

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

B9903064

C.P. 9061

MAR 12

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

8/21/80

TA 710-3
H3
H64
No. 45

FOR REFERENCE

not to be taken from this room

SR-45

August 8, 1980

KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825

Gentlemen:

Subject: Grading Memorandum
Marina Business Center No. 1
Maunaloa, Honolulu, Oahu, Hawaii

The above project was generally constructed with on-site and approved borrow material. The fill was placed and compacted in thin layers. A soil technician from our office was present at the site on an intermittent basis to observe grading progress and to take density tests. Whenever fill operations were on a continuous basis, a soil technician usually visited the site daily.

Grading Plan dated March 14, 1980 by M & E Pacific, Inc. was used as a guide for soil testing purposes.

A tabulation of the field density test results is attached. Where low tests were noted, the area was rerolled and in most cases retested. The density test results at the time and at the locations taken were, in our opinion, in general conformance with the density requirements of the Revised Ordinances of Honolulu, 1969 As Amended.

Even though, in our opinion, the field density tests by our office conform, in general, to the density requirements of the City's Ordinance, the passage of time may result in changes in soil conditions and we suggest the following precautions:

1. Some expansive soil and/or soft pockets may have gone undetected during the earthwork. The building pad grading and design of the structures may have to be adjusted or corrected if undetected conditions are encountered in the future.
2. Some creep or settlements may occur near the tops of slopes and near utility trenches. Foundations near tops of slopes, over sloping ground or near utility trenches should be avoided or designed under the guidance of an engineer.

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

KACOR REALTY, INC.
August 8, 1980
Page 2

3. Lot regrading by cutting, filling or altering the drainage pattern may cause ground instability in some situations. For this reason, lot regrading should be avoided or made under the guidance of a Soils Engineer.

Our work on this project does not include the following:

Retaining walls, finish grading not observed and tested by our office, etc.

We have employed accepted engineering and testing procedures and our professional opinions and conclusions are made in accordance with generally accepted soil and foundation engineering principles and practices. However, we do not undertake to guarantee the construction nor do we relieve the contractor of his primary responsibility to produce a completed project conforming to the project plans and specifications.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:lw

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: July 3, 1979

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
LABORATORY TEST RESULTS

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
- Field Density Test Results
- Boring Logs
- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
- Signature
- Your use and files

No. of Copies
Sets 2
Sheets _____

General Remarks:

If changes in the material are detected during the grading work, additional testing is recommended.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. W. Wakahiro

MARINA BUSINESS CENTER #1

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

SAMPLE NO.	BORROW FROM	BORROW FROM
	PUNAHOU	SAND ISLAND
DEPTH BELOW SURFACE		
DESCRIPTION	BROWN CLAYEY SILT W/SAND	TAN BROWN SILTY SAND & GRAVEL
GRAIN-SIZE ANALYSIS (% Passing)		
Sieve		
1-1/2"	100	95
1"	100	88
1/2"	98	69
#4	97	55
#10	90	43
#20	79	31
#40	65	23
#100	54	14
#200	51	11
ATTERBERG LIMITS		
Air Dried or Natural	NATURAL	NATURAL
Liquid Limit	44	43
Plastic Limit	31	32
Plasticity Index	13	11
Dilatancy	RAPID-SLOW	RAPID-SLOW
Toughness	WEAK	WEAK
Dry Strength	LOW-MED.	LOW-MED.
UNIFIED SOIL CLASSIFICATION	ML	GP - GM
APPARENT SPECIFIC GRAVITY		
CBR TEST		
(Surcharge - 51 P.S.F.)		
Molding Moisture, %	22.2	14.1
Molding Dry Density, P.C.F.	105.1	117.7
Swell upon saturation, %	0.3	NIL
CBR at 0.1" Penetration	61.0	91.7
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)		
Dry to Wet or Wet to Dry		
Max. Dry Density (P.C.F.)		
Optimum Moisture (%)		

REMARKS:

1. THE MATERIAL TESTED ABOVE MAY BE USED FOR GENERAL FILL & "SELECT BORROW" BELOW DRIVEWAYS AND PARKING LOTS. MAXIMUM SIZE OF ROCK SHOULD BE IN GENERAL CONFORMANCE WITH SPECIFICATIONS.

