F.G.E., LTD.

Fewell Geotechnical Engineering, Ltd.
99-960A Iwaena Street, · Aiea, Hawaii 96701 · (808) 488-1979

File 265-9
July 21, 1982

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

Attention: Mr. James C. White

Subject: Final Grading Report
Gentry Waipio Industrial Subdivision
First Increment, Phase 3
Gentry-Waipio Development
Waipio, Oahu, Hawaii

Gentlemen:

At your request, we have provided testing and observation services for the mass grading of the Gentry-Waipio Industrial Subdivision, First Increment, Phase 3, in Waipio, Oahu, Hawaii.

Work started with a general clearing and stripping of the entire construction area. Soft areas were overexcavated to firm ground, backfilled, and compacted prior to the start of fill placement.

Actual grading operations then commenced using Caterpillar 631 and 621 scrapers and D-9 dozers to cut, haul, and spread the fill. Compaction was accomplished using a Hyster 451 sheepsfoot.

The fill was generated from the proposed Park Site (Parcels "q" and "t") adjacent to the Puahi Subdivision of the Gentry-Waipio Development. The material consisted of low plasticity Clayey Silt (ML) and was placed and compacted in uniform lifts of 6 to 8 inches at moisture contents generally within 4 percent of the optimum moisture content as determined by ASTM D1557.

Field density tests performed by our firm indicated that adequate compaction was being obtained. These tests, upon which acceptance is based, show values in excess of 90 percent relative compaction as determined by the above-referenced test. Density tests taken in the upper 24 inches of the roadway embankments showed values exceeding 95 percent relative compaction.

Lots 1 through 19 and the roadways have either been cut or filled to final grade as designated by the field grade stakes and compacted to 90 percent relative compaction. The upper 24 inches of the roadways have been compacted to 95 percent.

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In summary, the mass grading for the Gentry-Waipio Industrial Subdivision, First Increment, Phase 3 has been completed in general accordance with the Grading Ordinances of the City and County of Honolulu and the recommendations of our Soil Investigation Report dated November, 1976. These lots and roadways are ready for further improvements and should be grassed as soon as practicable.

The Site Plan, Figure 1, indicates the field density test locations. The location of Parcels "q" and "t" are shown on Figure 2. 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 regarding this matter, please contact us at your convenience.

Respectfully submitted,

FEWELL GEOTECHNICAL ENGINEERING, LTD.

Alan J. Shimamoto

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

AJS/fse

Enclosures

Table I

Summary of Laboratory Test Results

Sample Designation	Description	Maximum Dry Density (pcf)	Optimum Moisture Content %
A	Reddish Brown Clayey SILT (ML)	103.0	23.3
B	Reddish Brown Clayey SILT (ML)	105.4	24.5
C	Reddish Brown SILT (ML)	100.0	27.0

File 265-9
Gentry Waipio Industrial Subdivision
First Increment, Phase 3
Gentry-Waipio Development
Waipio, Oahu, Hawaii

