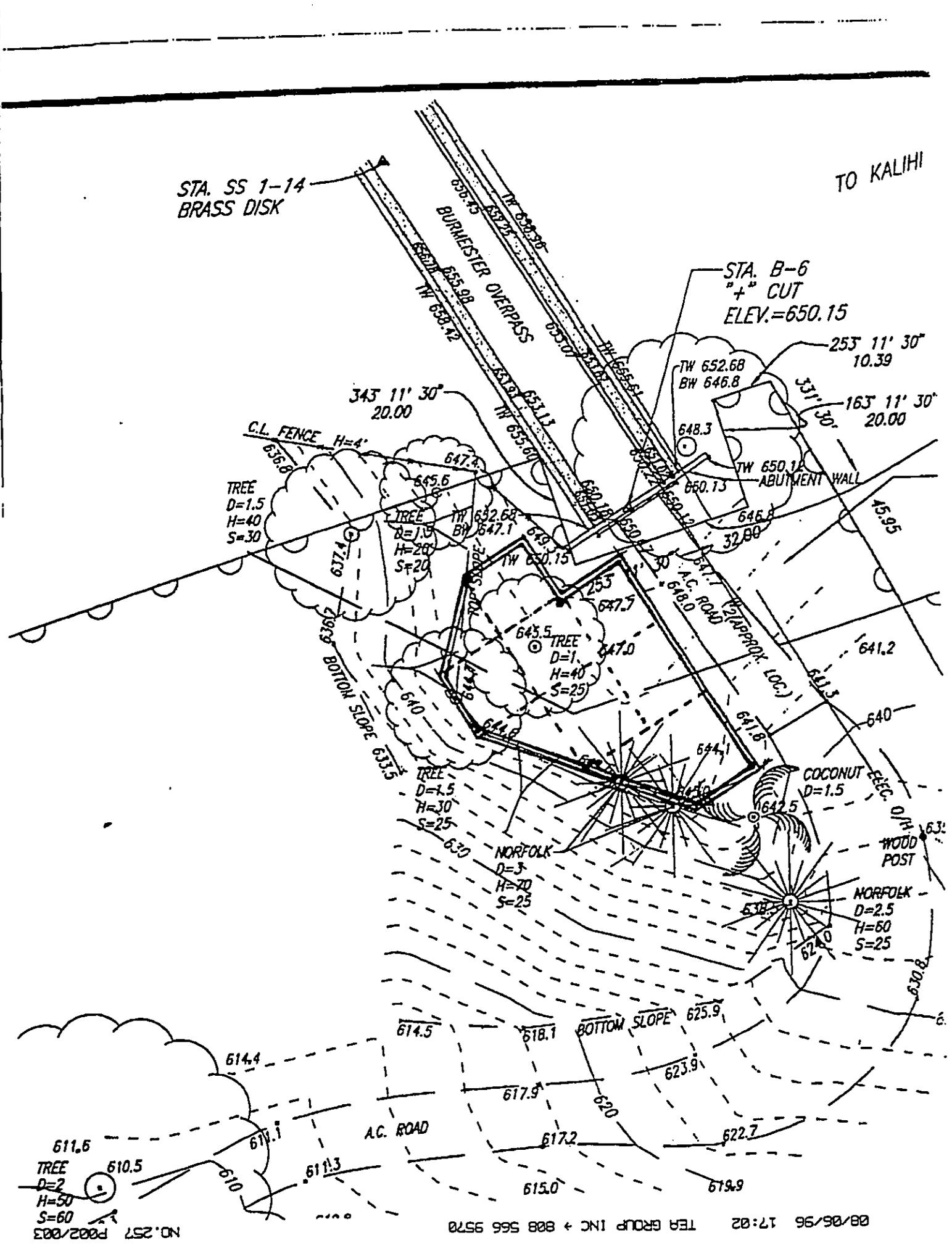
GTE DATE

DCR DATE

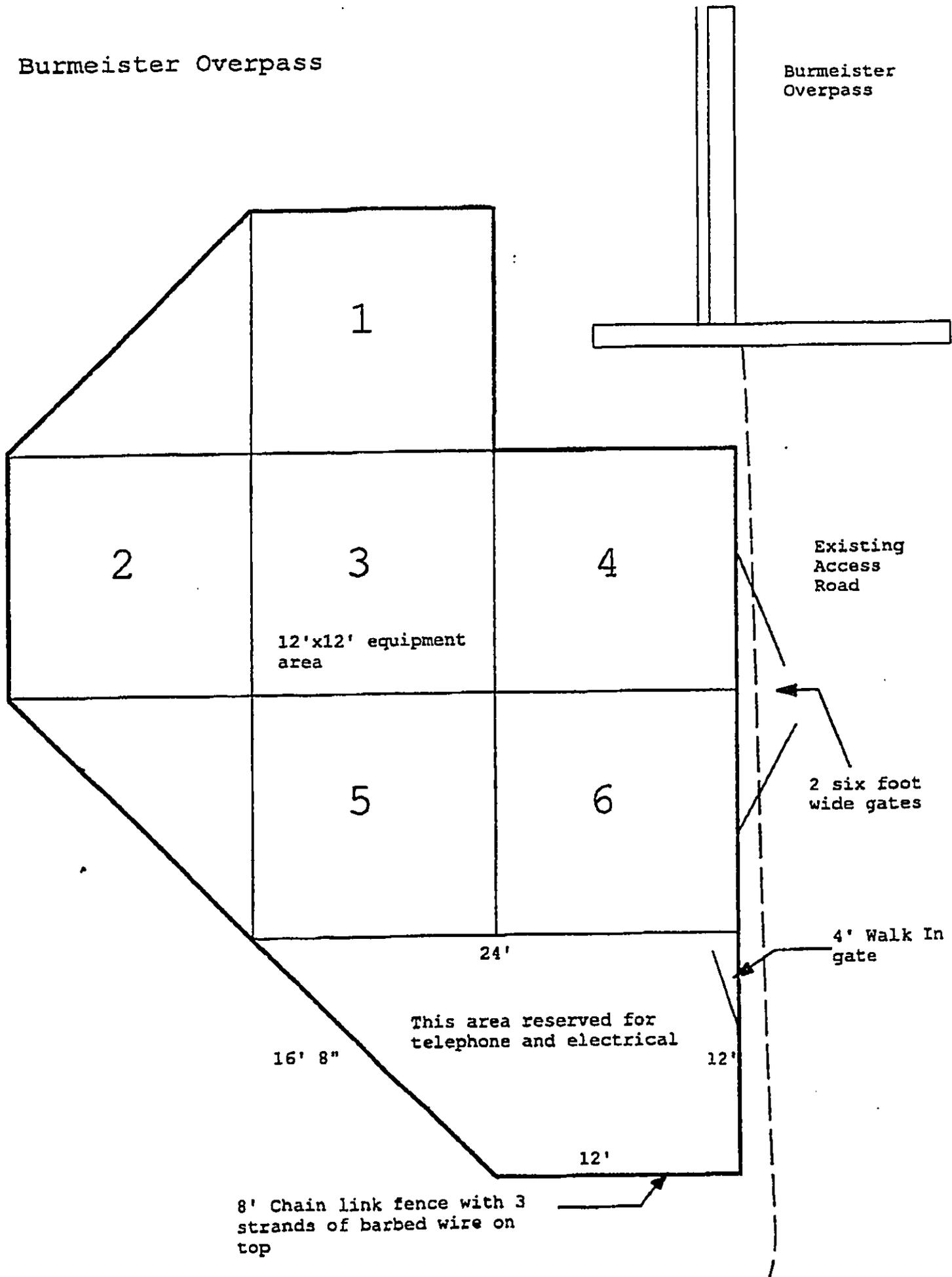
HONOLULU CELLULAR DATE