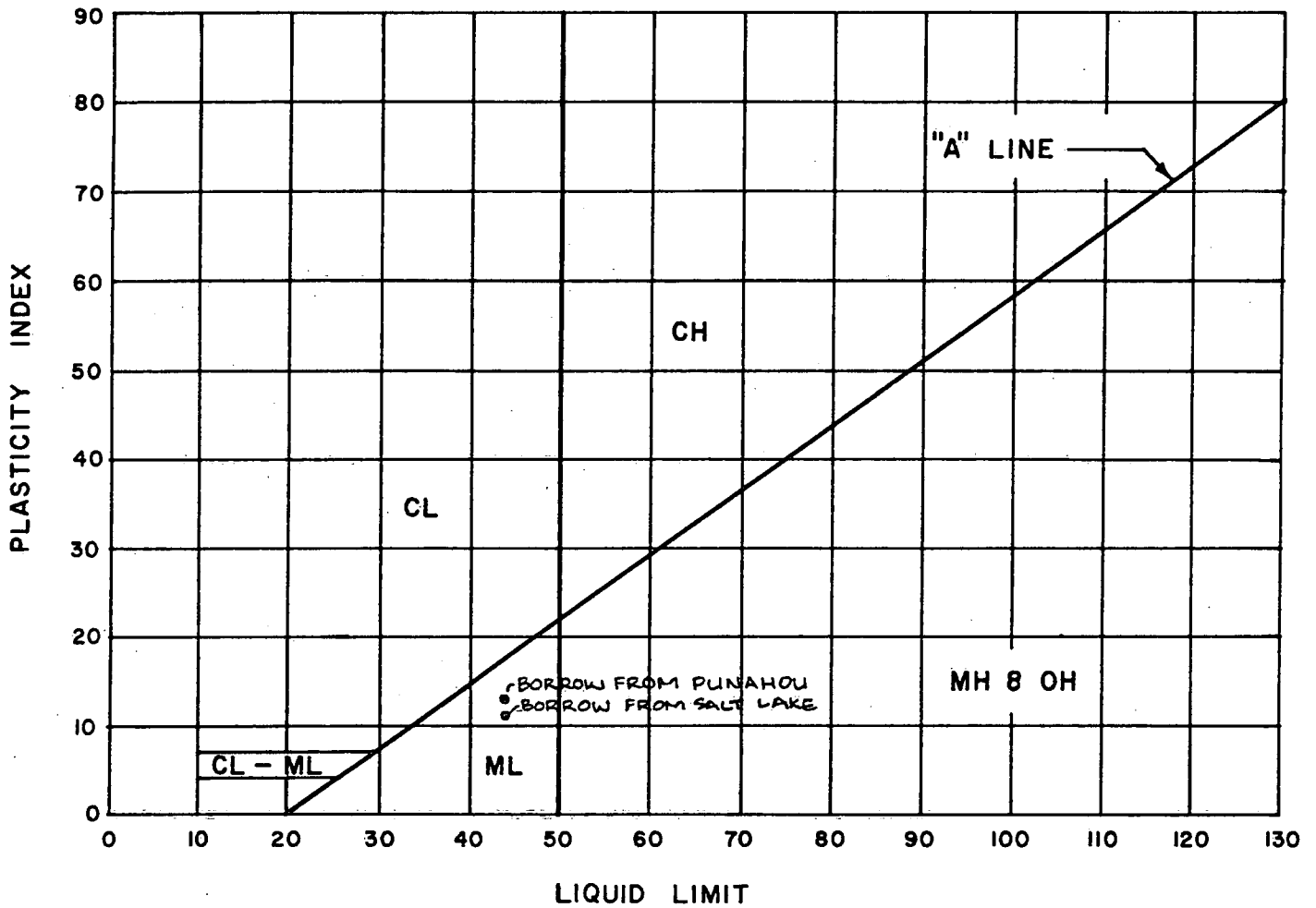
Date 6/21/79 By WM

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER #1

LOCATION: MAUNALUA, HONOLULU, OAHU, HAWAII



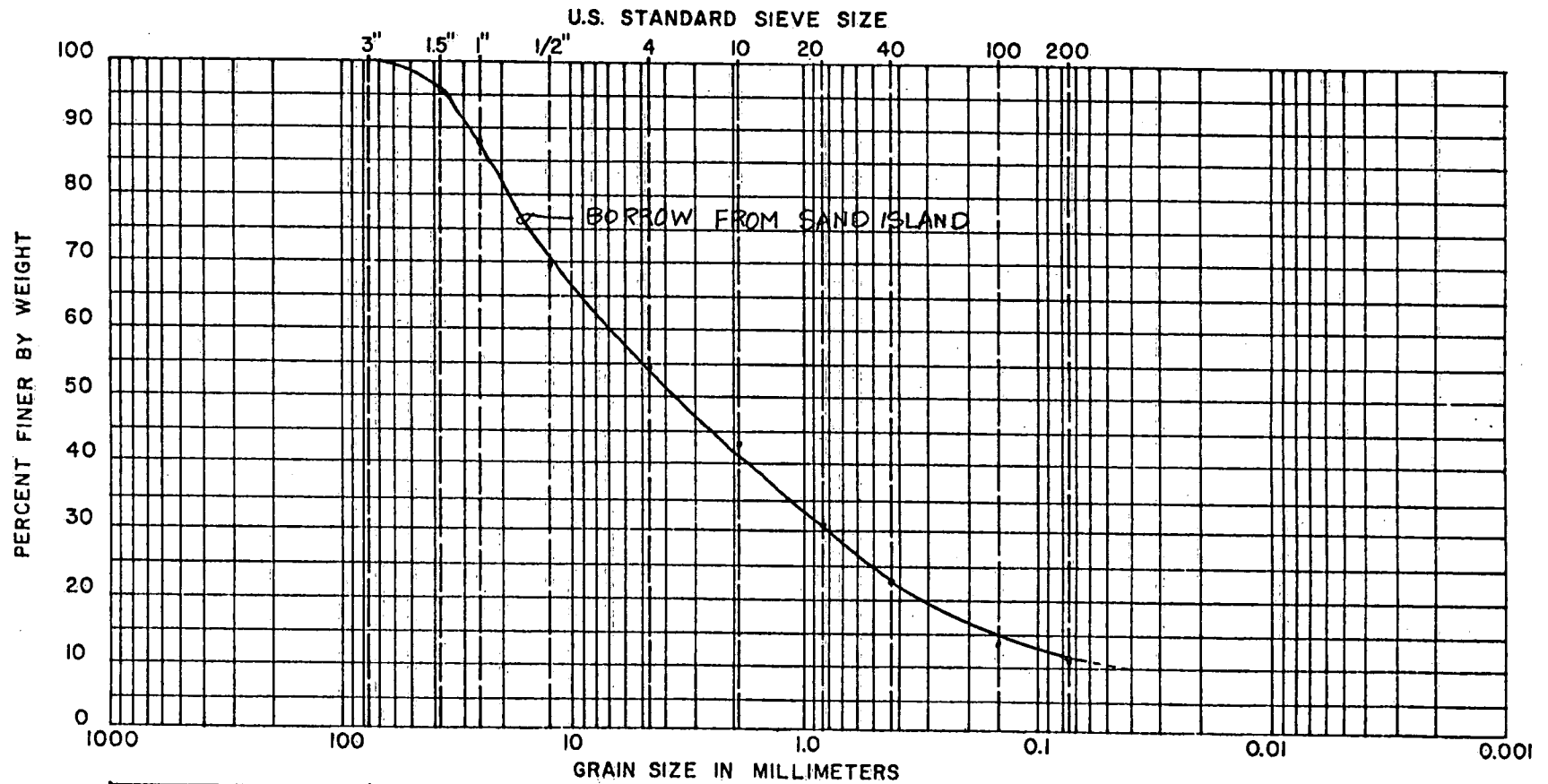
DATE 6/21/79 BY lm

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

GRAIN-SIZE ANALYSIS CURVE

PROJECT: MARINA BUSINESS CENTER #1

LOCATION: MAUNALUA, HONOLULU, OAHU, HAWAII



COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

DATE 5-30-79 BY LL

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: July 25, 1979

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
LABORATORY TEST REPORT

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
- Field Density Test Results
- Boring Logs
- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
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General Remarks:

If changes in the material are detected during the grading work, additional testing is recommended.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

MARINA BUSINESS CENTER NO 1

TABLE I - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	OFF-SITE BORROW FROM KAHALUU			
	# 1		# 2	
DESCRIPTION	MOTTLED BROWN SILTY CLAY		MOTTLED BROWN SILTY CLAY	
GRAIN-SIZE ANALYSIS (% Passing)	W/DEC. ROCK		W/DEC. ROCK	
Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL		NATURAL	
Liquid Limit	105		96	
Plastic Limit	47		42	
Plasticity Index	58		54	
Dilatancy	SLOW		SLOW	
Toughness	MEDIUM		MED.	
Dry Strength	MEDIUM		MED.	
UNIFIED SOIL CLASSIFICATION				
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	36 45*		35 44*	
Molding Dry Density, P.C.F.	85		86	
Swell upon saturation, %	1.1		1.6	
CBR at 0.1" Penetration	16.0		14.3	
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS:

* MOISTURE CONTENT AFTER 4 DAY SOAK.
 1. RECOMMEND OFF-SITE BORROW BE APPROVED FOR SELECT FILL. HIGH MOISTURE SOILS SHOULD BE DRIED TO OPTIMUM MOISTURE.

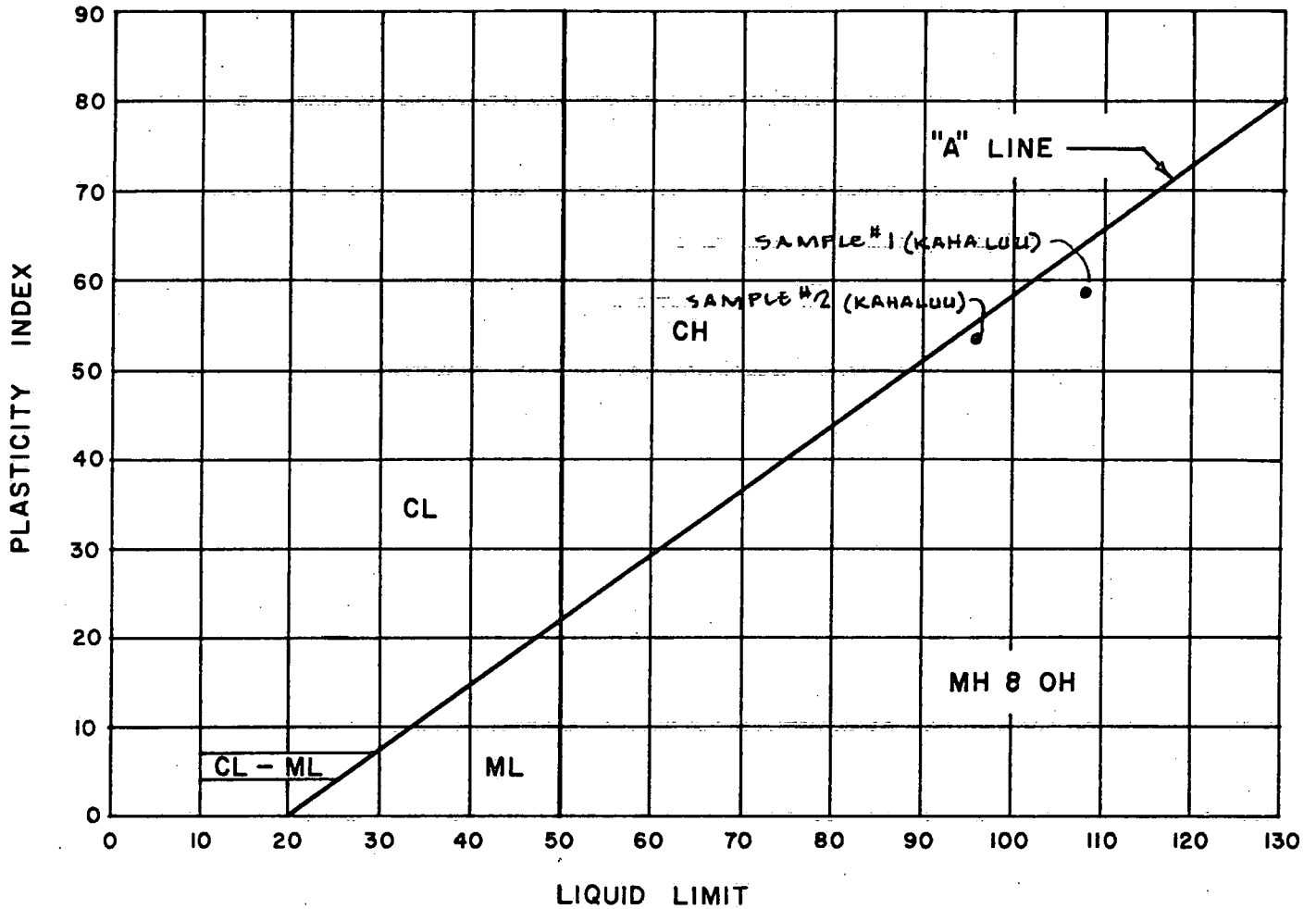
WALTER LUM ASSOCIATES, INC.
 CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 7-23-79 By W.W.

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER #1

LOCATION: MAUNALUA, OAHU, HAWAII



DATE 7-23-79 BY w.w.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM ASSOCIATES, INC.

CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO

3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

July 25, 1979

MEMORANDUM

TO: MR. MICHAEL MORITA
Kacor Realty, Inc.

FROM: Walter Lum Associates, Inc.