TABLE II

SUMMARY OF FIELD DENSITY TEST RESULTS

Test No.	Date 1981	Location	Elevation	Field Density (pcf)	Moisture Content (%)	Material Type	Compaction (%)	Remarks
1	8-3	Lot #5	FG-2.0'	97	27	A	94	
2	8-3	Lot #2	FG-8.5'	96	26	A	93	
3	8-3	Lot #6	FG-2.0'	93	26	A	90	
4	8-3	Lot #1	FG-5.5'	93	26	A	90	
5	8-4	Lot #4	FG-1.0'	94	26	A	92	
6	8-4	Lot #3	FG-1.5'	95	26	A	92	
7	8-4	Lot #6	FG-0.5'	93	26	A	91	
8	8-5	Lot #1	FG-5.0'	95	26	A	93	
9	8-5	Lot #2	FG-7.0'	94	26	A	92	
10	8-5	Lot #5	FG-1.0'	92	25	A	89	Accepted with additional compaction
11	8-5	Lot #4	FG-2.0'	94	27	A	91	
12	8-5	Lot #3	FG-2.5'	97	23	A	94	
13	8-6	Lot #7 East	FG-2.0'	97	26	A	94	
14	8-6	Lot #8 East	FG-2.0'	95	26	A	92	
15	8-6	Lot #7 West	FG-1.5'	93	26	A	90	
16	8-6	Lot #8 West	FG-2.0'	95	26	A	92	
17	8-6	Lot #7 East	FG-0.5'	94	26	A	91	
18	8-6	Lot #8 East	FG-1.5'	91	27	A	89	Accepted with additional compaction
19	8-7	Lot #1 North	FG-4.0'	94	25	A	91	
20	8-7	Lot #1 South	FG-3.5'	96	26	A	93	
21	8-7	Lot #2 North	FG-6.5'	95	27	A	92	
22	8-7	Lot #2 South	FG-6.0'	94	26	A	91	
23	8-7	Lot #1 South	FG-3.0'	95	27	A	92	
24	8-10	Lot #1	FG-2.0'	97	27	A	94	
25	8-10	Lot #2	FG-5.0'	95	25	A	92	
26	8-10	Lot #3	FG-3.0'	94	24	A	91	
27	8-10	Lot #1	FG-1.0'	95	26	A	92	
28	8-10	Lot #2	FG-4.0'	96	26	A	93	
29	8-10	Lot #2	FG-4.0'	98	24	A	95	
30	8-11	Lot #2	FG-3.0'	96	27	A	93	
31	8-11	Lot #3	FG-3.0'	96	25	A	93	
32	8-11	Lot #2	FG-2.0'	94	26	A	91	
33	8-11	Lot #3	FG-1.5'	95	27	A	93	
34	8-11	Lot #2	FG-1.0'	99	25	A	96	
35	8-11	Lot #3	FG	99	24	A	96	
36	8-12	Lot #2	FG	97	26	A	94	
37	8-12	Lot #5	FG-1.5'	98	26	A	95	
38	8-12	Lot #4	FG-1.0'	100	27	A	97	
39	8-12	Lot #5	FG-1.0'	94	26	A	92	
40	8-12	Lot #6	FG 0.5'	98	25	A	95	
41	8-12	Lot #5	FG	94	26	A	91	
42	8-12	Lot #4	FG	96	23	A	94	
43	8-13	Lot #6	FG	98	25	A	95	
44	8-13	Lot #5	FG	93	26	A	90	
45	8-13	Lot #6	FG	97	25	A	94	

TABLE II (cont'd)

SUMMARY OF FIELD DENSITY TEST RESULTS

Test No.	Date 1981	Location	Elevation	Field Density (pcf)	Moisture Content (%)	Material Type	Compaction (%)	Remarks
46	8-13	Lot #5	FG	100	24	A	98	
47	8-14	Lot #14	FG-5.0'	96	27	A	93	
48	8-14	Lot #15	FG-5.0'	95	25	A	92	
49	8-14	Lot #13	FG-4.0'	92	26	A	89	Accepted with additional compaction
50	8-14	Lot #16	FG-4.0'	93	27	A	90	
51	8-14	Lot #14	FG-3.0'	96	26	A	95	
52	8-14	Lot #15	FG-3.0'	99	24	A	96	
53	8-17	Lot #14	FG-2.0'	96	25	A	93	
54	8-17	Lot #16	FG-3.0'	98	27	A	95	
55	8-17	Lot #13	FG-1.0'	97	26	B	92	
56	8-17	Lot #15	FG-2.0'	94	27	B	90	
57	8-17	Lot #14	FG	102	25	B	97	
58	8-17	Lot #13	FG	101	24	B	96	
59	8-18	Lot #15	FG-1.5'	99	25	B	94	
60	8-18	Lot #16	FG-2.0'	100	24	B	95	
61	8-18	Lot #13	FG	97	25	B	92	
62	8-18	Lot #14	FG	99	24	B	94	
63	8-18	Lot #15	FG-0.5'	102	25	A	98	
64	8-19	Lot #16	FG-1.5'	101	27	A	98	
65	8-19	Lot #15	FG	97	24	A	95	
66	8-19	Lot #15	FG	96	23	A	93	
67	8-19	Lot #16	FG-1.0'	98	25	A	95	
68	8-19	Lot #16	FG-0.5'	106	24	A	100+	
69	8-19	Lot #16	FG	99	23	A	96	
70	8-20	Lot #17	FG-5.0'	97	23	A	94	
71	8-20	Lot #17	FG-4.5'	99	24	A	96	
72	8-20	Lot #17	FG-3.5'	102	23	A	99	
73	8-20	Lot #18	FG-2.0'	97	25	A	95	
74	8-20	Lot #18	FG-1.0'	95	24	A	92	
75	8-21	Lot #18	FG	101	25	B	96	
76	8-21	Lot #18	FG	97	26	B	92	
77	8-21	Lot #17	FG-3.0'	100	24	A	97	
78	8-21	Lot #17	FG-2.0'	94	24	A	92	
79	8-21	Lot #17	FG-1.0'	96	23	A	93	
80	8-21	Lot #17	FG-1.0'	99	25	B	94	
81	8-21	Lot #17	FG	103	25	B	97	
82	8-21	Lot #17	FG	101	24	B	96	
83	8-25	Ukee St. Ext.	FSG-1.0'	101	25	A	98	
84	8-25	Ukee St. Ext.	FSG-1.0'	101	24	A	98	
85	8-25	Ukee St. Ext.	FSG-1.5'	101	25	A	99	
86*	9-1	Lot #12 Warehouse Area	FG-1.0'	99	25	A	96	
87*	9-1	Lot #14 Warehouse Area	FG-0.5'	99	27	A	96	
88*	9-16	Lot #17 Warehouse Area	FG	102	23	A	99	

