Hickam Golf Course Non-potable ; 12-in water main

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU
630 SOUTH BERETANIA STREET
HONOLULU, HAWAII 96843
PHONE (808) 527-6180
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April 15, 1996

Mr. Gary Gill, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Negative Declaration for the Proposed Hickam Golf Course: 12-Inch Nonpotable Water Main; Honolulu International Airport, TMK:1-1-03, Honolulu, Oahu, Hawaii

The Honolulu Board of Water Supply has reviewed the comments received during the 30-day public comment period which began on July 8, 1995. We have determined that this project will not have significant effect and are issuing a negative declaration. Please publish this notice in the May 8, 1996 issue of The Environmental Notice.

We transmit the completed OEQC Bulletin Publication Form, four copies of the final Environmental Assessment and a diskette containing the project description in ASCII text format.

If you have any questions, please contact Larry Hazama at 527-5202.

Very truly yours,

RAYMOND H. SATO
Manager and Chief Engineer

Enclosures

1996-05-08-OA-FEA. Hickam Golf Course non-potable: 12-in water main - Honolulu International Airport

FINAL
ENVIRONMENTAL ASSESSMENT

FOR

HICKAM GOLF COURSE
NON-POTABLE: 12-INCH WATER MAIN
HONOLULU INTERNATIONAL AIRPORT

HONOLULU, OAHU, HAWAII

Prepared for: **Board of Water Supply**
City & County of Honolulu

Prepared by: **KFC Engineering Management, Inc.**

March 1996

FINAL
ENVIRONMENTAL ASSESSMENT

FOR

HICKAM GOLF COURSE
NON-POTABLE: 12-INCH WATER MAIN
HONOLULU INTERNATIONAL AIRPORT
Tax Map Key: 1-1-03

Job No.: 96-103

This Final Environmental Assessment is prepared pursuant to Chapter 343, Hawaii Revised Statutes

Approving Agency: Board of Water Supply
City and County of Honolulu

Responsible Official: _____ _____
Raymond Sato — Date
Chief Engineer

Prepared by: KFC Engineering Management, Inc.
Honolulu, Hawaii

March 1996

TABLE OF CONTENT

PREFACE

This final environmental assessment (EA) and notice of anticipated negative declaration are prepared pursuant to Chapter 343, Hawaii Revised Statutes, Title 11 (as amended), Chapter 200, Administrative Rules, Department of Health and Federal Aviation Administration Orders 5050.4A (October 8, 1985), 1050.1D (December 21, 1983) and its appendices. The proposed action is an agency action involving the expenditure of City & County funds by the Board of Water Supply, City & County of Honolulu. This final EA and notice of anticipated negative declaration will be filed with the State Office of Environmental Quality Control by the proposing agency for public review pursuant to ACT 241, Session Laws of Hawaii (1992).

The proposed action assessed herein is the construction of a new 12-inch non-potable water line across the airfield of Honolulu International Airport. The intent of the action is to replace the potable water supply used to irrigate the Hickam golf course with a non-potable supply.

SUMMARY

HICKAM GOLF COURSE
NON-POTABLE: 12-INCH WATER MAIN
Honolulu International Airport

District: Honolulu

Tax Map Key: 1-1-03

Proposing Agency: Board of Water Supply
City & County of Honolulu
630 S. Beretania St.
Honolulu, Hawaii 96843

EA Preparer: KFC Engineering Management, Inc.
400 Rodgers Blvd. Suite 715
Honolulu, Hawaii 96819

Existing Land Use: Honolulu International Airport Airfield

Proposed Action: Proposed action is to construct a 12-inch non-potable water supply line for irrigation of the Hickam golf course. Length of the proposed waterline is approximately 2008 linear feet. This project extends from the Airport Rescue Fire Station on the north side of the Honolulu International Airport airfield, crossing two taxiways and one runway, to the southern airport property line.

Construction of this water main will utilize both microtunneling technique and open cut trench method. Microtunneling operations will be utilized to install the water main under active runways and taxiways, while open cut trench construction will be used only in the areas where work will not affect air traffic. This will minimize the impact on airport operations and safety.

Impacts & Benefits: Temporary impacts during construction include minor degradation of environmental quality (air, water, etc.), safety as well as inconvenience of airport operations, construction dust, and construction dewatering activities. On the other hand, positive impact such as potable ground water

conservation can be accomplished due to the increased use of non-potable water for irrigation in lieu of potable water use.

SECTION I

PROJECT DESCRIPTION

I. PROJECT DESCRIPTION:

1.1 Purpose of Proposed Action

The Board of Water Supply, City and County of Honolulu is proposing to construct a new 12-inch non-potable water main across the airfield of Honolulu International Airport (HIA). This new water line will replace the current potable water irrigation supply for Hickam golf course with a non-potable water supply. The proposed water main will be able to transmit a flow rate of one (1) million gallons per day from the Kalauao Springs Non-potable Water System.

1.2 Location

The proposed water main will be routed through the airfield of Honolulu International Airport (HIA). HIA is located on the south coast of Oahu, approximately three (3) miles west of downtown Honolulu. It is bordered on the east by Keehi Lagoon, the west by Hickam Air Force Base and north by Nimitz Highway and H-1 Freeway. The project site is defined by Tax Map Key 1-1-03. HIA is a jointly owned civil carrier and military airport. The greater portions of the airfield, the air carrier terminal buildings and general aviation facilities are owned and operated by the State of Hawaii, Department of Transportation, Airports Division. Major facilities at the airport include four runways and associated taxiways, aprons, hangers and tie-downs, Overseas terminal building and Inter-Island terminal building with parking and car rental facilities, and a range of supporting facilities such as air cargo and maintenance, FAA Control Tower, National Weather Service Building and navigational aids. (See *Appendix 'A'*)

1.3 Description

This non-potable water main is approximately 2008 linear feet. It extends from the end of the existing non-potable water main near the Airport Rescue Fire Station on the north side of Honolulu International Airport, across Taxiway 'A', Runway '8L' and Taxiway 'B' to the Hickam Air Force Base property line on the south side of the airfield. HAFB just completed the installation of the other portion of this water main from the end point of this portion to the golf course.

This project will utilize both standard open cut trench construction method outside the Taxiway 'A' and Runway '8L' safety zone and trenchless microtunneling technique under Taxiway 'A' and Runway '8L' (See *Appendix 'B'*). This combined construction method will minimize the impacts on airport operations and safety.

1.4 Permits Required

The new non-potable water main will be located in the airfield of HIA, and will require dewatering during construction. Therefore it will require, but shall not be limited to the following permits:

* NPDES Permit --- Notice Of Intent (NOI) Form 1, Form 'A', Form 'G'
  State of Hawaii
  Department of Health
  Clean Water Branch

  NOI Form 1 and Form 'A' are required to be submitted with Form 'G'. Form 1 consists of general information, and Form 'A' consists of water quality analysis. Form 'G' is required for disposal of construction dewatering effluent into State waters. Some portions of the trench and the microtunneling jacking pits require dewatering since the inverts are below the ground water table.

* NPDES Permit --- Notice Of Intent (NOI) Form 'C'
  State of Hawaii
  Department of Health
  Clean Water Branch

  This NOI Form 'C' is required for storm water runoff associated with construction activity. Since the proposed water main is located in the airport operational area, it will be included as part of the airport NPDES general permit (HI-R10A076).

* FAA form 7460-1 --- Notice of Proposed Construction or Alteration
  US Department of Transportation
  Federal Aviation Administration
  Western-Pacific Region
  Air Traffic Division AWP-530

  Any proposed construction or alteration inside the Airport Operational Area (AOA) requires FAA notification.

All these permits are being prepared by KFC Engineering Management, Inc. on behalf of the Board of Water Supply, City and County of Honolulu. The project will be designed and constructed in accordance with the City and County of Honolulu, Board of Water Supply water system standards and all associated FAA standards. NPDES permit application Form 1, Form 'A' and Form 'F' for hydrotesting water discharge are not required. All hydrotesting water will be discharged into the desiltation pond without going into Manuwai Canal. *(See Appendix E)*

1.5 Construction Materials and Methods

The proposed water main will be constructed with PVC pipe, poly-wrapped ductile iron pipe and welded steel pipe. PVC pipe will be used in the open cut areas without a reinforced concrete jacket. Poly-wrapped ductile iron pipes with reinforced concrete jackets will be used under Taxiway 'B' and under a 36-inch concrete drain pipe. Twenty-four (24)-inch welded steel pipe will be used for microtunneling casing, and 12-inch welded steel pipe will be used as carrier pipe inside the casing under Taxiway 'A' and Runway '8L'. The purpose of using welded steel pipe is to ensure a maintenance and leakage free water main. Typical trench and microtunneling cross-sections are provided in *Appendix 'C'*.

Construction will be divided into three phases in order to control the work and minimize the impacts to the airport operations (See *Appendix 'D'*). The Contractor will be prohibited to proceed with work in the next phase prior to completion of the work in the previous phase.

Phase 1: From beginning point at Sta. 0+00 to Sta. 7+50.
The Contractor will complete the 265 feet of water main under Taxiway 'A' with microtunneling operations technique and 485 feet of water main with standard open cut trench construction technique.

Phase 2: From Sta. 7+50 to Sta. 13+20.
The Contractor will construct 510 feet of water main under Runway '8L' with microtunneling operations technique and 60 feet of water main with standard open cut trench construction.

Phase 3: From Sta. 13+20 to Sta. 20+08.
The Contractor may choose an alternate construction method (either open cut trench construction or microtunneling operation). The Contractor will construct 423 feet of water main with standard open cut trench construction and 265 feet of water main with either option 'A' or option 'B'. Option 'A' is open cut construction consisting of 265 feet of poly-wrapped ductile iron pipe with concrete jacket under Taxiway 'B' and restoration of Taxiway 'B' pavement. Option 'B' is microtunneling operation consisting of 265 feet drive with 24-inch steel casing and 12-inch welded steel carrier pipe.

Construction dewatering will be required during microtunneling operations and some portions of open cut trench construction since the jacking pit inverts and some portions of the trench inverts are below the ground water table.

Prior to any construction, a desiltation/settling pond will be constructed using the natural contours of the existing terrain on the north side of Runway '8L' between Taxiway 'A' and Runway '8L'. This pond shall be constructed in such a way that the majority of surface runoff from the construction site in this area will end up in the pond. A sump area will be created at the low point of the pond, and the desiltation fence or fabric with rock will be placed between the sump area and the rest of the pond. A pump(s) will transport water from this sump to the Manuwai Canal in such a manner as to keep the pond level low to prevent flooding of the surrounding area. This pond will be used to process both surface water runoff and construction dewatering effluent prior to discharge into the Manuwai Canal (See *Appendix 'E'*). During the construction, Contractor will comply with all procedures and requirements in the NPDES permit application and BMP. In addition, the Contractor will take discharge quality test periodically. The slurry from microtunneling operations will be hauled to the Airport Reef Runway disposal site in accordance with all airport regulations and requirements of the disposal management facility as specified in the plans and specifications.

1.6 Estimated Construction Schedule and Cost

The construction period for the proposed project is anticipated to last six (6) months. The current estimated cost of the project is approximately one million dollars, which will be funded entirely by the City and County of Honolulu, Board of Water Supply. The estimated construction start date is summer 1996.

SECTION II

AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS AND MITIGATIVE MEASURES

II. AFFECTED ENVIRONMENT AND POTENTIAL IMPACTS AND MITIGATIVE MEASURES

2.1 Existing Land Use

The project site is located in the airfield of Honolulu International Airport, but within the property limit of Hickam Air Force Base (HAFB). The site includes the edge of the Airport Rescue Fire Station parking lot, a portion of Taxiway 'A', a portion of Runway '8L', a portion of Taxiway 'B', and soil areas between these two taxiways and one runway in the HAFB property. Recently, HAFB reached an agreement in principle to transfer portions of Taxiway 'A', Taxiway 'B' and Runway '8L' in which the project site lies to the State Department of Transportation (DOT). Currently, the State DOT has a right-of-entry with the land transfer anticipated to be finalized in one to two years.

Impacts and Mitigation Measures

The installation of the proposed water main is not anticipated to hinder the existing land use in the vicinity and surrounding area.

2.2 Topography and Geology

HIA is located on the western end of Oahu's coastal plain, the area adjacent to the ocean formed from coral reefs and lagoonal deposits. Slopes are smooth and gentle. The coastal plains are used mostly for farming, ranching and urban development. The lagoonal deposits consist of coralline fragments in a matrix of very soft silt and clay with a thickness of 20 to 30 feet. HIA was constructed on a fill placed over lagoonal deposits, beach and dune sand deposits, consolidated coralline deposits, and recent coral reef. The majority of runways and taxiways at the airport were constructed over the former Lelepaua and Kaihikapu Fishpond and marsh lands surrounding these ponds.

The ground surface slopes gently up and down on a north to south direction. According to the topographic survey plan by Engineers Surveyors Hawaii, Inc. for this project, site elevations range approximately from +2 ft to +11 ft Mean Sea Level. Runways and taxiways are generally located at the higher elevation areas, and mounds and depressions make up the landscaped area. The taxiway and

runway surfaces were paved with asphalt concrete (AC) and concrete. Manuwai Canal is located approximately 300 ft east and parallel to the proposed water main (See *Appendix 'F'*).

Impacts and Mitigation Measures

The installation of the proposed water main is not anticipated to alter the existing topography in the vicinity and surrounding areas. The construction of this water main will not affect the fishpond deposits.

2.3 Soils

The subsurface conditions encountered at the site are shown in the boring logs (See *Appendix 'G'*). Subsurface conditions encountered generally consist of approximately 4 to 10 ft of fill material on the surface. The fill was composed of silty coralline sand with some coralline gravel ranging in consistency from very loose to very dense. The fill was underlain by a soft lagoonal deposit of silts and clays to depths of approximately 7.5 ft to 12.0 ft. Below the lagoonal deposit, backreef deposits consisting of very loose to very dense coralline sand and gravel and recemented coral reef were encountered. Ground water was determined to fluctuate with the tide from +0.7 ft to +2.6 ft MSL.

Impacts and Mitigation Measures

The installation of the proposed water main does not induce any significant negative impacts. Temporary disturbance of soils will occur during the excavation and backfill activities. The replacing of existing soil with rock and pipe cushion is not expected to pose any adverse effect on existing conditions. Existing surface conditions will be restored upon completion of construction.

2.4 Surface Water

Manuwai Canal is the only surface water in the near vicinity of the proposed project site. The canal is approximately 300 ft east and parallel to the proposed water main alignment.

Manuwai Canal is an unlined trapezoidal drainage channel with a bottom width ranging from 100 feet near the Pacific Ocean to 60 feet near the junction with the 19th Street Canal. There are culverts at places where the canal crosses Runway '8L' taxiways and roadways, and under the Inter-Island cargo parking apron. Periodic flooding occurs along the canal during storms when runoff exceeds 600 ft^3/s (5-yr storm).

Construction dewatering effluent from the microtunneling pits and some portions of the open cut trench will be discharged into the canal after desiltation in the settling pond. The dewatering effluent is uncontaminated brackish water with extremely low salinity (11 ppt), and nearly neutral base (pH value is approximately 7.48). (See *Appendix 'H'*)

Impacts and Mitigation Measures

There will be several temporary impacts concerning the quality of the canal waters during construction.

* Level of turbidity in the canal will increase minimally due to the disturbance of existing sediments.
* Dislocation of aquatic life in Manuwai Canal will occur.
* The impact of the chemical compositions will be insignificant since the canal is located next to the project site, the water chemistry shall be similar.
* No recreational activities occur nor are allowed in the canal.

Turbidity and other types of construction related impacts are expected to be temporary. The Contractor will follow the requirements and terms in the approved NPDES permits for the subject project.

Impacts to aquatic life are expected to be minimal since increased turbidity in Manuwai Canal will be temporary and sediments will eventually settle. Dislocated aquatic life will be able to return and reestablish in the area after the construction is complete.

2.5 Flora and Fauna

HIA is located in what would generally be called the kiawe/lowland shrub vegetation zone. However, the Nature Conservancy of Hawaii indicated that there were no known rare or endangered species of Flora and Fauna in the HIA boundaries and proposed project area.

The Aquatic Resources Division of the Department of Land and Natural Resources indicated that they do not have any survey information on Manuwai Canal, the drainage channel along Aolele Street. However, according to the Final Environmental Impact Statement of HIA prepared by Edward K. Noda Associates, 1991, and Environmental Assessment for Hickam Air Force Base Facilities Improvement, 1990, there were no rare and endangered species of flora and fauna in the Manuwai Canal.

Impacts and Mitigation Measures

Impacts concerning disturbance of aquatic life in Manuwai Canal are minimal as stated in section 2.4. The landscaping area next to the Airport Rescue Fire Station will be disturbed and restored upon completion of work. Displacement of weeds and rodents is not regarded as an adverse impact. Discharging dewatering effluent into Manuwai Canal may temporarily displace the fish and crustaceans in the area but no permanent impacts are anticipated.

2.6 Wetlands

Wetlands are defined as those areas that are inundated by surface or ground water with a frequency sufficient to support and under normal circumstances does or would support a prevalence of vegetative or aquatic life that requires saturated or seasonally saturated soil conditions for growth and reproduction (Executive Order 11990, protection of Wetlands). The proposed project is located within an area that was created by landfills and/or previously developed, and now in the airfield of HIA. Therefore, there are no wetlands in the areas of the proposed project.

Impacts and Mitigation Measures

Not applicable.

2.7 Floodplains

Floodplains are defined in Executive Order 11988, Flood Management, as "the low land and relatively flat area adjoining inland and coastal waters including floodprone areas of offshore islands, including at a minimum, that area subject to a one percent or greater chance of flooding in any given year." i.e., the area that

would be inundated by a 100-year flood. According to the Flood Insurance Rate Maps (FIRM), produced by the Federal Emergency Management Agency, HIA is designated as an area of undetermined but possible flood hazard (Zone D).

Impacts and Mitigation Measures

The proposed project will not increase the severity of the flooding potential. It does not appear that the proposed project will directly or indirectly impact a base floodplain. Therefore, it is assumed that there will be no flood plain impact and no further analysis is necessary.

2.8 Noise

Increase to ambient noise in the areas of the proposed construction will be produced primarily by motor vehicle traffic and the microtunneling machine. High level noise at the site is produced by aircrafts.

Impacts and Mitigation Measures

The ambient noise produced during construction is anticipated to be of no impact, as the noise levels experienced on the active airfield of HIA are considerably higher than those from the proposed construction. All workers or visitors entering the airfield are required to wear ear plugs per OSHA safety regulations.

