William P. Kenoi
Mayor

William T. Takaba
Managing Director

Warren H. W. Lee
Director

County of Hawai'i
DEPARTMENT OF PUBLIC WORKS
Aupuni Center
101 Pauahi Street, Suite 7 · Hilo, Hawai'i 96720-4224
(808) 961-8321 · Fax (808) 961-8630
www.co.hawaii.hi.us

June 10, 2009

Katherine Puana Kealoha, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu HI 96813

Re: Final Environmental Assessment (FEA) and Finding of No Significant Impact (FONSI) for County of Hawai'i, Building Division, Department of Public Works
Fire Administration Support Complex
TMK (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Hilo, Island of Hawai'i, Hawai'i

Dear Ms. Kealoha,

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and issues this Finding of No Significant Impact (FONSI). Please publish this notice in the Tuesday, June 23, 2009, OEQC Environmental Notice.

We have enclosed a completed OEQC Publication Form, four (4) copies of the Final Environmental Assessment. Should there be any questions, please call Mr. David Yamamoto, County of Hawai'i Project Engineer, at (808) 961-8466, or email him at dyamamoto@co.hawaii.hi.us.

for Warren H. W. Lee, Director

Enclosures: (1) Completed OEQC Publication Form
(2) Four (4) Copies of the Final EA

cc: M&E Pacific, Inc. (now AECOM Pacific, Inc.)
Building Division

Final Environmental Assessment

for

Fire Administration Support Complex

Waiākea, South Hilo, Island of Hawai'i, Hawai'i
TMK (3)2-4-001:176 & 178 (Previously Parcel 168 [portion])

JUNE 2009

Prepared for:

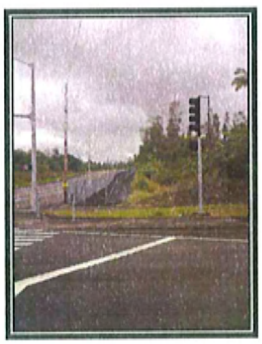
County of Hawai'i
Department of Public Works, Building Division
Aupuni Center, 101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720-4224

Prepared by:

M&E Pacific, Inc.

METCALF & EDDY | AECOM

Davies Pacific Center, 841 Bishop Street
Suite 1900, Honolulu, Hawai'i 96813

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SECTION 1

PROJECT SUMMARY

Project Name:	Fire Administration Support Complex
Applicable Law:	Hawai'i Revised Statues (HRS) Chapter 343
Type of Document:	Draft Environmental Assessment
Island:	Island of Hawai'i
District:	South Hilo
Tax Map Key (TMK):	3rd Tax Division (3)2-4-001:176 & 178 (previously parcel 168 [Portion])
Status:	Final Environmental Assessment (FEA) and Finding of No Significant Impact (FONSI).
Public Comment Period:	March 8, 2008 through April 7, 2008 (30 days)
Permits Required:	County of Hawai'i, Planning Department: Special Permit
Proposing Agency: (Applicant)	County of Hawai'i Department of Public Works Aupuni Center, 101 Pauahi Street, Suite 7 Hilo, Hawai'i 96720-4224 Phone: (808) 961-8331 Fax: (808) 961-8410
Determination Agency: (Approving Agency) (Accepting Authority)	Same as above.
Consultant: (Applicant Agent)	M&E Pacific, Inc. (now AECOM) Davies Pacific Center 841 Bishop Street, Suite 1900 Honolulu, Hawai'i 96813 Contact: Mr. Michael Nishimura, Project Manager Phone: (808) 521-3051 Fax: (808) 524-0246
Location:	Waiākea Pasture Land Waiākea, South Hilo, Island of Hawai'i, Hawai'i
Property Owner:	State of Hawai'i
State Land Use Classification:	Agricultural
County Zoning:	A-1a (Agricultural -1 acre)

County Plan:	Medium Density Urban
Proposed Action:	This project proposes the construction of a Fire Administration Support Complex to serve as the main, centralized base of operations for the County of Hawai'i Fire Department for the area. The first phase of the proposed complex, anticipated for construction commencement in late-2009, includes a Fire Administration Building, Emergency Dispatch Building, site infrastructure utilities, paved parking area, and paved access roadway within a 50'-wide right of way (ROW) on the eastern boundary of the site. Future phases will involve construction of a Fire Preparation & Training Building, parking, an open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be ADA accessible. The proposed project will centralize the administrative units, emergency dispatch, and personnel training for the Fire Department. A radio tower may also be required for use by the emergency dispatch.
Determination:	Finding of No Significant Impact (FONSI)

SECTION 2

CONSULTATION LIST

2.1 FEDERAL

2.1.1 AGENCY LIST

Natural Resource Conservation Service (NRCS)
U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS)
U.S. Environmental Protection Agency (EPA), Region 9

2.1.2 CONTACT INFORMATION AND SUMMARY

Natural Resource Conservation Service (NRCS)	
Contact:	Mr. Lawrence T. Yamamoto, Director
Address:	P.O. Box 50004 Honolulu, Hawai'i 96850
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS)	
Contact:	Mr. Patrick Leonard, Field Supervisor
Address:	300 Ala Moana Boulevard, #3-122 Honolulu, Hawai'i 96850
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
18 Jan 2008	Response received 1/21/08. Refer to **Appendix A** for response.
Summary:	Based on the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and Hawaiian hawk (*Buteo solitarius*) occur in the project vicinity. In addition, the threatened Newell's shearwater (*Puffinus auricularis newelli*) and endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) (collectively referred to as seabirds) are known to traverse the project site. We recommend you address potential project impacts to these listed species and include measures to minimize adverse impacts in your environmental review document. The following recommendations are provided to assist you in your plan development: • Information about Hawaiian hoary bat use of the project area is incomplete. Bat surveys could be conducted in areas where cutting or removal of trees is proposed. If Hawaiian hoary bats are found in the project area, you should contact our office for additional information about how to address potential impacts to this species. Because bat pups are found in nursery trees during the April through August breeding season, it is particularly important to avoid disturbance to trees during this period in areas where bats occur. Because bats can be harmed by barbed wire fences, their use should be minimized. • Where Hawaiian hawks occur, brush and tree clearing during the March through September breeding season may result in impacts to

	hawk nests. If biological surveys indicate the presence of nesting hawks in an area where March through September vegetation clearing is proposed, please contact our office for additional information about how to address potential impacts to this species. • Potential impacts to seabirds could be minimized by shielding outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. Because communication towers may pose a flight hazard to seabirds, please contact our office for further assistance, if any towers will be constructed in association with this project.

U.S. Environmental Protection Agency (EPA), Region 9	
Contact:	Mr. Dean Higuchi, Administrator
Address:	Pacific Islands Contact Office U.S. EPA, Region 9 P.O. Box 50003 Honolulu, Hawai'i 96850
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

2.2 STATE OF HAWAI'I

2.2.1 AGENCY LIST

Department of Business, Economic Development and Tourism (DBEDT), Office of Planning
Department of Hawaiian Home Lands (DHHL)
Department of Health (DOH), County of Hawai'i District Health Office
Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM)
Department of Land and Natural Resources, Division of Aquatic Resources (DAR)
Department of Land and Natural Resources, Division of Forestry & Wildlife (DFW)
Department of Land and Natural Resources, Engineering Division (ED)
Department of Land and Natural Resources, Historic Preservation Division (SHPD)
Department of Land and Natural Resources, Land Division (LD)
Department of Transportation (SDOT)
Office of Hawaiian Affairs (OHA)
State Office of Environmental Quality Control (OEQC)

2.2.2 CONTACT INFORMATION AND SUMMARY

Department of Business, Economic Development and Tourism (DBEDT), Office of Planning	
Contact:	Mr. Theodore Liu, Director
Address:	P.O. Box 2359 Honolulu, Hawai'i 96804
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Department of Hawaiian Home Lands (DHHL)	
Contact:	Mr. Ken Taguchi, Information & Community Relations
Address:	1099 Alakea Street, Suite 2000 Honolulu, Hawai'i 96813
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Department of Health (DOH), County of Hawai'i District Health Office	
Contact:	Mr. Newton Inouye, Acting District Environmental Health Program Chief
Address:	P.O. Box 916 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
10 Jan 2008	Response signed by Newton Inouye received 1/15/08. Refer to **Appendix A** for response.
Summary:	There is no record of a radiation incident on the proposed site. The Hazard Evaluation and Emergency Response (HEER) office does not have records of any investigation or cleanup activities at the proposed site. This property was former agricultural land in sugar cane production, and lands formerly used for sugar cane production are now being developed into communities where residential homes, schools, and commercial businesses are being constructed. Chemicals associated with the sugar cane industry persist in soil today, and may be a threat to public health and the environment. Elevated arsenic levels were discovered in soil at former sugar cane production areas on the islands. The HEER office has identified former sugar cane production areas for assessment throughout the state, and plans to work with property owners to conduct environmental assessments to identify and address elevated soil arsenic levels prior to finalizing development plans for the properties.

Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM)	
Address:	Post Office Box 621 Honolulu, Hawai'i 96809
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
7 Mar 2008	Response received 4/7/08. Refer to **Appendix A** for response.
Summary:	The reviewing agency responded with no comments.

Department of Land and Natural Resources, Division of Aquatic Resources (DAR)	
Address:	Post Office Box 621 Honolulu, Hawai'i 96809
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
13 Mar 2008	Response received 4/7/08. Refer to **Appendix A** for response.
Summary:	The reviewing agency responded with no comments.

Department of Land and Natural Resources, Division of Forestry & Wildlife (DFW)	
Address:	Post Office Box 621 Honolulu, Hawai'i 96809
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
7 Mar 2008	Response received 4/7/08. Refer to **Appendix A** for response.
Summary:	The reviewing agency responded with no objections.

Department of Land and Natural Resources, Engineering Division (ED)	
Address:	Post Office Box 621 Honolulu, Hawai'i 96809
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
28 Mar 2008	Response received 4/7/08. Refer to **Appendix A** for response.
Summary:	We confirm that part of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone A. The National Flood Insurance Program regulates developments within A as indicated in bold [underlined] letters below. Please take note that the remainder of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X. <u>Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken</u>. <u>Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards.</u>

Department of Land and Natural Resources, Historic Preservation Division (SHPD)	
Contact:	Ms. Melanie A. Chinen, Administrator
Address:	Kakuhihewa Building, Room 555 601 Kamokila Boulevard Kapolei, Hawai'i 96707
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
14 Apr 2008	Response signed by Nancy A. McMahon received 4/17/08. Refer to **Appendix A** for response.
Summary:	We have reviewed the Draft Environmental Assessment prepared by M&E Pacific, Inc., for the County of Hawai'i. We appreciate the attention given in the document to consultation with Native Hawaiian groups and individuals in the community to be included in the Cultural Impact Assessment. However, we are unable to determine that no historic properties will be affected by this project. There is a potential for the presence of unidentified archaeological and historical resources in this area of upper Hilo. These concerns are not addressed in the current DEA. We recommend that an Archaeological Inventory Survey be prepared for the property, pursuant to Hawai'i Administrative Rules §13-275.

Department of Land and Natural Resources, Land Division (LD)	
Contact:	Mr. Morris M. Atta, Administrator
Address:	Post Office Box 621 Honolulu, Hawai'i 96809
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
3 Apr 2008	Response signed by Charlene Unoki received 4/7/08. Refer to **Appendix A** for response.
Summary:	Other than the comments from Engineering Division, Division of Aquatic Resources, Commission on Water Resource Management, Division of Forestry & Wildlife, the Department of Land and Natural Resources has no other comments to offer on the subject matter.

Department of Transportation (SDOT)	
Contact:	Mr. Barry Fukunaga, Interim Director
Address:	869 Punchbowl Street Honolulu, Hawai'i 96813-5097
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
7 Jan 2008	Response signed by Francis Paul Keeno received 1/8/08. Refer to **Appendix A** for response.
Summary:	The proposal to develop the first phase of the Administration Support Complex (Fire Administration Building, Emergency Dispatch Building, Fire Preparation and Training Building, parking, open training area, and court yard area) is not anticipated to significantly impact any State transportation facilities. However, the Draft Environmental Assessment (Draft EA) should include a traffic assessment to evaluate and recommend any traffic mitigation measures or roadway improvements that may be needed with the full build-out of the

	master planned development. Copies of the Draft EA should be provided to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawaii District Office in Hilo for their review and comments.
Contact:	Mr. Brennon T. Morioka, Director
	869 Punchbowl Street
	Honolulu, Hawai'i 96813-5097
Contact:	Mr. Stanley Tamura, Engineering Program Manager
	Hawai'i District Office, 50 Maka'ala Street
	Hilo, Hawai'i 96720
31 Dec 2008	DEA sent to both the Director's Office (O'ahu) and Hawai'i District Office, refer to **Appendix A** for copy of correspondence.
28 Jan 2009	Response signed by Brennan R. Morioka received 1/30/09. Refer to **Appendix A** for response.
Summary:	DOT does not anticipate any adverse, significant impacts to State transportation facilities at present. However, to ensure acceptable levels-of-service, the DOT Highwas Division will monitor the cumulative traffic impacts to the Komohana Street and Puainako Street (State Route 2000) intersection from the various existing and planned development projects including the FASC. Should the cumulative impacts significantly alter traffic flows, DOT may request an updated traffic analysis. Please note that the traffic analysis used in the subject DEA is dated and that a more recent 2006 traffic count is available.

Office of Hawaiian Affairs (OHA)	
Contact:	Ms. Ululani Sherlock, Community Resource Coordinator / Mr. Clyde W. Nāmu'o, Administrator
Address:	Office of Hawaiian Affairs 162-A Baker Avenue / 711 Kapi'olani Boulevard, Suite 500 Hilo, Hawai'i 96720 / Honolulu, Hawai'i 96813
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
31 Dec 2007	Response signed by Clyde W. Nāmu'o received 1/4/08. Refer to **Appendix A** for response.
Summary:	OHA requested that a Cultural Impact Assessment (CIA) to be included in the EA in accordance with Chapter 343 of the Hawai'i Revised Statues (HRS). OHA also mentioned that in accordance with Section 6E-46.6, HRS and Chapter 13-300, Hawai'i Administrative Rules (HAR), work shall stop in the immediate vicinity and both the SHPD and OHA contacted should any significant cultural deposit of human skeletal remains are encountered during construction.

State Office of Environmental Quality Control (OEQC)	
Contact:	Mr. Genevieve Salmonson, Director
Address:	235 South Beretania Street, Suite 702 Honolulu, Hawai'i 96813
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received. Telephone call on January 20, 2009, to the OEQC confirmed that no OEQC response or comment letter was generated and issued.

2.3 COUNTY OF HAWAI'I

2.3.1 AGENCY LIST

Civil Defense
Department of Environmental Management (DEM)
Department of Parks and Recreation
Department of Public Works, Building Division / Engineering Division
Department of Water Supply
Fire Department
Hawai'i County Council
Mayor Harry Kim
Police Department
Planning Department

2.3.2 CONTACT INFORMATION AND SUMMARY

Civil Defense	
Contact:	Administrator
Address:	County of Hawai'i, Civil Defense 920 Ululani Street Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

Department of Environmental Management (DEM)	
Contact:	Ms. Bobby Jean Leithead-Todd, Director
Address:	County of Hawai'i, Department of Environmental Management 25 Aupuni Street, Room 210 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
4 Jan 2008	Response signed by Bobby Jean Leithead-Todd received 1/9/08. Refer to **Appendix A** for response.
Summary:	The Wastewater Division (WWD) indicated the following: (1) COH WW collection system is located on Kahikini Street, (2) WWD checklist should be used as a guide when connecting to the system, (3) a meeting with WWD staff is recommended prior to WW system connection planning and design and (4) a WW master plan submittal to the WWD is required for the entire parcel is required prior to the start of planning and design.

	The Solid Waste Division (SWD) indicated the following: (1) transfer stations may be used for disposal of solid waste, (2) aggregates and other construction waste should be reused when possible, (3) space should be provided for rubbish and recycling, (4) green waste sites may be used, (5) disposal of construction waste at COH transfer stations is prohibited and (6) a solid waste management plan submittal to the SWD is required.

