Gulick Avenue Relief Sewer

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

RECEIVED
'98 JUL 31 P1:45
OFC. OF ENVIRONMENTAL QUALITY CONTROL

July 23, 1998

IDEC 98-143

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Suite 702
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Finding of No Significant Impact for the
Gulick Avenue Relief Sewer, Kalihi Stream Crossing
TMK: 1-3-17, 18, 24, to 26, Honolulu, Oahu, Hawaii

The Department of Design & Construction has reviewed the comments received during the 30-day public comment period which extended from April 8, 1998 to May 8, 1998. It has been determined that this project will not have any significant environmental effects and has issued a Finding of No Significant Impact (FONSI). Please publish the notice in the August 23, 1998 OEQC Environmental Notice. ✓

We have enclosed a completed OEQC Publication Form and four copies of the final Supplemental Environmental Assessment. If you have any questions, please feel free to contact Warren Yamamoto at 527-6872 or Henry Morita of Akinaka & Associates at 536-7721.

Very truly yours,

FOR RANDALL K. FUJIKI
Director

Encl.

87

1998-08-23-OA-FEA-Gulick Avenue Relief Sewer

DEPARTMENT OF WASTEWATER MANAGEMENT

CITY AND COUNTY OF HONOLULU

FINAL

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

FOR

GULICK AVENUE RELIEF SEWER

AT
KALIHI, HONOLULU, HAWAII
TMK: 1-3-17, 18, 24 TO 26

JULY 1998

PROPOSING AGENCY: DEPARTMENT OF DESIGN & CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET
HONOLULU, HAWAII

RESPONSIBLE OFFICIAL: _____ 7-27-98
FOR RANDALL K. FUJIKI Date
DIRECTOR

PREPARED BY: AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS
250 NORTH BERETANIA STREET, SUITE 300
HONOLULU, HAWAII 96817

THIS ENVIRONMENTAL DOCUMENT IS SUBMITTED PURSUANT TO CHAPTER 343, HRS

SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT
GULICK AVENUE RELIEF SEWER

TABLE OF CONTENTS

EXHIBITS

APPENDICES

I. INTRODUCTION

A. PROJECT DESCRIPTION

The proposed project involves relief of Gulick Avenue Sewers. The recommended alternative includes installation of relief sewer lines on: 1) Likelike Highway between Kono and Makuahine Streets, 2) Kalihi Street between Likelike Highway and Maliu Street and, 3) Makuahine Street from Likelike Highway to School Street. Rehabilitation and replacement of the existing lines in these areas are also recommended.

B. PROJECT LOCATION

EXHIBIT 1: LOCATION MAP shows the Project in Southern Oahu at the northern edge of Honolulu. The area is mainly residential with supporting neighborhood - commercial sections. The area is approaching full development as envisioned by the City & County's Primary Urban Center *Development Plan* (Development Plan).

New pipeline construction is shown on **EXHIBIT 2: VICINITY MAP**. Kalihi Stream crossing parallels Likelike Highway and will reside in the state highway right-of-way. Access to the site is from Likelike Highway and an abandoned asphalt concrete pathway for pedestrians. The pathway served as a route to pedestrian walkways under Likelike Highway Bridge which have been removed.

C. NEED FOR SUPPLEMENTAL EA

An Environmental Assessment (EA) was prepared for the Project and the Final EA/FONSI was published in the August 23, 1995 OEQC Bulletin. This EA included the plan to hang the new sewer line crossing Kalihi Stream on the existing Likelike Highway bridge. The plan has been revised due to calculations which revealed that the bridge cannot support the additional load.

Discussions within this Supplemental EA are limited to the Kalihi Stream crossing which is the only change within the Project. The discussions will cover existing conditions, environmental setting, alternatives and impacts.

II. DESCRIPTION OF PROPOSED PROJECT

A. BACKGROUND AND EXISTING CONDITIONS

The Project requires a sewer line crossing Kalihi Stream in the vicinity of Likelike Highway. The existing crossing is an inverted siphon at Kalihi Valley District Park. Inspections and capacity calculations indicated that the siphon and the downstream mains are undersized and in need of repairs. Narrow streets and dense residential facilities in the area do not promote traditional construction or improvements.

Likelike Highway crossing of Kalihi Stream consists of a cast-in-place concrete bridge with reinforced concrete piers on spreadfooting. The original construction (1953) included pedestrian walkways along the north and south abutments and outside the west girder. Subsequent bridge alterations included removal of the walkways and installation of concrete barrier railings.

Kalihi Stream at the crossing has been altered for the bridge construction, pedestrian walkway and drain installation. Drains consist of 30" pipe (south bank) and 42" (north bank) discharging into the stream. Wingwalls and CRM walls direct storm flows to the bridge and protect the adjacent lands. Trees, brush and grasses along the stream banks are described as "weeds and garden escapees" by the flora & fauna report (**APPENDIX A**).

B. VISUAL INSPECTIONS

Visual conditions at the stream crossing site are shown on the photographs of **EXHIBIT 3: SITE CONDITIONS.** The photographs were selected to show limited accessibility, bridge/channel improvements and overgrown conditions. Urban litter, debris, and graffiti were much in evidence at the site.

Surveys of the site were completed by Botanical Consultants (**APPENDIX A**) and AECOS, Inc. (**APPENDIX B**). As noted in Appendix A, the plant cover along the banks is dominated by mixed introduced vegetation. This vegetation can be described as weeds and garden escapees.

Appendix B concluded that none of the aquatic species observed during the survey are valuable or of concern from a preservation perspective. Most of that observed can be described as pest species which have been introduced to Hawaiian streams in the last several decades.

C. PROPOSED IMPROVEMENTS

A utility bridge is proposed for the sewer crossing of Kalihi Stream. This bridge will be constructed of reinforced concrete and solely dedicated to support the sewer pipeline. Bridge site plan and sections are included in this report as **EXHIBITS 4 & 5**.

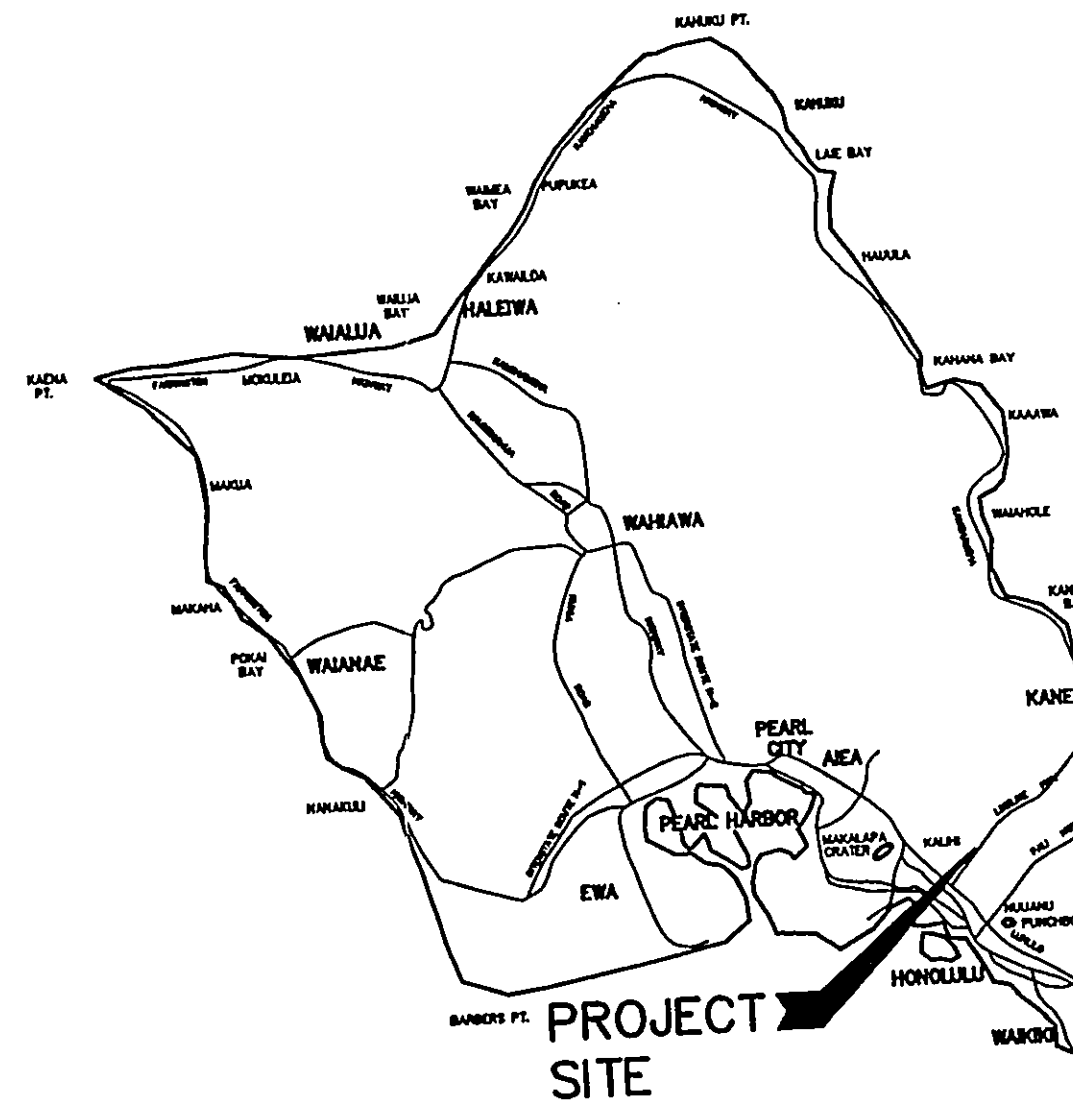
The new piers will follow the spacing and alignment of the existing piers. By conforming to the spacing and alignment, stream flow conditions will be maintained. Improvements such as channel lining may upset the downstream bed stability and will not be included. Alternate means to cross the stream are discussed in Section VI.

D. PROJECT FUNDING

The preliminary construction cost estimate for the entire Project is approximately $9.1 million of which $650,000 is the estimate for the crossing. Funding for this project will be provided by the City and County of Honolulu. Construction of the Project will not require direct assessments to the residents being served by the improvements.

FILE: ISLAND
SCALE: 1=1
BEG: 10/17/94

PM: HSM
OPER: BKM
REVISED: 10/17/94



GULICK AVENUE RELIEF SEWER

LOCATION MAP

AKINAKA & ASSOCIATES, LTD.

SCALE: AS SHOWN OCT. 1994

EXHIBIT 1

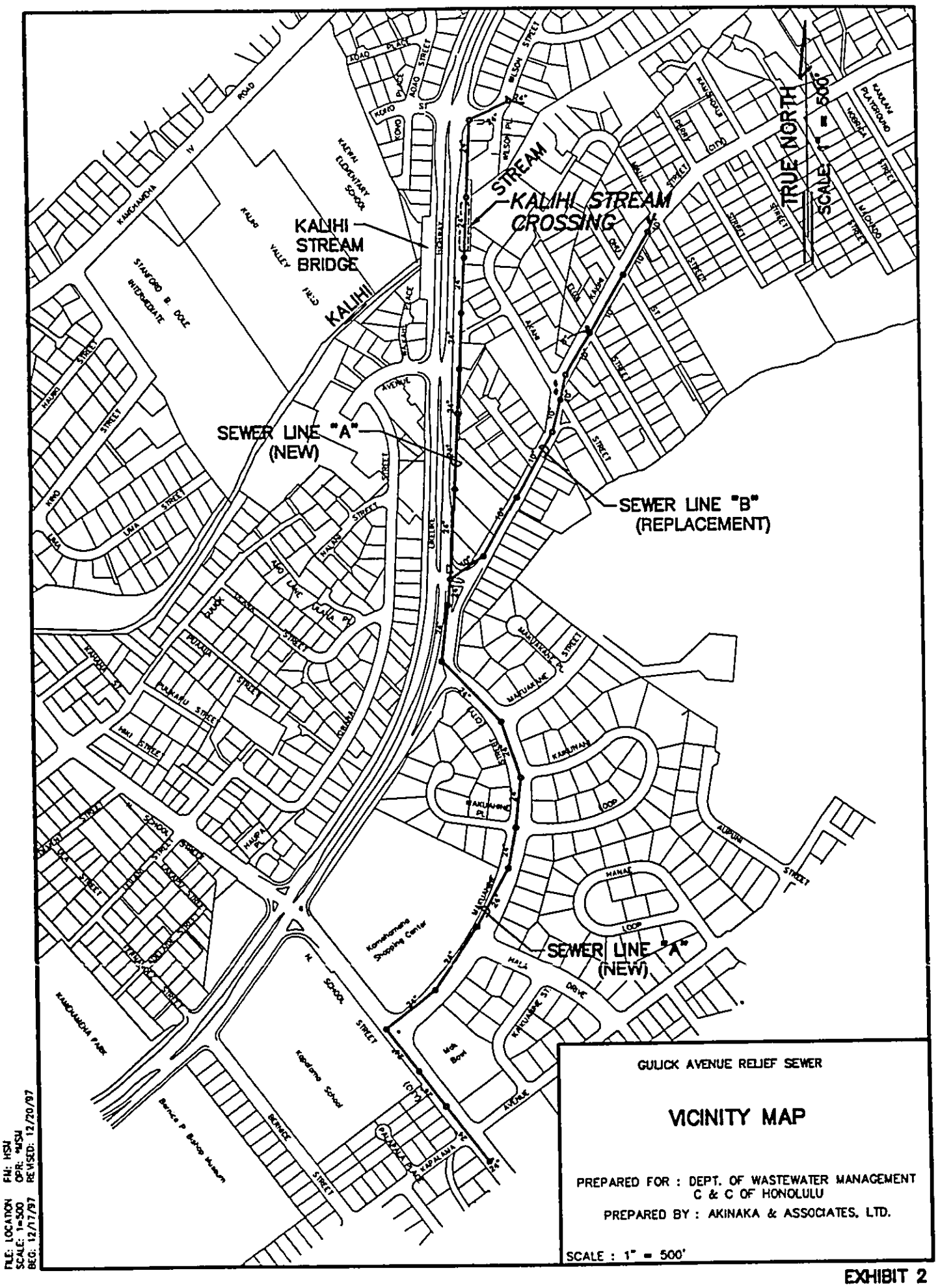
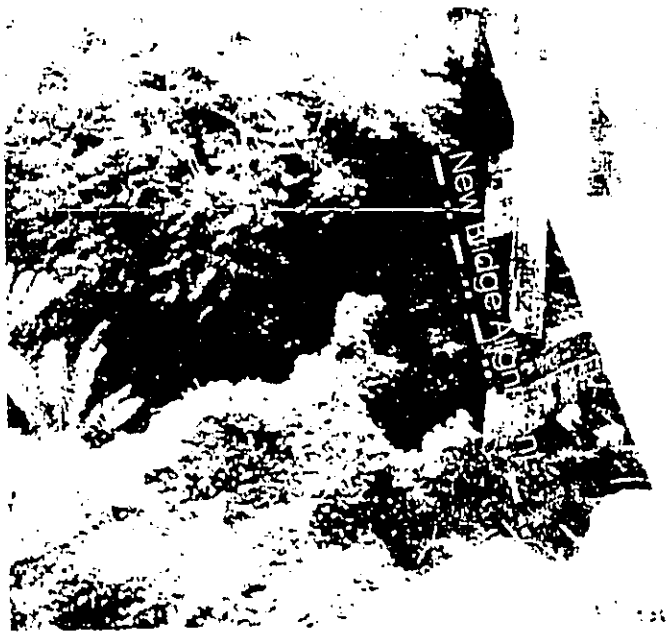