RE: Marina Business Center No. 1
Off-site Borrow from Marina Business Center No. 2

As requested, materials from the silting basin in Marina Business Center No. 2 were tested for possible use as a borrow material for surcharging and filling Marina Business Center No. 1.

Soil samples were recovered from the surface and from existing random pits (2 to 3 ft deep) in Marina Business Center No. 2 and tested in the laboratory.

The surface soils in Marina Business Center No. 2 appear to be highly expansive clay (CH) soils, 1 to 3 or more ft in thickness. Laboratory tests indicate expansions (CBR method) of about 7 to 10%. We recommend that this material not be used as a fill near the surface.

Below the expansive surface clay, a mixture of slight to moderately expansive clay (CL), sand and dredged coral were encountered in some of the pits along the northern berm of the silting basin adjacent to Keahole Street. This material may be used as general fill up to one foot below building foundations and slabs on ground.

From visual observations, a silty sand and coral stockpile was noted at the end of the silting basin near Kalaniana'ole Highway. The stockpiled material may be considered as select fill. Should you consider using this material in Marina Business Center No. 1, we suggest the material be tested to confirm our visual observations.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:es

Attachment: Summary of Laboratory Test Results

MARINA BUSINESS CENTER I

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORROW SITE BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	OFF-SITE BORROW - MARINA BUS. CTR. # 2		
	PIT #1 0'-1 1/2'	PIT #1 1'-2 1/2'	PIT #1 2'-3 1/2'
DESCRIPTION	GRAY-BROWN SANDY CLAY	LIGHT GRAY CLAYEY SAND w/CORAL	GRAY BROWN CLAYEY SAND w/CORAL
GRAIN-SIZE ANALYSIS (% Passing)			
Sieve			
1-1/2"		97	100
1"		94	95
1/2"		86	87
#4		79	78
#10		73	72
#20		67	66
#40		58	60
#100		39	42
#200		35	38
ATTERBERG LIMITS			
Air Dried or Natural	NATURAL	NATURAL	NATURAL
Liquid Limit	89	44	52
Plastic Limit	23	16	18
Plasticity Index	66	28	34
Dilatancy	SLOW	NONE-SLOW	SLOW
Toughness	MED-STIFF	MED-STIFF	MED-STIFF
Dry Strength	HIGH	MEDIUM	MEDIUM
UNIFIED SOIL CLASSIFICATION	CH	SC	SC
APPARENT SPECIFIC GRAVITY			
CBR TEST			
(Surcharge - 51 P.S.F.)			
Molding Moisture, %	25.7 54.7*	14 26*	16 24*
Molding Dry Density, P.C.F.	96.1	112	108
Swell upon saturation, %	9.7	1.8	1.3
CBR at 0.1" Penetration	1.8	16.4	20.7
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)			
Dry to Wet or Wet to Dry			
Max. Dry Density (P.C.F.)			
Optimum Moisture (%)			

REMARKS:
* MOISTURE CONTENT AFTER 4 DAY SOAK.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 7-23-79 By W.W.

MARINA BUSINESS CENTER No 1

TABLE I B - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	OFF-SITE BORROW - MARINA BUS. CTR. # 2			
	PIT # 2 0' - 1'±	PIT # 2 1' - 2'±	PIT # 3 0' - 1'±	PIT # 4 0' - 3'±
DESCRIPTION	GRAY BROWN CLAY	TAN GRAY SANDY CLAY W/CORAL FRAGMENTS	GRAY BROWN CLAY	GRAY BROWN CLAY W/SOME SAND
GRAIN-SIZE ANALYSIS (% Passing)				
Sieve				
1-1/2"				100
1"				99
1/2"				98
#4				95
#10				93
#20				91
#40				87
#100				71
#200				64
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL	NATURAL	NATURAL	NATURAL
Liquid Limit	104	43	69	100
Plastic Limit	24	16	23	22
Plasticity Index	80	27	46	78
Dilatancy	NONE	RAPID-SLOW	SLOW-NONE	NONE
Toughness	STIFF	MED.	MED.	VERY STIFF
Dry Strength	HIGH	MED.		HIGH
UNIFIED SOIL CLASSIFICATION	CH	CL	CH	CH
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %		14 26*	23 41*	
Molding Dry Density, P.C.F.		109	99	
Swell upon saturation, %		3.0	6.8	
CBR at 0.1" Penetration		5.7	2.0	
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS:

* MOISTURE CONTENT AFTER 4 DAY SOAK.

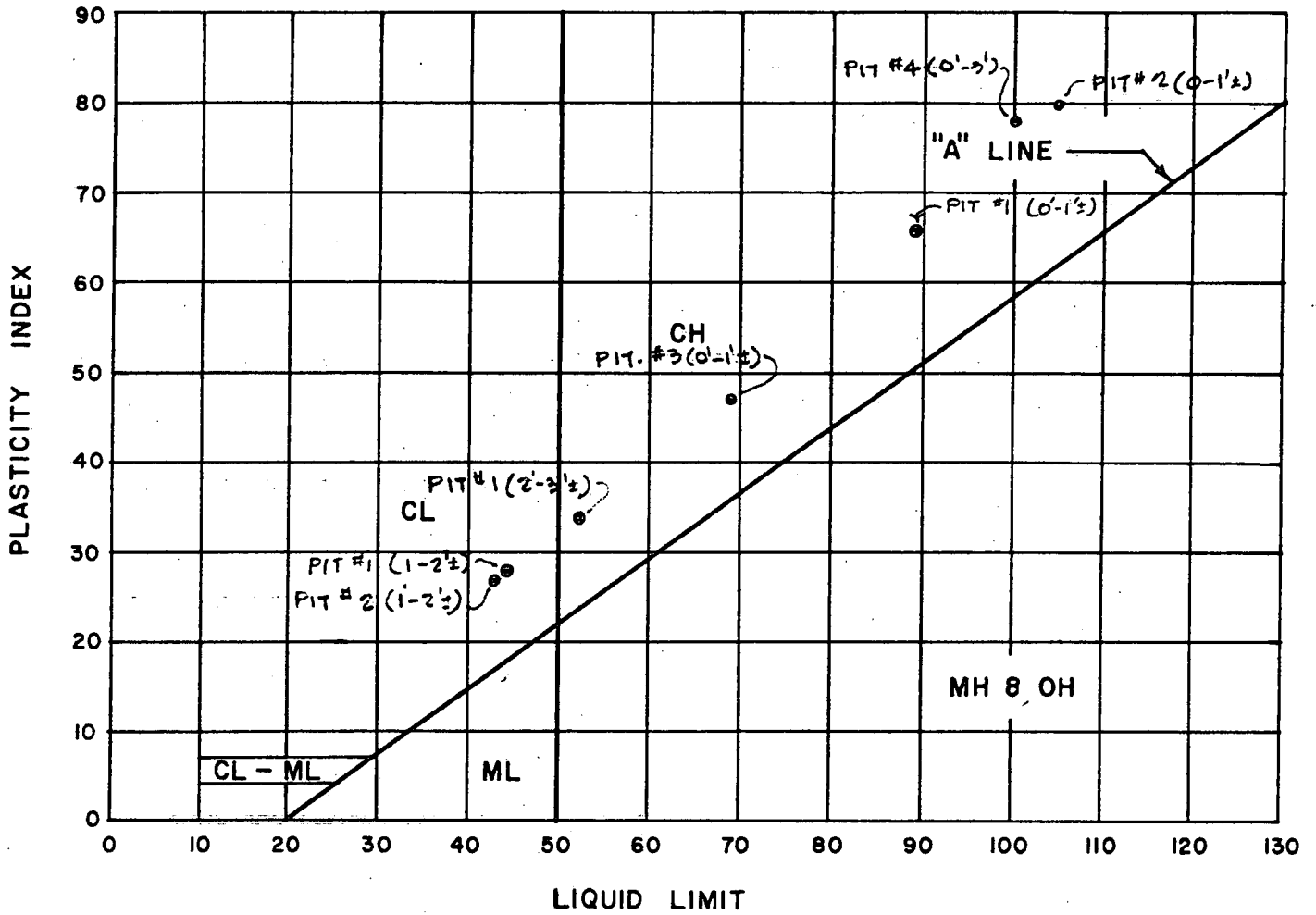
WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date _____ By _____

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER NR 1

LOCATION: MAUNALUA, HONOLULU, HAWAII



DATE 7-24-79 BY W.W.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: August 13, 1979

Gentlemen:

Re: MARINA BUSINESS CENTER NO. I
LABORATORY TEST RESULTS

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
- Field Density Test Results
- Boring Logs
- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
- Signature
- Your use and files

No. of Copies 2
Sets _____
Sheets _____

General Remarks:

If changes in the material are detected during the grading work, additional testing is recommended.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