Department of Parks and Recreation	
Contact:	Ms. Patricia G. Engelhard , Director
Address:	Aupuni Center 101 Pauahi Street, Suite 6 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

Department of Public Works, Building Division / Engineering Division	
Contact:	Mr. David Yamamoto, Project Manager
Address:	County of Hawai'i, Building Division—DPW 101 Pauahi Street, Suite 7 Hilo, Hawai'i 96720
22 Jan 2008	Draft DEA sent, refer to **Appendix A** for copy of correspondence.
1 Feb 2008	Response signed by David Yamamoto received. Refer to **Appendix A** for response.
Summary:	We have following comments to draft Environmental Assessment dated January 2008: 1. Page 1: Proposing Agency, delete Building Division, Contact David Yamamoto, Project Manager. 2. Page 2: phase 1 will include construction of Fire Administration and Emergency Dispatch. Construction of remaining facilities are future phases. 3. Page 2: confirm 90-feet high radio tower required. 4. 3.1 paragraph 3, suggest "dispersed" in place of "spread out". 5. 3.1 paragraph 4, fragmented. 6. 3.1 paragraph 5, This environmental assessment represents the initial and future phases of the administration support complex development. 7. 3.2.2 paragraph 4, This environmental assessment will determine the impacts of the initial and future phases of the project. 8. Figure 3.1, include proposed subdivision 9. Figure 3.2, include proposed subdivision 10. Figure 3.3, radio tower should be located adjacent to radio room to minimize cable length. Also, proposed location highly visible and not appealing. 11. Figure 3.3, Fire Station location at rear of site does not necessarily support quick egress objective. 12. 3.3, budget for initial phase currently $14,600,000 13. 3.5.2, is this an alternative? Fire (Desmond) to provide order of priority for all facilities.

	14. Section 3: include discussion on proposed subdivision 15. Figure 5.5, include proposed subdivision 16. 5.1.5, typically the agricultural capability subclass rating is described. 17. 5.1.8.3 paragraph 2, the lava hazard to the site is posed by Mauna Loa and is located on its northeast slope 18. 5.4, include description from County General Plan Land Use Pattern Allocation Guide Map (LUPAG), i.e., "important agricultural land" 19. Figure 5.5, include proposed subdivision 20. Figure 5.6, include proposed subdivision 21. Figure 5.7, include proposed subdivision 22. Section 5, typically "scenic and open space resources" are discussed.
Contact:	Mr. David Yamamoto, Project Manager
27 Feb 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
1 Apr 2008	Response from Kelly Gomes, DPW—Engineering Division (ED), received. Refer to **Appendix A** for response.
Summary:	All development-generated runoff shall be disposed of on site. A drainage study shall be prepared and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works. A portion of subject parcel is located within Flood Zone A as designated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Flood Zone A is the Special Flood Hazard Area inundated by the 100-year flood where base flood elevations have not been determined. Any construction within the designated FEMA flood zone shall comply with the requirements of Chapter 27, Floodplain Management, of the Hawaii County Code. All earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawaii County Code. The Traffic Division has reviewed the Traffic Impact Analysis Report within the subject assessment and agrees with its conclusions.

Department of Water Supply	
Contact:	Mr. Milton Pavao, Department Head
Address:	345 Kekuanaoa Street, Suite 20 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
8 Apr 2008	Response signed by Milton D. Pavao, P.E., received 4/11/08. Refer to **Appendix A** for response.
Summary:	Water can be made available from the existing 12-inch waterline within Mohouli Street, fronting the proposed project site. Please be informed that our records do not show that there is an existing service lateral installed at the proposed project site. There is an existing pressure reducing station and valve box located near the project site, which may have been mistaken for a service lateral and meter box.

	Prior to issuing a water commitment for the proposed project, the Department would request estimated maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for review and approval. After review of the calculations, the Department will determine the water commitment deposit amount, facilities charges due, and any water system improvements required for final approval. Please be informed that the existing 12-inch waterline fronting the project site is adequate to provide the required 2,000 gallons per minute flow for fire protection, as per the Department's Water System Standards. Please also be informed that any meter(s) serving the proposed project will require the installation of a reduced pressure type backflow prevention assembly within five feet of the meter on private property. The Department must inspect and approve the installation before water service can be activated.

Fire Department	
Contact:	Mr. Darryl J. Oliveira, Fire Chief
Address:	25 Aupuni Street Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
10 Jan 2008	Response signed by Darryl Oliveria received 1/17/08. Refer to **Appendix A** for response.
Summary:	The reviewing agency responded with no comments.
Contact:	Mr. Desmond Wery, CIP Manager
12 Jan 2008	Response received 1/17/08 via email from Desmond Wery. Refer to **Appendix A** for response.
Summary:	After discussion with the fire Chief, the following order of priority [for the build-out of the entire complex] is being provided: 1. Emergency Dispatch 2. Fire Administration Building 3. Fire Preparation & Training 4. Warehouse 5. Covered Training 6. Museum 7. Dormitory Facility 8. Fire Station The addition of the dormitory facility was necessitated by eliminating the dormitory facilities from the Emergency Dispatch building, but we hope to build this as a future attachment to the communications building.
Contact:	Mr. Darryl J. Oliveira, Fire Chief
27 Feb 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
25 Mar 2008	Response signed by Darryl Oliveria received 3/28/08. Refer to **Appendix A** for response.

Summary:

Fire apparatus access roads shall be in accordance with UFC Section 10.207:

"Fire Apparatus Access Roads

"Sec. 10.207. (a) General. Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.

"(b) Where Required. Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.

"EXCEPTIONS: 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

"(c) Width. The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.

"(d) Vertical Clearance. Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

"EXCEPTION: Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.

"(e) Permissible Modifications. Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.

"(f) Surface. Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)

"(g) Turning Radius. The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)

	"(h) Turnarounds. All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus. "(i) Bridges. When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus. "(j) Grade. The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%) "(k) Obstruction. The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times. "(l) Signs. When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both." Water supply shall be in accordance with UFC Section 10.301: "(c) Water Supply. An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow. "Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable or providing the required fire flow. "The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207."

Hawai'i County Council	
Contact:	Mr. Pete Hoffman, Council Chair
Address:	64-1067 Māmalahoa Hwy, Suite C-5 Kamuela, Hawai'i 96743
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

Mayor Harry Kim	
Contact:	Mayor Harry Kim
Address:	25 Aupuni Street, Room 215 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

Police Department	
Contact:	Mr. Lawrence K. Mahuna, Police Chief
Address:	349 Kapi'olani Street Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
20 Dec 2007	Response signed by Lawrence K. Mahuna received 12/27/07. Refer to **Appendix A** for response.
Summary:	Proposed project does not appear to impact any of the existing or proposed Police Department projects, plans, police, or programs. Only concern is to ensure adequate parking for staff as the plan calls for in the Communications-Dispatch staff to be relocated to the proposed Dispatch Building.

Planning Department	
Contact:	Mr. Christopher J. Yuen, Planning Director
Address:	Aupuni Center 101 Pauahi Street, Suite 3 Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
4 Jan 2008	Response signed by Christopher H. Yuen received 1/11/08. Refer to **Appendix A** for response.
Summary:	The subject property is located in the State Land Use (SLU) Agriculture District. The County zoning designation for the property is A-1a (Agriculture District, minimum building site of 1 acre). However, the property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawaii (ALISH). Moreover, Hawaii County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use. A portion of the property appears to be within the FEMA flood zone. Contact the County of Hawaii, Department of Public Works, Engineering Division at (808) 961-8327 to verify if the proposed structure(s) will be located within the flood zone. Because of the property's proximity to residential development, please address the Environmental Assessment proposed mitigation of light and noise pollution, particularly from the open training area.

Contact:	Mr. Christopher J. Yuen, Planning Director
3 Mar 2008	DEA sent, refer to **Appendix A** for copy of correspondence.
2 Apr 2008	Response signed by Christopher H. Yuen received 4/4/08. Refer to **Appendix A** for response.
Summary:	On March 7, 2008, Final Subdivision Approval No. SUB-08-000713 was granted to subdivide Tax Map Key 2-4-001:168 into Lots 1, 2, 3, and Road. An affordable, elderly rental housing project has been proposed for Lot 3, which is *makai* of the Fire Administrative Support Complex proposed for Lot 2. The Environmental Assessment should address the potential impacts of the Fire Administrative Support Complex on a development in Lot 3. Otherwise, we have no additional comments to offer regarding the Draft EA.

2.4 COMMUNITY

2.4.1 ORGANIZATION LIST

Hawaiian Telcom
Hawai'i Electric Light Company (HELCO)
Hawai'i Natural Heritage Foundation (HNHF)
Hawai'i's 1000 Friends
Historic Hawai'i Foundation (HHF)
The Nature Conservancy (TNC)
Oceanic Time Warner Cable
The Outdoor Circle
University of Hawai'i at Manoa Environmental Center
Mrs. Pualani "Pua" Kanaka'ole Kanahele
Mrs. Chiyomi Leina'ala Fukino, M.D.
Mr. Kepa Maly
Mr. Fred Cachola
Ms. Mikilani Ho
Mr. Robert "Sonny" & Mrs. Roberta Keakealani
Ms. Maria Kaimipono Orr
Edith Kanaka'ole Foundation / Halau O Kekuhi
Hilo Hawaiian Civic Club
Native Hawaiian Legal Corporation

2.4.2 CONTACT INFORMATION AND SUMMARY

Hawaiian Telcom	
Contact:	Director
Address:	1177 Bishop Street Honolulu, Hawai'i 96813
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence. No response or comments received.

Hawai'i Electric Light Company	
Contact:	Director
Address:	1200 Kilauea Avenue
	Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Hawai'i Natural Heritage Foundation	
Contact:	Mr. Roy Kam, Database Manager
Address:	3050 Maile Way, Gilmore Hall, Suite 406
	Honolulu, Hawai'i 96822
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Hawaii's 1000 Friends	
Contact:	Donna Wong, Executive Director
Address:	25 Maluniu Avenue, Suite 102, #282
	Kailua, Hawai'i 96734
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Historic Hawai'i Foundation	
Contact:	Ms. Kiersten Faulkner, Executive Director
Address:	680 Iwilei Road, Suite 690
	Honolulu, Hawai'i 96817
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

The Nature Conservancy	
Contact:	Mr. Jeff Mikulina, Director
Address:	923 Nu'uanu Avenue
	Honolulu, Hawai'i 96817
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Oceanic Time Warner Cable	
Contact:	Director
Address:	1257 Kilauea Avenue
	Hilo, Hawai'i 96720
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

The Outdoor Circle	
Contact:	Ms. Kathy Whitmire, President
Address:	1314 South King Street, Suite 306
	Honolulu, Hawai'i 96814
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

University of Hawai'i at Mānoa Environmental Center	
Contact:	Dr. John T. Harrison, Ph.D., Environmental Coordinator
Address:	2500 Dole Street, Krauss Annex 19
	Honolulu, Hawai'i 96822
17 Dec 2007	Consultation Request Letter sent, refer to **Appendix A** for copy of correspondence.
	No response or comments received.

Mrs. Pualani "Pua" Kanaka'ole Kanahele	
Contact:	Mrs. Pualani "Pua" Kanaka'ole Kanahele
Address:	Ke Po'ohala (Hawaiian Life Styles Department) Hawai'i Community College Building 380, Room 34 200 West Kāwili Street Hilo, Hawai'i 96720
8 Jan 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence.
	No response or comments received.

Mrs. Chiyomi Leina'ala Fukino, M.D.	
Contact:	Mrs. Chiyomi Leina'ala Fukino, M.D.
Address:	1250 Punchbowl Street Honolulu, Hawai'i 96813
8 Jan 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence.
	No response or comments received.

Mr. Kepa Maly	
Contact:	Mr. Kepa Maly
Address:	554 Keonaona Street Hilo, Hawai'i 96720
6 Mar 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

Mr. Fred Cachola	
Contact:	Mr. Fred Cachola
Address:	91-485 Kuhialoko Street 'Ewa Beach, Hawai'i 96706
6 Mar 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. Fred Cachola declined the opportunity to provide consultation due to his unfamiliarity of cultural resources in the project area. He contacted his sister who lives on Mohouli Street near the project area; however, she is also unknowledgeable of cultural practices and resources associated with the project area or potentially affected by the project's undertaking. Fred recommended that the Edith Kanaka'ole Foundation be contacted for Cultural Impact Assessment consultation requests. He pointed out that this foundation is very reputable and have been awarded accolades on their knowledgeable contributions to past and on-going Cultural Impact Assessments, primarily in the East Hawai'i region.

Ms. Mikilani Ho	
Contact:	Ms. Mikilani Ho
Address:	47-565 Hui Iwa Street Kāne'ohe, Hawai'i 96813
6 Mar 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

Mr. Robert "Sonny" & Mrs. Roberta Keakealani	
Contact:	Mr. Robert "Sonny" & Mrs. Roberta Keakealani
Address:	P.O. Box 6043 Kamuela, Hawai'i 96743
6 Mar 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

Ms. Maria Kaimipono Orr	
Contact:	Ms. Maria Kaimipono Orr
Address:	95-230 Hokuloa Loop Mililani, Hawai'i 96789
6 Mar 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

Edith Kanaka'ole Foundation / Halau O Kekuhi	
Contact:	Kekuhi Kanae Kanahele Keali'ikanaka'oleoHaililani, Executive Director & Kumu Hula, Halau O Kekuhi
Address:	Ke Ana La'ahana 1500 Kalaniana'ole Avenue Hilo, Hawai'i 96720-4914
4 Apr 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. Kekuhi Kanae Kanahele Keali'ikanaka'oleoHaililani declined the opportunity to provide consultation.

Hilo Hawaiian Civic Club	
Contact:	President
Address:	PO Box 543 Hilo, Hawai'i 96721
11 Jan 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

Native Hawaiian Legal Corporation	
Contact:	Native Hawaiian Legal Corporation
Address:	1164 Bishop Street, Suite 1205 Honolulu, Hawai'i 96813
11 Jan 2008	Consultation Request Letter sent, refer to **Appendix B** for copy of correspondence. No response or comments received.

SECTION 3

PROJECT DESCRIPTION

3.1 PROJECT NEED AND OBJECTIVE

The County of Hawai'i Fire Department (HFD) is responsible for a wide range of services critical and essential to the well-being of people of the County. These services include fire protection and prevention, on-site emergency medical services, land and sea search and rescue and hazardous materials response. As part of its public services responsibilities, the HFD takes an active role in reducing risk and minimizing hazards in general in the County by providing public education, awareness and emergency preparedness programs.

The HFD consists of a number of operation units in two main divisions with facilities dispersed over different locations that act to support its responsibilities. Those two divisions and operational units are:

(1) Emergency Operations Division; and,

(2) Support Services Division consisting of the Emergency Medical Services (EMS) Bureau, Training Bureau (includes the Company/Training Recruit Section and Volunteer Training Section), Fire Prevention Bureau, Auxiliary Services Bureau (includes the Communication Section, Logistics/Supply Section and Apparatus/Equipment maintenance Section) and Administrative Services.

The HFD currently employs a staff of about 43 personnel in its administrative units among several facilities units throughout Hilo. This administrative staff is estimated to increase to about 52 personnel by the year 2027. Inherent coordination and operational difficulties arise due to the dispersed nature of the administrative facilities. The HFD prides itself with being a progressive and proactive agency that seeks news ways to better serve the County community.

The HFD proposes to consolidate its facilities by developing a Fire Administration Support Complex (FASC). A centralized FASC facility would help to eliminate the existing inefficiencies from having separate facilities, and would provide a centralized access point for the public to share its concerns with the HFD.

This Environmental Assessment (EA) discusses possible environmental impacts the proposed project may have on the existing site and presents prospective mitigative strategies for any potential adverse impacts the project may generate. The proposed development covered in this EA represents both the initial and future phases (to project site build-out) of the development of the administration support complex. The information discussed in this document is based upon the findings presented in previous reports including published annual reports by the HFD and other offices of the COH and the COH Preliminary Architectural Program for the proposed FASC.

3.2 PROJECT HISTORY AND DESCRIPTION

3.2.1 PROJECT HISTORY

The various facilities housing the different HFD administrative units were constructed over a number of years, and staff levels have steadily grown over that period of time. The HFD recently recognized a need to consolidate its administration personnel into a

single complex located in Hilo. General planning and allocation of funds for the FASC began in July 2007. The more detailed planning and the design phase of the project began in September 2007. The final design phase of the project will occur concurrently with the environmental review process. Construction will not commence until the completion of the environmental review process.

