SECTION 2. SITE CHARACTERIZATION

2.1 Regional Geology

The Island of Oahu was built by the extrusion of basaltic lavas from the Waianae and Koolau shield volcanoes. The older Waianae Volcano is estimated to be middle to late Pliocene in age and forms the bulk of the western third of the island. The younger Koolau Volcano is estimated to be late Pliocene to early Pleistocene (Ice Age) in age and forms the majority of the eastern two-thirds of the island. The Waianae Volcano became extinct while the Koolau Volcano was still active, and its eastern flank was partially buried below Koolau lavas banking against its eastern flank. These banked or ponded lavas formed a broad plateau referred to as the Schofield Plateau.

The Schofield Plateau was formed when lavas from the Koolau Volcano ponded against the already eroded slopes of the Waianae Volcano in the late Pleistocene Epoch. The dips of the lava beds are generally near horizontal (between 3 to 5 degrees from horizontal). The lava flows on the plateau have undergone in-situ weathering extending to depths of 50 to 100 feet and are characterized by the red colors of the soil. In general, Kualakai VMS and CCTV, Kunia West CCTV, Waipio CCTV, and H-2 VMS and CCTV sites are located on the southerly side of the Schofield Plateau.

Physical and chemical weathering, followed by erosion of this plateau, generated sediments which were transported to the coast. The Farrington VMS and Palailai CCTV, and Speed Reader 4 sites are generally located in areas of alluvial deposits.

2.2 Existing Site Conditions

The project sites are along Interstate Route H-1 Freeway from the Palailai Interchange to the Kunia Interchange, H-2 near the Waipio Interchange, and Farrington Highway between Laaloa Street and the Palailai Interchange in the Districts of Honolulu and Ewa on the Island of Oahu, Hawaii. The project locations and general vicinities are shown on the Project Location Map, Plate 1. The approximate locations of each site are shown on the Site Plans, Plates 2.1 through 2.9. The following provides a brief description of the existing conditions at each CCTV, VMS, and speed reader site.

2.2.1 Farrington VMS/Speed Reader Site

The VMS/Speed Reader site is located on Farrington Highway to the east of the intersection with Laaloa Street. The VMS will be situated on the right shoulder of the eastbound direction of Farrington Highway. The site is relatively flat with existing ground surface elevations at about +109 to +110 feet Mean Sea Level (MSL). The site is covered with small to medium-sized shrubs.

2.2.2 Palailai CCTV Site

The site is located in the eastbound direction of Interstate Route H-1 Freeway at the Palailai Interchange. The site is generally located at the southwest corner of H-1 Freeway and Kalaeloa Boulevard. The site is relatively flat; however, it is adjacent to the embankment slope of the H-1 westbound exit ramp. The site is covered with grass.

2.2.3 Kualakai CCTV Site

The site is located in the westbound direction of Interstate Route H-1 Freeway at the Kualakai Parkway Interchange. The site is generally located on the top of an embankment at the west corner of H-1 Freeway and Kualakai Parkway. The site is relatively flat with an existing ground surface elevation of about +234 feet MSL.

2.2.4 H-2 VMS Site

The site is located in the southbound direction of Interstate Route H-2 Freeway about 3,800 feet south of the Waipio Interchange. The VMS bridge structure foundations are situated on slopes (about two horizontal to one vertical [2H:1V] inclination) of the median (east side) and the west bank. A retaining wall is present along the west bank of H-2 Freeway. The retaining wall is on the order of about 7 feet high.

2.2.5 Waipio CCTV Site

The site is located near the Interstate Route H-2 Freeway on-ramp for the northbound direction traffic of the Waipio Interchange. The site is relatively flat with existing ground surface elevations at about +481 to +482 feet MSL. The site is covered with grass.

2.2.6 H-2 CCTV Site

The site is located on the median of Interstate Route H-2 Freeway about 3,000 feet south of the Waipio Interchange. The site is relatively flat with existing ground surface elevations ranging from about +396 to +399 feet MSL. The site is covered with California grass.

2.2.7 Kualakai VMS Site

The site is located on the right shoulder of the westbound direction of Interstate Route H-1 Freeway. The site is about 3,700 feet to the east of the Kualakai Parkway Interchange. The site is relatively flat with an existing ground surface elevation of about +221 feet MSL.

2.2.8 Kunia West CCTV Site

The site is located on the right shoulder of the eastbound direction of Interstate Route H-1 Freeway. The site is about 3,300 feet to the west of the Kunia Interchange. The site is relatively flat with an existing ground surface elevation of about +221 feet MSL.