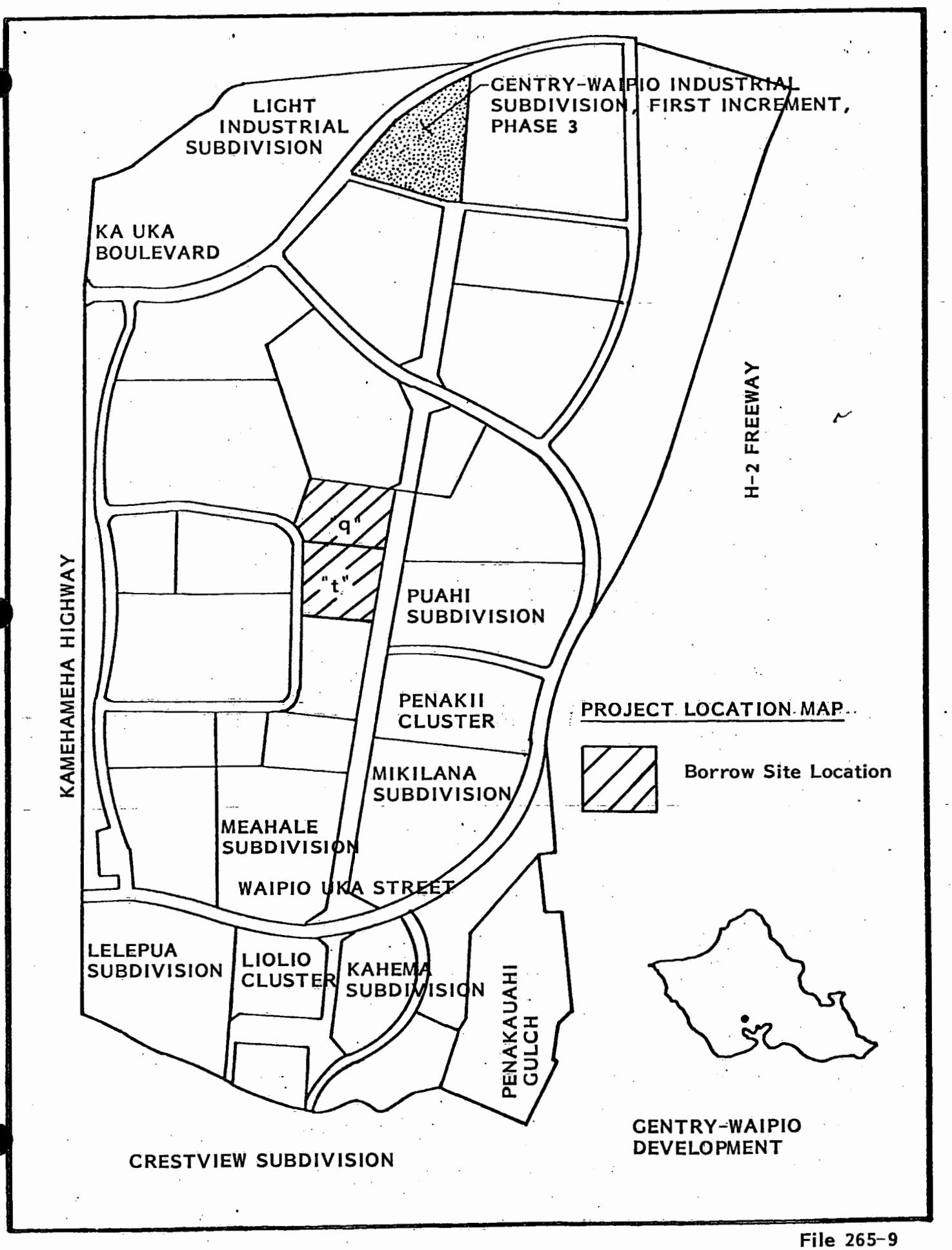
TABLE II (cont'd)