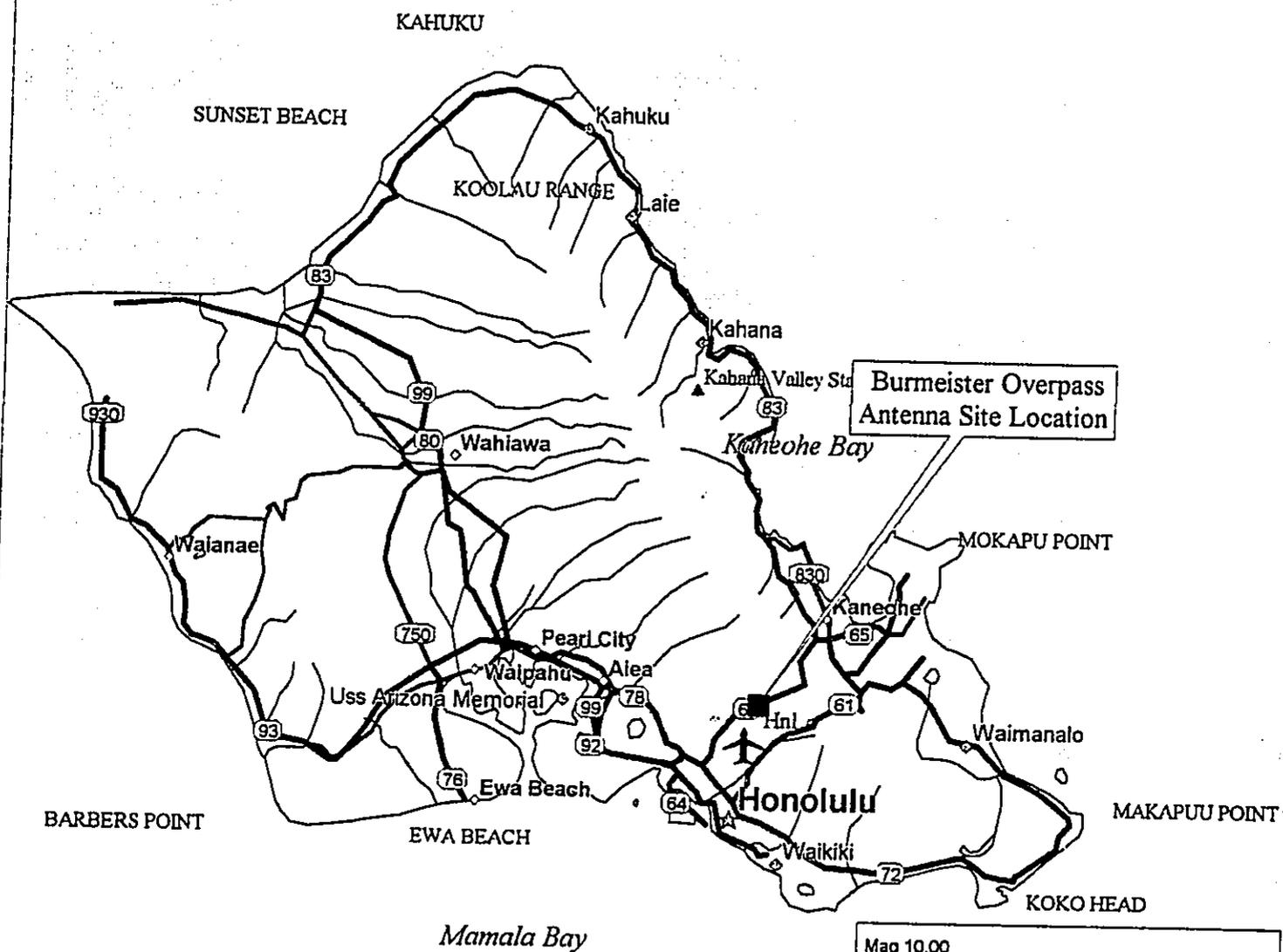
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Burmeister Overpass



