



## **CHAPTER 5: INFRASTRUCTURE AND PUBLIC FACILITIES**

This chapter discusses the environmental consequences on infrastructure and public facilities serving the area resulting from implementing the Proposed Project. Discussion of probable impacts addresses the No Action Alternative and the Proposed Action. The No Action Alternative represents a future scenario “without the project” providing a baseline of future environmental conditions to assess and evaluate probable impacts or changes on infrastructure and public facilities resulting from the Proposed Action.

A Preliminary Engineering Report (PER) was prepared by Sam O. Hirota, Inc. that addressed water, wastewater and drainage infrastructure (SOH, 2018). A copy of this PER is included in Appendix D. A traffic impact analysis report was conducted by Austin Tsutsumi Associates, Inc. and is included in Appendix N. Information from these studies were used to address infrastructure.

### **5.1 WATER FACILITIES**

#### **5.1.1 Existing Conditions**

The Petition Area is an undeveloped site that is not currently serviced by on-site potable water infrastructure. The City Board of Water Supply (BWS) provides potable water service to existing sections of HMP, the Hawai‘i State Veterans Cemetery, Ocean View Garden, and surrounding uses via a network of water transmission mains.

The water system serving HMP is provided by the City’s potable water system from two connections. The main connection point to this system is located at the entrance to HMP in the vicinity of Mahinui Road and Kamehameha Highway. A 6-inch meter on Kamehameha Highway services HMP, and has a capacity of 1,000 gallons per minute (gpm). Ocean View Garden’s irrigation system is serviced via a separate 1-inch lateral coming off a 5/8-inch meter from Kumakua Place.

Water demand generated from HMP consists of operations occurring within existing building and irrigation for cemetery landscape. HMP has about 31,000 sf of floor area for buildings on the property that include administration buildings, baseyard, chapel, and a funeral home. Based upon the City BWS water system standards for planning, these office-related activities would generate about 3,100 gallons per day of water (100 gallons per 1,000 sf of floor area). This existing office water demand should generally remain the same with the project.

The majority of existing water demand is primarily related to irrigation of the cemetery’s landscape, with a smaller portion of water used for cemetery water features and visitor needs (i.e. filling individual containers to water flowers placed on burials). An average of 10,000 gallons of water a day is used by HMP for irrigation of their existing 80 acre cemetery. This average daily

water use was estimated based on an average water demand of 125 gallons per acre per day. Irrigation demand was calculated based upon available 2017-18 water use billings for the Ocean View Garden cemetery. Irrigation water use varies depending upon weather conditions, and HMP's irrigation demand has generally been fairly low to moderate due to the wetter climate conditions in Windward O'ahu. In comparison, BWS planning standards allocate average daily demands of 4,000 gallons per acre for agricultural use, schools, and parks, and 2,500 gallons per acre for single-family use.

## 5.1.2 Potential Project Impact and Mitigation

### No Action Alternative

No impacts to existing water facilities or current demands would occur under the No Action Alternative because there would be no expansion of HMP's cemetery. HMP operations would continue as present and would be serviced by existing municipal water infrastructure. This would not result in conditions requiring upgrade or expansion of these utilities.

### Proposed Action

Consultation with the City BWS for this project indicated their existing water system is adequate to accommodate the proposed expansion of the cemetery (January 17, 2018 [EISPN comment](#) letter in Appendix A). [BWS's review of the Draft EIS further confirmed the water system being adequate to accommodate the project based upon their October 11, 2018 comment letter \(Appendix A\)](#). However, the BWS indicated that the feasibility of using non-potable water for irrigating the cemetery expansion should be first investigated [in their EISPN comment letter](#). It was suggested that the Halekou irrigation wells currently being used to irrigate the Veterans Cemetery should be evaluated for potential use. If non-potable water is either unavailable or infeasible, a report documenting this investigation needs to be submitted to the BWS.

[The feasibility of developing a non-potable water system using the Halekou wells is discussed below. Based upon BWS's review of the Draft EIS, it was recommended that water conservation measures be included, such as utilizing drought tolerant plants, xeriscape landscaping, and efficient irrigation systems. These measures would be incorporated into design plans developed where feasible. However, use of a rain catchment system for non-potable water for irrigation is not feasible given the limited acreage available for cemetery expansion and unpredictability with having a reliable and available source \(e.g. during summer\).](#)

[Further, the existing water system is adequate to support the proposed project and provides a reliable water source. The Petitioner would pay the water system facilities charges for resource development, transmission, and daily storage when water is made available. Construction drawings and the project construction schedule would be coordinated with BWS for review during the project design phase to minimize impacts to the City's water system.](#)

### Project Effect on Potable Water System

¶ **When** the project connects to the City’s existing potable water system, this additional demand created would not have a significant impact on the City’s water system, which is supported by BWS’s comment letters on the existing water system’s adequacy. Given Kāne‘ohe’s wet climate, with annual rainfall averaging about 53.8 inches per year, the need for irrigating grounds would be greatly decreased. Irrigation would only be needed during drier periods, such as during summer months, or during periods of low rainfall. It has been estimated that an average of about 3,500 gpd of water would be needed for irrigation of the expanded cemetery. This estimate is based upon an average use of 125 gallons per acre per day for the Ocean View Garden. With this increased demand, the total average daily water use for irrigation with the project would be 13,500 gpd.

Site improvements propose to connect the cemetery expansion area’s irrigation system to the City’s existing waterline at the end of Kumakua Place. There is already an existing waterline being used to irrigate the Ocean View Garden site. The existing 5/8-inch meter serving Ocean View Garden would need to be upgraded to a 2-inch water meter to accommodate the additional water flow needed (SOH, 2018). The water source serving Kumakua Place is from a reservoir at the 500-foot elevation, and should have adequate water pressure for the proposed cemetery expansion to service cemetery elevations that reach a maximum of 360 feet AMSL.

There is another waterline in Lipalu Street that was considered for connection. However, this alternative was not feasible because the existing system will not have the required pressure to service cemetery expansion areas. The existing 272-foot windward reservoir service limit is not high enough to support the proposed cemetery elevations. The highest elevation that can adequately receive water from an existing system is 100 feet below the reservoir spillway at elevation (service up to 172-foot elevation).

### Preliminary Non-Potable Water Use Evaluation

Based upon a preliminary assessment, it was determined that it would not be feasible to utilize a non-potable water source for the project because: 1) developing a well within the Petition Area or existing HMP cemetery area are not feasible or practicable, and 2) the Halekou well system would not be sufficient to service additional demand from the cemetery expansion area. Further evaluation and a report documenting these results would be prepared during the project’s design phase for submittal to the BWS.

The existing shallow well and seep located within the Petition Area east of Ocean View Garden cannot be used for irrigation because there is insufficient water capacity. Based upon the groundwater study conducted, this well is served by perched water from a relatively small area overlying the impermeable Ko’olau volcanics beneath. Furthermore, drawing water from this well would impact the natural discharge of ~~subsurface water~~ ~~groundwater~~ moving downslope into the seep located below it, and consequently impact habitat for the endangered Hawaiian damselfly.

Other areas within the Petition Area and HMP property are also not suitable in the development of even a moderate capacity well anywhere due to the Kailua volcanics beneath. This area is located over basalt flows that are dense, massive, and relatively impermeable due to almost the complete filling of interstices with secondary minerals resulting from hydrothermal alteration. Clinker beds, where they occur, have been cemented into hard and essentially impermeable breccia. Joints of intruded dikes are also filled with secondary minerals. In addition, the deep weathering of the Kailua volcanics across the area has resulted in stiff silt and clay residual soils underlain by saprolite to depths exceeding 50 feet making development of a well impractical (TNWRE, 2018).

The State Department of Defense (DOD) uses non-potable water to irrigate the Veterans Cemetery. There are six non-potable wells (Halekou irrigation wells) located on State property near the H-3 and Kamehameha Highway interchange that are being used. The elevation of the well heads is approximately 240 feet AMSL. The elevation of the Veterans Cemetery ranges from 300 to 340 feet AMSL, which is comparatively higher. The existing irrigation system at the Veterans Cemetery is known to function properly. It is unknown whether all wells are being utilized (HHF, 2008).

Engineering analysis discussed in the PER determined that connection to the State's non-potable Halekou well water system serving the Veterans Cemetery would not be feasible. Irrigation via this system is infeasible given upgrades that would likely be needed to service additional project water demands. System pumps would likely require upgrades in order to overcome additional friction loss from the additional length of pipeline required and higher static head pressures resulting from the cemetery expansion area's comparatively higher elevation relative to the well system. Higher elevation portions of the cemetery expansion area are located at approximately 360 feet AMSL which is considerably higher than the Halekou irrigation system well heads located at approximately 240 feet AMSL. Without pump upgrades, sufficient water pressure could not be achieved to irrigate higher elevation portions of the cemetery expansion area.

## **5.2 WASTEWATER FACILITIES**

### **5.2.1 Existing Conditions**

The City Department of Environmental Services (DES) provides municipal wastewater collection and treatment in the Kāneʻohe district via a system of wastewater pump stations and sewer lines. The Petition Area is currently undeveloped and is not served by the City's wastewater system.

#### **Wastewater Collection System**

Sewer mains and laterals are located within City streets in the vicinity of HMP and the Petition Area and include an 8-inch municipal transmission line in Lipalu Street. This infrastructure collects wastewater from nearby residential subdivisions. There are no sewer lines within Kamehameha Highway fronting the HMP site. As a result, HMP is not serviced by this municipal

system, and wastewater generated by HMP's present facilities are treated by an approved septic system. The Hawai'i State Veterans Cemetery wastewaters are serviced by a sewer lateral extending from Kumakua Place.

Wastewater from residential subdivisions in the Petition Area vicinity are conveyed by area sewer mains to the Kāne'ōhe Wastewater Pre-Treatment Facility (WWPTF) for pre-treatment. Transport of wastewater in force mains is aided by area pump stations. The nearest pump station to HMP and the Petition Area is the Halekou Waste Water Pump Station.

Wastewater from the Kāne'ōhe WWPTF is then conveyed via the Kāne'ōhe/Kailua Force Main No. 1 to the Kailua Regional Wastewater Treatment Plant (WWTP). This force main begins at the Kāne'ōhe Effluent Pump Station located within the fenced site of the Kāne'ōhe WWPTF. This force main travels underground along the makai boundary of the Bay View Golf Park and the Kokokahi YMCA, turning mauka to Kāne'ōhe Bay Drive. The sewer main continues beneath Kāne'ōhe Bay Drive until it reaches the Kailua Regional WWTP.

The Kailua Regional WWTP was originally built in 1965 to serve the town of Kailua and surrounding communities. The wastewater treatment plant now serves the Ko'olaupoko District that encompasses Kahalu'u, Kāne'ōhe, Kailua, and Maunawili (USEPA, 2010). Treated effluent is then discharged into Kailua Bay via the Mokapu outfall that is located over 5,000 feet offshore at an average depth of 110 feet.

The City is currently in the process of constructing a new three-mile-long wastewater treatment tunnel that will connect the Kāne'ōhe pretreatment facility with the Kailua Regional WWTP. The tunnel is the largest sewer project in state history, according to the City, and will replace an older force main that has been subject to numerous failures. It is part of Honolulu's ongoing efforts to eliminate sewer overflows and spills.

## **5.2.2 Potential Project Impact and Mitigation**

### **No Action Alternative**

Impacts to existing municipal sewer facilities are not anticipated under the No Action Alternative. Wastewater produced through HMP operations would continue to be serviced by an approved septic system. Upgrade or expansion of these utilities would not be required. The Veterans Cemetery operations would remain similar to present and additional wastewaters would not be produced.

**Proposed Action**

Adverse impacts to existing municipal wastewater infrastructure are not anticipated as a result of implementation under the Proposed Action. The project does not include improvements, such as restrooms, that would generate increased wastewater impacting the City’s system. As a result, improvements to existing municipal wastewater infrastructure would not be required. No mitigation is necessary.

**5.3 DRAINAGE FACILITIES**

**5.3.1 Existing Conditions**

Existing municipal drainage facilities are available within the residential subdivisions surrounding HMP and within the subdivisions below the Petition Area. These facilities were generally developed as part of existing residential subdivisions. The municipal system generally consists of various storm drains within roadways, inlets, and catch basins that collect runoff from the street.

There are no City drainage facilities within Kamehameha Highway fronting HMP and surrounding areas. Highway drainage facilities are maintained by the State Department of Transportation. There are existing concrete lined drainage ditches routed along Kamehameha Highway within the State’s right-of-way fronting the HMP property that collect stormwater runoff and discharge into periodic catch basins as shown on Exhibit 5.1.



Northwest View of Drainage Facility Along Highway  
at HMP’s Main Entrance

Southeast View of Drainage Facility Along Highway  
at HMP Entrance Across Mahinui Road

**Exhibit 5.1 Photos of Existing Drainage Facilities Along Kamehameha Highway**

### **Existing Drainage System Serving Petition Area**

Within the Petition Area, stormwater runoff generally sheet flows downslope in a north-northwesterly direction following natural ephemeral drainageways and lower lying areas based upon the site's current topography. Stormwater sheet flowing toward the Pikoiloa subdivision is first collected by City drainage swales. This system of swales was designed to collect and convey stormwater to existing City catch basin structures.

Approximately six catch basins identified along the Petition Area border the residential properties, with two larger structures situated at the end of Lipalu Street and Ohaha Place. Exhibit 5.2 includes photos of the catch basin at the end of Ohaha Place as well as the general area where the catch basin at the end of Lipalu Street is situated. Prior inspection of these swales indicated they were poorly maintained with residents noting flooding has occurred when the swales became overwhelmed.



Stormflow that cannot be accommodated by the municipal system sheet flows further downslope to a privately owned drainage system. This system is located along the mauka property line of Pikoiloa subdivision properties bordering the Petition Area boundary. This drainage system consists of a series of swales. Each property owner is responsible for maintaining the portion of the drainage system within their property. Runoff collected by the municipal and private systems is eventually channeled into Kāwā Stream, and later discharges into Kāneʻohe Bay.

A preliminary engineering report prepared in 2008 for an earlier project proposal (HHF, 2008) obtained hydrology studies from the City and County that were completed as part of the Drainage Master Plans for the Pikoiloa subdivisions. Approved Drainage Master Plans were required to address all stormwater requirements prior to the development of any subdivision. Based on these documents, it appeared that the collection of the existing stormwater runoff quantities from the

Petition Area were addressed as part of the development of Pikoiloa 9, Pikoiloa 10, and Parkway Subdivisions via various collection points in the residential areas.

