

DEPARTMENT OF PUBLIC WORKS
CITY AND COUNTY OF HONOLULU

DIVISION OF ENGINEERING
650 SOUTH KING STREET, 11TH FLOOR • HONOLULU, HAWAII 96813

Phone: (808) 523-4341 • Fax: (808) 527-5867

JEREMY HARRIS
MAYOR



'97 OCT 15 P2:04

JONATHAN K. SHIMADA, PhD
DIRECTOR

REFLECTED TO

TECHNICAL SOLUTION FOR POTENTIAL FLOODING IN
THE KALOI GULCH DRAINAGE BASIN

September 18, 1997

A. MEMBERS

NAME

COMPANY/REPRESENTS

Craig Arakaki
Marvin Fukagawa
Greg Hiyakumoto
Daniel Hong
Felix Limtiaco
Kay Muranaka
Tom Nance

Engineering Concepts, Inc./Ewa-Makai West, Gentry
Department of Public Works/City
R. M. Towill Corporation/Ewa Villages
Gray, Hong, Bills & Associates, Inc./Haseko
Limtiaco Consulting Group/Haseko
Engineering Concepts, Inc./Campbell Estates
Tom Nance Water Resource Engineering/Gentry & Coral
Creek Golf Course
Department of Public Works/City
Department of Public Works/City
Department of Public Works/City
R. M. Towill Corporation/State

B. BACKGROUND

As a follow up to the September 4, 1997 meeting involving the City and developers within the Kaloi Gulch Drainage Basin, a technical group was formed to derive a technical solution for potential flooding in the Kaloi Gulch Drainage Basin. The group was given until September 18, 1997 to prepare recommendations.

As experienced in November 1996, flooding of the Ewa Villages project in the Kaloi Gulch Drainage Basin occurred due to the lack of an outlet to the ocean. Developments are presently required to provide retention basins for the storage of storm water runoff within their respective projects. During time of heavy storms, the volume of the storm water runoff may exceed the storage capacity of the retention basins and cause flooding in the area, as occurred in the November 1996 storm. As such, it is the intent of this technical group to derive a plan to pass runoff to the ocean to provide a degree of flood protection for the existing developments.

As a starting basis, the group was faced with the following timelines:

- 1) Passing of 1,200 cfs to the ocean by January 1998.
- 2) Passing of 2,500 cfs to the ocean by January 2000.
- 3) Passing of 11,500 cfs to the ocean by the year 2005.

C. TECHNICAL SOLUTION

In developing the Kaloi Gulch Drainage Basin the following conditions were derived at for the stated timelines.

- 1) The maximum allowable hydraulic grade line within Haseko's basin will be limited to an elevation of 11 feet.
- 2) The access road to Oneula Park shall be raised and berms installed within Oneula Park to convey 2,500 cfs from Haseko's basin to the ocean and to protect the existing Ewa Beach residences.
- 3) The overflow weir elevation from Haseko's 15 acre retention basin (invert = 3 feet) to Oneula Park will be set at an elevation of approximately 8.5 Feet. Measures to convey the overflow to Oneula Park shall be designed to protect the existing Ewa Beach residences.


10-1-97
Okawa
10-6-97
10/8/97
10/13/97
MA for Puy Tisatuu

- 4) The channel invert at the Haseko/Ewa-Makai West interface will be set at an elevation of ¹³~~15~~ feet. The channel within Haseko's property shall be designed to convey 1,200 cfs with freeboard capacity of 2,500 cfs and maintaining a hydraulic grade line of ¹³~~15~~ feet as shown in Exhibit A.
- 5) The channel invert at the Ewa-Makai West/ Gentry interface will be set at an elevation of 14 feet. The channel within Ewa-Makai West property shall be designed to convey 1,200 cfs with a freeboard capacity of 2,500 cfs as shown in Exhibits A and B. Any modifications to the channel will require the approval of all parties involved in this agreement.
- 6) Man-made diversion of storm water runoff to the west of the existing Kaloi Gulch berms shall not be allowed.
- 7) At the Ewa Villages/Gentry interface a drainage structure designed to convey 2,500 cfs shall be constructed.
- 8) Each property owner will be responsible for the design and construction of all necessary improvements on their respective property.

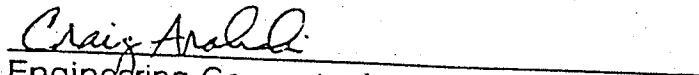
The passing of 11,500 cfs will take place tentatively at the year 2005 to provide a permanent outlet to the ocean, unless otherwise noted.