2.9 Air Quality

Air quality in the proposed project site will mainly be influenced by the dust from excavation and backfill, and exhaust gases from traffic emissions.

Impacts and Mitigation Measures

* Dust Control

Dust control is extremely critical in the airfield for airport operations and safety. During construction, dust from excavation and backfill are expected and will be monitored by the Construction Manager. The Contractor is required to provide necessary dust control as specified on the plans and specifications. Dust

controls at the site includes frequent watering of exposed dirt surface and immediate paving or landscaping of completed areas of construction. Open body trucks will be covered at all times while transporting materials that may generate fugitive dust. All measures taken shall comply with State of Hawaii, Department of Health Administrative Rules, Title 11, Chapters 59 and 60 and all applicable county ordinances relating to excavation and stockpiling procedures. Strict adherence to approved erosion and dust control plans is expected to minimize any negative impacts.

* Traffic Emissions

During construction, air quality is expected to be degraded by exhaust gases from the construction equipment and automobiles. However, the impacts are expected to be insignificant since the construction period is very short and the amount of emission from the automobiles and equipment are negligible compared with those from the airplanes. Proper maintenance of construction equipment and automobiles will help to reduce exhaust emissions.

2.10 Historic and Archeological Resources

The project site has been previously graded and there are no visible archaeological or historic resources. Traditional Hawaiian (Prehistoric or pre-1778) land use in this area appears to have been limited to fishponds on the original tidal and mud flats. These traditional aquacultural features have been buried beneath approximately 8 feet of the dredged coralline fill during the early part of the 20th century. The State Historic Preservation Division has indicated that there are two buried fishponds, Lelepaua and Kaihikapu Fishpond, in the airfield of HIA as shown in *Appendix 'T*. HIA was constructed on fill placed over lagoonal deposits, beach and dune deposits, consolidated coralline deposits, and recent coral reef. The majority of runways and taxiways were constructed over these two fishponds.

The previous uses of the site include:

Prior to construction of Taxiway 'A', the land surrounding and under the taxiway was used as a bunker storage area for explosives. Taxiway 'A' was constructed in 1959.

Prior to construction of Runway '8L', the runway was used as a taxiway between Hickam Air Force Base and HIA (John Rodgers Airport). That taxiway was constructed over the filled fishponds in 1942. The runway was constructed in 1950.

Taxiway 'B' was constructed over the filled fishponds and agricultural areas in 1952.

Impacts and Mitigation Measures

The proposed water main crosses Taxiway 'A', Runway '8L', and Taxiway 'B'. The invert of the water main will be approximately 3 feet below existing grade in the non-pavement areas, and 8 feet below taxiways and runway. Since the HIA airfield was constructed on the fill material and the proposed water main will be constructed in the layer of filled material, there shall not be any impacts on the two buried fishponds. Should historic sites, including human burials, be uncovered during installation of the main, all work in the area will terminate and the Historic Preservation Division will be contacted for further action.

2.11 Economic Activity

The proposed water main will be constructed in the airfield to replace the potable irrigation for Hickam golf course with a non-potable supply. This will benefit our State by conserving the potable ground water.

Impacts and Mitigation Measures

It is not anticipated that this project will disrupt any established communities, residences or businesses, and will not create an appreciable change in employment. In addition, the project will not alter any off-airport surface transportation patterns and will not create any additional congestion on off-airport streets. As microtunneling techniques will be utilized under the taxiways and runway, it is not anticipated that this project will have any significant impact on airport operations and air traffic. Minor impacts, such as airport security checks, FAA Control Tower communications, etc. are anticipated due to the temporary increase of the contractor's ground vehicle traffic on and around the airfield. The proposed construction site is located in the secured airport operational area and access to the site requires Airport security clearance.

2.12 Utilities

The water main will cross several electrical cables for taxiway lights and runway lights, FAA communication cables and one 36-inch concrete drain pipe. The electrical cables under the taxiways and runway are approximately 3 feet below the existing grade; the FAA communication cables are located 3 feet below the existing grade at the non-paved areas; and the 36-inch concrete drain pipe is at an invert of +3.5 feet MSL. (See *Appendix 'J'*)

Impacts and Mitigation Measures

As the proposed water main will be constructed approximately 8' feet below the taxiways and runway with microtunneling technique, the electrical cables will be far above the water main. The water main will be aligned to avoid the FAA cables, 36-inch drain pipe and any known existing utilities. The Contractor is required to verify, tone, check all utilities and hand excavate and expose the FAA cables before commencement of any work.

2.13 Roadways and Traffic

The Contractor will start construction of the water main next to the Airport Rescue Fire Station, and will use a designated access gate and haul route from the airport to Reef Runway disposal facility. All traffic crossing active taxiways and runway are required to obtain prior approval from the FAA Control Tower.

Impacts and Mitigation Measures

It is anticipated that the Airport Rescue Fire Station area will be congested for a short period of time while the Contractor is working on the connection to the existing water main. The Contractor and Construction Manager will coordinate with the Airport Rescue Fire Station before commencement of work.

It is anticipated that during all phases of construction, the construction vehicles may have minor impacts on FAA Control Tower communication, and insignificant impacts on the air traffic. The construction equipment and workers will be working outside the taxiway and runway safety zone. Closure of Taxiway 'B' may be required for a short period of time. The Construction Manager will coordinate with the Contractor, FAA Control Tower and Airport Operation office for the closure of Taxiway 'B'.

Further mitigation methods to be used include training of all contractor personnel working in the airfield to ensure compliance with all FAA and HIA regulations regarding movement of vehicles and equipment within the airfield. All drivers shall obtain ramp licenses from Airport Security Office.

2.14 Airport Security, Fire and Emergency Service

The proposed project site is located in the HIA airfield. Access to and egress from the site requires security clearance. Airport security, Airport Rescue Fire Station, and emergency services (Code 22) are contacted only if necessary.

Impacts and Mitigation Measures

It is anticipated that there will be insignificant impacts on Airport security, Airport Rescue Fire Station, and emergency service (Code 22). They will be notified of construction activities and scheduling ahead of time. Contractor will provide his own security guards at the access gate and all working personnel entering the AOA will require security clearance from the airport security office.

SECTION III

ALTERNATIVES TO THE PROPOSED ACTION

III. ALTERNATIVES TO THE PROPOSED ACTION

3.1 "No Action" Alternative

This alternative would remove all impacts associated with the construction of the water main. However, this alternative is not considered viable because all impacts are considered small and insignificant, and the proposed project would benefit the people of Hawaii in conservation of potable ground water resources.

3.2 Open Cut Trench Construction Across The Airfield

This alternative would increase impacts on erosion control, water quality, and air quality, as well as airport operations. This alternative would require more excavation and backfill, haul in and haul out material, and increase discharge of dewatering effluent associated with construction activities. In addition, this alternative would require closures of Taxiway 'A', Runway '8L' and Taxiway 'B'. Runway '8L' and Taxiway 'A' are the major runway and taxiway for the overseas traffic and one of the major departure runways for the Inter-Island air traffic. This alternative would greatly impact the cost and safety of airport operations by increasing the delay time of the airlines and passengers. However, the construction cost would be less than alternatives in section 3.3 and section 3.5.

3.3 Alternative Route Around The Airfield

This alternative would have more impacts than the previous alternative during construction on erosion control, water quality and air quality due to the substantially increased length of the water main. This alternative would impact other airfield pavements in Hickam Air Force Base, or other military land uses including residential and the golf course. The construction cost would be much higher than the other alternatives.

3.4 Use of Existing Abandoned 8-inch Fuel Line or 12-inch Waterline

This alternative would require cleaning, flushing, hydrotesting of the existing lines and installation of some portions of the new water main. Use of the existing 8-inch abandoned fuel line or 12-inch waterline may be economized in construction cost across the taxiways and runway. Minimal negative impacts to the environment may be achieved with less amount of construction than other alternatives. However, construction on both north and south sides of the airport would still be required. Both existing lines are not concrete jacketed under the taxiways and runway. These two lines probably consist numerous leaky joints and cracks. This alternative would require an unknown allowance for leakage and crack repairs during the construction, and more maintenance work in the future.

Although the construction cost would be significantly less than any other alternatives, this alternative is not considered viable because of the future impacts to the airport operations and safety from the water main breakage and more maintenance work required. In addition, the existing 8-inch fuel line does not have sufficient capacity.

3.5 Combined Construction Methods

* Microtunneling under Taxiway 'A' and Runway '8L'
* Open Cut Construction in other areas

This alternative would include microtunneling technique and standard open cut trench construction across the airfield. The use of microtunneling technique under Taxiway 'A' and Runway '8L' would reduce the negative impacts on airport operations and safety as well as the negative impacts to the environment. The use of open cut trench construction in other areas would be employed for economical purposes. Impacts such as increased dust and turbidity in the canal would be minimal if dust controls, best management plan (BMP) and erosion control in NPDES permit applications were enforced during construction.

Construction cost would be higher than the alternative in 3.2 , Open Cut Trench Construction Across The Airfield. However, minimizing impacts to airport operations with the microtunneling technique would be more preferable.

Among all these alternatives listed above, alternative in section 3.5 is more desirable in terms of the environmental and economic aspects.

SECTION IV

DETERMINATION

IV. DETERMINATION

The negative impacts of the proposed action has been assessed and it has been determined that an environmental impact statement is not required. Hence, this document will serve as a Notice of Negative Declaration. The determination of a Negative Declaration is based on the following:

1. The proposed action does not involve an irrevocable commitment to loss or destruction of any natural or cultural resources.

2. The proposed action does not conflict with the State's long term environmental policies or goals and guidelines as expressed in Chapter 344, Hawaii Revised Statues, and any revisions thereof and amendments thereto, court decisions or executive orders.

3. The proposed action does have a positive socio-economical impact as the conservation of potable ground water resources benefits every one in Hawaii.

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

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

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

7. The proposed action does not detrimentally affect air, water or ambient noise levels.

8. There are no significant Flora and Fauna species near the proposed project areas.

9. The proposed action does not affect an environmentally sensitive area such as flood plain, tsunami zone, erosion-prone area or geologically hazardous land.

10. The proposed action does have a minor impact on water quality with an increased turbidity in Manuwai Canal. However, the Best Management Practice (BMP) and sediment control effort as stated in NOI Form 'C', and permit request for construction dewatering from the Department of Health were filed, and will be enforced during construction. *(see Appendix E)*

SECTION V

AGENCIES CONSULTED AND REFERENCES

V. AGENCIES CONSULTED AND REFERENCES

5.1 Agencies Consulted:

1. Board of Water Supply
   City & County of Honolulu
   Contact Person: James Yamauchi

2. Department of Transportation
   Airport Division, State of Hawaii
   Contact Person: Ben Schlapak

3. Department of Land and Natural Resources
   State Historic Preservation Division
   Contact Person: Tom Dye

4. Department of Land and Natural Resources
   Forestry and Wildlife Division
   Contact Person: Wayne Ching

5. Department of Land Utilization
   Special Management Area Use Permit
   Contact Person: Joan Takano

6. Honolulu Air Traffic Control Tower
   Federal Aviation Administration
   Contact Person: Bob Rabideau

7. Department of Land and Natural Resources
   Aquatic Resources Division
   Contact Person: Richard Sixberry

8. Hickam Air Force Base
   15 CES/CEC
   Contact Person: Robert Okazaki

Others:

Nature Conservancy of Hawaii
Contact Person: Roy Kam

5.2 References

1. State of Hawaii, Department of Transportation, Airport Division, 1981. Honolulu International Airport, Inter-Island Terminal Complex, Draft Environmental Assessment.

2. Bishop Museum Bulletin No. 104, Archeology of Oahu, J. Gilbert McAliister, 1983.

3. Pacific Geotechnical Engineers, Inc., 1995. Draft Report for Geotechnical Engineering Investigation, Hickam Golf Course, Non-Potable: 12" Water Main.

4. NPDES Permit Application, 1995. Hickam Golf Course, Non-potable: 12" Water Main, Notice of Intent (NOI) Form 'C', and Form 'G'.

5. State of Hawaii, Department of Transportation, Airport Division, 1991. Honolulu International Airport, Final Environmental Impact Statement.

6. Hickam Air Force Base, 1990. Hickam Air Force Base Facilities Improvements, Environmental Assessment

SECTION VI

DRAFT ENVIRONMENTAL ASSESSMENT COMMENTS AND RESPONSE

BOARD OF WATER SUPPLY

CITY AND COUNTY OF HONOLULU

COPY

95 JUN 23 PM 2:14
KFC AIRPORT, INC.

June 22, 1995

Mr. Gary Gill, Director
Office of Environmental Quality Control
220 South King Street, 4th Floor
Honolulu, Hawaii 96813

Dear Mr. Gill:

Subject: Draft Environmental Assessment (DEA) for the Proposed Hickam Golf Course: 12-Inch Nonpotable Water Main, Honolulu International Airport, TMK:1-1-03, Honolulu, Oahu, Hawaii

A DEA for the proposed construction project has been prepared for the Board of Water Supply. A negative declaration is anticipated. Please publish a notice of this action in the next Office of Environmental Quality Control (OEQC) Bulletin.

The completed OEQC Bulletin Publication Form and four copies of the DEA are enclosed.

If you have any questions, please contact James Yamauchi at 527-5202.

Very truly yours,

for RAYMOND H. SATO
Manager and Chief Engineer

Enclosures

cc: Dexter Kubota, KFC Engineering Management

BENJAMIN J. CAYETANO
GOVERNOR

GARY GILL
DIRECTOR

STATE OF HAWAII
OFFICE OF ENVIRONMENTAL QUALITY CONTROL
220 SOUTH KING STREET
FOURTH FLOOR
HONOLULU, HAWAII 96813
TELEPHONE (808) 586-4185
FACSIMILE (808) 586-7452

July 6, 1995

KFC AIRPORT, HI
95 JUL 12 PM 1:27

Mr. Raymond Sato
Board of Water Supply
630 South Beretania Street
Honolulu, Hawaii 96843

Attention: Mr. James Yamauchi

Dear Mr. Sato:

Subject: Draft Environmental Assessment (EA) for Hickam Golf Course 12-inch Nonpotable Water Main, Oahu; TMK: 1-1-3

After a careful review of the subject project, we recommend that you include the following in the final EA:

1. The introductory section of the draft EA mentions a 2007 linear foot water main, but the total footage for Phases 1, 2 and 3 is only 1024 linear feet. Please clarify.

2. Discuss the proposed method of transmission of the nonpotable water from the project site at the airport to its destination at Hickam Golf Course.

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

Sincerely,

GARY GILL
Director

GG/NH:kk

c: Dexter Kubota, KFC Engineering

August 29, 1995

Mr. Gary Gill
Office of Environmental Quality Control
220 S. King Street, 4th Floor
Honolulu, Hawaii 96813

Attention: Ms. Nancy Heinrich

Dear Mr. Gill:

Subject: Draft Environmental Assessment for Hickam Golf Course, 12" Nonpotable Water Main, Oahu, TMK: 1-1-3

Thank you for your comments. The clarification for your comments are as followed:

1. The total linear footage of the proposed water main is approximately 2007 feet. The 1024 feet in Phase 1, 2 and 3 represents the total microtunneling footage.

   Phase 1: 262 feet of microtunneling sections and 488 feet open cut sections.

   Phase 2: 500 feet of microtunneling sections and 70 feet open cut sections.

   Phase 3. 262 feet of microtunneling section and 425 feet open cut sections.

2. Hickam Force will install another portion of this water line from the end point of this portion to the golf course. By the time this is on construction, Hickam Air Force shall have installed their portion of this water line.

If you have any questions, please call Dexter Kubota at 836-7787.

Sincerely,

Raymond Sato
Chief Engineer

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE 6/8/95 JOB NO. 2042

ATTENTION Mr. Richard Sixberry

RE: Hickam Golf Course, Non-Potable 12" Water Main
Honolulu International Airport
Honolulu, Hawaii

TO: Department of Land and Natural Resources
Aquatic Resources Division
1151 Punchbowl Street, Room 330
Honolulu, Hawaii 96813

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of letter [ ] Change order [ ] _____

COPIES	DATE	NO.	DESCRIPTION
1	6/8/95		Prefinal Draft Environmental Assessment.

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[ ] For your use
[ ] As requested
[X] For review and comment
[ ] FOR BIDS DUE _____ 19 ____

[ ] Approved as submitted
[ ] Approved as noted
[ ] Returned for corrections
[ ] _____

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REMARKS _____

COPY TO Board of Water Supply w/o Draft EA

SIGNED Dexter Kubota / Project Manager

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF AQUATIC RESOURCES
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

CHAIRPERSON
MICHAEL D. WILSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT S. COLOMA-AGARAN

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

June 20,1995

95 JUL 11 PM 1:12
KFC AIRPORT, INC.

Mr. Dexter Kubota, Project Manager
KFC Engineering Management, Inc.
Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96813

Ref. Hickam Golf Course, Non-Potable 12" Water Main

Dear Mr. Kubota,,

We have reviewed the Draft Environmental Assessment for the non-potable 12-inch water main and determined that no long-term adverse effect on aquatic resource values is expected from the activities proposed.

Although some temporary disturbance and dislocation of aquatic life will occur in the Manuwai Canal, the mitigation measures recommended for the project are adequate and would limit or prevent excessive impacts to the aquatic environment. However, we suggest that those mitigation measures be incorporated, as conditions, into the permit process."

William Devick, Program Manager
Division of Aquatic Resources

cc: OCEA

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/8/95 JOB NO. 2042
ATTENTION	Mr. Michael Buck
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Department of Land and Natural Resources
Forestry and Wildlife Division
1151 Punchbowl Street, Room 325
Honolulu, Hawaii 96813

GENTLEMEN:

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SIGNED Dexter Kubota / Project Manager

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

MICHAEL D. WILSON
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES

DEPUTY
GILBERT S. COLOMA-AGARAN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
DIVISION OF FORESTRY AND WILDLIFE
1151 PUNCHBOWL STREET
HONOLULU, HAWAII 96813

AQUACULTURE DEVELOPMENT PROGRAM
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CONSERVATION AND ENVIRONMENTAL AFFAIRS
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CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION
LAND MANAGEMENT
STATE PARKS
WATER AND LAND DEVELOPMENT
WATER RESOURCE MANAGEMENT

June 14, 1995

c:\wfc\cdua\9495\kubota.ltr

Mr. Dexter Kubota, Project Manager
KFC Engineering Management, Inc.
Honolulu International Airport
400 Rodgers Blvd., Ste. 715
Honolulu, HI 96819

Dear Mr. Kubota:

SUBJECT: **Prefinal Draft Environmental Assessment for Hickam Golf Course, Non-Potable 12" Water Main**

The Division of Forestry and Wildlife has had the opportunity to review the subject matter and have concluded that the project will not have any affect on our programs. From the information presented, it is doubtful that there will be any affects on waterbirds or seabirds that may frequent adjacent areas of the project.

