SECTION 2. SITE CHARACTERIZATION

2.1 Regional Geology

The Island of Oahu was built by the extrusion of basaltic lava from the Waianae and Koolau shield volcanoes. The older Waianae Volcano is estimated to be middle to late Pliocene in age, and the younger Koolau Volcano is estimated to be late Pliocene to early Pleistocene in age. After a long period of volcanic inactivity, during which time erosion incised deep valleys into the Koolau shield, volcanic activity returned with a series of lava flows followed by cinder and tuff cone formations. These series are referred to as the Honolulu Volcanic Series. The project site is at the southwestern flank of the Koolau Mountain Range.

During the Pleistocene Epoch (Ice Age), sea levels fluctuated in response to the cycles of continental glaciation. As the glaciers grew and advanced, less water was available to fill the oceanic basins such that sea levels fell below the present stands of the sea. When the glaciers melted and receded, an excess of water became available such that the sea levels rose to elevations above the present sea level.

The processes of erosion and deposition were affected by these glacio-eustatic sea level fluctuations. When the sea level was low, the erosional base level was correspondingly lower, and valleys were carved to depths below the present sea level. When the sea level was high, the erosional base level was raised such that sediments accumulated at higher elevations.

In the mountainous regions of Hawaii and in the heads of valleys, the erosional processes are dominated by detachment of soil and rock masses from the valley walls and are transported downslope toward the axis of a valley primarily by gravity as colluvium. Once these materials reach the stream in the central portion of a valley, alluvial processes become dominant, and the sediments are transported and deposited as alluvium.

The project site is near the mouth of Kapakahi Valley, which trends roughly north to south from the Koolau Mountain Range toward the Pacific Ocean. Kapakahi Valley is essentially a deep erosional valley carved into the Koolau Shield Volcano by stream processes and mass wasting of the adjacent slopes. As a result, the project site is

generally underlain by colluvial and alluvial deposits followed by Koolau basalt formation. In addition, some fills were placed at portions of the site, as a result of the original roadway construction. The fill materials are believed to resemble the native colluvial and alluvial deposits in character.

2.2 Site Description

The project site is located at the intersection of Kalanianaole Highway and Kalaniiki Street in the Kahala area of Honolulu on the Island of Oahu, Hawaii. The intersection is generally bounded by Kalani High School to the northeast and residential homes to the south and northwest.

Based on our field observations, the project site was observed to be relatively flat with a gentle slope in the eastbound direction of Kalanianaole Highway. Based on the provided project drawings, the existing ground surface elevations of the intersection range from about +16 to +19 feet Mean Sea Level (MSL) with a slope gradient of about 1 percent. At this intersection, Kalanianaole Highway generally consists of three lanes of traffic in each direction with additional left turn only lanes onto Kalaniiki Street in either direction. Kalaniiki and Waieli Streets generally consist of three lanes at the intersection.

Based on the information provided, we understand that two of the existing single pole traffic signals on Kalaniiki and Waieli Streets and two of the existing mast arm traffic signals in the Kalanianaole Highway median will be replaced by Standard Type II Traffic Signals. The layout of the intersection and proposed traffic signal replacement location are presented on the Site Plan, Plate 2.

2.3 Subsurface Conditions

We explored the subsurface conditions at the project site by drilling and sampling one boring, designated as Boring No. 2, to a depth of about 26.7 feet below the existing ground surface. The approximate boring location is shown on the Site Plan, Plate 2.

Our boring generally encountered a pavement structure consisting of approximately 5 inches of asphaltic concrete overlay followed by about 6 inches of Portland cement concrete. Below the pavement, fill material consisting of stiff to very

stiff clay was encountered at a depth of approximately 6 feet underlain by medium hard to hard basalt rock formation extending to the maximum depth explored of about 26.7 feet below the existing ground surface.

We did not encounter groundwater in the boring at the time of our field exploration. However, it should be noted that groundwater levels are subject to change due to rainfall, time of year, seasonal precipitation, surface water runoff, and other factors.

Detailed descriptions of the field exploration methodology are presented in Appendix A. Descriptions and graphic representations of the materials encountered in the boring are presented on the Log of Boring in Appendix A. Results of the laboratory tests performed on selected soil samples are presented in Appendix B. Photographs of core samples recovered from our field exploration are provided in Appendix C.

END OF SITE CHARACTERIZATION