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GP #277

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

SR 77

TA 710.3
H3
H64
No 77

April 7, 1983

FOR REFERENCE

not to be taken from this room

HARRISON & SHAW
c/o Mr. Akana Ma
Design 21
Suite 1150, Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813

Gentlemen:

Subject: Hawaii Business Park
Grading Memorandum

The above project was generally graded with on-site and off-site materials. 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.

A soil engineer or technician visited the site on an "on-call" basis to observe footing excavations. Random probings with a 1/2-in. rod generally indicated fairly stiff soils at the bottoms of footing excavations. In localized areas where pockets of loose or soft soils were encountered, the loose soils were either compacted or removed and replaced with selected granular soils compacted in thin lifts.

Construction Plans (Sheets C-1, S-2 and S-3) for Hawaii Business Park dated June 2, 1982 by Design 21 were used as guides for fill depths, soil testing purposes and for field observations during foundation excavations.

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.

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

WITHDRAWN

HARRISON & SHAW

April 7, 1983

Page 2

Even though, in our opinion, the field density tests by our office conform to the density requirements of the City's Ordinance, the passage of time may result in changes in soil conditions.

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:vl

cc: Design 21, Attn: Mr. Akana Ma
Nakamura & Tyau, Attn: Mr. Reubeu Tyau
Community Planning, Inc., Attn: Mr. Robert Sarae
Steel Tech, Inc., Attn: Mr. Val Peroff

WALTER LUM ASSOCIATES, INC.

CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO
3030 WAIALAE AVE., HONOLULU, HAWAII 96816 • TEL. 737-7931TO: RICHARD H. S. LEE, INC.
384-A Kam Highway
Pearl City, Hawaii 96782DATE: April 21, 1982

Gentlemen:

Re: HAWAII BUSINESS PARK
(PEARL CITY INDUSTRIAL PARK - LOTS 1 THRU 5)
LABORATORY TEST REPORTWe 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:

cc: Design 21

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakaiki

HAWAII BUSINESS PARK
(PEARL CITY INDUSTRIAL PARK - LOTS 1 THRU 5)
TABLE I - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	<u>BORROW - NEAR CUTTER FORD</u> <u>WAIMALEA</u>			ON-SITE (SOUTH-EAST CORNER)
	# 1	# 2	# 3	# 4
DESCRIPTION	DARK BROWN SILTY GRAVEL & SAND	REDDISH BROWN SILTY CLAY, CRUSHED A.C. & CORAL	GRAY SILTY GRAVEL W/SAND	
GRAIN-SIZE ANALYSIS (% Passing) Sieve				
1-1/2"	95	95	100	
1"	89	87	89	
1/2"	76	71	64	
#4	50	52	38	
#10	33	37	26	
#20	23	28	17	
#40	18	24	13	
#100	12	19	10	
#200	9	18	9	
ATTERBERG LIMITS				
Air Dried or Natural		NATURAL		NATURAL
Liquid Limit		36		57
Plastic Limit		21		32
Plasticity Index		15		25
Natural Water Content, %		-		-
Dilatancy		SLOW		RAPID-SLOW
Toughness		MED TO HEAVY		MEDIUM
Dry Strength		MEDIUM		MEDIUM
UNIFIED SOIL CLASSIFICATION	GP-GM	GC	GP-GM	MH
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	8.1	7.4	9.5	28
Molding Dry Density, P.C.F.	124	130	124	85
Swell upon saturation, %	NIL	NIL	NIL	1.5
CBR at 0.1" Penetration	69.4	86.9	91.5	13.9
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. SAMPLES # 1, 2 & 3 - RECOMMEND FOR GENERAL
 FILL & SELECT BORROW FOR PAVEMENTS.

2. SAMPLE # 4 - RECOMMEND FOR GENERAL FILL

Date 4-20-82 By WW UP TO 12" BELOW BOTTOM OF SLAB AND FINISH PAV'T.

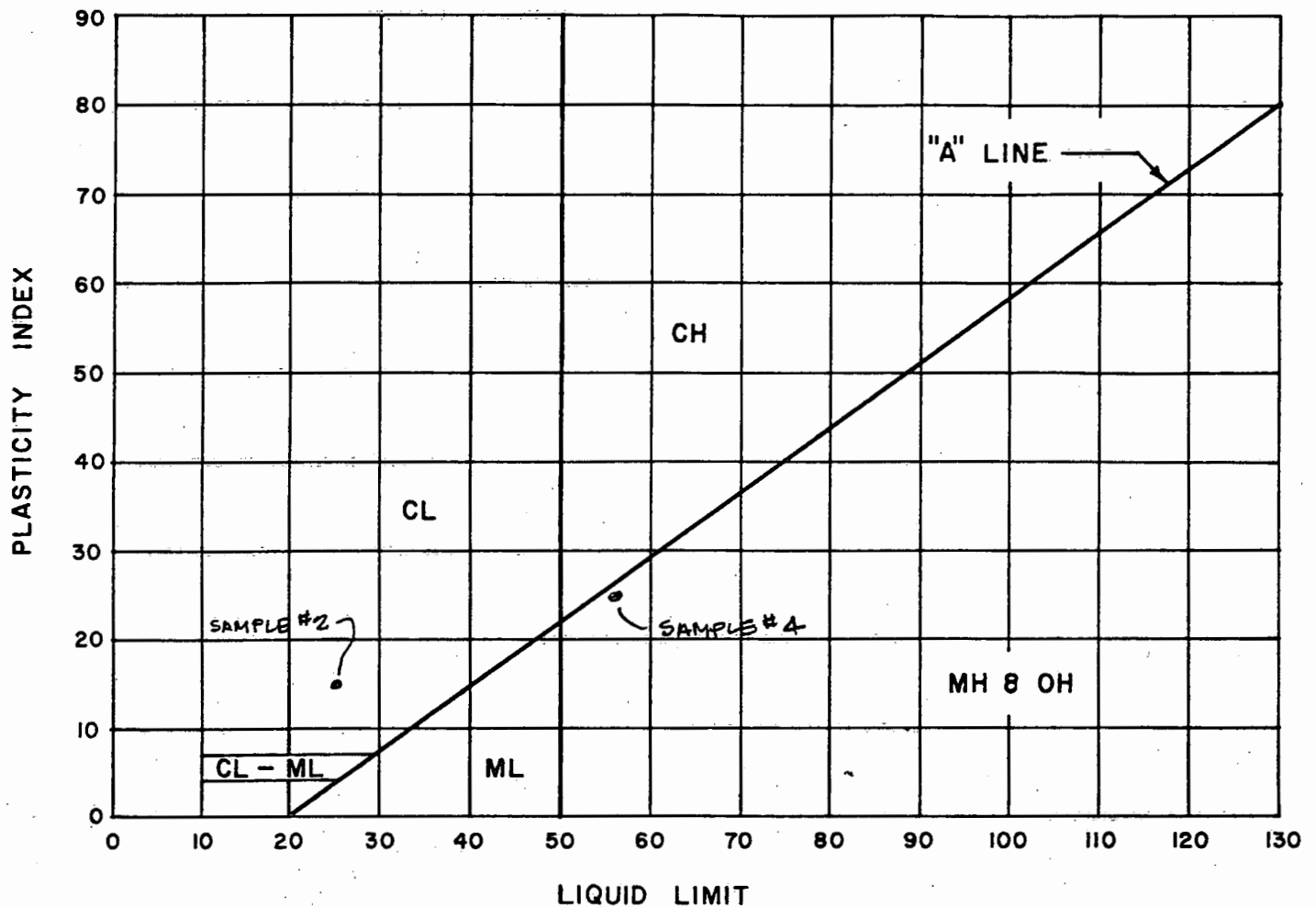
WALTER LUM ASSOCIATES, INC.

STRUCTURAL & SOIL ENGINEERS

PLASTICITY CHART

PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIKAWA, OAHU, HAWAII



DATE 4-20-82 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

August 19, 1982

MEMORANDUM

TO: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21

FROM: Walter Lum Associates, Inc.

RE: Hawaii Business Center
Pearl City, Oahu, Hawaii

As requested by Design 21, a meeting was held at the site, August 12, 1982, regarding the suspected soft area near Building "D" and the off-site borrow material being hauled to the site.

Present at the site:

Akana Ma, Design 21
Reuben Tyau, Nakamura & Tyau, Inc.
Robert Sarae, Community Planning, Inc.
Val Peroff, Steel Tech, Inc.
Marty Stately, Steel Tech, Inc.
Richard Lee, Richard H. S. Lee, Inc.
Paul Picone, Walter Lum Associates, Inc.
Wallace Wakahiro, Walter Lum Associates, Inc.

FIELD OBSERVATIONS

1. The existing ground surface in a localized area (mauka perimeter of Building "D") was proofrolled with a self-propelled sheepfoot roller. Slight weaving was noted during the proofrolling.

Two shallow pits about 2 to 2-1/2 ft deep were excavated with a narrow (about 12-in.) "hopto" bucket. Field observations and hand probings with a 1/2-in. ϕ rod indicated fairly stiff soils along the sides and bottom of the pits.

2. Off-site granular borrow material was stockpiled at the site. The material in the stockpiles was a fairly well-graded sandy gravel (about 1-1/2-in. maximum size) mixed with A.C. fragments varying in size from less than 3-in. to about 24 inches.

There was some concern that the larger A.C. fragments would not break up during the compaction work which may result in a poorly compacted fill. A test pad located within the stockpile area was compacted with an 825 Caterpillar Sheepsfoot Compactor. After 2 passes, the large A.C. fragments were generally broken down to about 6-in. or smaller.

DISCUSSION AND COMMENTS

1. It appeared that additional proofrolling at this point in time will not readily uncover soft pockets in the existing fill. Since our report of January 30, 1976 which indicated possible soft areas in this fill, the passage of time may have caused some drying of the surface soils forming a fairly stiff surface layer and making the detection of soft localized areas by proofrolling difficult at best.

It was agreed in the field that additional proofrolling will not be done and that shallow probings would be made in the footing excavations located within the general area of the existing fill to probe for soft pockets.

HARRISON & SHAW
August 19, 1982
Page 3

2. Because the sheepfoot compactor was able to crush the A.C. fragments within a few passes, the on-site stockpiled material was approved for select granular fill. The contractor was requested to spread the material in thin layers so that most of the larger A.C. fragments will be crushed to 6-in. or smaller sizes.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:vl

cc: Design 21,
Attn: Mr. Akana Ma
Nakamura & Tyau, Inc.,
Attn: Mr. Reuben Tyau
Community Planning, Inc.,
Attn: Mr. Robert Sarae
Steel Tech, Inc.
Attn: Val Peroff
Steel Tech, Inc.,
Attn: Mr. Marty Stately
Richard H. S. Lee, Inc.,
Attn: Mr. Richard Lee

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

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

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO

Lat

September 2, 1982

MEMORANDUM

TO: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21

FROM: Walter Lum Associates, Inc.

RE: Hawaii Business Park
Additional Probings in Building "D"

As previously agreed at the August 12, 1982 field meeting (see memo of August 19, 1982), probings were made at the approximate footing locations (footings located by Steel Tech, Inc.) shown on the attached sketch. The probings were made with a 2-in. diameter blunt point driven with a 140-lb hammer falling 30 inches.

The probings were made to attempt to locate soft spots in an old localized fill area.

The attached logs of probings generally indicated fairly stiff subsurface soils below the bottoms of footings except near Grid Location D-B/D-3.

At Grid Location D-B/D-3, soft to medium consistency soils were encountered from about 2 to 4 ft below existing grade followed by stiff soils (existing grade about 1 ft below finish slab). It is recommended that the footing be overexcavated down to the stiff soils and backfilled with selected on-site granular materials.

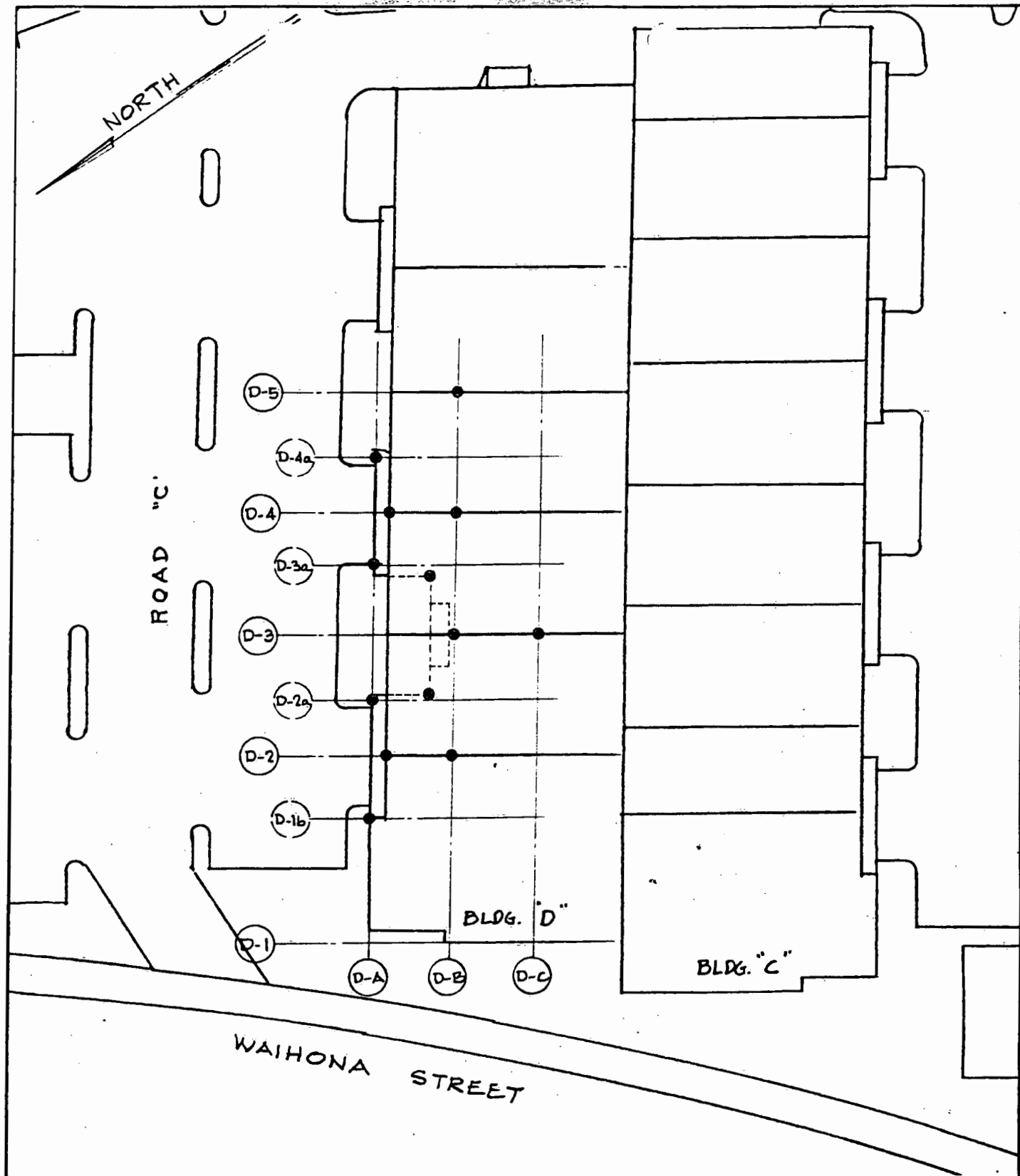
Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By Wallace Wakahiro
Wallace Wakahiro

WW:vl

cc: Design 21, Attn: Mr. Akana Ma
Nakamura & Tyau, Inc., Attn: Mr. Reuben Tyau
Community Planning, Inc., Attn: Mr. Robert Sarae
Steel Tech, Inc., Attn: Mr. Val Peroff
Mr. Marty Stately (Field Supt.)