Thank you for the opportunity to comment.

Very truly yours,

Michael G. Buck
Administrator

cc: Oahu DOFAW Branch
OCEA

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/8/95 JOB NO. 2042
ATTENTION	Mr. Don Hibbard
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Department of Land and Natural Resources
State Historic Preservation Division
33 S. King Street, 6th Floor
Honolulu, Hawaii 96813

GENTLEMEN:

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COPY TO Board of Water Supply w/o Draft EA

SIGNED Dexter Kubota / Project Manager

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

DEPUTY
GILBERT COLOMA-AGARAN

AQUACULTURE DEVELOPMENT PROGRAM
AQUATIC RESOURCES
CONSERVATION AND ENVIRONMENTAL AFFAIRS
CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
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

August 7, 1995

Dexter Kubota
KFC Engineering Management, Inc.
400 Rodgers Blvd., Suite 715
Honolulu, Hawaii 96819

LOG NO: 15194
DOC NO: 9508TD12

Dear Mr. Kubota:

SUBJECT: **Revised Design, Hickam Golf Course Non-potable 12-inch Water Main, Honolulu International Airport**
Moanalua, Kona, O'ahu
TMK: 1-1-3

In response to our June, 1995 letter to you (LOG NO: 14828), Jing Liang provided us with a revised Cross Section with proposed water line invert for this project. The revised cross section shows that the proposed depth of the waterline invert is now shallower than in the prefinal draft environmental assessment, and is at or above ground water level over its entire length.

Because fishpond sediments are located below the water table, we now believe the revised waterline invert will have "no effect" on historic sites.

If you have any questions please call Tom Dye at 587-0014.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jk

95 AUG 11 PM 2:12
KFC AIRPORT, INC

BENJAMIN J. CAYETANO
GOVERNOR OF HAWAII

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

DEPUTY
GILBERT COLOMA-AGARAN

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CONSERVATION AND RESOURCES ENFORCEMENT
CONVEYANCES
FORESTRY AND WILDLIFE
HISTORIC PRESERVATION DIVISION
LAND MANAGEMENT
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

July 7, 1995

Dexter Kubota
KFC Engineering Management, Inc.
400 Rodgers Blvd., Suite 715
Honolulu, Hawaii 96819

LOG NO: 14828
DOC NO: 9507TD03

Dear Mr. Kubota:

SUBJECT: **Prefinal Draft Environmental Assessment (DEA), Hickam Golf Course Non-potable 12-inch Water Main, Honolulu International Airport**
Moanalua, Kona, O`ahu
TMK: 1-1-3

Thank you for the opportunity to review this prefinal DEA. The proposed water main will be installed at Ka`ihikapu fishpond (Site 50-80-13-81), which is buried beneath the airport runways, and which, in our opinion, is significant for the information that it contains on Hawaiian history and prehistory. At page 11 the DEA states that "the proposed water main will be constructed in the layer of filled material" over the fishpond. However, Appendix G, Plate 3, "Generalized Subsurface Cross Section A-A'" shows the proposed "waterline invert" running below the "Silty, gravelly, coralline sand (fill)" for over half its length. The proposed waterline invert below the fill is in sediments described as "soft to medium stiff silts and clays." This is the kind of sediment that one would expect to be deposited in the calm fishpond waters, and closely matches the fishpond sediments that have been excavated from other buried fishponds along the south shore of O`ahu. Based on this information, we do not concur with the determination on page 11 that "there shall not be any impacts on the two buried fishponds." We believe that the project has the potential to destroy information on Hawaiian history and prehistory that is contained within the buried sediments of Ka`ihikapu fishpond.

We believe that the possible "adverse effects" of this project can be mitigated through a program of data collection at one of the standard open cut trench construction areas. Appropriate samples from the walls and below the base of the trench would be collected, analyzed, and reported according to a data recovery plan approved by our office.

If you have any questions please call Tom Dye at 587-0014.

Aloha,

DON HIBBARD, Administrator
State Historic Preservation Division

TD:jk

KFC AIRPORT, INC. 95 JUL 12 PM 1:21

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/8/95 JOB NO. 2042
ATTENTION	Mr. Art Challecombe
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Department of Land Utilization
650 S. King Street, 7th Floor
Honolulu, Hawaii 96813

GENTLEMEN:

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REMARKS _____

COPY TO Board of Water Supply w/o Draft EA

SIGNED _____
Dexter Kubota / Project Manager

KFC PHONE CONVERSATION RECORD

Incoming ( )
Outgoing (X)

Talked with Mr. Art Challecombe Date 8/7/95 Time 8:30 am

of Department of Land Utilization (Affiliation) Recorded by: Jing Shan Liang

Job Name: Hickam Golf Course, Non-Potable: 12" Water Main, HIA

Job No.: KFC 2042

Subject/Discussion: I called to follow up the review comments of Draft Environmental Assessment for the subject project submitted on 6/8/95. Mr. Challecombe stated that since the project will be located in the airfield area, a permit from his office is not required, and he has no comments. When I requested a response letter, he stated that since his department does not have a jurisdiction over the subject area, and he does not have enough staffs, a response letter will not be available.

Response/Action: No response or follow up is required. However, a phone conversation log will be attached to Final EA as a response.

Follow-Up Required: None

Refer to: _____ (X) File

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/8/95 JOB NO. 2042
ATTENTION	Mr. Bob Rabideau
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Federal Aviation Adminstration
Airport District Office
P. O. Box 50244
Honolulu, Hawaii 96850-0001

GENTLEMEN:

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REMARKS _____

COPY TO Board of Water Supply w/o Draft EA

SIGNED Dexter Kubota / Project Manager

U.S. Department
of Transportation
**Federal Aviation
Administration**

Honolulu Airport Traffic Control Tower
760 Worchester Avenue
Honolulu, HI 96818

July 5, 1995

KFC Engineering Management, Inc.
400 Rodgers Boulevard, Suite 715
Honolulu, Hawaii 96819

Dear Sir:

Honolulu Airport Traffic Control Tower has no objections to your proposal on the Hickam Golf Couse non-potable water main project.

Robert A. Rabideau
Air Traffic Manager

KFC AIRPORT INC
05 JUL 95 07:16

OPTIONAL FORM 99 (7-90)
FAX TRANSMITTAL # of pages ▶ 1

To Mr. Jung	From Debbie Saito
Dept/Agency FAA	Phone #
Fax #	Fax #

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/8/95 JOB NO. 2042
ATTENTION	Mr. Robert Okazaki
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Hickam Air Force Base
15 CES/CECC
75-H STREET
Hickam Air Force Base 96853-5233

GENTLEMEN:

WE ARE SENDING YOU [X] Attached [ ] Under separate cover via _____ the following items:

[ ] Shop drawings [ ] Prints [ ] Plans [ ] Samples [ ] Specifications

[ ] Copy of letter [ ] Change order [ ] _____

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REMARKS _____

COPY TO Board of Water Supply w/o Draft EA

SIGNED _____
Dexter Kubota / Project Manager

DEPARTMENT OF THE AIR FORCE
PACIFIC AIR FORCES

MEMORANDUM FOR KFC ENGINEERING MANAGEMENT, INC.
HONOLULU INTERNATIONAL AIRPORT
400 RODGERS BLVD., SUITE 715
HONOLULU, HI 96819
ATTN: MR. JING LIANG

07 SEP 1995

FROM: 15 CES/CEV
75 H Street
Hickam AFB HI 96853-5328

SUBJECT: Draft Environmental Assessment, Hickam Golf Course Non-Potable 12 Inch Water Main

1. Thank you for the opportunity to comment on subject assessment. We have no comments at this time. We regret the delay in responding, but the document was not originally sent to this office.

2. Contact Capt Will Broadway, 449-7514, if you have any questions.

Mark A Ruse

MARK A. RUSE, Capt, USAF
Chief, Environmental Flight
15th Civil Engineer Squadron

95 SEP -7 PM 12:55 KFC AIRPORT HNL

OPTIONAL FORM 99 (7-90)

FAX TRANSMITTAL # of pages ▶ 1

To JING LIANG	From Capt Ruse
Dept./Agency	Phone # 449 1584
Fax # 834-4833	Fax # 449 9723

NSN 7540-01-317-7368 5099-101 GENERAL SERVICES ADMINISTRATION

KFC Engineering Management, Inc.

Honolulu International Airport
400 Rodgers Blvd., Suite 715
Honolulu, HI 96819
(808) 833-1841 * Telefax (808) 834-4833

LETTER OF TRANSMITTAL

DATE	6/13/95 JOB NO. 2042
ATTENTION	Mr. Ben Schlapak
RE:	Hickam Golf Course, Non-Potable 12" Water Main
	Honolulu International Airport
	Honolulu, Hawaii

TO: Department of Transportation, Airport Division
Honolulu International Airport
400 Rodgers Blvd. Suite 700
Honolulu, Hawaii 96820

GENTLEMEN:
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REMARKS _____

COPY TO Board of Water Supply w/o Draft EA

SIGNED Dexter Kubota / Project Manager

KFC AIRPORT, INC.

PROJECT MANAGEMENT CONSULTANTS ■ PLANNING • ARCHITECTURAL / ENGINEERING DESIGN • CONSTRUCTION MANAGEMENT

MEMORANDUM

February 23, 1996

To: File

From: Jing Liang, KFC Airport, Inc.

Subject: Draft Environmental Assessment Review
Hickam Golf Course
Non-potable: 12" Water Main
Honolulu International Airport

The followings are the review comments of the draft environmental assessment orally presented by the Department of Transportation, Airports Division, State of Hawaii, for the subject project:

1. All parties shall be aware of the land transfer being negotiated.

2. Contractor shall be aware of the dredging and maintenance of the Manuwai Canal during construction.

3. As part of its water quality analysis program, the State may require water quality measurements to be taken periodically.

400 Rodgers Boulevard, Suite 710 • Honolulu, Hawaii 96819 • Phone (808) 836-7787 • Telefax (808) 834-4833

February 23, 1996

Mr. Ben Schlapak
Department of Transportation
Airports Division, State of Hawaii
400 Rodgers Blvd. Suite 700
Honolulu, Hawaii 96819

Attention: Mr. Ben Schlapak

Dear Mr. Schlapak:

Subject: Draft Environmental Assessment for Hickam Golf Course 12" Non-potable Water Main, Oahu, TMK: 1-1-3

Thank you for your comments. The clarification for your comments are as followed:

1. The land transfer was addressed in the **Part II, Section 2.1, Existing Land Used.**

2. Contractor will follow the procedures and regulation in the NPDES permits applications and Best Management Practice for the subject project. Portion of the permit applications is included in the Appendix E.

3. Contractor will take water quality test periodically during construction in accordance with the NPDES permits.

If you have any question, please call Dexter Kubota at 836-7787.

