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REPORT

to

GENTRY, HAWAII, LTD.

Honolulu, Hawaii

on

SOILS INVESTIGATION

for

HEEIA LANDING AREA 6 STOCKPILE

Heeia, Oahu, Hawaii

TMK: 4-6-16: 1

by

GJ. HAWAII, LTD.

807 Ilaniwai Street

Honolulu, Hawaii 96813

SEPTEMBER, 1973

MUNICIPAL REFERENCE & RECORDS CENTER
City & County of Honolulu
City Hall Annex 558 S. King Street
Honolulu, Hawaii 96813

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Consultants in the Applied Earth Sciences

File No. R3-0039-H1
27 September 1973

Gentry Hawaii, Ltd.
146 Hekili Street
Kailua, Oahu, Hawaii 96734

Attention: Mr. Harvey Gerwig

Subject: Heeia Landing Area 6 Stockpile
Heeia, Oahu, Hawaii
SOILS INVESTIGATION

Gentlemen:

Transmitted herein are the results of the Soils Investigation accomplished for the Heeia Landing Area 6 Stockpile project. This report was accomplished in accordance with a request from Mr. Harvey Gerwig.

Area 6 Stockpile lies in the Northwest portion of the Heeia Landing project, and is bounded at one extreme by Kamehameha Highway (see Figure 1, Site Plan and Location of Test Borings).

This report was prepared utilizing information obtained from three previous Soils Investigations. These investigations were (a) a preliminary soils reconnaissance performed by Walter Lum and Associates dated 7 June 1971, (b) a preliminary soils investigation by Gribaldo, Jones-Hawaii, Ltd. dated 15 November 1973, and (c) a soils investigation for the Heeia Landing Sewage Lift Station by Gribaldo, Jones-Hawaii, Ltd. dated 19 July 1973.