SUMMARY OF FIELD DENSITY TEST RESULTS

Test No.	Date	Location	Elevation	Field Density (pcf)	Moisture Content (%)	Material Type	Compaction (%)	Remarks
	1981							
89*	9-16	Lot #16 Warehouse Area	FG	97	23	A	94	
90	9-16	Roadway	FSG	99	25	A	96	
91	9-16	Roadway	FSG	100	26	A	97	
	1982							
293**	5-19	Road "D"	FSG-0.5'	100	27	C	100	
296**	5-19	Road "D"	FSG	101	27	C	100	
300**	5-20	Road "D"	FSG	99	26	C	99	

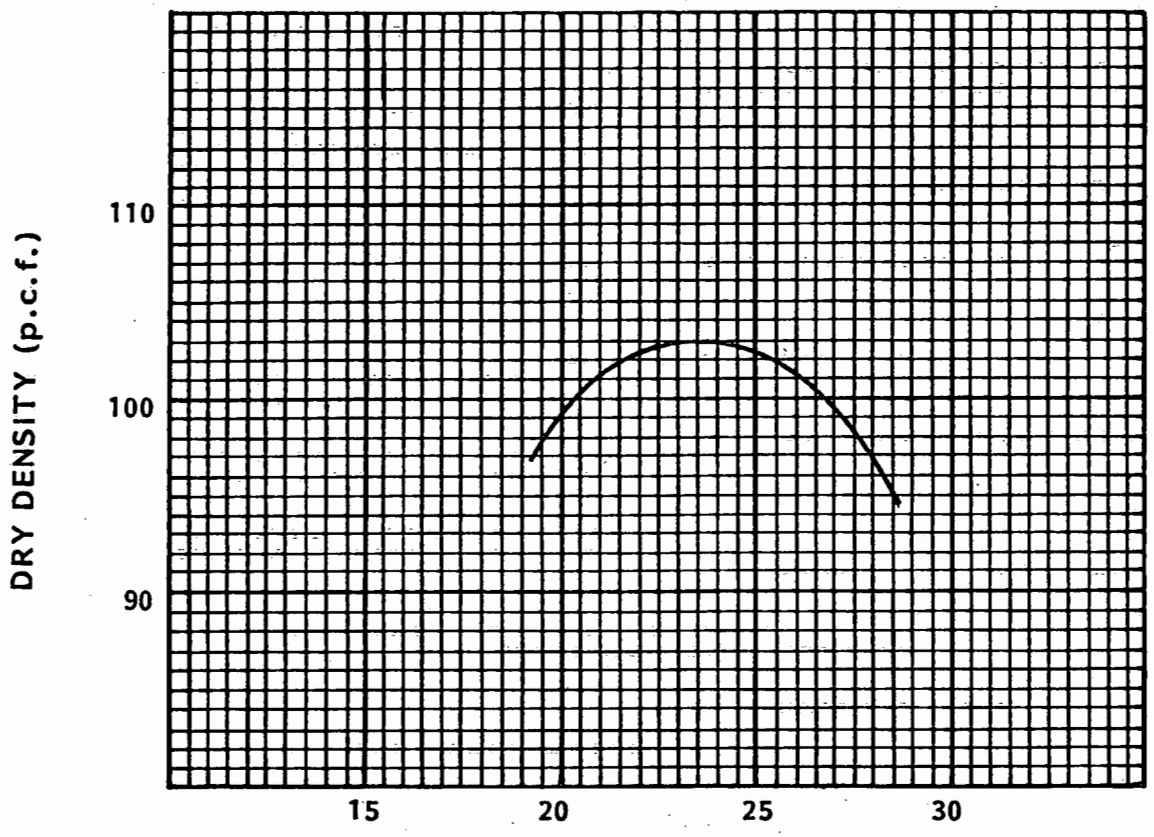
*Test No's 86 through 89 were taken during the individual Lot Grading of Lots 12, 14, 16, and 17 after the completion of the original mass grading of these lots.