LEGEND

- PROBING

PROBING LOCATION SKETCH
HAWAII BUSINESS PARK
WAIAWA HAWAII

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

WALTER LUM ASSOCIATES, INC.

3030 WAIALAE AVENUE HONOLULU, HAWAII 96818 • PHONE 737-7931

Probing No. D-A/D-1b, D-A/D-2, D-A/D-2a, D-A/D-3a, D-A/D-4, D-A/D-4a

Date AUG. 31, 1982

Project HAWAII BUSINESS PARK

Hammer:

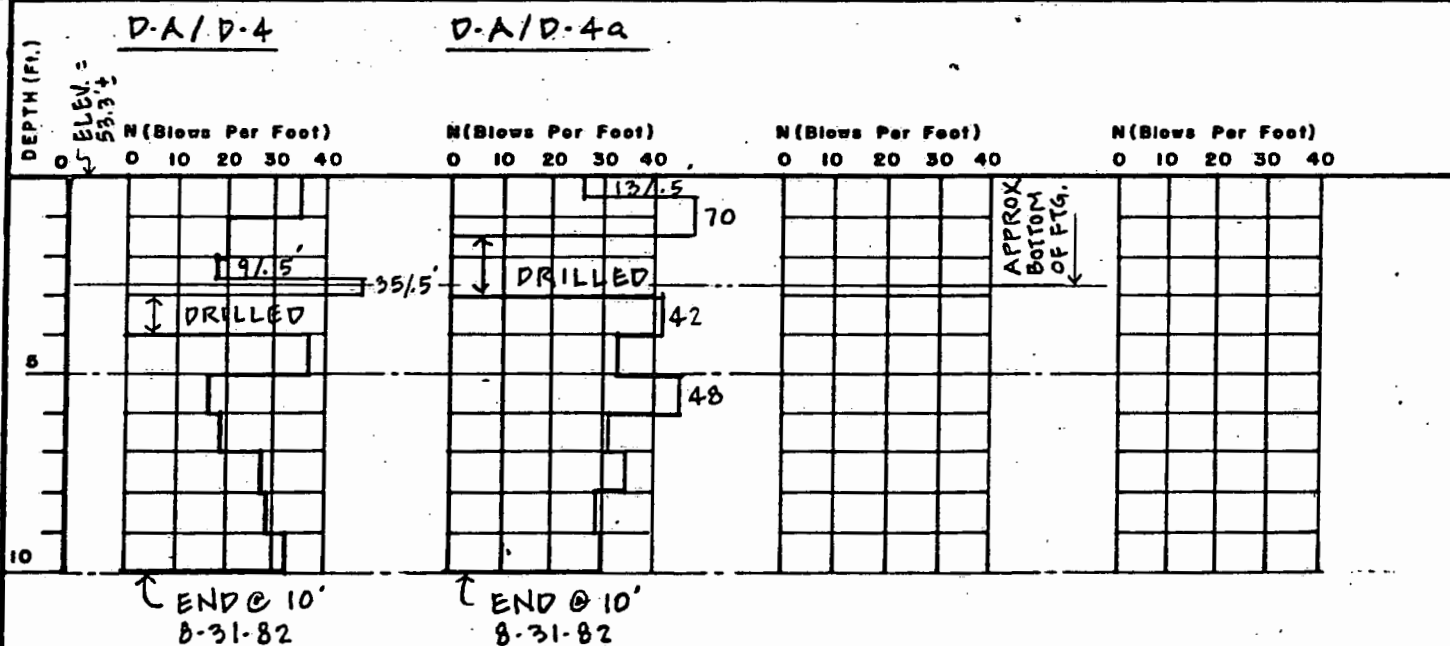
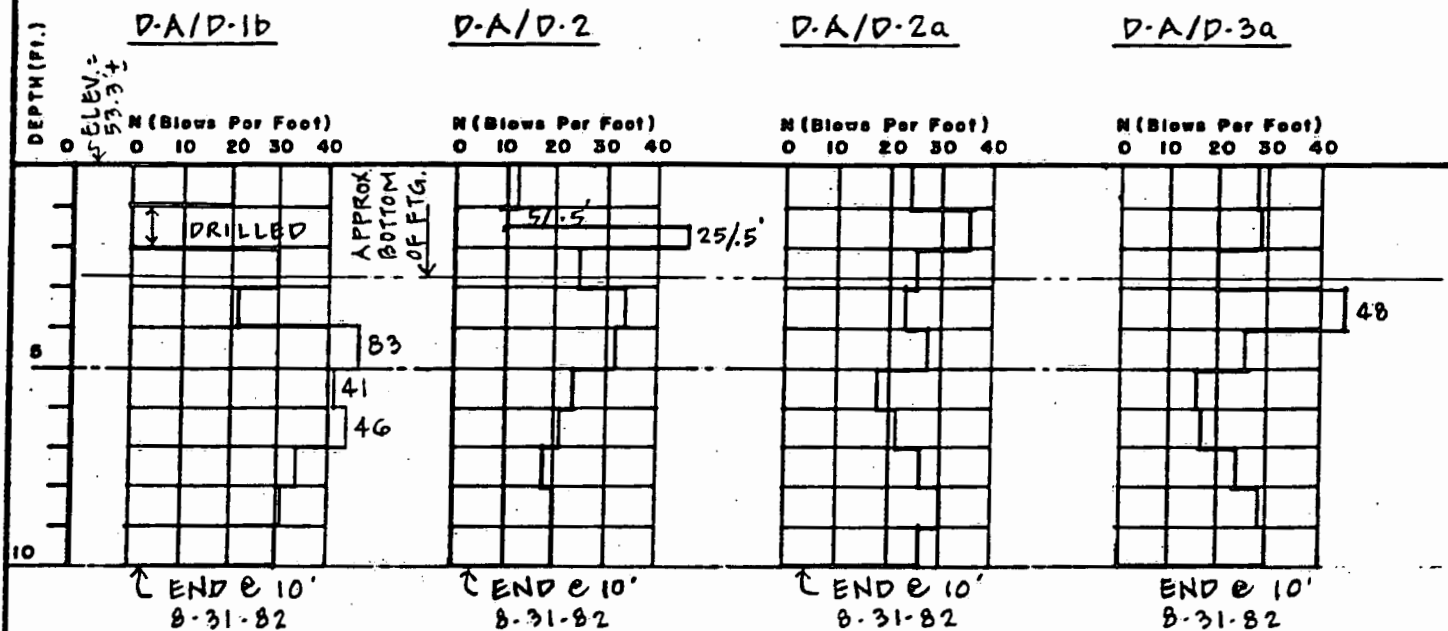
WAIAWA, HAWAII

Weight

140 #

Drop

30"



WALTER LUM ASSOCIATES, INC.

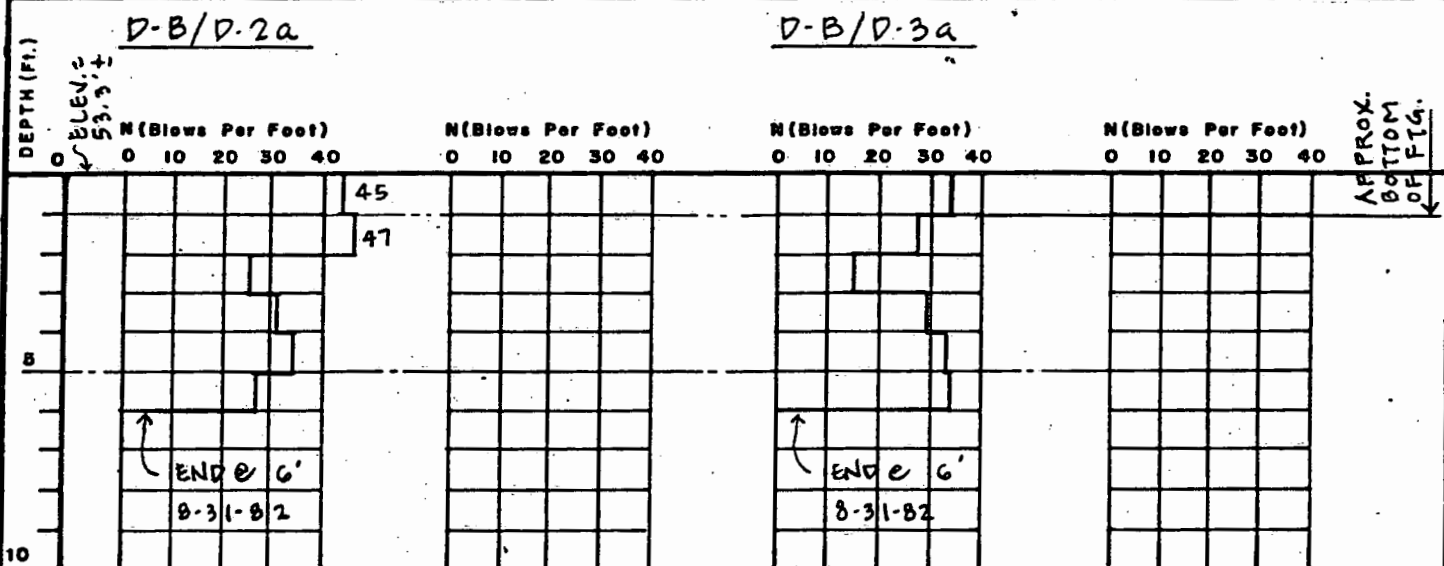
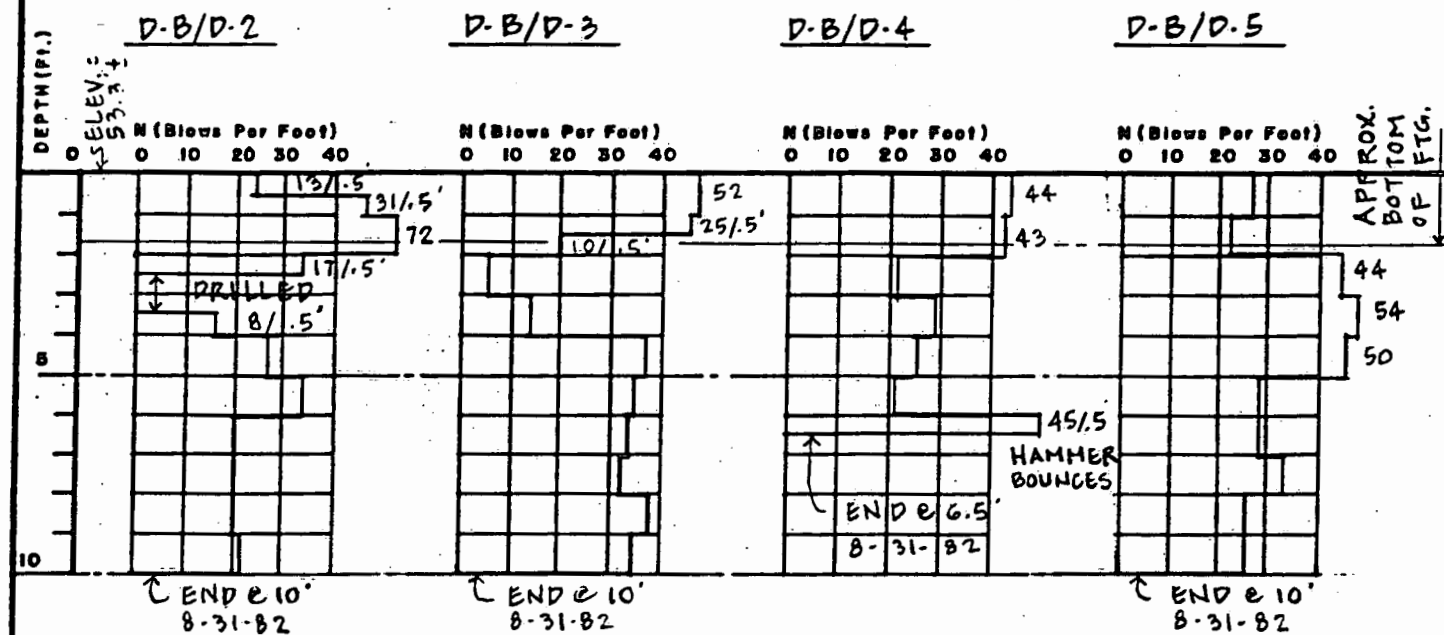
3030 WAIALAE AVENUE HONOLULU, HAWAII 96816 • PHONE 737-7931

Probing No. D-B/D-2, D-B/D-3, D-B/D-4
D-B/D-5, D-B/D-2a, D-B/D-3a

Date AUG. 31, 1982

Project HAWAII BUSINESS PARK
WAI'AWA, HAWAII

Hammer
 Weight 140 #
 Drop 30"

