PROPOSED SUBDIVISION OF LOT 17-D
OF LAND COURT APPLICATION 1695
SOIL RECONNAISSANCE REPORT

MANANA-UKA, EWA, OAHU, HAWAII
TAX MAP KEY: 9-7-25: POR. 9

FOR REFERENCE
not to be taken from this room

To:
PARK ENGINEERING, INC.

WALTER LUM ASSOCIATES, INC.
CIVIL, STRUCTURAL, SOILS ENGINEERS
JUNE 18, 1973
June 18, 1973

PARK ENGINEERING, INC.
1149 Bethel Street, Room 710
Honolulu, Hawaii 96813

Gentlemen:

Subject: Proposed Subdivision of Lot 17-D
Of Land Court Application 1695
At Manana-Uka, Ewa, Oahu, Hawaii
Tax Map Key: 9-7-25: Por. 9
Soil Reconnaissance Report

In accordance with your request, a reconnaissance of soil conditions
was made for residential development studies at the site of the
proposed Subdivision of Lot 17-D of Land Court Application 1695 at
Manana-Uka, Ewa, Oahu, Hawaii.

The soil reconnaissance consisted of a review of selected soil and
geologic maps and visual observations at the site.

FIELD OBSERVATIONS

The proposed site is located on the west (Wahiawa) side of Waimano
Home Road about 1,000 to 2,000 ft north of the intersection of Waimano
Home Road and Komo Mai Drive.

The site generally slopes down in a westerly direction from Waimano
Home Road at about 3 to 1 or 4 to 1 gradients for about the first 10 to
40 ft, then at about 2 to 1 slopes with steeper localized variations.

From visual observations, most of the sloping grounds are covered with
shrubs. The exposed soils at the top of the slopes may be generally
approximated as surface layers of silty clays over decomposed rocks and/
or boulders. Some rocks or decomposed rock outcrops were noted about
75 to 100 ft below the level of Waimano Home Road. Some loose boulders,
cobbles, rocks and decomposed rocks were also noted along the toes of
slopes.
GEOLOGIC AND SOIL DESCRIPTION BY OTHERS

Geologic Description By Others

According to the Geologic Map of Oahu by Stearns, the slopes and tops of slopes are mapped as Koolau basalts, (Tkb); the northern floor of the ridge as consolidated deposits, chiefly older alluvium (Qa).

Soil Description By Others

According to the U. S. Soil Conservation Service (1972), the surface soils are mapped as follows:

Northern Floor of Ridge

Kawaihapai stony clay loam (KlaB: 2 to 6% slope) Moderate shrink-swell potential; stony in places.

Slopes

Rockland (rRK).

Top of Slope

Lahaina silty clay (LaA & LaB: 0 to 7% slopes) Moderate shrink-swell potential. USGS classification, "CL-ML" soils.

Annual Rainfall

The average rainfall at the proposed site may vary from 50 to 75 inches annually.

DISCUSSION AND RECOMMENDATIONS

The present plan is to construct single-family residences along the top of slope next to Waimano Home Road. Driveways fronting Waimano Home Road are planned for each lot.
In our opinion, single-family residences can be designed for selected areas on the site. The following discussion and guidelines should be considered for development studies:

1. Because the site is situated mostly over sloping ground, no grading or minimum grading on the lots should be considered. Fill should be avoided, if practicable.

2. Post and beam type foundations are recommended for the residences, garages and portions of driveways that extend over slopes.

3. Structures should be designed to tolerate and resist some settlements and as small units on platforms or decks resting on post and beams that would allow floors to be re-leveled should settlements occur. Odd-shaped and split-level structures should be minimized or designed to float as a unit.

4. To minimize the effects of slope creep, the foot blocks should be supported on short pipe piles that extend below an estimated creep zone. The pipe piles should be about 10 ft or more in depth. The foot blocks should be tied up and down the slope.

5. Retaining walls should be avoided or kept to a minimum wherever practicable.

6. Good surface drainage away from the foundation of structures should be maintained and the site graded to prevent ponding of water.

7. The bottom of utility trenches should be daylighted and graded to shed water. The backfill and drainage of utility trenches should be carefully designed. Flexible connections should be used.

Although not noted during the soil reconnaissance, unforeseen conditions such as soft spots, "CH" clay pockets, and seepage water may exist in localized areas. Planning should be kept flexible and adjustments may have to be made in these areas.
Additional explorations including borings and/or probings, and testing of soil samples should be made as the plans for the subdivision are developed.

Attached are the location sketch and limitations.

Respectfully submitted,

WALTER LUM ASSOCIATES, INC.

By [Signature]

Ezra/Koike
LIMITATIONS

In general, soil formations are commonly erratic and rarely uniform or regular. Soil conditions and water levels may change with the passage of time and construction methods or improvements at the site.

If there is a substantial lapse of time between the submission of this report, or if conditions have changed due to natural causes, plan changes, or construction operations at or adjacent to the site, it is recommended that this report be reviewed to determine the applicability of the recommendations considering the time lapse and the changed conditions.

Our professional services were performed, findings obtained and recommendations prepared in accordance with generally accepted engineering practices. This warranty is in lieu of all other warranties expressed or implied.