**Test No's 293, 296, and 300 were taken during the revised grading for Road "D" during the installation of the utilities and site improvements (FGE, Ltd. File 265-91).



File 265-9
Figure 2

LABORATORY COMPACTION CURVE



Sample: Bag "A"

Description: Reddish Brown Clayey SILT (ML)

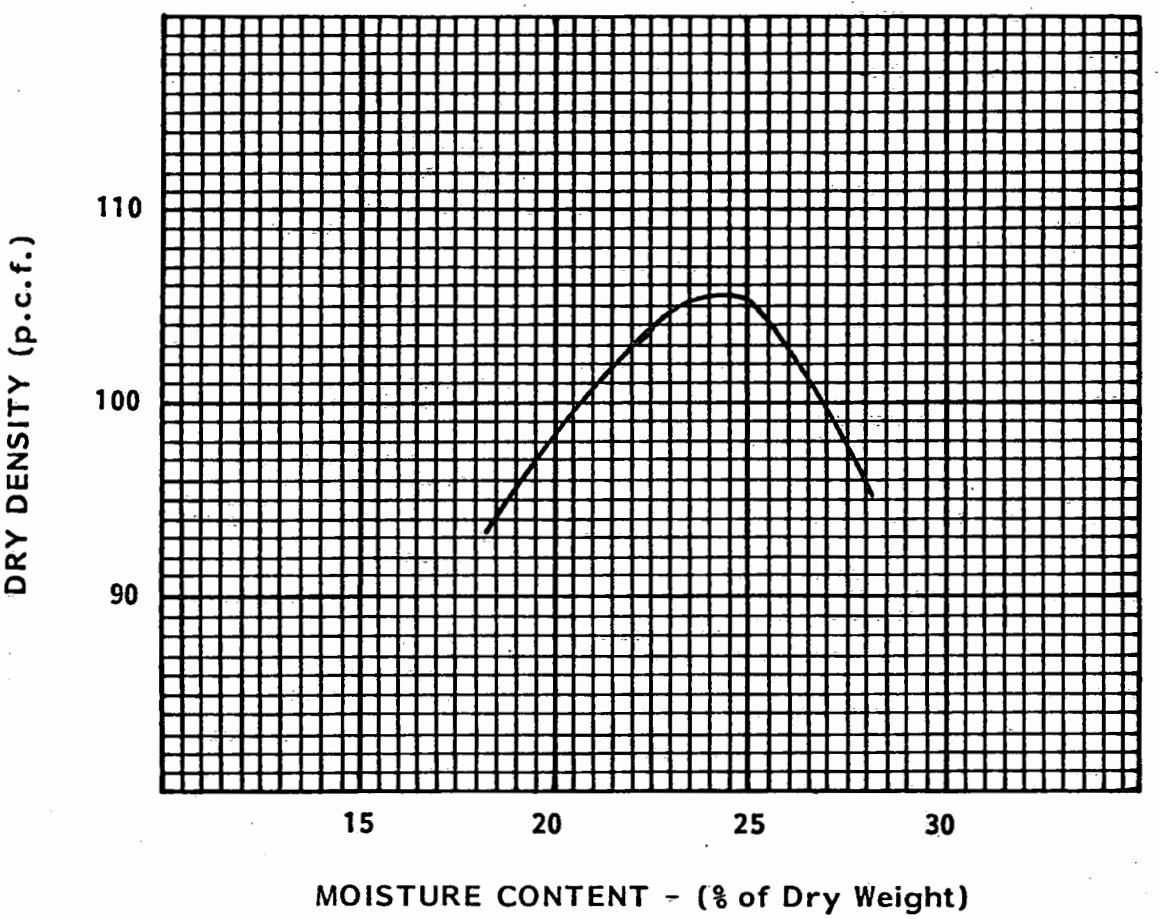
Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 103.0 pcf

Optimum Moisture Content: 23.3 %

File 265-9
Figure 3

LABORATORY COMPACTION CURVE



Sample: Bag "B"

Description: Reddish Brown Clayey SILT (ML)