3.2.2 PROJECT DESCRIPTION

M&E Pacific, Inc. (M&E) was contracted by the lead consultant Anbe, Aruga & Ishizu, Architects, Inc. (AAI) in December 2007 on behalf of the COH to conduct an EA, conduct a Traffic Impact Assessment Report (TIAR) and to complete the Special Permit (SP) for the proposed FASC.

The proposed site for the FASC is on the Mohouli Street extension just west of the Komohana Street in Hilo ultimately consisting of the following buildings and facilities:

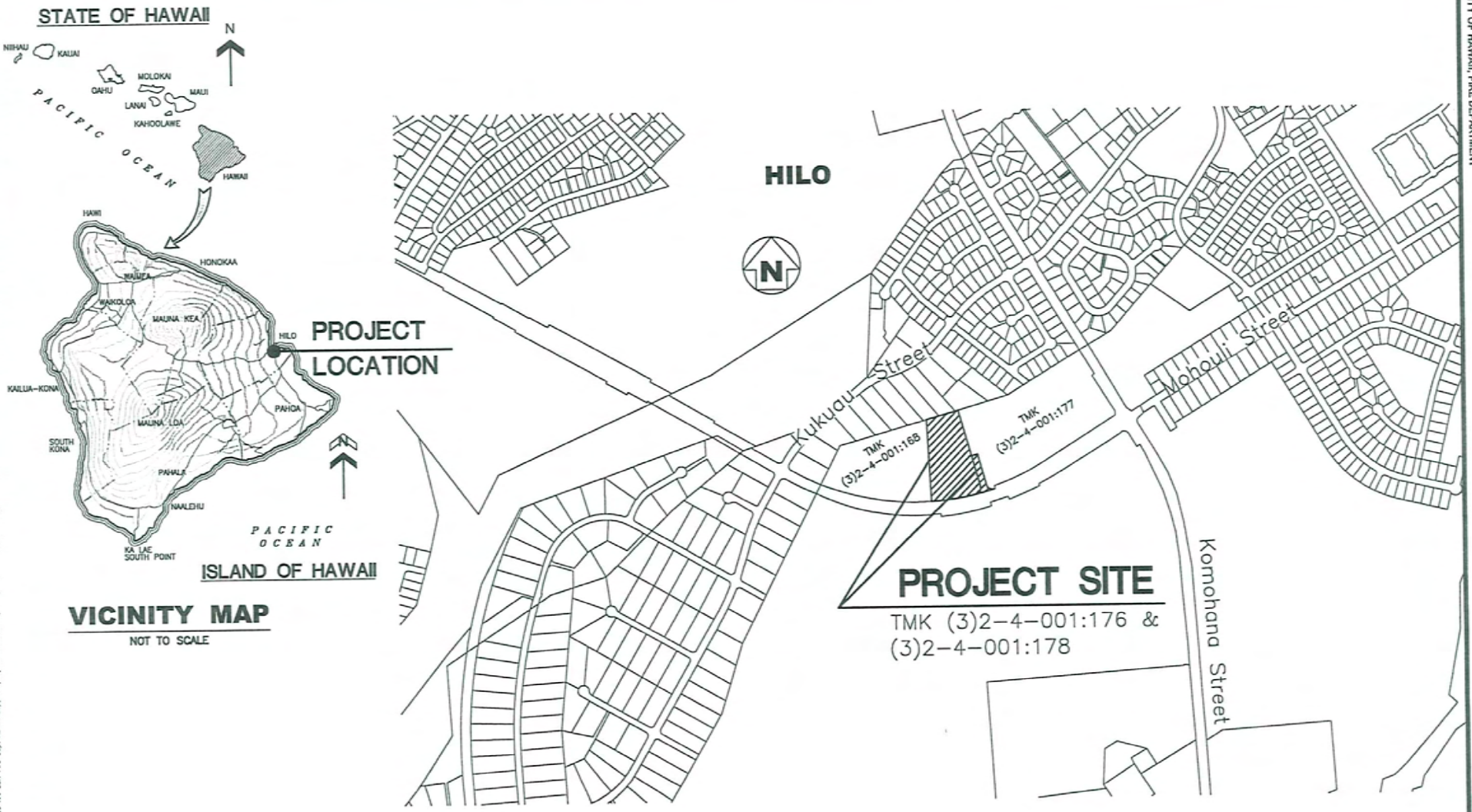
(1) Fire Administration Building
(2) Emergency Dispatch Building
(3) Fire Preparation & Training Building
(4) Museum
(5) Covered Training Area
(6) Warehouse
(7) Fire Station
(8) Radio Tower for Emergency Dispatch Use
(9) Site Infrastructure Utilities
(10) Paved Parking Area
(11) Paved Access Roadway Within a 50'-wide ROW on the Eastern Boundary of the Site

Existing County water service is available along Mohouli Street, and a County wastewater main and service is available in an adjacent subdivision north of the site. A location map of the project area is shown in **Figure 3.1**. A photograph of the existing project site is shown in **Figure 3.2**.

Only the Fire Administration Building, Emergency Dispatch Building, site infrastructure utilities, paved parking area, and paved access roadway within a 50'-wide ROW on the eastern boundary of the site are planned for the initial phase of the project. A conceptual site map of the project area for this initial phase is shown in **Figure 3.3**. The other facilities are planned as a future expansion of the complex. A 90-foot microwave antenna tower is being considered to accommodate radio and emergency dispatch requirements. A radio line-of-site study prior to the tower's construction will be done by the County to determine whether it is required. Future growth may require the height of the tower to be increased to a minimum of 125 feet. This environmental assessment will determine the impacts of both the initial phase and entire site build-out.

On March 7, 2008, Final Subdivision Approval No. SUB-08-000713 was granted to subdivide Tax Map Key 2-4-001:168 into Lots 1, 2, 3, and Road. An affordable, elderly rental housing project has been proposed for Lot 3, which is *makai* of the Fire Administrative Support Complex proposed for Lot 2. The Fire Administrative Support Complex is proposed for Lot 2 (now parcel 176) and Road (now parcel 178).

An accessible route will be provided for access to all proposed facilities. Accessible parking will be provided near the all three proposed buildings.



SOURCE: HAWAII STATEWIDE GIS PROGRAM

M&E Pacific, Inc.
METCALF & EDDY | AECOM
DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

PROJECT LOCATION MAP
NOT TO SCALE

Figure 3.1
Project Location Map
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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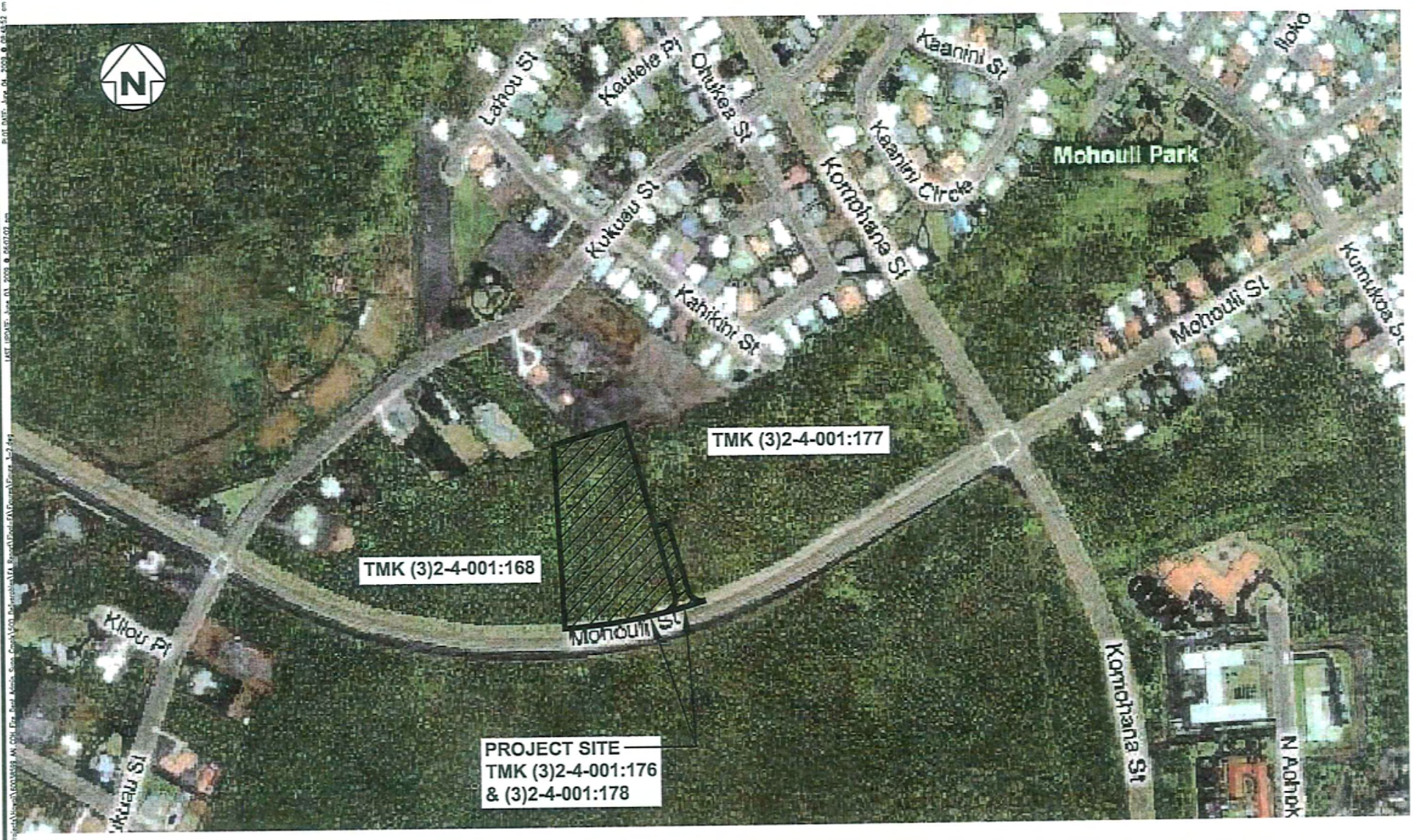

SOURCES: HAWAII STATEWIDE GIS PROGRAM; MICROSOFT CORPORATION

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METCALF & EDDY | AECOM
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EXISTING PROJECT SITE

NOT TO SCALE

Figure 3.2
EXISTING PROJECT SITE
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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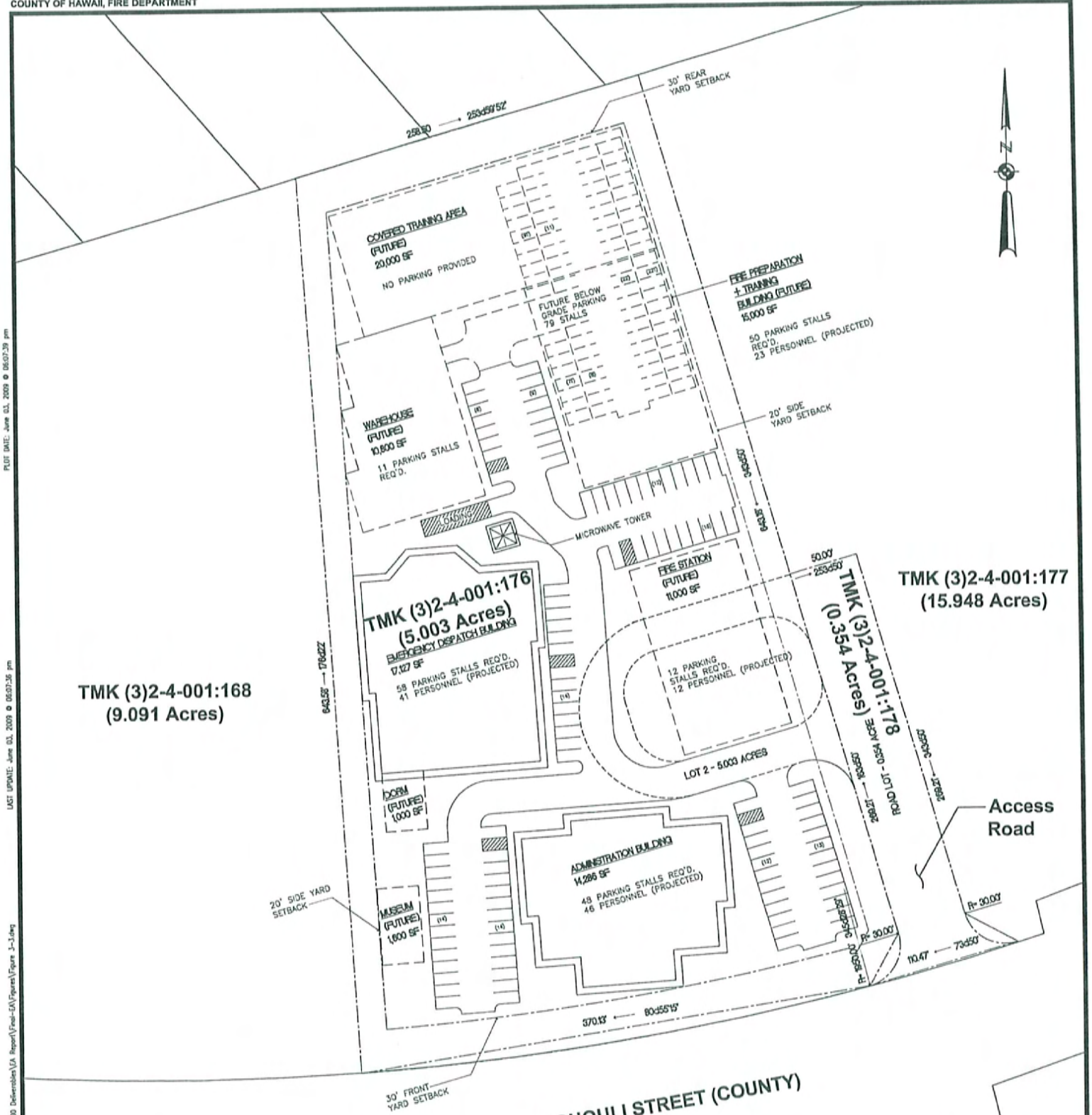

CONCEPTUAL SITE PLAN

SCALE: 1" = 100'

0 100 200 300

1" = 100' SCALE FEET

SOURCES: ANBE, ARUGA & ISHIZU ARCHITECTS, INC.; HAWAII STATEWIDE GIS PROGRAM; COUNTY OF HAWAII

M&E Pacific, Inc.

METCALF & EDDY | AECOM

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Figure 3.3
CONCEPTUAL SITE PLAN
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

PLOT DATE: June 03, 2009 @ 06:07:39 pm
LAST UPDATE: June 03, 2009 @ 06:07:36 pm
PATH/FILENAME: P:\Projects\Hawaii\60035599 AM COH Fire Dept Admin Supp Cmplx\500 Deliverables\EA Report\Final-EA\Figures\Figure 3-3.dwg

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3.3 PROJECT COST AND DURATION

The budget of the initial phase of project construction is currently $14.6 million. The construction budget for access roadway and sewerline installation is anticipated to be $1.5 million. The consulting budget at the time this report is being written is anticipated to be $1 million. This project is wholly funded by the COH with no funding from the State of Hawai'i or the federal government. Construction is expected to commence in late 2009 and last 18 months.

3.4 PURPOSE OF ENVIRONMENTAL ASSESSMENT

This EA results from the use of State lands and County funds, and the location of the project site within an agricultural-use zoned area.

In accordance with Chapter 343 of the Hawai'i Revised Statutes and the Department of Health's Hawai'i Administrative Rules Title 11-200, an EA is required to provide a written evaluation of environmental, technical, social, and economic aspects of the proposed FASC development. The EA identifies potential project impacts and their significance, and develops strategies to mitigate those impacts. The EA then compares all aspects and impacts against 13 significance criteria listed in §11-200-12 to provide a determination as to whether an Environmental Impact Statement EIS is required.

The EA process includes periods of public review, in which the affected community may voice their comments and concerns to the proposed work. If the EA establishes that the proposed activity will not affect the surrounding environment to a significant degree, the agency will issue a Finding of No Significant Impact (FONSI). Should the analysis indicate that a significant impact will be experienced due to the proposed activity; the agency must then prepare an EIS, which is a more detailed evaluation of the proposed action and alternatives.

3.5 ALTERNATIVES CONSIDERED

3.5.1 NO ACTION

The "No Action" alternative entails the decision to not construct the proposed FASC. Therefore, this alternative will not incur any physical or social effects on the environment or benefits to the County Community and would not require further costs for planning, design, and construction by the State.