D. SUBMITTED

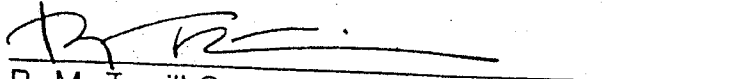
We the undersigned acknowledge and agree to the conditions presented herein and fully endorse this technical solution.


Division of Engineering
Department of Public Works
City and County of Honolulu
(Coordinator)

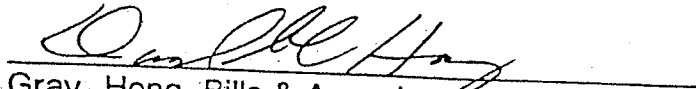
9/19/97
Date


Engineering Concepts, Inc.
(Ewa-Makai West by Gentry)
Subject to our letter dated 9/19/97

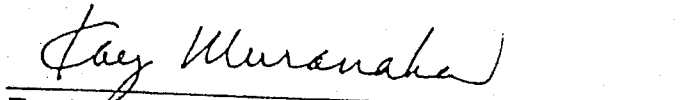
9/19/97
Date


R. M. Towill Corporation
(Ewa Villages) Subject to our letter dated 9-19-97

9-19-97
Date


Gray, Hong, Bills & Associates, Inc.
(Haseko)

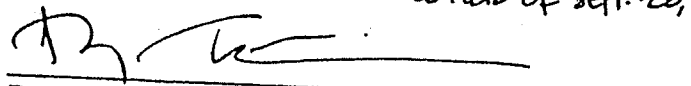
9-18-97
Date


Engineering Concepts, Inc.
(Campbell Estates)
Subject to our letter dated 9/19/97
Tom Nance

9/19/97
Date

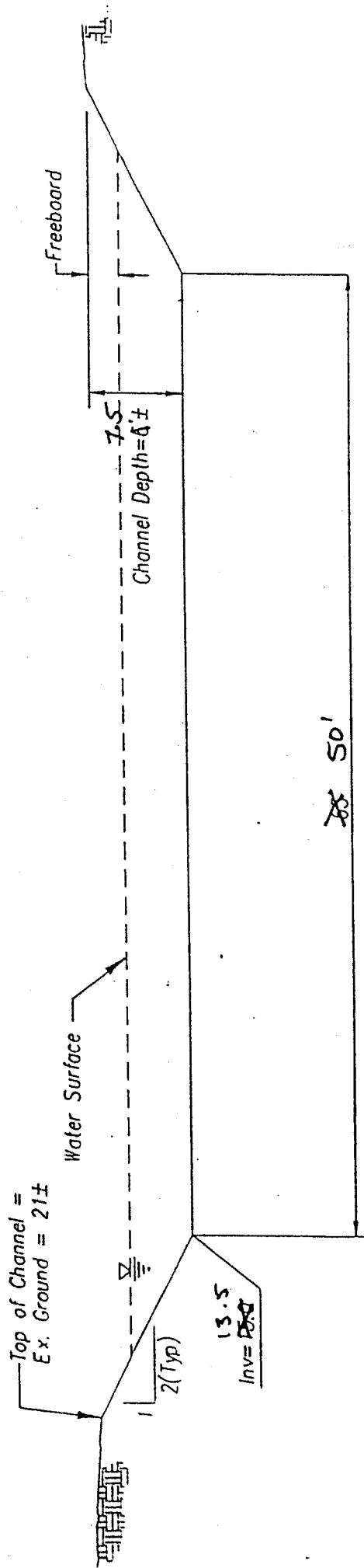
Tom Nance Water Resource Engineering
(Gentry and Coral Creek Golf Course)
SUBJECT TO MY ATTACHED LETTER OF SEPT. 22, 1997