KALIHI STREAM BRIDGE
KALIHI STREAM CROSSING
SEWER LINE "A" (NEW)
SEWER LINE "B" (REPLACEMENT)
SEWER LINE "A" (NEW)
TRUE NORTH
SCALE 1" = 500'
KALIHI
STREAM
Kamehameha Shopping Center
Kapalama School
Bernice P. Bishop Museum
KAMEHAMEHA PARK
Stanford B. Dole Intermediate
Kalihi Elementary School
GULICK AVENUE RELIEF SEWER
VICINITY MAP
PREPARED FOR : DEPT. OF WASTEWATER MANAGEMENT
C & C OF HONOLULU
PREPARED BY : AKINAKA & ASSOCIATES, LTD.
SCALE : 1" = 500'
FILE: LOCATION FN: HSN
SCALE: 1=500 OPR: *HSN
REVISED: 12/20/97
BEG: 12/17/97

EXHIBIT 2



Kalihi Stream Crossing
(Likelike Highway)

Existing
Piers

Kalihi Stream Crossing
(Likelike Highway)

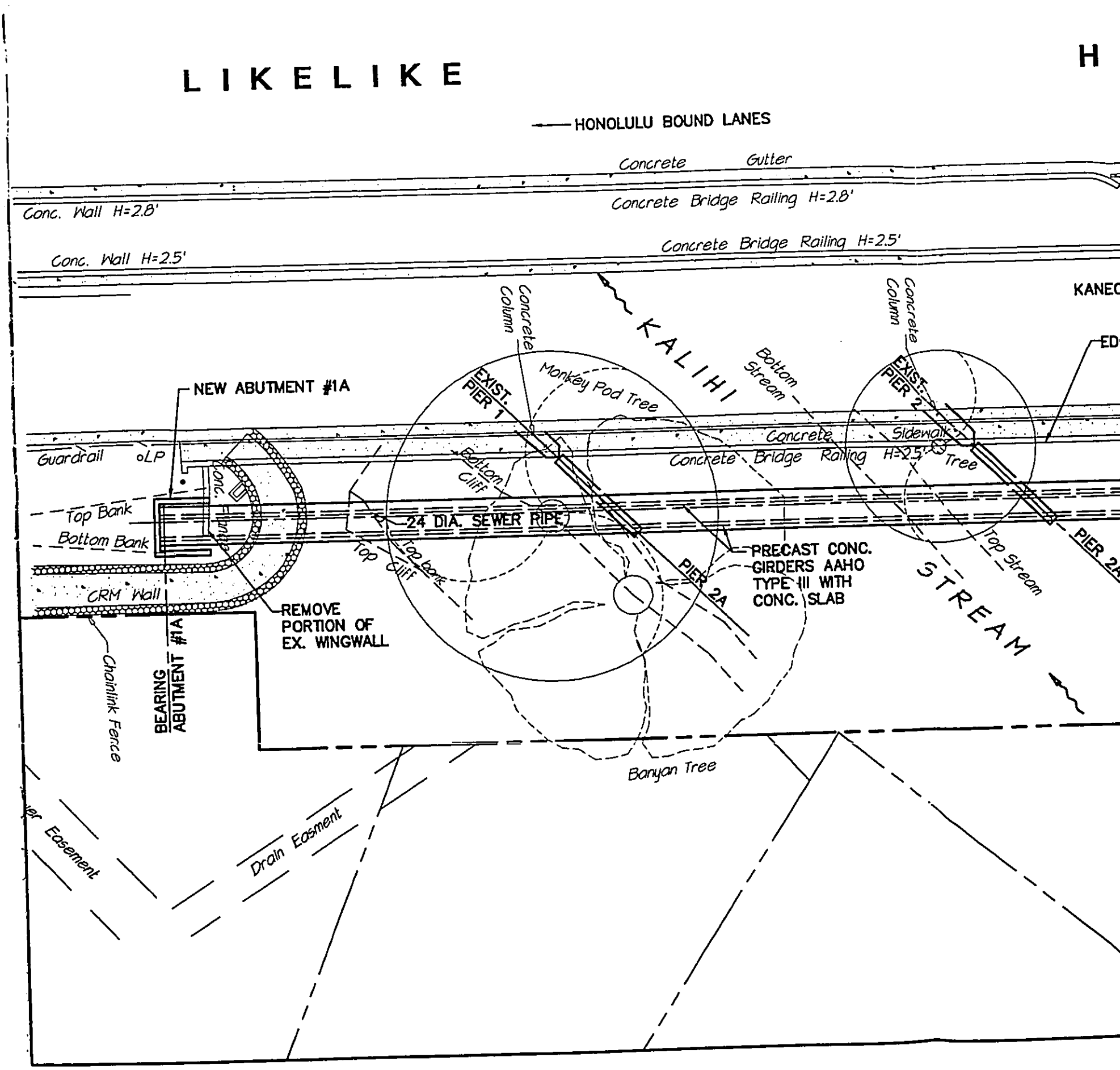
EXHIBIT 3

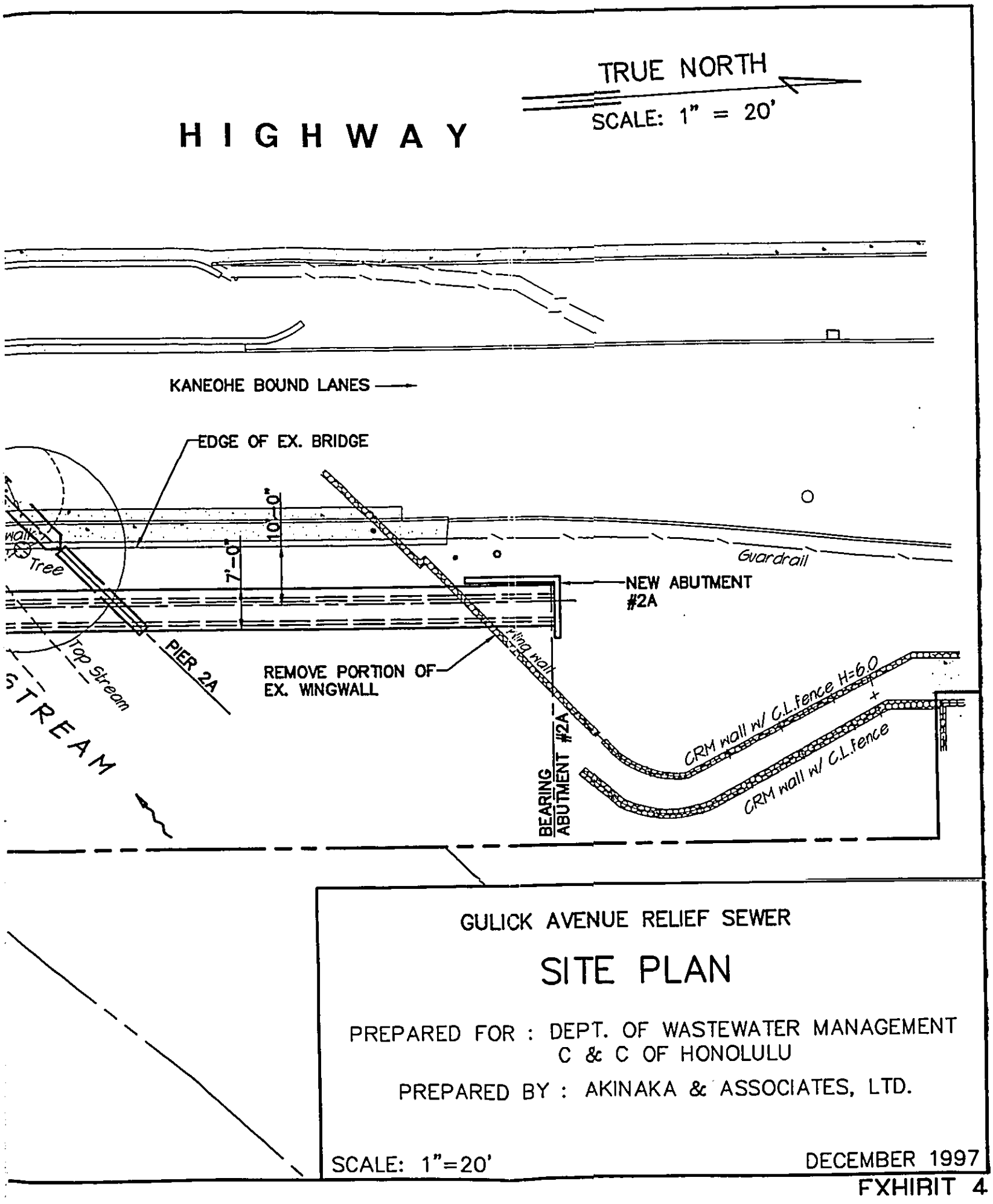
SITE CONDITION

Gulick Ave.
Relief Sewer
Supplemental E.A.

FILE: STREAM
SCALE: 1=400
BEG: 11/29/97

PM: HSM
OPR: RGQ,*MSM
REVISED: 12/20/97





GULICK AVENUE RELIEF SEWER

SITE PLAN

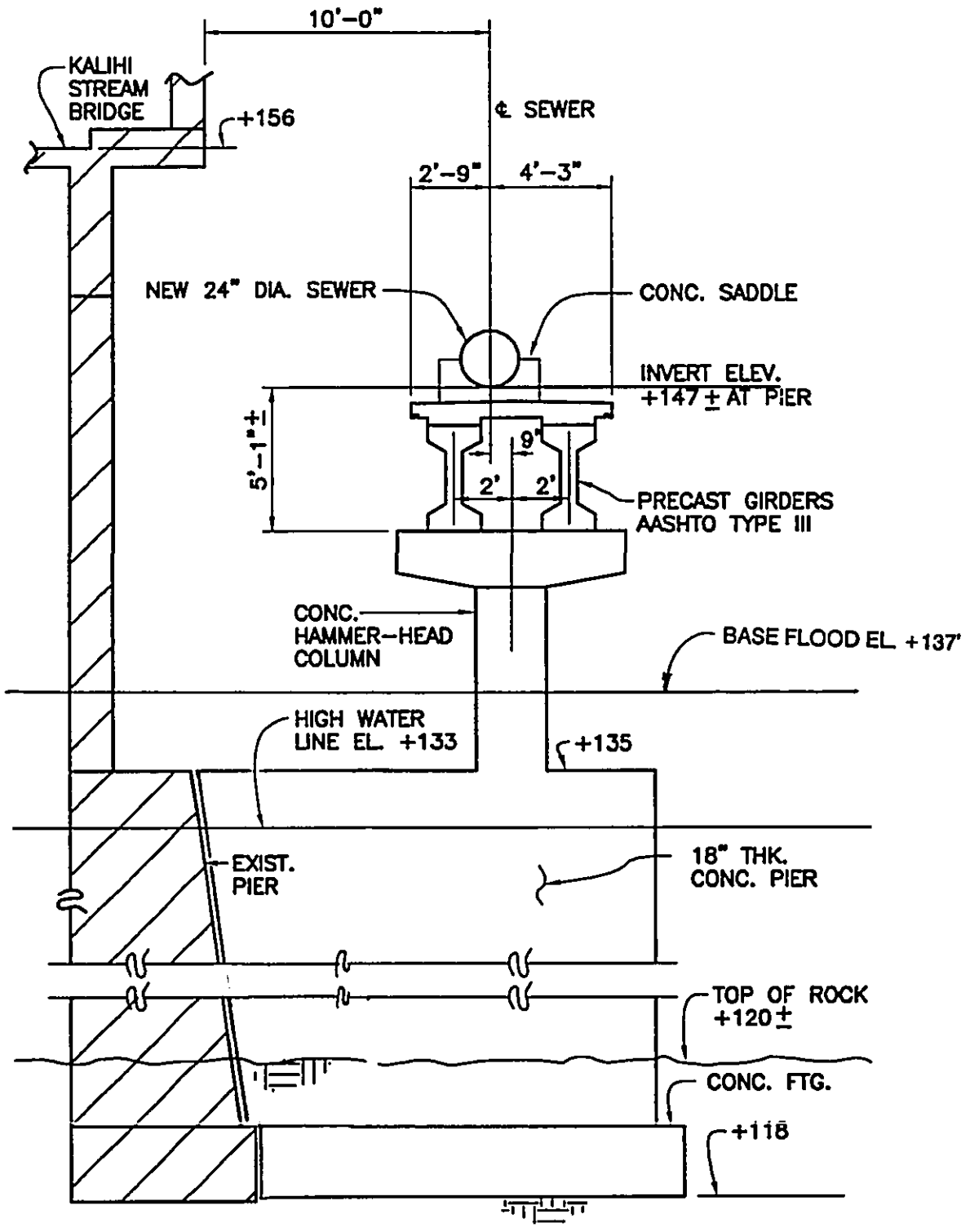
PREPARED FOR : DEPT. OF WASTEWATER MANAGEMENT
C & C OF HONOLULU

PREPARED BY : AKINAKA & ASSOCIATES, LTD.

SCALE: 1"=20'

DECEMBER 1997

EXHIBIT 4



BASE FLOOD ELEVATION
FROM FEMA FLOOD INSURANCE
STUDY, DATED SEPT. 28, 1990

GULICK AVENUE RELIEF SEWER

BRIDGE SECTION

PREPARED FOR : DEPT. OF WASTEWATER MANAGEMENT
C & C OF HONOLULU

PREPARED BY : AKINAKA & ASSOCIATES, LTD.

NOT TO SCALE DECEMBER 1997

FILE: SECT PM: BMG
SCALE: 1=1 OPER: BKM,RGQ,*MSM
BEG: 11/29/97 REVISED: 12/20/97

EXHIBIT 5

III. ENVIRONMENTAL SETTING

A. TOPOGRAPHY

Kalihi Stream is typical of upper valley streams in Hawaii with steep banks and mixed boulder/sediment stream bed. The stream width is about 30 feet wide with flowline gradient of approximately two percent.

B. GEOLOGY/SOILS

Borings for the highway bridge indicate that hard lava is overlain by approximately two feet of top soil or a loose mixture of gravel and small boulders. Additional borings will be scheduled for design of the utility bridge.

C. CLIMATE

The area has a mild subtropical climate with prevailing northeast trade winds. Mean annual temperature is 77°F. Occasional average temperatures in the lower seventies in January-February and slightly over 80°F during August-October. The mean annual rainfall averages 22.4 inches at the Honolulu International Airport. The mean annual precipitation at the Nuuanu Reservoir No. 4 is 124 inches. Heavy rains often occur during November-February, with only about 20 percent of the annual rainfall occurring in March-October.

D. BIOLOGY

There are no known endangered species of flora or fauna located within the project site. Due to the fully developed areas surrounding the project, construction of this project will have no impact on wildlife. Appendices A&B discuss observations of flora and fauna in the area.

