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REPORT ON
TMK 8-9-4-328
NANAKULI HOMES SUBDIVISION STREETS
NANAKULI, WAIANAE, OAHU, HAWAII

328
Permit #3631

for

DEPARTMENT OF HAWAIIAN HOME LANDS
HONOLULU, HAWAII

October 17, 1969

ARTHUR AKINAKA

HONOLULU, HAWAII

MUNICIPAL REFERENCE & RECORDS CENTER
City & County of Honolulu
City Hall Annex, 5th Floor, Street
Honolulu, Hawaii 96813

by

K. B. Hirashima
Ahsing, Mills and Associates, Inc.
P. O. Box 206
Aiea, Hawaii 96701



AHSING, MILLS and ASSOCIATES, INC.

Robert W. H. Ahsing - William K. Mills - Lawrence K. Ahsing - K. B. Hirashima - Francis K. Y. Mau
99-110 KAHALE STREET • P. O. BOX 206 • AIEA, HAWAII 96701 • PHONE 462-400

October 17, 1969

Arthur Akinaka
Room 201
1339 North School Street
Honolulu, Hawaii 96817

Re: Nanakuli Hawaiian Homes Subdivision
Nanakuli, Oahu, Hawaii

Dear Mr. Akinaka:

Forwarded herewith are four (4) copies of our soils investigation report for the proposed street for the above project.

Soil conditions on the site are on the whole favorable except possibly the portion of the site with gray clay surface soils. This portion of the site is shown in Plate B (the darker area). It is suggested this portion of the roadway should be excavated to 18" and back-filled with non-expansive material.

Very truly yours,

AHSING, MILLS AND ASSOCIATES, INC.

By 
K. B. Hirashima

KBH:na

INTRODUCTION

It is proposed to construct roadways for vehicular traffic to Nanakuli Residence Area.

The purpose of this investigation was to determine the nature of the soils on the proposed route and their suitability when used for embankment as subgrade purposes.

FIELD INVESTIGATION

The field investigation included borings, identification of materials, sampling and recording. The borings were done by Nat Whiton Drilling Company. In all cases, the borings were made at centerline of roadway and to subgrade. The materials were identified and recorded. Samples were taken for testing. Plate A shows the boring log and Figure 1 shows material description.