This project is part of the HFD plan for improved efficiency and quality of public service to the people of the County and is proposed because the current condition of a fractured geography of facilities brings inherent inefficiencies to HFD operations. Quality of service especially in the areas of emergency dispatch and public interaction and feedback would benefit greatly from the development of the FASC. Construction of the proposed facility is anticipated to increase efficiency in HFD and HPD service to the community and improve their response time by providing a centralized base of operations. The benefits from constructing the proposed FASC are greater than any negative issue identified in this EA. Therefore, the "No Action" alternative is not the preferred alternative.

3.5.2 CONSTRUCTION OF THE EMERGENCY DISPATCH, FIRE ADMINISTRATION AND FIRE PREPARATION & TRAINING BUILDINGS IN PHASES

A possible alternative construction alternative could entail the decision to develop the three primary buildings of the site (i.e. the Fire Administration, Emergency Dispatch and Fire Preparation & Training Buildings) in phases. In terms of public safety the emergency dispatch facility could be ranked as the most important followed by the fire administration facility. However, the infrastructure of the site, that is the parking, lighting and utilities,

should be constructed with the first building of any possible scenario to keep overall environmental effects to the area to a minimum. The HFD has provided the following order of priority for the build-out of the entire complex:

1. Emergency Dispatch
2. Fire Administration Building
3. Fire Preparation & Training
4. Warehouse
5. Covered Training
6. Museum
7. Dormitory Facility
8. Fire Station

The addition of the dormitory facility was necessitated by eliminating the dormitory facilities from the Emergency Dispatch building, but the HFD hopes to build this as a future attachment to the communications building.

3.5.3 CONSTRUCTION OF THE SITE COMPONENTS IN DIFFERENT LOCATIONS

A possible alternative construction alternative is to develop the different proposed facilities at different locations.

This option may offer prospective benefits that include optimization for the minimization of potential impacts on the facilities' surroundings (such as, isolation of the training area or staging of the emergency response vehicles) to minimize noise, dust, traffic, lighting, infrastructure, etc. impacts on the environment and adjoining neighborhoods.

This option would present disadvantages that include, but are not limited to, decentralized operations, potential additional cost for land acquisition and site / infrastructure support development, additional efforts for permitting and environmental assessments for the different sites, and the potential for cumulative adverse impacts for each of the different sites on their surroundings.

The prospective and anticipated disadvantages of this option apparently outweigh its benefits; thus, this alternative is considered to be undesirable when compared to the proposed project development in its proposed location and build-out.

3.5.4 ALTERNATIVE SITE

The last alternative is the construction of the FASC at an alternate site. The potential impacts of the complex being relocated to an alternate site depend on the existing condition of the alternate site.

If the alternate site is at a previously developed site, then the site would probably have minimal environmental impacts. Existing infrastructure including driveways, water, sewer, electrical and TV/cable would probably be in place. The relocation of the FASC to a developed site would also have minimal impacts on drainage since the existing site would consist of impervious cover. Impacts on floral and fauna would also be reduced.

Relocation of the project to another undeveloped site would have similar impacts as the currently proposed site. An alternate site, either developed or undeveloped, would

require funds to acquire the site rather than at the currently proposed location that will involve government land transfer. An alternate site location may also not be as ideal as the current site. The current site is centrally located and between existing Fire Department facilities.

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SECTION 4

DESCRIPTION OF ACTION'S TECHNICAL, ECONOMIC, SOCIAL AND ENVIRONMENTAL CHARACTERISTICS

4.1 TECHNICAL

The proposed FASC site is currently undeveloped, and no development has previously occurred on the site. The portion of Mohouli Street extension fronting the site from Komohana Street up to Kūkūau Street was constructed in 2000–2001. The proposed FASC will ultimately consist of the following main structures: Administration Building, Emergency Dispatch Building, Training Building, Museum, Outdoor Covered Training Area, Warehouse, Fire Station and Radio Tower.

Utilities to support the site shall consist of electricity, water, sewer, stormwater drainage, communication, cable television and telephone. The water service lateral is in place, but all other utility laterals or secondaries will have to be installed. All utility laterals will connect to their respective mains at the front of the site, but the sewer lateral connection will have to be connected at the back of the complex. A utility and access easement will be defined to protect and facilitate the maintenance of the proposed sewer lateral.

Other facilities including parking lot paving, site lighting and landscaping will be installed to support the complex. The parking lot shall be sufficient to handle the roughly forecasted number of 52 future employees and the visitors estimated to use the complex. Parking requirements have been coordinated with the County of Hawai'i, Police Department to ensure adequate parking for staff as the plan calls for their Communications-Dispatch staff to be relocated to the Dispatch Building.

4.2 ECONOMIC

This project is entirely funded by the County of Hawai'i. This project is not anticipated to cause an increase in taxes to the general public. The development of the proposed FASC shall provide the HFD with the opportunity to consolidate and improve the efficiency of their operations. The County of Hawai'i Police Department (HPD) will also benefit from the facilities in the Emergency Dispatch Building as they will be allowed to utilize the facilities.

4.3 SOCIAL

The proposed FASC will enable the HFD to improve its operational efficiency and quality of services rendered to the public. The HFD should able to streamline administrative responsibilities such as immediate and long-term planning. The FASC will also provide the public with a dedicated access point for it to share its concerns with the Department, thus making the social benefit mutual between the Department and the public. A great benefit for the public will the new emergency dispatch facility which will be jointly used by both the HPD and HFD. Emergency response time may improve and the communication between the two emergency service providers and the party in need will be clearer. The long-term planned development including the HFD Museum will also improve the quality of the community by providing the public with an additional education venue. The proposed fire station would also provide a great public benefit to the surrounding area. The Central and Kaumana Fire Stations are nearest to the proposed site and are about 1½ miles away. The centralized base of operations that the project provides will improve

the efficiency and response time for both the HFD and HPD. This results in better service and increased safety for the community.

4.4 ENVIRONMENTAL

As presented in subsequent sections of this Environmental Assessment, construction of the proposed FASC is not anticipated to adversely affect the overall environmental quality of the area. Potential impacts to the environmental integrity of the project site and the surrounding areas will be sufficiently mitigated through appropriate design methods, site grading and drainage features, the use of site-specific Best Management Practices (BMPs), the use of proper erosion control methods and environmentally-conscious construction methods.

Short-term construction related impacts are expected from this project. These impacts and the recommended approaches to mitigate their effects are discussed in the following sections of this EA.

The facility will be designed to LEED Silver compliance as contained in the design / construction plans. Renewable energy sources will be considered in the design of the project. Photovoltaic and small, wind-harvesting electrical generation for peripheral uses, such as, parking lot lighting, will be considered in the design / construction plans as much as practicable. Solar energy will also be considered for incorporation into the building plans. Design / construction plans will also include the use of recyclable materials; steel studs and structural members; and, wood products from certified sustainable sources, as much as practicable.

The design / construction plans will incorporate existing native plants found on the site into the landscaping design as much as practicable. Additionally, consideration will be made to have the plans call for the removal of any invasive species of plants within the site, and include landscaping with drought-tolerant native or indigenous species of plants that are common to the area. Tree and landscape planting will provide shading for paved parking areas and cooling of building elements and outdoor-use areas as much as practicable

No long-term adverse impacts due to FASC are expected. These issues are examined in detail in the subsequent sections of this EA.

SECTION 5

AFFECTED ENVIRONMENT, ANTICIPATED EFFECTS, AND PROPOSED MITIGATIVE MEASURES

5 AFFECTED ENVIRONMENT

5.1 PHYSICAL

5.1.1 LOCATION

The project is located on eastern side of the Island of Hawai'i within the South Hilo District. The parcels are identified as the State of Hawai'i Third (3rd) Tax Division, Tax Map Key (TMK) 2-4-001:176&178 (previously portion [Por.] 168). The original parcel 168 was approximately thirty (30) acres and was subdivided into three (3) lots; Lot 1 (now parcel 168), Lot 2 (now parcel 176), and Lot 3 (now parcel 177), and a Road lot (now parcel 178). Parcels 168, 176, 177, and 178 are approximately 9.1 acres, 5.0 acres, 15.9 acres, and 0.35 acres, respectively. The proposed project is located on parcels 176 and 178. The parcels border Mohouli Street between Komohana Street to Kūkūau Street.

The project is surrounded by Waiākea Pasture Land to the south, Sunrise Estates Subdivision to the west (beyond parcel 168), Sunrise Ridge Subdivision and Pacific Heights Subdivision to the north, and University Heights Subdivision to the east (beyond parcel 177. The University of Hawai'i at Hilo is southwest of the project site. The parcels border Mohouli Street between Komohana Street to Kūkūau Street as shown on the project location map (**Figure 3.1**). An affordable, elderly rental housing project has been proposed for parcel 177.

Impacts and Mitigative Measures:

As the site is located adjacent to a residential community, emphasis will be placed on the minimization of impacts by the proposed project on the surrounding neighborhood. A temporary increase in fugitive dust emissions and exhaust emissions from construction equipment and vehicles is anticipated in the project area during construction; however, this increase is expected to be relatively insignificant due to the rapid dispersal caused by the local winds. These effects are short-term in nature and will cease upon completion of the proposed project. No long-term effects on air quality due to the operation of construction equipment or vehicles are anticipated as their presence and use will be temporary. Dust mitigative measures, such as, regular periodic water spraying, dust fences and screens, fast-growing groundcover, and mulching will be considered as potential Best Management Practices (BMPs) during the construction phase.

The County will consider minimizing any potential light-nuisance impacts including the use of shielded outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, and implementing construction curfew periods

Mitigation measures may be taken to minimize noise impacts, including the use of mufflers on equipment vehicles / equipment, and implementing construction curfew periods. Temporary noise impacts will also be generated during the course of responding to fire alarms, as well as, the use of the open training area. These noise disturbances are unavoidable but will be intermittent and of short duration. Additionally, specific hours of training and curfew will be implemented and coordinated as necessary with the neighboring residential community and potential receptors.

Additionally, the implementation of curfew periods on construction and training activities will minimize any nuisance caused by dust and exhaust emissions and noise on neighboring and nearby residences, schools and businesses.

5.1.2 CLIMATE

Description:

According to the Western Regional Climate Center, the average temperature at the nearby Hilo 86A station is 72.9°F with average minimum and average maximum monthly temperatures ranging from 65.8°F and 80.0°F, respectively. The annual rainfall averages approximately 133 inches.

As described in the *Atlas of Hawai'i*, Third Edition (1998), there are two generally recognized seasons in Hawai'i, the *kau* or the warm season when the sun is almost directly overhead and northeasterly tradewinds are present, and the *ho'oilo* or the season of cooler temperatures, lower sun, more variable winds and extensive rains. The northeasterly tradewinds predominate during the summer months (May through September), and weaken during the winter (November through March) when southerly or westerly winds occur due to localized low pressure and frontal systems.

Located on the windward side of the Island of Hawai'i, Waiākea is exposed to northeasterly trade winds during the day and southwesterly winds in the evening. The mean wind speed is approximately seven (8) miles per hour.

Impacts and Mitigative Measures:

As the site is relatively, small and flat and does not represent a regional impact to the climate, no short-term or long-term adverse impacts to the climate are anticipated in the project area. Therefore, no mitigative measures are required.

5.1.3 AIR QUALITY

Ambient air quality refers to the state of purity of the general outdoor atmosphere. Ambient air quality is regulated under the Clean Air Act. The US Environmental Protection Agency (EPA) established National Ambient Air Quality Standards (NAAQS) for six criteria pollutants as a measure of ambient air quality. These six criteria pollutants include carbon monoxide, nitrogen dioxide, sulfur dioxide, lead, ozone and particulate matter less than or equal to 10 micrometers (PM_{10}). In addition, the State of Hawai'i established standards for carbon monoxide and nitrogen dioxide that are more stringent that Federal standards as well as an additional ambient air standard for hydrogen sulfide (HIAAQS). **Table 5-1** summarizes the Federal and State Air Quality Standards.

TABLE 5-1
NATIONAL AND STATE AMBIENT AIR QUALITY STANDARDS

Pollutant	Averaging Time	NAAQS ($\mu g/m^3$)	HI AAQS ($\mu g/m^3$)
Carbon Monoxide	1-hour 8-hour	40,000 10,000	10,000 5,000
Nitrogen Dioxide	Annual	100	70
Sulfur Dioxide	3-hour 24-hour Annual	No Standard 365 80	1,300 365 80
Lead	Quarterly	1.5	1.5
Ozone	8-hour	157	157
PM_{10}	24-hour Annual	150 50	150 50
Hydrogen Sulfide	1-hour	No Standard	35

Source: Hawai'i Department of Health, December 2002

There are five air monitoring stations on the Island of Hawai'i; one of which is in Hilo. The Hilo station only monitors the air for sulfur dioxide (SO_2). According to the State of Hawai'i Department of Health (DOH) 2006 Annual Summary of Hawai'i Air Quality Data, there have been no occurrences for the 3-hour sulfur dioxide readings that were greater than 1300 $\mu g/m^3$. In fact, in recorded history, the top two readings within a single year were 451 $\mu g/m^3$ and 405 $\mu g/m^3$. There were also no occurrences for the 24-hour sulfur dioxide readings that were greater than 365 $\mu g/m^3$. The two highest readings were 161 $\mu g/m^3$ and 96 $\mu g/m^3$. The average 3-hour and 24-hour sulfur dioxide daily reading is 8 $\mu g/m^3$.

Impacts and Mitigative Measures:
The principle sources of air pollution associated with this project will be fugitive dust emissions resulting from construction activities. These effects are short-term in nature and will cease upon completion of the proposed project. No long-term effects on air quality due to the operation of construction equipment or vehicles are anticipated as their presence and use will be temporary. Dust mitigative measures, such as regular periodic water spraying, dust fences and screens, fast-growing groundcover, and mulching shall be considered under the Best Management Practices (BMPs) during the construction phase.

A temporary increase in exhaust emissions from construction equipment and vehicles is anticipated in the project area during construction; however, this increase is expected to be relatively insignificant due to the rapid dispersal caused by the local winds.

Implementation of construction curfew periods will also minimize any nuisance caused by dust and exhaust emissions on neighboring and nearby residences, schools and businesses.

No cumulative effects on air quality are anticipated due to the temporary nature of the construction activity. No long-term mitigative measures are required.

5.1.4 TOPOGRAPHY

Description:

The Lot 2 of the parcel is located in a mildly hilly area. The ground elevation ranges from approximately 330 to 345 feet above mean sea level.

Impacts and Mitigative Measures:

Construction work will involve some earthwork grading and paving. Although the proposed project will slightly modify the site's existing topography and increase the impermeable area due to pavement and concrete structures and buildings, the overall drainage pattern will be maintained. Any additional overland flow anticipated due to the site grading and/or paving will be addressed and appropriately discharged as per State and County requirements through the use of drywells that dispose runoff on-site. Thus the project will not increase runoff from the site from the existing condition.

5.1.5 SOILS

Description:

According to the United States Department of Agriculture, Natural Resources Conservation Service's Web Soil Survey, the soil in the parcel is Keaukaha (rKFD)—extremely rocky muck with 6 to 20 percent slopes—and Pahoehoe (rLW)—lava flows with slopes from 0 to 40 percent. Refer to the soils map, **Figure 5.1**.

Keaukaha series soil consists of well-drained, thin organic soils overlying pahoehoe bedrock and occupy the low areas of Mauna Loa. They are at an elevation ranging from near sea level to 1,000 feet and receive from 90 inches to more than 150 inches of rainfall annually. Their mean annual soil temperature is between 72° and 74° Fahrenheit. The natural vegetation consists of ʻōhiʻa, tree fern, uluhe fern and guava. These soils and Kiloa, Olaa, Panaewa and Papai soils are in the same general area. Keaukaha soils are used for woodland, pasture and homesites.