Burmeister Overpass Antenna Site Location



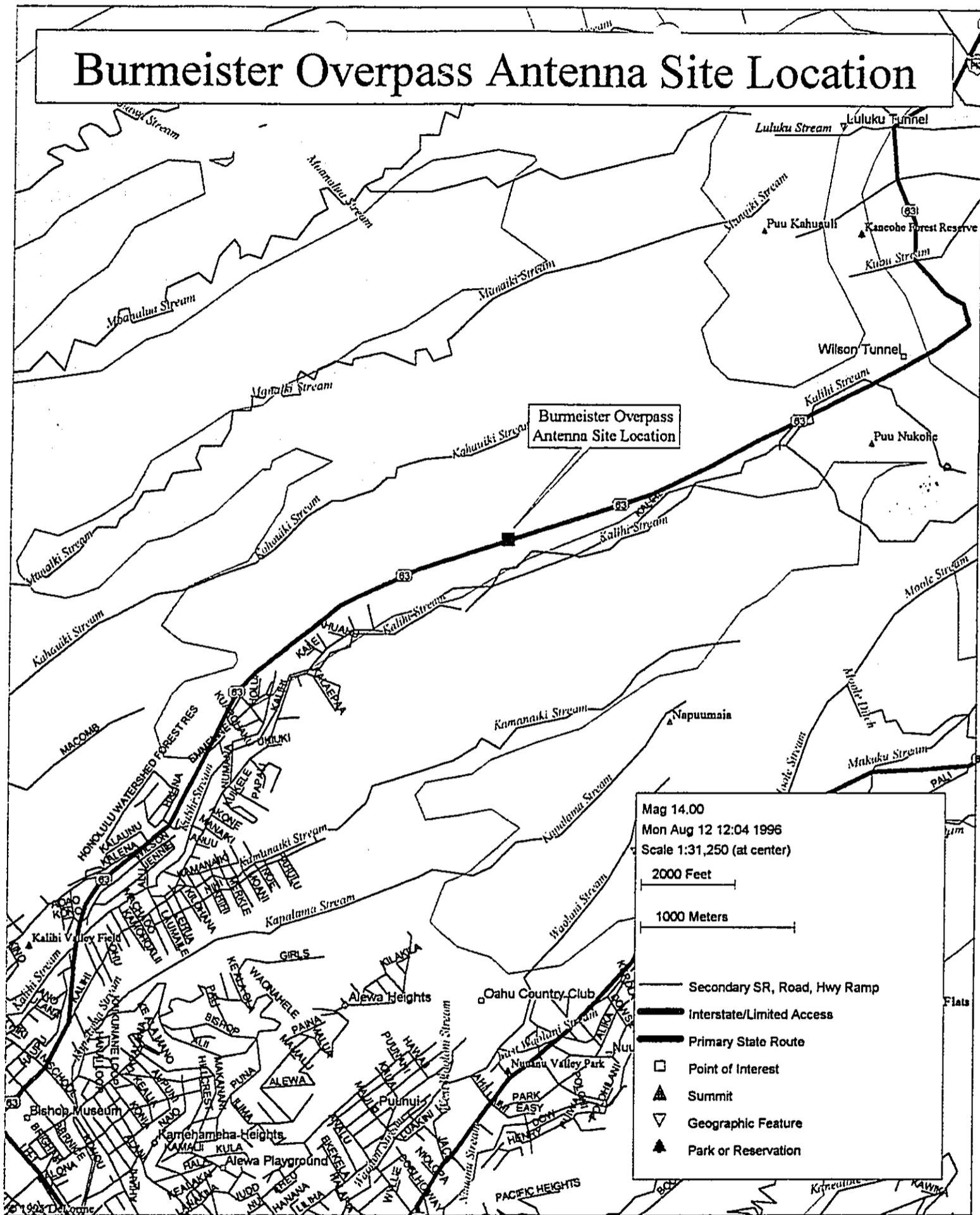
Mag 10.00
 Mon Aug 12 12:13 1996
 Scale 1:400,000 (at center)