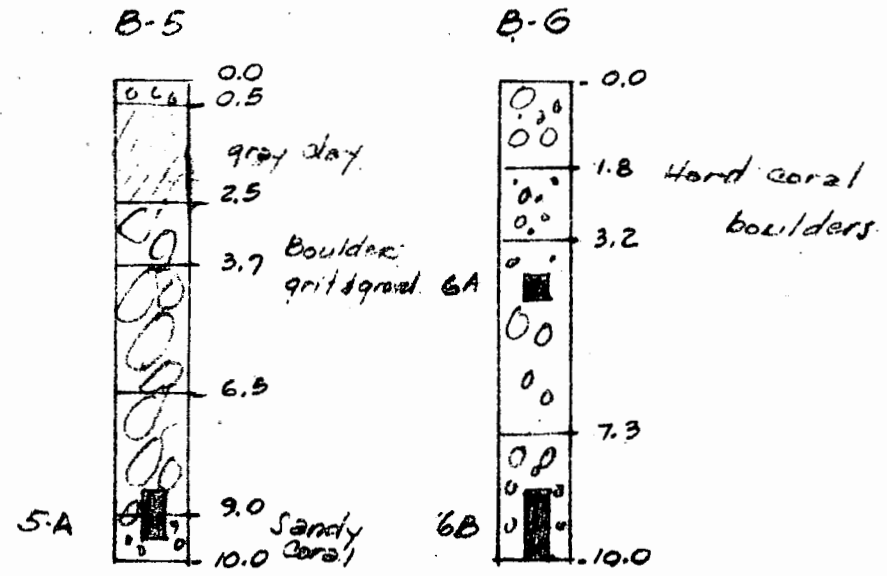
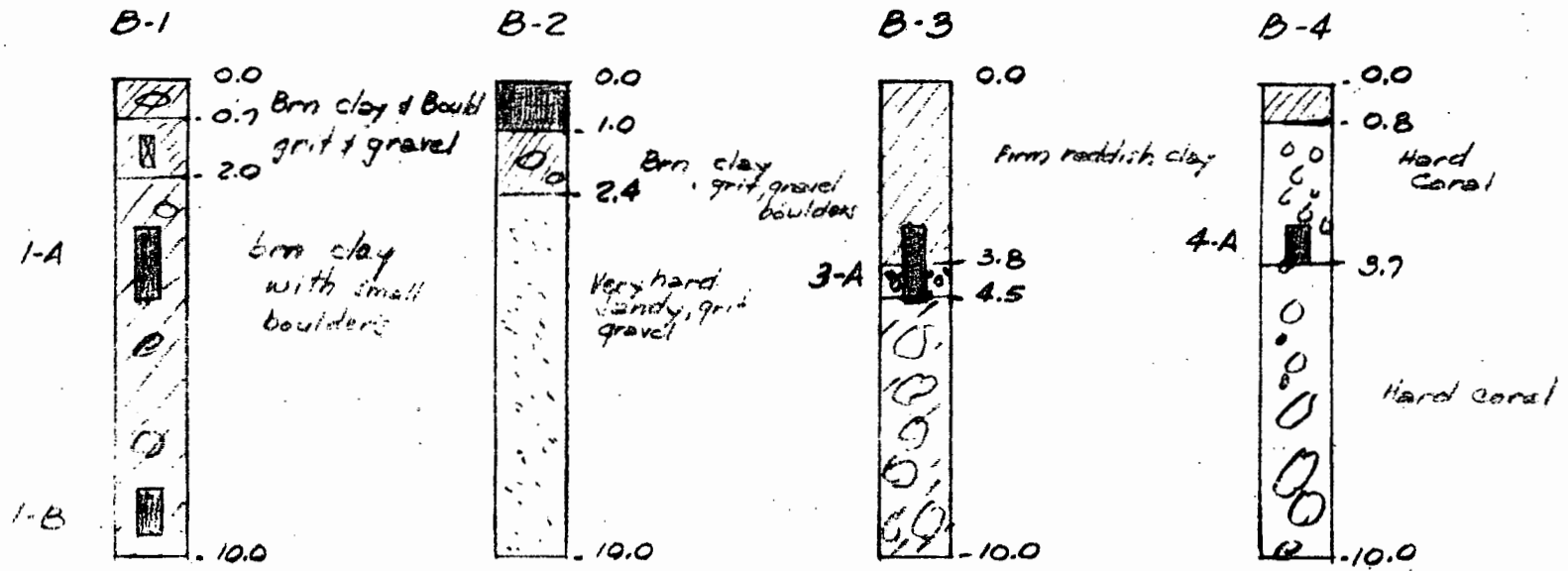
LABORATORY INVESTIGATION

Samples from the field were tested for suitability for roadway construction. Samples were undisturbed and disturbed as indicated in Table 1.

The following is a list of tests performed:

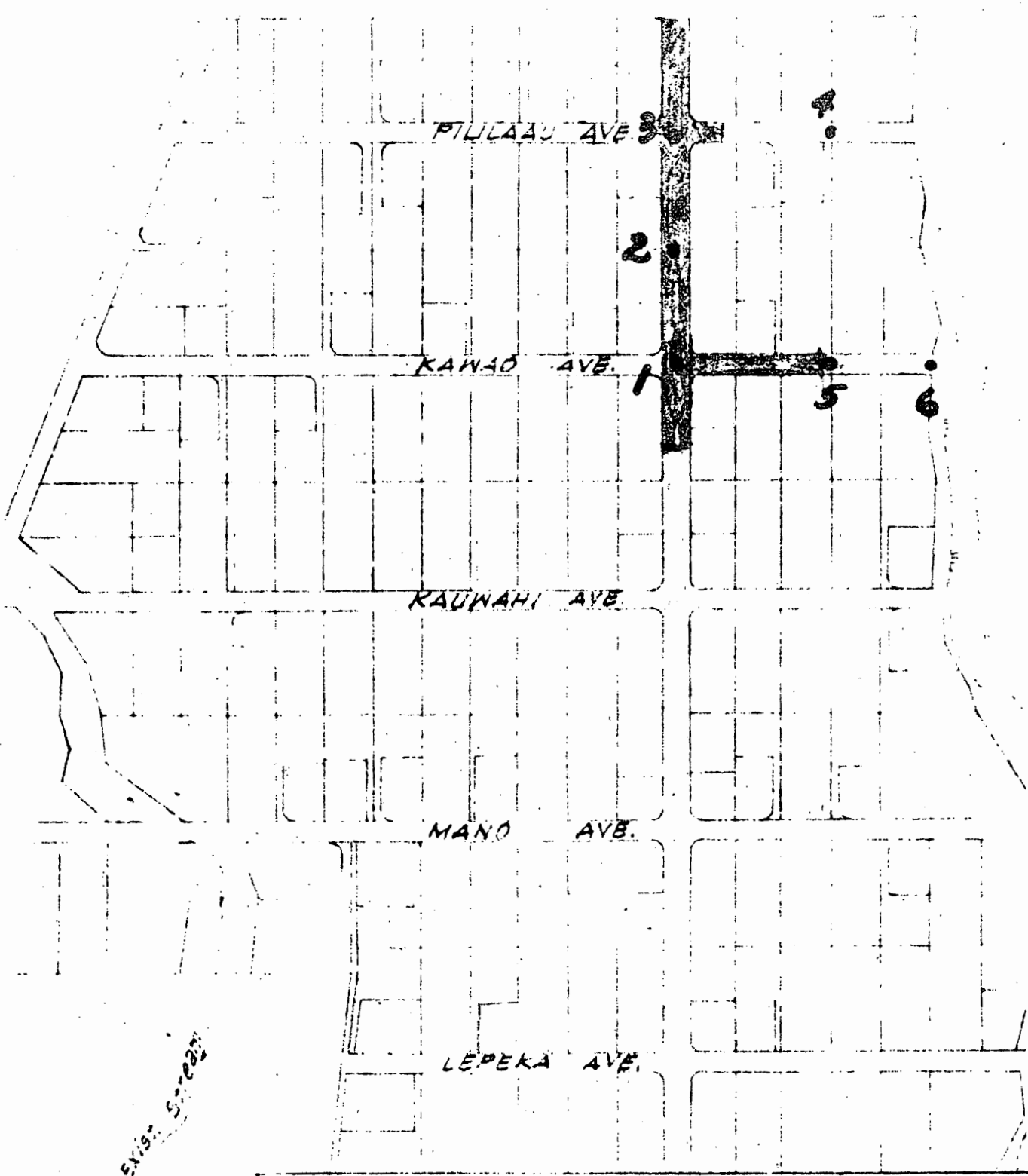
- a. Atterberg Limits
- b. Moisture-Density Relation (AASHO T-180-57)
- c. Grading Analysis (Hydrometer)
- d. California Bearing Ratio
- e. Natural Moisture Content
- f. Specific Gravity

The results of the laboratory tests are shown on Table 1.



NANAKULI STREET
UNIT 3
BORING LOGS

PLATE A.