A hydraulic analysis of the drainage system was conducted after further evaluation of the existing storm drain infrastructure based upon construction documents recorded with the City. This downstream system was designed to meet current, undeveloped conditions within the Petition Area for the 10-year, 1-hour storm. This system analysis, based on the existing stormwater runoff quantities referenced from Drainage Master Plans and full system hydraulic flow calculations, showed that the existing drainage system was adequate for the current, undeveloped conditions within the Petition Area. However, it may have little excess capacity to accommodate additional peak runoff (HHF, 2008).

### **Current Evaluation of Petition Area**

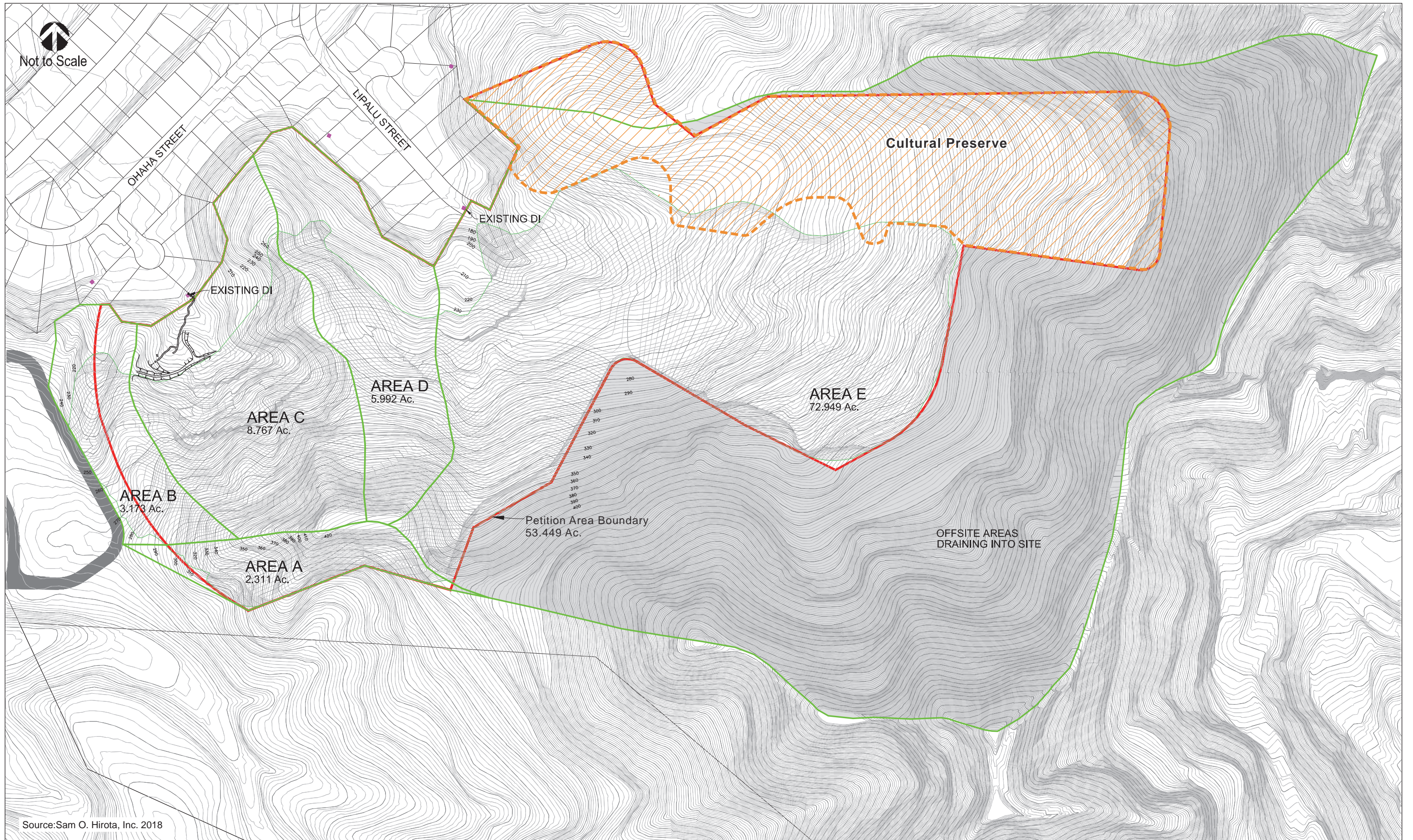
The undeveloped Petition Area is densely vegetated with large canopy trees in the western portions of the area. During recent field investigations, it was noted the canopy, primarily from invasive albizia trees, prevented sunlight from filtering through. This is prevalent on the western portion of the site, where minimal ground cover is evident and some erosion is occurring. The eastern portion of the site has a smaller canopy trees, more ground cover, and heavy vines over boulders due to more sun exposure.

Drainage calculations were prepared in accordance with the City DPP's updated Storm Drainage Standards for the 10-year and 100-year, 1-hour storm events, dated August 2017. These calculations are discussed in detail in the PER included in Appendix D. For the purpose of the project drainage assessment, the drainage area encompasses both the 53.45 acre Petition Area and the surrounding upslope watershed area for a total of 93.2 acres. The drainage area used for this study is shown on Figure 5.1.

As shown on Figure 5.1, there are a total of five sub drainage areas (Areas A to E). Area E is the largest and includes the central and eastern portions of the cemetery expansion along with the Cultural Preserve. This area corresponds to the Lipalu watershed previously discussed in Chapter 3 that drains into the catchment basin at the end of Lipalu Street. The other four drainage areas serve the smaller western watershed area that discharge into the catchment basin at the end of Ohaha Place.

The Petition Area also consists of offsite drainage areas in addition to onsite drainage areas. Offsite drainage areas include land mauka of the Petition Area, to an elevation of 670 feet MSL. A standard runoff coefficient of 0.35 is assumed for storm events, representing a conservative value for timber lands of moderate to steep slopes. Flows for the 10- and 100-year storms are estimated to be approximately 110 cfs and 174 cfs, respectively.





**Existing Drainage Areas**

**Figure 5.1**

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## **5.3.2 Potential Project Impact and Mitigation**

### **No Action Alternative**

Drainage conditions within the Petition Area would remain similar to existing conditions under the No Action alternative, and would not include any upgrade or improvements to existing drainage facilities. The topography of the Petition Area would allow for stormwater to continue sheet flowing toward lower lying areas following natural drainageways and into the City's existing swales and catchment structures on Lipalu Street, Ohaha Place, and elsewhere.

Concrete swales on residential properties downslope from the Petition Area would likely continue to be poorly maintained, and residents would probably continue to experience periodic flooding on their property, especially during storms greater than the 10-year event. This is because existing drainage facilities are sized for the 10-year, 1-hour design storm, and have little excess capacity to accommodate additional peak runoff. Erosion would continue to occur, particularly within the western portion of the Petition Area because the heavy tree canopy would continue to prevent sunlight from filtering to the ground inhibiting groundcover growth.

### **Proposed Action**

The project will change ephemeral drainageways and drainage patterns within the cemetery expansion area as a result of grading activities; however, this change would not have an adverse effect on overall drainage conditions. The rate of stormwater runoff and the volume of runoff being discharged from the Petition Area would change with the implementation of the Proposed Action. Overall, grading improvements would have a beneficial impact on existing drainage conditions by reducing the volume of stormwater runoff and improving the quality of water being discharged.

Project improvements proposed would change existing site conditions from undeveloped forest to a predominantly landscaped grass area. Topographic conditions would change to create a more level site with sloped grades of less than 20%.

Therefore, runoff rates are expected to decrease because the reduction in slope and the development of landscaped groundcover would increase permeability. Reduction of stormwater runoff rates would result in a corresponding reduction of runoff volumes. Landscaped groundcover will enhance stormwater infiltration and create a vegetated buffer strip serving as a low impact development (LID) improvement. Stormwater would continue to travel in a north-northwesterly direction downslope through the Petition Area for eventual discharge into the City's existing drainage facilities.

Approximately 2 acres of impervious surface would be added to the Petition Area from development of new roadways. After project implementation, the remainder of the Petition Area would consist of cemetery lands, undeveloped land within the Cultural Preserve, and mountainous terrain mauka of the Petition Area. Project implementation results in a 2% total increase in impervious area within the 92.3 acre drainage area. The Cultural Preserve would remain unchanged and would have minimal change to stormwater runoff.

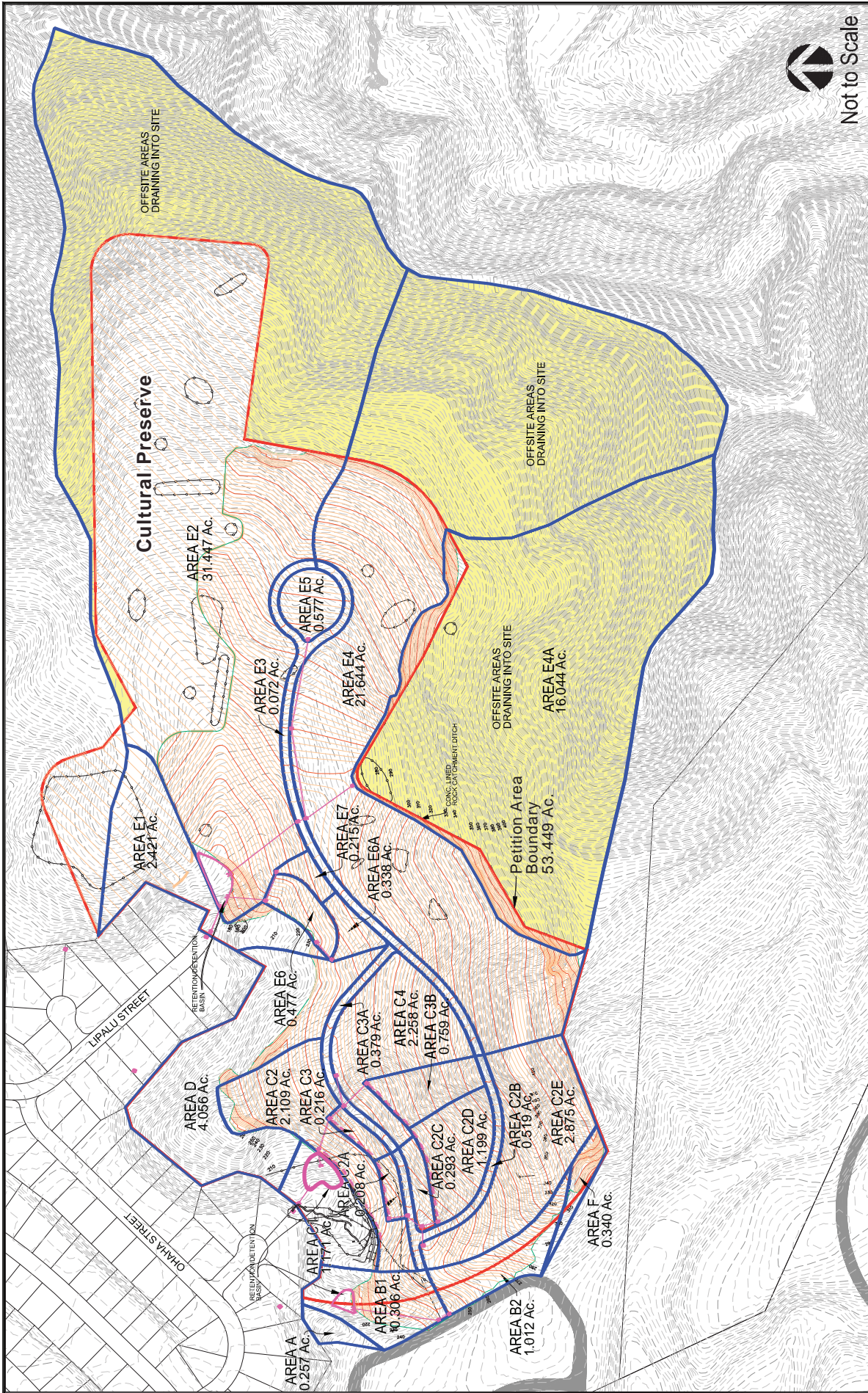
Projected Change to Runoff Rates and Volumes

Figure 5.2 shows the new drainage areas proposed based upon proposed grading plans. The five main drainage areas have been divided into subareas, appropriately named, to graphically show the changes occurring to the site’s drainage pattern. Drainage improvements consisting of detention basins are also shown and discussed in more detail below. Projected stormwater runoff rates associated with the project were calculated for the 10-year and 100-year, 1 hour storm events. Results of these calculations are shown in Table 5.1.

<b>Table 5.1 Proposed Runoff Rates</b>					
	<b>Rainfall Intensity 10yr-1hr (inches)</b>	<b>Rainfall Intensity 100yr-1hr (inches)</b>	<b>Runoff Coefficient</b>	<b>Flow Q<sub>10</sub> (cfs)</b>	<b>Flow Q<sub>100</sub> (cfs)</b>
<b>Existing Conditions</b>	2.96	4.63	0.35	110.3	173.9
<b>Proposed Conditions</b>	2.96	4.63	0.25 - 0.35	106.1	166.0
<b>Differential</b>				<b>-4.2 (-4%)</b>	<b>-7.9 (-4%)</b>
Source: SOH, 2018					

The proposed project would result in the reduction of the runoff flow rate due to: 1) a decrease in the slope of the large open portion of the site; 2) improved site permeability with proposed turf grass landscaping; 3) reduced runoff coefficient on an average of 0.25-0.35; 4) reduced runoff velocity; and 5) increased time of runoff concentration within the Petition Area. These factors result in a reduction of the 10-year and 100-year storm water flows by 4.2 cfs and 7.9 cfs, respectively.

The resulting decrease in runoff rate would also produce a decrease in runoff volume. Providing a well landscaped, stable surface for stormwater infiltration would contribute to the reduction in the overall volume of water leaving the site. Projected runoff volumes are outlined in Table 5.2. As shown, the proposed project would reduce the volume of stormwater runoff by 18,665 cf and 29,180 cf for the 10-year and 100-year storms, respectively. This amounts to a beneficial 5.5% decrease in runoff volumes.