2.2.9 Speed Reader 4 Site

Speed Reader 4 site is located on Farrington Highway about 3,000 feet to the west of the Palailai Interchange. The speed reader pole will be situated on the right shoulder of the eastbound direction of Farrington Highway. The site is relatively flat and is covered with small to medium-sized shrubs.

2.3 Subsurface Conditions

We explored the subsurface conditions at the CCTV, VMS, and speed reader sites by drilling and sampling one boring at each location. In addition, one boring previously drilled for the Freeway Management System, Interstate Routes H-1, H-2 and Moanalua Freeway (H-201), Phase 1C project was used to determine the subsurface conditions near the H-2 VMS structure. The borings extended to depths of about 20.3 to 32.5 feet below the existing ground surface. The approximate boring locations are shown on the Site Plans, Plates 2.1 through 2.9.

The subsurface conditions at each CCTV, VMS, and speed reader location are presented in the following subsections.

2.3.1 Farrington VMS/Speed Reader Site

Boring No. 1, drilled near the Farrington VMS site, generally encountered alluvium consisting of very stiff clayey and silty soils interbedded with boulders extending to the maximum depth explored of about 32.5 feet below the existing ground surface. A thick boulder layer was encountered at a depth of about 13 feet below the existing ground surface and extended to a depth of about 29 feet below the existing ground surface.

2.3.2 Palailai CCTV Site

Boring No. 2, drilled near the Palailai CCTV site, generally encountered alluvium consisting of very stiff to hard clayey silt extending to the maximum depth explored of about 21.5 feet below the existing ground surface.

2.3.3 Kualakai CCTV Site

Boring No. 3, drilled near the Kualakai CCTV site, generally encountered fill consisting of a 2-foot thick layer of very dense silty gravel underlain by clayey silt and boulders extending to a depth of about 14 feet below the existing ground surface. The fill was underlain by stiff to hard residual and saprolitic soils extending to the maximum depth explored of about 21.5 feet below the existing ground surface.

2.3.4 H-2 VMS Site

Boring No. 4, drilled near the H-2 VMS site, generally encountered residual and saprolitic soils extending to the maximum depth explored of about 30.8 feet below the existing ground surface. The residual and saprolitic soils consisted of very stiff to hard silty and clayey soils. Boulders were encountered within the saprolitic soils.

2.3.5 Waipio CCTV Site

Boring No. 5, drilled near the Waipio CCTV site, generally encountered residual soils consisting of very stiff to hard clayey silt and silty clay extending to the maximum depth explored of about 20.6 feet below the existing ground surface.

2.3.6 H-2 CCTV Site

Boring No. 6, drilled near the H-2 CCTV site, generally encountered residual and saprolitic soils consisting of very stiff to hard clayey silt and silty clay extending to a depth of about 19 feet below the existing ground surface. Below the saprolitic soils, basalt rock formation was encountered extending to the maximum depth explored of about 20.3 feet below the existing ground surface.

2.3.7 Kualakai VMS Site

Boring No. 7, drilled near the Kualakai VMS site, generally encountered a thin layer of fill over alluvium consisting of hard clayey silt extending to a depth of about 8 feet below the existing ground surface. Saprolitic soils consisting of very stiff silty clay were encountered below the alluvium and extended to a depth of about 13.5 feet below the existing ground surface. Below the saprolitic soils, very dense weathered basalt was encountered in the boring and extended to a depth of about 17.5 feet below the existing ground surface. Slightly weathered, medium hard basalt rock formation was encountered below the weathered basalt and extended to the maximum depth explored of about 30.5 feet below the existing ground surface.

2.3.8 Kunia West CCTV Site

Boring No. 8 ,drilled near the Kunia West CCTV site, generally encountered alluvium consisting of hard clayey silt extending to a depth of about 6 feet below the existing ground surface. The alluvium was underlain by residual soils consisting of very stiff clayey silt extending to a depth of about 11 feet below the existing ground surface. Below the residual soils, soft to medium hard weathered basalt rock formation was encountered in the boring extending to the maximum depth explored of about 20.3 feet below the existing ground surface.

2.3.9 Speed Reader 4 Site

Boring No. 9, drilled near the Speed Reader 4 site, generally encountered fill consisting of medium dense sandy gravel extending to a depth of about 2 feet below the existing ground surface. The fill was underlain by alluvium consisting of stiff to very stiff clayey silt extending to the maximum depth explored of about 21.5 feet below the existing ground surface.

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

Detailed descriptions of the materials encountered from our field exploration are presented on the Logs of Borings in Appendix A. Results of the laboratory tests performed on selected soil and rock samples are presented in Appendix B.

END OF SITE CHARACTERIZATION