MARINA BUSINESS CENTER NO. 1

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	OFFSITE BORROW - FT. SHAFTER			OFFSITE BORROW PIER 40
	# 1	# 2	# 3	# 4
DESCRIPTION	TAN BROWN CLAY	BROWN SILTY SAND (MUDROCK)	TAN BROWN CLAY	TAN WHITE SILTY SAND (CORAL, SHELLS)
GRAIN-SIZE ANALYSIS (% Passing)				
Sieve				
1-1/2"		100		98
1"		99		96
1/2"		96		84
#4		86		69
#10		66		60
#20		43		52
#40		29		45
#100		14		13
#200		11		6
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL	NATURAL	NATURAL	NATURAL
Liquid Limit	58	NON-PLASTIC	65	NON-PLASTIC
Plastic Limit	25	-	26	-
Plasticity Index	33	-	39	-
Dilatancy	SLOW-NONE	-	SLOW	-
Toughness	MED. STIFF	-	STIFF	-
Dry Strength	HIGH	-	HIGH	-
UNIFIED SOIL CLASSIFICATION	CH	SW-SM	CH	SW-SM
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	23.8 / 32.6*	19.9 / 29.9*	22.9 / 34.2*	13.4 / 20.0*
Molding Dry Density, P.C.F.	102.4	94.3	100.1	101.9
Swell upon saturation, %	1.7	0.1	3.5	NIL
CBR at 0.1" Penetration	10.3	51	4.3	35
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK

- SAMPLES 1 & 3 (FT. SHAFTER) MAY BE APPROVED FOR FILL UP TO 18" BELOW FINISH GRADE.
- SAMPLES 2 & 4 MAY BE APPROVED FOR FILLS UP TO FINISH GRADE.

WALTER LUM ASSOCIATES, INC.
CIVIL STRUCTURAL SOILS ENGINEERS

Date 8-10-79 By MIC

MARINA BUSINESS CENTER NO. 1

TABLE I B - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	OFFSITE BORROW-			
SAMPLE NO.	PLAYLAND-HALAWA			
DEPTH BELOW SURFACE	# 5			
DESCRIPTION	BROWN CLAYEY SAND w/ GRAVEL			
GRAIN-SIZE ANALYSIS (% Passing)				
Sieve				
1-1/2"	88			
1"	83			
1/2"	76			
#4	71			
#10	68			
#20	65			
#40	62			
#100	54			
#200	49			
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL			
Liquid Limit	55			
Plastic Limit	28			
Plasticity Index	27			
Dilatancy	SLOW			
Toughness	MED. STIFF			
Dry Strength	HIGH			
UNIFIED SOIL CLASSIFICATION	SM-SC			
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	22.1 / 38.7*			
Molding Dry Density, P.C.F.	99.3			
Swell upon saturation, %	3.7			
CBR at 0.1" Penetration	6.8			
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

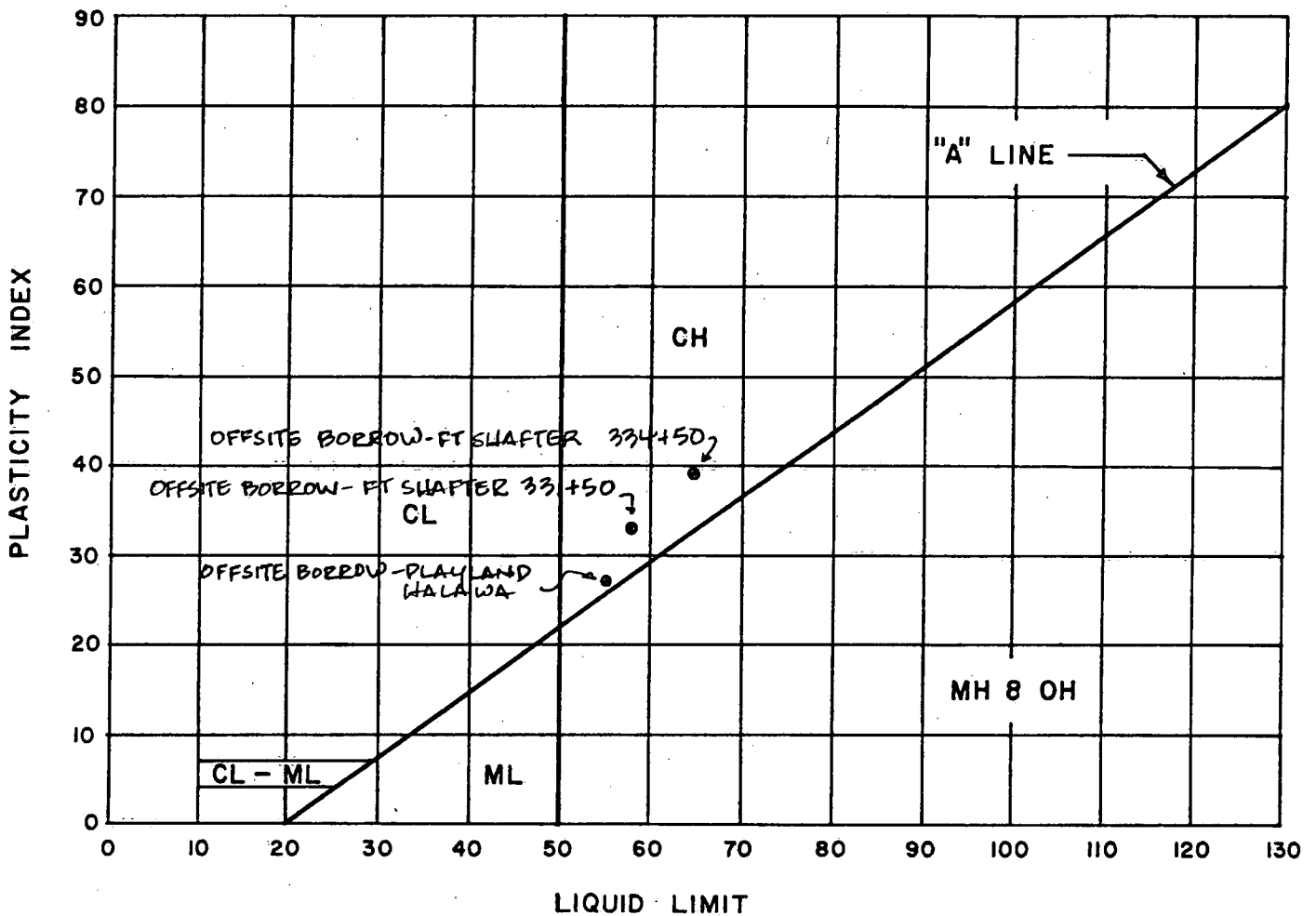
REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK
 1. SAMPLE # 5 MAY BE APPROVED FOR FILL
 UP TO 18" BELOW FINISH GRADE.

WALTER LUM ASSOCIATES, INC.
 CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 8-10-79 By MIC

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER NO. 1
LOCATION: MAUNALUA, HONOLULU, HAWAII