Source: Sam O. Hirota, Inc. 2018

**Proposed Drainage Improvements**

**Figure 5.2**

Hawaiian Memorial Park Cemetery Expansion Project Final Environmental Impact Statement  
 Kāne'ōhe, O'ahu, Hawai'i

	Rainfall Intensity 10yr-1hr (inches)	Rainfall Intensity 100yr-1hr (inches)	Runoff Coefficient	Volume V <sub>10</sub> (cf)	Volume V <sub>100</sub> (cf)
<b>Existing Conditions</b>	2.96	4.63	0.35	350,465	548,194
<b>Proposed Conditions</b>	2.96	4.63	0.25 - 0.35	331,810	519,014
<b>Differential</b>				<b>-18,665</b> (-5.5%)	<b>-29,180</b> (-5.5%)
Source: SOH, 2018					

Proposed Drainage Improvements

The City recently adopted new “Rules Relating to Water Quality” under their Administrative Rules, Title 20, Department of Planning and Permitting (August 2017). These new rules address water quality both during the construction and post-construction periods. Under these rules, the cemetery expansion is defined as a “Priority A” project, which involves land disturbance of one or more acres. Post-construction stormwater requirements include: incorporation of appropriate LID strategies and source control BMPs, including on-site retention of the water quality volume (WQV) or biofiltration BMPs for the remaining portion of the WQV not retained on-site.

The WQV is defined as the design storm runoff depth, times the volumetric runoff coefficient, times the drainage management area, times the percentage of impervious area on site. For this calculation, the design storm runoff depth is one inch for basins and the water quality volume is approximately 12,700 cf for the 33.6-acre of disturbed area within the Petition Area. Therefore, planned drainage improvements include the use of two LID strategies and source control BMPs in order to meet the new requirements: 1) retention/detention basins, and 2) vegetative buffers.

Proposed roadways would be graded to direct runoff to drain inlets located adjacent to these roads as shown on Figure 5.2. Runoff from drain inlets would be piped through drain lines conveying stormwater to lower portions of the site where three permanent retention/detention basins are proposed. These and other basins would initially be constructed to handle sediment laden runoff resulting from grading activities during construction. Three of these basins proposed for the lower portion of the site would remain as permanent post-construction LID improvements. The basins would function as a detention system and retain stormwater for water quality purpose.

As discussed in Chapter 2, it is projected that an additional 12,700 cubic feet (cf) of storage and infiltration would be accommodated by proposed grading plans. Stormwater from the cemetery expansion would be detained and allowed to infiltrate within permanent detention basins. These basins could retain a temporary pool of water that is designed to drain between storm events. Outlets would be designed to be no smaller than 4 inches in diameter allowing a basin to drain completely within 48 hours when full, and 24 to 36 hours when half full. An emergency spillway

would also be designed to allow the basin to safely overtop when experiencing a larger storm event.

Detention basins would reduce the volume of stormwater discharge from the site by an additional 3% for the 100-year, 1-hour storm event. Therefore, the cumulative total decrease in runoff volumes during a 100-year storm event with improved site conditions (reduced rate, infiltration, etc.) and detention basins, would be about 8.5%. Runoff volumes for the 10-year storm would similarly be reduced by about 8.5% in total. A summary description of the detention basins is provided:

1. Detention Basin A. A smaller detention basin of about 1,500 square feet in size is located on the western end of the Petition Area. This basin is intended to detain stormwater runoff for the area along the edge of the Ocean View Garden site and the western edge of the cemetery expansion.
2. Detention Basin B. This detention basin is about 4,500 square feet in size, and is located in the northwest area of the cemetery expansion. This basin is intended to collect stormwater runoff from this western area where the hillside would be excavated, and would drain into the existing drainage culvert behind residences at Ohaha Place.
3. Detention Basin C. This detention basin is about 5,000 square feet in size, and is located in the central area of the cemetery expansion site near the end of Lipalu Street. This basin is intended to generally collect stormwater runoff from the central portion of the Petition Area. This basin would have a drain connecting to the existing drainage culvert at the end of Lipalu Street.

Project development would also result in a vegetated buffer strip between the cemetery and lower lying areas. A vegetated buffer strip is a grassy slope vegetated with turf grass that is designed to accommodate sheet flow and removes pollutants by vegetative filtration.

Stormwater would eventually drain from all detention basins through outlet structures that direct flow to pipes outletting adjacent to existing catchment structures on Lipalu Street and Ohaha Place. No impacts are expected to these catchment structures because of the projected reduction in runoff volume and flow rates. Additionally, construction of the project is not expected to damage existing Lipalu Street and Ohaha Place catchment structures. No work would occur within these catchment structures. However, if any damage occurs they would be repaired to City standards with acceptance by the City.

In summary, proposed improvements would reduce runoff volume by about 8.5% for the 10 and 100-year, 1 hour storm events relative to existing conditions. Given that existing drainage structures presently appear to lack capacity beyond the 10-year storm event they were designed for, proposed improvements would beneficially impact the structures and reduce potential flooding for downstream residences. Based upon proposed drainage improvements, no further mitigative measures are necessary.

## **5.4 SOLID WASTE FACILITIES**

### **5.4.1 Existing Conditions**

The City Honolulu Department of Environmental Service (DES) Refuse Division collects municipal solid waste and recyclables for single-family residences. The DES also provides this service for a limited number of multi-family properties, non-residential customers, and City agencies on O‘ahu. Bulky items are collected on a monthly basis and disposed of at the Waimānalo Gulch Sanitary Landfill, O‘ahu’s only municipal solid waste landfill located in west O‘ahu.

Recyclable materials like glass bottles and aluminum cans are sorted and shipped to remanufacturing facilities to be made into new products (Department of Environmental Services, 2005). Low-grade paper and plastics that were not disposed as recyclables are processed at the Honolulu Program of Waste Energy Recovery (H-POWER) waste-to-energy facility. The H-POWER energy recycling plant is located in Campbell Industrial Park in west O‘ahu. Construction and demolition debris are taken to the privately-owned PVT Nānākuli Construction and Demolition Material Landfill.

The City DES operates 10 waste processing areas on O‘ahu that include six drop-off convenience centers, three refuse transfer stations, and a landfill. Only residential waste is accepted at convenience centers. This waste includes municipal solid waste, green waste, batteries, and bulky items. Combustible refuse is sent to the H-POWER waste-to-energy plant, while noncombustible waste is sent to the landfill. Bulky items including appliances, tires, and auto batteries are sent to recycling facilities.

#### **Current Waste Processing in Region**

Transfer stations are open to commercial and residential waste. Rules and procedures for drop off convenience centers are applicable to City DES transfer stations. The Kapa‘a Refuse Transfer Station, located on Kapa‘a Quarry Road is the closest City DES waste processing facility to HMP. The Kapa‘a Transfer Station is one of the two largest facilities operated by the City, and is operational every day of the week except for select holidays. The transfer station has a receiving limit of 500 tons of municipal solid waste per day (Beck, 2008).

The Petition Area is located within the City’s Ko‘olaupoko collection district that serves the area along the entire windward coastline from Waimānalo to Kahuku. The Petition Area is not serviced by municipal refuse collection services as the site is undeveloped and does not generate solid waste needing to be collected. Waste collection at HMP is provided by a private waste hauler, and is taken directly to City disposal facilities at H-POWER or the Waimānalo Gulch Sanitary Landfill.

The City provides curbside green waste collection for single-family residences. City collected green waste is transported to an offsite green waste processing facility, Hawaiian Earth Products (HEP). HEP has three facilities on O‘ahu, with one facility located in Waimanalo. These facilities



process green waste from homeowners, commercial yard services, and government and commercial sources into compost and mulch. Households can also deposit green waste at City DES waste drop-off convenience centers and transfer stations, which are then transported to HEP.

Green waste generated by commercial and governmental sources are not collected by the City. Therefore, private entities such as HMP, must dispose of green waste themselves or contract disposal through a private hauler. Although City transfer stations collect green waste from commercial and governmental sources, transport trucks are limited to a maximum of 10 percent green waste per load at these facilities. Green waste generated from commercial and governmental sources is banned from landfill disposal. HMP operational protocol does not prescribe removal of greenwaste generated from onsite landscaping activities. This greenwaste is left to decay onsite.

## **5.4.2 Potential Project Impact and Mitigation**

### **No Action Alternative**

Under this alternative, operation of existing areas of HMP would continue. A private waste hauler would continue to collect, transport, and dispose of solid waste generated onsite. Green waste (vegetation cuttings and debris) would continue to be generated from site landscape maintenance activities. This greenwaste would continue to be disposed of on site. Operation of HMP under this alternative would not generate additional impacts on municipal collection services from what is already occurring.

### **Proposed Action**

Under the Proposed Action, construction of site improvements, roadways, retaining walls, etc. would generate construction debris that would need to be taken to the PVT Nānākuli Construction and Demolition Material Landfill for disposal. Solid waste generated from construction of these improvements would be typical of construction related activities and would have a short-term impact. This waste would consist primarily of vegetation and rocks. The construction contractor would be responsible for disposal of this waste.

The amount of construction debris generated is expected to be significant mainly because of the volume of excess materials generated from site excavation activities. About 57,300 cubic yards of excess material would remain after site grading activities are completed. This excess material would be utilized within the existing HMP site to the extent possible. However, remaining quantities would need to be disposed of at the private Nānākuli landfill site. Construction would occur in phases, so excess material needing disposal would occur over the entire construction period (about 12 months).

Once the project has been completed, long-term cemetery operations should not generate much additional solid waste and should have a minimal impact on solid waste processing facilities. Project implementation would increase the number of burial services that could occur in the Petition Area. Waste generated from these services would continue to be collected and disposed of by a private waste hauler.

Cemetery expansion would also require additional landscape maintenance that will generate some green waste, primarily grass cuttings and flowers left at burial plots. Additional green waste generated would not be significant and would continue to be left on site to decompose. Decomposition of small, dispersed quantities of greenwaste should not result in the creation of excessive noxious odors that would impact sensitive land uses in the vicinity.

Activities associated with the Cultural Preserve are not expected to generate a lot of solid waste and debris. Such material would likely consist of landscape trimmings and other vegetation as part of cultural landscape restoration and cultural practices. This material could be disposed of as part of other vegetative material processed by HMP under their existing operations.

## **5.5 ELECTRICAL AND COMMUNICATION FACILITIES**

### **5.5.1 Existing Conditions**

Electrical service is provided to HMP by the Hawaiian Electric Company (HECO) via overhead subtransmission lines located on utility poles. These utility poles are routed along roadways in the vicinity of the Petition Area. Primary subtransmission lines in the area provide between 4,000 and 12,000 volts of power (4 to 12kV). Secondary, or distribution, lines are located on utility poles below the primary lines, and bring electrical power to smaller customers (e.g. residences, businesses).

Subtransmission lines servicing HMP are routed along Kamehameha Highway along HMP's southern boundary. Underground distribution lines connected to this network provide power to HMP facilities. An underground line enters from Kumakua Place and traverses several hundred feet before ending at a 7.2 kV transformer. The Petition Area is undeveloped and is not serviced by existing power or communications facilities.

Telephone and cable service is provided to HMP facilities by Hawaiian Telcom and Spectrum, respectively. These services are provided from overhead lines typically routed on utility poles shared with HECO utility lines. Lines for these communication providers are usually strung below electrical lines on utility poles. These overhead communication lines connect with applicable HMP facilities via lines routed through underground utility ducts.

## 5.5.2 Potential Project Impact and Mitigation

### No Action Alternative

Adverse impacts to existing electrical and communication facilities are not anticipated under the No Action Alternative. Existing HMP operations would continue as present and would not negatively impact existing services or facilities, nor result in conditions that would require upgrade or expansion of these utilities.

### Proposed Action

Project implementation under the Proposed Action will not result in adverse impacts to existing electrical facilities. Improvements that would increase electrical demand and require expansion of existing electrical infrastructure are not proposed. Existing HMP facilities and operations would similarly not require additional electrical improvements to incorporate the cemetery expansion as part of their current operations.

The cemetery expansion and Cultural Preserve would not require service or facilities from Hawaiian Telcom or Spectrum. Therefore, the project would have no effect on these utility companies or their services and facilities. Existing HMP facilities and operations would continue at their present locations and would not require additional communication improvements with the project.

## 5.6 TRANSPORTATION FACILITIES

Austin, Tsutsumi & Associates, Inc. (ATA) conducted a Traffic Impact Analysis Report (TIAR) for the project, and this [updated](#) report ([January 2019](#)) is included in Appendix N of this document. Traffic counts were taken at select study intersections to determine existing traffic operations during the weekday morning (AM) and afternoon (PM) commuter periods, and during the weekend (Saturday) peak period. Future traffic projections with and without the project were generated for the study year 2040, and analysis of traffic conditions was performed.

Study intersections include the following:

1. Kamehameha Highway and Mahinui Road and Hawaiian Memorial Park Driveway 1 (unsignalized);
2. Kamehameha Highway and Halekou Road and Hawaiian Memorial Park Driveway 2 (unsignalized);

Methods for calculating volume to capacity ratios and delays prescribed under the Transportation Research Board's *Highway Capacity Manual 6<sup>th</sup> Edition* were used. The analysis methodology also used Level of Service (LOS) as a qualitative measure to describe traffic flow conditions at study intersections. LOS values range from free-flow conditions (LOS A) to congested conditions (LOS F).

Analyses for study intersections occurred using the traffic analysis software Synchro, which is able to prepare reports based on HCM methodologies. These reports contain control delay results as based on intersection lane geometry, signal timing, and hourly traffic volumes. A LOS value is assigned to each approach and intersection movement as a qualitative measure of performance, based on vehicular delay at each intersection. These results, as confirmed or refined by study field observations, constituted the technical analysis informing the basis of resulting recommendations.

