File 392-4  
September 23, 1983

Gentry-Waipio, Ltd.  
94-539 Puahi Street  
Waipahu, Hawaii 96797

Attention: Mr. Randolph K. Ouye

Subject: Final Grading Report  
Ihona (Parcel "b")  
Gentry-Waipio Development  
Waipio, Oahu, Hawaii

Gentlemen:

At your request, we have provided testing and observation services for the Ihona project of the Gentry-Waipio Development. The major portion of the earthwork was completed by May 5, 1983, while grading of the roadways was completed by August 22, 1983 after the utilities were installed. This letter summarizes our observations and test results. Our scope-of-work did not include monitoring the subsequent construction of the dwellings and related items.

Prior to the start of actual grading operations, the site was cleared and stripped of the surface vegetation, rubble and other deleterious materials. The natural ground was then rolled with Caterpillar 815 and Raygo Ram 75 compactors. Soft spots, uncompacted fills and stockpiles of construction debris were removed.

Fill material was generated from excess material excavated from the adjacent Laulea, Nohea, and Neighborhood Park projects at the Gentry-Waipio Development shown in Figure 1. The fill was a low to moderate plasticity silt (ML), and was placed and compacted in relatively uniform lifts of 8 inches in thickness, at moisture contents generally within 3% of the optimum as determined by laboratory compaction test, ASTM D1557.

Field density tests performed by our firm indicate that adequate compaction was being obtained. These tests, upon which acceptance is based, showed values in excess of 90% relative compaction as determined by the above-referenced test. Additionally, density tests taken in the upper 24 inches of the roadway and parking areas indicate relative compaction of 95% or more.

Building Pads A through H and J through L have been graded to final grade elevations as designated by the field grade stakes and compacted to 90% relative compaction. Roadways A through D and related parking areas have similarly been graded and compacted to 95% relative compaction within 24 inches of final subgrade.
In summary, earthwork of the Ihona Project has been completed in general accordance with the Grading Ordinance of the City and County of Honolulu and the recommendations of our Subsurface Investigation Report dated August 16, 1982, and are ready to receive further improvements. Building pads should not be allowed to dry excessively and slopes should be grassed as soon as practical.

A Site Plan, Figure 2, is included to indicate the field density test locations. The results of the laboratory and field tests performed by our firm are summarized in Tables I and II and graphically exhibited in Figures 3 through 6.

Should you have any questions concerning this matter, please do not hesitate to contact us at your convenience.

Respectfully submitted,

FEWELL GEOTECHNICAL ENGINEERING, LTD.

By Alan J. Shimamoto, P.E.
Project Engineer

Attachments

Copy to (2): Community Planning, Inc.
(Attn: Mr. Robert Sarae)
Table I

<table>
<thead>
<tr>
<th>Sample No.</th>
<th>Description</th>
<th>Maximum Dry Density (p.c.f.)</th>
<th>Optimum Moisture Content (%)</th>
<th>Liquid Limit</th>
<th>Plasticity Index</th>
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<tbody>
<tr>
<td>B</td>
<td>Light Reddish Brown Clayey SILT (ML) - Borrow material from Laulea Subdivision</td>
<td>101</td>
<td>27</td>
<td>48</td>
<td>9</td>
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<td>D</td>
<td>Reddish Brown Clayey SILT (ML) - Borrow material from Laulea Subdivision</td>
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<td>8A</td>
<td>Reddish Brown SILT (ML) - Borrow material from Neighborhood Park</td>
<td>102</td>
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<tr>
<td>2B</td>
<td>Reddish Brown SILT (ML) - Borrow material from Nohea Subdivision</td>
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<td>Test No.</td>
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<td>Location</td>
<td>Elevation</td>
<td>Dry Density (p.c.f.)</td>
<td>Moisture Content (%)</td>
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<tr>
<td>---------</td>
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<td>----------------------</td>
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<tr>
<td>1</td>
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<td>Pads F &amp; G</td>
<td>FG-2.0'</td>
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<td>2</td>
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<td>Pad G</td>
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<td>4-12</td>
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<td>Pad K</td>
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## Table II

**Summary of Density Test Results**

<table>
<thead>
<tr>
<th>Test No.</th>
<th>Date 1983</th>
<th>Location</th>
<th>Elevation</th>
<th>Dry Density (p.c.f.)</th>
<th>Moisture Content (%)</th>
<th>Material Type</th>
<th>Percent Compaction</th>
<th>Remarks</th>
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<td>8A</td>
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<td>2B</td>
<td>97</td>
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<td>Pad L</td>
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<td>2B</td>
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<td>D</td>
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<td>D</td>
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<td>≥ 90</td>
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<td>D</td>
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<td>23</td>
<td>D</td>
<td>96</td>
<td>≥ 90, Retest #141</td>
</tr>
</tbody>
</table>

*Missing test numbers are for tests on utility backfills, etc., which do not pertain to mass grading.*
Sample: "B"

Description: Light Reddish Brown Clayey SILT (ML)

Laboratory Test Procedure: ASTM D1557


Optimum Moisture Content: 27%
Sample: "D"

Description: Reddish Brown Clayey SILT (ML)

Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 100 p.c.f.