Keaukaha extremely rocky muck with 6 to 20 percent slopes occurs near the city of Hilo and is undulating to rolling and follows the topography of the underlying pahoehoe lava. Rock outcrops occupy about 25 percent of the area. In a representative profile, the surface layer is very dark brown muck about 8-inches thick and underlain by pahoehoe lava bedrock. This soil is strongly acidic. The soil above the lava is rapidly permeable. The pahoehoe lava is very slowly permeable, but water moves rapidly through the cracks. Runoff is medium and the erosion hazard is slight. In places, roots area matted over the pahoehoe lava or extend a few feet into the cracks. Most of this soil is native forest while some areas are cleared and used for pasture (Pasture Group 9). The suitability of the soil as a source of both topsoil and road fill is poor: pahoehoe lava at depth of less than 10 inches. Permeability is about 3 to 20 inches per hour, reaction is roughly 1 to 5.5 pH, shrink-swell potential is high, and corrosivity for both uncoated steel and concrete is moderate. The agricultural capability subclass rating for soils in the project area is VIIs (limited mainly because it is shallow, droughty or stony), non-irrigated, which includes soils that have very severe limitations that make them unsuited to cultivation and that restrict their use largely to pasture or range, woodland or wildlife. Additionally, the property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawai'i (ALISH). As such, the proposed use will not be detrimental to the island's agricultural resource base nor will it have an adverse impact on the overall agricultural productivity of the region and the island.

KEY
rKFD Keaukaha Extremely Rocky Muck, 6 to 20 Percent Slopes
rLW Lava Flows, Pahoehoe

Figure 5.1
SOILS MAP
Environmental Assessment for the County of Hawaii Fire Department Administration Support Complex
June 2009

SOURCE: HAWAII STATEWIDE GIS PROGRAM; NATURAL RESOURCE CONSERVATION SERVICE (NRCS), NATIONAL COOPERATIVE SOIL SURVEY

SOILS MAP
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The lava flow of 1881 covers most of the site. Only the back portion of the lot opposite from Mohouli Street is not covered by the flow.

According to the University of Hawai'i, Land Study Bureau's overall master productivity rating (Map 626) for agricultural use of the subject property is Class "D" ("Poor"—Land Productivity Index range of 30 to 54), unirrigated, with Land Type 300 (Pāhoehoe with Ōla'a; Depth—shallow and frequent outcrops with pāhoehoe; Texture—moderately fine; Color—dark gray; Parent Material—volcanic ash and pāhoehoe; Stoniness—stony; Drainage—well drained; Slope—0 to 35 percent, mostly under 15 percent; Clime—very humid, cloudy; Mean Annual Rainfall—125 to 175 inches; Elevation—100 to 2,000 feet; Machine Tillability—poorly suited; District—Puna).

The property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawai'i (ALISH). Moreover, Hawai'i County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use.

There is no record of a radiation incident on the proposed site. The Hazard Evaluation and Emergency Response (HEER) office does not have records of any investigation or cleanup activities at the proposed site. This property was former agricultural land in sugar cane production, and lands formerly used for sugar cane production are now being developed into communities where residential homes, schools, and commercial businesses are being constructed. Chemicals associated with the sugar cane industry persist in soil today, and may be a threat to public health and the environment. Elevated arsenic levels were discovered in soil at former sugar cane production areas on the islands. The HEER office has identified former sugar cane production areas for assessment throughout the state, and plans to work with property owners to conduct environmental assessments to identify and address elevated soil arsenic levels prior to finalizing development plans for the properties.

Impacts and Mitigative Measures:
No short-term or long-term adverse impacts to the soils are anticipated in the project vicinity. Therefore, no mitigative measures are required. The proposed fixed structures will be designed in accordance with the existing soil condition as recommended by the Geotechnical Engineer. Soil erosion will be prevented during construction through the use of appropriate BMPs (grassing, mulching, silt fence, erosion mats, gravel, etc.) and construction methods. Excavated soil will be either utilized or disposed of in conformance with current Federal, State, and County regulations. Long-term soil erosion is not anticipated as a result of this project.

5.1.6 WATER RESOURCES

Description:
The project area lies within the Hilo aquifer system, which has a sustainable yield of approximately 347 million gallons per day (mgd). A map of the aquifer systems and sustainable yields for the Island of Hawai'i is presented in **Figure 5.2**. According to the United States Environmental Protection Agency's "Sole Source Aquifer Designations," there are no sole source aquifers on the Island of Hawai'i.

According to the 2005 County of Hawai'i General Plan (General Plan), the Hilo Water System supplies South Hilo with three surface and groundwater sources. The three sources are Olaa Flume Source, Panaewa Well, and Piihonua Well. The General Plan

states that an average of approximately 6.0 mgd is consumed and the total normal capacity is greater than 20 mgd.

An existing County of Hawai'i Department of Water Supply (DWS) water main runs along Mohouli Street just south of Lot 2 site. The existing ductile iron water main is 12-inches in diameter.

Impacts and Mitigative Measures:
The proposed facilities, showers, and other potable water sources will be serviced by the 12-inch water main. The proposed facilities are anticipated to have a minimal impact on the water supply or demand of other DWS customers in the Waiākea area.

5.1.7 WATER QUALITY

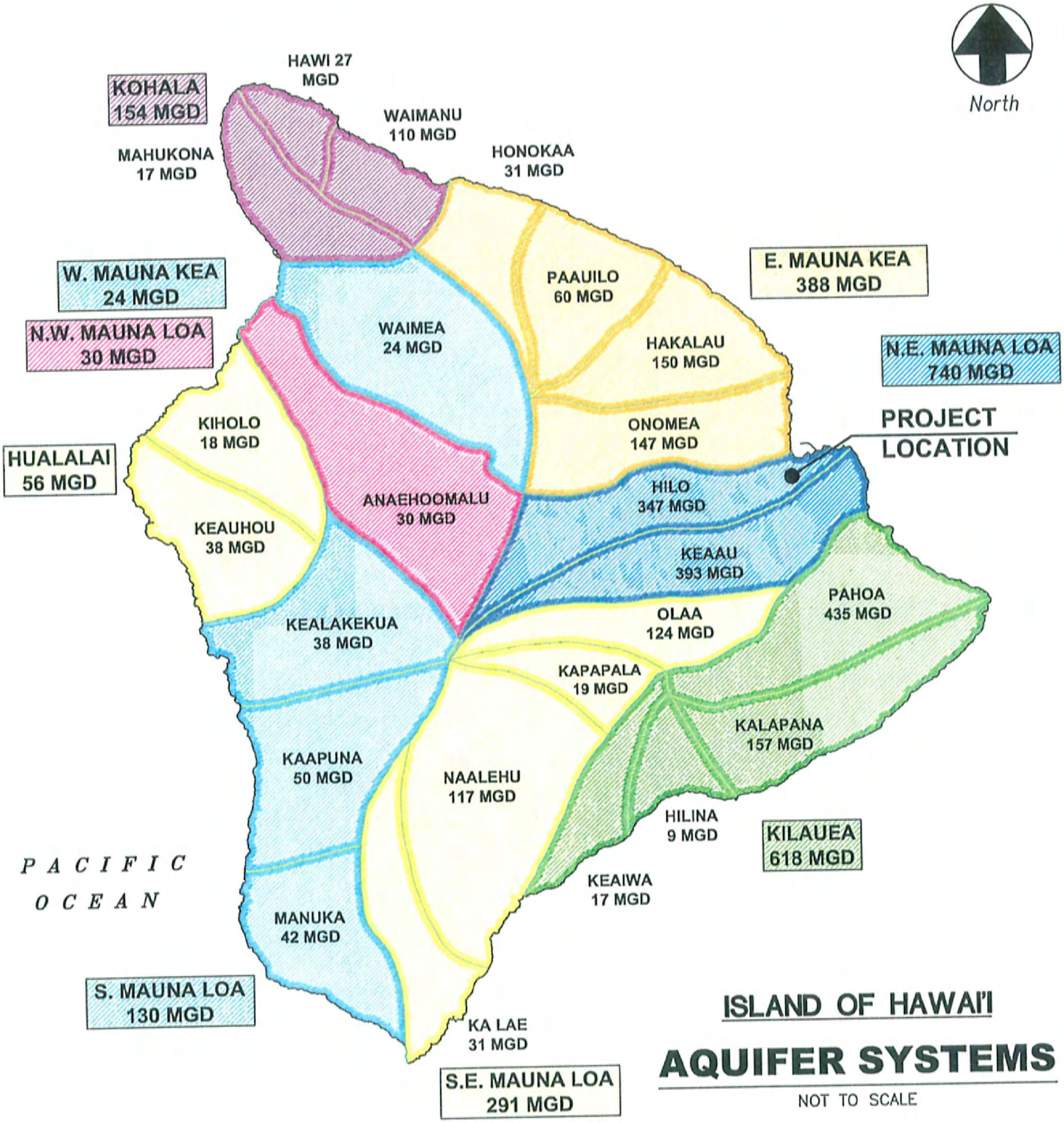
Description:
The project site is near two streams, Alenaio Stream and Waiākea Stream. Both streams are classified as Class 2 inland water. The Waiākea Stream flows into the Waiākea Fishpond, then Wailoa River State Park, and finally into the Hilo Bay. Waiākea Fishpond is classified as Class AA marine water, and Hilo Bay is classified as Class A marine water. These waters are not to receive any discharges that have not received the best degree of treatment or control compatible with the criteria established for this class.

Impacts and Mitigative Measures:
Construction activities described may temporarily affect the water quality of the streams. Construction debris will be properly collected and disposed of as required by current Federal, State and County regulations. Additionally, all earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawai'i County Code.

To minimize and isolate any decrease in water quality, the construction Contractor may be instructed to monitor the water quality as required by the State of Hawai'i Department of Health, and will be required to install and maintain adequate BMPs and employ appropriate construction methods to prevent construction storm water discharge from entering the state waters.

The disturbed area during construction will exceed one acre; therefore, a National Pollution Discharge Elimination System (NPDES) Permit Notice of Intent (NOI) Form C for Stormwater Associated with Construction Activities from the State of Hawai'i Department of Health (DOH) will be required. Other NOIs will be obtained as required by construction methods used for this project. Stormwater runoff from the construction site will be controlled using the appropriate construction methods and BMPs, such as mulching, grassing, silt fences, graveled ingress and ingress and inlet filters at existing catch basins and drain inlets. Dust nuisance may be mitigated through the use of dust screens and regular watering with trucks.

Stormwater runoff at the project site is anticipated to increase with the installation of the proposed facilities, due to the site grading, pavement and concrete structures. Any increase in runoff will be appropriately discharged to unpaved areas with high percolation rates where feasible. Should local sump areas develop with the installation of the proposed improvements, they may be discharged through the use of shallow drywells. The existing overall drainage pattern, however, will be maintained with this project. All development-generated runoff shall be disposed of on-site. A drainage study shall be



ISLAND OF HAWAII
TOTAL = 2,431 MGD

HYDROLOGIC UNITS
Aquifer System & Sustainable Yields

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Figure 5.2
Island of Hawai'i Aquifer Systems
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

SOURCE: STATE DEPARTMENT OF LAND AND NATURAL RESOURCES (DLNR); HAWAII STATE WIDE GIS PROGRAM

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prepared and the recommended drainage system shall be constructed meeting the approval of the County Department of Public Works.

Any potential impacts to the water quality will be properly mitigated as recommended above.

5.1.8 NATURAL HAZARDS

Natural hazards in Hawai'i include floods, hurricanes, volcanoes and earthquakes. Existing conditions about these natural hazards and potential effects on these hazards due to proposed project are described as follows.

5.1.8.1 Floods

Description:

The project site is located in Zones A and X, as determined by the US Federal Emergency Management Agency (FEMA) on the Flood Insurance Rate Map (FIRM) Community Panel 155166 0880C (revised September 16, 1988). Zone A regions are special flood hazard areas inundated by 100-year flood. Zone X regions are classified as other areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood or areas determined to be outside 500-year flood plain. See the FIRM map, **Figure 5.3**.

Impacts and Mitigative Measures:

The majority of the project area is within flood Zone X (500-year flood area) and a small portion of the project area is within flood Zone A (100-year coastal flooding zone). The proposed project will not have any short-term or long term impacts on existing flood zones. Therefore, no mitigation measures are required. The project will not worsen the potential for flooding of the site and its surrounding areas. The project is relatively flat and regionally small and will not impact the climate. Additionally, existing drainage patterns will be preserved and any increase in surface runoff will be contained within the site and disposed of in injection drywells. Thus, runoff from the site to adjacent properties will not be increased from the existing condition.

The National Flood Insurance Program (NFIP) does not have any regulations for developments within flood Zone X; however, it regulates developments within flood Zone A. For flood Zone A, the project site must comply with the rules and regulations of the NFIP presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. 44CFR indicates the minimum standards set forth by the NFIP, and the County's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. Any construction within the designated FEMA flood zone shall comply with the requirements of Chapter 27, *Floodplain Management*, of the *Hawai'i County Code*.

5.1.8.2 Hurricanes

Description:

Hawai'i is subject to the threat of approaching tropical storms and hurricanes. The first hurricane officially recorded in Hawai'i (Hiki) occurred in 1950. Newspaper accounts and meteorological data collection indicate that storm systems occur more frequently in Hawaiian waters than previously thought (Atlas of Hawai'i, 1998). More recently, Hurricanes 'Iwa (1982) and 'Iniki (1992) struck the Hawaiian Islands.

Hawai'i remains vulnerable to hurricanes, although they are rare events. These storms bring very heavy rains that may contribute to soil and slope instability, and high winds that contribute to surf hazards.

Impacts and Mitigative Measures:
Modifications to the project site will not affect the climate in the vicinity of the project area as discussed in Section 5.1.2 since the relative scale of the site is small and does not affect the region of the area. The proposed facility features will be designed and constructed to best minimize damage during tropical storm, hurricane, or strong wind events.

5.1.8.3 Volcanic Eruptions

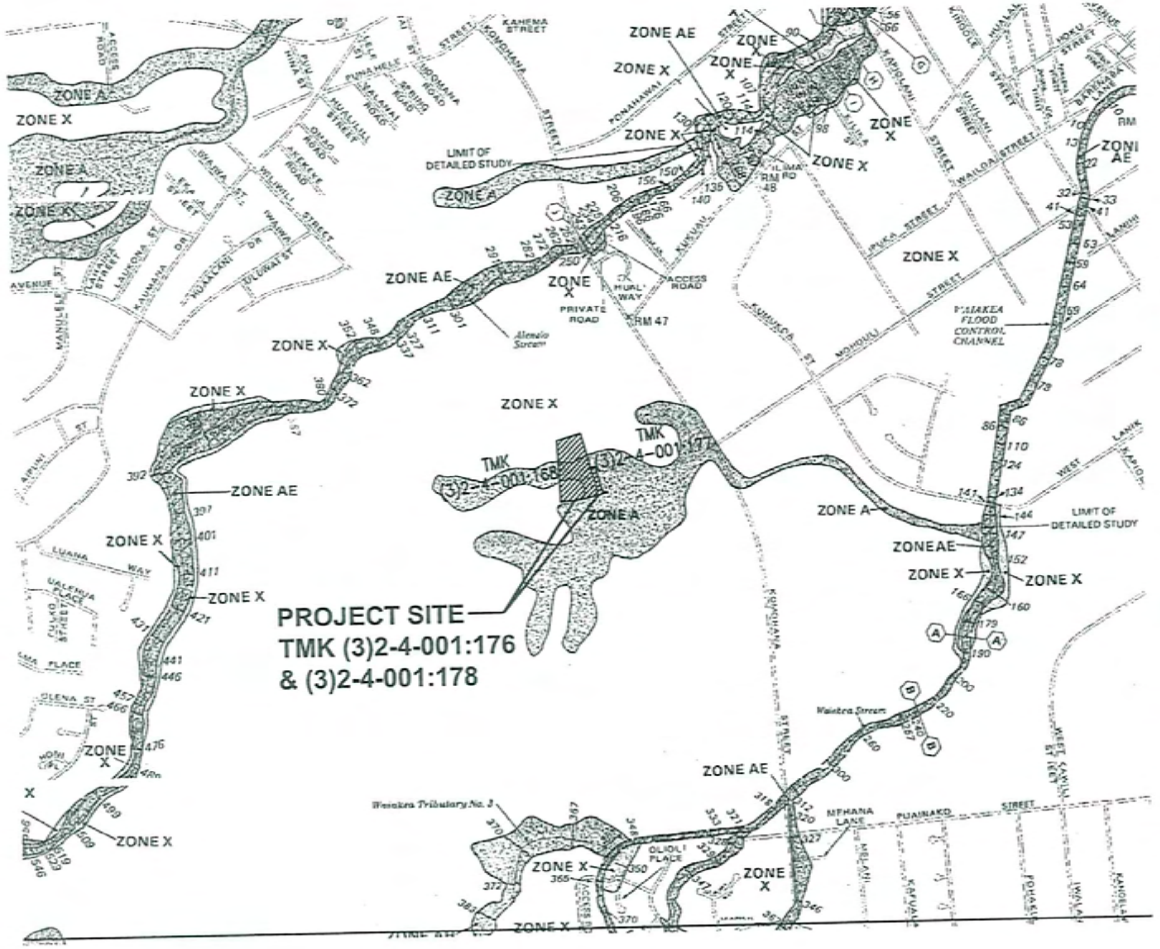
Description:
There are four active volcanoes on the Island of Hawai'i. Kilauea is an active volcano that has been continuously erupting since January 1983. Kilauea is located outside of the project region to the north. Mauna Loa last erupted in 1984. The Lo'ihi volcano last erupted in 1996, and Hualalai last erupted in 1801 and is expected to erupt again within the next 100 years.