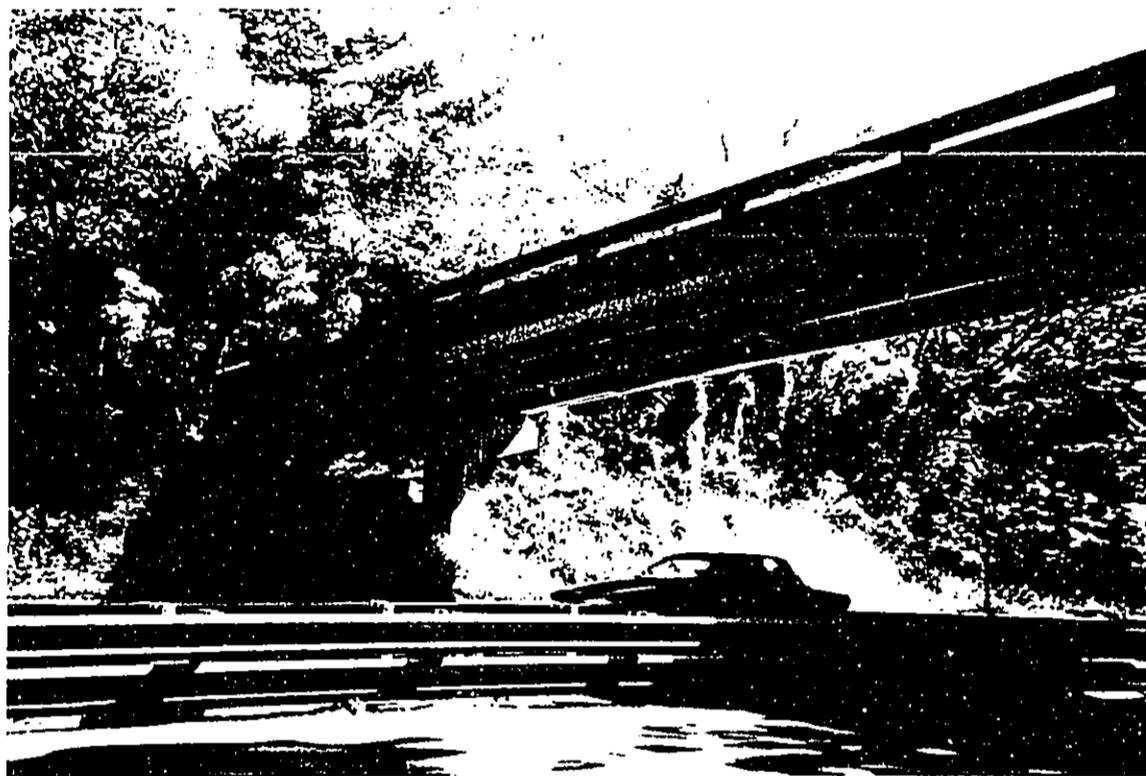
5 Miles

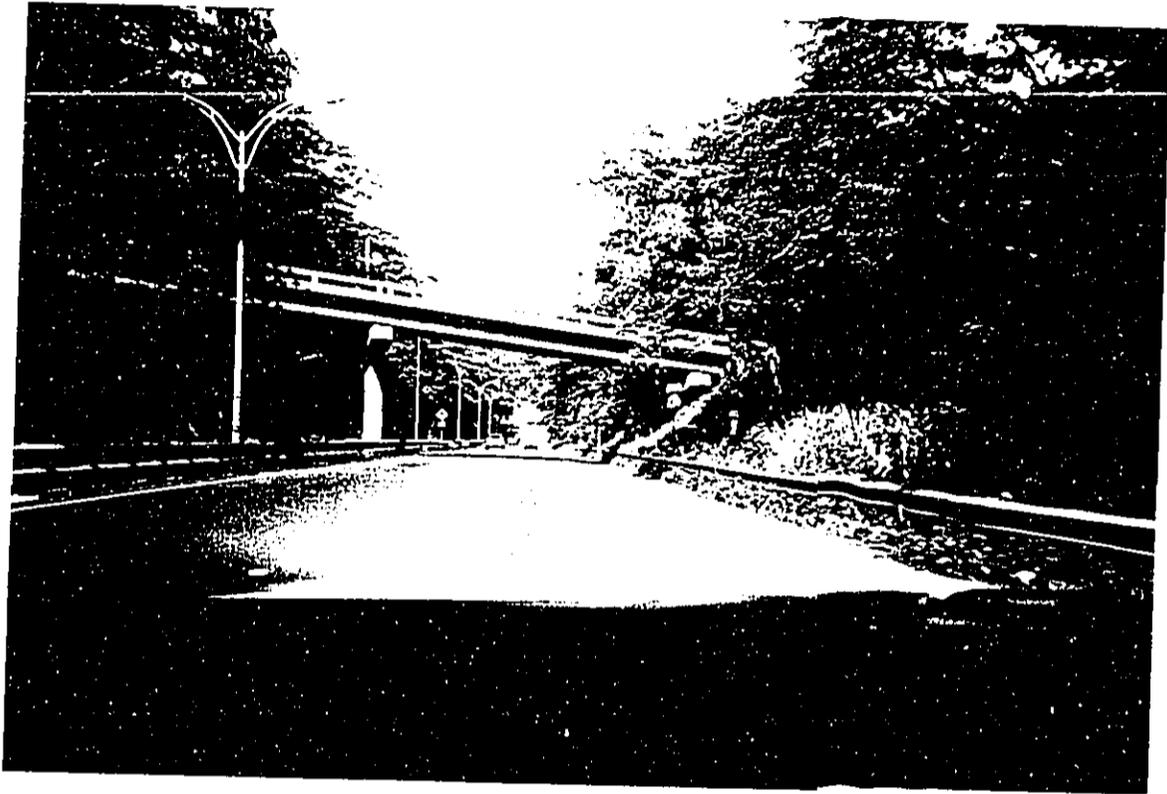
10 KM

- Major Connector
- State Route
- Interstate/Limited Access
- Primary State Route
- ☆ State Capitol
- ◇ Town, Small City
- ▲ Park or Reservation

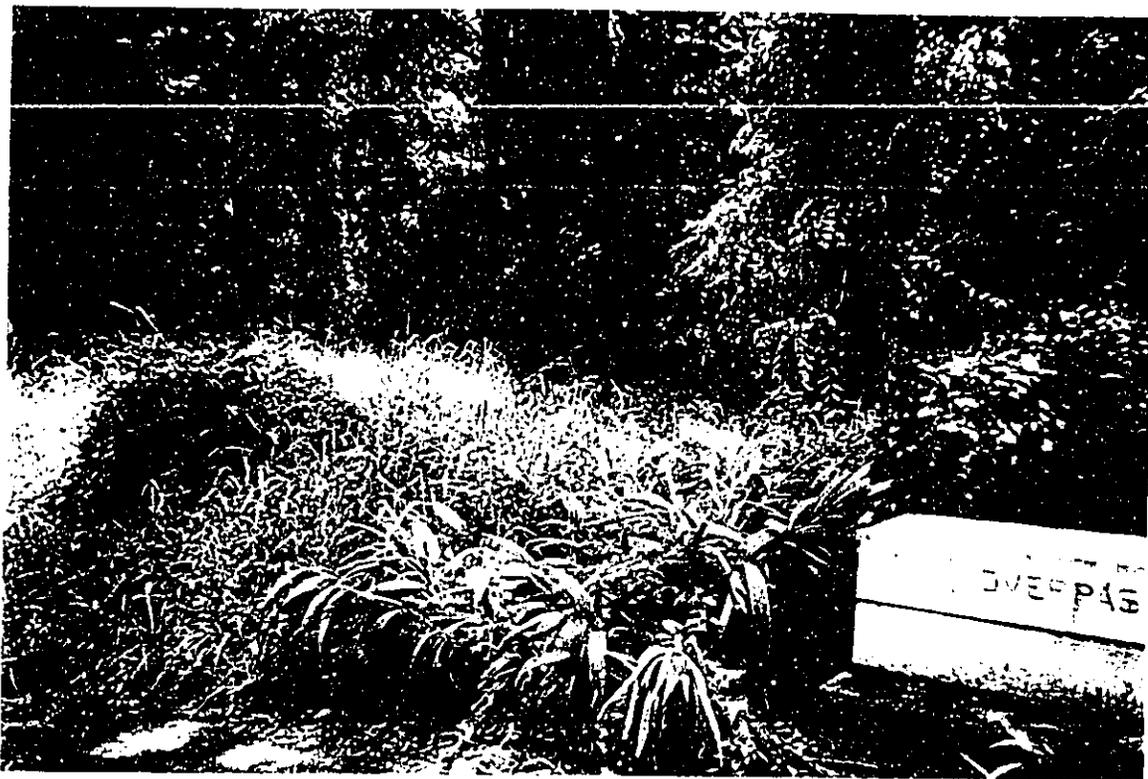