Optimum Moisture Content: 26%
Sample: "8A"

Description: Reddish Brown SILT (ML)

Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 102 p.c.f.

Optimum Moisture Content: 26%

LABORATORY COMPACTION CURVE

MOISTURE CONTENT - (% of Dry Weight)
Sample: "2B"

Description: Reddish Brown SILT (ML)

Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 97 p.c.f.

Optimum Moisture Content: 27%
AREA B

LIMIT OF GRADING

AREA A

LEVEL

FINISH GRADE

190' (TOE SLOPE TO R/W)

AREA B

EXIST GROUND

FUTURE 60' R/W

LEVEL

FINISH GRADE

TYPICAL SECTION

SCALE: HORIZ 1"=40'

VERT 1"=10'

SECTION AA

SCALE: HORIZ 1"=40'

VERT 1"=10'

PLAN

PROFILE

DETAIL- OVERFLOW SPILLWAY

(Not to Scale)

LEGEND

PERMIT NO. 310

PERMIT DATED 3-18-62

APPROVED

DIRECTOR
NOTE: B.G. (BASELINE GRADE) ARE FROM CONSTRUCTION PLANS FOR "SENTRY WAIPIO PROJECT" 1.5 M.G. RESERVOIR, DEEP WELLS, WATER LINE AND ACCESS ROAD.

TYPICAL SECTION

SCALE: HORZ 1"=40' VERT 1"=10'

GRADE PERMIT NO. 310
PROPOSED EROSION CONTROL PLAN

NAME OF DEVELOPMENT: Waipio Gentry - Borrow Site Plan
OWNER: Gentry-Waipio, A Joint Venture
ENGINEER: Community Planning, Inc.
LOCATION: Waipio, Ewa, Oahu, Hawaii
TAX MAP KEY: 9-4-06
AREA: Area "A" = 3.0 acres
       Area "B" = 3.0 acres
PREPARED BY: Jon M. Young
DATE: April 29, 1982

SOIL AND GENERAL SITE CONDITIONS:

The borrow site is on abandoned agricultural land, overgrown
with grass and shrubs, and sloping gently northward with elevations ranging from 425 feet to 440 feet above sea level.

EROSION HAZARD:

The erosion hazard is slight due to the small area to be graded (3.0 acres), the low rainfall index (250) and the heavy vegetation covering the land.

CONSTRUCTION SCHEDULE:

Note: Both Areas A and B will be graded concurrently.

1. Clear and grub and grade sediment basin at the downstream end of both Areas "A" and "B" (June 14 - July 9, 1982)

2. Commence borrow site grading, beginning from the sediment basin and working upstream to the limits of the borrow site (July 9 - December 1, 1982)

3. Grass all exposed areas (December 1-17, 1982)

EROSION CONTROL MEASURES:

1. Sediment basin together with overflow spillway
2. Grassing of all exposed areas immediately after completion of grading

SEVERITY RATING CALCULATIONS:

1. Project Conditions

The 6.0-acre borrow site is separated into two areas: Area A (3.0 acres) and Area B (3.0 acres). Both areas consist of soils classified as Molokai silty clay loam, 3 to 7 percent (MuB).

Grading will be during the summer and winter months over a six-month period, and the entire graded area will be grassed immediately after grading.

2. Values of Equation Factors

Note: Area A and Area B are separate but similar in area and graded condition. Therefore, the severity rating is equal for both areas. The following calculations are for Area A.

\[ F = 2 \] (Table 1 - Damaged area more than 300 feet from site, no stream or channel from site to damaged area)

\[ T = 6 \text{ months} \]

\[ D = 4 \] (Table 2 - Pearl Harbor - West Loch, Class AA water)

\[ E = RK(\text{LS})(\text{CP}) \]

\[ R = 250 \] (Exhibit 3) to commence June 14, 1982, and be completed by December 17, 1982

Compute \( R \) for period of disturbance less than one full year (Exhibit 4)

\[ \% R \text{ to December 17} = 90.0 \]

\[ \% R \text{ to June 14} = \frac{56.0}{34.0} \]

Value of \( R = 250 \times 34.0 \text{ percent} = 85.0 \)

\[ K = 0.24 \] (MuB), from Table, Exhibit 5
(LS) factor for length and steepness of slope
Graded area: $S = 2\%$ for $L \leq 630$ feet
From Exhibit 6,
$LS = 0.35$ for $S = 2\%, L \leq 630$ feet

(CP) Condition 2, Exhibit 8
Grading in winter and summer months with the area seeded, $C = 0.60$
Erosion control measures:
Incremental grading, $P = 0.7$
Sediment basin, $P = 0.8$
$CP = 0.60 \times 0.7 \times 0.8 = 0.34$