E. AIR QUALITY

Although no information on air quality at the project site was obtained, it is observed that the air is relatively clear and low in pollution. This is because of the distance from the central business district and industries which produce noxious gases.

F. NOISE

Noise levels were not measured at the project site. The noise levels are basically normal residential activities and highway road traffic.

G. ARCHAEOLOGY

There are no identified historic or archaeologically significant locations located within the project site. However, should any unanticipated sites, artifacts or remains, such as shell, bone or charcoal deposits, be discovered during construction, the work would be halted and mitigating measures will be discussed with the State Historic Preservation Office prior to commencing construction activity.

H. FLOOD HAZARD

Construction of the stream crossing requires work within the Kalihi Stream flood way. The new piers will follow the spacing, alignment and thickness of the existing piers at Likelike Highway bridge. The Contractor must develop a plan to suspend work, remove material from the stream area and install protective measures during inclement weather conditions. Normal rainfall situations could be mitigated with silt screens but larger storms will require concrete barriers if construction is at an intermediate stage.

EXHIBIT 5 shows the base flood elevation obtained from the FEMA Flood Insurance Study dated 9/28/90. Floodway limits and base flood elevations are shown on **EXHIBIT 6: FLOOD LIMITS**. **EXHIBIT 6** indicates that the flood remains within the stream area.

I. STREAM WATER QUALITY

APPENDIX B includes a discussion on the stream's water quality with a tabulation of chemical characteristics. The tabulation suggests eutrophic conditions and sluggish waters. Nitrogen levels exceeded the water quality criteria of the State regulations.

IV. PROBABLE IMPACTS OF THE PROPOSED ACTION ON THE ENVIRONMENT

A. SHORT TERM IMPACTS

Short term impacts of the proposed project will be primarily due to construction. Use of construction equipment such as cranes, backhoes, trucks, and compactors will create noise, dust and exhaust emissions. The noise of the construction equipment will be minimized by placing mufflers on machinery, avoiding unnecessary "gunning" of equipment, and restricting construction activity during daylight hours.

Construction activities will partially interfere with the flow of vehicular traffic. Traffic control by off-duty Police Officers and/or trained construction flagmen will mitigate traffic congestion. Parking will be restricted on the highway during construction. Construction plans will be reviewed for coordination by all utility companies affected.

Presence of groundwater is not indicated on the borings for Likelike Highway Bridge. Recent borings by Fewell Geotechnical Engineering (1997) confirm the absence of groundwater in the project depths. Pumping and other dewatering operations may be required if surface water enters the excavation. Open excavations will be protected with sand bags if in proximity to the normal stream alignment. Use of detention ponds to control dewatering fluids will mitigate sediment propagation.

B. LONG TERM IMPACTS

There are no negative long term impacts from this portion of the sewer project. The crossing structure will be below the motorist view plane and is similar to the existing highway bridge. Adjacent trees will visually screen the proposed construction as shown in the photographs (**EXHIBIT 3**). Two of the trees that interfere with construction of the bridge will be removed. These trees are regularly trimmed back during highway maintenance.

When the Project is completed, sewer lines in vicinity of Gulick Avenue Extension (mauka of School Street) will be relieved and overflows should be eliminated.

V. ADVERSE IMPACTS WHICH CANNOT BE AVOIDED

The noise level will increase during the construction period. This effect will be of short duration, lasting only for the construction phase. The noise level can be reduced by the contractor by ensuring proper functioning of mufflers on all equipment, and conducting construction activity only during daylight hours, between 7:30 a.m. to 5:00 p.m. Actual construction schedule will be as allowed by the Department of Transportation, Division of Highways.

During construction, dust may be generated during pipe installation. The contractor will be required to comply with the procedures outlined by the Department of Health to mitigate the dust emission.

Traffic along the highway will be disrupted for short periods during delivery of material and installation of the concrete girders and sewer line.

Trees within the work site will be trimmed back and two trees removed to allow construction. Botanical surveys (**APPENDIX A**) confirm that the affected trees are not an endangered species. Trimming of the trees are a normal maintenance operation of the State Division of Highways.

Installation of the pier footings will require excavation within the stream floodway. Also, equipment and material will traverse the stream section in order to build the footings and piers. A Best Management Practice (BMP) procedure will be developed to mitigate any adverse impacts.

Social and economic impacts were addressed in the original EA.

VI. ALTERNATIVES TO THE PROPOSED ACTION

A. REINFORCING THE EXISTING BRIDGE

The existing bridge can be strengthened by adding columns mid-way between the existing piers. This method will affect the hydraulic conditions and increase the backwater levels. Also, the columns add another element to block the stream during high storm flows.

Another reinforcing method is to add a reinforced concrete jacket to the outside girder supported by additional columns on the existing pier alignment. The work to reinforce the outside girder is at least equivalent to constructing a new stream crossing since the footings must be expanded. Concerns of affecting the stability of the existing bridge must be included in the decision.

B. UNDER STREAM PROFILE

Placing the pipe under the stream can be accomplished by tunneling, horizontal drilling or trench excavation. Microtunneling will be specified for other sections of the Project and therefore an attractive alternate construction method. The sewer profile, geology and available work space do not allow use of microtunneling in this situation.

Horizontal directional drilling (HDD) is also a means to place the pipe under the stream by tunneling. Plans were reviewed by HDD contractors for applicability of this technology. Due to the size of the pipeline (24" I.D.) and geology (hard lava & boulders), the consensus was that HDD is not appropriate due to the vertical alignment and geology (stones).

Installation by trench excavation was the normal means of construction in the past. For inverted siphons, three pipe lines were installed for various levels of flow. Extensive excavation will be required for the pipelines and concrete encasement. Concrete grouted rock paving is required on the stream bank to prevent erosion. Inverted siphons require increased maintenance and have a higher potential for blockage and resultant sewage spills. Cost for the inverted siphon construction is equivalent to the stream crossing structure.

C. NO ACTION ALTERNATIVE

The "no action" alternate is not practical as inspections have shown that the existing sewer systems are deteriorated and should be repaired. Studies (Preliminary Engineering Report, Islandwide Sewer Adequacy Project) have also shown that the sewer system is undersized at several locations.

VII. RELATIONSHIP BETWEEN LOCAL SHORT TERM USES AND MAINTENANCE AND ENHANCEMENT OF LONG TERM PRODUCTIVITY

The short term use of the utility bridge is the same as its long term use - transport sewer flows across Kalihi Stream. The proposed action, if implemented, will enable the City and County of Honolulu to meet the sewer demands of the Development Plans projected land use.

The proposed action will not involve trade-offs between short-term uses, foreclose future options, narrow the range of beneficial use of the environment, nor pose long-term risks to health and safety.

VIII. MITIGATING MEASURES TO MINIMIZE ADVERSE IMPACTS

The short term impacts occurring during the construction work will be minimized by applying current techniques and methods. In addition, restrictions of operational hours will minimize noise impacts to the adjoining area.

To minimize pollutant emissions from internal construction engines, the contractor will be responsible for proper maintenance of all construction equipment and vehicles.

The contractor will be required to comply with Department of Health regulations to mitigate dust emission. Dust is not anticipated to be a problem due to the rocky nature of the native material. Dust problems can be mitigated by use of an appropriate water sprinkling method and limiting the area being worked at any one time.

Traffic control by off-duty Police Officers and/or trained construction flagmen will moderate traffic congestion.

Best Management Practices (BMP) to minimize water quality impacts include:

1. Minimize area of clear and grubbing. Since the stream bed is mainly stone and cobbles, the disturbed material will not generate high levels of sediments.

2. Minimize dewatering of excavation. Leak resistant forms and berms will reduce water from entering the excavation.

3. Use of detention ponds. A detention pond located away from low flows could be used if dewatering is required. Also, construction of the initial pier could use the excavated area of the second pier as a detention pond.

4. Disposal of excavated material outside the floodway limits will prevent generation of sediment. The existing material to be excavated is mainly hard rock, therefore high levels of sediments are not expected.

5. Use of silt fences downstream from the work area may be required if the excavated material does not conform to the boring logs.

IX. IRREVERSIBLE AND IRRETRIEVABLE COMMITMENTS OF RESOURCES

The construction of the proposed project would involve the commitment of certain natural and fiscal resources. The commitment of construction materials, manpower, and energy are mostly unrenewable and irretrievable. The impacts of using these resources should, however, be weighed against the benefits to the residents of Kalihi who will not experience future sewage overflows and benefit from non-degradation of water quality and public health. There will be no loss of any natural or cultural resources.

X. DETERMINATION

Based on the preceding paragraphs, it is anticipated that the proposed action will result in no significant adverse impacts other than those described in this assessment. Consequently, a finding of no significant impact (FONSI) is recommended and therefore, an Environmental Impact Statement would not be required.

XI. REASONS SUPPORTING RECOMMENDED DETERMINATION

A. The proposed action does not involve an irrevocable commitment or loss of or destruction of any natural or cultural resource:

There are no natural or cultural resources associated with the project site. Development of the project area has substantially altered the site from its natural condition.

B. The proposed action does not curtail the range of beneficial uses of the environment:

The proposed project is consistent with the County's General Plan and the Department of Wastewater Managements planning standards and would not curtail beneficial uses of the environment in the area. The proposed project will be compatible with the uses of the surrounding area.

C. The proposed action is in concert with the State's long-term environmental policies, goals and guidelines as expressed in Chapter 343, HRS, and any revisions and amendments thereto, court decisions and executive orders:

The proposed project is consistent with the State's Land Use Plan which is in concert with all applicable policies, goals and guidelines. No long-term environmental conflicts are foreseen.

D. The proposed action does not substantially affect the economic or social welfare of the community or State:

The economic impact will be affected by the short-term, construction related activities. Cash infusion during the construction phase will be the primary short-term economic impact. Upon completion of the project, the economic situation should return to the existing condition.

E. The proposed action does not involve substantial secondary impacts, such as population changes or effects on public facilities:

The proposed project will not directly result in an increase of population in the area but the project will eliminate restriction to growth due to the inadequacy of the existing system. The proposed project will allow development of lands in conformance with the existing Development plan.

F. The proposed action does not substantially affect public health:

Only the short-term impacts have potential for affecting public health. Construction activities will be regulated to minimize noise, dust and exhaust emissions.

G. The proposed action does not involve a substantial degradation of environmental quality:

The existing physical aspects of the surrounding area will be preserved.

H. The proposed action is individually limited and cumulatively, does not have a considerable effect upon the environment or involve a commitment for larger actions:

The proposed action, either individually or cumulatively, will not have a considerable effect on the environment, nor will it involve a commitment to larger actions.

I. The proposed action does not substantially affect rare, threatened or endangered species or habitats:

There are no known rare, threatened or endangered species or habitat associated with the project site. **(See APPENDIX A & B)**

J. The proposed action does not detrimentally affect air or water quality or ambient noise levels:

Short-term impacts on air and water quality, as well as noise, may occur during the construction period, but will be mitigated by normal construction practices and will be regulated by the project plans and specifications.

K. The proposed action does not affect an environmentally sensitive area such as a tsunami zone, erosion-prone area, geologically hazardous land, estuary or coastal waters.

The proposed project is not located in an environmentally sensitive area. The project is not located within a tsunami zone. The project is not located on unique geologically hazardous lands. It is also not expected to have any significant adverse impacts on fresh or coastal waters. Affects to the flood plain will be mitigated by adopting a BMP procedure.

L. The proposed action does not substantially affect scenic vistas and view planes identified in County of State plans or studies.

The top of the stream crossing structure will be seven feet below the adjacent highway bridge pavement level. A solid concrete barrier on the highway bridge screens the proposed structure from vehicular passengers. Trees within the stream and along the bank blocks the view of the structure from residents on the easterly side of Likelike Highway.

M. The proposed action does not require substantial energy consumption.

Energy consumption is limited to the construction effort. The system is a collector sewer and will operate by gravity.

XII. LIST OF NECESSARY REVIEW/APPROVALS (KALIHI STREAM CROSSING)

A. STATE OF HAWAII

1. Department of Health

   a. Community Noise Permit for Construction Activities

   b. Air Quality-Authority to Construct Permit and Permit to Operate

   c. Construction Plan Approval

   d. NPDES Permits

      (1) Construction Dewatering
      (2) Hydrotesting Disposal

2. Department of Transportation

   a. Construction plan approval

   b. State Highway - Permit to Perform Works

3. Department of Land & Natural Resources

   a. Permit for Stream Channel Alteration and Diversions

   b. Historic Site Review

B. CITY & COUNTY OF HONOLULU

1. Building Department

   a. Building Permit for Building, Electrical, Plumbing

XIII. ORGANIZATIONS AND PERSONS CONTACTED DURING ORIGINAL EA

A. ORIGINAL ENVIRONMENTAL ASSESSMENT

1. STATE OF HAWAII

a. Department of Accounting and General Services

b. Department of Business, Economic Development and Tourism

c. Department of Education

d. Department of Land and Natural Resources

e. Department of Transportation

f. State Historic Preservation Division

g. Department of Health

h. University of Hawaii

i. American Lung Association

2. CITY AND COUNTY OF HONOLULU

a. Board of Water Supply

b. Building Department

c. Department of Land Utilization

d. Department of Public Works

e. Department of Transportation Services

f. Police Department

g. Fire Department

3. FEDERAL

   a. U.S. Army Corps of Engineers

4. OTHERS

   a. AT&T Company

   b. Gasco, Inc.

   c. Hawaiian Electric Company, Inc.

   d. Oceanic Cable

   e. GTE Hawaiian Tel

   f. Kalihi Neighborhood Board

   g. Kamehameha Shopping Center

   h. Outdoor Circle
   1314 So. King Street, Suite 306
   Honolulu, HI. 96814

   i. Neighborhood Association

B. SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT

1. STATE OF HAWAII

   a. Department of Land & Natural Resources

   b. Department of Transportation

   c. Department of Health

   d. University of Hawaii

   e. Elected Officials (Senator, Representative)

2. CITY AND COUNTY OF HONOLULU

   a. Building Department

   b. Department of Land Utilization

   c. Fire Department

   d. Police Department

   e. Council Person

3. FEDERAL

   a. U.S. Army Corps of Engineers

   b. U.S. Fish and Wildlife Service

4. OTHERS

   a. Kalihi Neighborhood Board

   b. Outdoor Circle

   c. Neighborhood Associates

XIV. BIBLIOGRAPHY

A. Design Standards of the Dept.. of Wastewater Management, Volume 1 (Feb. 1984) & Volume 2 (Jul. 1984), Dept. of Public Works, City and County of Honolulu.

B. Standard Details for Public Works Construction, City and County of Honolulu, September 1984.

C. Standard Specifications for Public Works Construction, City and County of Honolulu, September 1986.

D. Islandwide Sewer Adequacy Study (Hart Street Area), City & County of Honolulu, Dept. of Public Works, Dept.. of Wastewater Management, Park Engineering, September 1990.

E. State of Hawaii, Department of Business, Economic Development & Tourism, The State of Hawaii Data Book, 1990: A Statistical Abstract, 1987.