The project area is located on the northeast slope of Mauna Loa, roughly 36 miles northeast of the Mauna Loa summit and 26 miles southeast of the Mauna Kea summit. The lava hazard to the project site is posed by Mauna Loa. The project area is in lava hazard zone 3 on an ascending scale of risk from 9 to 1, as determined by the United States Geological Survey (USGS). The lava flow hazard zones are based on the location of eruptive vents, past lava flow coverage, and topography. A map of the lava hazard zones for the Island of Hawai'i is presented as **Figure 5.4**. Zone 3 areas are areas in which 15 to 25 percent of the area has been covered by lava since 1800 and 15 to 75 percent of the area have been covered by lava in the last 750 years.

Impacts and Mitigative Measures:
The probability of volcano eruption occurrence in the project region is slim as an eruption has not been recorded for the area for over 2 decades. Project construction will not affect or worsen the probability of volcanic eruption occurrence. The proposed facilities will comply with current regulatory design standards.

5.1.8.4 Earthquakes

Description:
Earthquakes in Hawai'i typically result from magmatic migration underground. As there are four volcanoes currently classified as "active," future earthquakes associated with underground lava movements are expected. There have been 23 large earthquakes with a magnitude of 6.0 or greater recorded since 1868 (Atlas of Hawai'i, Third Edition, 1998 and Volcanic and Seismic Hazards on the Island of Hawai'i, USGS, 1997), the most recent occurring in October 2006 (6.7 magnitude).



LEGEND

SPECIAL FLOOD HAZARD AREAS INUNDATED BY 100-YEAR FLOOD

- ZONE A — No base flood elevations determined.
- ZONE AE — Base flood elevations determined.
- ZONE AH — Flood depths of 1 to 3 feet (usually areas of ponding); base flood elevations determined.
- ZONE AO — Flood depths of 1 to 3 feet (usually sheet flow on sloping terrain); average depths determined. For areas of alluvial fan flooding, velocities also determined.
- ZONE A99 — To be protected from 100-year flood by Federal flood protection system under construction; no base elevations determined.
- ZONE V — Coastal flood with velocity hazard (wave action); no base flood elevations determined.
- ZONE VE — Coastal flood with velocity hazard (wave action); base flood elevations determined.

FLOODWAY AREAS IN ZONE AE

OTHER FLOOD AREAS

- ZONE X — Areas of 500-year flood; areas of 100-year flood with average depths of less than 1 foot or with drainage areas less than 1 square mile; and areas protected by levees from 100-year flood.

OTHER AREAS

- ZONE X — Areas determined to be outside 500-year flood plain.
- ZONE D — Areas in which flood hazards are undetermined.

Flood Boundary

Floodway Boundary

Zone D Boundary

Boundary Dividing Special Flood Hazard Zones, and Boundary Dividing Areas of Different Coastal Base Flood Elevations Within Special Flood Hazard Zones.

513 — Base Flood Elevation Line; Elevation in Feet*

D–D — Cross Section Line

(EL 987) — Base Flood Elevation in Feet Where Uniform Within Zone*

RM7 X — Elevation Reference Mark

• M20 — Coastline Mile

*Referenced to the National Geodetic Vertical Datum of 1929

APPROXIMATE SCALE-IN FEET

600 0 600

FIRM
FLOOD INSURANCE RATE MAP

HAWAII COUNTY, HAWAII

PANEL 880 OF 1900
(SEE MAP INDEX FOR PANELS NOT PRINTED)

PANEL LOCATION

COMMUNITY-PANEL NUMBER
155166 0880 C

MAP REVISED:
SEPTEMBER 16,1988

Federal Emergency Management Agency

SOURCE: HAWAII STATEWIDE GIS PROGRAM; FEDERAL EMERGENCY MANAGEMENT AGENCY (FEMA), FLOOD INSURANCE RATE MAP (FIRM)

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FLOOD INSURANCE RATE MAP

SCALE AS NOTED

Figure 5.3
FLOOD INSURANCE RATE MAP
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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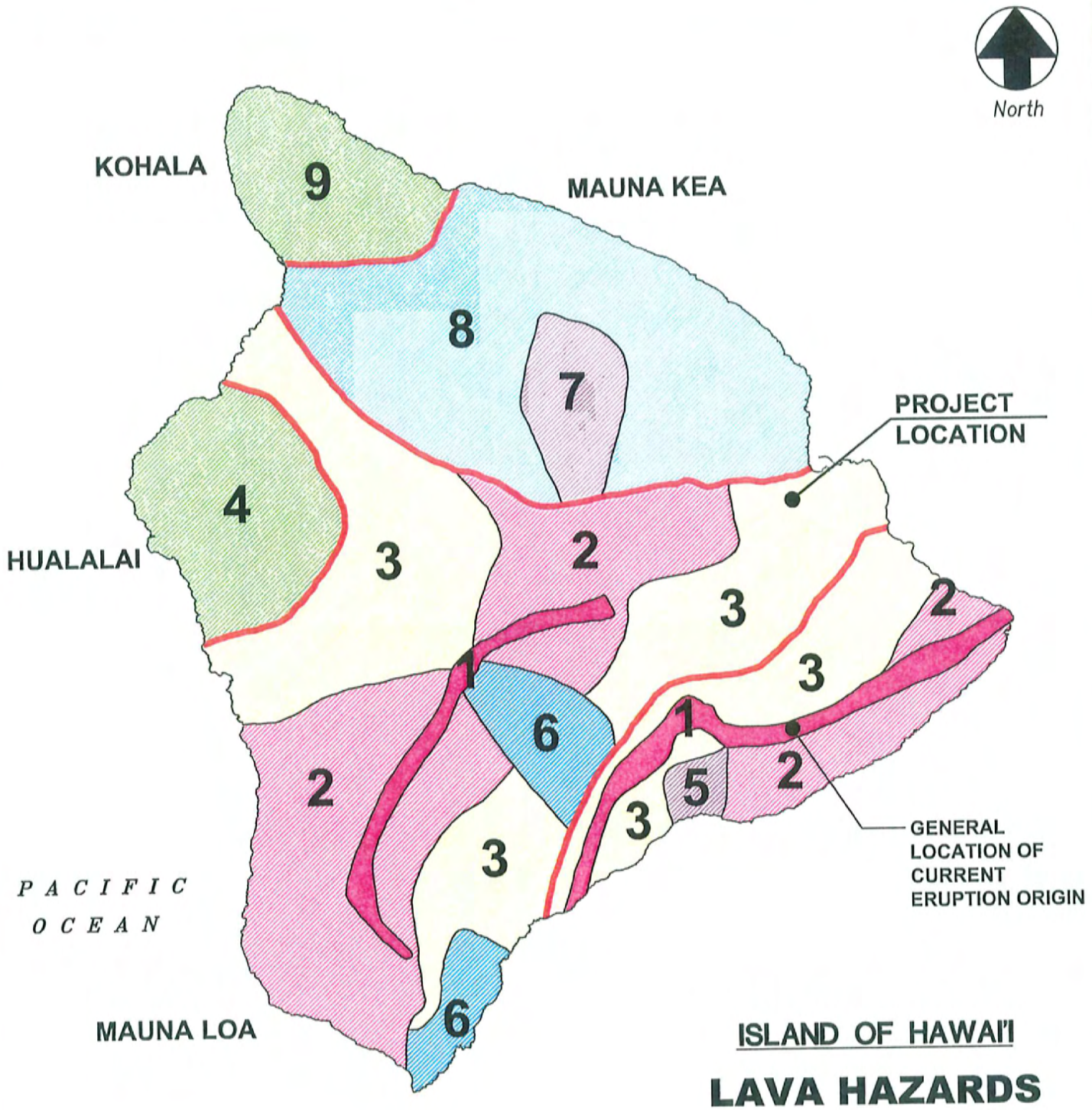

ISLAND OF HAWAI'I

LAVA HAZARDS

NOT TO SCALE

Hazard Zones are ranked from 1 (highest risk) to 9 (lowest risk)

SOURCE: HAWAII STATEWIDE GIS PROGRAM; U.S. DEPARTMENT OF THE INTERIOR

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Figure 5.4
Island of Hawai'i Lava Hazards
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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Large earthquakes of this magnitude can cause structural damage to non-reinforced buildings and can cause coastal subsidence. The entire Island of Hawai'i is designated as Seismic Zone 4, based upon the United Building Code's (UBC) seismic zone criteria that ranges from 0 to 4, with 0 being the lowest risk and 4 being the highest risk.

Research suggests that many of the significant earthquakes on the Island of Hawai'i have resulted from the seaward sliding of the south flanks of Kilauea and Mauna Loa along a nearly horizontal fault. This fault is thought to be the buried boundary between the ancient oceanic crust and the volcanic edifice, approximately 6 miles deep. Earthquakes resulting from fault include the November 1972 magnitude 7.2 Kalapana earthquake which resulted in the loss of two lives, caused considerable damage, and generated a tsunami that inundated the Kau and Puna coastlines.

Impacts and Mitigative Measures:
The project structures will be designed to meet seismic requirements for the region. Project construction will not affect or worsen the probability of earthquake occurrence or severity. The proposed project will comply with the current regulatory design standards.

5.1.9 FLORA AND FAUNA

Description:
A Vertebrate Faunal Survey was conducted in February 2009 for the project, and the report is included with this EA as **Appendix E**. The goals of this survey were to:

1. Document the species of birds and mammals observed on or near the property; and,

2. Devote special attention to documenting the presence and possible use of this property by native and migratory species, particularly those that are listed as threatened or endangered (such as, the Hawaiian Hawk and Hawaiian Hoary Bat).

The only birds and mammals encountered during the survey were alien species. No migratory shorebirds or seabirds were observed nor expected on the project property; however, the Newell Shearwater and Hawaiian Petrel might be observed flying over the site as they move between their mountain nesting areas and the sea. Outside lights should contain shields that direct the light downward to minimize distraction for these birds from March to September. Juvenile Shearwaters and Petrels are particularly prone to disorientation by lights and can fly into powerlines or fall prey to dogs, cats or vehicle strikes. The endangered 'Io (Hawaiian Hawk) and non-endangered Pueo (Hawaiian Short-Eared Owl) occur in man-altered, as well as, native habitats throughout the Island of Hawai'i. None were recorded during the project survey; but, they may forage in the project area on occasion. No 'Io nests were found. The endangered Hawaiian Hoary Bat is more often seen on the Islands of Hawai'i and Kaua'i, but is much less common on the other islands. No bats were detected during the survey possibly due to the time of year and adverse (wind and rain) foraging conditions for bats. They utilize a wide spectrum of habitats from native forest to urban and agricultural lands. Their breeding season runs from April to August, during which time trees should not be cut or disturbed as young bats that are still dependent on their mothers are confined to roosting in trees. Additionally, barbed-wire fences are threats to both adult and juvenile bats.

Several flora and fauna surveys were conducted recently for undeveloped agriculturally zoned sites near the site. The closest and most recent survey was conducted for the

Final Environmental Assessment (FEA) for the US Department of Agriculture (USDA) Pacific Basin Agricultural Research Center project. The USDA research center site is located about 2,000 feet to the south of the proposed FASC site. Both the USDA research center and FASC sites were undeveloped prior to development.

Char & Associates conducted the flora survey in May 2000 and March 2001 of the USDA research center site and is available from the OEQC for reference. The survey found large tracts of natural growth that consisted primarily of ohia lehua (*Metrosideros polymorpha*), uluhe ferns (*Dicranopteris linearis*), strawberry guava (*Psidium cattleianum*), and melastoma (*Melastoma candidum*). The undeveloped site also had guava (*Psidium guajava*), hala (*Pandanus tectorius*), gunpowder tree (*Trema orientalis*), melochia (*Melociha umbellate*), and king palm (*Archontophoenix alexandrea*).The ohia trees on the proposed FASC site appeared be 15 to 30 feet tall, and the flora listed above are most likely present on the proposed site.

The survey for the USDA research center site noted that 23 native plants on the site. Seventeen were indigenous (native to the Hawaiian Islands and elsewhere) and the remaining 6 were endemic (native to the Hawaiian Islands and not found anywhere else). The endemic species were the ohia, amau (*Sadleria pallida*), hapuu (*Cibotium glaucum*), wahine noho mauna (*Adenophorus tamariscinus*), neneleau and ahaniu or uki (*Machaerina mariscoides ssp. meyenii*). These native species are not rare, threatened or endangered.

Rana Productions, Ltd. conducted the fauna survey for the USDA research center in December 2001. Eight bird species were observed during the survey. All species were alien in Hawai'i. Three species of mammal were observed during the survey, and as in the case of the bird species, all species were alien in Hawai'i. The Hawai'i Natural Heritage Program (HNHP)[1] was also consulted (see **Appendix A**), and while a review of their database records determined that no threatened or endangered species have been recorded within the site.

Consultation with the United States Department of the Interior Fish and Wildlife Service (FWS) revealed that the federally endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) is known to occur in the vicinity of the project area. Additionally, the FWS indicated that several species which are not listed under the Endangered Species Act (ESA) but are protected under the Migratory Bird Treaty Act may transit the area. These birds may fly through the area while traveling to or from their montane nesting areas, however they not known to inhabit the area encompassing the site. The FWS further suggested that the endangered Hawaiian hoary bat or 'ope'ape'a (*Herpestes a. auropunctatus*) may use resources within the proposed FASC site even though they were not observed in the survey for the USDA research center. Likewise, endangered native bird species such as the Hawaiian hawk or i'o, short-eared owl or pueo, dark-rumped Petrel or ua'u (*Pterodroma phaeopygia sandwichensis*) and Newell's Shearwater or 'a'o (*Puffinus auricularis newelli*) not observed in the survey may also use the resources within the proposed site. The FWS pointed out that since the project undertaking is not funded by the federal government, it is not subject to ESA review and coordination by them. Coordination with the FWS for this EA and the project's faunal

[1] The Hawai'i Natural Heritage Program database is compiled based upon on the research and observations of scientists and individuals, and is not necessarily a result of comprehensive site-specific field survey.

survey represent the County's good-faith effort to assess any potential impacts to the environment and existing habitats.

Correspondences related to the flora and faunal consultations are provided in **Appendix A**.

Impacts and Mitigative Measures:
The development of the proposed FASC would not have a significant adverse impact on the flora present within or in the vicinity of the project site. No rare, threatened or endangered species of plants were found.

The existing larger ohi'a tree could be incorporated into the proposed landscaping plans were feasible. Native plants could also be considered for the landscaping of the site. Botanists, horticulturalists or others familiar with growing native species in the Hilo area could be contacted for a list of native plants suitable for landscape use.

The FWS raised concerns that the night-flying birds, especially those protected by the Migratory Bird Treaty Act, may become disoriented from the bright lights of the proposed site lighting elements, which may cause them to land in an area where they are vulnerable to vehicle collisions and non-native predators. Additionally, the FWS is concerned that the migrating birds may collide with the light poles while in flight. To minimize the potential effect upon the birds, the County will consider:

- Having all lighting associated with the proposed facilities to be shielded downward so that bulbs are not visible at bulb height from their sides (at least for a minimum yearly period from March to September);
- Installing the lights to be mounted on the shortest poles possible;
- Limiting the poles to not extend above the height of surrounding existing vegetation of approximately 30 feet;
- Specifying in the design that bulbs with the lowest wattage possible be used with the lighting elements.

The use of lights at night during the peak seabird fallout period from September 15 to December 15 will be avoided as much as practicable, and personnel will be educated regarding seabird fallout. These mitigative strategies will help to minimize the potential disorientation of the birds, and will minimize possible collision of the birds with the light poles, as recommended by the FWS. The radio tower being constructed in association with this project may pose a flight hazard to seabirds. The 'ope'ape'a should not have a problem of colliding with vehicles buildings, communication towers or light poles as the mammals use ultrasonic echolocation to navigation.