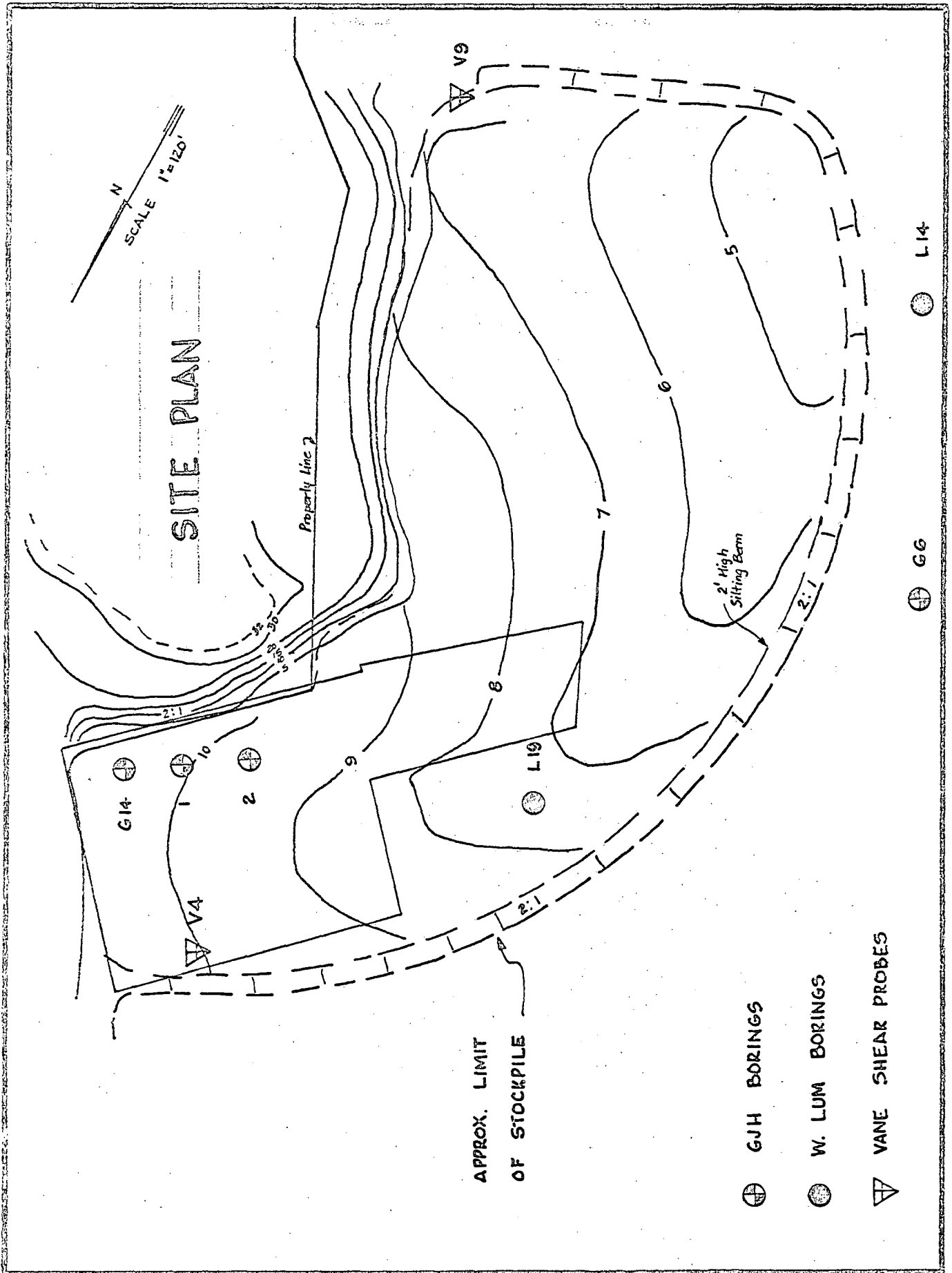


Figure 1 - Site Plan and Locations of Test Borings

Copies of appropriate boring logs and laboratory test data are attached in the appendix of this report.

Existing Site Conditions

The portion of the site encompassed by Area 6 Stockpile presently exists as unimproved meadowland that has in part been subjected to grazing. The Northwestern boundary of Area 6 is bounded by a dirt road at an approximate average height of six feet above the meadowland. The meadowland is covered by a fairly dense growth of "California" grass.

Subsurface Soil Conditions

The major portion of Area 6 Stockpile is underlain by less than ten feet of soft clays that are in turn underlain by stiff soils. The upper one to two feet of soils are somewhat stiffer than those immediately below them. The groundwater table was encountered within two feet of the existing ground surface.

DISCUSSION, CONCLUSION AND RECOMMENDATIONS

1. We believe that the proposed Heeia Landing Area 6 Stockpile may be developed to support structures, roads, and appurtenances.
2. The method of development we believe to be appropriate for Heeia Landing Area 6 Stockpile is the generation of a pad of fill over the existing native soils. This pad would be utilized to (a) provide bridging over the native soils, (b) provide a surcharge type load over the native soils, and (c) provide a firm base upon which to construct facilities.
3. The variance in existing surface conditions over Area 6, and height of fill to be placed will result in different compaction requirements over the area.
4. Generally, in Area 6, where the final design grade is less than six feet above the existing ground elevation, both the standing grass and grass root mat should be removed. Where the final design grade is more than six feet above the existing ground elevation, only the standing grass need be removed. Existing subsurface, and surface soil conditions may necessitate modification to the above criteria.
5. Where the fill abuts slope banks, all grass, both standing and root mat, must be removed from the existing banks.
6. The degree of compaction obtained in Area 6 will be dependant upon the in-situ density of the existing surface materials.

The degree of compaction required will be as high as can be attained without causing damage to the underlying subsurface soils. It is anticipated that the amount of compaction possible will increase with increasing lifts of fill.

7. The top four feet of fill should have a relative compaction of 90%. In roadway areas 95% relative compaction for the upper two feet of fill should be attained.

8. We recommend that all construction equipment be as light as possible, and that the use of vibratory equipment be prohibited. With the use of lightweight construction equipment, we anticipate that a working fill pad between one and three feet thick will initially be required across substantial portions of Area 6. The exact thickness of the working pad will be determined by field observations, soil conditions, and the actual construction equipment utilized by the contractor. The compaction requirements specified are not a function of the type of construction equipment utilized. The working pad should be constructed as a wave extending outward from the firm bank.

9. Hauling equipment must utilize designated haul roads and by-passes. Heavily loaded equipment should not be driven onto portions that have been filled. Grading and compaction equipment should not be operated with sudden reverses or stops in Stockpile Area No. 6.

10. Should soft areas or excessive pumping be encountered,

work should immediately stop in these areas until the Soils Engineer has been notified, and recommendations for correcting these areas have been given.

11. Loose stockpile heights should not exceed three feet in Area 6 unless authorized by the Soils Engineer. Further, no materials should be stockpiled adjacent to slopes.

12. Samples of material proposed for fill should be submitted to the Soils Engineer no less than four working days before its intended jobsite use.

13. Following completion of filling operations, settlement markers should be installed, and periodic readings taken to evaluate settlements of the subsurface soils.

LIMITATIONS AND UNIFORMITY OF CONDITIONS

1. The recommendations for this report are based upon the assumption that the soils conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the present time, GJ Hawaii, Ltd. should be notified so that supplemental recommendations can be given.
2. This report is issued with the understanding that it is the responsibility of the owner, or of his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architect and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to see that the Contractors and Subcontractors carry out such recommendations in the field.
3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they be due to natural processes or to the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review and should not be relied

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upon after a period of one year.

Very truly yours,

GJ HAWAII, LTD.

William M. McMorrow

William M. McMorrow, P.E.
President



Copies: 2 to William Hee and Associates (Attn: W. Hee)
5 to Gentry Hawaii, Ltd. (Attn: H. Gerwig)