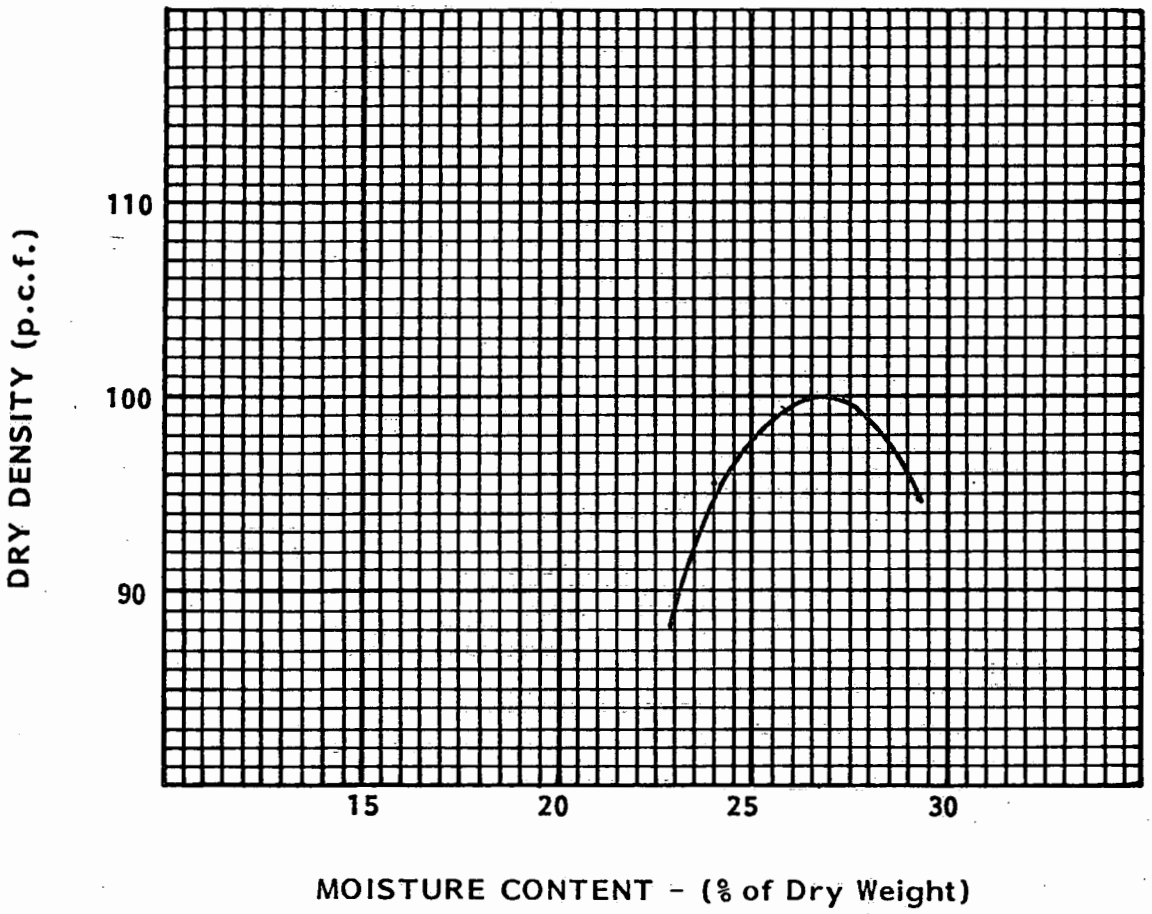
Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 105.4 pcf

Optimum Moisture Content: 24.5 %

File 265-9
Figure 4

LABORATORY COMPACTION CURVE



Sample: Bag "C"

Description: Reddish Brown SILT (ML)