Further coordination with the FWS has indicated that a bird survey in the area (near Hilo Harbor) has indicated a low passage rate of seabirds; thus, there is not a lot of concern for adverse impacts of the proposed tower on seabirds and their normal flight and migratory patterns, additionally since the project occurs in an urban location. The design of the microwave antenna tower will minimize its surface area and be in line with surrounding vegetation as much as practicable. The tower design will also conform to applicable County ordinances and guideline requirements / criteria for its proximity to the Hilo International Airport, as applicable. The County may consider coordinating a night-time, bird echo survey with the FWS later prior to construction of the microwave antenna tower.

The County may also consider coordinating a bat echo survey with the FWS prior to construction in areas where the project calls for the cutting or removal of trees. If Hawaiian hoary bats are found in the area, the FWS will be contacted for information on how to address potential impacts to the hoary bats. Disturbing trees in areas where bats occur during the April through August breeding season will be avoided, as much as practicable because bat pups can be found in nursery trees during those months. Use of barbed wire fences will be minimized or eliminated, as bats can be harmed by them.

The FWS also raised concerns that vegetation clearing during the March through September Hawaiian hawk breeding season may result in impacts to hawk nests. If surveys of the area indicate the presence of nesting hawks where brush and tree clearing are proposed during the breeding season, the County will consider contacting the FWS for information on how to avoid adversely impacting the hawks.

5.1.10 VISUAL
5.1.11 SCENIC AND OPEN SPACE RESOURCES

Description:

The project site is located near several residential subdivisions and the Waiākea Forest Reserve. The project site is located on an undeveloped parcel near a few paved streets.

Impacts and Mitigative Measures:

This project includes Fire Administration, Emergency Dispatch, and Fire Preparation and Training Buildings, offices, paved parking area and access road, a court yard, a training area, and a radio tower. These facilities and structures are relatively flat and will conform to agency height restrictions and guidelines. Thus, project effects on existing scenic and open space resources will be minimal. Mountain and ocean views will be preserved by the project and County setbacks from the property lines and roadway rights-of-way for the project's structures will be incorporated into the site development. The proposed facility will serve the community and will not substantially alter or change the essential character of the land and present use. The fire administration support complex will not be inconsistent with the essential character of the mixed residential, agricultural and commercial uses of the surrounding properties. At full build-out, roughly 50% of the site will either be open space or occupied by paved parking areas essentially flat and flush with the finish grade of the lot. Landscaping within the site will also screen or minimize visual impacts from the proposed improvements.

Construction activities will disrupt aesthetic qualities temporarily. Disruptions will be minor and short term and will result primarily from activities associated with the installation of the proposed facilities. The facilities will be designed to minimize its impact on the natural beauty of the site.

5.2 SOCIAL
5.2.1 CULTURAL RESOURCES

Description:

In accordance with the Hawai'i State Constitution, the County protects and preserves cultural, historical and archaeological assets and sites, burials and funerary objects, and traditional practices and access rights. According to the State Historic Preservation Department's (SHPD's) Hawai'i National Register of Historic Places no historical or archeological site are located within the project area.

To supplement this finding, the following organizations were contacted. No comments or reservations have been received at this time.

Department of Hawaiian Homelands
Hawai'i Natural Heritage Program
Office of Hawaiian Affairs

Copies of the consultation requests and responses received are provided in **Appendix A**.

Impacts and Mitigative Measures:
The proposed project will not result in an adverse impact to the site as a historical cultural resource, nor will it impact the historical or cultural integrity of the surrounding areas. No significant short-term or long-term impacts are anticipated, therefore, no mitigative measures are required.

5.2.2 CULTURAL IMPACT ASSESSMENT

Description:
In accordance with policy of the State of Hawai'i under Chapter 343, HRS, a Cultural Impact Assessment (CIA) is included in this EA to promote responsible decision making.

Articles IX and XII of the State Constitution, other state laws, and the courts of the State require government agencies to promote and preserve cultural beliefs, practices, and resources of native Hawaiians and other ethnic groups. Chapter 343 also requires environmental assessment of cultural resources, in determining the significance of a proposed project.

To assess the cultural practices, values and characteristics associated with the project area, prospective informants knowledgeable with the history, use and culture of the area were planned to be interviewed. A total of 10 entities, referred by the Office of Hawaiian Affairs (OHA) in Hilo as being cultural resource contacts, were asked to be interviewed via correspondence in January 2008, to obtain a broad range of cultural resource perspectives about the area and acquire a wide range of viewpoints about the potential project impacts on cultural features. These potential interviewees were as follows:

(1) Mrs. Pualani "Pua" Kanaka'ole Kanahele
(2) Mrs. Chiyomi Leina'ala Fukino, M.D.
(3) Mr. Kepa Maly
(4) Mr. Fred Cachola
(5) Ms. Mikilani Ho
(6) Mr. Robert "Sonny" & Mrs. Roberta Keakealani
(7) Ms. Maria Kaimipono Orr
(8) Edith Kanaka'ole Foundation / Halau O Kekuhi
(9) Hilo Hawaiian Civic Club
(10) Native Hawaiian Legal Corporation

In addition to identifying cultural practices, relevance and history of the project site and its surrounding areas, the informants were asked about their knowledge of any native, endangered or threatened floral and faunal species; archaeological and historic properties or sites; aesthetic or visual resources; *mauka-makai* or other traditional accesses; and, socioeconomic value associated with the project site. The discussions were planned to help determine potential impacts to these resources that the proposed

project may have, and identify any concerns that the individual or entity has about the project undertaking and any of its features. None of these individuals and entities had any knowledge of cultural; historical; archaeological; visual; or native, threatened, or endangered floral or faunal resources at or near the project site. The project occurs in an area not know to be inhabited or used by Hawaiians. There were no concerns regarding the project that were identified by the informants.

An Archaeological Assessment Report (AAR) was completed for the project in November 2008, and submitted to the SHPD for review and processing in December 2008. Both the AAR and SHPD's determination letter of concurrence (dated February 28, 2009) are included with this EA as **Appendix E**. The AAR summarizes that no archaeological, historic or cultural sites, properties, resources or features are located on the project parcel. The entire parcel is completely covered by pāhoehoe lava from the 1880 to 1881 flow. Any traditional cultural resources constructed prior to that flow are no longer visible. The recent flow lava also prevented any modern sugar cane or other agricultural pursuits. At the time of this report, there are no cultural resources, modern structures, or modern disturbances on the study parcel.

Impacts and Mitigative Measures:
No cultural or historical concerns were identified by the interviewees or the Archaeological Assessment Report. Thus, no impacts or mitigative measures for cultural, archaeological or historical resources are proposed for the project.

In accordance with HRS Section 6E-46.6 and HAR Chapter 13-300, if any significant archaeological, historic, or cultural deposits or human skeletal remains are encountered during construction, work shall stop in the immediate vicinity and both the SHPD and OHA shall be notified. This requirement will be included in the project design/construction plans.

5.2.3 PUBLIC SERVICES / INFRASTRUCTURE

Description:
Proposed vehicular access to and from the project site is through a proposed single dedicated driveway off of Mohouli Street. The right-of-way on the side of the road will be developed and the road paved for construction access and left for the future road. There are currently no paved surfaces within the project site.

Existing Hawai'i Electric Light Company, Inc. (HELCO) street lighting and a 12-inch County Department of Water Supply (DWS) waterline are located along Mohouli Street fronting the site. A water service lateral does not currently exist for the project site, and the project site does not have an existing electrical service secondary. A DWS pressure-reducing station and valve box are located near the project site along Mohouli Street.

The two other County streets in the vicinity, Komohana and Kūkūau Streets, have existing street lighting on utilities poles with overhead electrical and waterlines. A subdivision, Sunrise Ridge, located to the north of the project site has an existing County sewer system along Kahikini Street.

Impacts and Mitigative Measures:
Water service for the proposed project will be provided through the installation of a new lateral from the existing DWS 12-inch water main within Mohouli Street into the site. The DWS points out that the existing 12-inch waterline fronting the project site is adequate to provide the required 2,000 gallons-per-minute (gpm) flow for fire protection, as per the

DWS Water System Standards. The new water service line will be installed in an underground trench to protect it from damage and fire hydrants will have to be installed on the proposed project site for on-site fire protection. Any meter(s) serving the proposed project will require the installation of a reduced-pressure type backflow prevention assembly within five feet of the meter on private property. The DWS must inspect and approve the installation before water service can be activated. Prior to issuing a water commitment for the proposed project, the DWS will request estimated maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for their review and approval. After their review of the calculations, the DWS will determine the water commitment deposit amount and facilities charges due to them from the project owner / developer, and any water system improvements required for final approval.

Fire apparatus access roads shall be in accordance with UFC Section 10.207:

"**Fire Apparatus Access Roads**

"**Sec. 10.207.** (a) **General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.

"(b) **Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.

"**EXCEPTIONS:** 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

"(c) **Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.

"(d) **Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

"**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and

approved signs are installed and maintained indicating the established vertical clearance.

"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.

"(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)

"(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)

"(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

"(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus.

"(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%)

"(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times.

"(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."

Water supply shall be in accordance with UFC Section 10.301:

"(c) **Water Supply.** An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow.

"Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable or providing the required fire flow.

"The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207."

All wastewater shall be handled by the existing County wastewater system in the Sunrise Ridge subdivision just north of the project area along Kahikini Street. The Civil Engineer of record will calculate wastewater flow rates to determine the existing system can accommodate the added flow. The proposed wastewater lines shall be designed and constructed in accordance with the current County of Hawai'i codes and regulations. The proposed sewer lateral will be installed in an underground trench within a proposed utility and access easement. All wastewater generated should be a domestic-type wastewater with no significant amounts of oils or industrial chemicals. The County Wastewater Division Design Checklist will be used as a guide to connect to their system and a meeting with the Wastewater Division staff is recommended by the County to be arranged prior to the start of planning and design phases. A wastewater master plan study for the entire parcel will be completed and submitted to the County.

Electrical service will be provided by a connection to the existing HELCO underground power primary on Mohouli Street. Site lighting will be provided at the site temporarily for construction and permanently to provide security and visibility. Appropriate lighting will also be provided at the comfort station. Mitigation measures may be taken to minimize any light-nuisance impacts to the environment and community including the use of shielded outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, and implementing construction curfew periods.

ADA parking stalls, loading zones, accessible routes, and pedestrian access ramps will be provided to the buildings.

A new waterline, electrical duct, telephone/communication duct to support the full FASC build-out will be constructed during the initial phase of this project. The future utilities will connect to the existing utilities.

Disruption of existing public utilities is not anticipated due to construction of the proposed FASC. Residents and businesses located on near the project site should not experience a disruption of service.

Construction and demolition waste shall not be disposed of at any County solid waste transfer stations. Commercial operations, State and Federal agencies, religious entities and non-profit organizations shall not use transfer stations for solid waste disposal. A Solid Waste Management Plan in accordance with County guidelines shall be submitted to the County. The County recommends that aggregates and any other construction/demolition waste be responsibly reused to its fullest extent; ample and equal room be provided for rubbish and recycling; and, green waste be transported to the green waste sites located at the Hilo transfer station, or other suitable diversion programs.

5.2.4 NOISE

Description:

The project site is bordered by residential subdivisions. Residents are spread out on lots at least 1 acre in size on the *mauka* side of the site along Kūkūau Street and are more densely packed on lots at least 10,000 square feet in size on the *makai* side along Komohana Street. An affordable, elderly rental housing project has been proposed for the adjacent parcel (TMK [3]2-4-001:177) east of the site. Temporary noise impacts will occur from construction activities for the development of the property and are unavoidable. Some ambient noise level may be generated from training activities on at

the FASC and from vehicular movements along Mohuoli Street. Ambient noise within the immediate project area is generally low, with the main noise sources being vehicular traffic. Additional background noise is provided from natural sources, such as the wind and rain. Emergency vehicles such as ambulances will be serviced by the FASC, but sirens should be silent. Ambulances will only be re-supplied and will not be transporting any patients while at the FASC.

During construction, noise levels will increase from the operation of heavy construction equipment. Typical heavy construction equipment will include but may not be limited to backhoes, front loaders, concrete trucks, flat bed trucks, etc. Typical noise levels generated by this equipment will range from 80 to 90 decibels (dBA). These will be short-term and regulated impacts.

Impacts and Mitigative Measures:
Noise generated by construction activities will comply with noise provisions established in Title 11, Chapter 46 (Community Noise Control) of the State Department of Health Administrative Rules, and no further measures are required to mitigate short-term impacts. Construction activities are short-term and localized in nature; therefore no long-term or cumulative impacts are anticipated.

The noise generated by the use of the proposed facilities is anticipated to be on the same level as the existing ambient noise and will not adversely impact to the surrounding environment. No mitigative measures are necessary.

Mitigation measures may be taken to minimize noise impacts, including the use of mufflers on equipment vehicles / equipment, and implementing construction curfew periods. Temporary noise impacts will also be generated during the course of responding to fire alarms, as well as, the use of the open training area. These noise disturbances are unavoidable but will be intermittent and of short duration. Additionally, specific hours of training and curfew will be implemented and coordinated as necessary with the neighboring residential community and potential receptors.

5.2.5 TRAFFIC

Description:
The proposed project is expected to be occupied in two years or sooner and would be expanded over a 20-year period. Therefore, traffic forecasts were prepared for 2010, 2017 and 2027 study periods. A Traffic Impact Assessment Report (TIAR) was completed for the project in February 2008, and is included with this EA as **Appendix C**.

Access to the project site would be through a 50-foot roadway right of way on the eastern boundary of the site. Other roadways in the area include Komohana Street and Kūkūau Street. The major intersections in the vicinity that would be affected by project generated traffic include the Komohana Street and Kūkūau Street intersections with Mohouli Street, and the Komohana Street/Kūkūau intersection.

The proposed project is scheduled for occupancy in two years from 2007 and would be expanded over a 20-year planning horizon. During the 20-year period from the 2007 traffic count date to full development, ambient traffic on the area roadways can be expected to increase due to regional growth and new projects in the area. The traffic that would be generated from the proposed project was added to the ambient traffic forecast to obtain the total with project traffic forecasts for the three study forecast years. A two-step process was used to develop the ambient traffic forecasts. The first step developed

a background traffic forecast based on regional traffic growth and committed projects. The second step added traffic which would be generated by proposed development on the University of Hawai'i at Hilo (UHH) *mauka* property.

The traditional three-step process of trip generation, trip distribution, and trip assignment was used to forecast future traffic that would be generated by the proposed project. The trip generation step forecasts the number of new trips that would be produced in each of the two study periods. The trip distribution step allocates these new trips by direction of travel. Finally, the trip assignment step assigns the trips to the specific turning movements at the study intersections. The trip generation step forecasts the volume of vehicle trips that would be generated by the proposed project during the morning and afternoon peak periods. The trip generation rates for a government office complex were used for the proposed project, with the number of trips generated in 2010, 2017 and 2027 based on projected floor area.

The concept of level of service is used to quantify the quality of traffic flow on roadway facilities. The Transportation Research Board (TRB) has developed procedures to calculate level of service value(s) by measuring traffic volumes against the capacities of different types of roadway facilities. Two of the study intersections on Kūkūau Street are currently unsignalized. The procedure used for analyzing unsignalized intersections calculates vehicle delays and levels of service based on the distribution of gaps in traffic on the major street and driver judgment in selecting gaps through which to execute turns. For two-way stop intersections where only the minor street traffic is controlled by a stop sign, levels of service are calculated for the critical turning movements including outbound movements from the stop-controlled approach, and left turns from the major street to the minor street. The procedure does not calculate an overall intersection level of service.

The Highway Capacity Manual defines the relationship between level of service and delay (in seconds/vehicle) for unsignalized intersections as shown below:

LEVEL OF SERVICE	DELAY (Seconds/Vehicle)
A	< 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.1

The County considers levels of service A to D as acceptable for unsignalized intersections. Level of service F (with average delays longer than 50 seconds) is considered undesirable for unsignalized intersections and would indicate the possible need for mitigation. Level of service F conditions could be tolerated if the delays are not much higher than 60 seconds, traffic queues are short, and there are no reasonable mitigating measures available.