Burmeister Overpass Antenna Site Location







EQUIPMENT CABINET LOCATION AREA



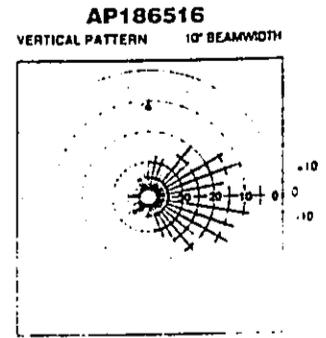
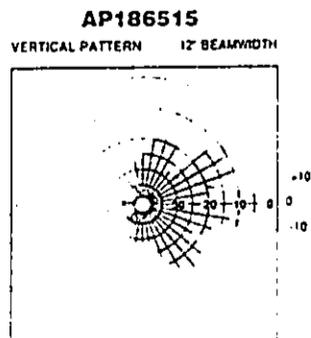
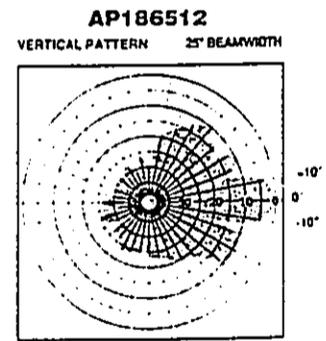
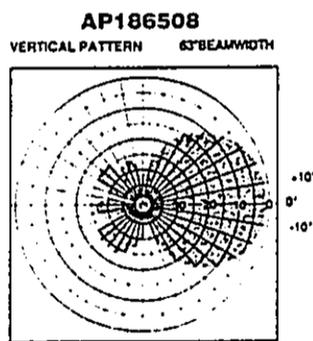
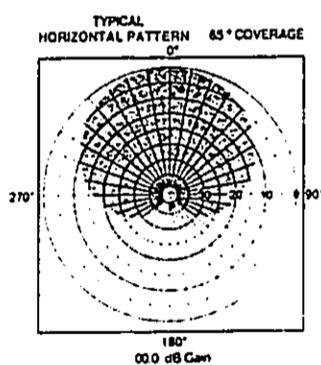
CELLite® 65° Directional Panel Antennas