Sincerely,

Raymond Sato
Chief Engineer

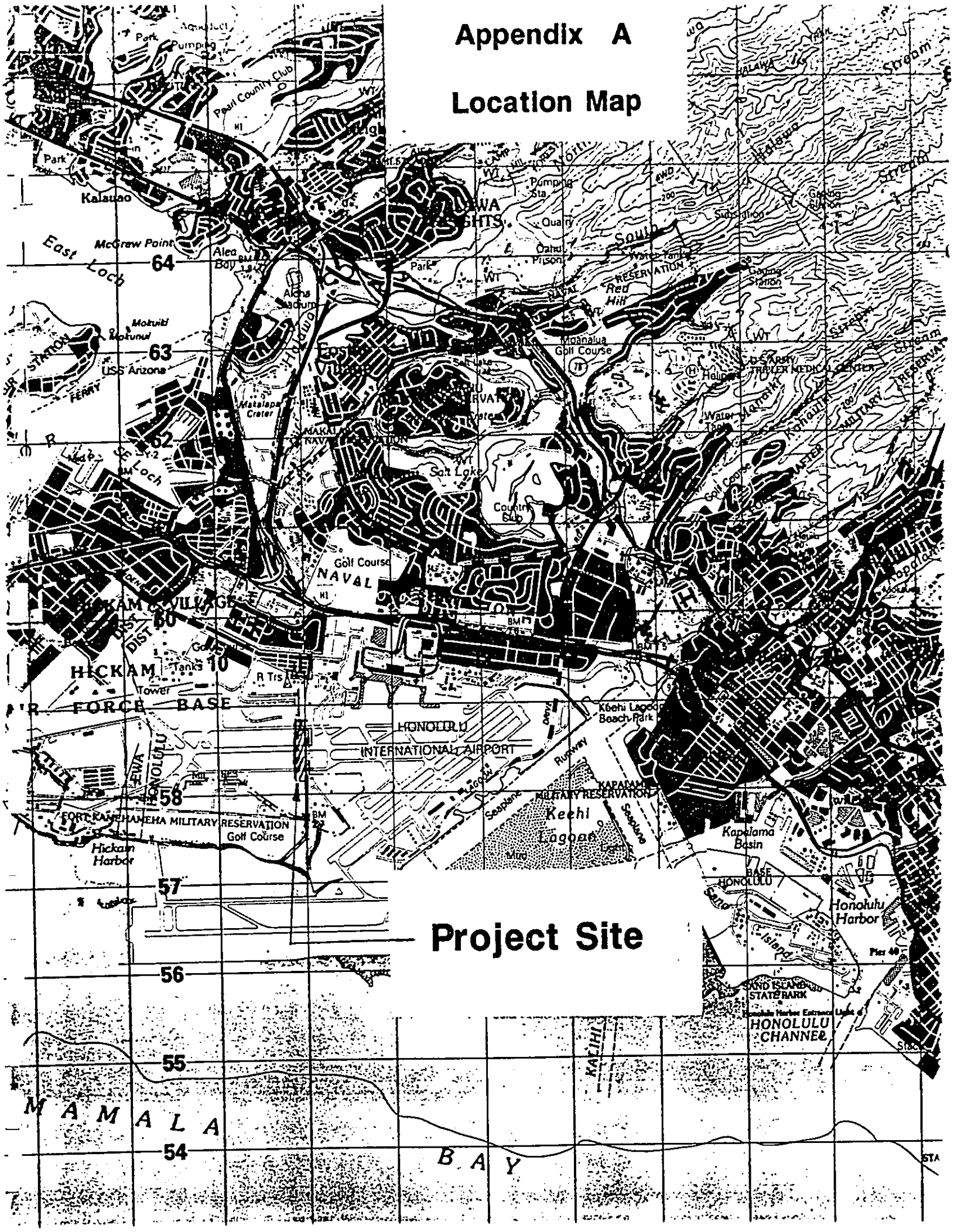
APPENDIX A

LOCATION MAP

DOCUMENT EDGE CUT OFF

Appendix A

Location Map

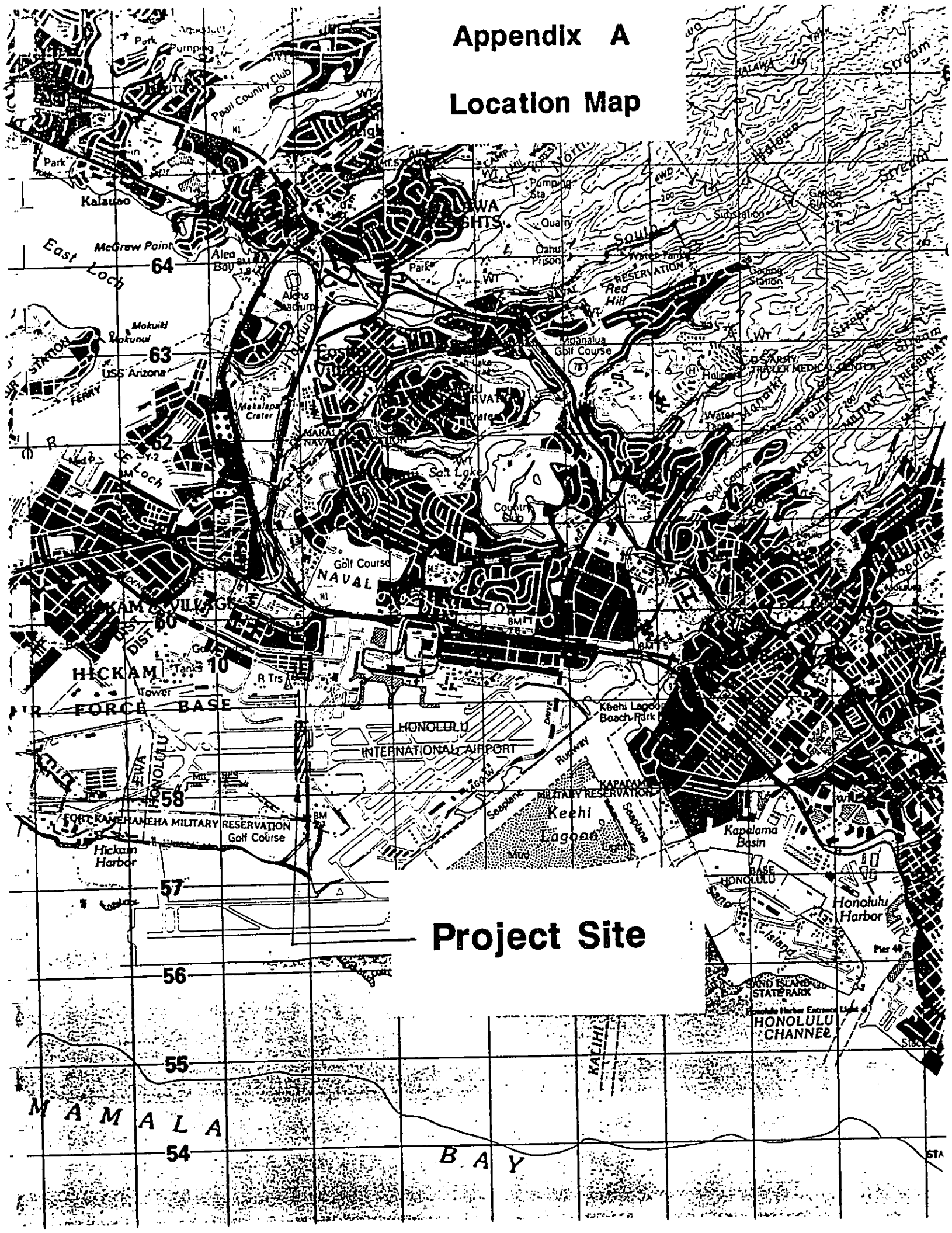


CORRECTION

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

Appendix A

Location Map



APPENDIX B

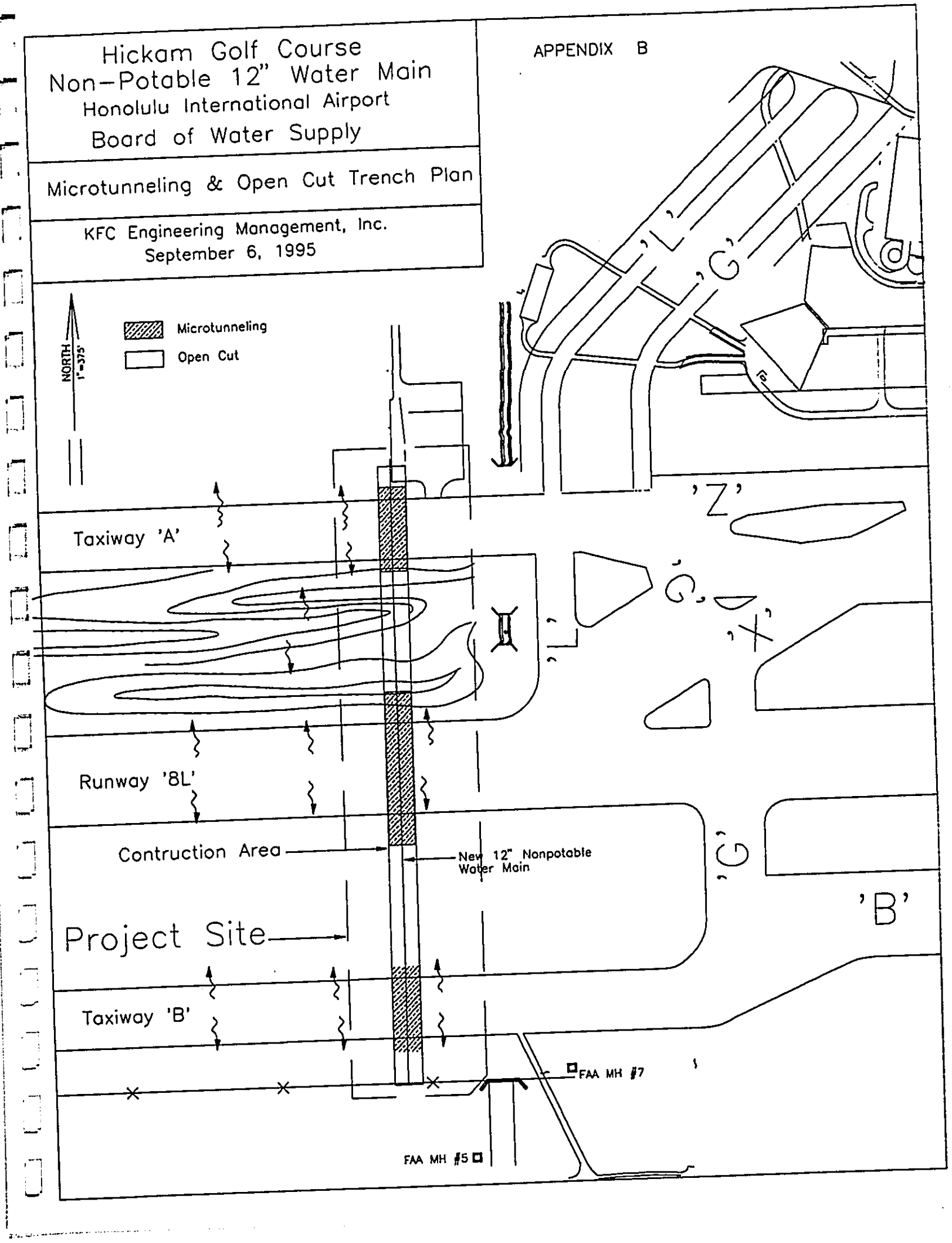
MICROTUNNELING & OPEN CUT TRENCH PLAN

APPENDIX B

Hickam Golf Course
Non-Potable 12" Water Main
Honolulu International Airport
Board of Water Supply

Microtunneling & Open Cut Trench Plan

KFC Engineering Management, Inc.
September 6, 1995



APPENDIX C

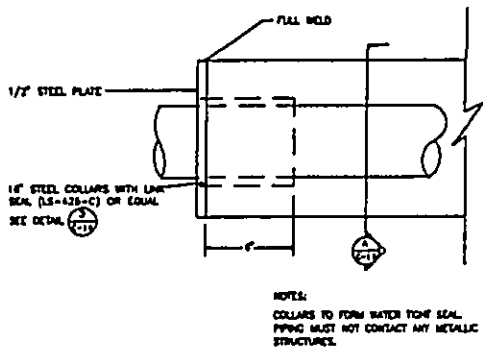
CROSS-SECTION DETAILS

* TYPICAL MICROTUNNELING DETAILS
* TYPICAL OPEN CUT TRENCH DETAILS

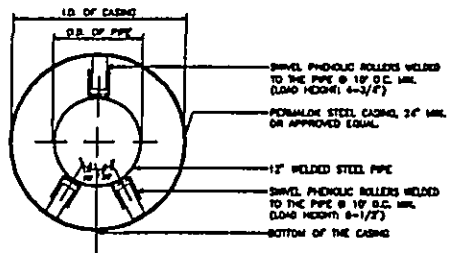
APPENDIX C

CROSS SECTION DETAILS

TYPICAL MICROTUNNELING DETAILS

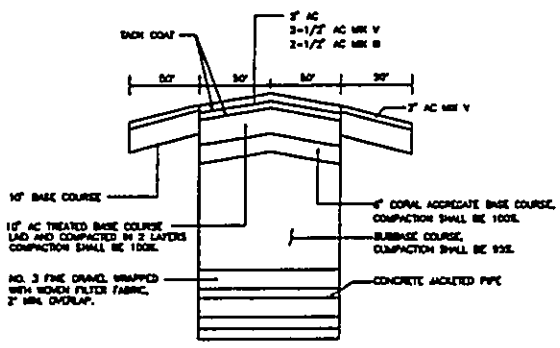


1/C PIPE CASING DETAIL
N.T.S.

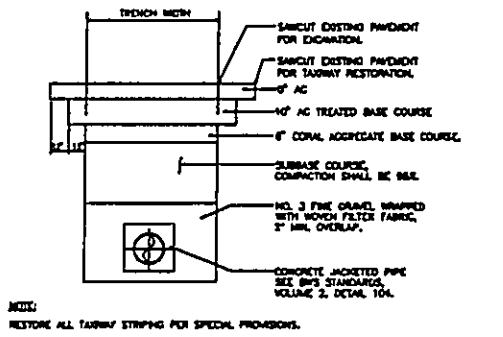


A/C CASING DETAIL
N.T.S.

TYPICAL OPEN CUT TRENCH DETAILS



2/C TAXIWAY 'B' PAVEMENT SECTION
N.T.S.

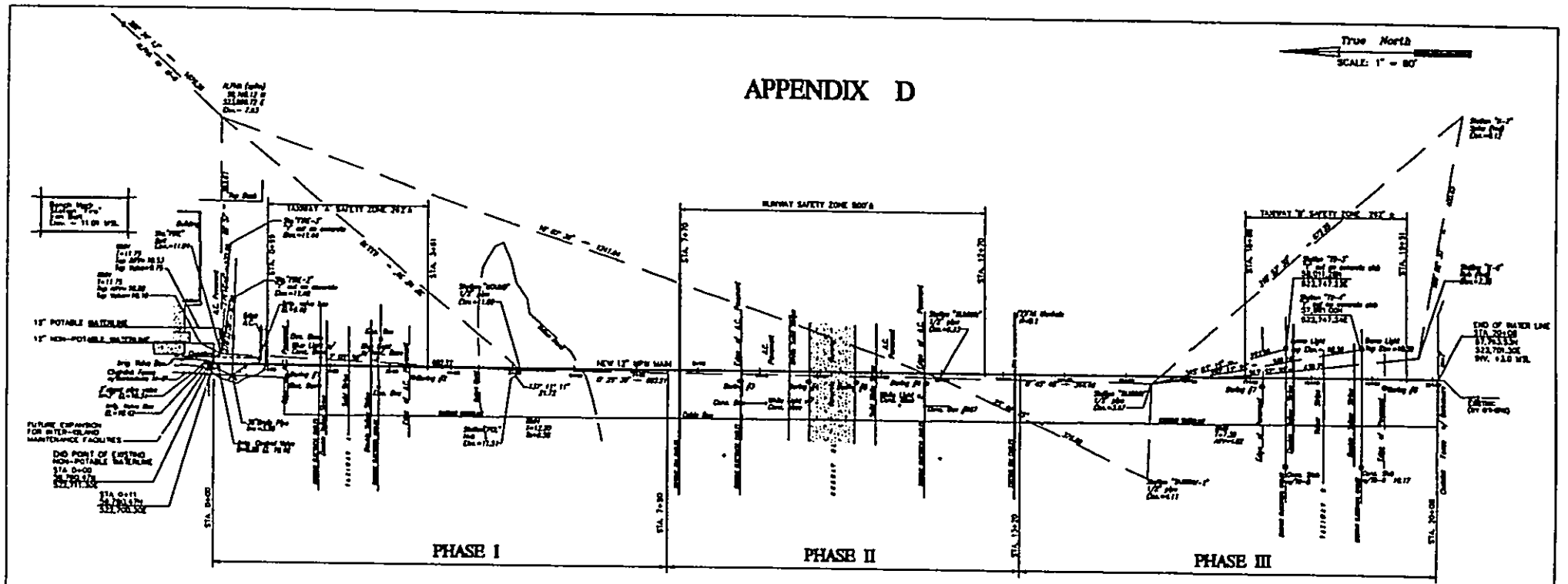


3/C TYPICAL TRENCH DETAIL FOR UNPAVED AREAS
N.T.S.

APPENDIX D

PHASING PLAN

APPENDIX D



PHASE I

1. ALL SAFETY PRECAUTIONS SUCH AS LIGHTS, TEMPORARY STRIPING AND BARRICADES MUST BE IN PLACE PRIOR TO BEGINNING WORK IN THE AFFECTED AREA. (ALL PHASES)
2. ALL PIPE MUST BE TESTED, INSPECTED AND APPROVED BEFORE GROUND CLOSURE AND TRENCH FILL. ALL WELDS MUST BE X-RAYED AND TESTED. X-RAYS & TEST RESULTS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW. (ALL PHASES)
3. BORE EQUIPMENT SHALL BE PLACED OUTSIDE THE SAFETY REALM OF TAXIWAY "A". DURING BORE OPERATIONS, ALL MEN, MATERIAL AND EQUIPMENT SHALL REMAIN OUTSIDE 131' OF TAXIWAY "A" CENTERLINE.
4. UPON ACCEPTANCE OF THE WATERLINE SECTION, THE TRENCH MUST BE RETURNED TO GRADE AND CONDITION BEFORE WORK CONTINUES WITH ENGINEER'S APPROVAL.
5. STEEL PLATES SHALL BE PLACED OVER THE EQUIPMENT PITS WHEN NOT IN USE.
6. ALL SECTIONS OF THE WATERLINE MUST BE TESTED PRIOR TO BACKFILLING AND PROGRESSING TO THE NEXT PHASE. MINIMIZE DISRUPTION TO THE AIRPORT'S DAILY OPERATIONS.
7. SUBMIT DAILY WORK REPORTS ON PROGRESS OF BORES TO THE ENGINEER FOR REVIEW.
8. MAINTAIN RADIO COMMUNICATION WITH THE AIR TRAFFIC CONTROL TOWER DURING ALL PHASES OF CONSTRUCTION.
9. CONTRACTOR SHALL DETERMINE SIZE OF PIT REQUIRED FOR THE BORE OPERATIONS. PIT MEASUREMENTS, CALCULATIONS, AND LOCATIONS SHALL BE SUBMITTED TO ENGINEER FOR REVIEW.
10. SHOULD CONSTRUCTION ACTIVITY BE REQUIRED INSIDE SAFETY REALMS, THE ENGINEER SHALL BE NOTIFIED 24 HOURS IN ADVANCE.
11. NIGHT WORK MAY BE REQUIRED DURING BORE OPERATIONS, PROVIDE LIGHTING PLAN FOR THE ENGINEER'S REVIEW. (ALL PHASES)
12. CONTRACTOR SHALL COORDINATE WITH THE AIRPORT FIRE RESCUE STATION PRIOR TO START OF ANY WORK.
13. CONTRACTOR SHALL VERIFY ELECTRICAL CABLES AND TONE THE AREA FOR EXISTING UTILITIES PRIOR TO BORE OPERATIONS (ALL PHASES)

PHASE II

1. RUNWAY 8L-26R BORE OPERATION AND PHASE III TRENCH WORK MAY OVERLAP BARRING ANY SAFETY HAZARDS AND WITH APPROVAL FROM THE ENGINEER.
2. BORE EQUIPMENT SHALL BE PLACED OUTSIDE THE SAFETY REALM OF RUNWAY "8L". ALL MEN, MATERIAL AND EQUIPMENT SHALL REMAIN OUTSIDE 250' OF RUNWAY "8L" CENTERLINE AT ALL TIMES.
3. BORE EQUIPMENT PIT SHALL BE PLACED NORTH OF RUNWAY 8L-26R WITH THE RECEIVING PIT OUTSIDE THE SAFETY REALM.

PHASE III

1. THIS PHASE CONSISTS OF THE WORK FROM END OF PHASE II TO THE END OF THE LINE WITH EITHER OPEN CUT TRENCH CONSTRUCTION OR MICROTUNNELING TECHNIQUE UNDER TAXIWAY "B".
2. DURING BORE OPERATION, ALL MEN, MATERIALS, AND EQUIPMENT SHALL REMAIN OUTSIDE 131' OF TAXIWAY "B" CENTERLINE AT ALL TIMES.
3. FOR TAXIWAY "B" CLOSURE, CONTRACTOR SHALL INFORM THE ENGINEER 2 WEEKS BEFORE THE CLOSURE, AND PERFORM THE FOLLOWING:
   A. DISCONNECT THE LIGHTING CIRCUITS.
   B. PLACE BARRICADES WITH ALTERNATE ORANGE AND WHITE MARKINGS AT EACH ENTRANCE OF THE CLOSED TAXIWAY. THE BARRICADE SHALL BE SUPPLEMENTED WITH FLASHING YELLOW LIGHTS. THE INTENSITY OF THE LIGHTS AND SPACING FOR BARRICADES, FLAGS, AND LIGHTS MUST BE SUCH TO DELINEATE ADEQUATELY THE HAZARDOUS AREA.

SEE DETAIL 6/C-10

PHASING PLAN

SCALE: 1" = 80'

GRAPHIC SCALE IN FEET

80 40 0 80 160

DENNIS C. KUROYA — LICENSED PROFESSIONAL ENGINEER — No. 9569-E — HAWAII, U.S.A.

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION.

BY: _____

DATE: _____

REVISION #	DATE	DESCRIPTION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU
JOB NO. 98-103
HICKAM GOLF COURSE
NON-POTABLE: 12-INCH WATER MAIN
CONSTRUCTION PHASING PLAN

APPROVED _____ CHIEF, PLANNING AND ENGINEERING DIVISION — DATE:

DRAWN BY: ENGINEER & DWG BY: DCK — FILE NO.

FIELD BOOK NO. — SCALE: — SHEET C-3 OF 14 SHEETS

APPENDIX E

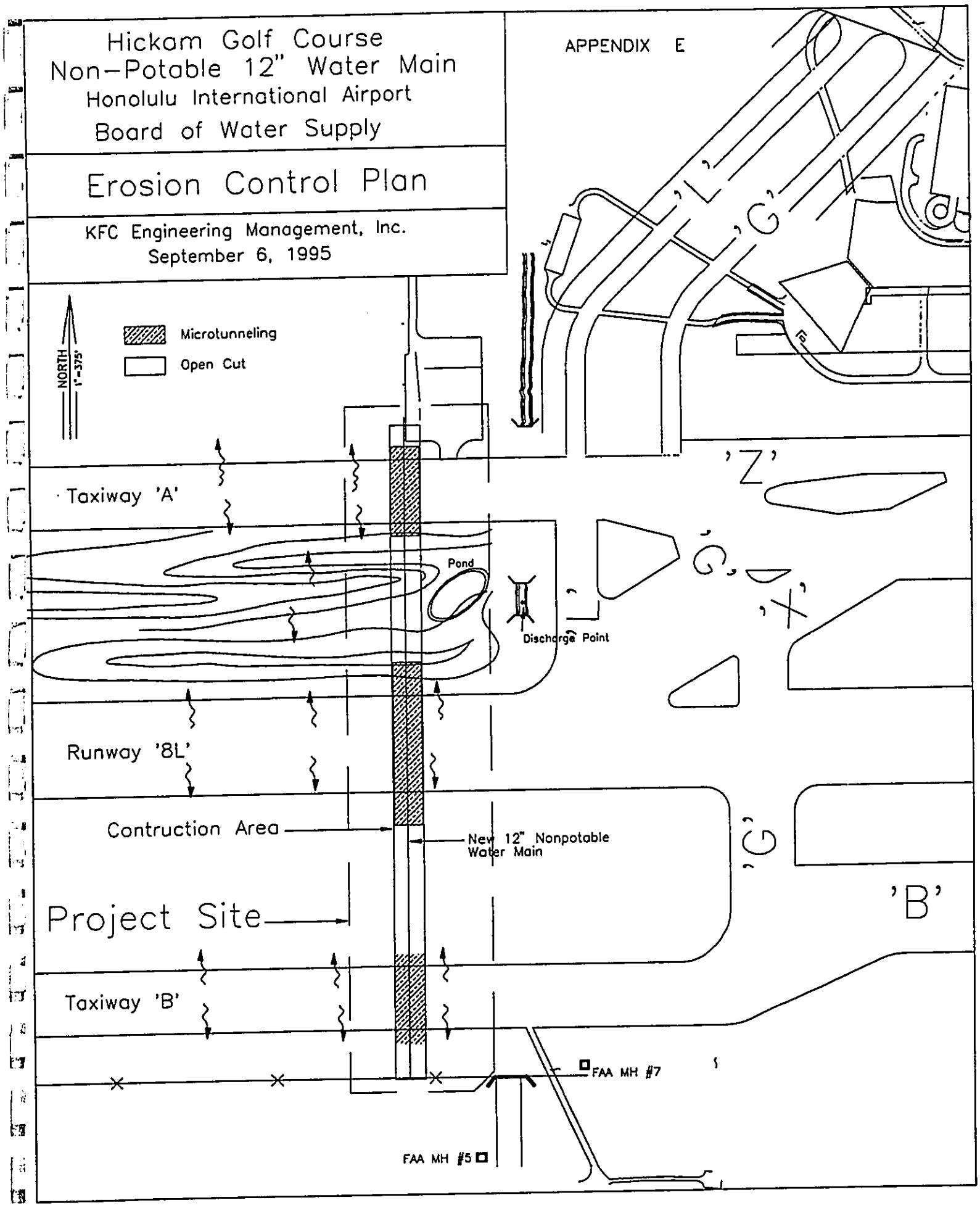
EROSION CONTROL MAP
&
DEWATERING DISCHARGE PLAN
&
HYDROTESTING WATER FLOW CALCULATION

APPENDIX E

Hickam Golf Course
Non-Potable 12" Water Main
Honolulu International Airport
Board of Water Supply

Erosion Control Plan

KFC Engineering Management, Inc.
September 6, 1995



PART III

DEWATERING PLAN

Phase I:

Prior to any construction between taxiway "A" and runway "8L", a desiltation/settling pond will be constructed using the natural contours of the existing terrain on the "8L" side of the hill between the two airfield pavements. This pond should be constructed in such a way that the majority of surface runoff from the construction site in this area will end up in the pond. A sump area will be created at the low point of the pond, and a desiltation fence of rock or fabric placed between the sump area and the rest of the pond. A pump(s) will be used to take water from this sump to the Manuwai Canal in such a manner as to keep the pond level low and prevent flooding of the surrounding area. This pond will be used to process both surface runoff water and construction dewatering water/microtunneling slurry water prior to discharge into the Manuwai Canal.