3. Calculations
$E = RK(\text{LS})(\text{CP})$
\[ = 85.0 \times 0.24 \times 0.35 \times 0.34 = 2.43 \]
$H = (2 \text{ FT} + 3D) \times AE$
\[ = ([2 \times 2 \times 0.5] + [3 \times 4]) \times 3.0 \times 2.43 = 102 \]
$102 < 50,000$ (maximum allowable severity rating)
Compare maximum allowable construction area times erosion rate:
$A \times E = 3 \times 2.43 = 7$
$7 < 3,571$ (maximum allowable from Exhibit 9)

APPROVED:

[Signatures]
Dir. & Chief Engr., DPW
Date: 5/18/82

[Signatures]
Chief, Div. of Eng., DPW
Date: 5/17/82
TO: Gentry Waipio, Inc.
94-770 Kamehameha Highway
Waipahu, Hawaii 96797

Date: October 12, 1983

Gentlemen:

Re:
GENTRY WAIPIO – IHONA (PARCEL "b")

TMK: 9-4-06; POR. 13

We are sending you herewith X Under separate cover __________

<table>
<thead>
<tr>
<th>No. of Copies</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Approved Grading Permit No. 310</td>
</tr>
</tbody>
</table>

For:
X Your information and use ___ Approval
___ Review and comment ___ Signature
___ As requested ___

Remarks:
The date of our approval, September 6, 1983, is the closing date of the permit. The bond filed with the City for the grading work shall remain in effect for a period of one year after the closing date; therefore, it will be returned to you on September 6, 1984.

Very truly yours,

For MICHAEL J. CHUN
Director and Chief Engineer

Attach.
cc: Community Planning, Inc., w/attach.
United Pacific Insurance Company w/attach.
bcc: Service Engineer w/original
Application is hereby made to do grading work in conformity with Chapter 23, R. O. 1978, As Amended, as follows:

<table>
<thead>
<tr>
<th>TAX MAP KEY</th>
<th>ENG. SOILS REPORT</th>
<th>EST. QUANTITY</th>
<th>PERMIT FEE</th>
<th>FEE RECEIVED</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZONE 9, SEC. 4, PLAT 06, PAR. 13, LOT 2</td>
<td>Final Soils Report</td>
<td>Excav. Cu. Yd.</td>
<td>$228.00</td>
<td>$228.00</td>
</tr>
</tbody>
</table>

Located at **Gentry-Waipio, Borrow Site Area** (Road C), Waipio, Ewa

Lot Area: **3.0** Acres

Description of Soil:
- Existing Ground: Reddish-brown soils

Remarks/Purpose of Work: To grade site (borrow)

**To the Applicant:**
Permission is hereby given to do the above work according to the conditions hereon and according to the approved plans and specifications pertaining thereto, subject to compliance with Chapter 23, R. O. 1978, As Amended.

Remarks:

**Date** 7/6/82

Contractor shall notify this office two working days before commencing any work and arrange for necessary inspectional services.

**THIS PERMIT WILL EXPIRE UNLESS WORK IS STARTED WITHIN 90 DAYS FROM DATE OF ISSUE; OR IF WORK IS SUSPENDED OR ABANDONED FOR 60 DAYS OR MORE AFTER WORK ISbegun; OR ONE YEAR FROM DATE OF ISSUE.**

I hereby certify that all work as requested above has been completed in conformity with Chapter 23, R. O. 1978, As Amended in accordance with the approved plans and specifications.

**Date** 9-1-83

**Date** 9-6-83
July 12, 1982  Begin mass excavation to fill "Knuol" project
(C.P. #190)
July 19, 1982  Mass fill for Knuol project complete.
Aug 1982  No work done
Sept 1982  
Oct 1982  Material used to fill lots in Pushi Subd.
Nov 1982  
Dec 1982  
Jan 10/1983  No activity going on.
Feb, 1983  
March, 1983  Material used to fill various projects
April, 1983  
May 24, 1983  Randy Ohye was told to check on remainder
of work to be done & was reminded that area
has to be grassed upon completion.
June, 1983  No work done
July, 1983  
August 17, 1983  Area grass seeded & mulched.
September 30, 1983

Dr. Michael Chun
Director and Chief Engineer
Department of Public Works
City and County of Honolulu
Honolulu, Hawaii 96813

Dear Dr. Chun:

Subject: Grading Certification
Ihona (Parcel "b")
Gentry Waipio Development
Waipio, Ewa, Oahu, Hawaii
Tax Map Key: 9-4-06: Por. 13

Enclosed is a copy of the Final Grading Report by Fewell Geotechnical Engineering, Ltd. dated September 23, 1983.

Grading for the subject project is completed and in substantial conformance with the approved plans dated January 19, 1983.

Very truly yours,
COMMUNITY PLANNING, INC.

Bernard P. Kea

BPK:RS:do
Enclosure

cc: Gentry Pacific, Ltd. (R. Ouye)
Oahu Construction Co., Ltd.