ELECTRICAL SPECIFICATIONS	AP186508	AP186512	AP186515	AP186516
Frequency Range - MHz	1710-1990	1710-1990	1710-1990	1710-1990
Gain min. - dBd/dBi	8/10	12/14	15/17	16/18
Bandwidth - MHz for 1.3:1 VSWR*	280	280	280	280
Horizontal Beamwidth - Degrees	65	65	65	65
Vertical Beamwidth - Degrees	63	25	12	10
Polarization	Vertical			
Power, Max. - Watts	500	500	500	500
Front-to-Back Ratio - dB	>25	>25	>25	>25
Lightning Protection	Direct Ground			
Connector Type - Standard	7/16 DIN Female			
Electrical Downtilt - Degrees	0	0	0, 2, 6	0, 2, 5, 10
Null Fill - dB	N/A	N/A	> -25	> -25
3rd Order IMD at 2 x 38 dBm - dBc	< -160			

Note: All VSWR data referenced to 50 Ohms.

MECHANICAL SPECIFICATIONS	AP186508	AP186512	AP186515	AP186516
Dimensions - WxDxH - in.	7.8 x 2.0 x 11.8	7.8 x 2.0 x 23.6	7.8 x 2.0 x 39.4	7.8 x 2.0 x 51.2
mm.	198 x 50 x 300	198 x 50 x 600	198 x 50 x 1000	198 x 50 x 1300
Weight - (excl. mtng. hwre.) - lbs.(kg)	2.2(1.)	3.3(1.5)	8.6(3.9)	10.4(4.7)
Weight - Mounting Hardware (APM14-1) - lbs. (kg)	1.1(.5)	1.1(.5)	1.1(.5)	1.1(.5)
Radiating Element Material	Aluminum			
Radome Material	UV-Stabilized High Impact ABS Plastic			
Wind Loading Area - ft. ² (m ²)	.419(.039)	.817(.078)	1.39(.13)	1.81(.169)
Rated Wind Velocity - mph (km/hr)	125(200)	125(200)	125(200)	125(200)
Lateral Thrust @ Rated Winds - lbs.(kg)	24.3(11.0)	54.6(22.9)	90.4(41.0)	121.9(55.3)
Mounting Hardware - Supplied	Aluminum and Hot Dipped Galvanized Steel			



CELWAVE
DIVISION OF RADIO FREQUENCY SYSTEMS INC

2 Ryan Road, Marlboro, NJ 07746-1899 • 1(800) CELWAVE • (908)462 1880



Western PCS II- Proposed Hawaii Kai PCS Site • Oahu- Hawaii

RADIO FREQUENCY CALCULATED LEVELS

PREPARED FOR: Burmeister Bridge
SITE: Burmeister Bridge

BY: DAMIAN AMEEN
ACC
92-1002 Makakilo Drive
Suite 45
Kapolei, HI 96707
808-672-5478

Statement of Damian Ameen, Consulting Engineer

The firm of Ameen Communications Company, Inc., Consulting Engineers, has been retained by the Western PCS II ("Western PCS II") to evaluate the PCS telephone base station constructed on *Burmeister Bridge*, in the Pali Valley area of Oahu, Hawaii, for compliance with appropriate guidelines for limiting human exposure to radio frequency electromagnetic fields.

Prevailing Exposure Standards

In General Docket 79-144, the Federal Communications Commission adopted the radio frequency protection guide of the American National Standards Institute Standard C95.1-1982, "Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz." The effective date for applying this standard to FCC licensees was January 1, 1986, and a summary of the limits of the ANSI Standard is shown in Figure 1A. The most restrictive limit applies at frequencies between 30 and 300 MHz, where FM and VHF television stations operate, the limit is higher at UHF and PCS frequencies, as shown. The exposures are to be averaged over some interval of time (six minutes in C95.1-1982), as it is the rate of absorption of radio frequency ("RF") energy that ANSI is limiting, rather than the peak exposure at any one moment.

In 1992, the American National Standards Institute published ANSI/IEEE Standard C95.1-1992 ("ANSI"), a summary of which is shown in Figure 1B. This revision of C95.1-1982 defines "controlled" and "uncontrolled" environments, setting for the latter more restrictive exposure limits but longer periods for time averaging. Although there are a number of changes from the 1982 Standard, the controlled (*i.e.*, occupational) limits are approximately the same, while uncontrolled (*i.e.*, public) limits are generally five times more restrictive.

Although the FCC has not yet acted on its expected adoption of the revised standard, the most restrictive criteria of either standard are used in this report to evaluate the exposure conditions at the proposed PCS site. The limit for continuous exposure to RF energy at 1800 MHz, the lowest frequency assigned for PCS base station use, is 5 mW/cm² (milliwatts per square centimeter) for occupational exposure situations and 1.28 mW/cm² for public exposure situations.