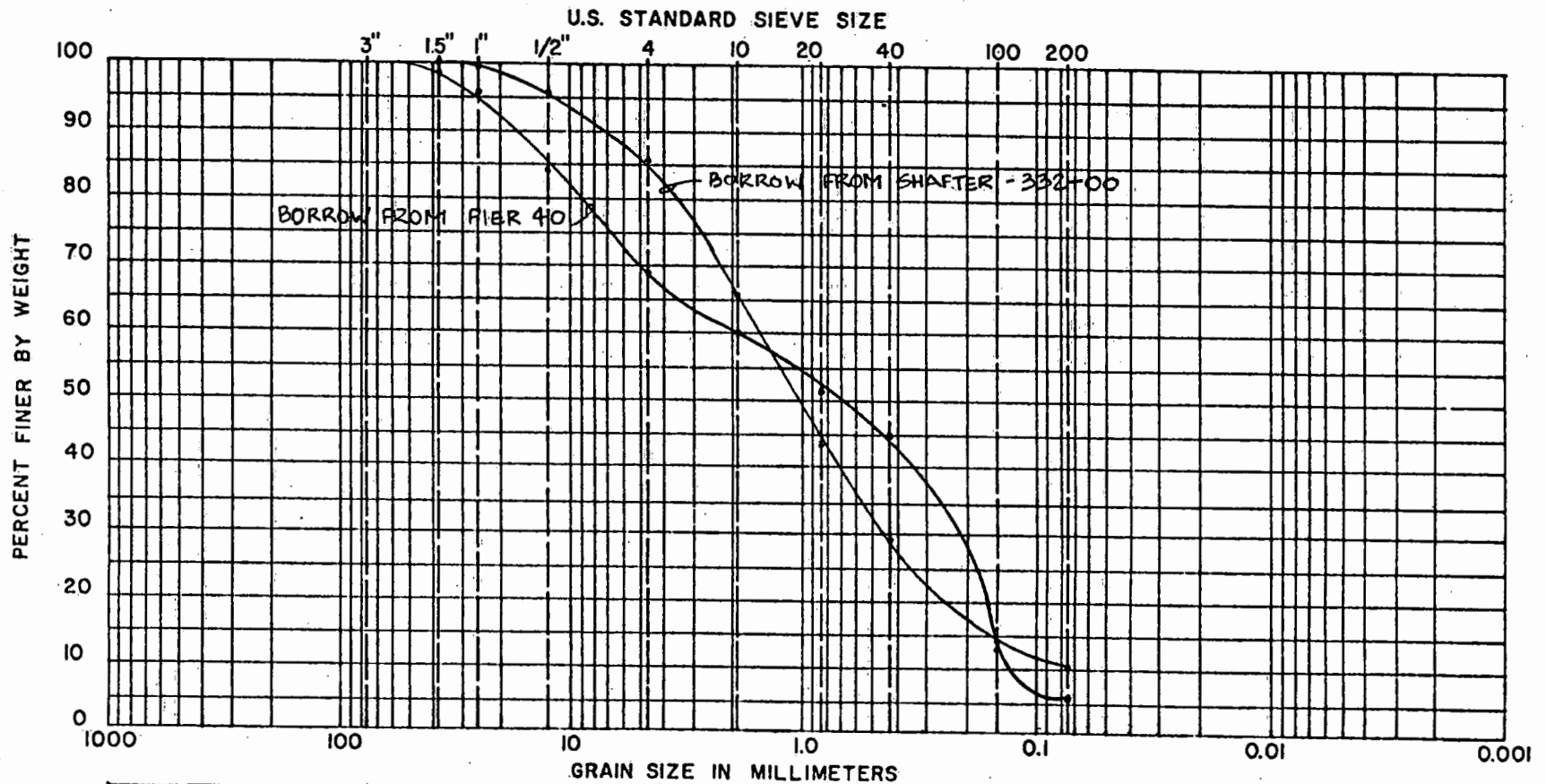
DATE 8-10-79 BY MK

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

GRAIN-SIZE ANALYSIS CURVE

PROJECT: MARINA BUSINESS CENTER NO. 1

LOCATION: MAUNALUA, HONOLULU, HAWAII



COBBLE	GRAVEL		SAND			SILT OR CLAY
	COARSE	FINE	COARSE	MEDIUM	FINE	

DATE 8/8/79 BY wm

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7921

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: October 17, 1979

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
LABORATORY TEST RESULTS

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
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General Remarks:

If changes in the material are detected during the grading work, additional testing is recommended.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

MARINA BUSINESS CENTER NO. 1

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

SOIL NO.	BORROW FROM		
DATE	KAIMUKI STOPPING		
PROJECT NO.	CENTER		
DESCRIPTION	MOTTLE RED BROWN SILTY CLAYEY SAND & GRAVEL		
GRAIN-SIZE ANALYSIS (% Passing)			
Sieve			
1-1/2"	97		
1"	87		
1/2"	78		
#4	70		
#10	61		
#20	53		
#40	48		
#100	40		
#200	30		
ATTERBERG LIMITS			
Air Dried or Natural	NATURAL		
Liquid Limit	43		
Plastic Limit	22		
Plasticity Index	21		
Dilatancy	SLOW		
Toughness	MEDIUM		
Dry Strength	MED. HIGH		
UNIFIED SOIL CLASSIFICATION	SO-GC		
APPARENT SPECIFIC GRAVITY			
CBR TEST			
(Surcharge - 5t P.S.F.)			
Molding Moisture, %	18.4 / 22.3*		
Molding Dry Density, P.C.F.	114.8		
Swell upon saturation, %	0.2		
CBR at 0.1" Penetration	46.7		
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)			
Dry to Wet or Wet to Dry			
Max. Dry Density (P.C.F.)			
Optimum Moisture (%)			

REMARKS: * MOISTURE CONTENT AFTER 4-DAY SOAK

1. THE BORROW MATERIAL MAY BE APPROVED FOR USE AS FILL UP TO FINISH GRADE.

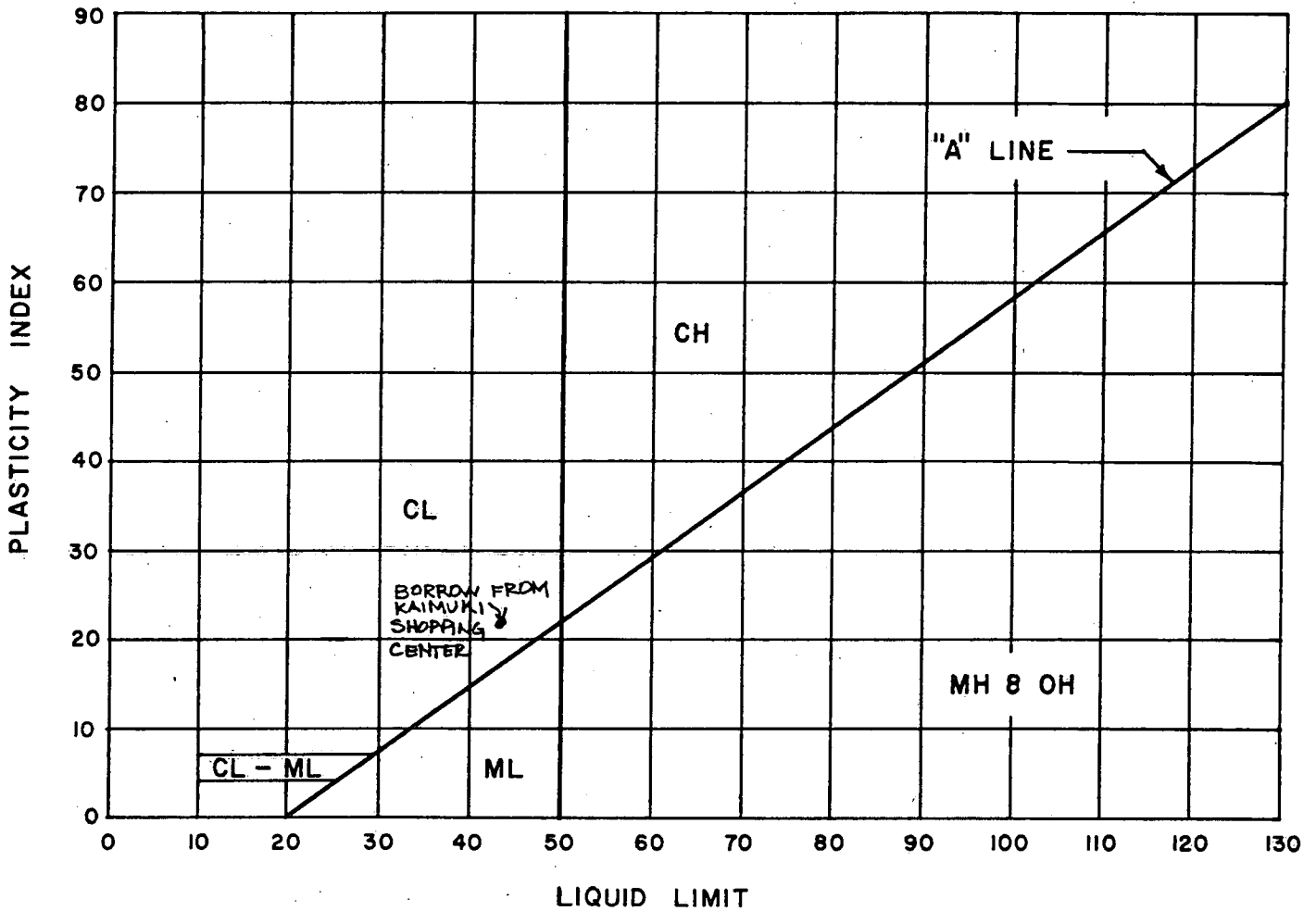
WALTER LUM ASSOCIATES, INC.
CIVIL STRUCTURAL SOILS ENGINEERS

Date 10-16-79 By AF

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER NO.1

LOCATION: MAUNALUA, HONOLULU, HAWAII



DATE 10-16-79 BY AB

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: November 30, 1979

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
LABORATORY TEST REPORT

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
- Field Density Test Results
- Boring Logs
- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
- Signature
- Your use and files

No. of Copies
Sets 2
Sheets _____

General Remarks:

If changes in the material are detected during the grading work, additional testing is recommended.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

MARINA BUSINESS CENTER NO. 1

TABLE I - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	ON-SITE STOCKPILE			
	<u>KAIMUKI</u> <u>BORROW #2</u> <u>BROWN</u> <u>CLAY</u>	<u>HAAIONE</u> <u>BORROW</u> <u>GRAY-BROWN</u> <u>CLAY</u>	<u>MARINA 4</u> <u>BORROW</u> <u>GRAY</u> <u>SANDY</u> <u>CLAY</u>	
DESCRIPTION				
GRAIN-SIZE ANALYSIS (% Passing)				
Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	<u>NATURAL</u>	<u>NATURAL</u>	<u>NATURAL</u>	
Liquid Limit	<u>60</u>	<u>78</u>	<u>44</u>	
Plastic Limit	<u>28</u>	<u>31</u>	<u>17</u>	
Plasticity Index	<u>32</u>	<u>47</u>	<u>27</u>	
Dilatancy	<u>SLOW</u>	<u>SLOW-NONE</u>	<u>SLOW</u>	
Toughness	<u>MED. STIFF</u>	<u>STIFF</u>	<u>MED-STIFF</u>	
Dry Strength	<u>HIGH</u>	<u>VERY HIGH</u>	<u>MEDIUM</u>	
UNIFIED SOIL CLASSIFICATION	<u>CH</u>	<u>CH</u>	<u>CL</u>	
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %		<u>29.5/49.1*</u>	<u>17.5/24.9*</u>	
Molding Dry Density, P.C.F.		<u>90.0</u>	<u>107.7</u>	
Swell upon saturation, %		<u>8.6</u>	<u>1.4</u>	
CBR at 0.1" Penetration		<u>1.7</u>	<u>17.0</u>	
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry				
Max. Dry Density (P.C.F.)				
Optimum Moisture (%)				

REMARKS: * - MOISTURE CONTENT AFTER 4-DAY SOAK

1. BORROW FROM KAIMUKI SHPG. CR. & HAAIONE - RECOMMEND AS GENERAL FILL BELOW 3' OF FIN. GRD.
2. MARINA 4 BORROW - RECOMMEND UP TO FIN. GRD.