Phase II:

Prior to any construction between runway "8L" and taxiway "B", a desiltation/settling pond will be constructed near the drain inlet. The drain inlet will be protected from surface runoff with a sandbag barrier. A sump area will be created at the low point of the pond, and a desiltation fence of rock or fabric placed between the sump area and the rest of the pond. A pump(s) will be used to take water from this sump to the drain inlet in such a manner as to keep the pond level low and prevent flooding of the surrounding area. This pond will be used to process both surface runoff water and construction dewatering water/microtunneling slurry water prior to discharge into the Manuwai Canal through the drain inlet.

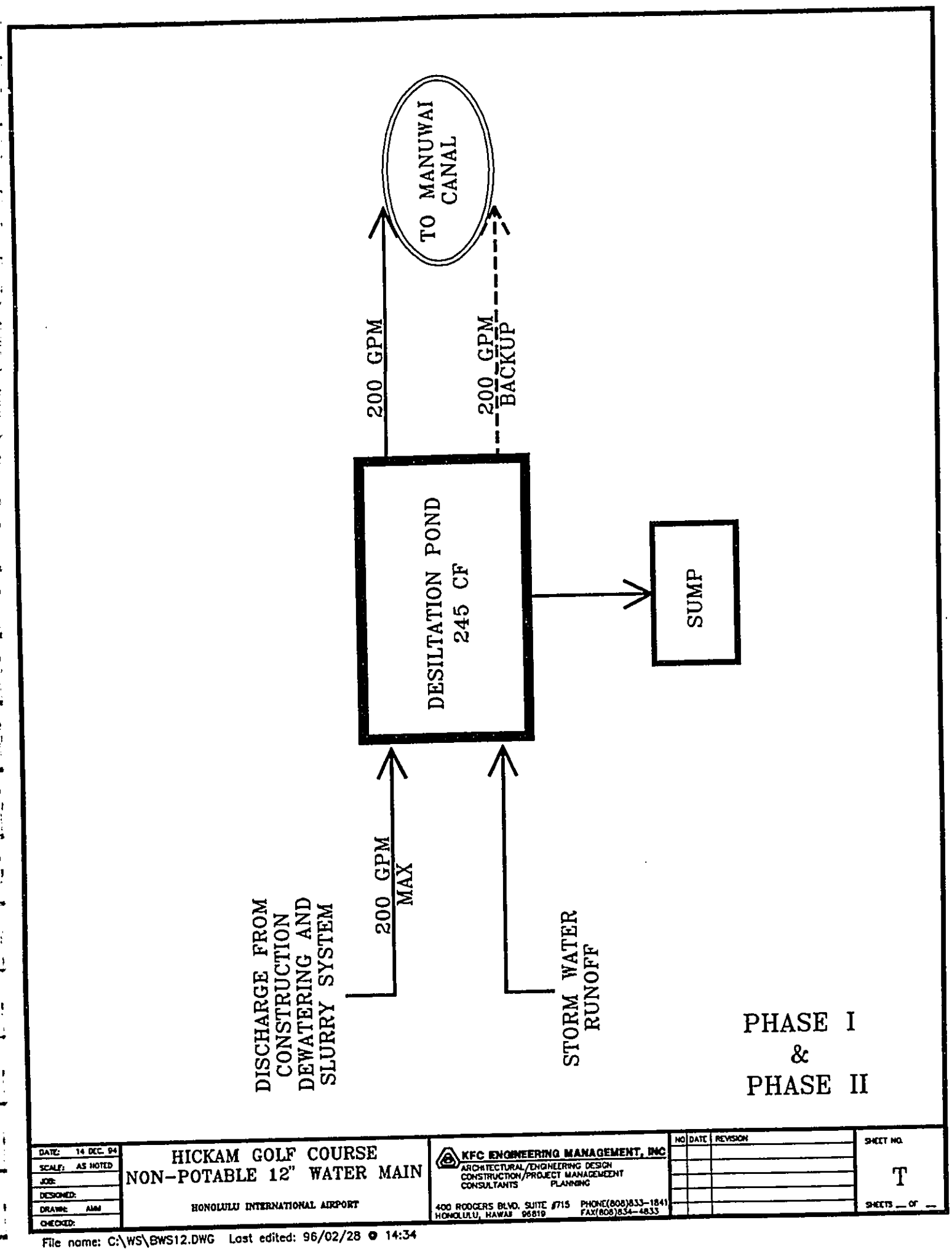
Mitigative Plan:

If regular monitoring and (or) visual inspection shows any physical changes to the water quality, the Contractor shall notify the owner's representative, and immediately apply one of the following mitigative measures:

1. Discharge the water inflow to Inter-Island Maintenance Area Evaporation pond located on the side of the Access Road to Airport Rescue Fire Station No. 1 from Elliot St.

2. Add more silt screens and sedimentation tanks.

3. Stop the project.



DATE: 14 DEC. 94	HICKAM GOLF COURSE NON-POTABLE 12" WATER MAIN	KFC ENGINEERING MANAGEMENT, INC	NO. DATE REVISION
SCALE: AS NOTED		ARCHITECTURAL/ENGINEERING DESIGN CONSTRUCTION/PROJECT MANAGEMENT CONSULTANTS PLANNING	SHEET NO. T
JOB:	HONOLULU INTERNATIONAL AIRPORT	400 RODGERS BLVD. SUITE #715 HONOLULU, HAWAII 96819 PHONE(808)833-1841 FAX(808)834-4833	SHEETS __ OF __
DESIGNED:			
DRAWN: AMM			
CHECKED:			

File name: C:\WS\BWS12.DWG Last edited: 96/02/28 @ 14:34

Part II. Calculation for Hydrotesting Water

1. Water flow

* test station : 0+00 to 1+00 100'

$$\text{flow per day} = \frac{100' * \pi \cdot \frac{2^2}{4} \cdot \text{cf}}{\text{day}} \cdot \frac{1 \text{ Gallons}}{0.13368 \text{ cf}}$$

$$\equiv 587 \text{ Gallons/day}$$

* test station : 1+00 to 3+62 262'

flow per day $\equiv 587 * 2.62$

$\equiv 1539$ Gallons/day

* test station : 3+62 to 7+62 400'

flow per day $\equiv 4 * 587$

$\equiv 2348$ Gallons/day

test station 7+62 to 12+62. 500'

flow per day $\equiv 5 * 587$

$= 2935$ Gallons/day

* test station : 12+62. to 16+62 400'

flow per day $\equiv 2348$ Gallons/day

* test station : 16+62 to 19+24. 262'

flow per day $\equiv 1539$ Gallons/day

* test station ~~Spot~~ 19+24 to 20+07 83'

flow = $0.83 * 587 \equiv 487$ Gallons/day

Average flow per day $= \frac{587 + 1539*2 + 2348*2 + 2935 + 987}{7}$

$= 1683$ Gallons / day

Maximum flow per day $=$ 2935 Gallons / day.

B. Pond Capacity and Filtration Rate.

Per Appendix 'B' in NPDES permit application.

The pond will be $20' * 18' * 4.6'$.

The area of filtration $= 20' * 18' = 360$ sf.

Rate of Filtration $= k \cdot A \cdot \frac{dh}{dl}$.

where $k =$ coefficient of permeability.

$= 10^4$ gpd / ft^2.

$A =$ Area of flow ~~foot~~ cross section

$\frac{dh}{dl} =$ Hydraulic gradient.

$\frac{dh}{dl} = \frac{2'}{100'} = 0.02$.

Rate of Filtration $= k \cdot A \cdot \frac{dh}{dl}$

$= 10^4 * 360 * 0.02$

$= 72000$ gpd

$= 50$ gpm.

If a 4" pump is used to pump the ~~water~~ hydrotested water from the drain to the pond.

C. At Maximum daily flow condition:

Hydrotested water capacity = 2935 gallons.

Pump flow rate = 550 gpm.

Time required to pump = $\frac{2935}{550}$ = 5.3 minutes.

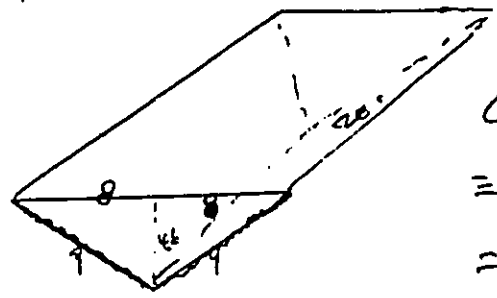
Rate of filtration = 50 gpm. (part)

The filtration capacity = 50 * 5.3 = 267 gallons

The water remaining in the pond = 2935 - 267 = 2668 g

From Appendix 'B' in NPDES permit application.

The pond dimension is 20' * 18' * 16'



Capacity of the pond

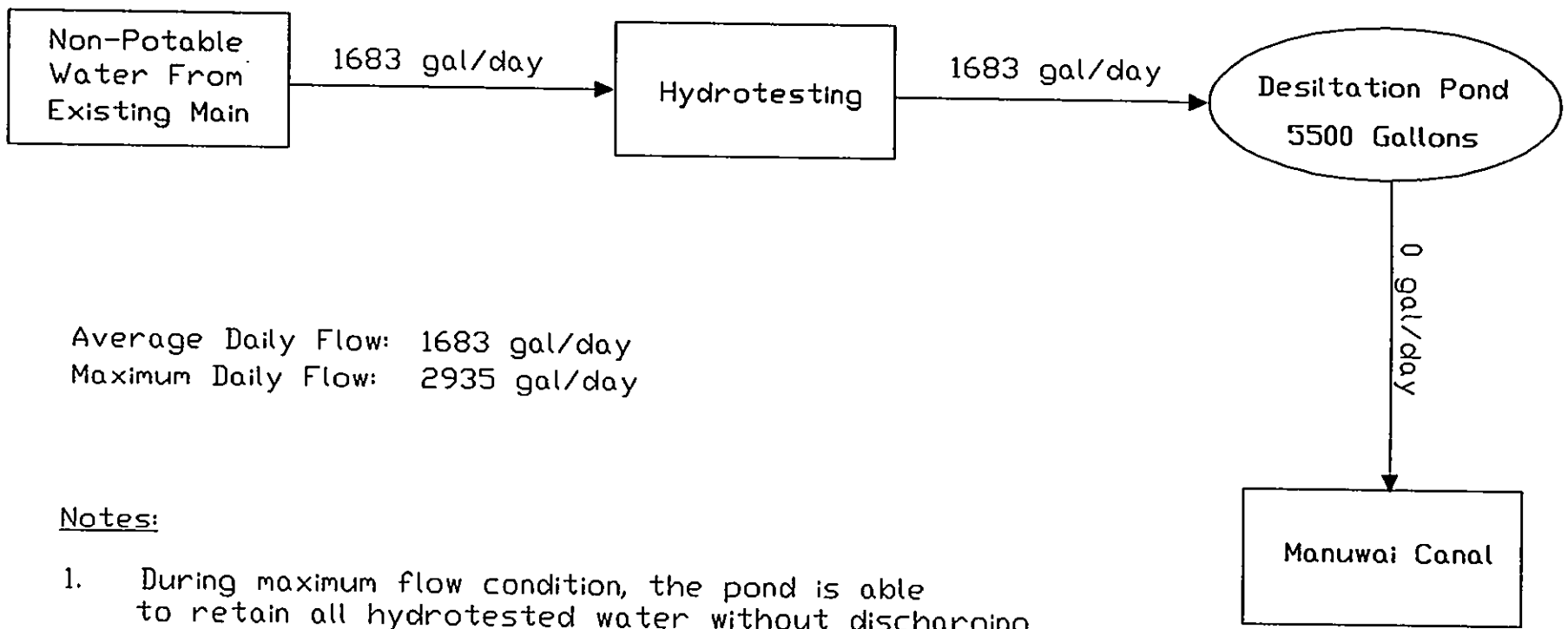
= 16 * 4.6 * $\frac{1}{2}$ * 20

= 736 ft.

= 5505 gallons. > 2668 g

Thus, the pond will be able to hold the hydrotest water without overflow or discharged into the canal, therefore, a permit to discharge the Hydrotested water is not necessary.

HYDROTESTING WATER FLOW DIAGRAM



Average Daily Flow: 1683 gal/day
Maximum Daily Flow: 2935 gal/day

Notes:

1. During maximum flow condition, the pond is able to retain all hydrotested water without discharging into the Canal.
2. NPDES permit to discharge hydrotested water is not necessary.
3. The daily flow shall be flow per each hydrotest.

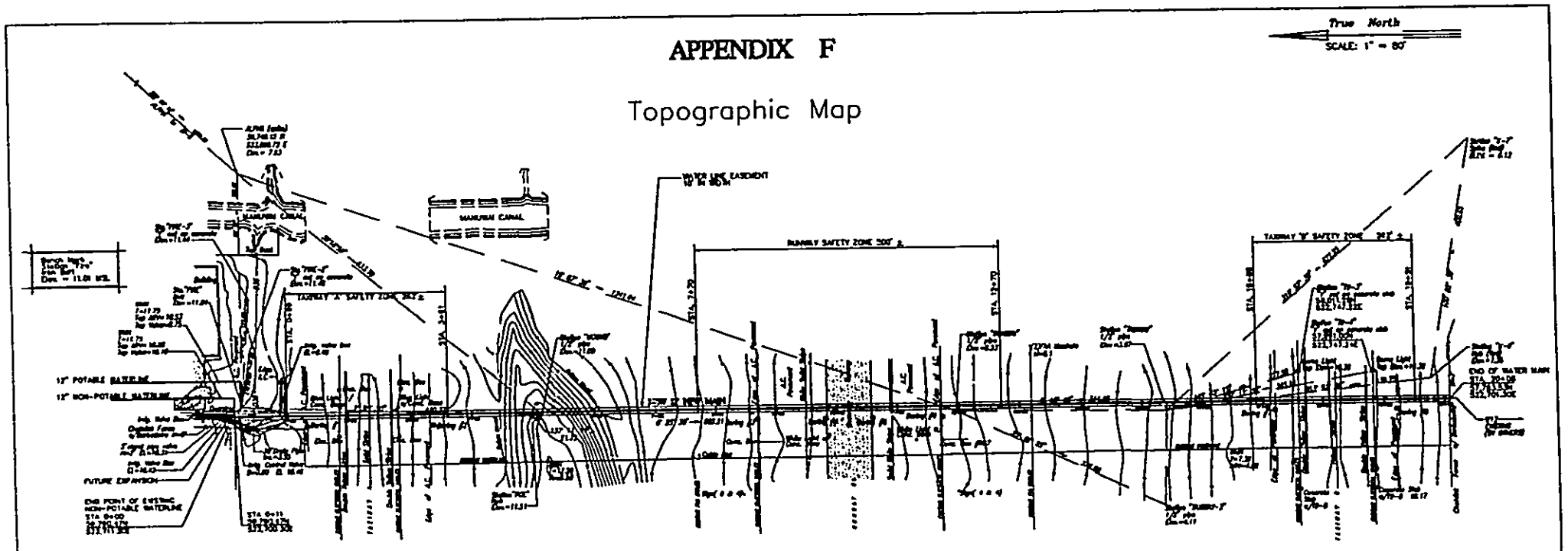
HYDROTESTING WATER FLOW DIAGRAM	
Hickam Golf Course, Non-Potable: 12" Water Main Honolulu International Airport Board of Water Supply, City & County of Honolulu	
KFC Engineering Management Inc.	Date 5/23/95

APPENDIX F

TOPOGRAPHIC MAP

APPENDIX F

Topographic Map



NOTES

1. CONTRACTOR SHALL VERIFY BENCH MARK AND ALPHA (BPM1) PRIOR TO CONSTRUCTION.
2. CONTRACTOR SHALL CONDUCT A PHOTOGRAPHIC AND VIDEO SURVEY OF TAXIWAY "A" & "B" AND RUNWAY "8L" WHERE BORE OPERATION WILL BE PERFORMED FOR DOCUMENTATION OF EXISTING CONDITIONS. THIS PRECONSTRUCTION SURVEY SHALL CONFORM TO THE SURVEY REQUIREMENT IN THE SPECIAL PROVISIONS.
3. CONTRACTOR SHALL CONSTRUCT A BERM USING THE EXISTING SEWAGE FOR DEWATERING POND PER NPDES PERMIT APPLICATION REQUIREMENTS. ALL WORK OF THIS POND SHALL BE PERFORMED PER THE DIRECTION OF THE ENGINEER.