The proposed facility is to be located on the side of the Burmeister Bridge in Pali area of Oahu in Honolulu County. The site appears to have a view up and down the Pali Highway. The facility proposed for this site will consist of multiple carriers, each with its own transmitting antennas. Each antenna grouping will consist of panel type.

Each antenna in the sector is a flat panel with dimensions of approximately 2' by 5" (height x width) mounted on a truss on the Bridge side area. Since directional antennas are used the

ERP towards the road directly below is less than 5 watts. These powers are for the maximum number of channels to be installed. The figures for maximum effective radiated power were used in this study, additional channels could be added later, so long as the maximum ERP does not exceed the values indicated in the Study Results section. Technical specifications for the site have been provided participating carriers.

PCS Facility Requirements

Because of the short wavelength of the frequencies assigned for PCS use, the antennas require line-of-sight paths for their signals to propagate. Therefore, they will generally be mounted above nearby buildings, terrain, and vegetation. The building location is well above most of the surrounding terrain. The energy directed toward any accessible location nearby will be limited by height of the bridge, restricted access to the area, antenna orientation away from the bridge towards the horizon, and the narrow beamwidth of the antenna elevation pattern.

When an additional cell site or sector is added to an existing PCS network the operating powers of the surrounding cells are reduced and the power of the modified site is itself low, in order not to create interference between adjacent cells. Because of the low power alone it is generally not possible for exposure conditions to approach the ANSI *limits* without being physically very near the antennas.

Modeling Method

The FCC has provided direction to the telecommunications industry on determining compliance with ANSI in the Office of Science and Technology Bulletin No.65, "Evaluating Compliance With FCC-Specified Guidelines for Human Exposure to Radio Frequency Radiation," dated October 1985. We have developed techniques for applying the formulas given in that Bulletin to calculate both ground level and on-building power densities at radio transmitting Sites. This method of evaluating expected exposure conditions is accepted by the FCC, and its accuracy has been verified by numerous field tests.

Study Results

The highest "worst case" exposure occurs directly below the antennas (the nearest anyone can approach the antennas) where the fields are predicted to be 0.01 mW/cm^2 . The antennas are to be installed so as to be shielded from view at street level by the bridge. This arrangement will also significantly attenuate the fields from the site at publicly-accessible areas. It should be emphasized these calculated values represent several "worst case" assumptions, including that of all transmitters on the air continuously and at full power. Such conditions are rarely, if ever, achieved in practice. Measured ground-level fields at operating PCS sites are typically 10-1,000 times less than the calculated "worst case" values.

The calculations also show that the facility could "build out" and still remain below 5% of the

most restrictive ANSI limit at accessible locations. Areas in front of the antenna are not accessible due to the significant drop to ground level. They do however meet all applicable standards. Levels within the building will be 100-1,000 times less due to the distance and attenuation caused by the building structure.

Conclusion

Based on the information and analysis above, it is my professional opinion that the PCS facility installed at Burmeister Bridge will comply with the prevailing standards for limiting human exposure to radio frequency energy and, therefore, will not for this reason cause a significant impact on the environment. The maximum fields in all ground-level and bridge areas are calculated to be less than 1% of the prevailing standards. This finding is consistent with measurements at operating PCS facilities where typical fields are well below the standards.

List of Figures

In carrying out these engineering studies, the following attached figures were prepared by me or under my direct supervision:

1. Summary of ANSI C95.1-1982 and C95.1-1992 Standards
2. Technical specifications of proposed operation
3. RFR.GROUND calculation methodology

Western PCS II- Proposed Hawaii Kai PCS Site • Oahu- Hawaii

State of Hawaii County of Honolulu

Damian Ameen, being first duly sworn upon oath, deposes and says:

1. That he is a qualified Radio Engineer, and is the Vice President of Engineering of Ameen Communications Company, Inc., with offices located near the city of Honolulu, Hawaii and Livermore, California.
2. That he graduated from Newark Collage of Engineering, in 1984, with a Bachelor of Science degree in Electrical Engineering and Computer Science, was an electronics engineer with the Motorola Communications, RAM Communications, Honolulu Cellular, with specialization in the areas of radio system design, microwave communications systems, public safety networks, cellular, paging, and PCS systems, and has been the Vice President of Ameen Communications Company, Inc., since July 1993,
3. That the firm of Ameen Communications Company, Inc., has been retained by the Western PCS II ("Western PCS II") to provide information regarding the compliance of the PCS transmitting facility located on Burmeister Bridge , in the Hawaii Kai area of Oahu, Hawaii, for compliance with appropriate guidelines for limiting human exposure to radio frequency electromagnetic fields,
4. That he has carried out such engineering work and that the results thereof are attached hereto and form a part of this affidavit, and
5. That the foregoing statement and the report regarding the aforementioned engineering work are true and correct of his own knowledge except such statements made therein on information and belief and, as to such statements, he believes them to be true.