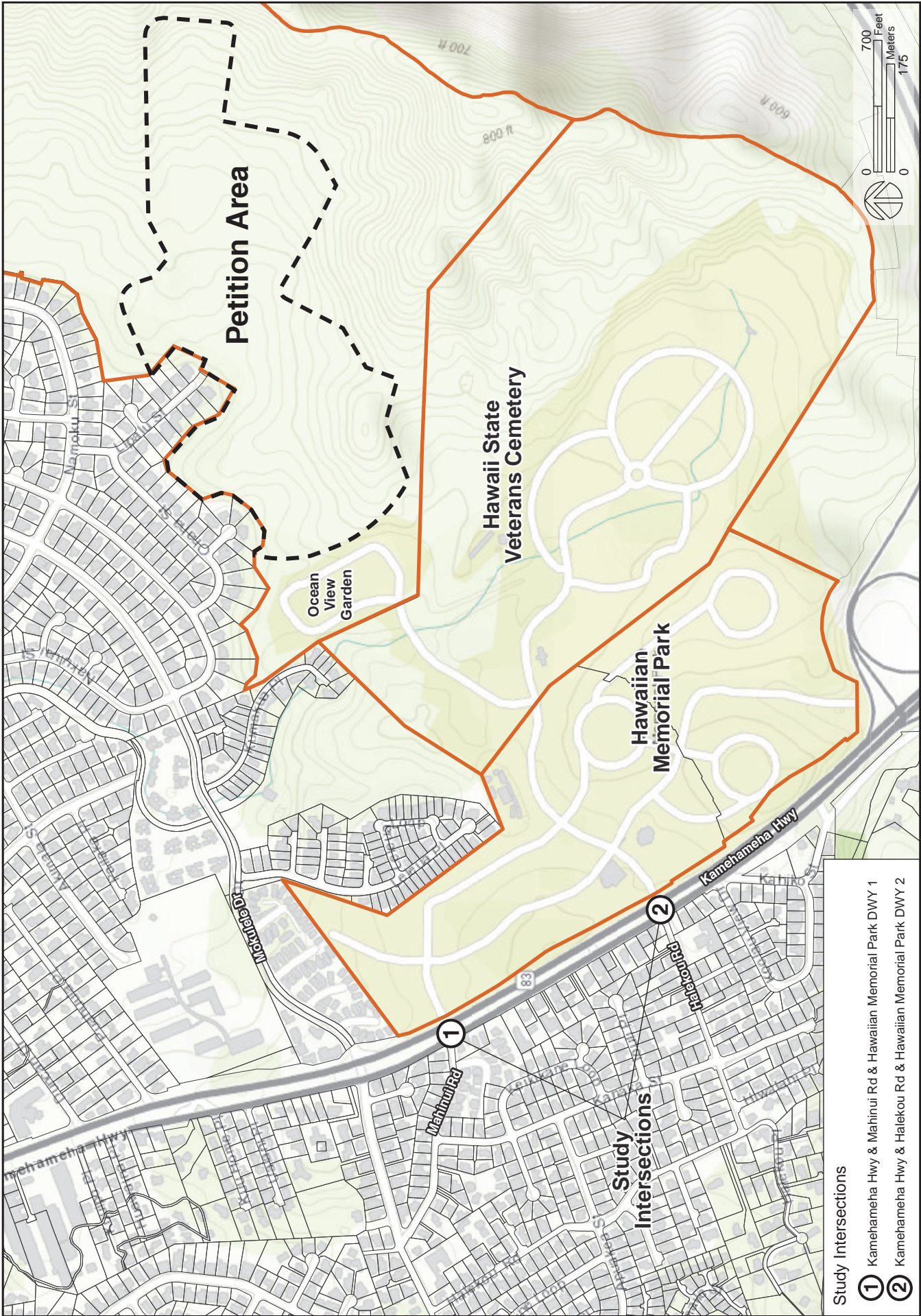
## 5.6.1 Existing Conditions

Major roadways near the Petition Area consists of Kamehameha Highway, Halekou Road, and Mahinui Road. Private, internal roads within Hawaiian Memorial Park are utilized by cemetery visitors and for daily operations and management of the site. HMP's internal roads also provide access to the Hawai'i State Veterans Cemetery that is land-locked east of HMP. Two of these private roads connect to the Mahinui Road and Halekou Road intersections with the highway. Figure 5.3 identifies these major roadways.

### 5.6.1.1 Existing Roadway System

Kamehameha Highway is part of Route 83 under the jurisdiction of the State Department of Transportation (DOT), Highways Division. This State highway is generally a north-south, four-lane, two-way, divided arterial roadway located in the vicinity of HMP by Halekou Road and Mahinui Road. The posted speed limit within the vicinity of the study intersections is 35 miles per hour (mph).

The portion of Halekou Road in the vicinity of Kamehameha Highway is an east-west, two-way, two-lane, undivided City roadway forming the western leg of a four-way unsignalized intersection with the highway. Halekou Road provides access to a residential community situated west of Kamehameha Highway. The primary entrance into the HMP and the Veterans Cemetery is situated on the eastern leg of the Kamehameha Highway/Halekou Road intersection, and is identified as HMP Driveway No. 2. Halekou Road has a posted speed limit of 25 mph.



**Figure 5.3**

**Existing Transportation Facilities**

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The portion of Mahinui Road in the vicinity of Kamehameha Highway is an east-west, two-way, two-lane, undivided City roadway. This road provides access to the residential community situated to the west of HMP, and forms the western leg of a four-way unsignalized intersection. HMP's second entrance is situated on the eastern leg of this intersection providing access to the cemetery. This entrance to the HMP is identified as HMP Driveway No. 1. Mahinui Road has a posted speed limit of 25 mph.

Private, internal roadways within the HMP property providing access throughout the cemetery and to the Hawai'i State Veterans Cemetery are owned and maintained by HMP. As previously discussed, these internal roads primarily serve as access for visitors to burial plots within various areas of the cemetery. The roadway within the State-owned Veterans Cemetery is owned and maintained by the State DOD. No posted speed limit signs are provided along these internal roadways. HMP has a roadway easement across the State Veterans Cemetery property to allow visitor access to Ocean View Garden.

#### 5.6.1.2 Existing Traffic Conditions

Manual turning movement traffic counts and field observations were conducted at study intersections on Tuesday, September 26, 2017 and Saturday, September 30, 2017. Based on traffic count data obtained, the weekday AM, PM, and Saturday peak hour of traffic was determined to be from 7:15 AM to 8:15 AM, 4:00 PM to 5:00 PM, and 11:45 AM to 12:45 PM respectively. Traffic count data is discussed in the project traffic study (Appendix N). Figure 5.4 shows the resulting existing traffic count data collected.

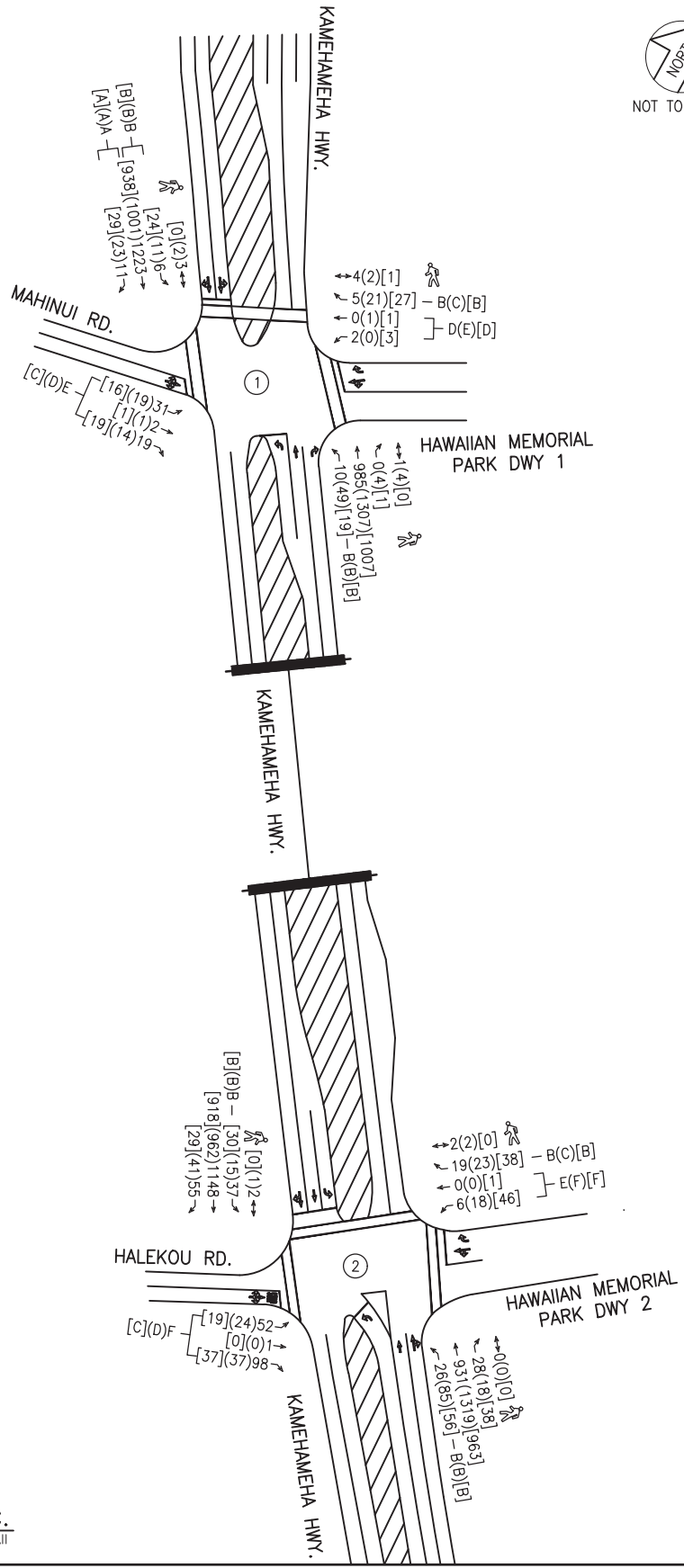
It should be noted that the existing counts of vehicles entering and exiting HMP at the two driveways reflect activities beyond just HMP. There are four separate "users" that account for traffic reflected in these counts. Users directly related to HMP consist of HMP staff working on site and visitors to the cemetery for funerals or to visit burial sites. A second user consists of employees of Hawaiian Memorial Park Mortuary (not part of HMP) that operates on site providing funeral services as previously discussed in Chapter 2. Another major user is the Hawai'i State Veterans Cemetery that includes State staff operating there along with visitors to that cemetery. Finally, the fourth user consists of residents participating in recreational activities (walking) within the cemetery (both HMP and Veterans Cemetery).

#### **Intersection Observations: AM and PM Peak Hour**

Kamehameha Highway in the HMP vicinity serves as the regional north-south travel corridor for vehicles in Kāne'ohe. During the AM peak hour, southbound traffic heading towards the Pali Highway to travel into downtown and urban Honolulu is heavier than northbound traffic. During the PM peak hour, this condition is reversed whereas northbound traffic is heavier due to commuters returning home from work.

**LEGEND**

- ##(##)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- (X) - UNSIGNALIZED INTERSECTION Y
- X(X)[X] - AM(PM)[WE] LOS
- ##(##)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC, PEDESTRIAN CROSSINGS



DATE OF COUNTS:  
 SEPTEMBER 26 & 30, 2017

AM PEAK HOUR:  
 7:15 AM - 8:15 AM

PM PEAK HOUR:  
 4:00 PM - 5:00 PM

WE PEAK HOUR:  
 11:45 AM - 12:45 PM

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**Existing Traffic Volumes and LOS Figure 5.4**

The laneage on the westbound approach (exiting the cemetery) at HMP's two driveways at their intersections with the highway is currently striped as a wide shared left/through/right lane. However, this lane was observed to operate as a shared left/through with a separate right-turn lane due to the available width of the driveway (Exhibit 5.3).



Exhibit 5.3 Westbound View of HMP Main Driveway (No. 2)  
Across Halekou Road

Vehicles making left-turns from the minor east-west approaches (HMP driveways and City roads) are able to use the space created by Kamehameha

Highway's wide median to turn onto or off of the highway in two stages. During the AM and PM peak traffic hour, both minor street left-turn movements onto Kamehameha Highway were executed during a gap, which is suspected to occur when the upstream and downstream traffic signal minor movement phase is occurring. Significant queueing was not observed at both study intersections. Excessive delays were observed for minor street movements. The issue appears to relate to driver comfort due to the relative high speeds and available sight distances due to the frequent change in grade along Kamehameha Highway. Drivers making left-turns along Kamehameha Highway into minor streets/HMP driveways appear to experience discomfort due to high speeds and short deceleration lengths.

Based on HMP's memorial service schedule, a total of three memorial services were scheduled during the time of traffic counts, which occurred at 11:00 AM, 1:00 PM, and 2:00 PM. During field observations, trips generated by memorial services were minimal as the services were not observed to be busy. The majority of the vehicles entering HMP were observed to park along both sides of the HMP's internal roadways and very few vehicles were parked at the parking lot across the funeral hall. Generally, trips generated by HMP were minimal and were observed to have light internal circulation with no significant queuing within the property and at study intersections.

Additionally, during the AM peak hour, queueing of about five to seven cars was observed at Mokulele Drive from both minor street directions. Queueing observed was able to clear within a single cycle. No residual queueing was observed. This intersection is located about 500 feet north (toward Kāne'ōhe Town) from HMP's Driveway No. 1 (across Mahinui Road).

It should be noted that U-turn movements are allowed only for southbound traveling vehicles at the highway's intersection with Kahiko Street, situated approximately 975 feet to the south of HMP's main entrance (Driveway No. 2). U-turns are also allowed only for northbound traveling vehicles along the highway at its intersection with Mahinui Road/Driveway No. 1. In addition,



connectivity is provided to Mahinui Road and Mokulele Drive via roads within the subdivision area west of Kamehameha Highway.

### **Intersection Observations: Saturday MD Peak Hour**

Generally, traffic within the HMP vicinity was lighter during the Saturday midday peak hour compared to weekday commuter peak hour traffic. Left-turn movements from minor streets were easier to execute as longer gaps were observed along Kamehameha Highway. No significant queuing was observed at the study intersections.

The volume of incoming vehicles to HMP on Saturday was heavier than weekday peak hours due to memorial services and visitation of burial plots by families, but is likely to vary throughout the day. During field observations, a total of three memorial services were held at 10:00 AM, 11:00 AM and 1:00 PM. The majority of vehicles related to trips to memorial services at the funeral hall were observed to park at the HMP's internal intersection near the building, along both sides of each internal roadways, and at the parking lot across of the funeral hall, which occupied a little over half of the total stalls.

The largest funeral service was at 10:00 AM and was observed to have approximately 30 to 50 persons in the funeral hall. The memorial service lasted approximately two hours. Two burial services were also observed within the cemetery grounds. Vehicles related to trips attending the burial service parked near the burial site and occurred sporadically within a two hour time frame. Internal circulation nearing the funeral service hall and near the burial sites operated smoothly. No significant queuing was observed within the property and at the study intersections.

#### **5.6.1.3 Public Transportation, Pedestrian and Bicycle Accessibility**

O'ahu Transit Services (OTS) operates TheBus, which is comprised of 519 buses servicing populated areas of O'ahu. Costs per ride vary based on rider characteristics such as age. Within the vicinity of HMP, access to TheBus is provided along Kamehameha Highway. Bus routes servicing these stops are routes 55, 65, and 77.