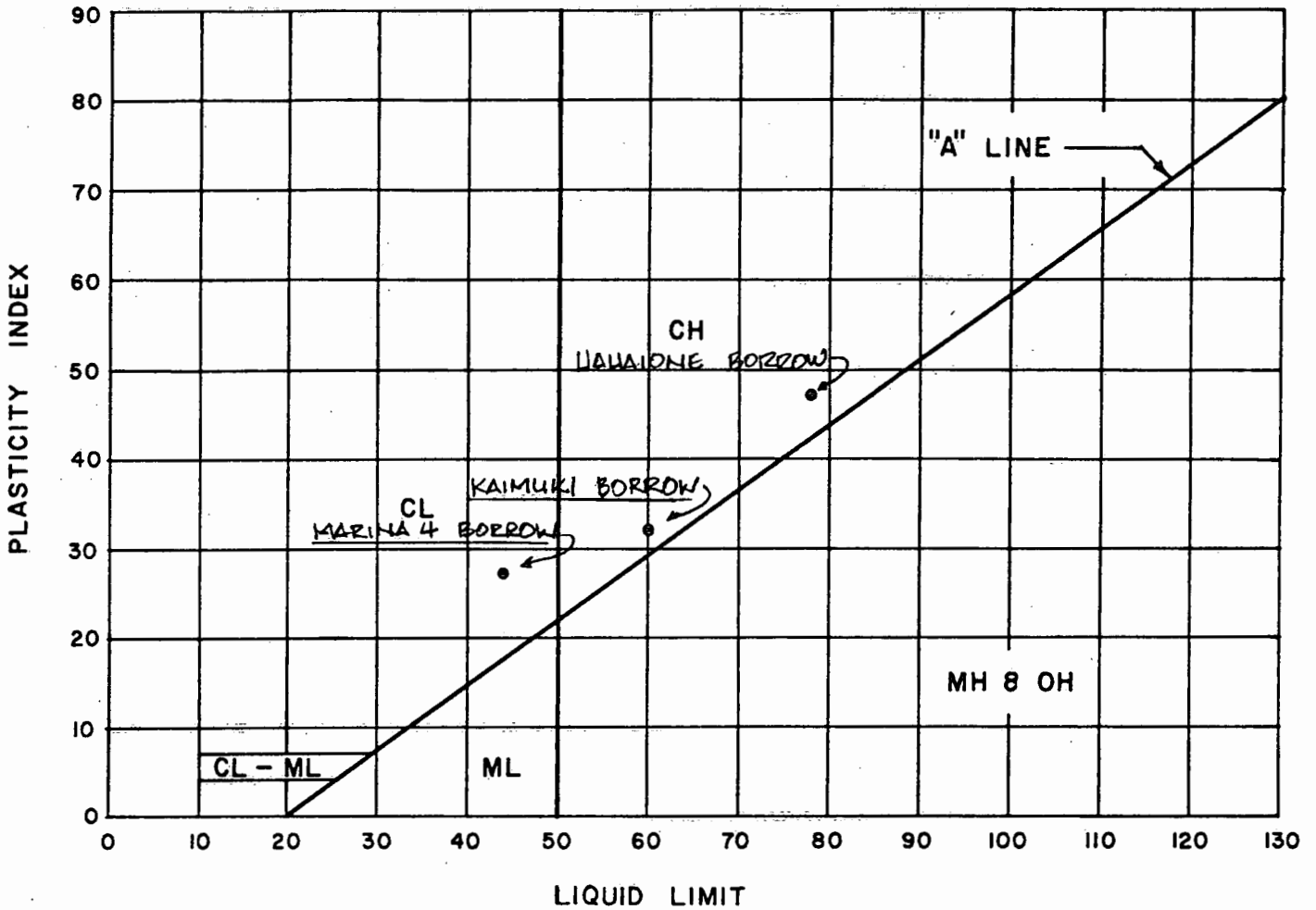
WALTER LUM ASSOCIATES, INC.
CIVIL STRUCTURAL SOILS ENGINEERS

Date 11-20-79 By MK.

PLASTICITY CHART

PROJECT: MARINA BUSINESS CENTER NO. 1

LOCATION: MAUNALUA, HONOLULU, HAWAII



DATE 11-21-79 BY MK

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: July 9, 1980

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
FIELD DENSITY TEST REPORT

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
- Field Density Test Results
- Boring Logs
- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
- Signature
- Your use and files

No. of Copies
Sets 2
Sheets _____

General Remarks:

For period ending July 3, 1980.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

FIELD DENSITY TEST REPORT

MARINA BUSINESS CENTER NO. 1

Field Density Test Results as follows:

Ending JULY 3 1980 Sheet 1 of 2 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
5-16-80	BANK (1)	0'±	21.5	90.4	104	87
"	PARKING LOT (2)	0'±	20.1	96.3	"	94
5-22-80	BANK (RETEST) (3)	0'±	20.5	92.4	104	89
6-8-80	BANK (RETEST) (4)	0'±	21.2	92.8	104	89
"	PIT BACKFILL (5)	3'±	19.2	114.3	111 ▲	>100
6-9-80	PIT BACKFILL (6)	2.5'±	18.9	101.5	102 ▲	99
6-12-80	PIT BACKFILL (7)	0'±	17.0	100.1	104	96
"	PIT BACKFILL (8)	2'±	17.1	103.7	"	99
6-24-80	PARKING LOT (9)	0'±	27.1	88.8	104	85
"	PARKING LOT (10)	0'±	28.2	85.8	"	83
6-26-80	PARKING LOT (RETEST) (11)	0'±	21.2	102.4	104	99

TO BE REROLLED & RETESTED
 TO BE REROLLED & RETESTED

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TO BE REROLLED & RETESTED

TO BE REROLLED & RETESTED
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- * Approximate depth below finish grade.
- ** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70
- *** Tests indicate the relative compaction of the soils only at the test locations.
- Indicates Test taken in the shown.

▲ MOISTURE DENSITY RESULTS PREVIOUSLY SUBMITTED UNDER "MARINA 4 SUBDIVISION" TEST RESULTS.

BY M. K. K. K.

FIELD DENSITY TEST REPORT

MARINA BUSINESS CENTER NO. 1

Field Density Test Results as follows:

Ending JULY 3 1980

Sheet 2 of 2 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
6-27-80	SUPERMARKET	1 1/2 (12)	16.9	103.3	104	99
6-30-80	BANK (RETEST)	0 1/2 (13)	15.0	103.7	104	99
"	DRUGSTORE	1 1/2 (14)	15.6	112.6	111 ▲	>100
7-1-80	SUPERMARKET	0 1/2 (15)	19.2	114.3	111 ▲	>100
7-3-80	PARKING LOT (RETEST)	1 1/2 (16)	19.6	106.4	104	>100

* Approximate depth below finish grade.
 ** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70
 *** Tests indicate the relative compaction of the soils only at the test locations.
 ○ Indicates Test taken in the shown.

▲ MOISTURE DENSITY RESULTS PREVIOUSLY SUBMITTED UNDER "MARINA 4 SUBDIVISION" TEST RESULTS

BY M. Kikuchi

MARINA BUSINESS CENTER NO. 1

TABLE I - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	OFFSITE			
SAMPLE NO.	BORROW FROM			
DEPTH BELOW SURFACE	FT. SHAFTER			
DESCRIPTION	BROWN SILTY SAND (MUDROCK)			
GRAIN-SIZE ANALYSIS (% Passing)				
Sieve				
1-1/2"	*			
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	*			
Liquid Limit				
Plastic Limit				
Plasticity Index				
Dilatancy				
Toughness				
Dry Strength				
UNIFIED SOIL CLASSIFICATION				
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	*			
Molding Dry Density, P.C.F.				
Swell upon saturation, %				
CBR at 0.1" Penetration				
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)				
Dry to Wet or Wet to Dry	A			
Max. Dry Density (P.C.F.)	WET TO DRY			
Optimum Moisture (%)	104			
	20.5			

REMARKS:

* PREVIOUSLY SUBMITTED ON AUGUST 13, 1979

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

Date 5-28-80 By R.H.