FLORA AND FAUNA SURVEY REPORT FOR THE PROPOSED GULICK AVENUE RELIEF SEWER LINE

FOR
AKINAKA & ASSOCIATES, LTD.
CONSULTING ENGINEERS
250 BERETANIA STREET, SUITE 300
HONOLULU, HAWAII 96817-4716

BY
EVANGELINE J. FUNK, PH.D.
BOTANICAL CONSULTANTS
HONOLULU, HAWAII 96835
1997

APPENDIX A

TABLE OF CONTENTS

INTRODUCTION

The proposed Gulick Avenue Relief Sewer will be constructed in a mostly urbanized area. At the proposed crossing of Kalihi Stream near Likelike Highway is the only place where the line will cross undeveloped terrain. Flora and fauna surveys of the undeveloped area, one-hundred feet above and one-hundred feet below the Likelike Highway bridge, were conducted in June 1997. The purpose of these surveys was to discover what plants and animals inhabit the site, to describe the vegetation, and to determine if any proposed or listed threatened or endangered species are present in the area. The results of the botanical survey will be presented first followed by the results of the fauna survey.

BOTANICAL HISTORY

At least six negative declarations for projects in Kalihi Valley have been prepared in the last ten years. The most complete study results are contained in the Board of Water Supply (1990) environmental assessment for an exploratory well in Kalihi Valley. In this document the vegetation of the site is summarized as the "the flora of the site consists mostly of bamboo and hau trees with a ground cover of bamboo leaves and rose apple seedlings".

Other documents, Dept. of Education (1989), Terry W. Hay (1989), and Dept. of Parks and Recreation (1997) either declared there would be no impact on the environment or noted that only introduced weeds would be disturbed. The declarations are not surprising in view of the fact that Kalihi Valley has been urbanized for many, many years.

METHODS

In June 1997 a two person team of environmental scientists carried out a reconnaissance of a two hundred foot segment of Kalihi Stream banks just above and just below the Likelike Highway bridge. Both sides of the stream were surveyed and the results of those surveys are presented here.

RESULTS

The plant cover along the banks of Kalihi Stream in the vicinity of Likelike Highway bridge is dominated by Mixed Introduced Vegetation. At the top of the banks, near the houses, there are large planted trees including monkey pods (*Samanea saman* (Jacq.) Merr.), banyans (*Ficus microcarpa* and *F. benjamina* L.), 'opiuma (*Pithecellobium dulce* (Roxb.) Benth), mango (*Mangifera indica* L.), and horseradish tree (*Moringa oleifera* Lam.), among others. The understory is elephant grass (*Pennisetum purpureum* Schumach.), Guinea grass (*Panicum maximum* Jacq.), and some large invasive vines. The most notable of the vines is ivory nut gourd (*Coccinia grandis* (L.) Voigt), Balsam pear (*Mommordica charantia* L.), and the big, white morning glory, koali pehu (*Ipomoea alba* L.). At the edges of the stream can be found large patches of *Ruellia brittoniana* E. Leonard. In summary, the vegetation along this portion of Kalihi Stream can be described as weeds and garden escapees. No irreparable damage will be done if this vegetation is disturbed.

ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), are known from lower Kalihi Stream.

SPECIES LIST

The plant families in the following species list have been alphabetically arranged within two groups, Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and nomenclature follow that of Neal (1965), Wagner, Herbst and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to The Hawaiian Islands since Cook or by the aborigines.
2. The scientific name.
3. The Hawaiian name and or the most widely used common name.
4. Abundance ratings are for this site only and they have the following meanings:

   Uncommon = a plant that was found less than five times.

   Occasional = a plant that was found between five to ten times.

   Common = a plant considered an important part of the vegetation.

   Locally abundant = plants found in large numbers over a limited area, for example the plants found in grassy patches.

This species list is the result of an extensive survey of this site during the dry season (June 1997) and it reflects the vegetative composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.

Scientific Name	Common Name	Abundance
MONOCOTYLEDONES		
ARACEAE - Aroid Family		
**Epipremnum pinnatum* (L.) Engl.	Golden pothos	Common
**Dieffenbachia picta* Schott	Dumb cane	Occasional
**Syngonium auritum* (L.) Schott.	Syngonium	Common
ARECACEAE - Palm Family		
**Areca catchu* L.	Betel-nut palm	Rare
**Cocos nucifera* L.	Coconut	Rare
COMMELINACEAE - Spiderwort Family		
**Commelina diffusa* N. L. Burm.	Honohono grass	Locally abundant
CYPERACEAE - Sedge Family		
**Cyperus alternifolius* L.	'Ahu'awa haole	Occasional
MUSACEAE - Banana Family		
**Musa x paradisiaca* L.	Banana	Uncommon
POACEAE - Grass Family		
**Brachiaria mutica* (Forssk.) Stapf.		California grass Locally abundant
**Cenchrus ciliaris* L.	Buffelgrass	Common
**Chloris barbata* (L.) Sw.	Swollen fingergrass	Occasional
**Cynodon dactylon* (L.) Pers.	Bermuda grass	Locally abundant
**Digitaria insularis* (L.) Mez ex Ekman	Sourgrass	Uncommon
**Panicum maximum* Jacq.	Guinea grass	Common
**Paspalum conjugatum* Bergius	Hilo grass	Locally abundant
**Paspalum urvillei* Stend.	Vasey grass	Occasional
**Pennisetum purpureum* Schumach.	Elephant grass	Common
**Setaria palmifolia* (J. Konig) Stapf.	Palmgrass	Occasional
**Sorghum halpense* (L.) Pers.	Johnson grass	Common
DICOTYLEDONES		
ACANTHACEAE - Acanthus Family		
**Asystasia gangetica* (L.) T. Anders	Chinese violet	Common
**Barleria cristata* L.	Philippine violet	Occasional
**Ruellia brittoniana* E. Leonard		Common
**Thunbergia* sp.		Uncommon

Scientific Name	Common Name	Abundance
AMARANTHACEAE - Amaranth Family		
**Amaranthus viridis* L.	Slender amaranth	Occasional
ANACARDIACEAE - Mango Family		
**Mangifera indica* L.	Mango	Uncommon
ASTERACEAE - Sunflower Family		
**Wedelia trilobata* (L.) Cass.	Wedelia	Occasional
**Synedrella nodiflora* (L.) Gaertn.	Nodeweed	Occasional
BIGNONIACEAE - Bignonia Family		
**Spathodea campanulata* P. Beauv.	African tulip	Occasional
CONVOLVULACEAE - Morning glory Family		
**Ipomoea alba* L.	Moon flower	Common
**Ipomoea cairica* (L.) Sweet	Koali 'ai	Occasional
**Ipomoea obscura* (L.) Ker-Gawl		Uncommon
CUCURBITACEAE - Cucumber Family		
**Coccinia grandis* (L.) Voight	Scarlet gourd	Occasional
**Momordica charantia* Crantz	Balsam apple	Common
EUPHORBIACEAE - Spurge Family		
**Aleurites moluccana* (L.) Willd.	Kukui	Occasional
**Ricinus cummunis* L.	Castor bean	Occasional
FABACEAE - Bean Family		
**Leucaena leucocephala* Lam deWit	Koa-haole	Common
**Phaseolus* sp.	Bean	Uncommon
**Pithecellobium dulce* (Roxb.) Benth	'Opiuma	Occasional
**Samanea saman* (Jacq.) Merr.	Monkey pod	Occasional
**Senna pendula* (Humb. & Bonpl. ex Willd.)		Common
MORACEAE - Fig Family		
**Ficus benjamina* L.	Weeping fig	Uncommon
**Ficus microcarpa* L. fil.	Chinese banyan	Uncommon
MORINGACEAE - Moringa Family		
**Moringa oleifera* Lam.	Horse-radish tree	Occasional

Scientific Name	Common Name	Abundance
MYRTACEAE - Myrtle Family		
**Syzygium cumini* (L.) Skeels	Java plum	Common
PHYTOLACCACEAE - Pokeweed Family		
**Rivina humilis* L.	Coral berry	Common
PORTULACACEAE - Purslane Family		
**Portulaca oleracea* L.	Pigweed	Occasional
RUBIACEAE - Coffee Family		
**Paederia scandens* (Lour.(Merr.	Maile pilau	Common
RUTACEAE - Rue Family		
**Murraya paniculata* (L.) Jack	Mock orange	Occasional
ULMACEAE - Elm Family		
**Trema orientalis* (L.) Blume	Gunpowder tree	Uncommon

FAUNA SURVEY REPORT

INTRODUCTION AND METHODS

This report summarizes the results of a fauna survey of the proposed Gulick Avenue Relief Sewer Line site, Honolulu, Hawaii which was conducted in June 1997. Because this area has been used for various human activities and the vegetation has been greatly altered, there is very little or no habitat for native birds. It does, however, offer abundant resources for many introduced, seed and fruit eating bird species. Three fixed station observation points (20 minutes at each station), one approximately one-hundred feet above the Likelike Highway bridge, one one-hundred feet below the bridge, and one on the bridge were used to collect data on the faunal activities at this site. Observations were made during early daylight hours in order to take advantage of the higher activity levels of both birds and mammals during cooler parts of the day. No nighttime observations were made.

RESULTS

Mammals - No mammal species were found during the survey. However, one dead cat *Felis catus*, was found along the stream. This carcass may of been dumped here or it may have washed in. No live cats were seen although they undoubtedly use the area.

Most urban and agricultural sites in the Hawaiian Islands may be considered to support rodent populations of varying sizes. During the survey the cucumber-like fruit of the ivory nut gourd and balsam apple were found to have been gnawed by both large and small rodents. We therefore assume that both the ubiquitous house mouse (*Mus musculus*) and at least one species of rat, most likely the black rat (also known as the roof, house, or ship rat) (*Rattus rattus*), inhabit this area.

Birds - Although the entire site has been extensively modified it does support a variety of non-native species. Most of the bird observation stations were in open areas where large numbers of ground feeding birds congregate or near large trees and

shrubs which provide resting places. The observation station on the bridge gave an overview of the site.

Nine species of introduced birds were found on this site. No native, indigenous, or migratory birds were seen at site. All of the bird species found during the survey are listed below. The annotated checklist follows the nomenclature of Pratt, Bruner and Berrett (1987).

SPECIES LIST

Family Passeridae: Old World Sparrows

Passer domesticus (House sparrow)

House sparrows are sometimes called feathered mice. These streaky brown and gray birds are a familiar commensal species and were seen on powerlines and in the open grassy area near the school. They appear to flock with the chestnut mannikins.

Family Emberizidae: Emberizine Finches

Cardinalis cardinalis (Northern cardinal)

Northern cardinals, both males and females were seen in the big trees and shrubs above the stream in low numbers. The bright red coloring of the male bird make him easily recognizable. The call of these birds is very distinctive.

Family Columbidae: Pigeons and Doves

Streptopelia chinensis (Spotted Dove)

The spotted dove is a large bird which is grayish brown with rosy blushed breast feathers. At the sides and back of the neck is a patch of black with white spots. The spotted dove was seen on powerlines, in the open, mowed school yard, and in trees above the stream.

Geopelia striata (Zebra Dove)

This ground dwelling, seed eating dove is smaller and often more abundant than the spotted dove. Zebra doves were very common on this site. They were seen on the open play ground, on the fence above the stream, powerlines, and in trees.

Family Sturnidae: Starlings and Mynas

Acridotheres tristis (Common Myna)

The ubiquitous myna is a plump, brown bird with a black head and tail. It has a white belly, tail tip and wing patches, and bright yellow legs, feet, bill, and eye liners. Mynas were seen in the trees, on lawns, in the parking lot of the school, and on the powerlines.

Family Pycnonotidae: Bulbuls

Pycnonotus cafer (Red-vented bulbul)

Large, raucous birds, red-vented bulbuls were seen in the trees, on fences, and in open school yard. Bulbuls are conspicuous for their noisy call and the bright red feathers beneath their tails. Primarily fruit eaters, the bulbuls appeared to be also feeding on insects, the small fruit of the banyan trees and the ivory nut gourd vine.

Family Estrildidae: Waxbills, Mannikins, and Parrotfinches

Lonchura malacca (Chestnut Mannikin)

These tiny, dark brown finches were seen in the open, mowed playground with mynas, and sparrows.

Padda oryzivora (Java sparrow)

Several of these tiny, brightly colored birds were seen in the haole koa bushes near the bridge and the school yard.

Family Zosteropidae: White-eyes

Zosterops japonicus (Japanese white-eye)

These small greenish birds with white eyes and pale bellies are very hard to see as they flit about among the trees. They give themselves away by their constant twittering. Many white-eyes inhabit the trees that line the upper bank of the stream.

ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543), or State of Hawaii listed species were found on or around the proposed Gulick Avenue Relief Sewer site.

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FAUNA SURVEY

FOR LOWER KALIHI STREAM AT THE LIKELIKE HIGHWAY

ISLAND OF O'AHU, HAWAI'I

BY
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JULY 1997

APPENDIX B

Fauna survey for lower Kalihi Stream at the Likelike Highway, Island of O'ahu, Hawai'i

July 14, 1997

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Introduction

In order to span Kalihi Stream with a new sewer line at Likelike Highway it has been proposed that supports (pillars) be added as extensions to the mauka (upstream) side of the existing bridge supports for northbound traffic lanes of the highway. The existing supports are within the banks of Kalihi Stream (within the Ordinary High Water Mark or OHWM). This report considers aquatic environments in the vicinity of the bridge and assesses the potential impacts of the proposed project on aquatic resources in Kalihi Stream.

Methods

A reconnaissance survey of Kalihi Stream beneath the Likelike Highway viaducts was conducted on June 17, 1997. Weather at the time was 70-80% cloud cover with very light showers moving from mauka to makai (Tradewinds). Water clarity was high and intervals of clear skies were sufficient to produce good to excellent viewing conditions in the stream despite the rain. Visual observations were combined with net sweeps to develop a semi-quantitative listing of the aquatic and riparian biota. Only macrobiota were assessed

Water samples were collected and *in situ* measurements of temperature and dissolved oxygen made to support a general characterization of the stream environment and the NPDES dewatering permit application process (see *AECOS*, 1997). Reported here are the basic water quality results. Table 1 presents information on analytical methods used.

General Description

Kalihi Stream under the Likelike Highway viaducts is confined in a natural stream bed with steep banks, consisting of fill material on the right bank and basalt outcrop on the left. Upstream of the viaducts and underneath them, stream width is on the order of 10

m (32 ft). Here the stream bed is mixed boulders, with sediment dominated by coarse sand to gravel, but containing some silt. Boulders are worn, but not strongly rounded, suggesting the source is basalt outcrops along the left bank. Stream depths are mostly on the order of 0.1 to 0.2 m (0.3 to 0.6 ft) in this area. Some 20 m (64 ft) upstream, occurs a series of deeper pools separated by low outcrops of smooth, dense basalt. The bottoms of these pools is layered with sand. Depths in the pools exceed 0.6 m (2 ft) in some places. Downstream from the viaduct, the stream channel narrows to about 4 m (13 ft) across, with large boulders more evident in the stream bed, and banks which are steep and high. Stream runs and pools are deeper than under the bridge spans: 0.5 to 0.7 m (1.6 to 2.3 ft).