Bus stops are located along the highway near the intersection of Kamehameha Highway and Halekou Road. These stops are located just north of the intersection, with one stop located in each direction. The crosswalk at this intersection is the closest crossing to these bus stops.

Pedestrian infrastructure in the vicinity of study intersections consist of sidewalks. These sidewalks span from Ko'olau View Drive to Kāne'ohē Bay Drive on the west side of Kamehameha Highway and from Kāne'ohē Elementary School to Kāne'ohē Bay Drive on the east side of the highway. Pedestrian volumes counted during the traffic counts are shown on Figure 5.4. In addition to providing a vehicle refuge, the wide median also provides a pedestrian refuge when crossing Kamehameha Highway. Although bus stops were located near the highway's intersection with Halekou Road, few pedestrians were observed crossing the intersection during the peak hours.

Bicycle lanes are not provided on either side of Kamehameha Highway.

### 5.6.1.4 Analysis of Existing Traffic Conditions

Analysis of study intersections was conducted for existing conditions based upon traffic data collected. The results of this analysis are shown in Table 5.3 and are summarized in this section. Figure 5.4 previously illustrated existing traffic volumes and the LOS for each intersection as well as the existing lane configuration.

#### **Kamehameha Highway & Mahinui Road**

Currently, all movements at this unsignalized intersection during weekday and weekend peak hours operate at LOS D or better, with the exception of the minor street movements which operate at LOS E during the weekday AM and PM peak traffic hour.

<b>Table 5.3 Existing 2017 Level of Service Analysis Results</b>									
Intersection	Existing Conditions								
	AM (Weekday Peak Hour)			PM (Weekday Peak Hour)			MD (Saturday Peak Hour)		
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS
<b>1. Kamehameha Highway &amp; Mahinui Road/Hawaiian Memorial Park Driveway 1</b>									
Northbound Left-Turn	12.2	0.02	<b>B</b>	11.3	0.09	<b>B</b>	10.7	0.03	<b>B</b>
Eastbound Left-Turn/ Through/ Right-Turn	39.6	<u>0.365</u>	<b>E</b>	31.8	0.22	<b>D</b>	23.2	0.17	<b>C</b>
Westbound Left-Turn/Through	30.2	0.02	<b>D</b>	45.0	0.01	<b>E</b>	31.3	0.03	<b>D</b>
Westbound Right-Turn	12.5	0.01	<b>B</b>	15.3	0.06	<b>C</b>	13.0	0.06	<b>B</b>
Southbound Left-Turn/Through	10.6	0.01	<b>B</b>	12.8	0.03	<b>B</b>	10.9	0.04	<b>B</b>
Southbound Through/ Right-Turn	0.2	0.00	<b>A</b>	0.4	0.00	<b>A</b>	0.5	0.00	<b>A</b>
<b>2. Kamehameha Highway &amp; Halekou Road/Hawaiian Memorial Park Driveway 2</b>									
Northbound Left-Turn	12.3	0.05	<b>B</b>	11.6	0.15	<b>B</b>	10.9	0.09	<b>B</b>
Eastbound Left-Turn/Through/ Right-Turn	65.7	0.79	<b>F</b>	31.1	0.33	<b>D</b>	22.8	0.23	<b>C</b>
Westbound Left-Turn/Through	36.7	0.05	<b>E</b>	74.0	0.28	<b>F</b>	51.2	0.40	<b>F</b>
Westbound Right-Turn	12.7	0.04	<b>B</b>	15.6	0.07	<b>C</b>	13.1	0.09	<b>B</b>
Southbound Left-Turn	10.8	0.06	<b>B</b>	13.1	0.04	<b>B</b>	11.0	0.05	<b>B</b>
Source: ATA, <del>2018</del> 2019									

### **Kamehameha Highway & Halekou Road**

All movements at this unsignalized intersection operate at LOS D or better with the exception of minor street movements that operate at LOS E/F during all peak traffic hours.

## **5.6.2 Potential Project Impact and Mitigation**

The year 2040 was used as the study year to project future traffic conditions with the project and without the project (No Action Alternative). Future conditions without the project were first projected to establish baseline conditions. Traffic projections were formulated by applying a growth rate to existing 2017 traffic count volumes as well as trips generated by identifying potential future developments in the vicinity of the project. Changes with the project could then be assessed relative to baseline conditions to determine project-related impacts.

A traffic signal study for the intersection of Kamehameha Highway with Halekou Road is currently underway by the State Department of Transportation (DOT) due to current operational conditions. As the study is still in progress and no outcome is recommended by the State DOT at this time, analysis was conducted for scenarios where a traffic signal at this intersection is and is not included. As a result, discussion in the No Action Alternative and Proposed Action is subdivided by these two scenarios.

### **No Action Alternative**

Projections for this alternative were based upon the O‘ahu Regional Travel Demand Model (ORTDM) which forecasts growth for years between 2007 and 2035. The resulting annual growth rate along Kamehameha Highway was determined to be approximately 0.4 percent per year. This growth rate was applied on all movements along Kamehameha Highway to represent regional traffic growth in the vicinity of the Project through Year 2040. Figures 5.5 and 5.6 illustrate the projected traffic volumes, intersection LOS, and the future lane configuration for scenarios under the No Action Alternative where a signal at the Kamehameha Highway/Halekou Road intersection is and is not recommended. Table 5.4 shows analysis results [\(updated with January 2019 report\)](#) with these projected volumes for signaling scenarios under this alternative.

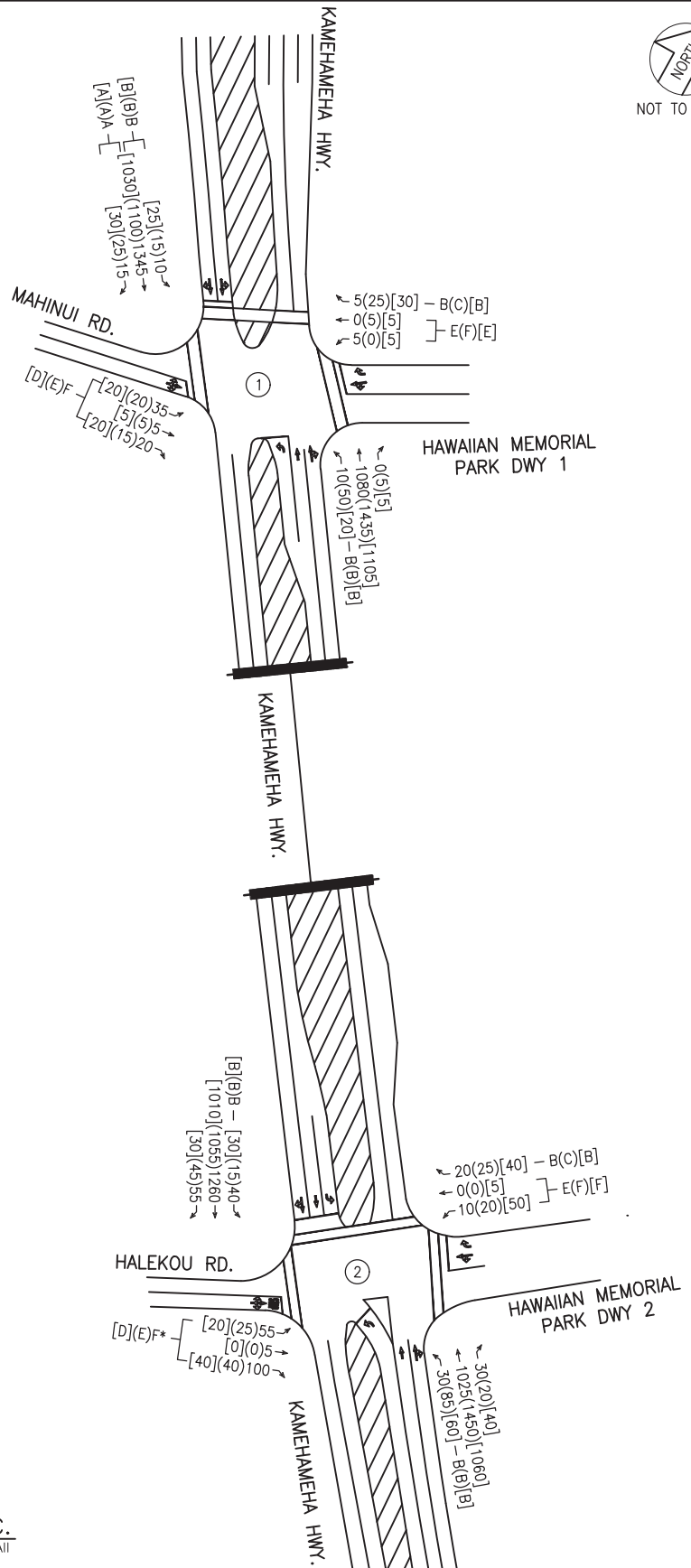
By year 2040, the Kāne‘ohe area is expected to remain similar to existing conditions. A former development project under the Hawai‘i Pacific University, Hawai‘i Loa Campus Master Plan, was originally expected to be completed by the year 2020. However, Hawai‘i Pacific University sold the Windward O‘ahu Campus to Castle Medical Center in December 2016 according to the Honolulu Star Advertiser. Castle Medical Center is currently leasing the property to Hawai‘i Pacific University for approximately three to five years as they determine how to use the property. Therefore, no nearby developments are anticipated to be completed by the year 2040.

**LEGEND**

##(###)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

(X) - UNSIGNALIZED INTERSECTION Y

X(X)[X] - AM(PM)[WE] LOS



**NOTE:**  
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**Traffic Projections and LOS without Project – No Signalization of Kamehameha Highway & Halekou Road**

**Figure 5.5**

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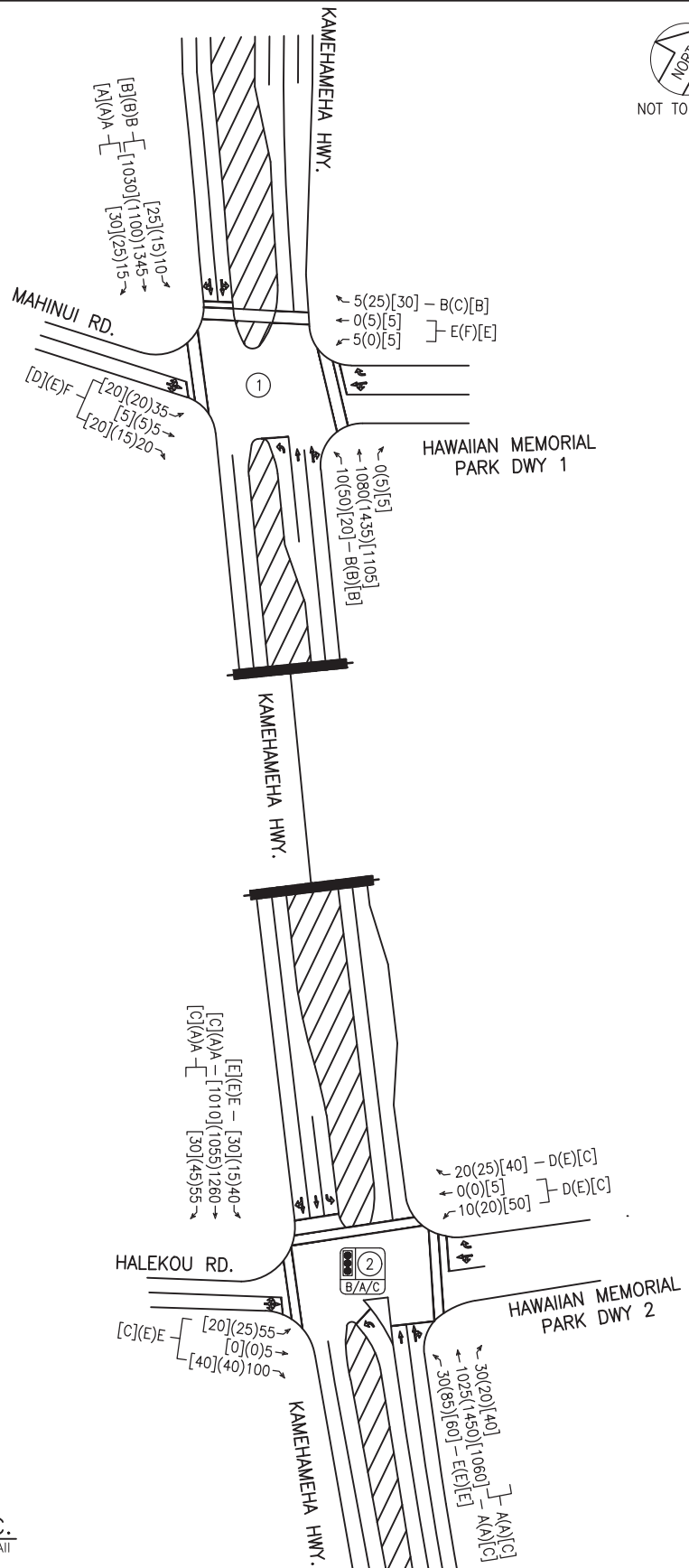
**LEGEND**

##(##)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

(X) - UNSIGNALIZED INTERSECTION Y

 - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS

X(X)[X] - AM(PM)[WE] LOS



**NOTE:**  
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**Traffic Projections and LOS without Project – Signalization of Kamehameha Highway & Halekou Road**