MOISTURE-DENSITY CURVE (ASTM D-1557-70, METHOD A)

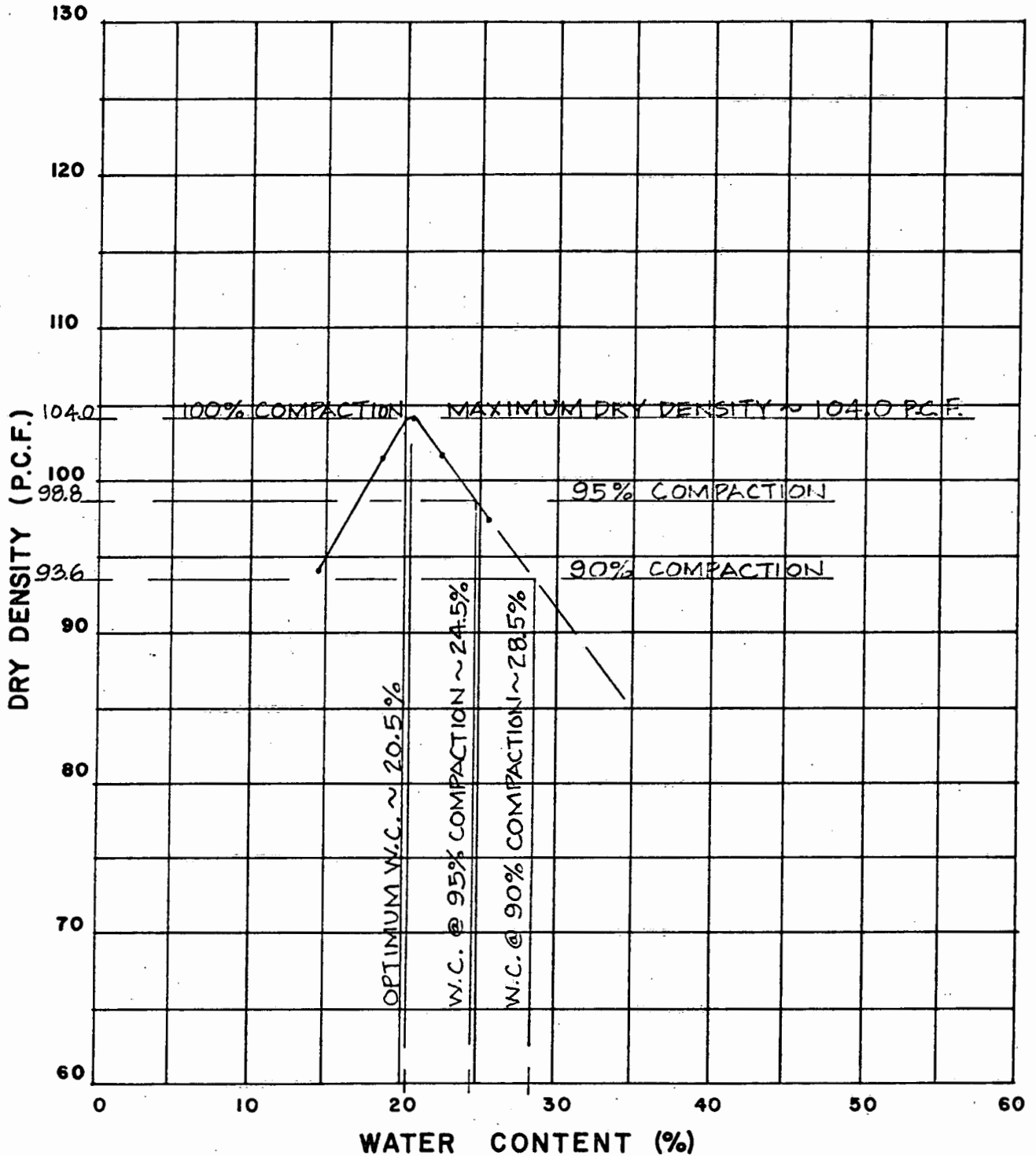
PROJECT: MARINA BUSINESS CENTER NO. 1

LOCATION: MAUNALUA HONOLULU HAWAII

SAMPLE NO.: OFFSITE BORROW FROM FT. SHAFTER

SAMPLE DESCRIPTION: BROWN SILTY SAND

AGGREGATE: $\frac{1}{4}$ " MINUS
MOLD SIZE: 4.0" ϕ X 4.584" HT
HAMMER: 10 LBS
LAYERS: 5 LAYERS
BLOWS: 56/LAYER

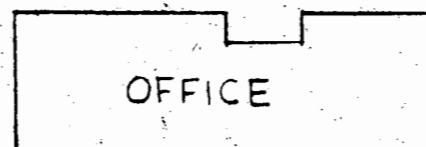
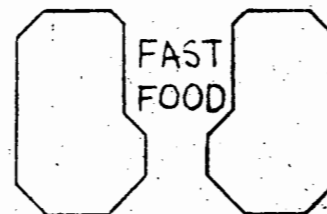
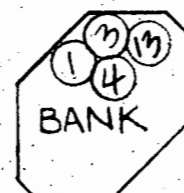
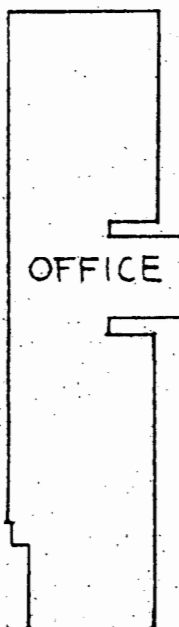


WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

DATE 5-8-80 BY GYS

KEAHOLE STREET

PA POND



2

11

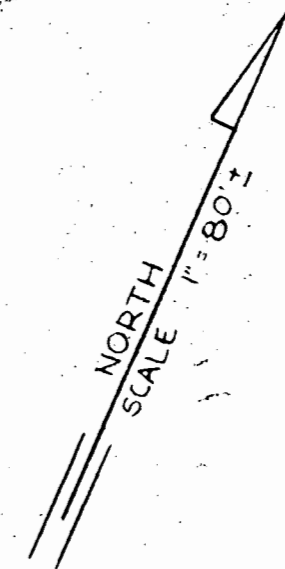
9

5

16

10

16



NOTE :

① INDICATES THE ESTIMATED LOCATION OF TEST #1 TAKEN IN THE AREA SHOWN FOR TEST RESULTS. SEE THE SUMMARY.

TEST LOCATION SKETCH
MARINA BUSINESS CENTER NO. 1
(MARKET DRUG STORE,
BANK & FAST FOOD)
MAUNALUA HONOLULU HAWAII
TAX MAP KEY : 3-9-08 : POR. 13

Dr. mL
Date 6/80

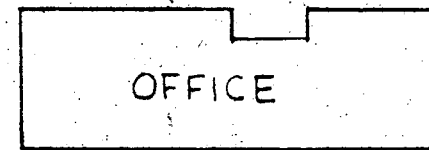
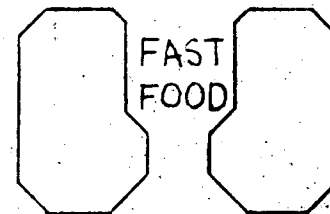
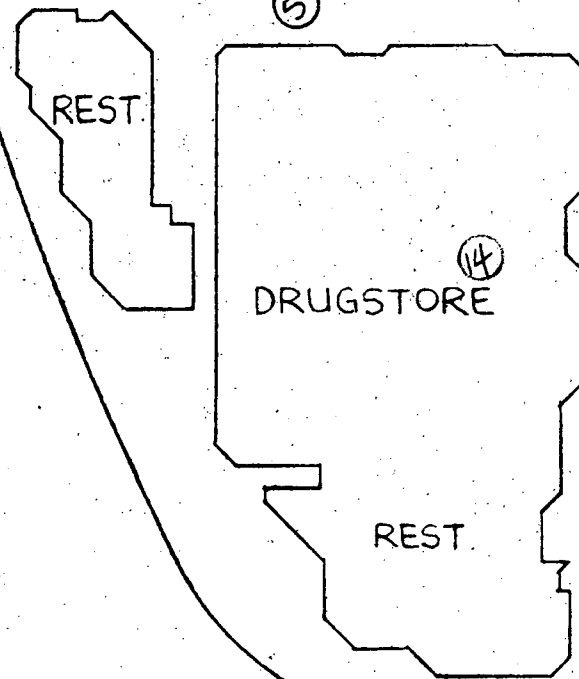
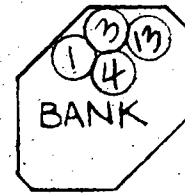
WALTER LIM ASSOCIATES, INC.
3030 WAIKALAE AVE
CIVIL ENGINEERS
PHONE 924-9111

Sheet
of

TEST DATES : FROM 5-16-80 TO 7-3-80

KEAHOLE STREET

KUAPA POND



2

11

9

8

5

16

10

16

NOTE:

① INDICATES THE ES OF TEST #1 TAKEN FOR TEST RESULTS.