Table 1. Analytical methods and instruments used in testing water from Kalihi Stream at Likelike Highway, June 17, 1997.

Analysis List	Method	Reference	Instrument
pH	EPA 150.1	EPA (1979)	Orion SA 250 pH meter
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI meter model 55
Temperature	EPA 170.1	EPA (1979)	YSI meter model 55, thermister calibrated to NBS certified thermometer
Conductivity	Method 2510B (EPA 120.1)	Standard Methods 18th Edition (1992)	Hydach pH/conductivity meter
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992)	Turner nephelometer
Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992)	Mettler H31 balance
Ammonia	alkaline phenol	Koroleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Nitrate + nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
Total Nitrogen	persulfate digestion /EPA 353.2	D'Elia et al. (1977)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion /EPA 365.1	EPA (1993)	Technicon AutoAnalyzer II

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In all, the physical environment at this location is of moderate quality, marred only by the considerable amounts of litter in the stream bed. An area of long term (although perhaps not recent) dumping down the steep slope of the ravine above the left bank accounts for some of the man-made debris in the stream, although material moving

downstream from urban Kalihi Valley, and litter from the highway, probably contributes much more.

Biota

Aquatic organisms orbserved or reported living in Kalihi Stream are given in Table 2. In June 1997, most abundant in the stream under the Likelike Highway bridges were the guppy or rainbowfish (*Poecilia reticulata*), armored catfish (*Hypostomus* sp.), and a melanid snail (*Tarebia granifera*). Young catfish were very abundant in shallows along the margins of the stream, and schools of adults were plentiful in the pools upstream of the bridge. Downstream from Likelike Highway, where the stream bed narrows and water flow is fast through moderately deep pools, swordtail (*Xiphophorus helleri*) is the most abundant fish.

Other aquatic species observed, although generally uncommon at the time of the survey, were American swamp crayfish (*Procambarus clarki*) and tadpoles of American bullfrog (*Rana catesbeiana*). A snail (Lymnaeidae) was collected in the small drainage structure entering on the right bank immediately downstream of the highway bridges. This intermittent drainage skirts along the mauka boundary of Kaewae Elementary School.

Table 2. Checklist of aquatic animals found or reported from Kalihi Stream.

Species	Common name	Status	QC Code	Source
INVERTEBRATES				
MOLLUSCA				
GASTROPODA - NERITIDAE				
Theodoxus vespertinus Sowerby	*hapawai*	**end.**	01	1)
GASTROPODA - THIARIDAE				
Tarebia granifera Lam.	melanid snail	nat.	21	*1)
PULMONATA - LYMNAEIDAE				
small sinistral snail	pond snail	nat.	20	
BIVALVIA - CORBICULIDAE				
Corbicula fluminea (Müller)	Asiatic flume clam	nat.	20†	
ARTHROPODA, CRUSTACEA				
DECAPODA - PALAEMONIDAE				
Macrobrachium grandimanus	Hawaiian prawn	**end.**	21	1)
DECAPODA - CAMBARIDAE				
Procambarus clarki (Girard)	American swamp crayfish	nat.	10	*1,2)
ARTHROPODA, INSECTA				
ODONATA, LIBELLULIDAE				
Pantala flavescens (Fabricius)	globe skimmer dragonfly	**ind.**	10	

Table 2. (continued)

VERTEBRATES				
FISHES - CICHILIDAE				
Oreochromis mossambica	Mozambique tilapia	nat.	10	1)
FISHES - CLARIIDAE				
Clarius fuscus	Chinese catfish	nat.	02	2)
FISHES - COBITIDAE				
Misgurnus anguillicaudatus	loach	nat.	02	2)
FISHES - ELEOTRIDAE				
Eleotris sandwicensis (Vaillant & Sauvage)	*ʻoʻopu akupa*	end.	02	2)
FISHES - GOBIIDAE				
Awaous genivittatus (Cuvier & Vaillant)	*ʻoʻopu naniha*	ind.	02	2)
Awaous stamineus (Eydoux & Soulcyet)	*ʻoʻopu nākea*	end.	02	2)
FISHES - KUHLIIDAE				
Kuhlia sandvicensis	*āholehole*	end.	01	1)
FISHES - LORICARIIDAE				
Hypostomus sp.	armored catfish	nat.	10	
FISHES - POECILIDAE				
Poecilia reticulata Peters	guppy	nat.	10	*1)
Xiphophorus helleri Heckel	swordtail	nat.	10	*1)

KEY TO SYMBOLS USED:

Status:

nat. - naturalized. An introduced or exotic species.
ind. - indigenous. A native species distributed elsewhere in the Pacific.
end. - endemic - A native species found only in the Hawaiian Islands.

QC Code:

01 - Reported in unpublished literature from this stream (see Source codes).
02 - Reported in published literature from this stream (see Source notes).
10 - Observed and identifed in the field.
20 - Collected and identifed in the laboratory; specimen(s) not saved.
21 - Collected and identifed in the laboratory; voucher specimen(s) saved.
† - Identified from non-living material (e.g., shell), sign, or call.

Source Codes:

* - Seen at project location on June 17, 1997 AND reported by source.
1) *AECOS* (1987) - lower Kalihi Stream location close to estuary.
2) Timbol and Maciolek (1978) - At Likelike Highway crossover.

Scattered valves (shells) of the flume clam (*Corbicula fluminea*) were collected from the stream bed. A search of sediment deposits did not reveal any live clams, but this introduced species is apparently in Kalihi Stream. A common dragonfly known as the globe skimmer (*Pantala flavescens*) was observed in the open area over the large stream pools. Two types of algae were seen. An encrusting blue-green (Cyanophyta), magenta in color, was observed coating rocks under the north bridge span. A bright-green, filamentous (hair-like) form (*Cladophora* sp.) was common on the rocks forming small waterfalls upstream from the span.

Water Quality

Results of basic water quality testing in Kalihi Stream at a point just under the north span of Likelike highway are presented in Table 3. Samples were obtained at 1115 on June 17, 1997.

Table 3. Water quality characteristics of lower Kalihi Stream (June 1997).

Date	Temp. (°C)	DO (mg/l)	Cond. (µmhos/cm)	pH (pH units)	Turbidity (ntu)	TSS (mg/l)
6-17-97 1115	24.0	7.40	212	8.14	2.14	2.3

	Nitrate + nitrite (µg N/l)	Ammonia (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
6-17-97 1115	128	32	327	39

The dissolved oxygen (DO) value represents 88% of saturation at the stream temperature. This moderately high value, coupled with high pH, suggests high primary productivity in the stream (i.e., eutrophic conditions). Turbidity and total suspended solids (TSS) values were not unusually high, reflecting the relatively clear water observed at the time of sampling. The criterion for stream turbidity in State of Hawaii water quality regulations (DOH, 1992) is a mean value not to exceed 2.0 ntu in the dry season flow. For TSS, the criterion is a mean value not to exceed 10.0 mg/l.

The total and inorganic forms of nitrogen (ammonia, nitrate, and nitrite) were substantially elevated at the time of sampling. These compounds contribute to plant and algal growth, supporting eutrophication. The water quality criteria in State regulations (DOH, 1992) have, as average dry season values for nitrate + nitrate and total N, of 30.0 µg N/l and 180 µg N/l, respectively. No criteria are set for ammonia in streams because this value should be quite low. Elevated ammonia in this case would be indicative of sluggish water (perhaps in pools upstream) and decay of organic matter. The water quality criterion for total P is a mean value not-to-exceed of 30.0 µg P/l. The single measurement made on June 17 is slightly higher.

Discussion

Kalihi Stream is assigned the code 3-3-11 by the Hawaii Stream Assessment (Hawaii Cooperative Park Service Unit, 1990) and listed as a continuous flowing, perennial

stream. Kalihi Stream, with its several branches, drains Kalihi Valley on the leeward side of the Island of O`ahu, flowing through Honolulu and into Honolulu Harbor. There has been evidence in the past that sediments in the lower or estuarine part of this stream, located in an industrial area and opening on the harbor, may be polluted (ECI, 1978; *AECOS*, 1979). Poor water quality in the lined estuary of this stream could adversely impact native species throughout the length of the stream because these species are anadromous, recruiting from larval stages that enter the stream through the mouth.

An extensive monitoring of water quality in Kalihi Stream was undertaken by the Water Resources Research Center at University of Hawaii (Matsushita and Young, 1973). The study appears to conclude that levels of chlorinated pesticides (around 1 ppt in water samples) were not indicative of contamination, although present knowledge of the effects of these persistent chemicals on stream biota would certainly suggest otherwise. The pesticides analysis was only a small part of this detailed study which provided a valuable baseline for Kalihi Stream water quality as it was in 1971-72. This study produced the following wet weather averages (and ranges) for Kalihi Stream as a whole: total N: 320 µg N/l (100 - 640 µg N/l), total P: 260 µg P/l (30 - 270 µg P/l). Our single sampling does not suggest that conditions have changed, although our total P is at the lower end of the values for total P in 1971-2.

Previous biological surveys have been conducted in the upper estuary (near Middle Street, between King St. and Dillingham Blvd.; *AECOS*, 1987) and under the Likelike Highway bridge (Timbol and Maciolek, 1978). As was the case with the current survey, these earlier observations found many introduced species living in the stream. However *AECOS* (1987) also reported native nerite snail (*Theodoxus vespertinus*) and native prawn (*Macrobrachium grandimanus*). Both of these species are typically found where stream and estuary meet. Neither was observed under the Likelike Highway bridge in June 1997.

A survey of island streams conducted by Timbol and Maciolek (1978) included a station on Kalihi Stream at Likelike Highway. These authors reported finding three species of native fishes or `o`opu (*Awaous genivittatus*, *A. stamineus*, and *Eleotris sandwicensis*), five species of exotic fishes (see Table 2), and crayfish (*Procambarus clarki*).

None of the aquatic species observed during the present survey is valuable or of concern from a resource preservation perspective. Indeed, most can be described as pest species which have been introduced to Hawaiian streams in the last several decades and whose presence contributes to the paucity of native fauna in this reach of Kalihi Stream. It can be concluded that the proposal to extend the Likelike bridge supports northward within the ordinary high water mark (OHWM) of Kalihi Stream will have no adverse consequences on stream resources.

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AECOS
970 N. Kalaheo Avenue, Suite C300 • Kailua, Hawaii 96734
Telephone: (808) 254-5884

RECEIVED
JUL 15 1997
AKINAKA & ASSOCIATES, LTD.

CLIENT: Akinaka & Associates

ATTENTION: Henry Morita

FILE No.:	888
REPORT DATE:	07/14/97
PAGE:	1 of 2

AECOS REPORT OF ANALYTICAL RESULTS

SAMPLE TYPE: groundwater
DATE SAMPLED: 06/17/97

AECOS LOG No.: 10673
DATE RECEIVED: 06/17/97

SAMPLE ID ⇨ / ANALYTE ⇩	Kalihi Stream	Analysis Date / Analyst ID
Dissolved Oxygen (mg/L)	7.40	06/17/97 eg
Dissolved Oxygen (% Saturation)	87.9	calc.
Temperature (°C)	24.0	06/17/97 eg
pH	8.14	06/17/97 me
Turbidity (NTU)	2.14	06/17/97 me
Total Suspended Solids (mg/L)	2.3	06/17/97 me
Oil & Grease (mg/L)	<0.61	06/20/97 me
PAH - EPA 8310 (µg/L)	ND*	06/26/97 PACE

SAMPLE ID ⇨ / ANALYTE ⇩	Kalihi Stream	Analysis Date / Analyst ID
Conductivity (µmhos/cm)	212	06/17/97 me
Ammonia (µg N/L)	32	06/23/97 dh
Nitrate+Nitrite (µg N/L)	128	6/25/97 dh
Total Nitrogen (µg N/L)	327	07/09/97 dh
Total Phosphorus (µg P/L)	39	07/07/97 dh
Lead (µg/L)	<5	06/30/97 PACE
BTEX (µg/L)	ND*	06/25/97 PACE
EPA 8080	ND* except Dieldrin	06/28/97 PACE
Dieldrin	0.034	DL = 0.02

ND - Not detected.
*See attached lists for Detection Limits
DL - detection limit

J. Mello, Laboratory Director

CLIENT: Akinaka & Associates

ATTENTION: Henry Morita

FILE No.:	888
REPORT DATE:	07/14/97
PAGE:	2 of 2

LOG No.: 10673

EPA 8015M/8020M - GAS/BTEX

	Detection Limit (µg/L)		Detection Limit (µg/L)
Benzene	0.5	Ethylbenzene	0.5
Toluene	0.5	Xylene (Total)	1

EPA 8310 PAH's in Water

	Detection Limit (µg/L)		Detection Limit (µg/L)
Naphthalene	0.5	Benzo(a)anthracene	0.05
Acenaphthylene	1	Chrysene	0.05
Acenaphthene	0.5	Benzo(b)fluoranthene	0.05
Fluorene	0.1	Benzo(k)fluoranthene	0.05
Phenanthrene	0.05	Benzo(a)pyrene	0.05
Anthracene	0.05	Dibenz(a,h)anthracene	0.2
Fluoranthene	0.05	Benzo(g,h,i)perylene	0.1
Pyrene	0.05	Indeno(1,2,3-cd)pyrene	0.05

EPA 8080 Organochlorine Pesticides/PCBs

	Detection Limit (µg/L)		Detection Limit (µg/L)
alpha-BHC	0.03	Endosulfan sulfate	0.66
beta-BHC	0.06	4,4'-DDT	0.12
delta-BHC	0.09	Methoxychlor	1.8
gamma-BHC (Lindane)	0.04	Chlordane	0.14
Heptachlor	0.03	Toxaphene	2.4
Aldrin	0.04	PCB 1016	1
Heptachlor Epoxide	0.83	PCB 1221	1
Endosulfan I	0.14	PCB 1232	1
Dieldrin	0.02	PCB 1242	1
4,4'-DDE	0.04	PCB 1248	1
Endrin	0.06	PCB 1254	1
Endosulfan II	0.04	PCB 1260	1
4,4'-DDD	0.11	Endrin aldehyde	0.23

WRITTEN COMMENTS

AND

RESPONSES

APPENDIX C

LIST OF CONSULTED AGENCIES

	NAME	CONSULTATION DATE	COMMENT DATE	RESPONSE DATE
1.	DEPARTMENT OF BUSINESS, ECONOMIC DEVELOPMENT & TOURISM	3/30/98		
2.	DEPARTMENT OF HEALTH ENVIRONMENTAL PLANNING OFFICE	3/30/98	5/4/98	7/6/98
3.	DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES	3/30/98	5/7/98	7/6/98
4.	DEPARTMENT OF LAND AND NATURAL RESOURCES	3/30/98	5/11/98	7/6/98
5.	DEPARTMENT OF TRANSPORTATION	3/30/98	4/16/98	7/6/98
6.	STATE HISTORIC PRESERVATION OFFICER (DLNR)	3/30/98	4/20/98	7/6/98
7.	OFFICE OF ENVIRONMENTAL QUALITY CONTROL	3/30/98	4/24/98	
8.	DEPARTMENT OF LAND UTILIZATION	3/30/98	4/15/98	7/6/98
9.	DEPARTMENT OF PUBLIC WORKS	3/30/98	4/16/98	7/6/98
10.	BOARD OF WATER SUPPLY	3/30/98	5/5/98	7/6/98
11.	PLANNING DEPARTMENT	3/30/98	4/15/98	7/6/98
12.	FIRE DEPARTMENT	3/30/98	4/6/98	7/6/98
13.	POLICE DEPARTMENT	3/30/98	4/2/98	7/6/98
14.	U.S. ARMY CORPS OF ENGINEERS	3/30/98	4/23/98	7/6/98
15.	UHM ENVIRONMENTAL CENTER	3/30/98	5/7/98	7/6/98

LIST OF CONSULTED AGENCIES

	NAME	CONSULTATION DATE	COMMENT DATE	RESPONSE DATE
16.	DEPARTMENT OF THE INTERIOR FISH & WILDLIFE SERVICE	3/30/98		
17.	SIERRA CLUB, HAWAII CHAPTER	3/30/98		
18.	THE OUTDOOR CIRCLE	3/30/98		
19.	KALIHI-PALAMA PUBLIC LIBRARY	3/30/98		
20.	KALIHI VALLEY NEIGHBORHOOD BOARD #16	3/30/98		
21.	LILIHA-KAPALAMA NEIGHBORHOOD BOARD #14	3/30/98		
22.	KALIHI-PALAMA NEIGHBORHOOD BOARD #15	3/30/98		
23.	COUNCILMEMBER DONNA MERCADO KIM	3/30/98		
24.	REPRESENTATIVE DENNIS ARAKAKI	3/30/98		
25.	SENATOR NORMAN MIZUGUCHI	3/30/98		

POLICE DEPARTMENT
CITY AND COUNTY OF HONOLULU
801 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96813 - AREA CODE (808) 529-3111

JEREMY HARRIS
MAYOR

LEE D. DONOHUE
ACTING CHIEF

WILLIAM B. CLARK
DEPUTY CHIEF

OUR REFERENCE BS-DL

April 2, 1998

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 North Beretania Street, 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

This is in response to your letter of March 30, 1998, concerning the Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Kalihi Stream Crossing.