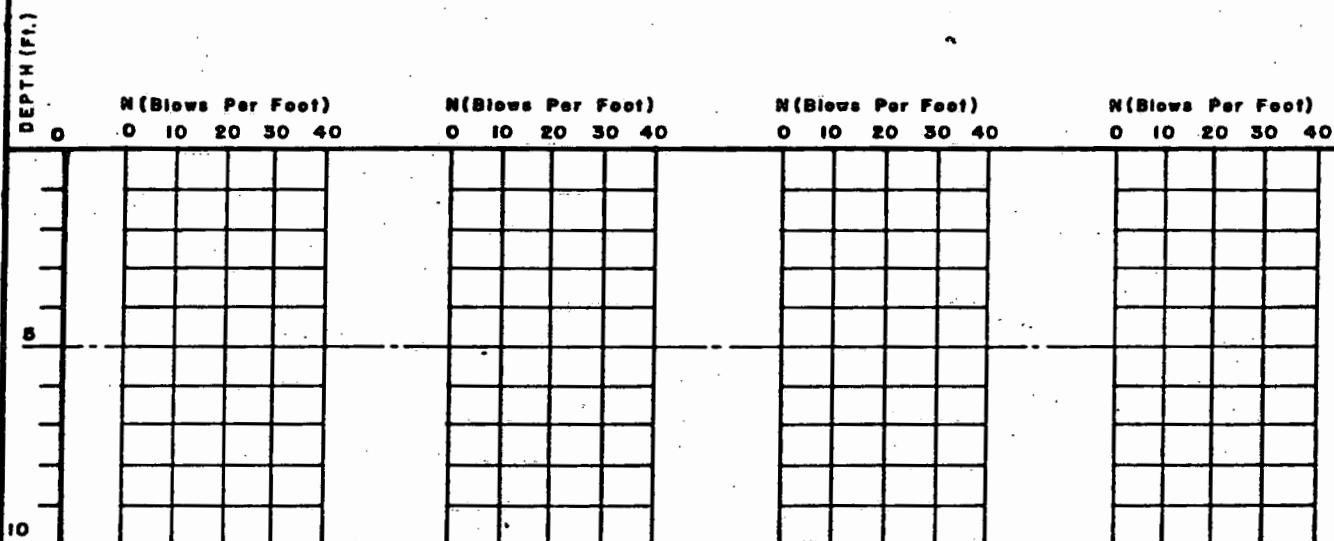
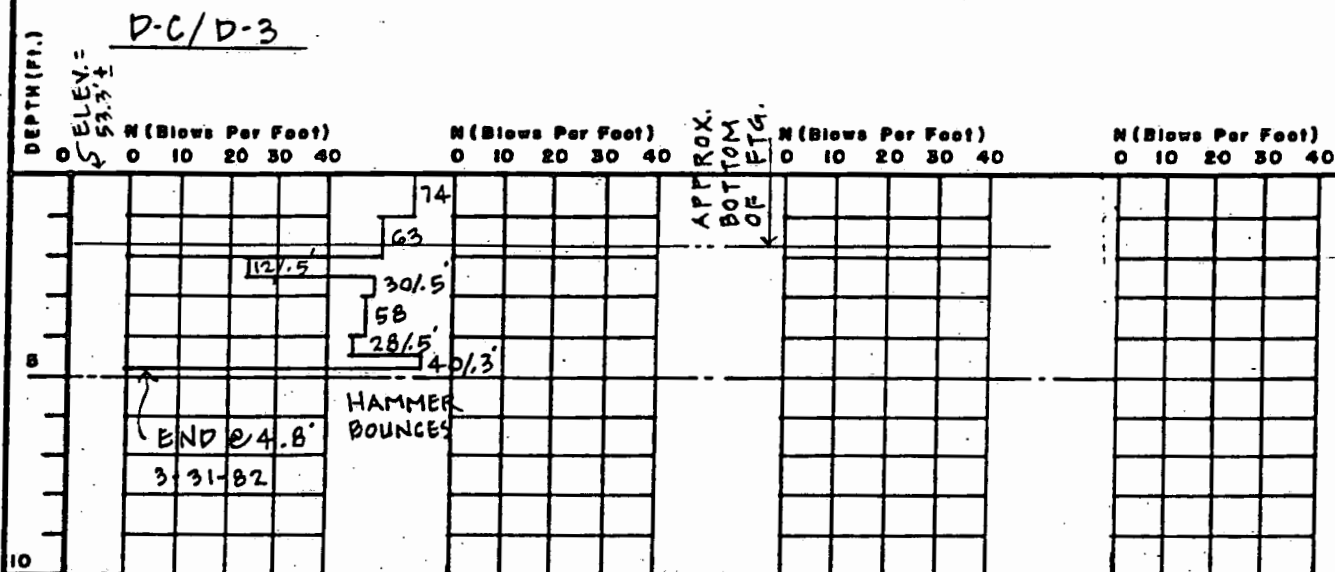


8080 WAIALAE AVENUE HONOLULU, HAWAII 96816 - PHONE 737-7981

Date AUG. 31, 1982

Hommer :

Weight 140#
Drop 30"



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: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21
Suite 1150, Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813

DATE: September 8, 1982

Gentlemen:

Re: HAWAII BUSINESS PARK
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 August 31, 1982.

cc: Design 21,
Attn: Mr. Akana Ma
Nakamura & Tyau, Inc.,
Attn: Mr. Reuben Tyau
Community Planning, Inc.,
Attn: Mr. Robert Sarae
Steel Tech, Inc.,
Attn: Mr. Val Peroff

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahe

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

FIELD DENSITY TEST REPORT**HAWAII BUSINESS PARK**

Field Density Test Results as follows:

Ending Aug. 31 19 82Sheet 1 of 3 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
8-9-82	BLDG. 'A' (1)	1'±	28	90	91.0	99
"	BLDG. 'B' (2)	1'±	34	86	"	95
"	BLDG. 'B' (3)	1'±	27	91	"	100
8-11-82	BLDG. 'B' (4)	0'±	6	114	127.0	89
"	BLDG. 'B' (5)	0'±	9	121	"	95
"	BLDG. 'B' (6)	0'±	6	127	"	100
"	BLDG. 'A' (7)	0'±	4	124	"	96
"	BLDG. 'A' (8)	0'±	8	115	"	91
"	BLDG. 'A' (9)	0'±	6	112	"	88
8-12-82	RETEST BLDG. 'B' (10)	0'±	8	118	127.0	93
"	RETEST BLDG. 'A' (11)	0'±	6	127	"	100
8-13-82	BLDG. 'E' (12)	1'±	26	100	103.0	97
"	BLDG. 'E' (13)	1'±	22	98	"	95
"	RD. 'C' (14)	1'±	20	99	"	96

TO BE
RE-ROLLED
RE-TESTEDTO BE
RE-ROLLED
RE-TESTED* Approximate depth below ~~finish grade~~ BOTTOM OF BASE COURSE CUSHION.

** 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 #1 taken in the AREA shown.

BY K.W.

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

FIELD DENSITY TEST REPORT**HAWAII BUSINESS PARK**

Field Density Test Results as follows:

Ending AUG. 31 19 82Sheet 2 of 3 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
8-13-82	BLDG.'D' (15)	2'±	27	84	91.0	92
"	BLDG.'D' (16)	2'±	17	100	103.0	97
"	BLDG.'D' (17)	1'±	19	86	91.0	95
"	BLDG.'C' (18)	2'±	21	92	"	>100
"	BLDG.'E' (19)	2'±	20	87	"	96
"	RD.'B' (20)	1'±	17	86	"	95
"	BLDG.'C' (21)	1'±	9	121	127.0	95
"	BLDG.'C' (22)	1'±	9	120	"	94
"	BLDG.'D' (23)	1'±	10	126	"	99
8-23-82	BLDG.'D' (24)	1'±	9	116	123.0	91
"	BLDG.'C' (25)	1'±	9	112	"	94
"	BLDG.'D' (26)	1'±	10	115	"	91

* Approximate depth below ~~finishing grade~~ BOTTOM OF BASE COURSE CUSHION.

** 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.

(15) Indicates Test #15 taken in the AREA shown.

BY W.W.

HAWAII BUSINESS PARK

TABLE I A - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	ON-SITE		ON-SITE (SOUTH-EAST
SAMPLE NO.	#1		# 4 CORNER)
DEPTH BELOW SURFACE			
DESCRIPTION	BROWN SILTY CLAY		BROWN SILTY CLAY W/ TRACES OF SAND
GRAIN-SIZE ANALYSIS			
(% Passing)			
Sieve			
1-1/2"			
1"			
1/2"			
#4			
#10			
#20			
#40			
#100			
#200			
ATTERBERG LIMITS			*
Air Dried or Natural	NATURAL		
Liquid Limit	62		
Plastic Limit	39		
Plasticity Index	23		
Natural Water Content, %			
Dilatancy	LOW		
Toughness	MEDIUM		
Dry Strength	MEDIUM		
UNIFIED SOIL CLASSIFICATION	MH		
APPARENT SPECIFIC GRAVITY			
CBR TEST			
(Surcharge - 51 P.S.F.)			*
Molding Moisture, %	31.5		
Molding Dry Density, P.C.F.	88.5		
Swell upon saturation, %	0.4		
CBR at 0.1" Penetration	31.0		
MOISTURE-DENSITY RELATIONS OF SOILS			
(ASTM D-1557-70, Method)	A		A
Dry to Wet or Wet to Dry			
Max. Dry Density (P.C.F.)	91		103
Optimum Moisture (%)	33		22.0

REMARKS:

* PREVIOUSLY SUBMITTED 4-20-82

WALTER LUM ASSOCIATES, INC.

STRUCTURAL & SOIL ENGINEERS

Date 8-27-82 By WW

HAWAII BUSINESS PARK

TABLE I B - SUMMARY OF LABORATORY TEST RESULTS

BORING NO. SAMPLE NO. DEPTH BELOW SURFACE	OFF-SITE BORROW #1	OFF-SITE BORROW FROM EWA	
		# 1	# 2
DESCRIPTION	DARK BROWN CLAYEY GRAVEL W/ SAND	WHITE SILTY SAND & CORAL FRAG.	TAN SILTY SAND & CORAL FRAG.
GRAIN-SIZE ANALYSIS (% Passing) Sieve			
1-1/2"	95	97	94
1"	90	92	90
1/2"	71	82	85
#4	52	66	62
#10	40	52	49
#20	32	41	40
#40	29	32	35
#100	24	23	26
#200	22	20	23
ATTERBERG LIMITS			
Air Dried or Natural	NATURAL	NATURAL	NATURAL
Liquid Limit	32	24	32
Plastic Limit	15	20	18
Plasticity Index	17	4	14
Natural Water Content, %			
Dilatancy	SLOW	RAPID	RAPID-SLOW
Toughness	MED. STIFF	WEAK	MED. STIFF
Dry Strength	MEDIUM	LOW	LOW
UNIFIED SOIL CLASSIFICATION	GC	GM	GC-SC
APPARENT SPECIFIC GRAVITY			
CBR TEST			
(Surcharge - 51 P.S.F.)			
Molding Moisture, %	8.6	11	11
Molding Dry Density, P.C.F.	126.7	122	124
Swell upon saturation, %	0.6	NIL	NIL
CBR at 0.1" Penetration	78.5	72.2	48.4
MOISTURE-DENSITY RELATIONS OF SOILS (ASTM D-1557-70, Method)			
Dry to Wet or Wet to Dry	D	D	D
Max. Dry Density (P.C.F.)	127	123	123
Optimum Moisture (%)	10	11	11

REMARKS:

WALTER LUM ASSOCIATES, INC.

STRUCTURAL & SOIL ENGINEERS

Date 8-27-82 By WW

HAWAII BUSINESS PARK

TABLE I C - SUMMARY OF LABORATORY TEST RESULTS

BORING NO.	FTG. AB-BA			
SAMPLE NO.	1			
DEPTH BELOW SURFACE	FTG. SUBGRADE			
	LIGHT BROWN			
	CLAY			
DESCRIPTION				
GRAIN-SIZE ANALYSIS				
(% Passing)				
Sieve				
1-1/2"				
1"				
1/2"				
#4				
#10				
#20				
#40				
#100				
#200				
ATTERBERG LIMITS				
Air Dried or Natural	NATURAL			
Liquid Limit	65			
Plastic Limit	28			
Plasticity Index	37			
Natural Water Content, %				
Dilatancy	SLOW			
Toughness	MED. STIFF			
Dry Strength	MEDIUM			
UNIFIED SOIL CLASSIFICATION	CH			
APPARENT SPECIFIC GRAVITY				
CBR TEST				
(Surcharge - 51 P.S.F.)				
Molding Moisture, %	25			
Molding Dry Density, P.C.F.	10.1			
Swell upon saturation, %	1.9			
CBR at 0.1" Penetration	15.6			
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:

SAMPLE #1 FROM FTG. SUBGRADE SLIGHTLY TO MODERATELY EXPANSIVE. CONTRACTOR REMOVED CLAYEY SOIL 12" ± BELOW SUBGRADE &

Date 8-27-82 By W.W.

REPLACED WITH SELECT GRANULAR FILL AND COMPACTED IN THIN LIFTS.

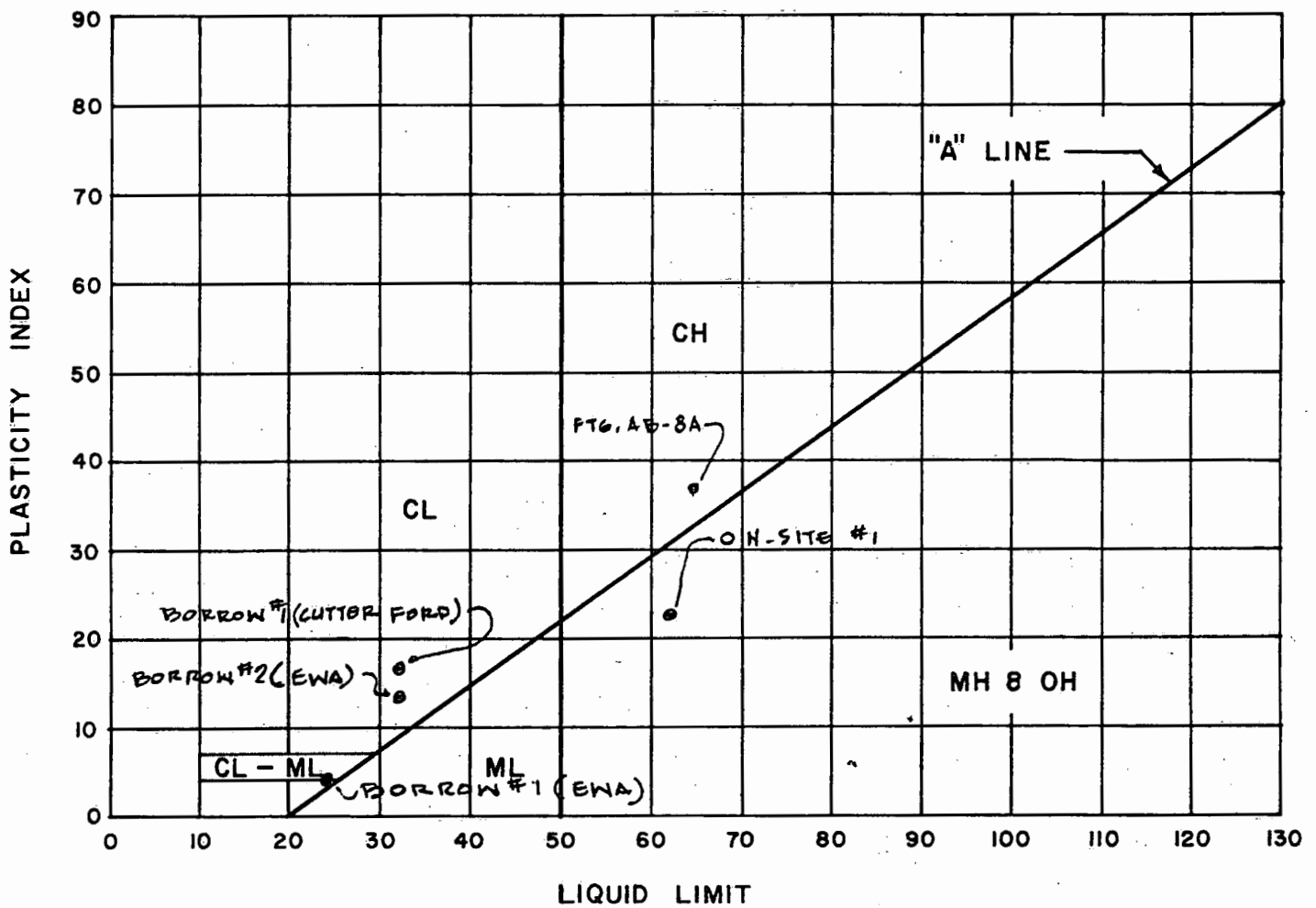
WALTER LUM ASSOCIATES, INC.