TEST LOCATION SK
MARINA BUSINESS C
(MARKET DRUG STO
BANK & FAST FOOD
MAUNALUA HONOLULU
TAX MAP KEY: 3-9-

Dr. mL
Date 6/80
Exp.

WALTER LIM A
3030 W
OVI B
MOSE

TEST DATES: FROM 5-16-80 TO 7-3-80

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931

TO: KACOR REALTY, INC.
P. O. Box 25007
Honolulu, Hawaii 96825
ATTENTION: Mr. John Higham

DATE: July 30, 1980

Gentlemen:

Re: MARINA BUSINESS CENTER NO. 1
FIELD DENSITY TEST REPORT

We Are Sending You Herewith

Under Separate Cover

- Prints
- Location Plan
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- Laboratory Test Results
- Soil Report

- Review and comment
- Approval
- Signature
- Your use and files

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General Remarks:

For period ending July 14, 1980.

cc: Park Engineering, Inc.

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

FIELD DENSITY TEST REPORT

MARINA BUSINESS CENTER NO. 1

Field Density Test Results as follows:

Ending JULY 14 1980 Sheet 1 of 1 Sheets

Date	BUILDING AREA	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
7-8-80	DRUG STORE ①	1'±	15.8	110.1	111 ▲	99
7-9-80	FAST FOOD ①	1'±	16.8	112.1	111 ▲	>100
"	DRUG STORE ②	0'±	14.3	106.4	104	>100
7-14-80	RESTAURANT ①	0'±	13.3	110.9	104	>100
"	OFFICE ①	0'±	19.6	108.2	"	>100
"	PARKING LOT (RETEST) ①	0'±	21.2	100.4	"	96
▲ MOISTURE DENSITY RESULTS PREVIOUSLY SUBMITTED UNDER "MARINA 4 SUBDIVISION" TEST RESULTS						

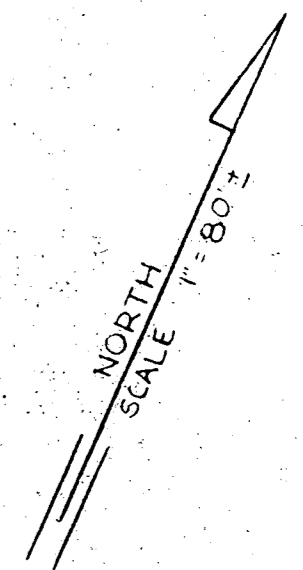
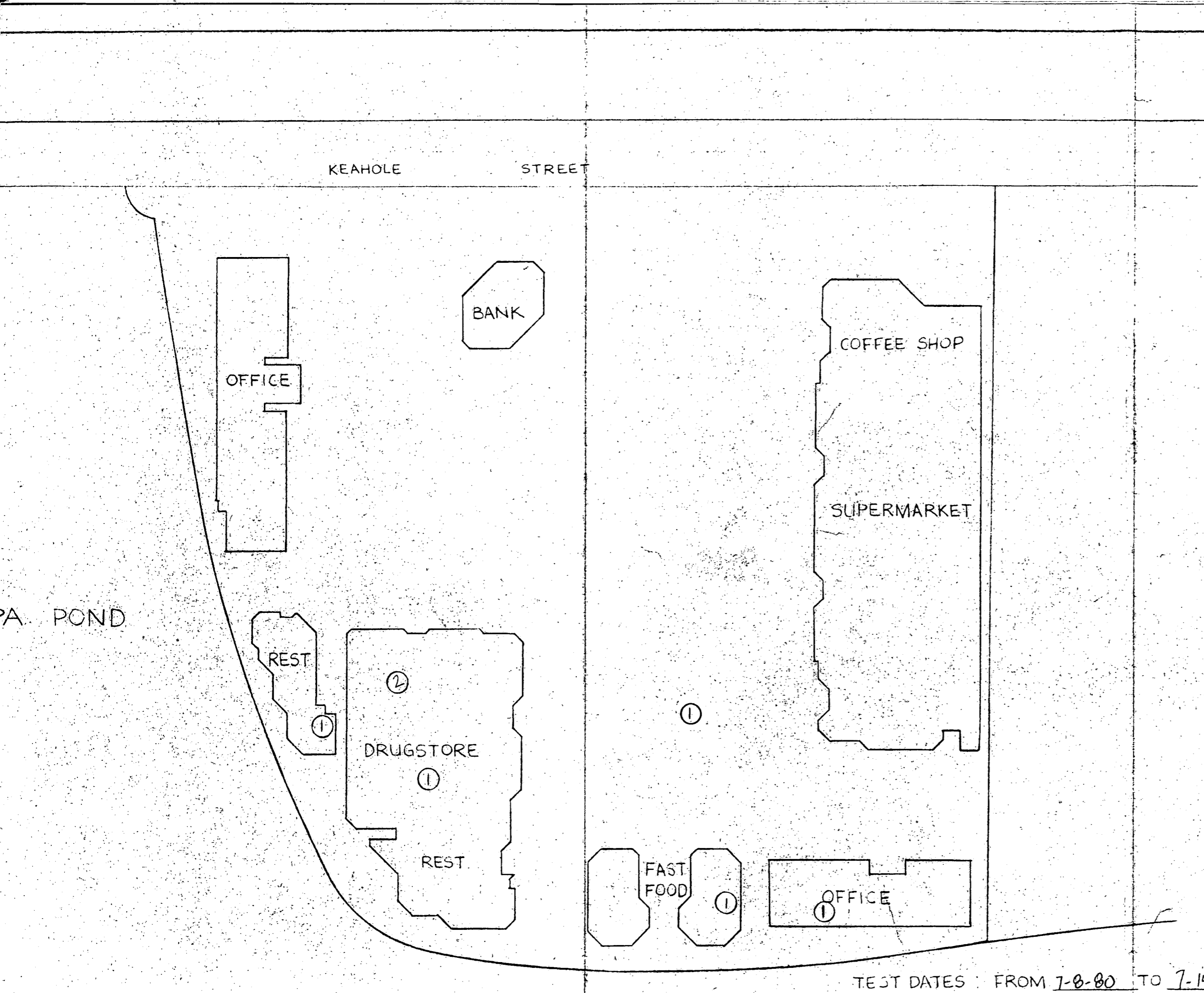
* Approximate depth below finish grade.

** Density in pounds per cubic foot. Standard density refers to density as indicated by the ASTM Method, D-1557-70

*** Tests indicate the relative compaction of the soils only at the test locations.

① Indicates Test #... taken in the AREA shown.

BY J. Sugikawa



NOTE

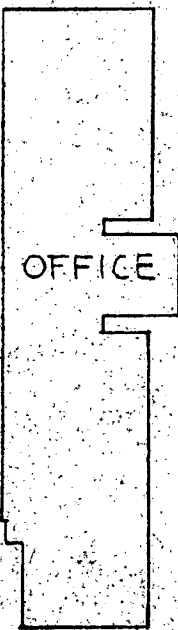
① INDICATES THE ESTIMATE LOCATION OF TEST #1 TAKEN IN THE AREA SHOWN FOR TEST RESULTS. SEE THE SUMMARY

<p>TEST LOCATION SKETCH MARINA BUSINESS CENTER NO. 1 (MARKET DRUG STORE BANK & FAST FOOD) MAUNALUA HONOLULU HAWAII TAX MAP KEY : 3-9-08 POR. 13</p>		
<p>Dr. M.L.</p> <p>Date 6/80</p> <p>Rev.</p>	<p>WALTER LIM ASSOCIATES, INC. 1000 WAIKALAE AVE. CIVIL ENGINEERS P.O. BOX 100001</p>	<p>Sheet</p> <p>of</p>

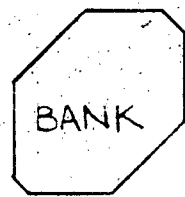
TEST DATES : FROM 7-8-80 TO 7-14-80

KEAHOLE STREET

KUAPA POND



OFFICE



BANK



COFFEE SHOP

SUPERMARKET

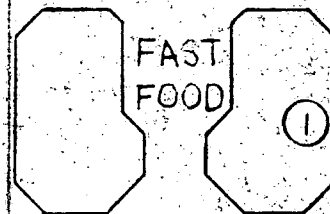


REST

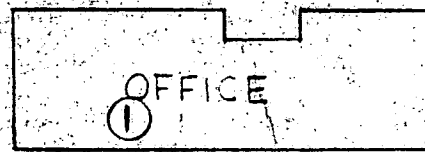


DRUGSTORE

REST



FAST FOOD



OFFICE

NOTE

① INDICATES THE LOCATION OF TEST #1 TAKEN FOR TEST RESULTS

TEST LOCATION S
MARINA BUSINESS
(MARKET DRUG ST
BANK & FAST FOO
MAUNALUA HONOL
TAX MAP KEY : 3-4

Dr. ILL WATER ILL

Date 6/80

TEST DATES : FROM 7-8-80 TO 7-14-80