Damian John Ameen

Subscribed and sworn to before me this 28th day of February, 1995

Western PCS II- Proposed Hawaii Kai PCS Site • Oahu- Hawaii
 ANSI C95. 1-1982 Radio Frequency Protection Guide

Frequency Range (MHz)	Electric Field Squared (V^2/m^2)	Magnetic Field Squared (A^2/m^2)	Equivalent Far-field Power Density (mW/cm^2)
0.3- 3	400,000	2.5	100
3 - 30	$4,000 \times (900-f)$	$0.025 \times (900/f^2)$	$900/f^2$
30 - 300	4,000	0.025	1.0
300 - 1,500	$4,000 \times (f/1300)$	$0.025 \times (f/1300)$	$f/1300$
1,500- 100,000	20,000	0.125	5.0

Note: f = frequency (MHz)

AMERICAN NATIONAL STANDARDS INSTITUTE (ANSI) 1991

C95.1-1991 RADIO FREQUENCY PROTECTION GUIDE

Table 1

FREQUENCY RANGE (MHz)	ELECTRIC FIELD STRENGTH E ² (V ² /m ²)	MAGNETIC FIELD STRENGTH H ² (A ² /m ²)	POWER DENSITY (mW/cm ²)
0.3-3.0	400,000	2.5	100
3-30	4,000 (900/f ²)	0.025	900/f ²
30-300	4,000	0.025	1.0
300-1500	4,000 (f/300)	0.025	f/300
1500-100,000	20,000	0.125	f/1500

- NOTE: f = Frequency in megahertz (MHz)
 E² = Electric field strength squared
 H² = Magnetic field strength squared
 V²/m²= Volts squared per meter squared
 A²/m²= Amperes squared per meter squared
 mW/cm²= Milliwatts per centimeter squared

Note: *f* is frequency of emission. in MHz.

Western PCS II- Proposed Hawaii Kai PCS Site • Oahu- Hawaii
RFR.GROUND Calculation Methodology Determination by Computer of ANSI Compliance Conditions

The U.S. Congress has required of the FCC that it evaluate its actions for possible significant impact on the environment. In General Docket 79-144, the FCC adopted the American National Standards Institute Standard C95.1-1982, "American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 300 kHz to 100 GHz." The guidelines in this Standard are now applicable to all FCC-licensed broadcast stations. The most restrictive guideline is 1 mW/cm², applying at FM and VHF television frequencies; at UHF television and PCS telephone frequencies, the guideline increases with increasing frequency, up to 5 mW/cm², applying at microwave frequencies and above. The exposure guideline at AM frequencies is 100 mW/cm². Exposures are to be averaged over a six-minute period, allowing, for example, a two-minute exposure to fields three times the limit if the remainder of the six-minute period does not include any significant exposure.

The FCC Office of Science and Technology Bulletin No.65 (October 1985) gives the formula for calculating power density from an individual radiation source:

$$\text{power density } S = \frac{2.56 \times 1.64 \times 100 \times RFF^2 \times [0.4 \times VERP + AERP]}{4\pi D^2}, \text{ in mW/cm}^2,$$

where VERP = total peak visual ERP (all polarization's), in kilowatts, AERP = total aural ERP (all polarization's), in kilowatts.

RFF = relative field factor at the direction to the actual point of calculation, and D = distance from the center of radiation to the point of calculation, in meters.

The factor of 2.56 accounts for the increase in power density due to ground reflection, assuming a reflection coefficient of 1.6 (1.6 x 1.6 = 2.56). The factor of 1.64 is the gain of a half-wave dipole relative to an isotropic radiator. The factor of 0.4 converts peak visual ERP to an average RMS value; for FM and PCS stations, of course, the value of VERP is zero. The factor of 100 in the numerator converts to the desired units of power density.

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KALIHI VALLEY NEIGHBORHOOD BOARD NO. 16

c/o NEIGHBORHOOD COMMISSION • CITY HALL, ROOM 400 • HONOLULU, HAWAII 96813

REC
'96 SEP 24 P4:09
September 21, 1996

UFC. OF ENVIRONMENTAL
QUALITY CONTROL

Mr. Harvey Luke
Western PCS II
1100 Alakea Street
Honolulu, HI. 96813

Re: Burmeister Overpass Communication Site

Dear Mr. Luke:

On September 11, 1996 the Kalihi Valley Neighborhood Board #16 unanimously passed a motion which "recommends the State Department of Transportation issue a conditional use permit for the antennas. Should the antennas negatively impact the environment or the residents the antennas would be removed."

Since the 24 antennas would be used by Western PCS, Hawaiian Wireless, Primeco, DCR, Honolulu Cellular and GTE, the Board requested that the antenna built in the Kalaepaa Drive residential neighborhood by GTE be removed. A representative from GTE said he would "get back to the Board," but to date there has been no communication from GTE to the Board. There is grave concern regarding the proliferation of antenna sites in residential/preservation/conservation areas in Kalihi Valley.

The Board encourages and urges the State Department of Transportation and the City and County of Honolulu to establish procedures which do more than require "notification" to the community when an antenna is to be established in any area.

Sincerely,

Ms. Maryrose McClelland

Ms. Maryrose McClelland, Chair

cc: Michael, Amuro, State DOT
Donald Clegg, Analytical Planning Consultants, Inc.
Senator Norman Mizuguchi
Representative Dennis Arakaki
Councilmember Donna M. Kim
Councilmember Mufi Hanneman

State Office of Environmental Quality Control
Oahu's Neighborhood Board System-Established 1973
City and County of Honolulu-Department of Land Utilization