**Figure 5.6**

Table 5.4 Base Year 2040 (No Action Alternative) LOS Analysis Summary																		
Intersection	Base Year 2040 (No Action Alternative) Without Traffic Signal						Base Year 2040 (No Action Alternative) Without Traffic Signal											
	AM (Weekday Peak Hour)		PM (Weekday Peak Hour)		MD (Saturday Peak Hour)		AM (Weekday Peak Hour)		PM (Weekday Peak Hour)		MD (Saturday Peak Hour)							
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS						
<b>1. Kamehameha Highway &amp; Mahinui Road/Hawaiian Memorial Park Driveway 1</b>																		
NB LT	13.2	0.02	B	12.0	0.10	B	11.2	0.04	B	13.2	0.02	B	12.0	0.10	B	11.4	0.04	B
EB LT/TH/RT	60.0	0.51	F	45.6	0.33	E	31.5	0.27	D	60.0	0.51	F	45.6	0.33	E	32.9	0.27	D
WB LT/TH	37.0	0.05	E	59.0	0.08	F	39.9	0.10	E	37.0	0.05	E	59.0	0.08	F	41.3	0.10	E
WB RT	13.2	0.01	B	16.6	0.08	C	13.8	0.07	B	13.2	0.01	B	16.6	0.08	C	14.0	0.07	B
SB LT/TH	11.2	0.02	B	14.0	0.04	B	11.6	0.05	B	11.2	0.02	B	14.0	0.04	B	11.7	0.05	B
SB TH/RT	0.6	0.00	A	0.8	0.00	A	0.7	0.00	A	0.6	0.00	A	0.8	0.00	A	0.8	0.00	A
<b>2. Kamehameha Highway &amp; Halekou Road/Hawaiian Memorial Park Driveway 2</b>																		
NB LT	13.2	0.07	B	12.4	0.16	B	11.6	0.11	B	72.1	0.67	E	66.8	0.79	E	70.6	0.78	E
NB TH	-	-	-	-	-	-	-	-	-	5.7	0.41	A	4.4	0.53	A	20.6	0.59	C
NB TH/RT	-	-	-	-	-	-	-	-	-	5.7	0.41	A	4.4	0.53	A	20.5	0.59	C
EB LT/TH/RT	128.1	1.02	F*	38.2	0.40	E	26.7	0.28	D	56.4	0.60	E	59.4	0.27	E	31.8	0.05	C
WB LT/TH	47.2	0.11	E	102.8	0.38	F	77.2	0.57	F	50.0	0.06	D	56.7	0.17	E	30.5	0.12	C
WB RT	13.3	0.05	B	17.0	0.08	C	14.0	0.10	B	49.4	0.01	D	55.5	0.02	E	29.2	0.01	C
SB LT	11.5	0.07	B	14.2	0.04	B	11.6	0.06	B	76.3	0.76	E	71.5	0.52	E	72.1	0.67	E
SB TH	-	-	-	-	-	-	-	-	-	6.6	0.51	A	5.1	0.42	A	21.6	0.58	C
SB TH/RT	-	-	-	-	-	-	-	-	-	6.5	0.51	A	5.1	0.42	A	21.5	0.58	C
<b>Overall</b>	<b>8.4</b>	<b>-</b>	<b>-</b>	<b>2.3</b>	<b>-</b>	<b>-</b>	<b>3.1</b>	<b>-</b>	<b>-</b>	<b>10.3</b>	<b>-</b>	<b>B</b>	<b>7.9</b>	<b>-</b>	<b>A</b>	<b>23.3</b>	<b>-</b>	<b>C</b>

Notes:  
 \* Denotes overcapacity condition, v/c ≥ 1.0  
 Source: ATA, 2018/2019 (Note: HCM Delays/v/c Ratios updated)

### No Action Alternative without Traffic Signal

All study intersections are projected to operate at an LOS similar to existing conditions, except for the eastbound movement at Halekou Road, which is anticipated to worsen and operate overcapacity at LOS F conditions. Existing intersection movements operating at LOS F and/or overcapacity will continue to operate at LOS F and/or overcapacity conditions without a traffic signal. Minor street movements would continue to experience excessive delays and are forecast to operate at LOS E/F conditions during all peak traffic hours due to relatively higher speeds and available sight distances along Kamehameha Highway. Descriptions of service conditions at each intersection are discussed below.

#### *Kamehameha Highway & Mahinui Road/HMP Driveway No. 1*

All major street movements during weekday and weekend peak hour are projected to operate at LOS B or better. Minor street movements that are projected to operate at LOS E/F during the AM and PM peak traffic hour, similar to existing conditions.

#### *Kamehameha Highway & Halekou Road/HMP Driveway No. 2*

Traffic flow along the highway is projected to operate well at LOS B for left-turn movements without signalization of this intersection. However, traffic movements from Halekou Road and HMP would continue to operate with excessive delays at LOS E and F during peak hours. Eastbound vehicles from Halekou Road would experience particularly long delays, and this movement is projected to operate over capacity (volume to capacity (V/C) ratio of 1.02) as shown on Table 5.4. Other movements from HMP's driveway would operate with considerable delays but would not operate over capacity.

### No Action Alternative with Traffic Signal

A traffic signal study for the intersection of Kamehameha Highway with Halekou Road is currently underway by the State DOT. This study is still in progress and no recommendations have been made at this time. Therefore, the traffic impact study analyzed both scenarios in which a traffic signal would and would not be recommended. This section addresses traffic conditions with a traffic signal [with results previously shown on Table 5.4](#).

The Kamehameha Highway/Halekou Road intersection is anticipated to operate at an overall LOS of C or better during all peak traffic hours. Major through movements are anticipated to operate at LOS C or better and all other minor and turning movements will operate under capacity at LOS E/F or better during all peak hours. A traffic signal at the intersection of Kamehameha Highway/Halekou Road is expected to create gaps in traffic for minor street movements at the intersection of Kamehameha Highway/Mahinui Road allowing execution of left/through movements. Descriptions of LOS conditions at each intersection under this scenario are discussed below.

Kamehameha Highway & Mahinui Road/HMP Driveway No. 1

Intersection movements during weekday and weekend peak hours are expected to operate at an LOS similar to conditions without signalization of the Kamehameha Highway/Halekou Road intersection. Weekday and weekend peak hour major street movements are expected to generally operate at LOS B or better. However, minor street movements would continue to operate at LOS E/F during the weekday and weekend peak traffic hours.

Kamehameha Highway & Halekou Road/HMP Driveway No. 2

Signalization of this intersection would create gaps in highway through traffic allowing for improved minor street movements making left/through movements across the highway. The overall intersection would operate at LOS A and B during the weekday peak hours, and LOS C on weekends. Left-turns from the highway would now experience increased delays (LOS E) due to the need to wait for their green phase during the signal cycle.

**Proposed Action**

The Institute of Transportation Engineers (ITE) *Trip Generation Manual, 9th Edition* is typically used to estimate vehicle trips generated by a project. However, only one (1) study was used to generate trip generation rates for cemetery land uses from this manual. The manual cautions users when applying trip generation data from a small sample size. Therefore, trip generation rates for the Project were derived using existing traffic count data collected.

Based on resulting trip generation rates developed, the cemetery expansion is forecasted to generate approximately 25, 27, and 71 additional trips (entering and exiting) during the weekday morning, afternoon, and Saturday peak hours, respectively. Table 5.5 highlights projected trips generated by the Project.

Table 5.5 Peak Hour Trips Generated by the Project										
Land Use Type	Independent Variable	AM (Weekday Peak Hour) (vph)			PM (Weekday Peak Hour)			MD (Saturday Peak Hour)		
		Enter	Exit	Total	Enter	Exit	Total	Enter	Exit	Total
Cemetery (Existing Trip Generation Rate)	28.2 Acres	14	<del>42</del> 11	25	19	8	27	30	41	71
Source: ATA, <del>2018</del> 2019										



Projected trips for the cemetery expansion are believed to be conservative (high) because the project only consists of expanding burial plots along with the Cultural Preserve. Much of the traffic entering and exiting HMP, particularly during weekday peak hours, is due to employees coming to work and leaving at the end of the day. These employees include the small number of additional maintenance staff needed (7 personnel) to service the expanded cemetery area. There should be no change to staff required for Hawaiian Memorial Park Mortuary or the Hawai'i State Veterans Cemetery with the project. Resident use of the cemetery for recreational purposes is also projected to remain the same, as the population in the nearby area is not expected to increase.

Activities associated with the Cultural Preserve would not generate much traffic, and such activities are not expected to occur on a regular daily basis. It is anticipated that activities could generally occur from one to three days a week, primarily on weekends when volunteers and participants are more available. Typically, about 5 to 10 persons would be present conducting activities. Vehicular traffic to the Preserve would also likely occur outside of the weekday morning peak hour. On weekends, participants would likely visit the site in the morning and leave in the afternoon, thus occurring outside of the Saturday, mid-day peak hour. Therefore, vehicular traffic associated with the Cultural Preserve would be minimal, and the more conservative project trips projected should be able to account for this in assessing traffic impacts.

Project generated trips were generally assigned throughout the study area based upon existing travel patterns. Traffic generated by the Project was added to forecasted Base Year 2040 traffic volumes (No Action Alternative) under both signaling scenarios to constitute traffic volumes for Future Year 2040 traffic conditions with the project for the signaling scenarios. Figure 5.7 and 5.8 illustrates 2040 forecast traffic volumes with the project under project signaling scenarios and identifies the LOS for study intersection movements. [These figures have been updated for the Final EIS to reflect actual trip volumes instead of rounding forecast volumes up.](#) Table 5.6 summarizes the LOS analysis results for movements at the study intersections under these scenarios.


#### Proposed Action without Traffic Signal

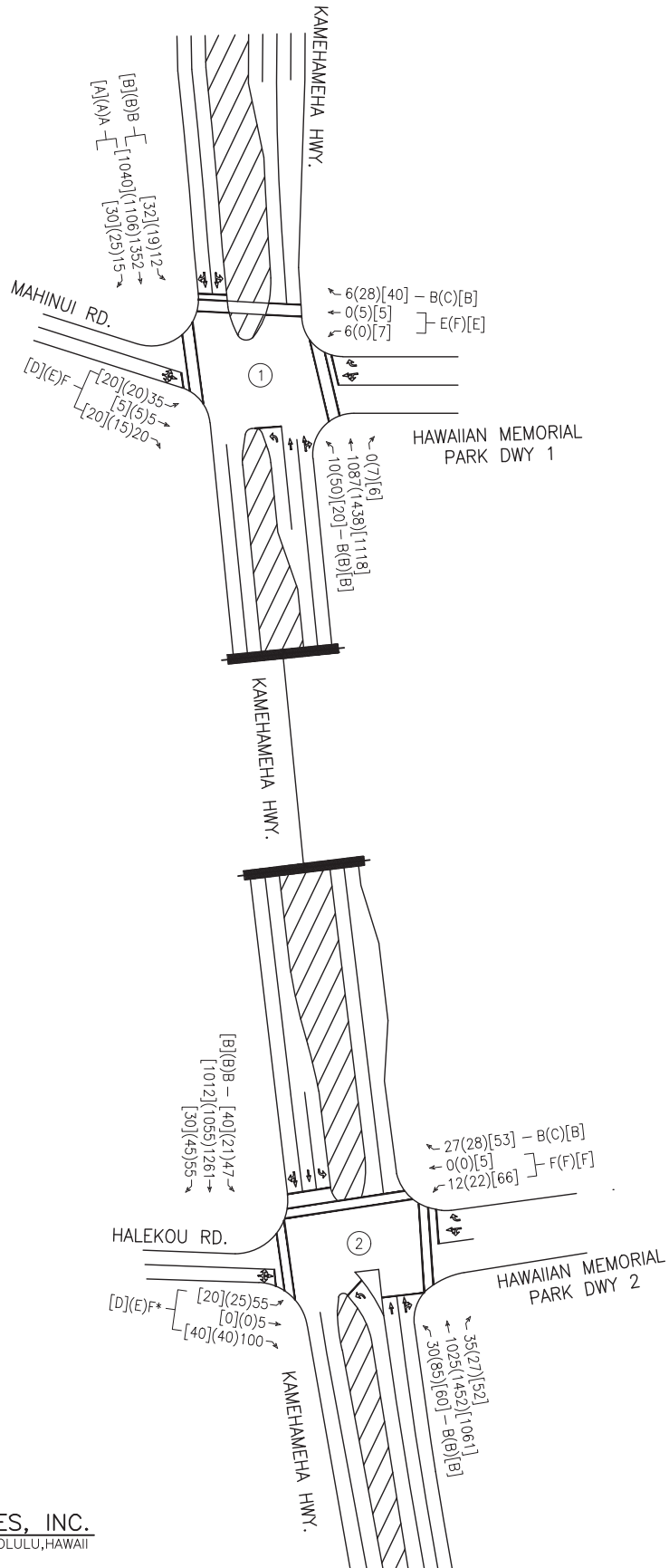
With the project, study intersections would operate with LOS similar to the No Action Alternative without signalization of Kamehameha Highway/Halekou Road. Highway turning movements would operate with little delay. However, minor street eastbound and westbound movements would continue to operate at LOS E/F during weekday peak traffic hours. Descriptions of LOS conditions at each intersection under this scenario are discussed below.

#### *Kamehameha Highway & Mahinui Road/HMP Driveway No. 1*

Under this scenario, intersection movements are expected to operate at LOS similar to conditions under the No Action Alternative. Weekday and weekend peak hour major street movements would continue to generally operate at LOS B or better. Minor street and turning movements would continue to operate at LOS E/F or better during weekday and weekend peak hours.