DEPARTMENT OF HAWAIIAN HOME LANDS
 NANAKULI STREET IMPROVEMENTS

UNIT 3

NANAKULI, MAIANAE, OAHU, HAWAII

DRAINAGE SYSTEM
 HYDROLOGIC MAP
 PLATE B

SUMMARY OF LABORATORY TEST RESULTS

NANAKULI HOMES

Table I

Boring No.	1		3		4		5		6	
Sample No.	1A	1B	3A		4A	5A	6A			
Depth (ft.)										
DESCRIPTION										
IN-PLACE DENSITIES										
Wet Density (lb/c.f.)	118.0	125.0	128.7		127.9	116.5	129.2			
Moist. Content, %	17.8	20.5	17.5		16.0	21.1	15.8			
Dry Density (lb/c.f.)	101.2	103.7	109.5		110.3	96.2	111.6			
DIRECT SHEAR TEST										
Cohesion (lb/s.f.)										
UNCONFINED COMP. TEST										
Yield Point (lb/s.f.)										
Ultimate Load (lb/s.f.)	2880	3900	3270		4150	3900	4010			
EXPANSION TEST										
Swell upon Saturation, %	4.2		3.2		1.5					
ATTERBURG LIMITS										
Liquid Limit	47		37		29					
Plasticity Index	20		15		10					
SPECIFIC GRAVITY										
	2.89									
GRADING ANALYSIS										
(% Passing)										
Sieve										
#4	51		70		54					
#10	50		68		48					
#20	48		66		43					
#40	45		60		38					
#80	43		57		32					
#100	41		53		28					
#200	39		48		25					
COMPACTION TEST										
(AASHTO Method T180-57)										
Max. Dry Density (lb/c.f.)			95.2		101.0					
Optimum Moist., %			28.0		23.5					
CBR TEST										
CBR at 0.1" Penetration			8.0		17.3					
CLASSIFICATION										

BORING NO. 1

0.0-----0.7 (0.7) Firm dark brown clay and boulders
0.7-----2.0 (1.3) Firm reddish clay with grit and gravel
2.0-----10.0 (8.0) Stiff light brown clay with grit and gravel--
small boulders at places

Sample Data:

<u>No.</u>	<u>Depth</u>	<u>Blows/0.5'</u>	<u>Type</u>	<u>Recovery</u>
1.	3.0 - 4.5 (1.5)	9, 13, 17	Split Spoon	1.5
2.	8.5 - 9.5 (1.0)	12, 35 --	Shelby	1.0

BORING NO. 2

0.0-----1.0 (1.0) Asphalt and coral fill
1.0-----2.4 (1.4) Stiff brown clay with grit, gravel and
boulders
2.4-----10.0 (7.6) Very hardpacked brown sandy clay with grit,
gravel and boulders

Note: No sample data was taken, too many boulders

BORING NO. 3

0.0-----3.8 (3.8) Firm to stiff reddish clay
3.8-----4.5 (0.7) Medium coral rock
4.5-----10.0 (5.5) Conglomerate of hardpacked mixture of boulders
and clay

Sample Data:

<u>No.</u>	<u>Depth</u>	<u>Blows/0.5'</u>	<u>Type</u>
1.	3.0 - 4.5 (1.5)	8, 10, 22	Shelby

BORING NO. 4

0.0-----0.8 (0.8) Stiff gray clay with grit, gravel and boulders
0.8-----3.7 (2.9) Medium and hard coral rock
3.7-----10.0 (6.3) Medium and hard gray rock with streaks of
decomposed rock

Sample Data:

<u>No.</u>	<u>Depth</u>	<u>Blows/0.5'</u>	<u>Type</u>
1.	3.0 - 3.7 (0.7)	22, 22/0.2'	Shelby refusal

Arthur Akinaha

9/29/69

Nanakuli, street improvement

BORING NO. 5

0.0-----0.5	(0.5)	Very hardpacked boulders, coral and clay
0.5-----2.5	(2.0)	Stiff light gray clay and gravel
2.5-----3.7	(1.2)	Boulder
3.7-----6.5	(2.8)	Hard - Boulders, grit, gravel and clay
6.5-----9.0	(2.5)	Very hardpacked brown sandy clay
9.0-----10.0	(1.0)	Medium coral rock with brown clay

Sample Data:

<u>No.</u>	<u>Depth</u>		<u>Blows/0.5'</u>	<u>Type</u>
1.	8.5 - 9.5	(1.0)	34, 60	Split Spoon

BORING NO. 6

0.0-----1.8	(1.8)	Very hardpacked boulders, coral and clay
1.8-----3.2	(1.4)	Boulder
3.2-----7.3	(4.1)	Very hardpacked boulder, gravel, grit and brown clay
7.3-----10.0	(2.7)	Very hardpacked sandy brown clay with grit, gravel and boulders

Sample Data:

<u>No.</u>	<u>Depth</u>		<u>Blows/0.5'</u>	<u>Type</u>	<u>Recovery</u>
1.	4.0 - 4.5	(0.5)	68	Split Spoon	none
2.	8.5 - 10.0	(1.5)	28, 32, 32	" "	1.3