STRUCTURAL & SOIL ENGINEERS

PLASTICITY CHART

PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIANA, OAHU, HAWAII



DATE 8-24-82 BY ww

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

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

PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIANA, OAHU, HAWAII

SAMPLE NO.: ON-SITE #1

SAMPLE DESCRIPTION: BROWN
SILTY CLAY

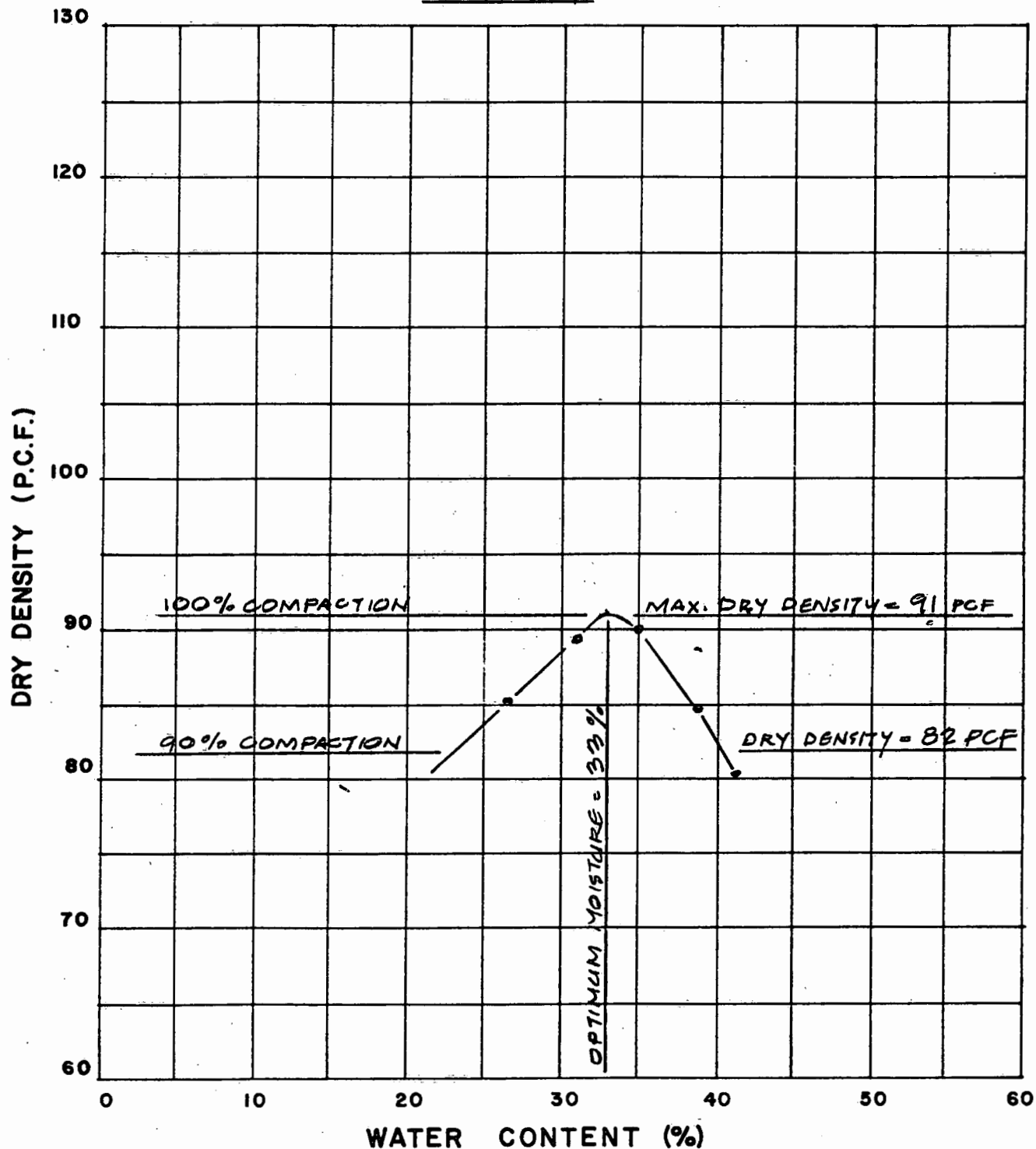
AGGREGATE: 1/4" MINUS

MOLD SIZE: 4"Ø x 4.58" H

HAMMER: 10 lb - 18" DROP

LAYERS: 5

BLOWS: 25 / LAYER



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

DATE 8-14-82 BY WW

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

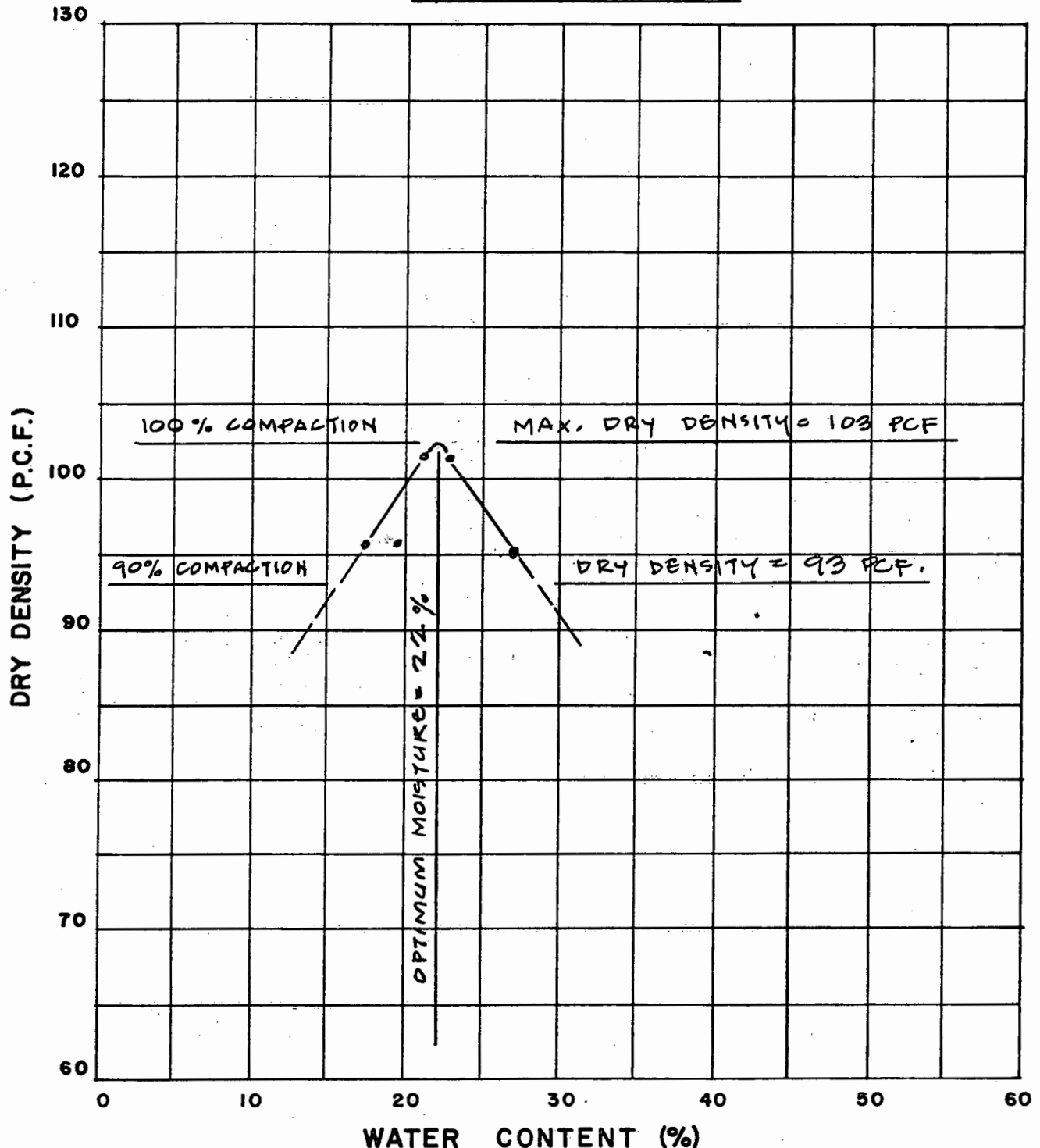
PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIKAWA, OAHU, HAWAII

SAMPLE NO.: #4 (ON-SITE)

SAMPLE DESCRIPTION: BROWN SILTY CLAY
W/ TRACES OF SAND

AGGREGATE: 1/4" MINUS
MOLD SIZE: 4" Ø x 4.58" H
HAMMER: 10 lb - 18" DROP
LAYERS: 5
BLOWS: 25 bls./LAYER



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

DATE 8-14-82 BY WW

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

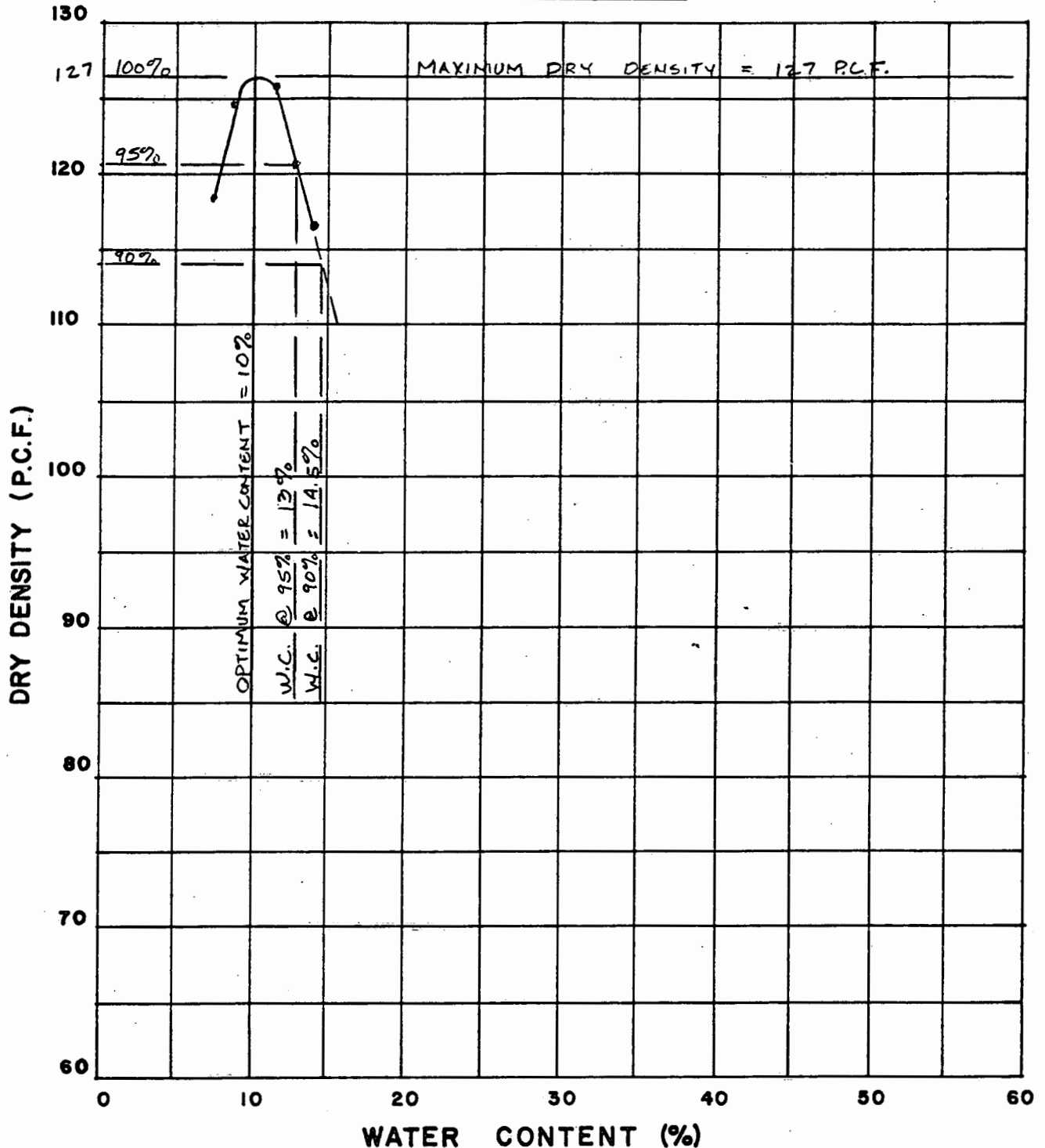
PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIAWA, OAHU, HAWAII

SAMPLE NO.: OFFSITE BORROW #1 (CUTTER FORD)

SAMPLE DESCRIPTION: DARK BROWN, CLAYEY GRAVEL W/SAND

AGGREGATE: 3/4" MINUS
 MOLD SIZE: 6" DIA. 4.75" HIGH
 HAMMER: 10 LBS.
 LAYERS: 5
 BLOWS: 56/LAYER



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

DATE 8-11-82 BY WW

MOISTURE-DENSITY CURVE (ASTM D-1557- , METHOD _)