**LEGEND**

- ##(##)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES
- (X) - UNSIGNALIZED INTERSECTION Y
-  - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS
- X(X)[X] - AM(PM)[WE] LOS



**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

**Traffic Projections and LOS with Project - No Signalization of Kamehameha Highway & Halekou Road**

**Figure 5.7**

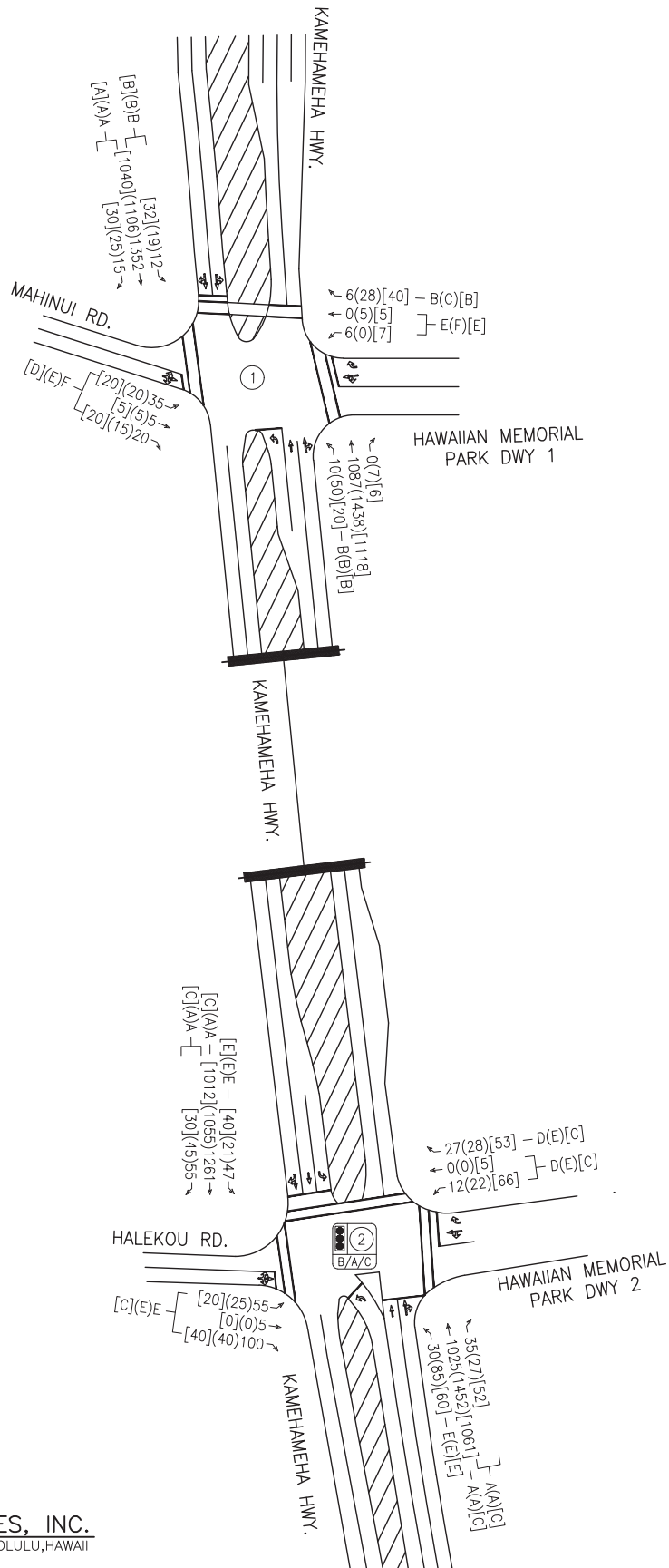
**LEGEND**

##(##)[##] - AM(PM)[WE] PEAK HOUR OF TRAFFIC VOLUMES

(X) - UNSIGNALIZED INTERSECTION Y

 - SIGNALIZED INTERSECTION Y, OVERALL AM/PM LOS

X(X)[X] - AM(PM)[WE] LOS



**NOTE:**  
THIS DRAWING IS FOR ILLUSTRATIVE PURPOSES ONLY. DO NOT USE FOR CONSTRUCTION.

**ATA** AUSTIN, TSUTSUMI & ASSOCIATES, INC.  
ENGINEERS, SURVEYORS HONOLULU, HAWAII

**Traffic Projections and LOS with Project - Signalization of Kamehameha Highway & Halekou Road**

**Figure 5.8**

**Table 5.6 Future Year 2040 (Proposed Action) LOS Analysis Summary**

Intersection	Future Year 2040 (Proposed Action) Without Traffic Signal						Future Year 2040 (Proposed Action) Without Traffic Signal								
	AM (Weekday Peak Hour)			PM (Weekday Peak Hour)			AM (Weekday Peak Hour)			PM (Weekday Peak Hour)					
	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS	HCM Delay	v/c Ratio	LOS			
<b>1. Kamehameha Highway &amp; Mahinui Road/Hawaiian Memorial Park Driveway 1</b>															
NB LT	13.2	0.07	B	12.4	0.16	B	11.6	0.11	B	72.7	0.67	E	70.6	0.78	E
EB LT/TH/RT	-	-	F	-	-	E	-	-	-	66.8	0.42	A	49.4	0.54	A
WB LT/TH	-	-	E	-	-	F	-	-	-	49.4	0.42	A	49.4	0.54	A
WB RT	144.4	1.05	F*	46.8	0.42	E	28.4	0.30	D	56.4	0.60	E	59.2	0.27	E
SB LT/TH	52.4	0.18	EF	122.5	1.05	F	116.5	0.81	F	53.2	0.07	D	56.5	0.20	E
SB RT	13.6	0.07	B	17.4	0.10	C	44.5	0.44	B	49.5	0.05	D	55.1	0.05	E
SB LT	11.6	0.09	B	14.6	0.07	B	11.8	0.08	B	72.9	0.78	E	76.3	0.76	E
SB TH	-	-	-	-	-	-	-	-	-	6.6	0.51	A	5.3	0.42	A
SB T+RT	-	-	-	-	-	-	-	-	-	6.6	0.51	A	5.3	0.42	A
<b>Overall</b>	<b>9.9</b>	-	-	<b>2.7</b>	-	-	<b>5.4</b>	-	-	<b>10.7</b>	-	B	<b>8.5</b>	-	C
<b>2. Kamehameha Highway &amp; Halekou Road/Hawaiian Memorial Park Driveway 2</b>															
NB LT	13.2	0.07	B	12.4	0.16	B	11.6	0.11	B	72.7	0.67	E	70.6	0.78	E
NB TH	-	-	-	-	-	-	-	-	-	66.8	0.42	A	49.4	0.54	A
NB TH/RT	-	-	-	-	-	-	-	-	-	49.4	0.42	A	49.4	0.54	A
EB LT/TH/RT	144.4	1.05	F*	46.8	0.42	E	28.4	0.30	D	56.4	0.60	E	59.2	0.27	E
WB LT/TH	52.4	0.18	EF	122.5	1.05	F	116.5	0.81	F	53.2	0.07	D	56.5	0.20	E
WB RT	13.6	0.07	B	17.4	0.10	C	44.5	0.44	B	49.5	0.05	D	55.1	0.05	E
SB LT	11.6	0.09	B	14.6	0.07	B	11.8	0.08	B	72.9	0.78	E	76.3	0.76	E
SB TH	-	-	-	-	-	-	-	-	-	6.6	0.51	A	5.3	0.42	A
SB T+RT	-	-	-	-	-	-	-	-	-	6.6	0.51	A	5.3	0.42	A
<b>Overall</b>	<b>9.9</b>	-	-	<b>2.7</b>	-	-	<b>5.4</b>	-	-	<b>10.7</b>	-	B	<b>8.5</b>	-	C

**Notes:**  
 \* Denotes overcapacity condition, v/c ≥ 1.0  
 Source: ATA, 2018/2019 (Note: HCM Delays/v/c Ratios Updated Based Upon Refined Projected Volumes)

*Kamehameha Highway & Halekou Road/HMP Driveway No. 2*

Under this scenario, major street and turning conditions along Kamehameha Highway are projected to operate at LOS B with relatively free flow conditions. Excessive delay in traffic movements during peak hours from Halekou Road and HMP are expected. Peak hour traffic movements for these east and westbound movements would generally operate at LOS E and F during peak hours. Eastbound vehicles from Halekou Road would continue to experience particularly long delays with this movement continuing to operate over capacity.

*Proposed Action with Traffic Signal*

With the project and signalization of Kamehameha Highway/Halekou Road, study intersections would operate similar to traffic conditions under the No Action Alternative. Traffic conditions would operate at LOS E or better during all peak traffic hours. Signalization of this intersection is expected to continue to allow gaps in traffic. These gaps allow for left/through minor street movements at the intersection of Kamehameha Highway/Mahinui Road.

*Kamehameha Highway & Mahinui Road/HMP Driveway No. 1*

All intersection movements during weekday and weekend peak hours are projected to generally operate at LOS B or better, except for the eastbound and westbound minor street movements. Westbound vehicles from HMP at this unsignalized intersection would continue to experience delays making left-turns toward Kailua, operating at LOS E/F during all weekday peak hours. Vehicles making right-turns from HMP's driveway would operate at LOS B/C. This movement was analyzed as being separate due to the wide width of HMP's driveway allowing it to function as two lanes (LT/TH and RT). Eastbound vehicles from the residential subdivisions exiting Mahinui Road would also continue to experience delays making predominantly left-turns toward Kāne'ōhe Town, operating at LOS E and F during the weekday peak hours. The weekend peak hour operates slightly better at LOS D.

*Kamehameha Highway & Halekou Road/HMP Driveway No. 2*

Vehicular traffic along Kamehameha Highway would generally operate at good levels-of-service in both north and southbound directions during weekday peak hours (LOS A) with signalization. Traffic conditions for these movements degrade to LOS C during the weekend peak hour. The only delays expected would be for north and southbound left-turns into Halekou Road and HMP (LOS E), however, traffic would operate with a V/C ratio of 0.79 or better during all peak hours.

Westbound vehicles exiting from HMP's main driveway along with eastbound vehicles at Halekou Road would experience delays making left-turns due to the wait at the signal, operating at LOS D/E or during the weekday morning and afternoon peak hours. These movements would operate better on the weekend with LOS C. The V/C ratio for these movements are generally low with the

exception of eastbound movements from Halekou Road during the weekday morning peak hour that is comparatively higher at ~~0.59~~ 0.60.

### Evaluation of Proposed Action Effects

Overall, the project would have minimal impact to the operation of the intersections analyzed. Traffic flow along with highway currently operates fairly well with little delay, resulting in vehicles generally travelling at high speeds. Left-turns from the highway similarly operate with few delays. However, excessive delay occurs for minor street movements. Delays are attributable to driver discomfort for approaches onto the highway due to the relatively high speed of highway traffic and available sight distances along the highway.

Without the project (No Action Alternative), excessive delays for minor street movements during all peak hours would continue and worsen due to increasing through traffic along the highway. In particular, increased delays and related reductions to service conditions would be experienced for minor street movements at the Kamehameha Highway and Halekou Road intersection. This intersection currently operates at LOS E/F. In the future, conditions for eastbound Halekou Road movements would further degrade, and operate at overcapacity with V/C ratios increasing to 1.02.

With signalization of this intersection, minor street traffic movements would operate at LOS D/E during the weekday peak hours and LOS C during the weekend. The change in operational conditions is because signalization would create gaps in traffic for the minor street movements to execute left/through movements. Minor street movements would continue to have delays (LOS E/F) at the intersection with Mahinui Road even with signalization.

With the project, conditions at the highway's intersections at both study intersections would not be significantly impacted either with or without signalization of the Halekou Road intersection. Without signalization, turning movements from the highway would continue to operate well at both study intersections with little delays (LOS B). However, minor streets would continue to operate with excessive delays (LOS E/F). With signalization, the study intersections would continue to operate at the same LOS as without the project. Therefore, the project is expected to have minimal impact on the study intersections.

Based upon further consultation and correspondence with the State DOT, the agency concurs with the TIAR findings in the Draft EIS that the proposed project is not anticipated to have a significant impact on State highways. Therefore, no transportation improvements to the State highway system are required for the proposed HMP project. However, the State DOT did recommend implementing the TIAR recommendation for restriping the HMP approaches to Kamehameha Highway to provide better exiting traffic flow. This measure is already identified as a proposed minimization measure. State DOT also recommended that the Petitioner provide for appropriate traffic control plans in the event activity causes traffic issues at access driveways. This is addressed under minimization measures.

### Proposed ~~Mitigative~~ Minimization Measures

Based on analysis of traffic data, striping of HMP's two westbound approaches at their driveways is recommended. Striping would delineate a shared left/through and separate right-turn lane to reflect current operating laneage. This change is expected to improve existing traffic flow out of HMP making it easier for drivers to distinguish lane movements from project driveways.

In the event that HMP has an infrequent large activity that may cause temporary traffic issues at access driveways (e.g. start and end of an event), an appropriate traffic control plan would be developed by the Petitioner to address this situation (e.g. hiring police officers or State sheriffs to support traffic control).

### Short-Term Construction Effects

Activities related to project implementation may result in short-term construction related impacts to roadways. Construction activities should not occur on weekends. Therefore, short-term impacts are only anticipated during weekdays. These activities include site grading, the construction of internal roadways connecting to Ocean View Garden, and construction of other site improvements such as retaining walls and detention basins. Construction-related workers could have temporary short-term effects associated with the movement of large equipment and worker vehicles traveling to and from the Petition Area during the morning and afternoon commuter periods. However, contractors and related workers would typically arrive at and leave the construction site outside of weekday commuter peak hours.

An estimated 30 to 40 persons could be working at the project site daily throughout the project's 1.5 year construction period. The magnitude and type of construction activities occurring would determine the number of workers required on a given day, which influences the number of vehicles arriving for construction activities. Impacts from vehicle arrival are only anticipated at the intersections of Kamehameha Highway with Mahinui and Halekou Roads. These vehicles are anticipated to arrive at HMP outside the weekday peak commuter traffic hour because workers typically start the job earlier and finish earlier. Therefore, the short-term impact to public roadways from vehicles arriving for construction related activities would be minimal. Staging areas within HMP or the Petition Area would be established for contractors, and sufficient space is available within HMP and the Ocean View Garden area to provide on-site vehicle parking.

During construction activities, traffic impacts would be mitigated by avoiding transport of large cargo and heavy equipment during peak weekday commuter traffic periods. Equipment and materials are planned to be staged on site to avoid multiple vehicle trips. Lane closures are not anticipated during construction. A permit will be obtained if any oversized and overweight equipment/loads need to be transported on State ~~or City~~ roadways. Other agency requirements and BMPs would be determined during the design phase of improvements implemented.

### Effects on Public Transportation, Bicycling, and Pedestrian Infrastructure

Operation of the cemetery's expansion would not impact public transit service or infrastructure in the vicinity of HMP. These services and facilities include public transit service by TheBus and associated bus stops near the intersection of Kamehameha Highway and Halekou Road. The cemetery expansion area is located well inland of roadways where TheBus operates and associated facilities are found. Therefore, cemetery expansion area operations should not affect services or infrastructure of TheBus. The majority of cemetery visitors would arrive by car but a small portion may commute to HMP via TheBus. Given the relatively small increase in cemetery visitor trips to the Petition Area expected, the small portion of visitors that may travel to the cemetery expansion area via TheBus would not overtax service delivery of routes near HMP.

Cemetery expansion area operations should not impact municipal bike paths or pedestrian crossings proximate to HMP as the expansion area is located a considerable distance from the highway. Most visitors would travel by car, and no project improvements would affect existing bike lanes or pedestrian crossings. Therefore, improvements to this infrastructure resulting from operation of the expanded cemetery area is not be needed.

On-site bicycle parking is not planned for the cemetery expansion or Cultural Preserve. Bicyclists could use existing internal roadways to visit various gravesite areas, and walk to a particular gravesite. Because gravesites are unique to an individual family member or visitor, having centralized bike racks are not necessary or appropriate.

## **5.7 RECREATIONAL FACILITIES**

### **5.7.1 Existing Conditions**

Existing public recreational facilities are located in the general vicinity of the Petition Area. These facilities include public parks and golf courses. Most municipal park sites are located within the Kāneʻohe town center, a significant distance north of HMP and the Petition Area. HMP is also used by nearby residents for passive recreational activities. Figure 5.9 (Existing Public Facilities) illustrates the location of these existing recreational facilities which are described below in greater detail.