SITE PLAN

SCALE: 1" = 80'

T.M.K.: 1-1-03

GRAPHIC SCALE IN FEET

80 40 0 80 160

THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION

BY: _____

DATE: _____

REVISION #	DATE	DESCRIPTION

BOARD OF WATER SUPPLY
CITY AND COUNTY OF HONOLULU

JOB NO. 96-103

HICKAM GOLF COURSE
NON-POTABLE: 12-INCH WATER MAIN

SITE PLAN

APPROVED _____ DATE:
MGR., PLANNING AND DEVELOPMENT DIVISION

DRAWN BY: _____ ENGINEER _____ CHKD BY: _____ FILE NO. _____

FIELD BOOK NO. _____ SCALE: _____ SHEET G-1 OF 16 SHEETS

APPENDIX G

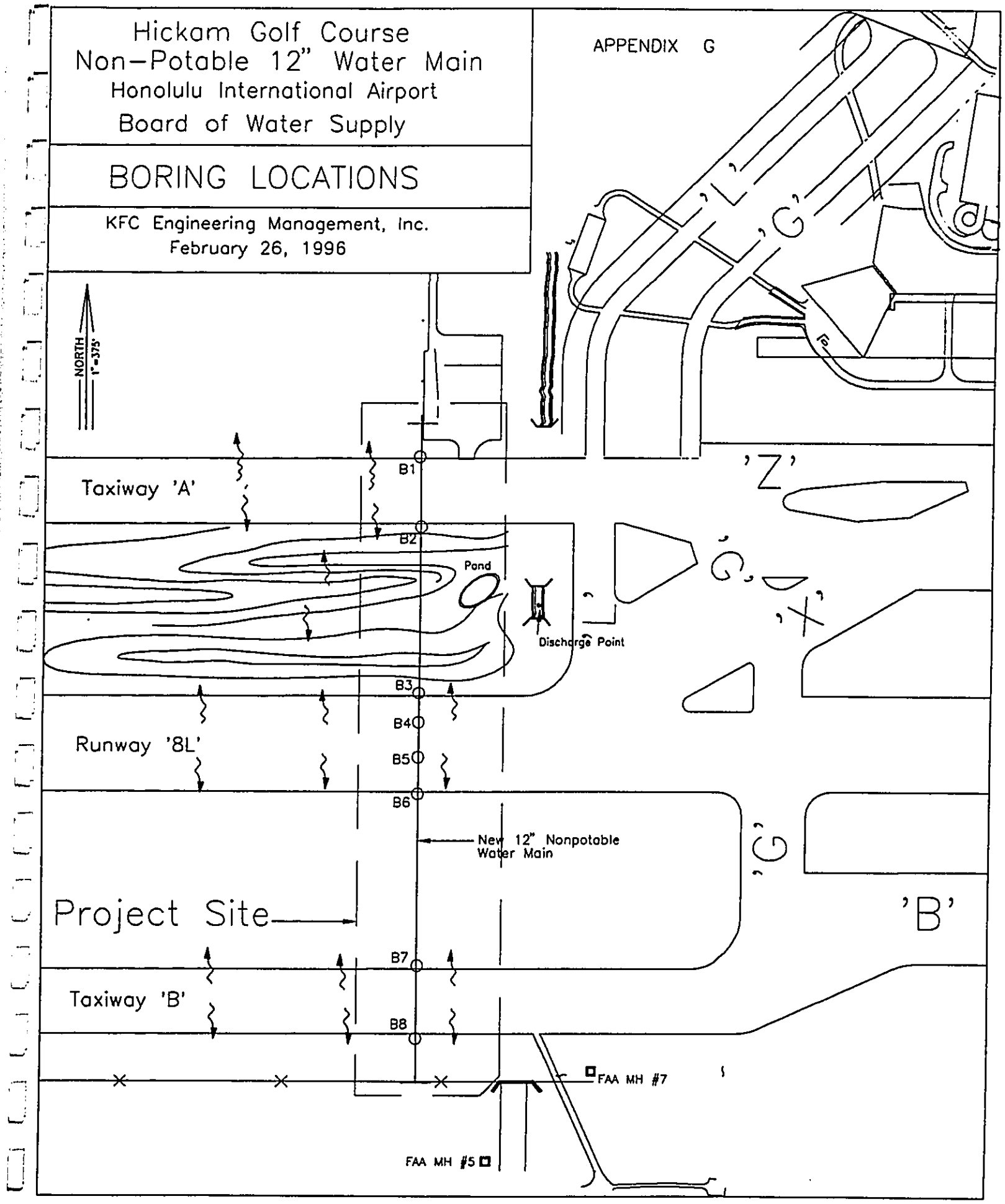
BORING LOGS AND SUBSURFACE CROSS-SECTION

APPENDIX G

Hickam Golf Course
Non–Potable 12" Water Main
Honolulu International Airport
Board of Water Supply

BORING LOCATIONS

KFC Engineering Management, Inc.
February 26, 1996



PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY II (12-19-94)

BORING 1 (Page 1 of 1)

SURFACE ELEVATION 7.2 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
					4				CH	Brown silty clay, soft, with some coralline sand and gravel, moist
					4					
					3	5				grades light brown and saturated
					62				GM	grades with seams of dark brown to light gray silty sand
					84					grades with dark brown to black decomposed woods and shell fragments
					70/4"	10				Light brown silty sandy coralline gravel, medium dense to dense, with some clayey silt, saturated
		NX	46	0						Light brown coral, weakly to moderately cemented, highly fractured (Type II coral)
		NX	57	10		15			GM	Light brown silty sandy coralline gravel, medium dense to dense, saturated
		NX	14	0		20				
						25				Boring completed at 25.0 feet on 10-27-94

Unable to obtain ground water level because of drilling process

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 2

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY IT (12-18-94)

BORING 2 (Page 1 of 1)

SURFACE ELEVATION 7.4 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO			BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (ROI) %						
					32				SM	Yellowish brown silty coralline sand, medium dense, with some gravel and shell fragments, moist (fill)
					5	5				grades with dark gray clayey silt
					4				ML	(Water level at 1637 hours on 10-28-94)
					128/7"					Gray clayey silt, soft, saturated
										grades with seam of gray silty sand and numerous shells
						10				grades grayish brown and clayey
		NX	100	50						Tan algal coral, medium hard, moderately cemented, moderately to highly fractured (Type I coral)
										grades with cemented silty sandy gravel (Type II coral) from 11.5 to 12.0 feet and from 13.0 to 13.5 feet
						15				Boring completed at 15.0 feet on 10-28-94

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 3

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY II (12-19-94)

BORING 3 (Page 1 of 1)

SURFACE ELEVATION 8.4 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
					34				SM	Brown silty sand, medium dense, with some coralline gravel, moist (fill)
					6	5			MH	Brown to dark brown clayey silt, soft, with some sand, moist (fill)
					3					grades brownish gray
					7					(Water level at 1645 hours on 10-28-94)
						10			GM	Light gray silty sandy coralline gravel, loose, saturated
					170/7"				GM	Tan silty sandy coralline gravel, very dense, saturated
					151/7"	15				

Boring completed at 16.1 feet on 10-28-94

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 4

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY II (12-10-94)

BORING 4 (Page 1 of 1)

SURFACE ELEVATION 10.3 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
										4-inch of asphaltic concrete
										12-inch of concrete
									SM	Tannish brown silty sand, dense, with some coralline gravel, moist (fill)
					55/4"					
					80	5				
					22					grades loose
					4				MH	Dark brownish gray sandy clayey silt, soft, saturated
					3					(Water level at 1500 hours on 10-28-94)
						10				
					11					grades light grayish brown
					13				GM	Light grayish brown silty sandy coralline gravel, loose, saturated
						15				
					23				SM	Light tannish brown silty sand, loose to medium dense, with coralline gravel, saturated
					28					
						20				
					13				GM	Light tannish brown silty sandy coralline gravel, medium dense, saturated
						25				
					45					
										Boring completed at 26.5 feet on 10-27-94

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 5

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY IT (12-18-94)

BORING 5 (Page 1 of 1)

SURFACE ELEVATION 10.4 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
									SM	4-inch of asphaltic concrete
					99					Tan silty sand, very dense, with some coralline gravel, moist (fill)
						5				grades silty
					52					grades medium dense and gravelly
					12				MH	Dark brownish gray clayey silt, soft, saturated
					4				SM	Gray silty sand, loose, with coralline gravel, saturated
					2	10				
										grades light gray and gravelly
		NX	80	60	130/5"	15				Light brownish gray coral, soft to medium hard, weakly cemented, slighly to moderately fractured (Type II coral)
										grades highly fractured
		NX	77	20		20			SM	Light brownish gray silty sand, with some coralline gravel, locally weakly cemented, saturated
						25				Boring completed at 25.0 feet on 10-28-94

Unstable to obtain ground water level because of drilling process

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 6

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY lt (12-19-94)

BORING 6 (Page 1 of 1)

SURFACE ELEVATION 8.6 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
					18				SM	Light brown silty sand, loose, with some coralline gravel, moist (fill)
					6	5				grades with increasing silt content
					3				MH	Dark brownish gray clayey silt, soft, moist
					10					(Water level at 1640 hours on 10-28-94)
					12					grades light brownish gray
						10			GM	Light brownish gray silty sandy coralline gravel, loose, saturated
					65	15				grades medium dense and gravelly
										Boring completed at 16.5 feet on 10-28-94

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- ☐ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 7

PROJECT 12-Inch Water Line JOB No. 7787-001

LOCATION Honolulu, Oahu, Hawaii DRAWN BY II (12-19-94)

BORING 7 (Page 1 of 1)

SURFACE ELEVATION 9.3 ± Feet

DATUM Mean Sea Level

LAB DATA		CORE INFO							
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
					22				SM	Tan silty sand, loose, with some coralline gravel, moist (fill)
					15	5				grades with trace coralline gravel and shell fragment
					23					
					9					grades silty
					16	10				(Water level at 1025 hours on 11-14-94)
					16				MH	Light brown clayey silt, medium stiff, saturated
									GM	Light gray silty sandy coralline gravel, loose, saturated
					22	15				

Boring completed at 16.5 feet on 11-14-94

NOTES:
- ■ – Undisturbed sample
- ⊠ – Disturbed sample
- □ – Sample lost during extraction
- ◪ – Standard penetration test sample (split-spoon sampler)
- I – Core run

DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

Pacific Geotechnical Engineers, Inc.

PLATE 8

PROJECT 12-Inch Water Line JOB No. 7787-001
LOCATION Honolulu, Oahu, Hawaii DRAWN BY IT (12-19-94)

BORING 8 (Page 1 of 1)

SURFACE ELEVATION 9.2 ± Feet
DATUM Mean Sea Level

LAB DATA		CORE INFO								
MOISTURE CONTENT %	DRY DENSITY (pcf)	CORE TYPE	RECOVERY %	RQD % or (RQI) %	BLOWS/FT.	DEPTH (feet)	SAMPLES	GRAPHIC LOG	SOIL CLASS	DESCRIPTION
					15				SM	Tan silty sand, loose, moist (fill)
					7	5				grades light brown
					4				MH	Gray clayey silt, soft, moist
					4					(Water level at 1142 hours on 11-14-94)
					10	10				
					9				GM	Light brown silty sandy coralline gravel, loose, saturated
					5	15				

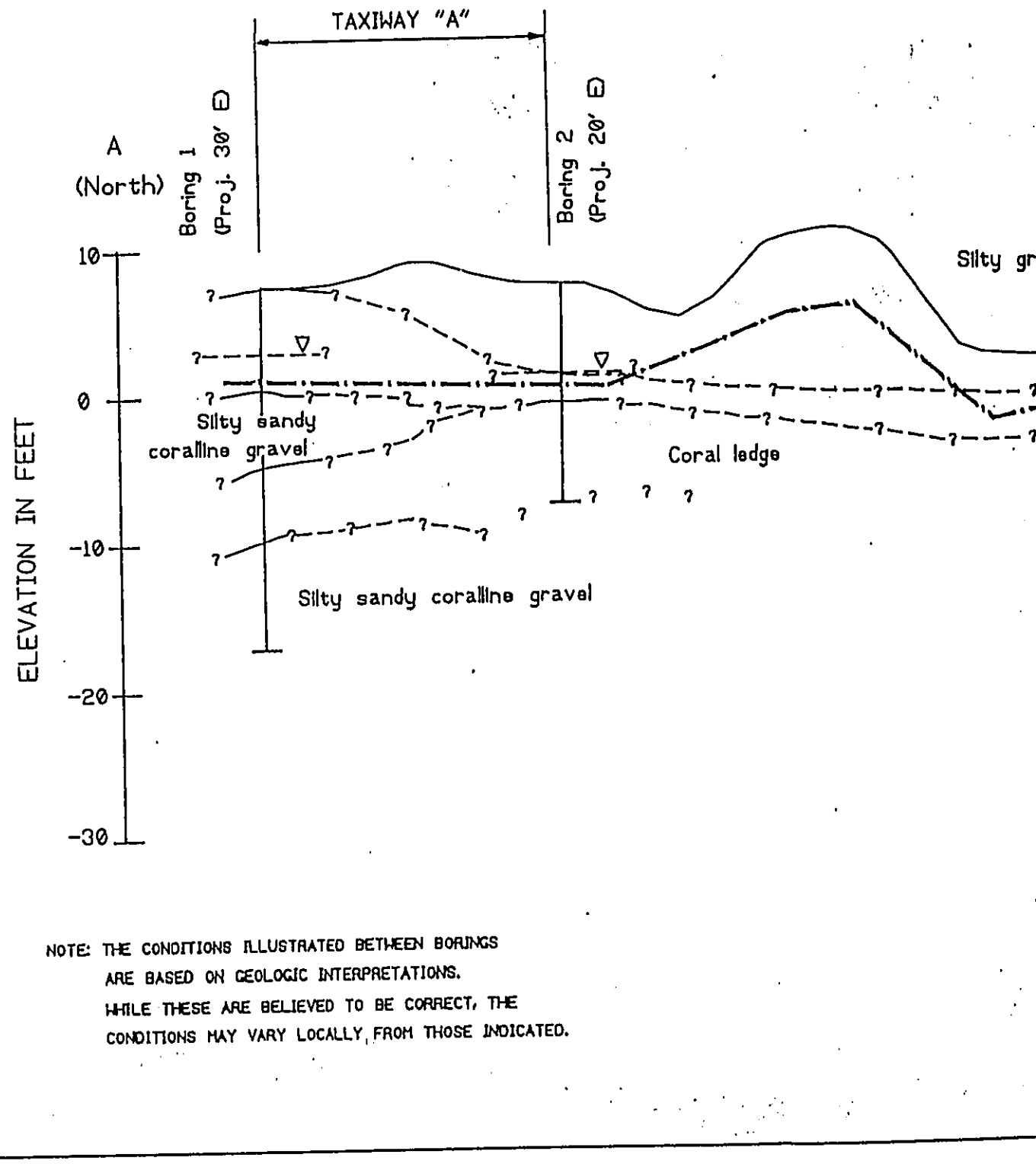
Boring completed at 15.5 feet on 11-14-94

NOTES:
■ – Undisturbed sample
⊠ – Disturbed sample
□ – Sample lost during extraction
◪ – Standard penetration test sample (split-spoon sampler)
I – Core run
DRIVING ENERGY: 140-lb. dropping 30 inches

LOG OF BORING

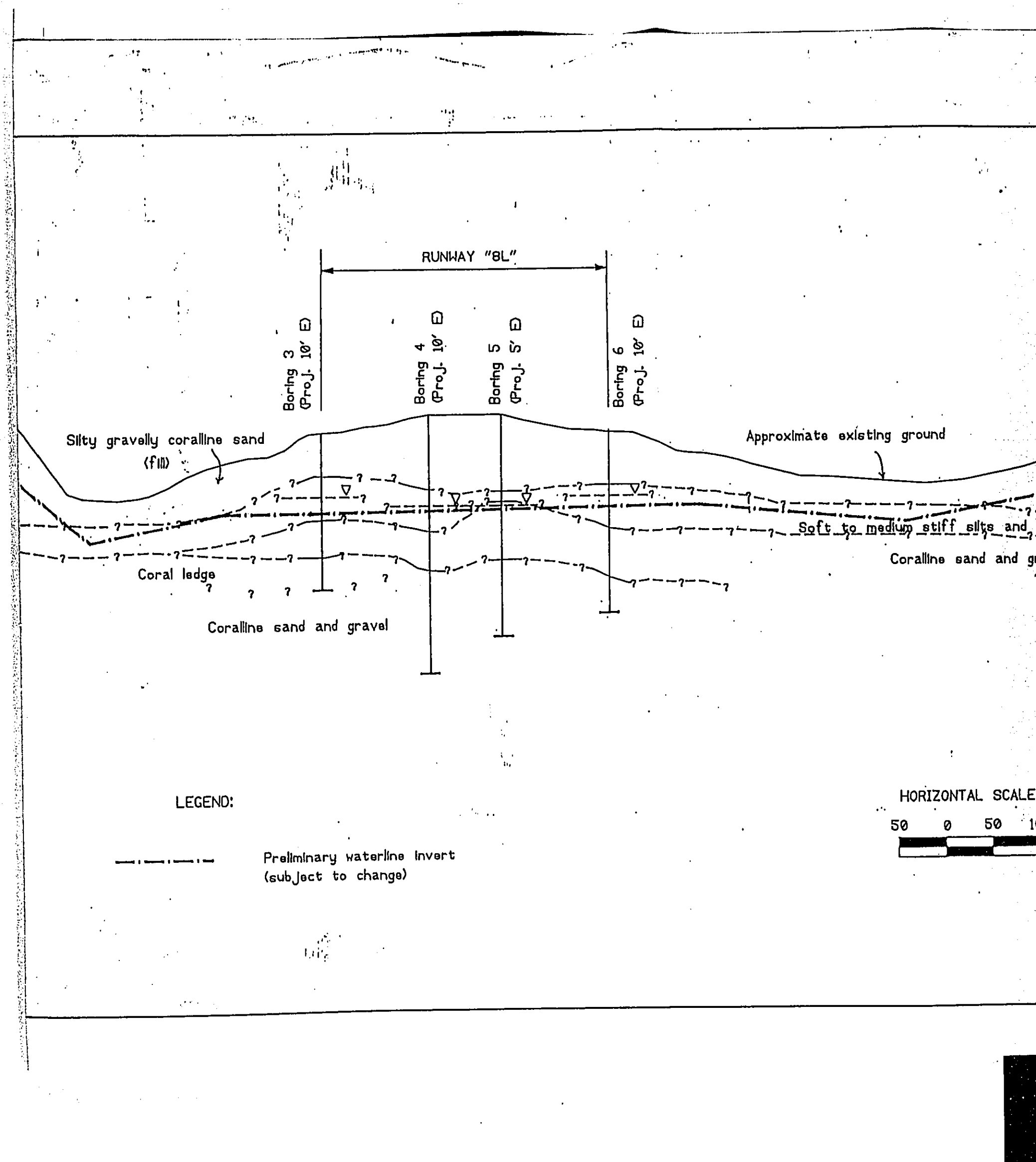
Pacific Geotechnical Engineers, Inc.