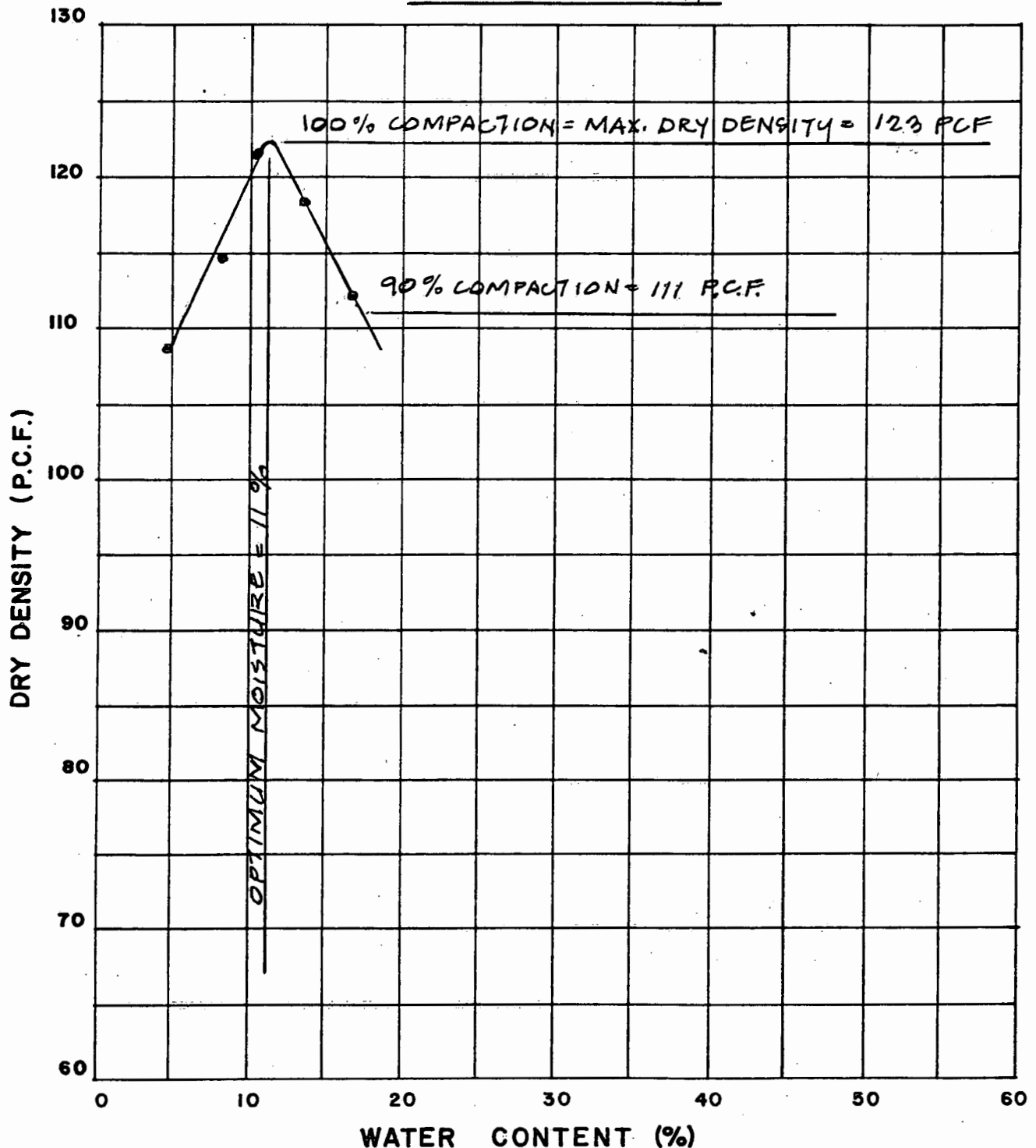
PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIANA, OAHU, HAWAII

SAMPLE NO.: BORROW #1 (EWA)

SAMPLE DESCRIPTION: WHITE SILTY SAND
& CORAL FRAGMENTS

AGGREGATE: 3/4" MINUS
MOLD SIZE: 6" Ø x 4.58 H
HAMMER: 10 lb. - 18" DROP
LAYERS: 5
BLOWS: 50/LAYER



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

DATE 9-7-82 BY WW

MOISTURE-DENSITY CURVE (ASTM D-1557- , METHOD _)

PROJECT: HAWAII BUSINESS PARK

LOCATION: WAIKAWA, OAHU, HAWAII

SAMPLE NO.: BORROW #2 (EWA)

SAMPLE DESCRIPTION: TAN CLAYEY SAND
& CORAL FRAGMENTS

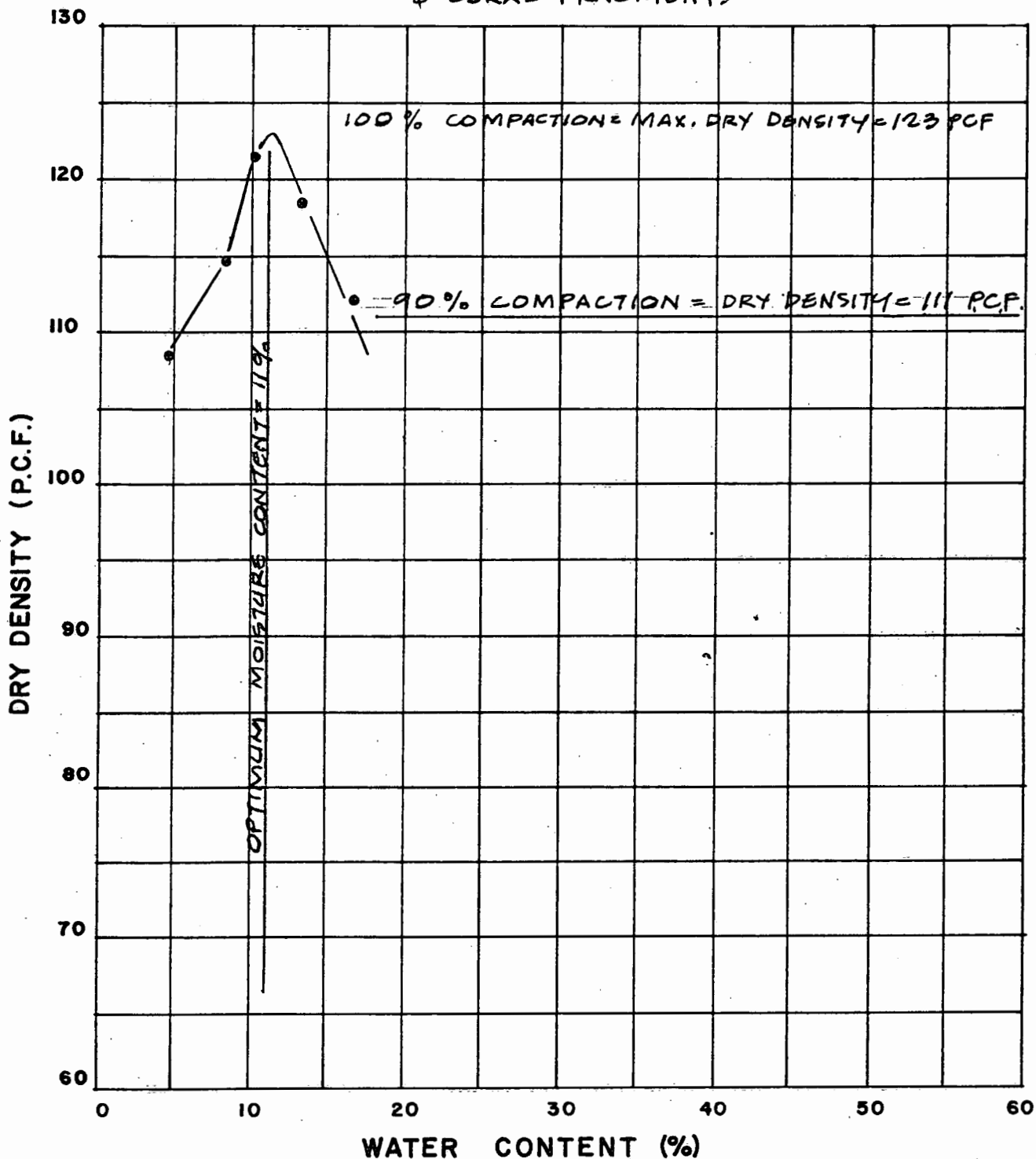
AGGREGATE: $\frac{3}{4}$ " MINUS

MOLD SIZE: $6" \times 4.58" \times 4$

HAMMER: 10lb-18" DROP

LAYERS: 5

BLOWS: 56/LAYER



WALTER LUM ASSOCIATES, INC.

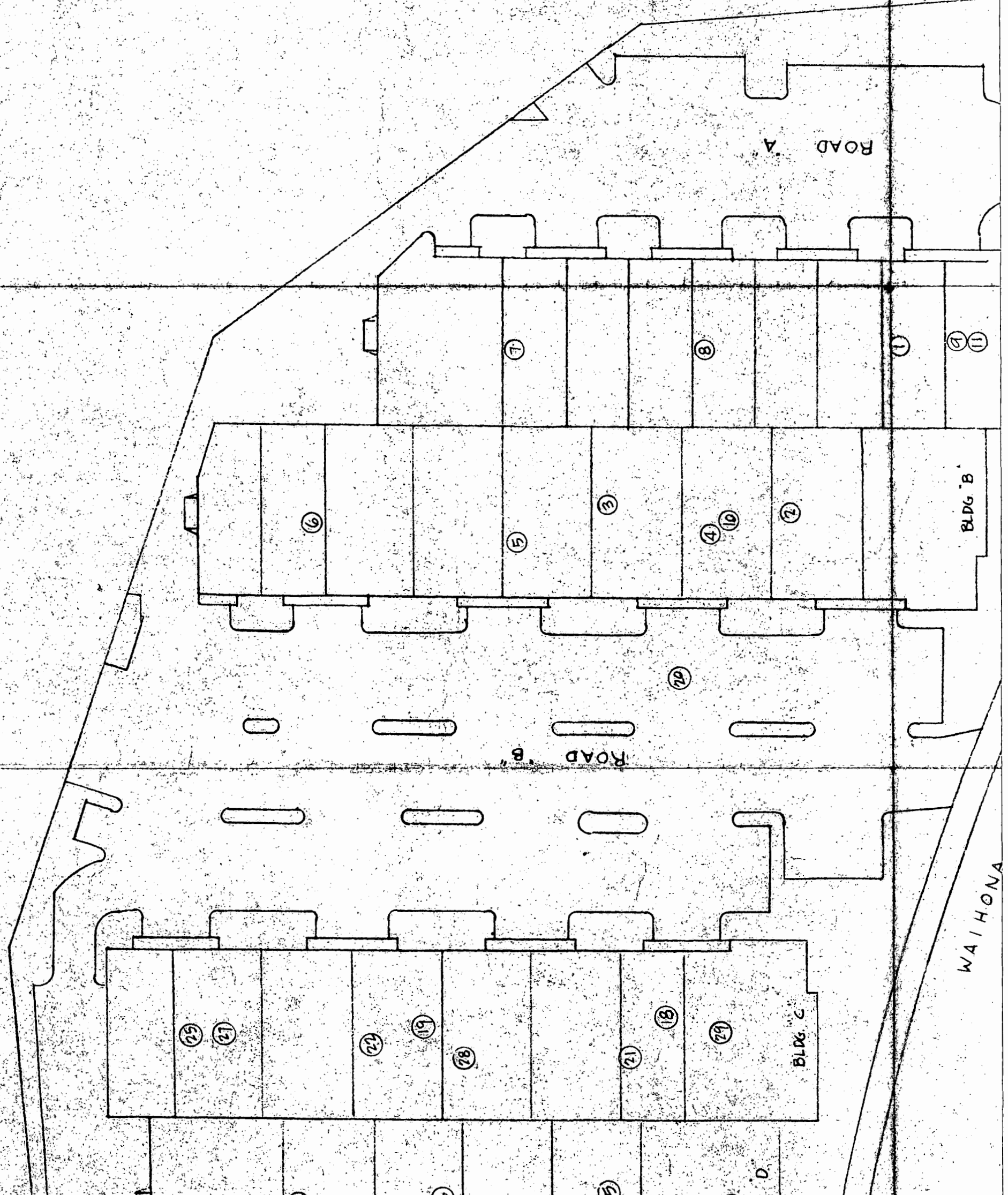
CIVIL, STRUCTURAL, SOILS ENGINEERS

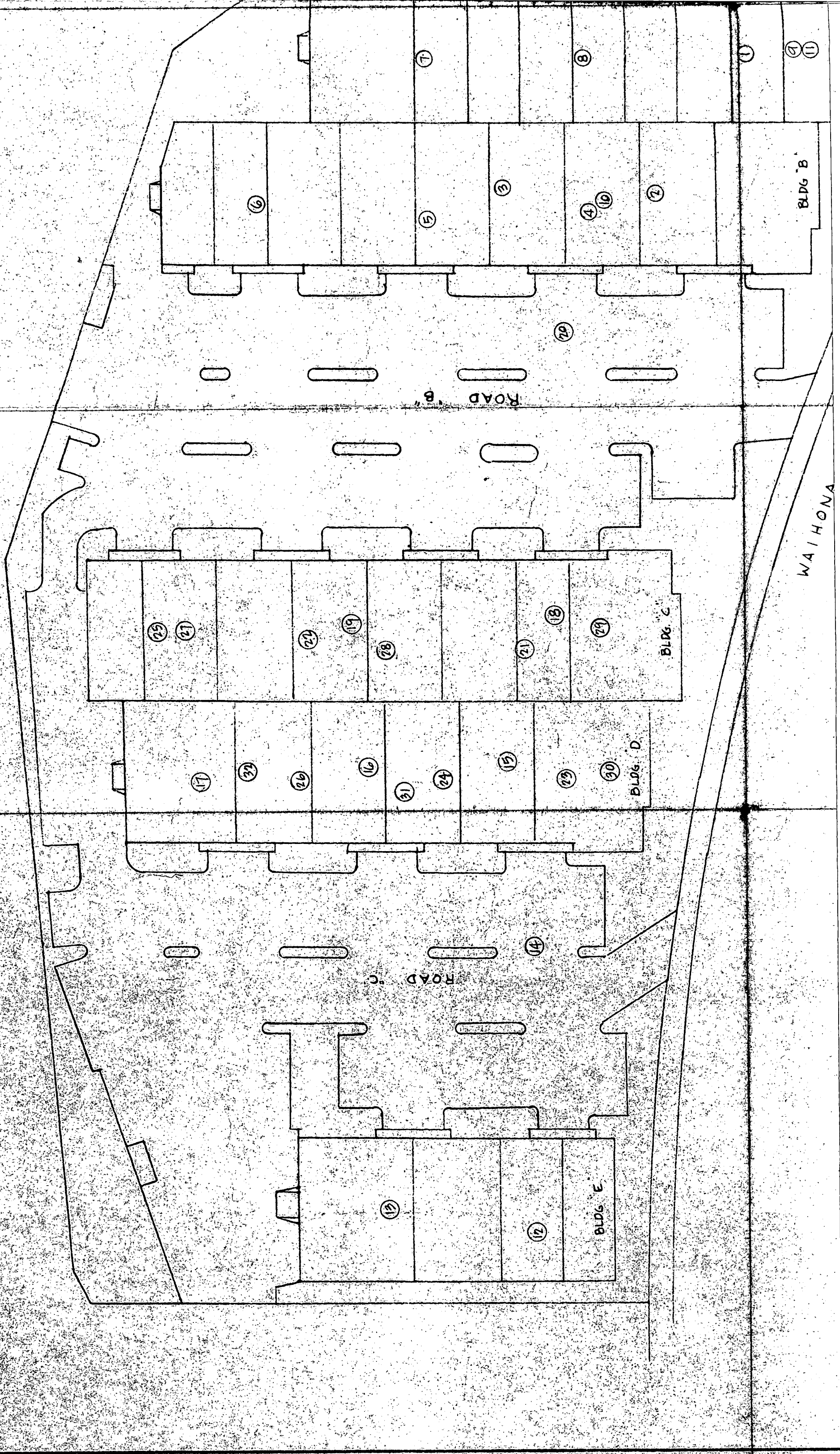
DATE 9-7-82 BY WW

Not to scale
NORTH

NOTE:

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





STREET

BLDG "A"

TEST DATES : FROM 8-9-82 TO 8-31-82

TEST LOCATION SKETCH
HAWAII BUSINESS PARK
WAIAWA, HAWAII
TAX MAP KEY: 9-6-07: 1, 2, 3, 4 & 5

Dr. R.H.	WALTER LUM ASSOCIATES, INC.	Sheet
Date 8/82	3030 WAIALAE AVE.	
Rev.	CIVIL ENGINEERS	of
	PHONE 737-7931	

Bldg "A"

TEST DATES: FROM 8-9

STREET

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: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21
Suite 1150, Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813

DATE: October 12, 1982

Gentlemen:

Re: HAWAII BUSINESS PARK
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 September 16, 1982.

cc: Design 21,
Attn: Mr. Akana Ma
Nakamura & Tyau, Inc.
Attn: Mr. Reuben Tyau
Community Planning, Inc.
Attn: Mr. Robert Sarae
Steel Tech, Inc.
Attn: Mr. Val Peroff

Yours truly,

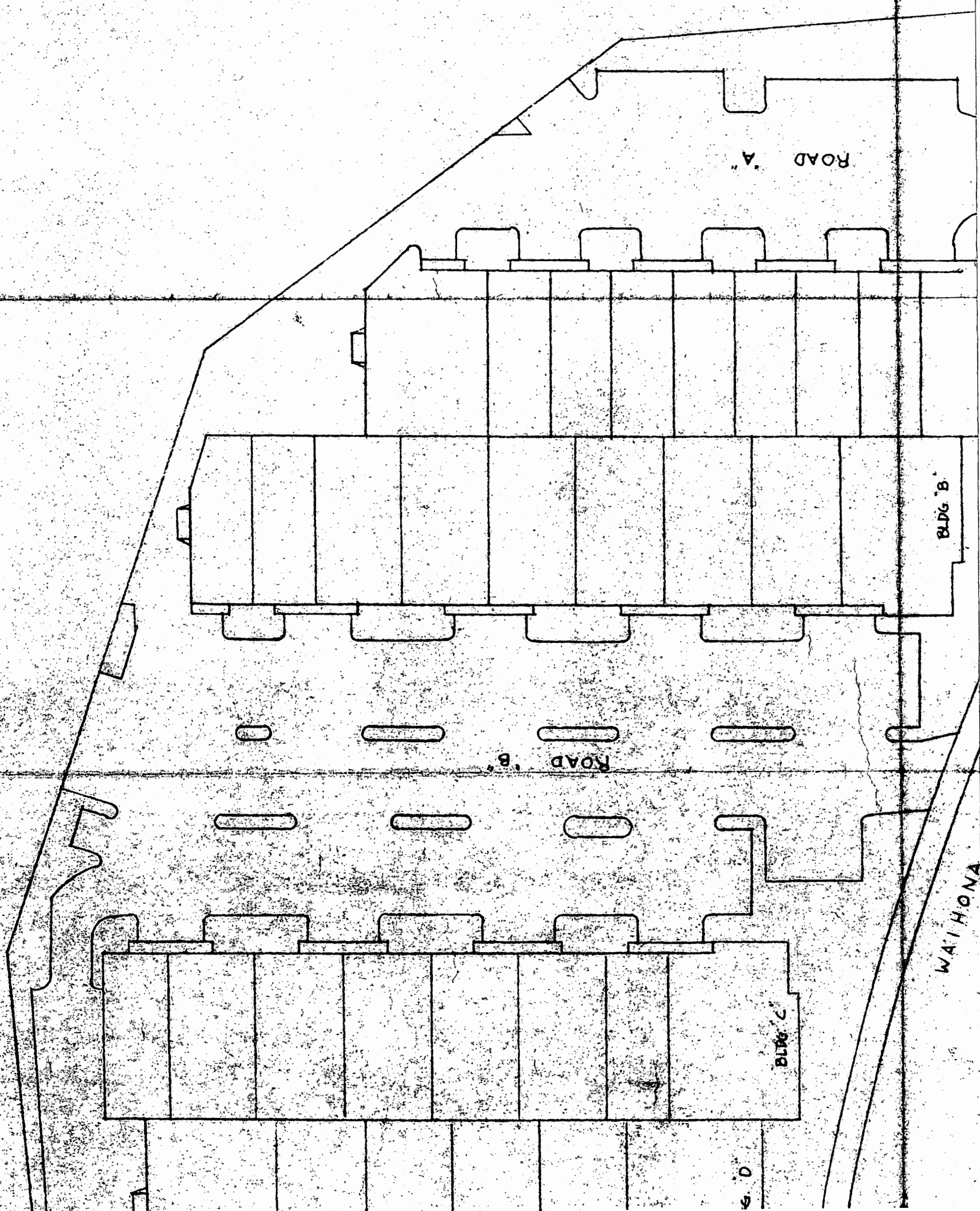
WALTER LUM ASSOCIATES, INC.

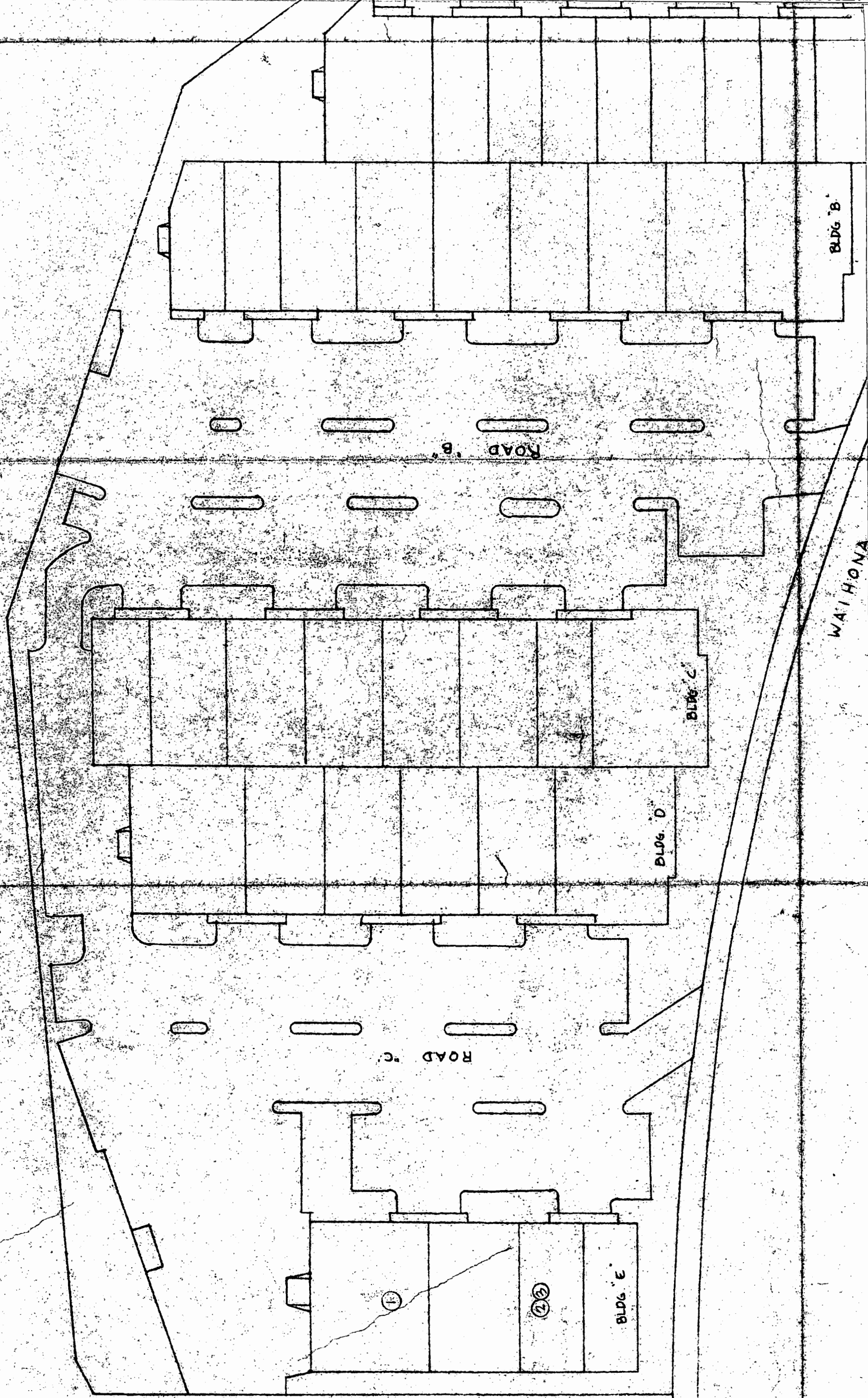
By W. Wakahe

NORTH
NOT TO SCALE

NOTE:

① INDICATES THE APPROXIMATE LOCATION
OF TEST #1 TAKEN IN THE AREA SHOWN
FOR TEST RESULTS, SEE THE SUMMARY





WAIHONA

BLDG. B

BLDG. C

BLDG. D

BLDG. A

ROAD B

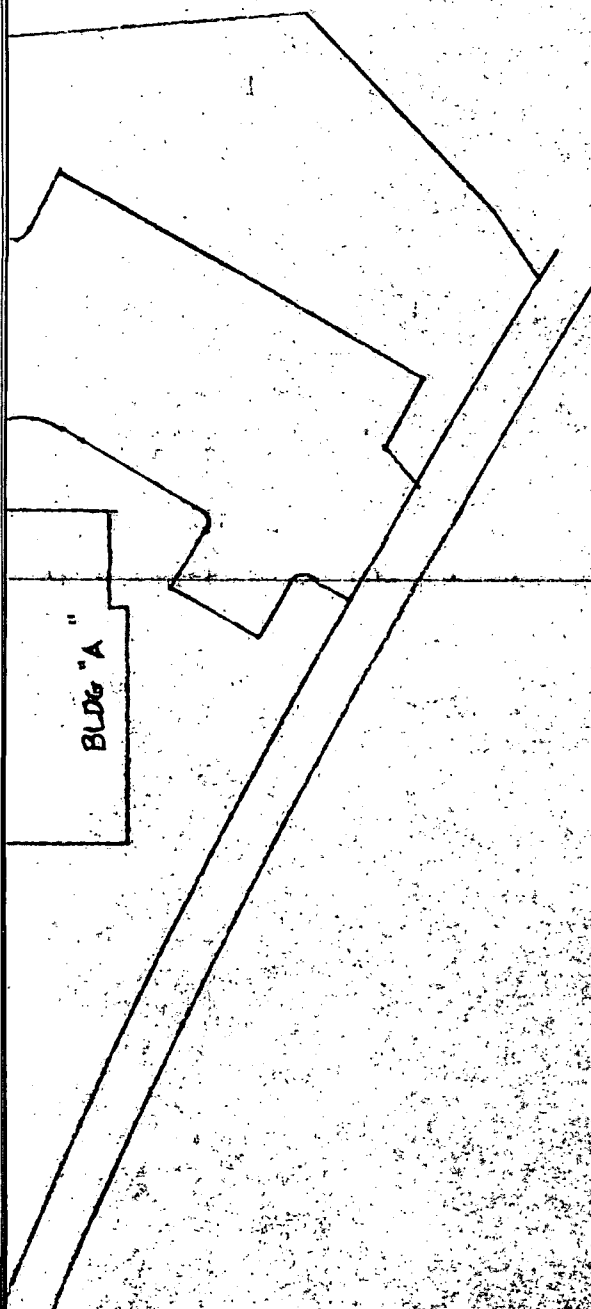
ROAD A

(2)

(1)

STREET

BLDG "A"



TEST DATE: FROM 9-10-82 TO

TEST LOCATION SKETCH

HAWAII BUSINESS PARK

WAIKAWA HAWAII

TAX MAP KEY: 9-6-07-12-3-4-5

Dr. R.H.

Date 8/82

Rev.

WALTER LUM ASSOCIATES, INC.
3000 WAIKAWA AVE.

CIVIL ENGINEERS
PHONE 737-7931

Sheet

of

BLDG "A"

STREET

TEST DATE: FROM

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: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21
Suite 1150, Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813

DATE: February 22, 1983

Gentlemen:

Re: HAWAII BUSINESS PARK
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 February 16, 1983.

cc: Design 21,
Attn: Mr. Akana Ma
Nakamura & Tyau, Inc.,
Attn: Mr. Reuben Tyau
Community Planning, Inc.,
Attn: Mr. Robert Sarae
Steel Tech, Inc.,
Attn: Mr. Val Peroff

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahiro

WALTER LUM ASSOCIATES, INC.