Since the potential problems that could generate calls for service appear to have been addressed, this project should have no significant impact on the operations of the Honolulu Police Department.

Thank you for the opportunity to comment.

Sincerely,

LEE D. DONOHUE
Acting Chief of Police

By
JAMES FEMIA, Assistant Chief
Administrative Bureau

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-011

July 6, 1998

MEMORANDUM

TO: MR. LEE D. DONOHUE, CHIEF OF POLICE
POLICE DEPARTMENT

ATTN: MR. JAMES FEMIA, ASSISTANT CHIEF
ADMINISTRATIVE BUREAU

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER BS-DL DATED APRIL 2, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER
DRAFT SUPPLEMENTAL ASSESSMENT (DSEA) FOR THE
KALIHI STREAM CROSSING, KALIHI, HAWAII

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief Sewer project.

We note that this project should have no significant impact on the operations of the Honolulu Police Department.

If you have any questions, please feel free to contact Warren Yamamoto at extension 6872.

RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

FIRE DEPARTMENT
CITY AND COUNTY OF HONOLULU
3375 KOAPAKA STREET, SUITE H425
HONOLULU, HAWAII 96819-1869

JEREMY HARRIS
MAYOR

ANTHONY J. LOPEZ, JR.
FIRE CHIEF

ATTILIO K. LEONARDI
FIRE DEPUTY CHIEF

April 6, 1998

APR 8 1998

AKINAKA & ASSOCIATES, LTD

Mr. Henry S. Morita
Akinaka & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Draft Supplemental Environmental Assessment for the
Gulick Avenue Relief Sewer, Kalihi Stream Crossing
Kalihi, Honolulu, Hawaii
HFD Internal No. OL 98-149

We received the Draft Supplemental Environmental Assessment for the subject project and have no objections or comments relating to the document.

If you need additional information, please contact Battalion Chief Charles Wassman of our Fire Prevention Bureau at 831-7778.

Very truly yours,

ANTHONY J. LOPEZ, JR.
Fire Chief

AJL/CW:bh

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0010

July 6, 1998

MEMORANDUM

TO: MR. ANTHONY J. LOPEZ, JR., FIRE CHIEF
FIRE DEPARTMENT

ATTN: CHARLES WASSMAN, BATTALION CHIEF
FIRE PREVENTION BUREAU

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER DATED APRIL 6, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (DSEA) FOR THE KALIHI STREAM CROSSING, KALIHI, HAWAII

Thank you for your comments relating to the DSEA for the proposed crossing over Kalihi Stream for the Gulick Avenue Relief Sewer project.

We note that you have no objections or comments relating to the DSEA.

If you have any questions, please feel free to contact Warren Yamamoto at extension 6872.

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

DEPARTMENT OF LAND UTILIZATION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4414 • FAX: (808) 527-6743

JEREMY HARRIS
MAYOR

JAN NAOE SULLIVAN
DIRECTOR

LORETTA K.C. CHEE
DEPUTY DIRECTOR

98-02271 (DT)

April 15, 1998

RECEIVED
APR 16 1998
AKINAKA & ASSOCIATES, LTD.

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 N. Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Draft Supplemental Environmental Assessment (EA)
Gulick Avenue Relief Sewer, Kalihi Stream Crossing

A "Finding of No Significant Impact" was published in the Office of Environmental Quality Control Bulletin on August 23, 1995, for the above project. The project includes the installation of relief sewer lines in the Kalihi area. A new sewer line was proposed for the existing Likelike Highway bridge, which crosses Kalihi Stream. The existing bridge will not support the additional load of the sewer line. Therefore, the supplemental EA is required for the construction of a new utility bridge to accommodate the sewer pipeline.

According to the federal Flood Insurance Rate Map, the proposed project is located within the 100-year floodway of Kalihi Stream. The City's flood hazard ordinance, Section 7.10 of the Land Use Ordinance, requires that a licensed professional engineer certify that the improvements within the floodway will not result in any increase in the regulatory flood elevations. The certification statements, including "no-rise" determination, shall include back-up documentation in the form of studies, plans, or other data, for transmittal to the Department of Public Works for their review and acceptance.

If you have any questions regarding the City's flood regulations, please contact Mr. Mario Siu-Li of our staff at 523-4247.

Very truly yours,

Loretta Chee

JAN NAOE SULLIVAN
for Director of Land Utilization

JNS:dt
9802271.djt

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. F' 'JIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-014

July 6, 1998

MEMORANDUM

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

ATTN: MR. MARIO SIU-LI

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER, 98-02271 (DT), DATED APRIL 15, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (DSEA) FOR THE KALIHI STREAM CROSSING, KALIHI, HAWAII

Thank you for your comments relating to the DSEA for the subject project. In response to your comments regarding the requirements of the City's flood hazard ordinance, Section 7.10 of the Land Use Ordinance, we wish to inform you that our consultant for the project, Akinaka & Associates, Ltd., has investigated the stream hydraulics and a licensed professional engineer will certify that the improvements within the floodway will not result in any increase in the regulatory flood elevations.

The "Flood Hazard Districts Certification" will be submitted to your office for submittal to the Department of Public Works under separate cover.

If you have any questions, please contact Warren Yamamoto at extension 6872 or Henry S. Morita of Akinaka & Associates at 536-7721.

cc: Akinaka & Associates, Ltd.

PLANNING DEPARTMENT
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 8TH FLOOR • HONOLULU, HAWAII 96813-3017
PHONE: (808) 523-4533 • FAX: (808) 523-4950

JEREMY HARRIS
MAYOR

PATRICK T. ONISHI
CHIEF PLANNING OFFICER

DONA L. HANAIKE
DEPUTY CHIEF PLANNING OFFICER

April 15, 1998

Mr. Henry S. Morita, L.P.E.
Executive Vice President
Akinaka and Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Draft Supplemental Environmental Assessment (SEA) for the
Gulick Avenue Relief Sewer, Kalihi Stream Crossing, Kalihi, Oahu, Hawaii

In response to your letter of March 30, 1998, we have reviewed the subject draft SEA and offer the following comments.

We have no objections to the proposed project. The proposed project is related to a previous Development Plan Public Facilities Map amendment submitted by the Department of Wastewater Management in 1996. The amendment, 96/PUC-1001(IC), was approved by the City Council and adopted as Ordinance 97-21 on May 16, 1997.

Thank you for the opportunity to comment on this matter. Should you have any questions, please contact Tim Hata of our staff at 527-6070.

Yours very truly,

PATRICK T. ONISHI
Chief Planning Officer

PTO:ft

c: WWM, Warren Yamamoto

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0003

July 6, 1998

MEMORANDUM

TO: MR. PATRICK T. ONISHI, CHIEF PLANNING OFFICER
PLANNING DEPARTMENT

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER TH 3/98-0729 DATED APRIL 15, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (DSEA) FOR THE KALIHI STREAM CROSSING, KALIHI, HAWAII

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief sewer project.

We note that you have no objections to the project.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at extension 6872.

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 523-4341 • FAX: (808) 527-5857

JEREMY HARRIS
MAYOR

JONATHAN K. SHIMADA, PhD
DIRECTOR AND CHIEF ENGINEER
ROLAND D. LIBBY, JR.
DEPUTY DIRECTOR

ENV 98-090

April 16, 1998

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Draft Supplemental Environmental Assessment (DSEA)
Gulick Avenue Relief Sewer, Kalihi Stream Crossing
TMK: 1-3-17, 18, 24 to 26

We have reviewed the subject DSEA and have the following comments:

1. The DEA should address best management practices (BMPs) proposed during construction to minimize impact to water quality in Kalihi Stream. Examples include removal of effluent inside the existing inverted siphon, clearing Kalihi Stream in order to gain access across the stream, possibly limiting construction work to dry months, etc.

2. An effluent discharge permit for construction dewatering in Kalihi Stream may be required if the discharge is to the City-owned portion of Kalihi Stream. If so, an application must be made and submitted together with appropriate BMPs.

3. Provide hydrological calculation to ensure "no rise" of water surface as required by Federal Emergency Management Agency (FEMA).

4. Exhibit 4: Please correct "AAHO" to read as "AASHTO."

Should you have any questions, please contact Mr. Alex Ho, Environmental Engineer, at 523-4150.

Very truly yours,

FOR JONATHAN K. SHIMADA, PhD
Director and Chief Engineer

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-013

July 6, 1998

MEMORANDUM

TO: MR. KENNETH E. SPRAGUE, DIRECTOR
DEPARTMENT OF ENVIRONMENTAL SERVICES

ATTN: MR. ALEX HO, ENVIRONMENTAL ENGINEER

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER, ENV 98-090, DATED APRIL 16, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER
DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (DSEA)
FOR THE KALIHI STREAM CROSSING

Thank you for your comments relating to the DSEA for the subject project. As discussed with Mr. Alex Ho, due to the reorganization, we are directing this response to your department for appropriate action. In response to the comments, the following information is provided.

1. The "Mitigating Measures to Minimize Adverse Impacts" section of the DSEA will be amended to address best management practices proposed during construction. The existing inverted siphon will remain in operation and actual work in the stream will be limited to the drier months.

2. Discharge for construction dewatering will not be in the City owned portion of Kalihi Stream.

3. Hydraulic calculations to ensure "no rise" of the water surface will be submitted to the Department of Land Utilization for forwarding to your department.

4. Exhibit 4 "AAHO" will be corrected to read "AASHTO."

If you have any questions, please feel free to contact Warren Yamamoto at extension 6872 or Henry S. Morita of Akinaka & Associates at 536-7721.

cc: Akinaka & Associates, Ltd.

BENJAMIN J. CAYETANO
GOVERNOR

KAZU HAYASHIDA
DIRECTOR

DEPUTY DIRECTORS
BRIAN K. MINAAI
GLENN M. OKIMOTO

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

IN REPLY REFER TO:
HWY-PS
2.8857

APR 16 1998

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 N. Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Draft Supplemental Environmental Assessment for the
Gulick Avenue Relief Sewer, Kalihi Stream Crossing,
Kalihi, Honolulu, Hawaii

Thank you for your transmittal of March 30, 1998, requesting our review and comments regarding the above project.

Please coordinate this project with our Highways Division's projects along Likelike Highway to avoid possible future conflicts.

Plans for work done within the Likelike Highway rights-of-way must be submitted for our review and approval.

Very truly yours,

KAZU HAYASHIDA
Director of Transportation

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0004

July 6, 1998

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

Dear Mr. Hayashida:

Subject: Your Letter HWY-PS 2.8857
Dated April 16, 1998 Relating to the
Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream adjacent to the Likelike Highway bridge.

We will coordinate this project with your Highway Division's projects along Likelike Highway to avoid possible future conflicts. Plans for work done within the Likelike Highway rights-of-way will be submitted to your office for reivew and approval.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at 527-6872.

Very truly yours,

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTIES

GILBERT COLOMA-AGARAN

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

STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

April 20, 1998

Henry S. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

LOG NO: 21318
DOC NO: 9804EJ17

Dear Mr. Morita:

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Kalihi Stream Crossing**
Kalihi, Kona, O'ahu
TMK: 1-3

Thank you for the opportunity to review the Draft Supplemental EA for the Kalihi Stream crossing project for the Gulick Avenue Relief Sewer. We commented in 1994 that a review of our records shows that there are no known historic sites at the project location, and that it is unlikely that subsurface historic sites will be found in the overall project corridor. The Kalihi Stream crossing portion covered in the current EA, has been previously altered during the construction of the existing bridge making it unlikely that historic sites remain. Therefore we believe that this project will have "no effect" on historic sites.

In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation Division must be contacted at 587-0047.

If you have any questions please call Elaine Jourdane at 587-0014.

Aloha,

Don Hibbard, Administrator
Historic Preservation Division

EJ:jk

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

July 6, 1998

IDEC 98-0001

Mr. Don Hibbard, Administrator
State Historic Preservation Division
Department of Land and Natural Resources
State of Hawaii
33 South King Street, 6th Floor
Honolulu, Hawaii 96813

Attention: Ms. Elaine Jourdane

Dear Mr. Hibbard:

Subject: Your Letter Log No.: 21318, Doc No.: 9804EJ17
Dated April 20, 1998 Relating to the
Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream adjacent to the Likelike Highway bridge.

We note that your records show that there are no known historic sites at the project location, and that the project area has been altered during construction of the existing bridge making it unlikely that historic sites remain. Therefore, this project will most likely have "no effect" on historic sites.

In the unlikely event that historic sites or remains are uncovered during construction, the construction specification will require that the Contractor shall stop work and immediately notify the Officer-in-Charge and the State Historic Preservation Officer at 587-0047.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at 527-6872.

Very truly yours,

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

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

REPLY TO
ATTENTION OF

April 23, 1998

Civil Works Branch

Mr. Henry S. Morita
Executive Vice President
Akinaka and Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Thank you for the opportunity to review and comment on the Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Kalihi Stream Crossing, Kalihi, Hawaii (TMK 1-3-17, 18, 24, 25, and 26). The following comments are provided in accordance with U.S. Army Corps of Engineers authorities to provide flood hazard information and to issue Department of the Army (DA) permits.

a. Based on the information provided, a DA permit may be required for the project. Please contact Mr. Alan Everson our Regulatory Section at 438-9258 for further information and refer to file number 950010016.

b. The flood hazard information, which was previously provided in our letter dated November 23, 1994, remains unchanged.