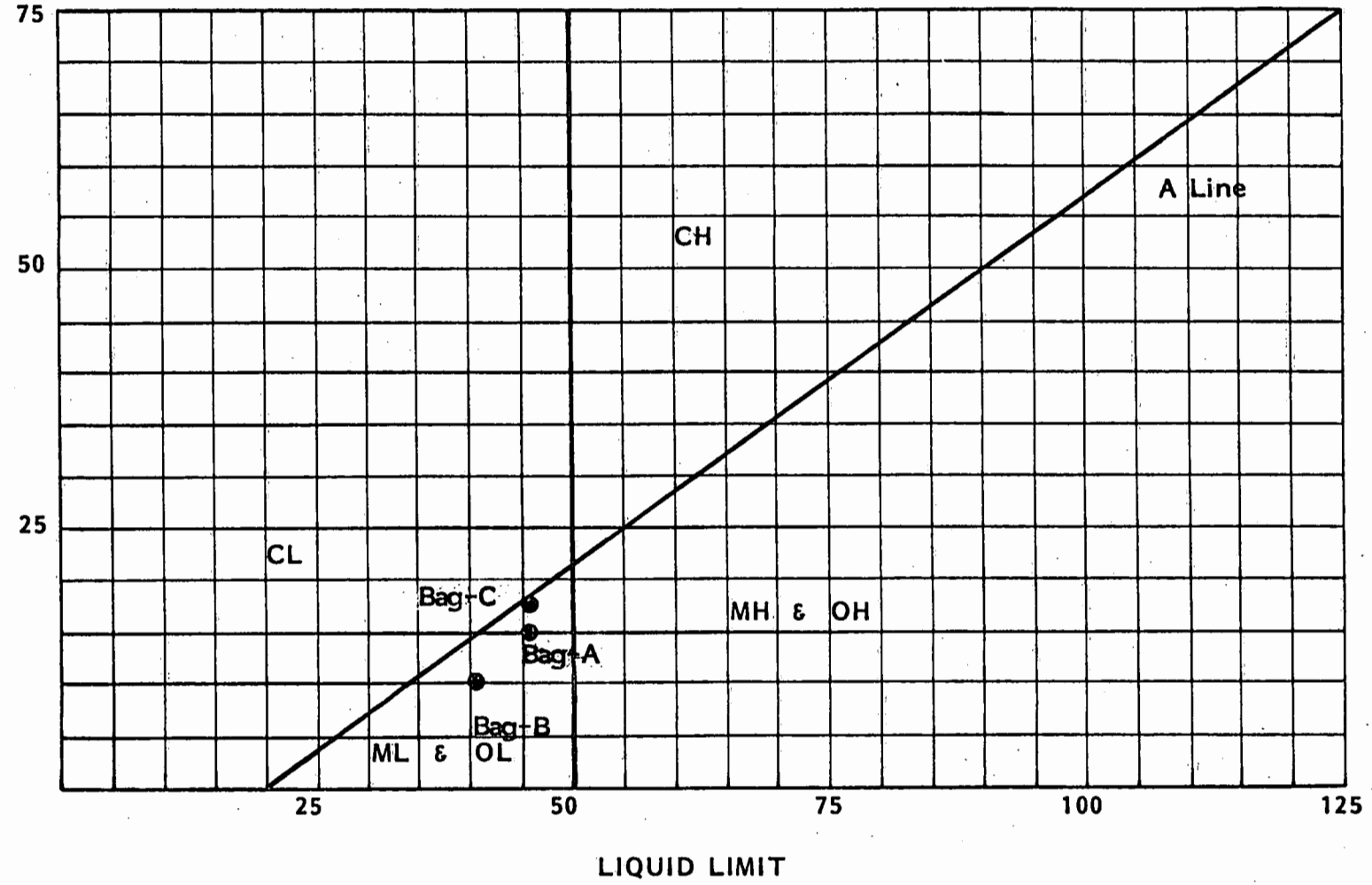
Laboratory Test Procedure: ASTM D1557

Maximum Dry Density: 100.0 pcf

Optimum Moisture Content: 27.0 %

File 265-9
Figure 5

PLASTICITY CHART



File 265-9
Figure 6

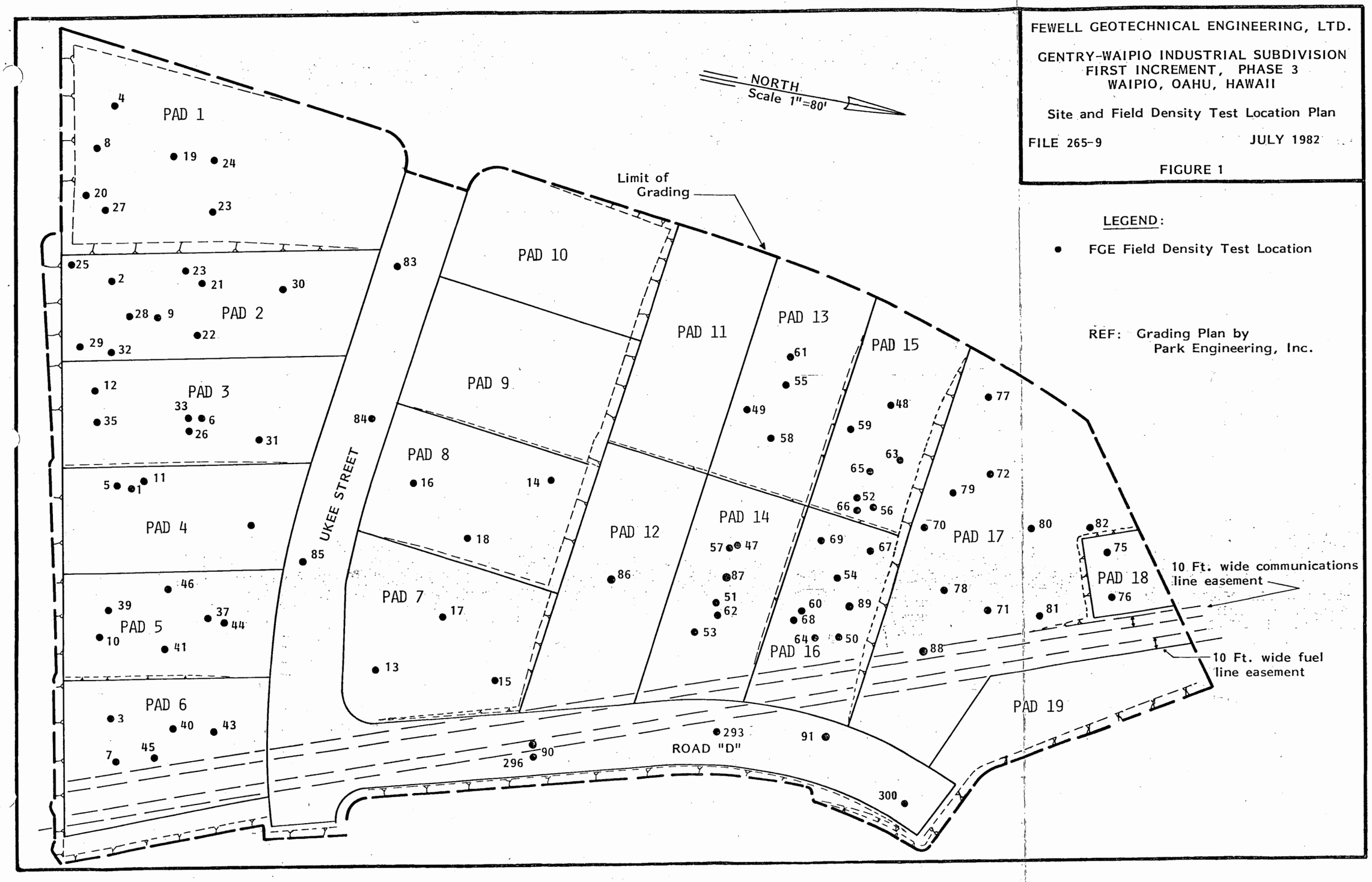
FEWELL GEOTECHNICAL ENGINEERING, LTD.

GENTRY-WAIPIO INDUSTRIAL SUBDIVISION
FIRST INCREMENT, PHASE 3
WAIPIO, OAHU, HAWAII

Site and Field Density Test Location Plan

FILE 265-9 JULY 1982

FIGURE 1



LEGEND:

● FGE Field Density Test Location

REF: Grading Plan by
Park Engineering, Inc.

82 04816
Engrg

park engineering, inc.
Suite 2085, Pacific Trade Center ☐ 190 S. King Street, Honolulu, Hawaii 96813 ☐ Telephone (808) 531-1676

RECEIVED
DIV. OF ENGINEERING
AUG 4 9 08 AM '82

G.P. # 9866

SR-62

RECEIVED
DEPT. OF PUBLIC WORKS
AUG 3 2 05 PM '82
TO

August 2, 1982

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

Attention: Division of Engineering

Dear Dr. Chun:

Subject: Gentry-Waipio Industrial Subdivision
First Increment Phase 3
Tax Map Key: 9-4-06: 8 & 13

This is to certify that grading within the subject subdivision have been completed and substantially conforms to elevations as shown on grading plan.

Attached is Final Grading Report by G.G.E., Ltd.

Sincerely yours,

ROBERT S. TORIGOE
REGISTERED LAND SURVEYOR
No. 1361
HAWAII, U. S. A.

Robert S. Torigoe
Registered Professional Surveyor
Certificate Number 1361-S

ma

Attachment

cc: Gentry Waipio, Ltd.
Royal Contracting Co., Ltd.
F. G. E., Ltd.