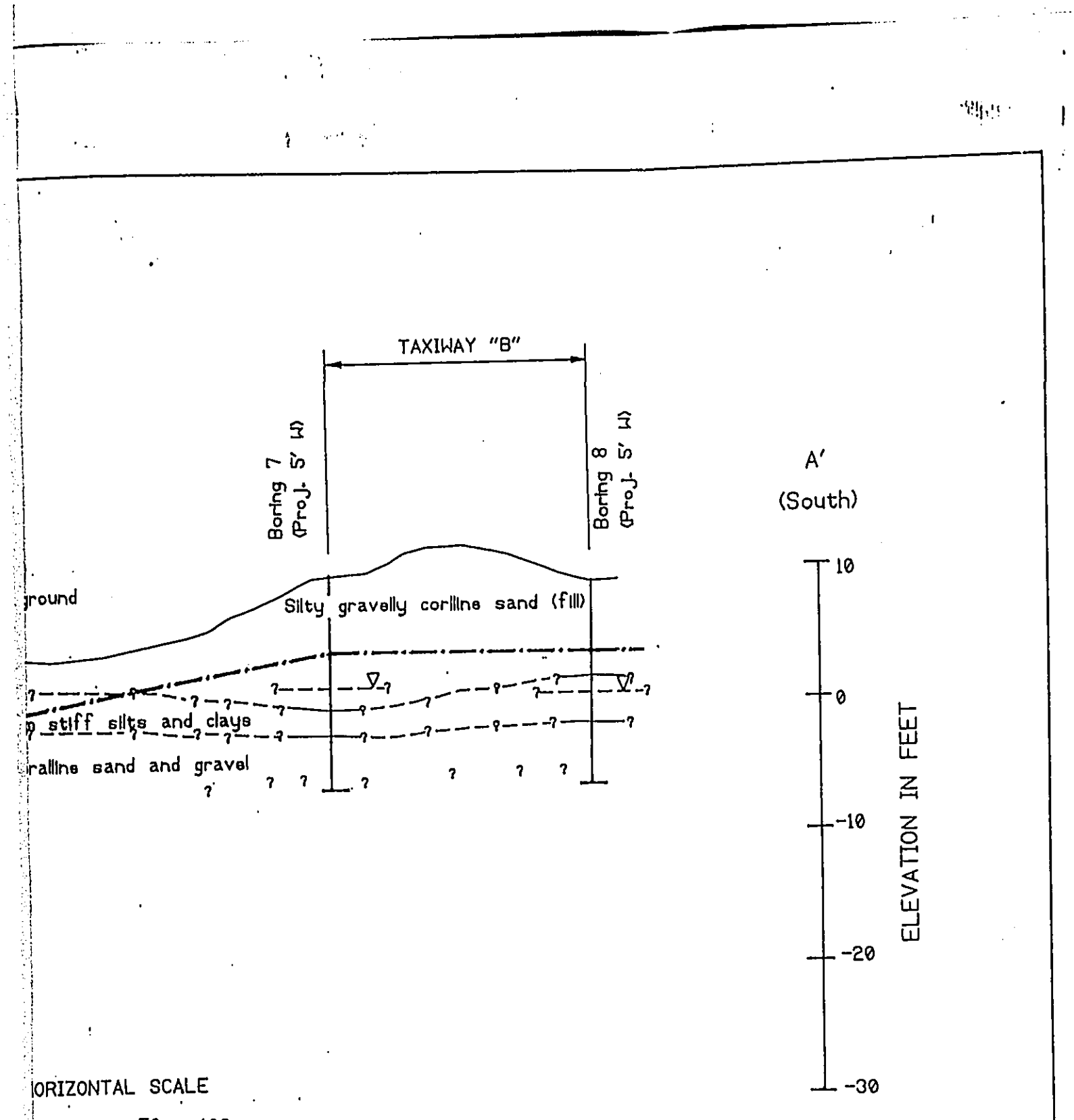
PLATE 9



NOTE: THE CONDITIONS ILLUSTRATED BETWEEN BORINGS ARE BASED ON GEOLOGIC INTERPRETATIONS. WHILE THESE ARE BELIEVED TO BE CORRECT, THE CONDITIONS MAY VARY LOCALLY FROM THOSE INDICATED.

7787-001 KFC Airports Inc 02-08-95 VK


RUNWAY "8L"
Boring 3 (Proj. 10' E)
Boring 4 (Proj. 10' E)
Boring 5 (Proj. 5' E)
Boring 6 (Proj. 10' E)
Silty gravelly coralline sand (fill)
Approximate existing ground
Soft to medium stiff silts and
Coralline sand and g
Coral ledge
Coralline sand and gravel
LEGEND:
Preliminary waterline invert (subject to change)
HORIZONTAL SCALE
50 0 50



GENERALIZED SUBSURFACE.
CROSS SECTION A-A'
(Looking East)

Pacific Geotechnical Engineers, Inc.

PLATE 3

APPENDIX H

WATER QUALITY REPORT

E.L. Pacific
Environmental Laboratory of the Pacific

Appendix H

Water Quality Report

...ve Laboratory for the Environmental Profession...
...puna Street, Suite 100 • Honolulu, Hawaii 96819
...ne. (808) 833-5663 Facsimile. (808) 833-7399

KFC AIRPORT, INC.

Laboratory Report

Client: KFC Airport, Inc.
400 Rodgers Blvd., Suite 710
Honolulu, HI 96819
Attention: Jing Shan Liang

Page: 1 of 3
ELP Project No.: 1805
Report Date: 28-Nov-94

Sample Description: Sample from Airport
Sample Matrix: water

Date Collected: 14-Nov-94
Date Received: 14-Nov-94

	Client ID:		KFC-1
	Matrix:		water
	Lab ID:	Method Blank	111494-17

Date	Analysis	Method	Units	MRL	Results	Results
	Toluene in water					
16-Nov-94	Extraction	EPA 5030				
16-Nov-94	Toluene	EPA 8020	mg/L (ppm)	0.001	ND	ND
	Wet Chemistry in water					
14-Nov-94	pH	EPA 150.1	units	0.01	NA	7.48
14-Nov-94	Temperature	EPA 170.1	°C	0.1	NA	30.0
18-Nov-94	Nitrogen, Total Kjeldahl (N)	EPA 351.2	mg/L (ppm)	1.0	ND	18.0
21-Nov-94	Nitrogen, Nitrate+Nitrite (N)	EPA 353.2	mg/L (ppm)	0.5	ND	2.9
22-Nov-94	Salinity	SM 210C	ppt	1	ND	11

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

Quality Control Data

SPIKES		Lab ID:	LCS1	LCS2		MS	MSD	
		Units:	%R	%R	RPD	%R	%R	RPD
Lab ID	Analysis	Method	Results	Results	Results	Results	Results	Results
	Toluene in water							
111594-35	Toluene	EPA 8020	101	NA	NA	94	103	9
	Wet Chemistry in water							
111594-38	Nitrogen, Total Kjeldahl (N)	EPA 351.2	104	100	4	90	99	10
111594-38	Nitrogen, Nitrate+Nitrite (N)	EPA 353.2	101	101	0	105	104	1

DUPLICATES		Lab ID:		OS	D	RPD
		Units:	are mg/L unless otherwise noted			percent
Lab ID	Analysis	Method		Results	Results	Results
	Wet Chemistry in water					
111494-17	pH (units)	EPA 150.1		7.48	7.44	1
111494-17	Salinity (ppt)	SM 210C		11	10	10

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

Definitions

D	Duplicate
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MRL	Method Reporting Limit
NA	Not Applicable
ND	Not Detected at the MRL
NR	Not Requested
OS	Original Sample
%R	Percent Recovery
PDS	Post Digestion Spike
RPD	Relative Percent Difference

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

E.L. Pacific
Environmental Laboratory of the Pacific

A Full Service Laboratory for the Environmental Professional
930 Mapunapuna Street, Suite 100 • Honolulu, Hawaii 96819
Telephone: (808) 833-5663 Facsimile: (808) 833-7399

Laboratory Report

Client: KFC Airport, Inc.
400 Rodgers Blvd., Suite 710
Honolulu, HI 96819
Attention: Jing Shan Liang

Page: 1 of 3
ELP Project No.: 1805-1
Report Date: 28-Nov-94

Sample Description: Sample from Airport
Sample Matrix: water

Date Collected: 14-Nov-94
Date Received: 14-Nov-94

	Client ID:					KFC-1
	Matrix:					water
	Lab ID:	Method Blank				111494-17
Date	**Analysis**	**Method**	**Units**	**MRL**	**Results**	**Results**
	Wet Chemistry in water					
14-Nov-94	Turbidity	EPA 180.1	N.T.U.	0.1	ND	423

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

Quality Control Data

DUPLICATES	Lab ID:		OS	D	RPD
	Units:	are mg/L unless otherwise noted			percent
Lab ID	**Analysis**	**Method**	**Results**	**Results**	**Results**
	Wet Chemistry in water				
111494-17	Turbidity (N.T.U.)	EPA 180.1	423	430	2

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

Definitions

D	Duplicate
LCS	Laboratory Control Sample
MS	Matrix Spike
MSD	Matrix Spike Duplicate
MRL	Method Reporting Limit
NA	Not Applicable
ND	Not Detected at the MRL
NR	Not Requested
OS	Original Sample
%R	Percent Recovery
PDS	Post Digestion Spike
RPD	Relative Percent Difference

Approved by: _____
Jeffrey Bryson, Laboratory Manager

Approved by: _____
Dirk Koeppenkastrop, PhD, Laboratory Director

ENVIRONMENTAL LABORATORY OF THE PACIFIC
SAMPLE RECEIVING/IN-HOUSE COC

LOGIN

Chain-of-Custody: ☒ Present ☒ Complete ☐ Absent ☐ Incomplete — Temperature: 7.5 °C (IR Thermometer)

Sample Containers: ☒ Intact ☐ Broken — Sample ID#(s): 111494-17

Sample Volume: ☒ Sufficient ☐ Insufficient — Sample ID#(s): _____ Affected Tests: _____

Label(s): ☒ Intact ☐ Missing / Illegible — Sample ID#(s): _____

COC vs Container Labels: ☒ Match ☐ Do not Match — Sample ID#(s): _____

Subcontracted samples: _____ _____ _____

_____ _____ _____

Name of Sub-Lab — Date Sent — Sample ID #

Sample receiving completed: _____ 11-4-94

Signature — Date

CUSTODIAN

Subsampling: Description: _____

_____

_____

Preservative(s): ☐ Field Preserved ☐ Added In-House *

*If added:

Sample ID #	Preservative	Name	Date

Sample Custodian: _____ 11/14/94

Signature — Date

Comments: NOTE LABEL VOLUME OF SEDIMENT IN SAMPLE - ANALYZE WATER ONLY NOTE ON WORK SHEET

ENVIRONMENTAL LABORATORY OF THE PACIFIC

930 Mapunapuna St., Suite 100
Honolulu, Hawaii 96819
Tel: (808) 833-5663 • Fax: (808) 833-7399

Chain of Custody / Analysis Request Form

LABORATORY USE ONLY
LAB JOB NO. 108180S
LAB DUE DATE 112894
LOCATION BOFS, VOA

Project Manager: VINCENT LIANG
Name KFC AIRPORT, INC
Address
Phone 836-7787 FAX 834-4833

Project I.D.
Job Name AIRPORT
Job Number
P.O. Number

3. Sampled by (Please Print)	4. # of Samples in Shipment	5. Date of Sample Shipment	6. Date Results Needed
J BOLINSKI	1	111494	113094

Indicate Analysis Requested: BTEX (TOLUENE) + NAPHTHALENE + TURBIDITY + SALINITY; MEAN TEMP 30.0°C

Item No.	Sample Number	Sample ID	COMP	GRAB	Matrix: Water	Preservation Method	Sampling: Date	Sampling: Time	Number of Containers						Lab ID: Laboratory Number
1	KFC-1			✓	✓	VIAL	11/4	1730	3	✓	✓	✓		✓	111494-17
2	TBLANK			~~✓~~	~~✓~~	HCl	11/4	~~1530~~	1	✓	OMIT JOB				
3															
4															
5															
6															
7															
8															
9															
10															

TURBIDITY ON SEPARATE REPORT

Released by (Signature)	Date / Time Released	Delivery Method	Received by (Signature)	Company / Agency Affiliation	Date / Time Received	Condition Noted
[signature]	111494 1200	DROP OFF	[signature]	LLDACITY	111494 1700	7.5°C

Comments: TURBIDITY, RESULTS NEEDED ON SEPARATE REPORT - ~~ANALYZE~~ ANALYZE - WATER - NOTE ON REPORT - LARGER AMOUNT OF SEDIMENT IN SAMPLE.

Please Check Box
- ☐ Dispose by Lab
- ☐ Return to Client
- ☐ Archive

INORGANIC LAB

Unitek Environmental Consultants, Inc.

930 Mapunapuna Street
Honolulu, Hawaii 96819
Telephone: (808) 836-0555
Fax Phone: (808) 836-2775

October 6, 1993

E. E. Black
401 Kamakee
Honolulu, HI 96814

Attention: Mr. Pete Nelson

This letter will serve as a report of the results of soil and water sampling performed on September 23, 1993 by E. E. Black at the Honolulu Airport Airlift Station. The tables below summarize the results of the analytical results. Copies of the laboratory reports and chain of custody forms are provided as attachments to this letter.

TABLE 1
Results of Laboratory Analyses for Petroleum Hydrocarbons in Water

Analyte	Sample #'s 001, 002, 003, 004, 005, 006, 007, 008 (mg/L)	Method Reporting Limit (mg/L)
TPH Diesel	ND	5
TPH Oil	ND	5
Benzene	ND	0.001
Toluene	0.002	0.001
Ethylbenzene	<0.001	0.001

TABLE 2
Results of Laboratory Analyses for Salinity, Turbidity, pH, DO, and Nitrogen

Analyte	Samples 4, 5, 001, & 002	Units	Method Reporting Limit
Turbidity	11.2	NTU	0.1
Salinity	8.43	ppt	1.0
Dissolved Oxygen	3.08	mg/L	0.1
pH	7.56	units	0.01
Nitrogen, Total Kjeldahl	0.280	mg/L	0.200
Nitrogen, Nitrate + Nitrite	3.9	mg/L	0.5

Unitek Environmental Consultants, Inc.

930 Mapunapuna Street
Honolulu, Hawaii 96819
Telephone: (808) 836-0555
Fax Phone: (808) 836-2773

DRAFT

October 1, 1993

E. E. Black

Attention: Mr. Pete Nelson

This letter will serve as a report of the results of soil and water sampling performed on September 23, 1993 by E. E. Black at the Honolulu Airport Airlift Station. The tables below summarize the results of the analytical results. Copies of the laboratory reports and chain of custody forms are provided as attachments to this letter.

TABLE 1
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TPH Diesel	ND	5
TPH Oil	ND	5
Benzene	ND	0.001
Toluene	0.002	0.001
Ethylbenzene	<0.001	0.001

TABLE 2
Results of Laboratory Analyses for Salinity and Turbidity

Analyte	Samples 4 & 5	Units	Method Reporting Limit
Turbidity	11.2	NTU	0.1
Salinity	8.43	ppt	1.0

Should you have any questions, or if you require any additional services, please call me at 836-0555, extension 215.