Sincerely,

Paul Mizue, P.E.
Chief, Civil Works Branch

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-015

July 6, 1998

Department of the Army
U.S. Army Engineer District, Honolulu
Fort Shafter, Hawaii 96858-5440

Attention: Mr. Paul Mizue, P.E.
Chief, Civil Works Branch

Gentlemen:

Subject: Your Letter Dated April 23, 1998 Relating to the Gulick Avenue Relief Sewer Draft Supplemental Environmental Assessment (DSEA) for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for your comments relating to the DSEA for the subject project. In response to your comments, we provide the following information.

1. Our consultant for the project, Akinaka & Associates, Ltd., has contacted Mr. Alan Everson of your staff in regards to the requirements of a Department of the Army permit.

2. The flood hazard information provided in your earlier letter will be included in the "Flood Hazard Districts Certification" submitted to the Department of Land Utilization.

If you have any questions, the point of contact at the City is Warren Yamamoto at 527-6872 or Henry S. Morita of Akinaka & Associates at 536-7721.

Very truly yours,

RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
235 SOUTH BERETANIA STREET
SUITE 702
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-4186

April 24, 1998

Mr. Kenneth E. Sprague, Director
City and County of Honolulu
Department of Wastewater Management
650 South King Street
Honolulu, Hawaii 96813

Dear Mr. Sprague:

Subject: Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Oahu

Thank you for the opportunity review the subject document. We have the following comments and questions.

1. The previous plan to hang the new sewer line on the existing Likelike Highway Bridge was abandoned because calculations revealed that the bridge cannot support the additional load. Please describe which agency performed the calculations and attach the calculation sheets to the final environmental assessment.

2. The new sewer bridge may invite pedestrians to dangerously use the structure as a crossing. Please describe any barriers, such as walls, fences, etc., that are planned to prevent pedestrians from using the utility bridge as a crossing.

3. Two trees that will interfere with construction of the bridge will be removed. Please describe the type, age, quality, size and value of the trees that will be removed. Are any of the affected trees placed on the City's Exceptional Tree List?

4. Please illustrate the visual impacts of the proposed structure (including any pedestrian barriers) from public places such as roads and lookouts. Photos of existing conditions taken from public view points are helpful in evaluating visual impacts. Renderings of future structures superimposed on photos of existing views should be provided. We recommend constructing and painting the structures with

materials and colors that blend with the surroundings. We also recommend landscaping with native Hawaiian plants to reduce the visual impacts.

5. Installation of the pier footings will require excavation within the stream floodway. Also, equipment will traverse the stream during construction. These activities will cause adverse water quality impacts. Please provide details of the Best Management Practice (BMP) procedures that will be implemented to minimize water quality impacts.

6. Please consult with the U.S. Army Corps of Engineers to determine whether an army permit is required for this project. Document the findings of this consultation in the final environmental assessment.

7. Please discuss the findings and reasons for supporting the FONSI determination based on all 13 significant criteria listed in §11-200-12 of the EIS rules. Please see the enclosed example.

Should you have any questions please call Jeyan Thirugnanam at 586-4185.

Sincerely,

Gary Gill
Director

c: Akinaka & Associates

Attachment

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-012

July 17, 1998

Mr. Gary Gill, Director
Office of Environmental Quality Control
State of Hawaii
235 South Beretania Street, Room 702
Honolulu, Hawaii 96813

Attention: Mr. Jeyan Thirugnanam

Dear Mr. Gill:

Subject: Your Letter Dated April 24, 1998 Relating to the Gulick Avenue Relief Sewer Draft Supplemental Environmental Assessment (DSEA) for the Kalihi Stream Crossing, Kalihi, Oahu, Hawaii

Thank you for your comments relating to the DSEA for the Gulick Avenue Relief Sewer project. In response to the comments, the following information is provided.

1. The State Department of Transportation (DOT), Highways Division, performed the calculation for the bridge loading capacity. During a meeting with DOT staff, it was stated that no additional vertical loads would be allowed as the existing highway bridge has an inventory rating of 27 tons which is less than the present HS-20 design loading of 36 tons. We did not request calculation sheets as the State DOT is the owner and operator of the bridge.

2. Chain-link fencings will be installed to prevent pedestrians from using the structure as a crossing. Railings will be provided for the safety of maintenance personnel.

3. Two trees that interfere with construction of the bridge will need to be removed with a third tree which is located approximately 20 feet from the bridge pier that may need to be trimmed. The attached letter report prepared by Botanical Consultants reports on the size, condition and type of the trees. None of the affected trees are on the list of exceptional trees.

4. In regards to visual impacts, EXHIBIT 5 of the DSEA shows that the top of the sewer line will be seven feet below the highway bridge pavement level. Also, photographs will be included in the supplemental environmental assessment showing the relative relationship between the existing bridge and the proposed Kalihi Stream Crossing. A solid concrete barrier was recently constructed eliminating all views of the proposed structure from vehicles traveling on the Likelike Highway bridge. There are no lookouts in the vicinity, and public view points of the proposed structure will be blocked by the existing topography and trees. The topography and trees that block the view planes are shown in EXHIBIT 3 of the DSEA. The proposed structure will be constructed with concrete which should blend in with the existing Likelike Highway bridge which is also a concrete structure. Both bridge structures will be left in its natural state. Painting of the proposed pipeline will be included in the contract with color selection made to blend in with the surroundings environment. Planting of native Hawaiian plants could be an option but would be outside the view planes.

5. Water quality impacts should be minimal for this project. Excavation in the floodway is limited to installation of the piers. There is minimal topsoil over hard basalt at the site. A detention pond could be located where low flows are not impeded or construction of the initial pier could use the excavated area of the second pier as a detention pond. Excavated material will be removed from the stream area and disposed at landfills or reused if acceptable.

   Section VIII, "Mitigating Measures to Minimize Adverse Impacts" of the DSEA will also be amended to address Best Management Practice (BMP) procedures to be implemented during construction.

6. Consultation with U.S. Army Engineer District, Honolulu has been initiated to determine the need for a Department of the Army permit. We will include documentation of the consultation in the final supplemental environmental assessment.

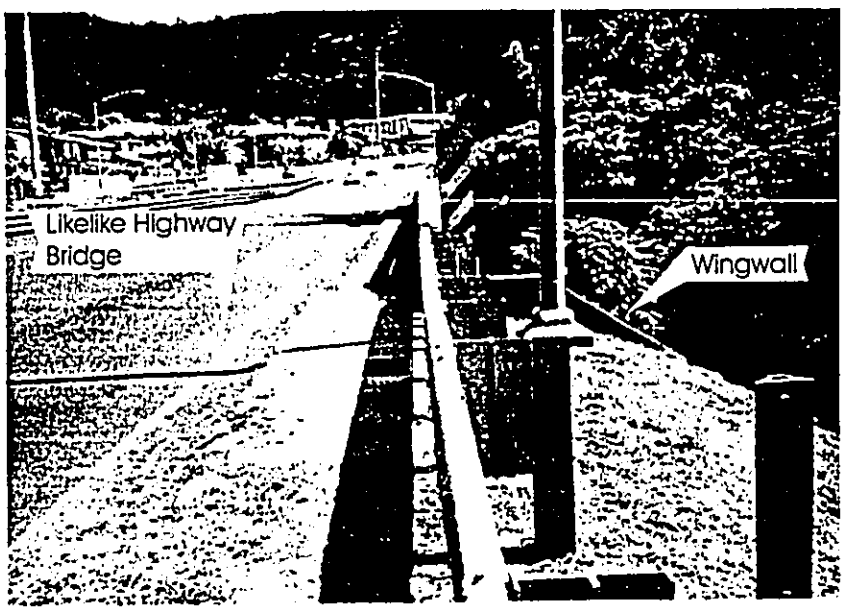
7. We will include discussions on the findings and reasons for supporting the FONSI determination based on the 13 significant criteria listed in the EIS rules.

If you have any questions, please feel free to contact Warren Yamamoto at 527-6872 or Henry S. Morita of Akinaka & Associates at 536-7721.

Very truly yours,

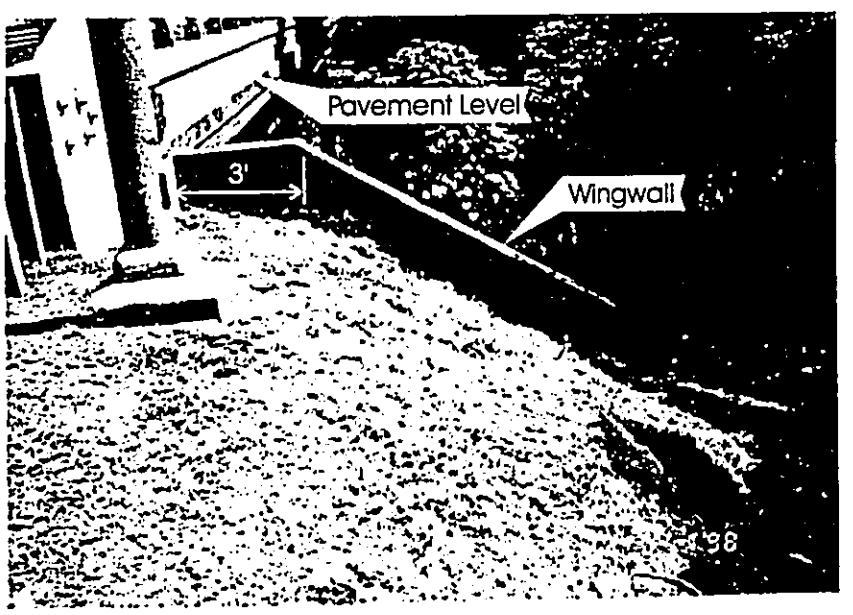
RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.



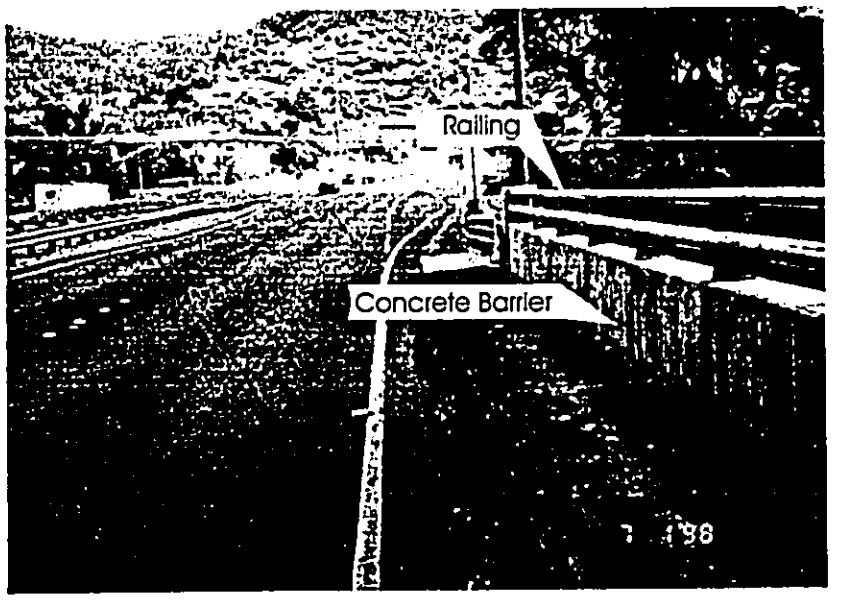
50' +/- Makai of Bridge Looking Mauka

The crossing structure will be behind the wingwall and seven feet below the bridge pavement level.



20' +/- Makai of Bridge Looking Mauka

The crossing structure will be ten feet right of the bridge.



On Likelike Bridge looking Mauka

Concrete barrier for railing support obstructs views over the bridge.

Gulick Avenue Relief Sewer

July 1998

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

LAWRENCE MIIKE
DIRECTOR OF HEALTH

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

In reply, please refer to:

May 4, 1998

94-242A/epo

Mr. Henry A. Morita
Executive Vice President
Akinaka & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Draft Supplemental Environmental Assessment
Gulick Avenue Relief Sewer
Kalihi Stream Crossing
Kalihi, Honolulu, Oahu
TMK: 1-3-17: 18, 24, 25, 26

Thank you for allowing us to review and comment on the subject document. We do not have any comments to offer at this time.

Sincerely,

BRUCE S. ANDERSON, Ph.D.
Deputy Director for
Environmental Health

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0006

July 6, 1998

Dr. Bruce S. Anderson
Deputy Director for Environmental Health
Department of Health
State of Hawaii
P. O. Box 3378
Honolulu, Hawaii 96801

Dear Dr. Anderson:

Subject: Your Letter 94-242A/epo
Dated May 4, 1998 Relating to the
Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for responding to our request for comments on the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief Sewer project

We note that you did not have any comments to offer.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at 527-6872.

Very truly yours,

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
FAX (808) 533-2714

May 5, 1998

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, Inc.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Your Transmittal of March 30, 1998 of the Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Kalihi Stream Crossing, Kalihi, Oahu, Vicinity of TMK: 1-3-28, 29

Thank you for the opportunity to review and comment on the proposed sewer crossing of Kalihi Stream.

We have no objections to the proposed project. We have no water system facilities within the Kalihi Stream project limits.

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

Very truly yours,

BROOKS H. ~~M. YUEN~~
Acting Manager and Chief Engineer

cc: Warren Yamamoto, Department of Wastewater Management

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0005

July 6, 1998

MEMORANDUM

TO: MR. BROOKS H. M. YUEN
ACTING MANAGER AND CHIEF ENGINEER
BOARD OF WATER SUPPLY

FROM: RANDALL K. FUJIKI, DIRECTOR
DEPARTMENT OF DESIGN AND CONSTRUCTION

SUBJECT: YOUR LETTER DATED MAY 5, 1998 RELATING TO THE GULICK AVENUE RELIEF SEWER DRAFT SUPPLEMENTAL ENVIRONMENTAL ASSESSMENT (DSEA) FOR THE KALIHI STREAM CROSSING, KALIHI, HAWAII

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief sewer project.

We note that you have no objections to the proposed project and that there are no water system facilities within the Kalihi Stream project limits.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at extension 6872.

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.

BENJAMIN J. CAYETANO
GOVERNOR

STATE OF HAWAII
DEPARTMENT OF ACCOUNTING AND GENERAL SERVICES
P.O. BOX 119, HONOLULU, HAWAII 96810

LETTER NO. (P) 1265.8

MAY 7 1998

RECEIVED
MAY 9 1998
AKINAKA & ASSOCIATES, LTD.

Mr. Henry S. Morita, Executive Vice President
Akinaka & Associates, Ltd.
Consulting Engineers
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Subject: Draft Supplemental Environmental Assessment
Gulick Avenue Relief Sewer
Kalihi Stream Crossing
Kalihi, Honolulu, Hawaii

Thank you for the opportunity to review the Draft Supplemental Environmental Assessment for the referenced subject which we received with your memorandum dated March 30, 1998.