CIVIL, STRUCTURAL, SOILS ENGINEERS

WALTER LUM
EDWARD WATANABE
EZRA KOIKE
WALLACE WAKAHIRO

3030 WAIALAE AVE., HONOLULU, HAWAII 96818 • TEL. 737-7931

FIELD DENSITY TEST REPORTHAWAII BUSINESS PARK

Field Density Test Results as follows:

Ending FEB. 16 1983Sheet 1 of 2 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
1-20-83	REAR BLDG "A" (1)	GRANULAR FILL 0'±	9	99	123	81
1-28-83	REAR PARKING LOT "A" (2)	0'±	24	103	103	100
"	FRONT PARKING LOT "A" (3)	0'±	25	101	"	98
RETEST (1)	REAR BLDG "A" (4)	GRANULAR FILL 0'±	7	112	123	91
1-31-83	ROAD "A" (5)	GRANULAR FILL 0'±	9	103	123	83
"	ROAD "A" (6)	GRANULAR FILL 0'±	9	104	"	85
"	ROAD "A" (7)	GRANULAR FILL 0'±	8	101	"	82
RETEST (4)	REAR BLDG "A" (8)	GRANULAR FILL 0'±	7	107	"	87
RETEST (8)	REAR BLDG "A" (9)	GRANULAR FILL 0'±	7	114	123	92
2-8-83	REAR BLDG "B" (10)	GRANULAR FILL 0'±	5	128	133	97
RETEST (9)	REAR ROAD "A" (11)	GRANULAR FILL 0'±	10	117	123	95
RETEST	REAR BLDG "A" (12)	GRANULAR FILL 0'±	11	120	"	97
"	ACCESS DRIVEWAY BLDG "A" (13)	GRANULAR FILL 0'±	8	103	"	84
"	PARKING LOT BLDG "B" (14)	GRANULAR FILL 0'±	7	102	"	83

* Approximate depth below finish ^{SURF} grade or as noted.

** 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 #1 taken in the AREA shown.

BY W.W.

FIELD DENSITY TEST REPORT

HAWAII BUSINESS PARK

Field Density Test Results as follows:

Ending FEB. 16 1983

Sheet 2 of 2 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
RETEST (13) 2-11-83	ACCESS DRIVEWAY BLDG. "A" (15)	GRANULAR FILL 0'±	4	121	123	99
"	ACCESS DRIVEWAY BLDG. "A" (16)	GRANULAR FILL 0'±	7	117	"	95
RETEST (5) "	ROAD "A" (17)	GRANULAR FILL 0'±	7	114	"	93
RETEST (6 & 7) "	ROAD "A" (18)	GRANULAR FILL 0'±	7	119	"	97
RETEST (14) "	REAR PARKING LOT "B" (19)	GRANULAR FILL 0'±	8	122	"	99
"	ACCESS ROADWAY BLDG. "B" (20)	GRANULAR FILL 0'±	7	126	"	>100
RETEST (17) 2-14-83	ROAD "A" (21)	GRANULAR FILL 0'±	5	121	123	98
2-16-83	REAR PARKING LOT "B" (22)	GRANULAR FILL 0'±	6	114	123	93
"	MIDDLE ROAD "B" (23)	GRANULAR FILL 0'±	12	122	"	99
"	FRONT PARKING LOT "B" (24)	GRANULAR FILL 0'±	7	125	"	>100

REROLLED

REROLLED

* 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.

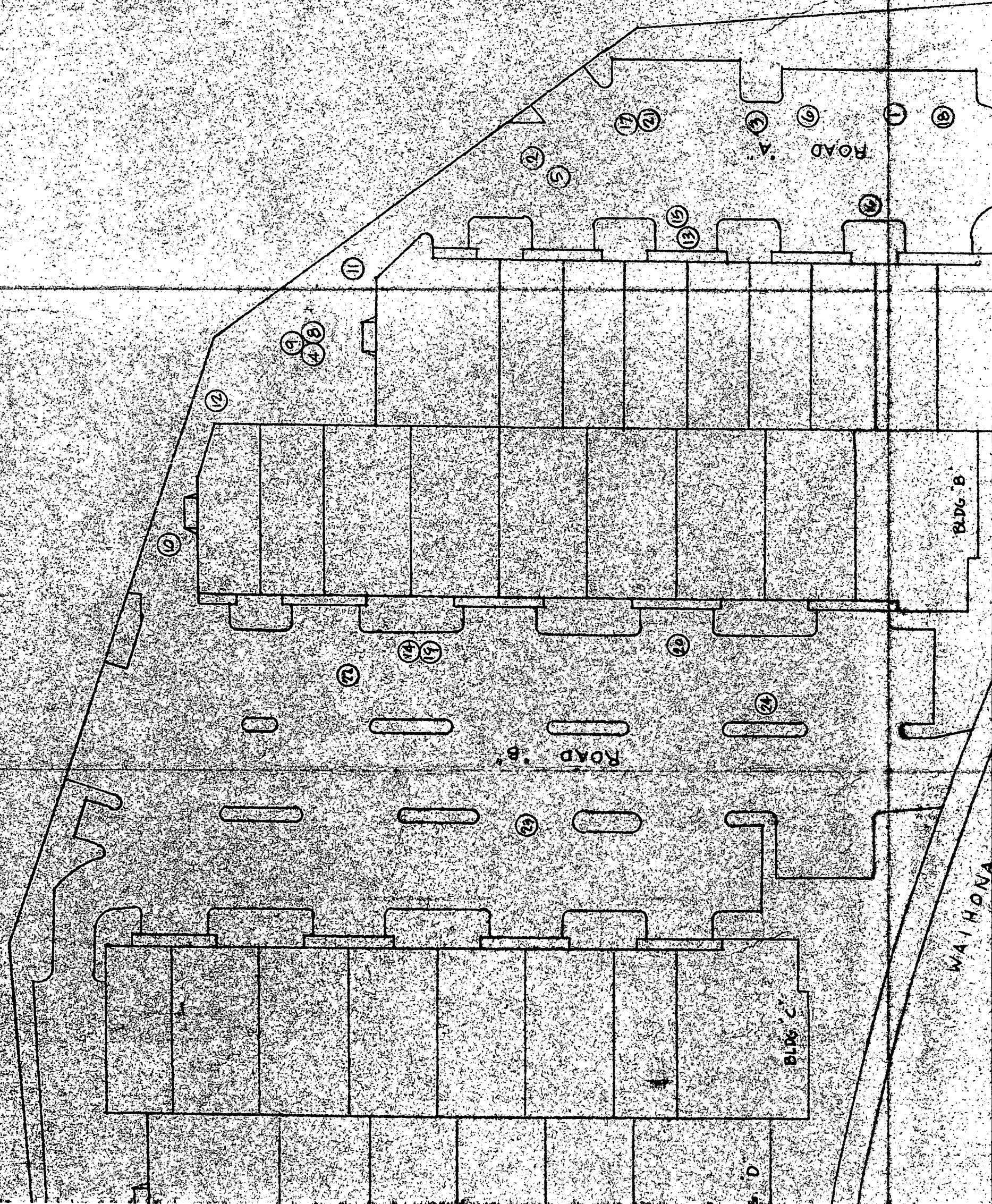
(15) Indicates Test #15 taken in the AREA shown.

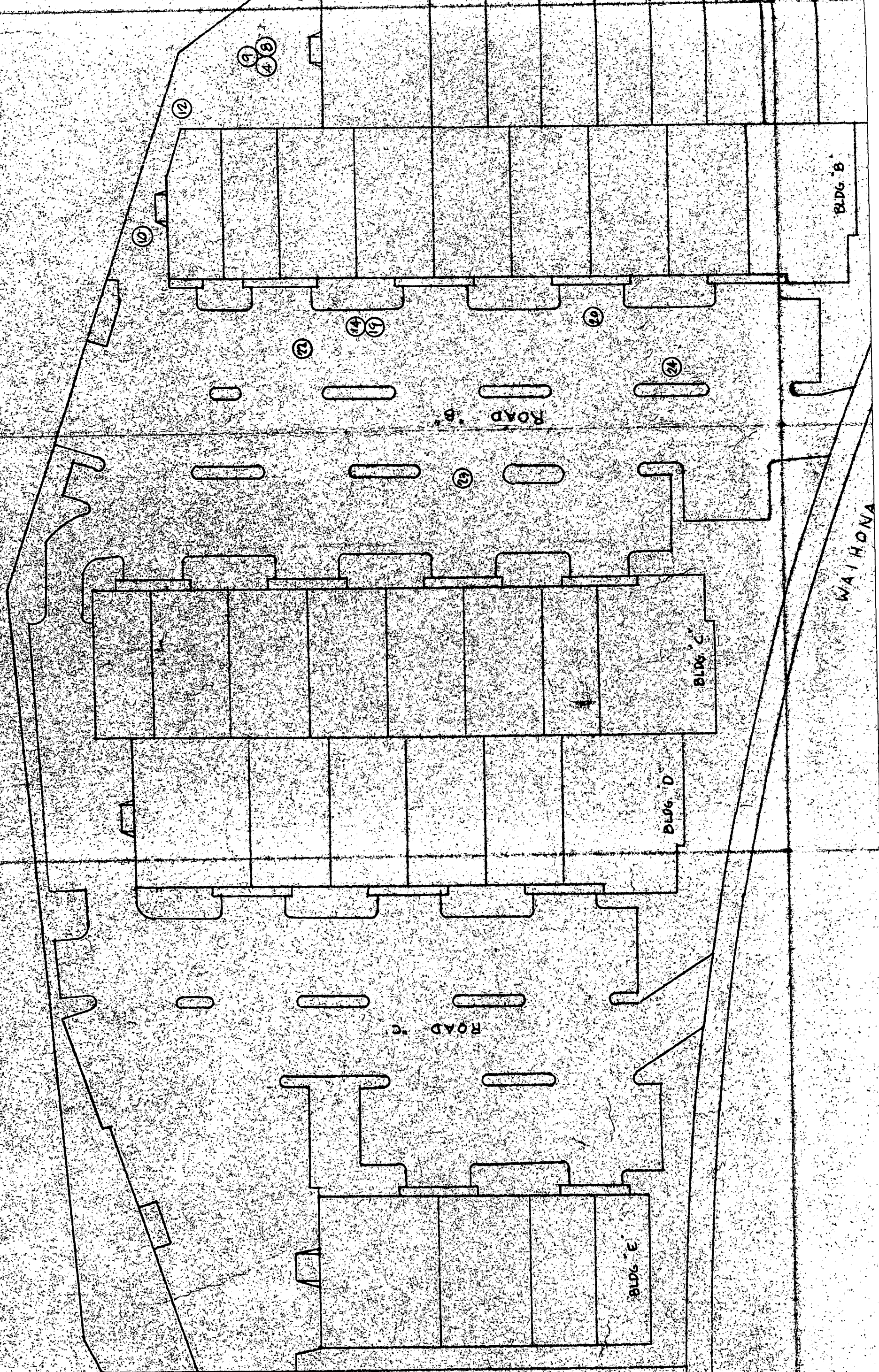
BY W.W.

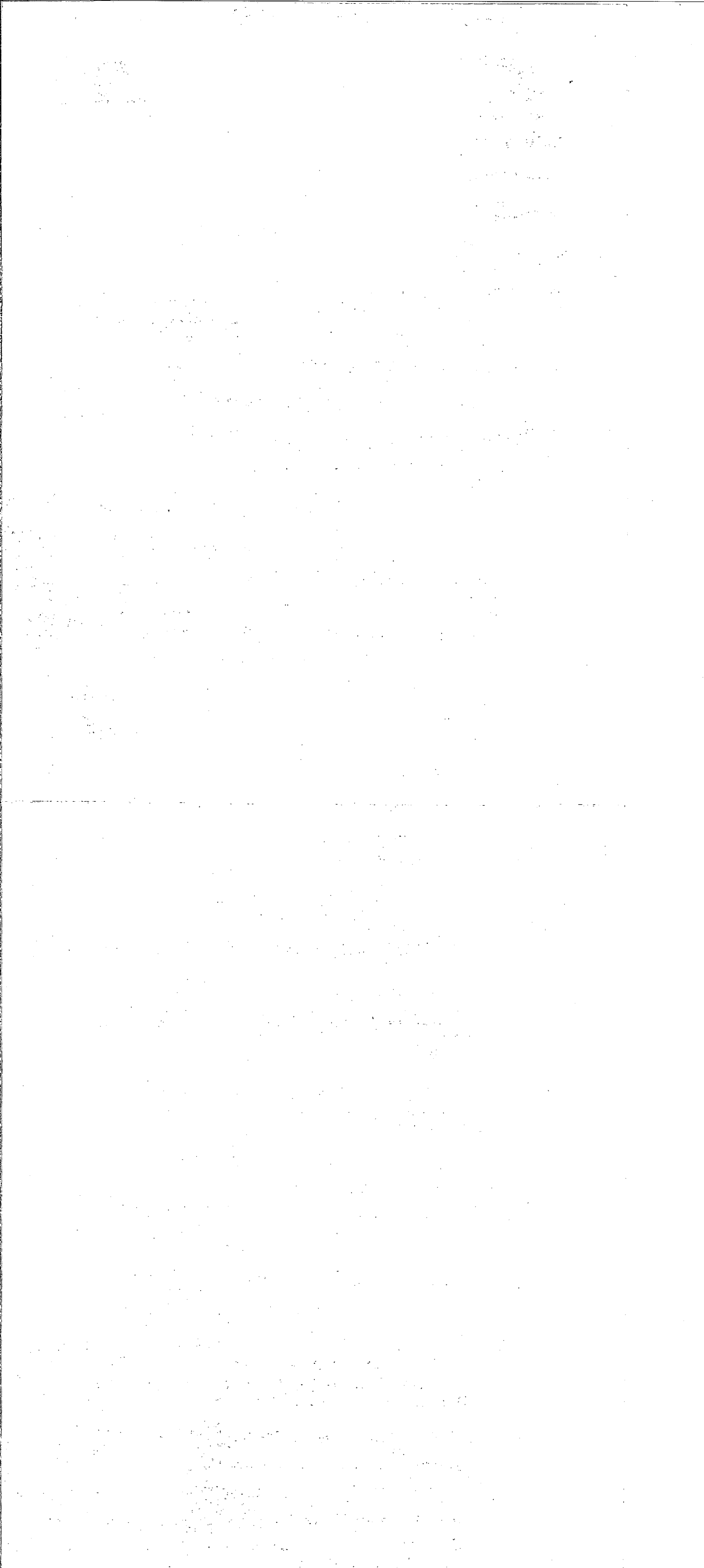
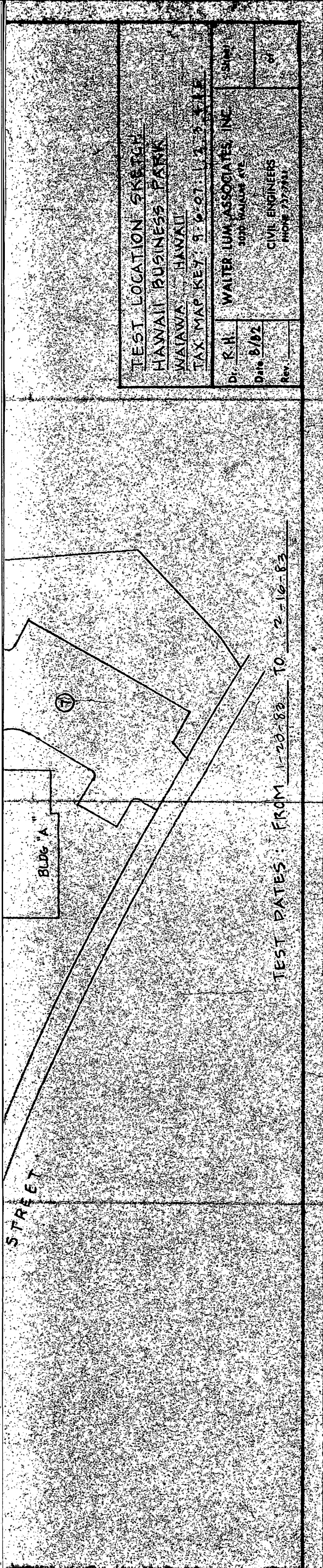
NORTH
NOT TO SCALE