Oct. 6, 1997
Date


R. M. Towill Corporation
(State). Subject to our letter dated 9-19-97

9-22-97
Date

cc: All Participants



CHANNEL SECTION

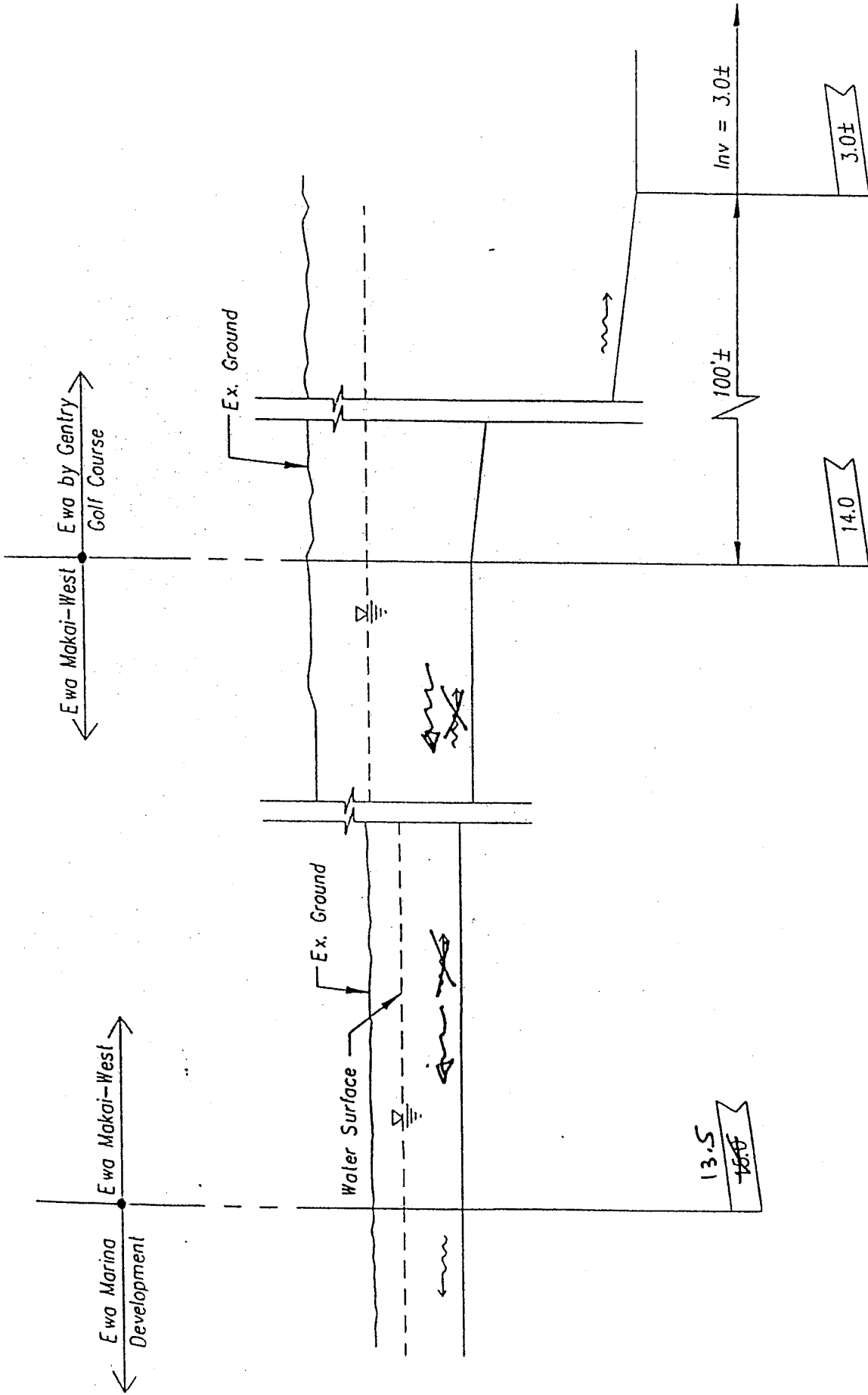
Scale: 1" = 10'-0"

Slope = 0.20%

Q (cfs)	Water Surface Elevation	Freeboard (ft.)
1200	18.0 18.0	X 3
2500 2500	21.0	0

KALOI GULCH
EXHIBIT A

By *By* *For* *10/15/97*
10-1-97
10-6-97



PROFILE

Scale: 1"=10'-0"

**KALOI GULCH
EXHIBIT B**

Handwritten signature and date: 10/12/1977

ENGINEERING CONCEPTS, INC.
CONSULTING ENGINEERS

97413

September 19, 1997

RECEIVED
DIV. OF ENGINEERING
SEP 19 3 10 PM '97

Jonathan Shimada, PhD
Director and Chief Engineer
Department of Public Works
650 South King Street
Honolulu, Hawaii 96813

Attention: Mr. Richard Suzuki

Subject: Technical Solution for Potential Flooding in the Kaloi Gulch Drainage Basin
Final Document

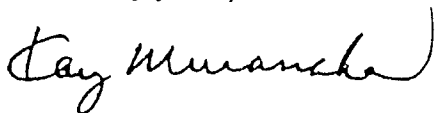
We have reviewed the proposed technical solution to relieve flooding in the Kaloi Basin during an interim period. We are signing the document acknowledging the recommendations as a workable, compromise interim agreement. We do have some comments and concerns regarding the following issue:

- Items C.4 and C.5, inverts of 15 feet at the Haseko/Ewa Makai-West boundary and 14 feet at the Ewa Makai-West/Gentry boundary. These inverts were offered as a compromise between disagreeing parties. We feel, however, that the invert at the Haseko/Ewa Makai-West boundary could and should be lower than 14 feet and closer to the ultimate channel invert of 12 feet. Design of the resulting channel could still be restricted to the indicated flows. The channel with the lower invert at the Haseko/Ewa Makai-West boundary would be narrower and cheaper than the wider, shallower channel proposed in Exhibits A and B. The restrictive inverts proposed in C.4 and C.5 does not appear to provide benefits to any of the developments, and only serves to increase the construction cost of this interim channel.
- It is also our understanding that flows in excess of 2,500 cfs entering Ewa Makai-West/Gentry will pass through and flow overland into Ewa Marina.

The recommendations outlined in the technical solution, if accepted, will be the first step in addressing the flooding problem in the Kaloi Basin. Continued coordination will be necessary during the planning and design of the proposed improvements.

We are pleased to offer these comments on the technical solutions document. Please call if you have any questions on the above.

Very truly yours,



Kay Muranaka, P.E.
Principal

EXHIBIT C

Jonathan Shimada, PhD.
September 23, 1997 - 97TN-306
Page two

Capacity of the Drainage Structure at the Railroad ROW

Item No. 7 of the technical solution calls for a drainage structure at the railroad ROW separating Ewa by Gentry and Ewa Villages to be designed for 2500 CFS. This represents a considerable restriction to stormwater conveyance, since City drainage standards call for a capacity of approximately 10,000 CFS at this location. Presumably, in the event of flowrates in excess of 2500 CFS, water would back up in Ewa Villages, possibly causing flood damage there, and overtop the railroad ROW, flowing uncontrollably into Ewa by Gentry. This was a problem in Palm Court of Ewa by Gentry during the November 1996 rainstorms. There is no conceivable benefit to imposing this restriction at the railroad ROW. If flows in excess of 2500 CFS do occur during the interim period, we would want it to pass harmlessly through an adequately sized railroad ROW opening. The present drainageway mauka of the railroad ROW (in the Ewa Village Golf Course) and makai (in the Coral Creek Golf Course) can accommodate the higher flowrates. There is no reason to unnecessarily risk flooding the residential areas of the Ewa Villages and Ewa by Gentry.

Flowrates in Excess of 2500 CFS Makai of Ewa by Gentry

I have no objection to an interim channel sizing of 1200 and 2500 CFS for the January 1998 and January 2000 milestones identified for the technical solution. This choice is a reasonable compromise between potentially greater storm magnitudes and the cost of constructing channels across currently undeveloped land in Ewa Makai West and Ewa Marina. However, it needs to be recognized that flowrates greater than 1200 and 2500 CFS may occur during the interim period. For the proposed solution, this water would sheet flow across Ewa Makai West and into Ewa Marina. It has the potential to cause damage to Ewa Marina's Phase 1 residential development or to existing houses along Papii Road. The committee of engineering consultants discussed diverting flows in excess of 2500 CFS to the west side of the existing Kaloi Gulch levees to avoid this possibility. It was not included in the recommendations due to the strong objections of the consultant for Ewa Marina. I believe this to be a significant mistake, incurring a risk which could be easily avoided.

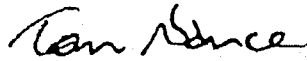
Potential Development of Ewa Makai West in the Interim Period

For the record, the City-approved drainage master plan for Ewa Makai West includes an interim drainage solution which provides for 100 percent retention of stormwater generated onsite. This interim development concept still must be considered valid as long as the retention storage is separate and apart from the interim, 1200/2500 CFS mauka-makai channel. It should be noted that for large storm events in the Kaloi Basin, the uncontrolled sheet flow in excess of 2500 CFS is likely to fill the Ewa Marina West interim retention basin. Proceeding with development of the site on an interim basis should not be held up because of this.

Jonathan Shlmada, PhD.
September 23, 1997 - 97TN-306
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Despite my objections to the deficiencies as discussed above, it is not my intention to impede implementation of the interim drainage solution. Rather, I hope consideration will be given to its improvement. I also believe that the developers of Ewa Marina are to be thanked for their willingness to accommodate the interim stormwater flows.

Sincerely,



Tom Nance

cc: Craig Arakaki and Kay Muranaka - Engineering Concepts
Greg Hiyakumoto and Jimmy Yamamoto - RM Towill
Danny Hong - Gray Hong Bills & Associates
Felx Limtiaco - Limtiaco Consulting Group
Dennis Toyama and Mel Takakura - DPW