The Gulick Avenue Relief Sewer, Kalihi Stream Crossing will not impact any Department of Accounting and General Services (DAGS) projects or existing facilities. However, DAGS recommends the Department of Education be contacted to coordinate construction work and to minimize disruptions to existing school operations.

If there are any questions, please have your staff contact Mr. Ronald Ching of the Planning Branch at 586-0490.

Sincerely,

GORDON MATSUOKA
Public Works Administrator

RC:jy
c: Mr. Warren Yamamoto, Dept. of Wastewater Mgmt.

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-0002

July 6, 1998

Mr. Gordon Matsuoka, Public Works Administrator
Department of Accounting and General Services
State of Hawaii
P. O. Box 119
Honolulu, Hawaii 96810

Attention: Mr. Ronald Ching, Planning Branch

Dear Mr. Matsuoka:

Subject: Your Letter Log No. (P) 1265.8
Dated May 7, 1998 Relating to the
Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for your comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief Sewer project.

We note that the proposed project will not impact any of your projects or existing facilities. The Department of Education should not be impacted by the construction of the Kalihi Stream Crossing.

If you have any questions, please feel free to contact Mr. Warren Yamamoto at 527-6872.

Very truly yours,

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Inc.

University of Hawai'i at Mānoa

Environmental Center
A Unit of Water Resources Research Center
Crawford 317 • 2550 Campus Road • Honolulu, Hawai'i 96822
Telephone: (808) 956-7361 • Facsimile: (808) 956-3980

May 07, 1998
EA:00172

Mr. Henry S. Morita
Akina & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita:

Draft Supplemental Environmental Assessment (DSEA)
Gulick Avenue Relief Sewer, Kalihi Stream Crossing
Kalihi , Honolulu, Oahu

In a supplement to the original Environmental Assessment, the City and County Department of Wastewater Management proposes to build a utility bridge for the sewer crossing of Kalihi Stream. The original EA planned to hang the new sewer line from the Likelike Highway bridge at its intersection with the Kalihi Stream. The plan has been revised due to calculations which revealed that the bridge cannot support the additional load.

We reviewed this draft Environmental Assessment (EA) with the assistance of Tori Cullins of the Environmental Center.

Need For Supplemental EA

The fact that the Likelike Highway bridge is unable to support a sewer pipe is somewhat disturbing, given the amount of unrestricted heavy traffic it currently supports. Our reviewers from the engineering program at the University stated that they would need much more information (and time) than was provided in the DSEA to determine if the bridge was indeed structurally able or unable to support the sewer pipe. It would be of great benefit to be given, in terms comprehensible to the general public, why it is that the Likelike Highway crossing of the Kalihi Stream is unable to support the weight of the sewer line.

Environmental Setting

C. Climate

The DSEA does not specify the time frame of the project. To avoid problems that would arise should the site be inundated by floodwaters or heavy surface runoff, it would be preferable for construction to be during the months of March -- October which are identified in the environmental setting (pg. III-1) as having only 20% of annual rainfall.

G. Archaeology

On page III-2, there is a statement that there "are no identified historic or archaeologically significant locations located within the project site." Please include the method used to determine this in the Final EA.

H. Flood Hazard

Please identify where the contractor will dispose of the material removed from the stream area.

IV. Short Term Impacts

On page IV-1, detention ponds are proposed to mitigate sediment propagation in the event of groundwater surfacing into the excavation. Where would these detention ponds be located, and how would they be prevented from filling with groundwater? Page III-1 describes the soil in the area as hard lava overlain with 2 feet of top soil or gravel and small boulders. In the Under Stream Profile on page VI-1, an underground pipeline could not be laid due to this geological formation. How would detention ponds be of benefit in this situation?

V. Long Term Impacts

On page V-I, two trees are proposed to be removed to allow bridge construction. Please identify the cumulative effect of removal of the trees on streamside stability and visual screening of the project.

Conclusion

In short, although we support the project, we suggest that it would be substantially improved by incorporation of the comments that our reviewers have provided.

Thank you for the opportunity to comment on this draft EA.

Sincerely,

John T. Harrison
Environmental Coordinator

cc: OEQC
City and County, Department of Wastewater Management
Roger Fujioka
Tori Cullins

DEPARTMENT OF DESIGN AND CONSTRUCTION
CITY AND COUNTY OF HONOLULU
650 SOUTH KING STREET, 2ND FLOOR
HONOLULU, HAWAII 96813
PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

IDEC 98-009

July 6, 1998

Mr. John T. Harrison, Environmental Coordinator
Environmental Center
University of Hawaii
Crawford 317
2550 Campus Road
Honolulu, Hawaii 96822

Dear Mr. Harrison:

Subject: Your Letter, EA:00172, Dated May 7, 1998
Relating to the Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for providing comments relating to the DSEA for the proposed sewer crossing over Kalihi Stream for the Gulick Avenue Relief Sewer project. In response to your comments, the following information is provided:

Likelike Highway Bridge
The State Department of Transportation (DOT), Highways Division, performed the calculations for the bridge loading capacity. During our meeting with DOT staff, it was stated that no additional vertical loads would be allowed as the existing highway bridge has an inventory rating of 27 tons which is less than the present HS-20 design loading of 36 tons. We did not request calculation sheets, as the State DOT is the owner and operator of the bridge.

C. Climate
We concur that construction of the Kalihi Stream crossing would be preferable during the months of March-October. The contract documents will specify that work within the floodway takes place during that time period.

G. Archaeology
The project area has been altered during construction of the existing bridge making it unlikely that historic sites remain. Therefore, the project will likely have "no effect" on historic sites. We have contacted the State Historic Preservation Division, Department of Land and Natural Resources, and they concur with the above statement. Attached is the letter from the State Historic Preservation Division.

H. Flood Hazard
We will include the flood limits on the construction plans with instructions to the contractor stating that material removed from the stream area must be disposed of outside the flood limits.

IV. Short Term Impacts
Detention ponds could be located where low flows are not impeded. After the excavation area is cleared, there should be no need for detention ponds as the area is hard lava below the topsoil. If required, construction of the initial pier could use the excavation area of the second pier for a detention pond. The required excavation to construct the pier footings are nominal (11 cy for one and 25 cy for the other). Leak-proof lining or leak-resistant forms could be used to control ground water.

V. Long Term Impacts
A letter report by "botanical consultants" is attached in respect to the type and condition of the trees proposed for removal. Removal of the trees within the floodway should improve the hydraulic condition as the trees presently decrease the stream hydraulic capacity. Streamside stability should not be affected, as the trees are not located on the side slopes. The trees in the area are routinely trimmed for highway maintenance eliminating any visual screening of the project.

Pertinent review comments will be incorporated into the proposed project. Should you have any questions, please feel free to contact Warren Yamamoto at 527-6872 or Henry Morita of Akinaka & Associates at 536-7721.

Very truly yours,

for RANDALL K. FUJIKI
Director

Attachment

cc: Akinaka & Associates, Ltd.

botanical consultants
p.o. box 90765 honolulu, hawaii 96835 (808) 923-4193 fax (808) 923-4193

May 9, 1998

Mr. Henry S. Morita
Akinaka & Associates, Ltd.
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96817-4716

Dear Mr. Morita,

In response to your request for assistance dated May 1, 1998, I submit the following:

There are two and possibly three trees that may interfer with the proposed construction of the Gulick Avenue Relief Sewer, Oahu. One tree which abuts the bridge support on the Ewa (western) side of the stream will have to be removed. This gunpowder tree (*Trema orientalis* (L.) Blume) is 35 to 40 feet in height and approximately 30 inches in diameter at breast height. The trunk of the tree has been hollowed out for about 3 feet. The heart wood of the tree has been eaten by termites. This is not a specimen tree.

Tne next closest tree to the bridge is a small to medium monkey pod tree (*Samanea samen* (Jacq.) Merr.) approximately 30 feet in height and approximately 24 inches in diameter at breast height. This little tree has been very badly pruned. Branches have been cut off at about 15 and 20 feet above the ground leaving branch stumps 2 to 3 feet long. Insects have entered the tree through these branch stumps. The tree is in poor condition and is not a specimen tree.

The third tree is located about 20 feet from the bridge pier and may have to be trimmed. It is a multitrunked banyan tree (*Ficus microcarpa* L.). This tree has been savagely trimmed and large branches have been broken by ropes having been tied to them to swing over the stream.

Seeds of banyan trees are being spread about by birds and are beginning to become pests in the conservation district.

Gunpowder, monkey pod, and banyan trees are very common on the lowlands of Oahu and none of these trees are on the list of exceptional trees.

I hope this answers your questions.

Yours truly,

Dr Evangeline J Funk - Botanist

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

May 11, 1998

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

LD-NAV
Ref.:2-KALIHI.RCM

Mr. Henry S. Morita
Executive Vice President
Akinaka & Associates, LTD.
Consulting Engineers
250 North Beretania Street, Suite 300
Honolulu, Hawaii 96813-4715

Dear Mr. Morita:

SUBJECT: Review : Draft Supplemental Environmental Assessment
Project : Kalihi Stream Crossing
Gulick Ave. Relief Sewer
Job No. : A&A DWM 94-01
Applicant: Akinaka & Associates, Ltd., on behalf of, the Department of Wastewater Management, City and County of Honolulu
Location : Kalihi, Island of Oahu, Hawaii
TMK : 1st/ 1-3-17, 18, 24, 25 and 26

Thank you for the opportunity to review and comment on the Draft Supplemental Environmental Assessment for the proposed Gulick Avenue Relief Sewer project.

Attached is our Division of Aquatic Resources, Historic Preservation Division and Commission on Water Resource Management's comments related to Natural, Historical and Water Resources value respectively.

The Department of Land and Natural Resources has no other comments to offer on the subject matter at this time.

Should you have any questions, please contact Nick Vaccaro at 587-0438.

Very truly yours,

DEAN Y. UCHIDA
Administrator

c: Oahu Land Board Member
Oahu District Land Office

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT
P. O. BOX 621
HONOLULU, HAWAII 96809

APR 28 1998

Apr 27 4 04 PM '98

TO: Mr. Dean Y. Uchida, Administrator
Land Division

FROM: Edwin T. Sakoda, Acting Deputy Director
Commission on Water Resource Management

SUBJECT: Draft Supplemental Environmental Assessment (TMK:1-3-17, 18, 24, 25, 26). Kalihi Stream Crossing Gulick Ave Relief Sewer.

Thank you for allowing us to comment on the subject document. We have no corrections or additions to offer at this time.

The Department of Wastewater Management acknowledges a stream channel alteration permit (HRS Chapter 174C-71) is required for the project (page XII-1).

If you have any questions, please call David Higa at 587-0249.

DH:fc

Ref. No.: 2-KALIHI.COM

State of Hawaii
Department of Land and Natural Resources
DIVISION OF AQUATIC RESOURCES
May 4, 1998

MEMORANDUM

To: Dean Y. Uchida, Administrator
Land Division
From: William Devick, Acting Administrator
Division of Aquatic Resources
Subject: Comments on: Draft Supplemental Environmental Assessment

Date of Request: 4/21/98 Suspense Date: 5/5/98

Summary of Project

Title: Kalihi Stream Crossing - Gulick Ave. Relief Sewer
Proj. By: Dept. of Wastewater Management, City & County of Honolulu
Location: Kalihi, Honolulu, Hawaii

Brief Descripion:

Proposed is a sewer line crossing of Kalihi Stream in the vicinity of Likelike Highway. The existing crossing is an inverted siphon at Kalihi Valley District Park. Inspections and capacity calculations indicate that the siphon and the downstream mains are undersized and in need of repairs.

A utility bridge is proposed for the new sewer crossing of Kalihi Stream. This bridge will be constructed of reinforced concrete and solely dedicated to support the sewer pipeline. The new support piers will follow the spacing and alignment of the existing piers, in order to maintain stream flow conditions. Improvements, such as channel linings, which may disrupt the stability of the streambed will not be included.

Comments:

The applicant should take appropriate mitigative measures to minimize erosion, and prevent cement products, oil, gas and other toxic substances associated with the use of heavy machinery from falling or leaching into Kalihi Stream.

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MAY 5 11 35 AM '98

MICHAEL D. WILSON, CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

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STATE OF HAWAII

DEPARTMENT OF LAND AND NATURAL RESOURCES

STATE HISTORIC PRESERVATION DIVISION
33 SOUTH KING STREET, 6TH FLOOR
HONOLULU, HAWAII 96813

May 4, 1998

MEMORANDUM

LOG NO: 21439
DOC NO: 9804EJ24

TO: Dean Uchida, Administrator
Land Division

FROM: Don Hibbard, Administrator
Historic Preservation Division

SUBJECT: **Chapter 6E-8 Historic Preservation Review -- Draft Supplemental Environmental Assessment for the Gulick Avenue Relief Sewer, Kalihi Stream Crossing (File No. 2-KALIHI.COM)**
Kalihi, Kona, O'ahu
TMK: 1-3

We responded directly to Akinaka & Associates Ltd. regarding this project (Log. 21318). Our comments consisted of the following:

> Thank you for the opportunity to review the Draft Supplemental EA for the Kalihi Stream crossing project for the Gulick Avenue Relief Sewer. We commented in 1994 that a review of our records shows that there are no known historic sites at the project location, and that it is unlikely that subsurface historic sites will be found in the overall project corridor. The Kalihi Stream crossing portion covered in the current EA, has been previously altered during the construction of the existing bridge making it unlikely that historic sites remain. Therefore we believe that this project will have "no effect" on historic sites.
>
> In the unlikely event that historic sites, including human burials, are uncovered during routine construction activities, all work in the vicinity must stop and the State Historic Preservation Division must be contacted at 587-0047.

EJ:jk

DEPARTMENT OF DESIGN AND CONSTRUCTION

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 2ND FLOOR
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PHONE: (808) 523-4564 • FAX: (808) 523-4567

JEREMY HARRIS
MAYOR

RANDALL K. FUJIKI, AIA
DIRECTOR

ROLAND D. LIBBY, JR., AIA
DEPUTY DIRECTOR

July 6, 1998

IDEC 98-008

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

Attn: Mr. Nick Vaccaro

Dear Mr. Uchida:

Subject: Your Letter, LD-NAV, Dated May 11, 1998
Relating to the Gulick Avenue Relief Sewer
Draft Supplemental Environmental Assessment (DSEA)
for the Kalihi Stream Crossing, Kalihi, Hawaii

Thank you for providing comments from the various Divisions of the Department of Land and Natural Resources (DLNR) relating to the DSEA for the subject project. In response to comments from the various divisions, the following information is provided:

Division of Aquatic Resources
The construction specifications and contract directives will include appropriate measures to minimize erosion and prevent toxic substances associated with the use of heavy equipment from entering Kalihi Stream.

State Historic Preservation Division
Please note that we have responded directly to the State Historic Preservation Division.

Commission on Water Resource Management
The City acknowledges that a stream alteration permit is required for the proposed project and that an application for the required permit was submitted on May 28, 1998.

If you have any questions, please call Mr. Warren Yamamoto at 527-6872.

Very truly yours,

for RANDALL K. FUJIKI
Director

cc: Akinaka & Associates, Ltd.