NOTE:

① INDICATES THE APPROXIMATE LOCATION OF TEST #1 TAKEN IN THE AREA SHOWN FOR TEST RESULTS, SEE THE SUMMARY







Block A

TEST DATES: FROM

STREET

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: HARRISON & SHAW
c/o Mr. Akana Ma
Design 21
Suite 1150, Pioneer Plaza
900 Fort Street Mall
Honolulu, Hawaii 96813

DATE: March 22, 1983

Gentlemen:

Re: HAWAII BUSINESS PARK

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 February 25, 1983.

cc: Design 21,
Attn: Mr. Akana Ma
Nakamura & Tyau, Inc.,
Attn: Mr. Reuben Tyau
Community Planning, Inc.,
Attn: Mr. Robert Sarae
Steel Tech, Inc.,
Attn: Mr. Val Peroff

Yours truly,

WALTER LUM ASSOCIATES, INC.

By W. Wakahe

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

FIELD DENSITY TEST REPORT**HAWAII BUSINESS PARK**

Field Density Test Results as follows:

Ending FEB. 25 1983Sheet 1 of 1 Sheets

Date	Lot No.	Fill Layer*	Moisture Content	Dry Density**	Standard Density**	Relative Compaction***
2-17-83	REAR PARKING LOT "B" ①	GRANULAR FILL 0'±	5	132	127	>100
RETEST "	REAR PARKING LOT B ②	GRANULAR FILL 0'±	6	120	123	98
2-24-83	OVER WATER-LINE REAR BLDG "E" ③	GRANULAR FILL 0'±	7	119	123	97
	OVER WATER-LINE REAR BLDG "D" ④	GRANULAR FILL 0'±	5	123	"	100
2-25-83	PARKING LOT "C" ⑤	GRANULAR FILL 0'±	6	131	123	>100
"	PARKING LOT "C" ⑥	GRANULAR FILL 0'±	8	118	"	96
"	REAR BLDG "E" ⑦	GRANULAR FILL 0'±	7	119	"	97
"	REAR BLDG "D" ⑧	GRANULAR FILL 0'±	9	120	"	98

* 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.

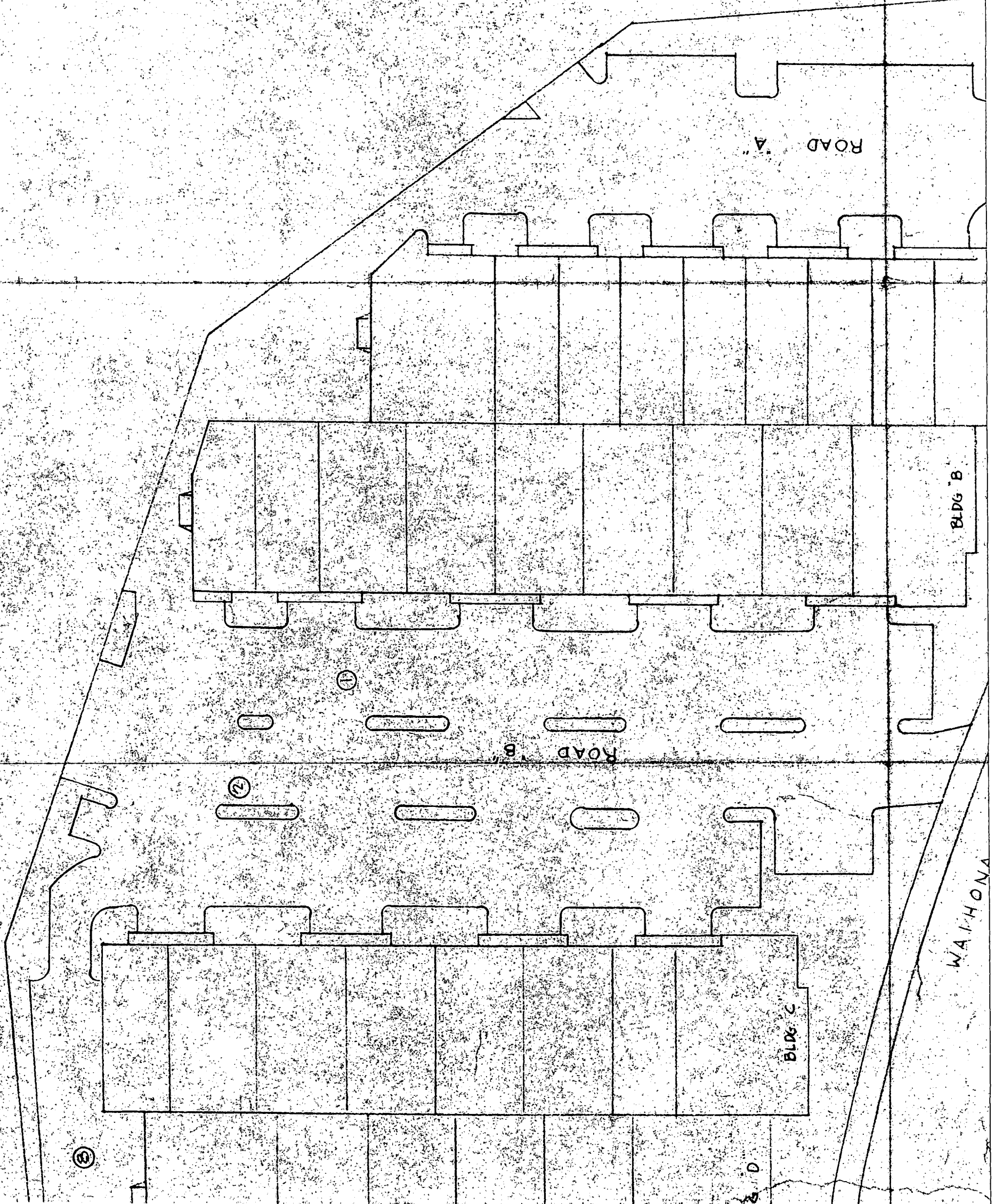
① Indicates Test #1 taken in the AREA shown.

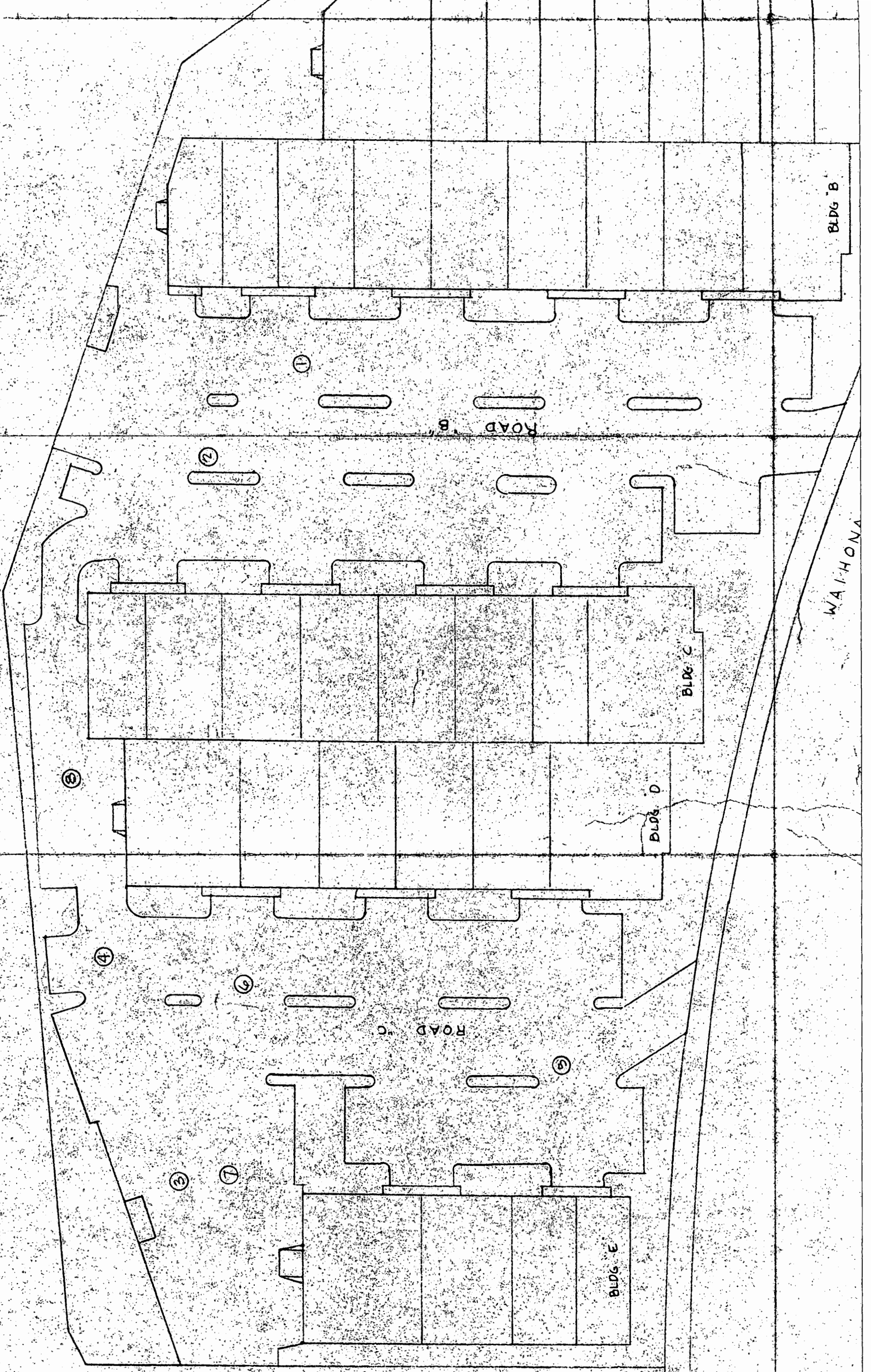
BY W.W.

NORTH
Not to scale

NOTE:

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





BLDG. B

BLDG. C

BLDG. D

BLDG. E

ROAD B

ROAD A

WAIHONA



STREET

BLDG "A"

TEST LOCATION SKETCH

HAWAII BUSINESS PARK

WAIKANA, HAWAII

TAX MAP KEY: 9-6-07: 1, 2, 3, 4 & 5

Dr. R. H.

Date 8/82

Rev.

WALTER LUM ASSOCIATES, INC.

3030 WAIKANA AVE.

CIVIL ENGINEERS

PHONE 737-7931

Sheet

of

TEST DATES: FROM 2-17-83 TO 2-25-83

BUDG "A"

TEST DATES: FROM 2

STREET

CITY AND COUNTY OF HONOLULU
DEPARTMENT OF PUBLIC WORKS
DIVISION OF ENGINEERING

DATE APR 3 1983 19__

FROM: H. J. YOUNG, CHIEF

TO:

- | | |
|--|---|
| ☐ CHIEF | ☒ CHIEF CONSTRUCTION ENGINEER |
| ☒ CHIEF PLANNING & DESIGN ENGR. <i>W</i> | ☐ DISTRICT CONSTR. ENGR. - EAST |
| ☐ CHIEF ADMINISTRATIVE ENGR. | ☒ DISTRICT CONSTR. ENGR. - WEST |
| ☐ CHIEF CONTROL ENGINEER | ☐ SERVICE ENGINEER |
| ☐ CHIEF DRAINAGE ENGINEER | ☐ FIELD SURVEY |
| ☐ CHIEF HIGHWAY ENGINEER | ☐ TESTING LAB |
| ☐ CHIEF STRUCTURAL ENGINEER | ☒ SECRETARY |
| ☐ INVESTIGATOR | ☐ |

FOR:

- | | |
|--|---|
| ☒ APPROPRIATE ATTENTION AND ACTION | ☐ ARRANGE MEETING |
| ☐ DRAFT REPLY | ☐ SIGNATURE |
| ☐ COMMENTS & RECOMMENDATIONS | ☐ INFORMATION |
| ☐ SEE ME | ☒ FILE <i>W/ GRADING PERMIT</i> |
| ☐ WORK ORDER | ☐ |

LOG. NO. _____ SUSPENSE _____

R. Papa:
Please see me.

Date 4/4/83

G.P. #277 - 95% COMP.

LANDSCAPING INCOMPLETE (PLANTING VEGETATION REMAINS)
EXP. DATE 5-9-83

✓ CLOSED - 5-31-83 - LANDSCAPING COMP.

GP#277

COMMUNITY PLANNING, INC.

700 BISHOP STREET, SUITE 608 HONOLULU, HAWAII 96813 TELEPHONE 531-4252, 521-7491

RECEIVED

COMMUNITY PLANNING

83-01829

APR 8 2 23 PM '83

April 8, 1983

ENGR

SR-77

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
Hawaii Business Park
Waiawa, Ewa, Oahu, Hawaii
Tax Map Key: 9-6-07: 1, 2, 3, 4 & 5

RECEIVED
DEPT OF PUBLIC WORKS
APR 8 9 39 AM '83

Enclosed is a copy of the final grading memorandum report by
Walter Lum Associates, Inc. dated April 7, 1983.

Grading for the subject project is completed and in substantial
conformance with the approved plans dated June 3, 1982.

Very truly yours,

COMMUNITY PLANNING, INC.

Bernard P. Kea
Bernard P. Kea

BPK:RS:do

Enclosure

cc: Design 21