Sincerely,

Richard Micklin
Senior Geologist/Manager

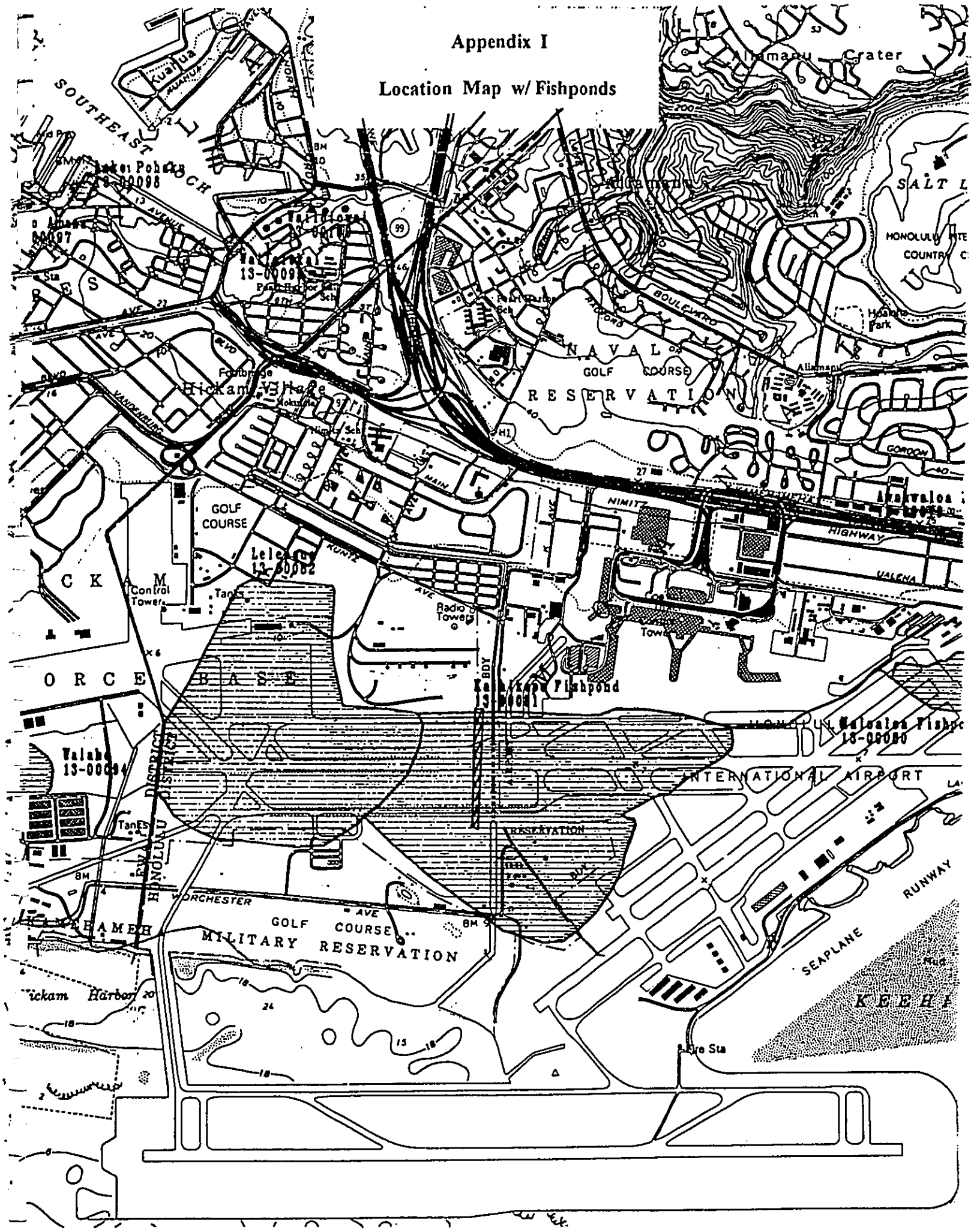
Attachments

APPENDIX I

LOCATION MAP W/ FISHPONDS

Appendix I

Location Map w/ Fishponds

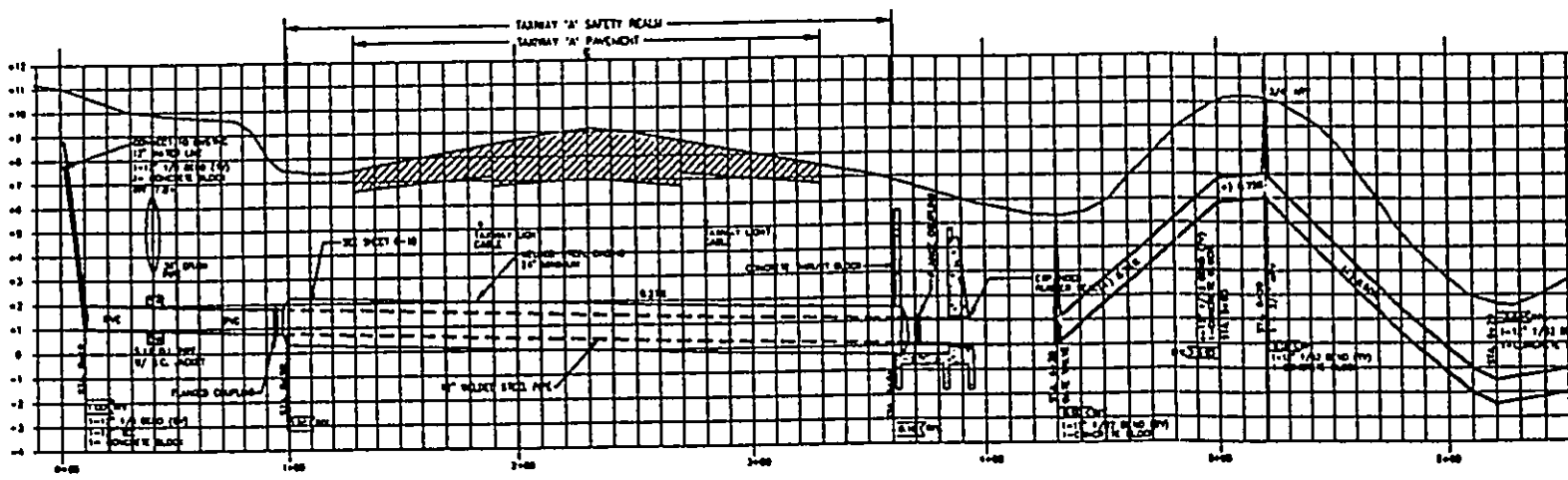


APPENDIX J

WATER MAIN PROFILE

APPENDIX J

WATER MAIN PROFILE
w/ Open Cut Trench under Taxiway 'B'



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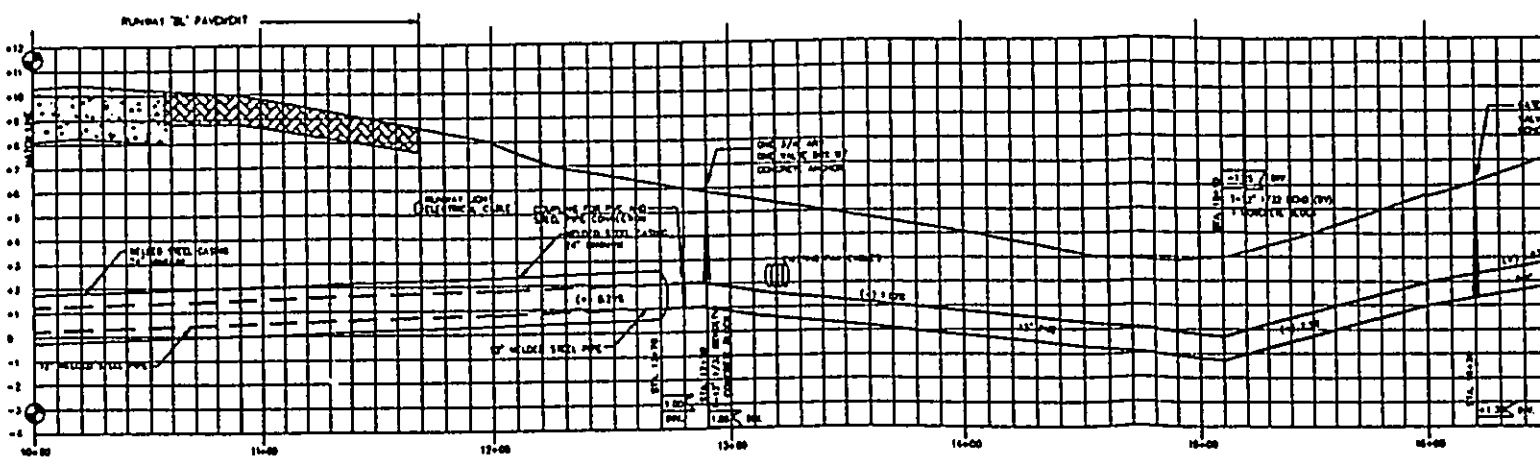

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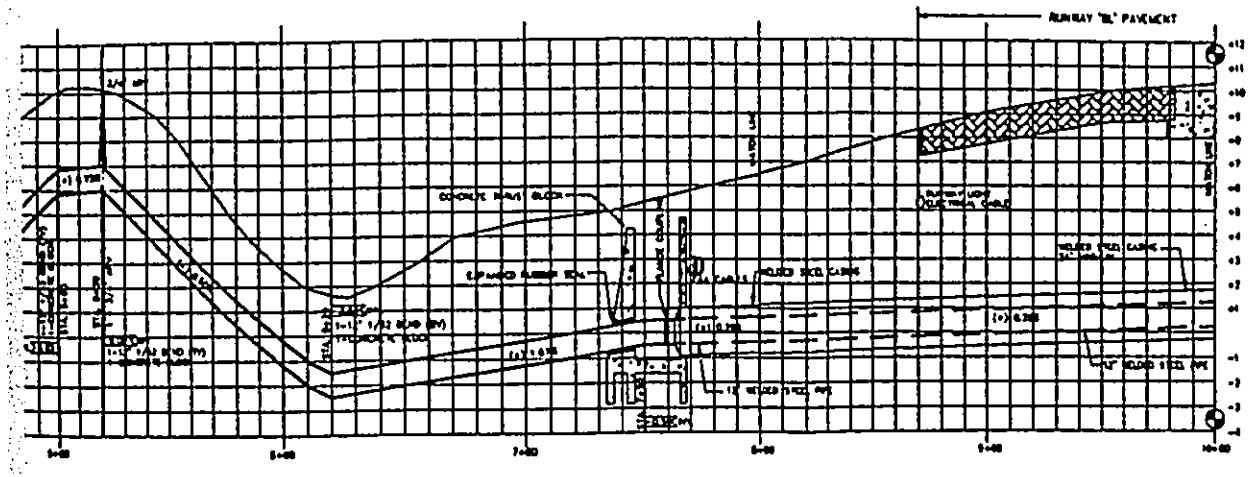
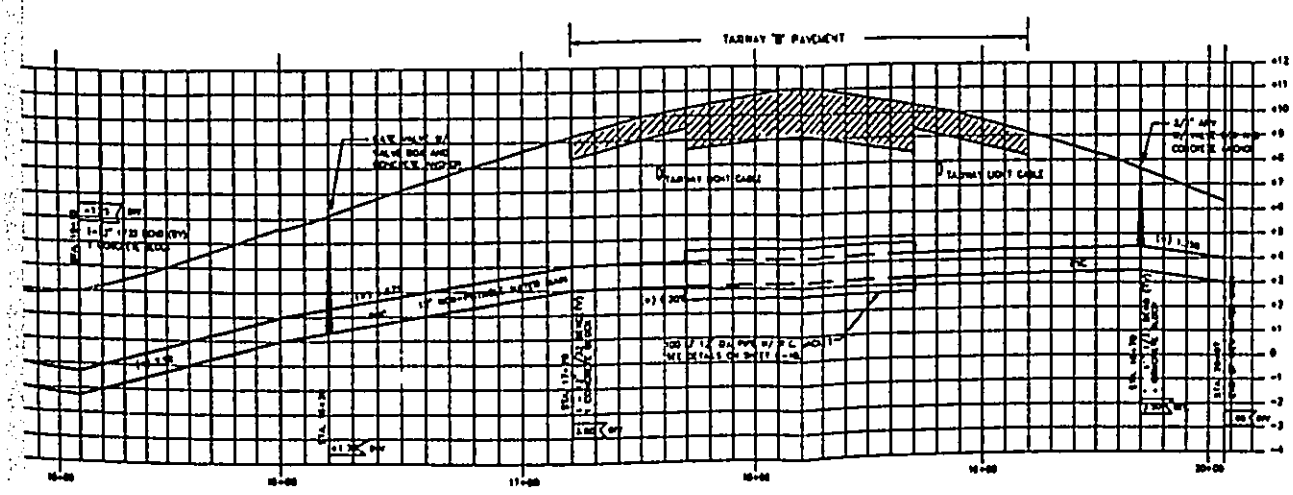


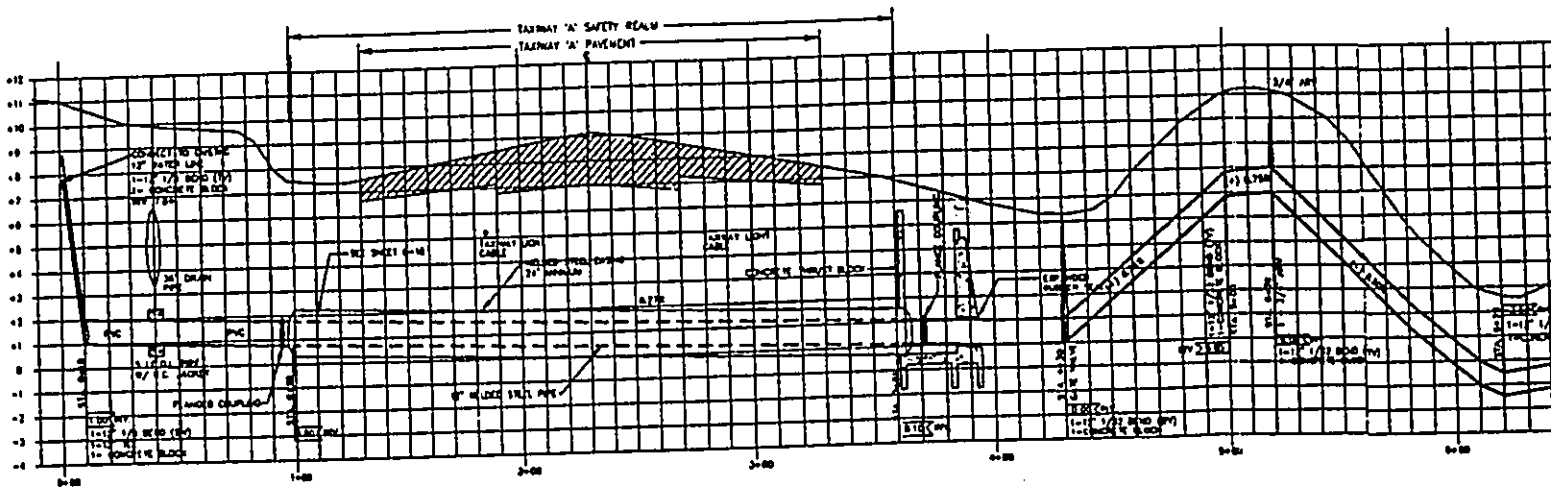
±00



0+07

APPENDIX J

WATER MAIN PROFILE
w/ Microtunneling under Taxiway 'B'



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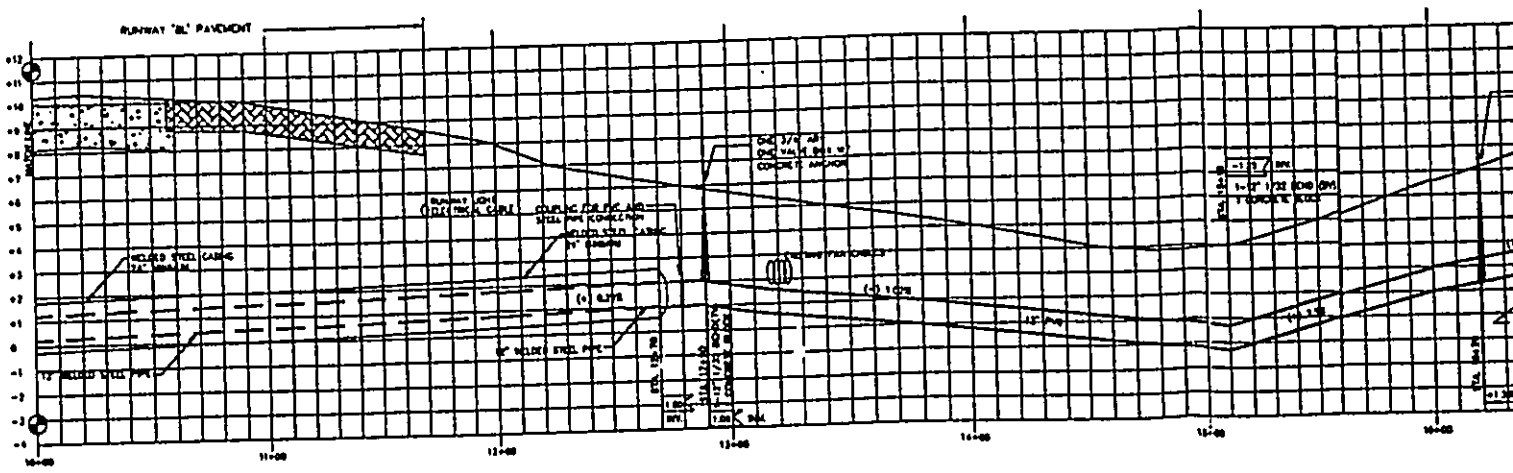

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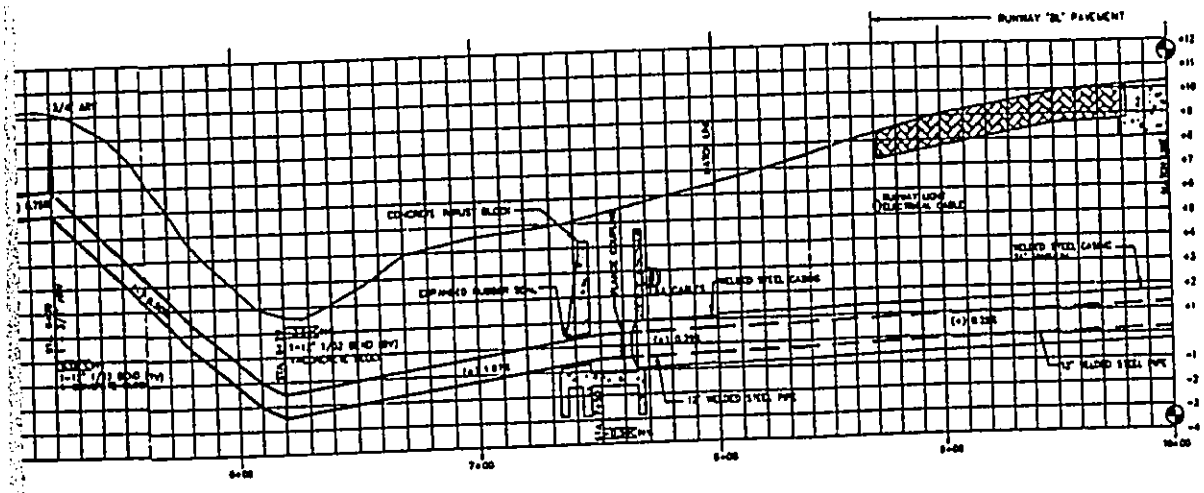
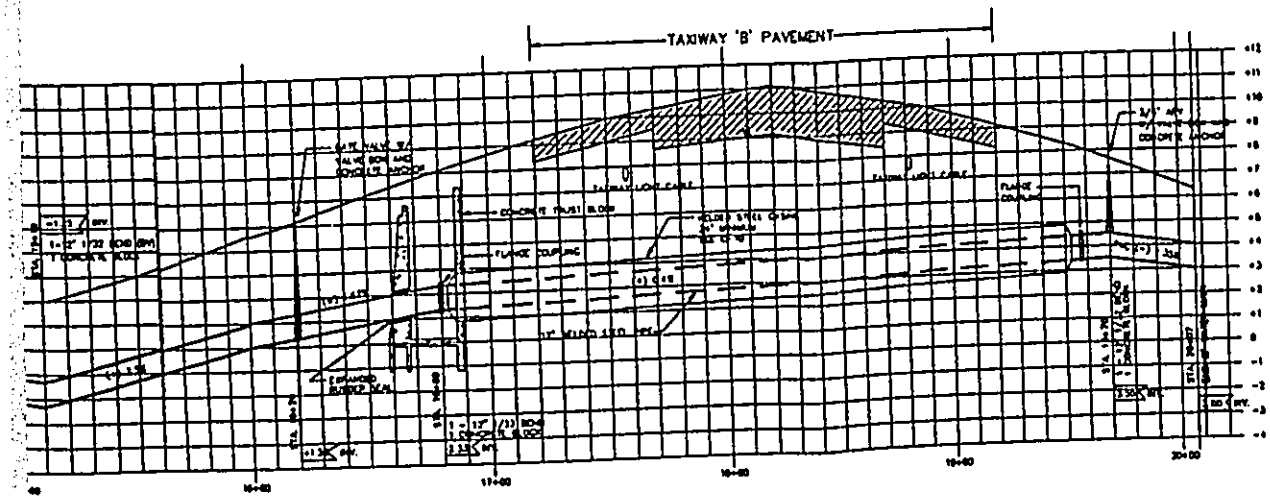


+00 TO 10+00



10+00 TO 20+07