#### **Recreational Use within HMP**

HMP was not designed nor established to support active or passive recreational use by the public. As such, there are no facilities provided to support such activities, such as pedestrian paths. However, over the years, residents have been using HMP for passive recreation (walking, jogging, and dog walking) on HMP's internal roadways, typically during early morning and late afternoon hours. As discussed in Chapter 1, it is estimated that about 15 to 20 people generally use the site for these activities on a daily basis during both mornings and afternoons (30 to 40 persons total daily). Although not intended, HMP continues to allow such passive recreational activities.





**Public Facilities Map**

**Figure 5.9**

Hawaiian Memorial Park Cemetery Expansion Project Final Environmental Impact Statement  
Kāne'ohe, O'ahu, Hawai'i

Within the Petition Area, there are no permitted passive recreational activities occurring. There have been instances of unauthorized activities (trespassing) occurring within the Petition Area, for activities such as paintball and hiking. In particular, hiking groups continue to travel into the Petition Area and other parts of HMP's property while undertaking the Oneawa Ridge hike. This has led to concerns for HMP regarding safety, liability, and potential endangerment of cultural areas. Although some hiking groups have received authorization from HMP to hike into their property, many groups have not obtained authorization and are considered trespassers by HMP.

Hiking groups access this hike from the Friendship Garden hiking area. Groups enter the Petition Area along the ridge and follow the trail, which circles around by Ocean View Garden and heads east toward Kawa'ewa'e Heiau. HMP has discussed their concerns with individuals leading the hikes, but no formal agreements have been reached. HMP continues to discourage trespassing as part of unauthorized hiking and other unauthorized recreational activities on their property.

### **Recreational Facilities in the Surrounding Vicinity**

The City Department of Parks and Recreation (DPR) manages most recreational facilities in the Kāne'ohe district, which include a botanical garden, regional parks, and community parks. These recreational facilities generally fall under DPR's District No. 4, Windward O'ahu. There is also a golf course managed by the City's Department of Enterprise Services. Facilities in the general vicinity of HMP include the following facilities identified on Figure 5.9.

***Pali Golf Course.*** This municipal 18-hole golf course is located southeast of HMP mauka of Kamehameha Highway.

***Ho'omaluhia Botanical Garden.*** This 400-acre botanical garden is located over half a mile away and west (mauka) of HMP, and extends behind residential subdivisions up to the H-3 Freeway. This botanical garden allows catch-and-release fishing in a reservoir, camping, activities associated with its visitor center, hiking, and passive outdoor recreation.

***Kaluapuhi Neighborhood Park.*** This City park is located within the Pikoiloa residential subdivision along Keana Road, and is situated about one mile north of the Petition Area. The park has two basketball courts, a volleyball court, pavilion, and a large open field used for activities.

***Bay View Golf Park.*** This privately-owned recreational facility is located along Kāne'ohe Bay Drive about 0.5 miles north of the Petition Area. This "park" consists of an 18-hole golf course, mini putt course, driving range, and a zip line for recreational use.

## 5.7.2 Potential Project Impact and Mitigation

### No Action Alternative

Under the No Action Alternative, no negative long-term impacts on authorized recreational activities occurring in existing areas of HMP and recreational facilities in the immediate vicinity are anticipated. Individuals would continue to be allowed to walk and jog within HMP. There would be no change to the Petition Area, therefore, use and activities occurring at recreational facilities in the vicinity would remain similar to present. HMP would continue to discourage unauthorized activities from occurring in the Petition Area.

### Proposed Action

The project would not have any long-term impact on existing recreational facilities in the general vicinity of HMP. Project implementation would not increase residential or visitor units, or generate increased demand for use of recreational facilities in the surrounding area due to population increases. The project consists of expanding the existing HMP cemetery along with the creation of a Cultural Preserve for cultural landscape restoration and cultural practices. Therefore, activities conducted within the Petition Area should have no effect on surrounding recreational facilities. A gated fence would be installed around the Petition Area, which would allow HMP improved capacity to manage access into the area. Fencing improvements would prevent unauthorized recreational activities that currently occur in the Petition Area from continuing.

Passive recreational activities (walking, jogging, and dog walking) would be allowed within the cemetery expansion area similar to existing portions of HMP. Although cemetery expansion improvements were not proposed or designed to support passive recreational use by the public, HMP would allow these passive recreational activities to occur in the expanded cemetery area. Passive recreational activities would not be allowed in the Cultural Preserve or undeveloped portions of the Petition Area surrounding the cemetery expansion area.

The short-term construction of the project should not impact surrounding recreational facilities or activities occurring there. Of the public recreational facilities identified, only the Kaluapuhi Neighborhood Park is located within the immediate vicinity that could be affected by construction activities. Other recreational facilities are located considerable distances away and would not be affected. Persons using the HMP site for passive recreational activities could be affected by construction noise and movement of construction personnel and equipment. However, the HMP site is not intended for these recreational activities, therefore, persons can continue to use HMP if they desire given the potential short-term nuisances caused by construction activities.

Construction activities related to grading of the Petition Area and construction of site improvements would generate short-term construction noise from equipment operation that may be audible to individuals within HMP grounds and at Kaluapuhi Neighborhood Park. However,

such noise should not be loud enough to significantly disrupt or prevent recreational activities from occurring at the park site. If necessary, the contractor implementing construction activities may obtain a construction noise permit from the State DOH. The permit would include restrictions to help mitigate potential noise impacts that may result from these short-term construction activities.

Similarly, fugitive dust emissions generated from these activities may affect individuals engaging in passive recreational activities at HMP. But, these persons can choose to conduct such passive recreational activities elsewhere or tolerate the short-term nuisance caused. Furthermore, the contractor implementing these improvements would comply with State DOH regulations and related permit conditions, reducing the likelihood and severity of such nuisances on recreational activities.

## **5.8 MEDICAL FACILITIES**

### **5.8.1 Existing Conditions**

Adventist Health Castle (AHCS) is the primary medical facility serving Windward O‘ahu. This medical facility was formerly named Castle Medical Center. The medical facility is located in Kailua on the southwest corner of the Kalaniana‘ole Highway and Kailua Road intersection. The facility began operating in 1963, and is a full-service medical center offering a wide range of inpatient, outpatient, and home-based services. AHCS is a 160-bed facility with more than 1,000 employees including over 300 physicians.

Comparatively smaller, private medical centers in the vicinity of HMP are located closer to the Kāne‘ohe town center. The Kaiser Permanente Koolau Medical Office is located along Kamehameha Highway about 0.7 miles north of HMP. This medical facility provides same day care, behavioral health, and diagnostic imaging services. U.S. Renal Care Windward Dialysis facility is a dialysis clinic located adjacent to Kaiser Permanente. The Aloha Nursing and Rehab Center is located along Kamehameha Highway north of HMP.

Pohai Nani is a senior care community on a 16-acre property that is part of the Good Samaritan Society. Pohai Nani provides a continuum of care and services for seniors that includes in-home services, senior apartments, wellness programming, assisted living and a skilled nursing center. Their main multi-story complex is located to the north about 2,000 feet away from the cemetery expansion site.

## **5.8.2 Potential Project Impact and Mitigation**

### **No Action Alternative**

Existing medical facilities in the vicinity of the Petition Area would not be impacted under the No Action Alternative. HMP operations would continue as present and would not result in increased demand on medical facilities or staff nor would they disrupt operations at these medical facilities.

### **Proposed Action**

Project implementation under the Proposed Action does not include new residential or visitor units that would increase Kāneʻohe's resident population and subsequent demand on emergency or medical services at nearby medical facilities. Activities conducted at the expanded cemetery along with the Cultural Preserve would not interfere with or disrupt patient care at these medical facilities. Activities would mainly consist of families visiting burial plots and private funeral services held at burial plots. Activities at the Cultural Preserve would consist of cultural landscape restoration and cultural practices that would not disrupt services provided at other medical facilities, including Pohai Nani.

The short-term construction of the project should not impact medical facilities or activities occurring there because such facilities are located considerable distances away. Pohai Nani is the closest facility to the Petition Area, and construction activities could be audible. However, construction noise should not be loud enough to significantly disrupt or prevent activities from occurring at this facility. It is important to note that the prevailing wind pattern is away from Pohai Nani. If necessary, the contractor implementing construction activities may obtain a construction noise permit from the State DOH that includes restrictions to help mitigate potential noise impacts from these short-term construction activities.

Fugitive dust emissions generated from these activities should not be an issue due to the facility's distance away from the site. Furthermore, the contractor implementing these improvements would comply with State DOH regulations and related permit conditions, reducing the likelihood and severity of such short-term nuisances.

## **5.9 EDUCATIONAL FACILITIES**

### **5.9.1 Existing Conditions**

HMP is situated within the Castle Complex of public schools, administered by the State Department of Education. Schools in the Castle Complex include eight elementary schools (ʻAhuimanu, Ben Parker, Heʻeia, Kahaluʻu, Kaneʻohe, Kapunahala, Puʻohala, and Waiahole), S.W. King Intermediate School, and James B. Castle High School. Schools within the general vicinity of HMP and the Petition Area are Kāneʻohe Elementary School, James B. Castle High

School, and Hawai'i Pacific University's Hawai'i Loa campus. These educational facilities are described in greater detail below.

Kāne'ōhe Elementary School is located about 250 feet north of the northern end of HMP along Mokulele Drive. This school is separated from the cemetery by a residential subdivision. This elementary school services students from pre-kindergarten to 6th grade and had a total enrollment of 617 students in the 2017 – 2018 academic year.

James B. Castle High School, commonly known as Castle High School, is located about a half mile north of the Petition Area along Kāne'ōhe Bay Drive. Castle High School is generally separated from the Petition Area by a residential neighborhood comprised predominantly of single-family homes. This educational facility serviced 1,173 high school aged students in the 2017-2018 academic year.

Hawai'i Pacific University's Hawai'i Loa campus is located about 1.5 miles southeast of HMP and the Petition Area. This 135-acre private university provides on-campus housing with full academic year accommodations for a maximum of 192 students. HPU's College of Natural and Computational Sciences, College of Health and Society, and other general educational classes are housed at campus facilities. Courses at these facilities and HPU's Downtown Campus are utilized by HPU undergraduate and graduate level students who total 4,081 students in 2018.

## **5.9.2 Potential Project Impact and Mitigation**

### **No Action Alternative**

Educational facilities in the surrounding area would not be impacted under the No Action Alternative. Existing cemetery operations at HMP will not increase the number of residential units in the surrounding area and should not result in increased demand on educational facilities or faculty due to increased demand from new students.

### **Proposed Action**

The project does not include new residential units that would increase Kāne'ōhe's resident population and subsequent demand on educational facilities and instructional staff at nearby schools. Cemetery activities would mainly consist of families visiting burial plots and private funeral services held that would not impact educational facilities. Activities occurring at the Cultural Preserve consist of cultural landscape restoration and cultural practices that would not disrupt or impact existing school facilities.

Activities associated with short-term construction of site improvements and associated facilities may generate some short-term construction noise from equipment. Fugitive dust emissions would also be generated from these activities. These construction related impacts should not impact

educational facilities in the surrounding area given their distance from the Petition Area. Construction noise should not be loud enough to significantly disrupt activities at Kāneʻohe Elementary School, which is the nearest facility. The contractor may obtain a construction noise permit that includes restrictions to help mitigate potential short-term noise impacts.

Fugitive dust emissions generated from these activities should not be an issue due to the school's distance away from the site. The contractor implementing these improvements would also comply with State DOH regulations and related permit conditions, reducing the likelihood and severity of such short-term nuisances

## **5.10 POLICE AND FIRE PROTECTION**

### **5.10.1 Existing Conditions**

#### **Honolulu Police Department**

The HMP and Petition Area fall within the Honolulu Police Department (HPD) District 4 operations bureau. District 4 is the largest HPD patrol area, encompassing the Windward Oʻahu region from Makapuʻu Point to Kahuku and Kawela Bay. The district is divided into four sectors, with Kāneʻohe designated as Sector 3. The main District 4 station is located in Kāneʻohe and is about 1.5 miles north of the Petition Area.

#### **Fire and Emergency Medical Services**

The City HFD has two fire stations in the Kāneʻohe area. The fire station located closest to the Petition Area is Station 17, located in the Kāneʻohe town center, approximately three miles north of HMP. Station 17 serves as the headquarters of Battalion 3 and is equipped with an engine company and ladder company. The next most proximate station is ʻAikahi Fire Station Number 19, located approximately four miles from HMP on Kāneʻohe Bay Drive. Station 19 is equipped with an engine company.

The City's Emergency Medical Services (EMS) responds to requests for ambulance assistance. City EMS service is comprised of 20 ambulances providing medical coverage for all of Oʻahu. Ambulances are staffed by Mobile Intensive Care Technicians (MICTs) trained and authorized to perform advanced life support functions in a pre-hospital emergency setting. An Emergency Medical Technician (EMT) trained in basic life support or an additional MICT constitutes the remainder of ambulance staff. On some calls, members of the HFD may assist MICTs or EMTs inside the ambulance.

Oʻahu is divided into two response districts, each with an EMT Field Operations supervisor. The Petition Area falls within District 2 which encompasses East Oʻahu (Honolulu Emergency Services Department). District 2 possesses nine EMS ambulance units and one rapid response unit. These EMS units are responsible for emergency medical service within the Petition Area.

## 5.10.2 Potential Project Impact and Mitigation

### No Action Alternative

No impacts to HPD, HFD, and EMS services are anticipated under the No Action Alternative. There are no residential or visitor units planned under this alternative that would increase demand for police, fire, and emergency services.

### Proposed Action

Under the Proposed Action, short-term ~~adverse~~ impacts could occur if contractors operating within the Petition Area require EMS services for injuries due to the need to call for their services. In addition, the contractor would install and maintain necessary safety equipment, such as signage, lighting, and barricades, to facilitate the flow of traffic from Kamehameha Highway into the project area as part of short-term minimization measures during the project's construction phase.

Other than ~~this~~ these short-term impacts, long-term impacts to HPD, HFD, and EMS services are not anticipated from project implementation. The project should not increase residential housing or visitor units and therefore should not place increased demand on police, fire, or EMS services associated with an increase in population. In particular, cemetery expansion consists primarily of landscaped grounds that would not create increased fire risk. Accessory improvements serving the expansion area are small in size and would similarly not increase fire risk.

Access roads proposed within the cemetery expansion area would facilitate access for emergency support vehicles, if necessary. Dimensioning requirements (width and vertical clearance) for City fire access would be incorporated into the design of proposed site improvements, as applicable. Design plans would be coordinated with the Honolulu Fire Department for review, as appropriate.