The unsignalized Mohouli Street/Kūkūau Street intersection approaches are currently operating at acceptable levels of service due to the lower traffic volumes on Mohouli

Street. The intersection is forecast to continue operating at acceptable levels of service in 2010. The proposed project would generate small volumes of traffic such that it would not affect traffic operations in 2010.

The traffic generated by the UHH Mauka Lands and the ambient traffic volumes forecast for Mohouli, Komohana and Kūkūau Streets would affect traffic operations at this intersection in 2017 and 2027. However, the small number of trips generated by the proposed project would not cause any changes in delay, indicating it would have not an adverse traffic impact.

The Komohana Street/Mohouli Street intersection is currently signalized. The methodology for analyzing signalized intersections calculates the levels of service for individual movements, approaches and the intersection as a whole based on the average stopped delay per vehicle. The results range from level of service A (best with average delays less than ten seconds) to F (worst with average delays longer than 80 seconds), described as follows;

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds/Vehicle)
A	< 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.1

The County considers levels of service A to D as acceptable for signalized intersections, with levels of service E and F indicating the need for mitigating measures. For signalized intersections, the major streets can be designed to have a higher level of service than the minor streets or turning lanes. Level of service E conditions are sometimes tolerated for minor traffic movements such as left turn movements if they maintain acceptable levels of service on the major street.

The level of service analysis for the Komohana Street/Mohouli Street intersection is operating at a minimally acceptable level of service D in the morning peak. The two approaches with the highest volumes, Komohana Street northbound, and Mohouli Street eastbound, are operating at level of service E, indicating the possible need for mitigating measures. The northbound through movement is operating at level of service F due to the backup of traffic from the next traffic signal. The primary reasons for these poor levels of service are the high volumes of vehicles on a single lane of traffic.

The intersection level of service is forecast to decrease to E in 2010 with the current roadway system and increase in ambient traffic, indicating that the current problem movements would worsen.

The large increases in ambient traffic forecast for 2017 would cause the intersection operations to fail (as evidenced by the intersection level of service F with the ambient forecasts) without any roadway improvements. Therefore, the total with project forecasts

were not analyzed. Mitigating measures analyzed for 2017 included widening Komohana Street to four lanes and combining the widening of Komohana Street and the Mohouli Street approaches.

The two previously described roadway widening improvements would not be able to accommodate the much higher ambient traffic volumes forecast for 2027. The intersection is forecast to operate at level of service E in the AM peak hour with level of service F on the Komohana Street northbound and southbound left turns, and the Mohouli Street westbound left turn. The intersection is forecast to operate at level of service F in the PM peak hour with level of service F on the Komohana Street northbound left and right turns, all the Mohouli Street westbound movements, and the eastbound left turn movement. The additional trips generated by the proposed project would not cause changes in levels of service on any movements at the intersection. This analysis suggests that additional mitigating measures would be required to meet the projected 2027 traffic volumes.

Impacts and Mitigative Measures:
The proposed County of Hawai'i Fire Administration Support Complex is forecast to generate a relatively small number of trips during the morning and afternoon commuter peak hours over its 20-year development period. This additional traffic in itself would not require mitigating measures. However, traffic on Komohana Street is already congested during the morning peak hour and the Mohouli Street intersection is in need of mitigation.

Major roadway improvements would be needed to accommodate the future traffic which would be generated from the UHH Mauka Lands. Both Komohana Street and its Mohouli Street approaches would have to be widened to four lanes by 2017 to accommodate this future land use. The *mauka* portion of Mohouli Street would need to be widened to four lanes between 2017 and 2027.

The currently unsignalized intersections at Mohouli Street/Kūkūau Street and Komohana Street/Kūkūau Street would require mitigation in the future due to the increases in ambient traffic. The first intersection would probably not warrant traffic signals in the future and a peak period ban on left turns/through movements should be considered. Traffic signals may be warranted at the latter intersection in the future.

The large ambient traffic increases forecast for this study and its subsequent major impacts were based on preliminary estimates of development of the UHH Mauka Lands. The traffic impacts should be reevaluated when the UHH Mauka Lands development proposals are better defined.

5.2.6 RECREATIONAL FACILITIES

Description:
The nearest recreational facilities are three County parks. COH Mohouli Park is located about 1,800 feet northeast of the site in the Mohouli Subdivision at the intersection of Hilinai and Kumukoa Streets. COH Univeristy Heights Park is located about 3,300 feet east in the University Heights Subdivision at the intersection of Kalili Place and Kalili Street. COH Ainako Park is located about 1 mile northwest in the Ainako Subdivision at the intersection of Laukona Street and Ainako Avenue.

Impacts and Mitigative Measures:
Construction of the FASC will have minimal impact, if any, on the nearby County parks. Mohouli Street can be used to access the parks, and Mohouli Street should remain open for the duration of the construction of the project.

The FASC should also have minimal impact on the nearby County parks once the complex is complete and in operation. Only possible impact will be increased traffic flow in the vicinity of the FASC. No Mitigative measures re necessary.

5.3 SOCIO-ECONOMIC

5.3.1 DEMOGRAPHICS

Description:
According to the 2000 census for the Hilo Census Designated Place (CDP), the total population of the area is 40,759 people. The Waimea CDP covers a total area of 58.44 square miles. The population density of the Waimea CDP is 750.8 per square mile while that of the entire island of Hawai'i is 36.9 (as 148,677 people reside on 4,028.02 square miles of land).

Impacts and Mitigative Measures:
The facility is not anticipated to induce or reduce the residential population in this area in the short-term or long-term. Therefore, no mitigative measures are required.

5.3.2 SOCIO-ECONOMIC ENVIRONMENT

Description:
The population of the South District has modestly increased since the 1980. By 2000, the district had seen an average growth of approximately 6.2 percent from its population in 1980 (County of Hawai'i, 2005).

The 2000 Census provided a profile of the general demographic and socio-economic environment of the Hilo CDP. While this may not apply to all the communities within Hilo, it does provide a glimpse of the social environment in the vicinity of the project area. The median age of the Hilo CDP resident is 38.6 years old. Of the population 16 years and older, 58.8% are employed, while 41.2% are either unemployed or not in the labor force (retired, disabled, etc.) Typical occupations include management, service, sales, and farming. The median household annual income for residents of the Hilo CDP is $39,139. The per capita income for the CDP is $18,220.

Impacts and Mitigative Measures:
The socio-economic environment, for all classes, is not expected to be adversely affected by the FASC project. Work related to the installation is not anticipated to significantly restrict traffic or require the closure of any businesses or recreation facilities. This work will also not cause the interruption of water service to current County of Hawai'i DWS customers. Therefore, no mitigative measures are required.

The proposed FASC will enhance the HFD's ability to serve the people of the County. The development of these and other similar possible economic opportunities will positively benefit the Hilo community.

5.3.3 ENVIRONMENTAL JUSTICE

Description:
No federal funding will be utilized for this project, therefore formal compliance with Executive Order (EO) 12898, *Federal Actions to Address Environmental Justice in*

Minority and Low-Income Populations is not required. However, this project complies with the intent of the EO which requires federal agencies to take appropriate steps to identify and avoid disproportionately high and adverse effects of federal projects on the health and welfare of minority and low-income populations.

Impacts and Mitigative Measures:
No negative impacts, long-term or cumulative, are anticipated. No persons will be displaced or adversely affected as a result of this project. Therefore, no mitigation measures are required.

5.4 LAND USES AND OWNERSHIP

5.4.1 LAND USE DESIGNATIONS

The land use designations for TMK: (3)2-4-001:176 & 178 (previously portion 168) are as follows:

State Land Use –	Agricultural
Hawai'i County General Plan –	Medium Density Urban
County Zoning –	Agricultural (A-1a)

These designations are shown on **Figures 5.5**, **5.6**, and **5.7**, respectively.

Impacts and Mitigative Measures:
The improvements proposed under this project will require the filing of a Special Permit due to the parcel being zoned as agricultural (A-1a) by the County. The Special Permit will also mitigate the inconsistency with the State Land Use "Agricultural" designation and the County General Plan Land Use Pattern Allocation Guide Map (LUPAG) designation "Important Agricultural Land." The improvement is consistent with the intended land uses under the County of Hawai'i General Plan "Medium Density Urban" designation.

The project site is not located within or in the vicinity of a designated Wilderness area, as determined from a review of the Bureau of Land Management, US Fish and Wildlife Service, USDA Forest Service, and the National Park Service Wilderness databases.

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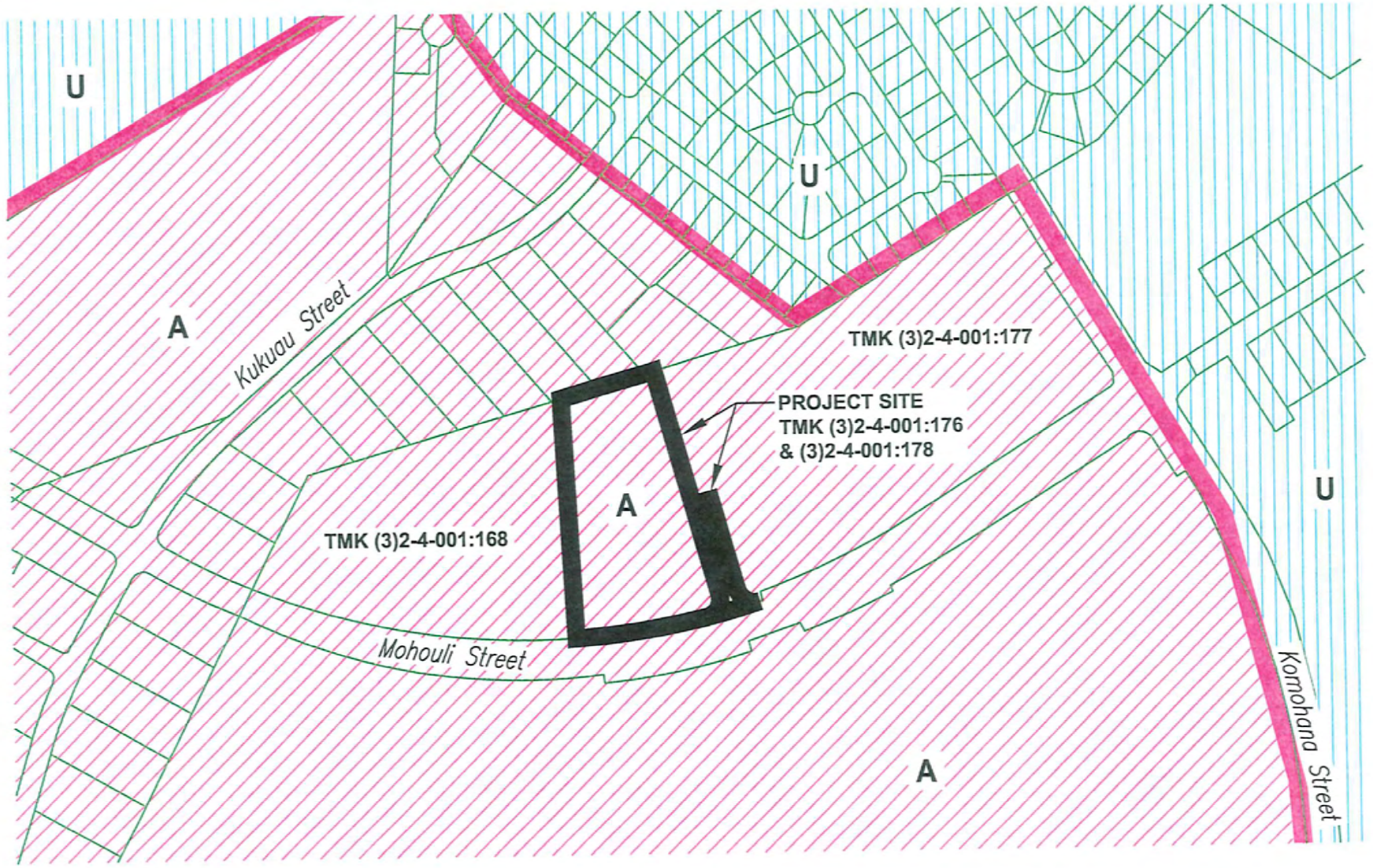

SOURCE: HAWAII STATEWIDE GIS PROGRAM; STATE OF HAWAII LAND USE COMMISSION

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STATE LAND USE MAP
NOT TO SCALE

Figure 5.5
STATE LAND USE MAP
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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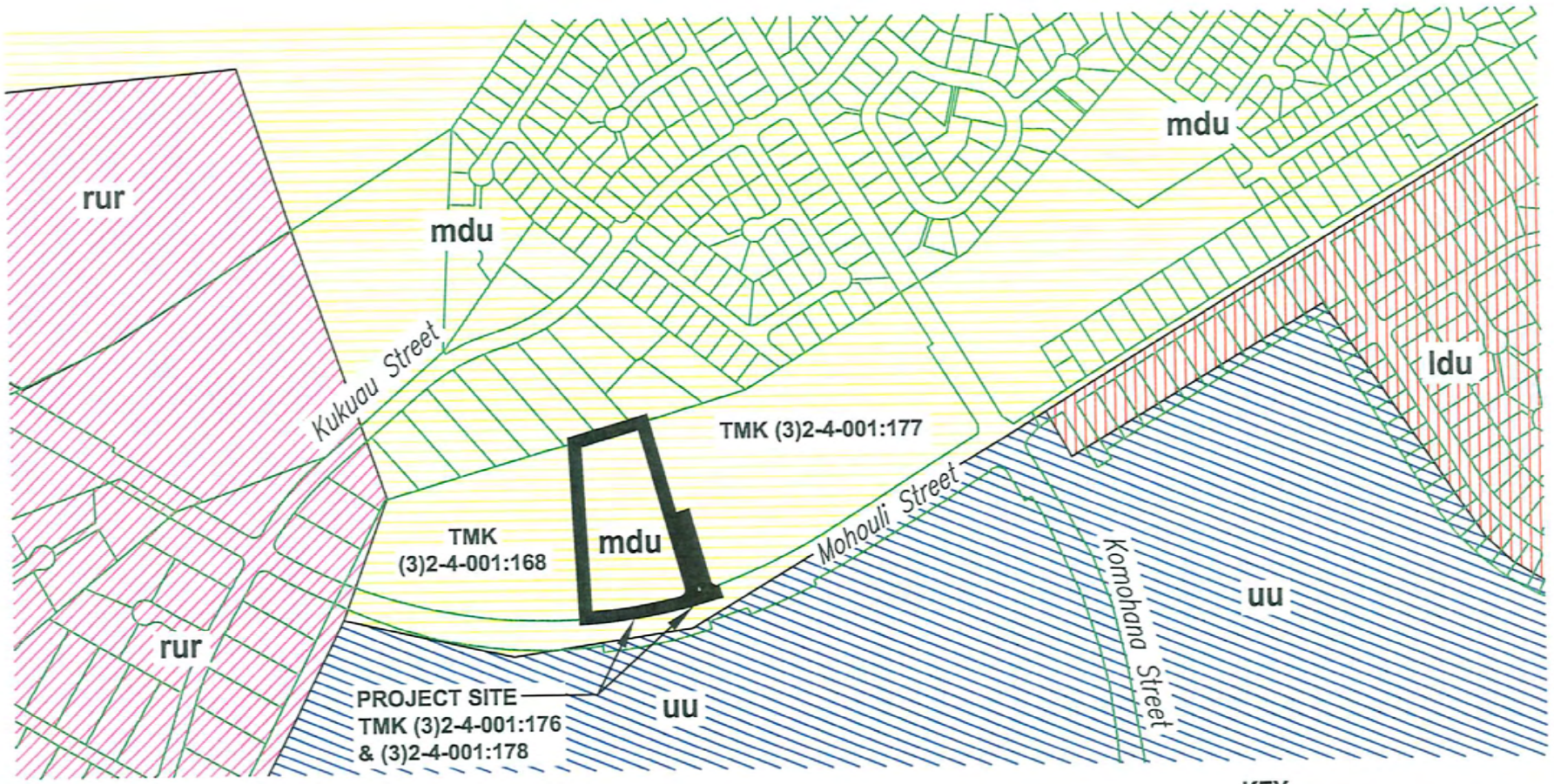

SOURCE: HAWAII STATEWIDE GIS PROGRAM; COUNTY OF HAWAII DEPT. OF PLANNING

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COUNTY GENERAL PLAN
NOT TO SCALE

Figure 5.6
COUNTY GENERAL PLAN
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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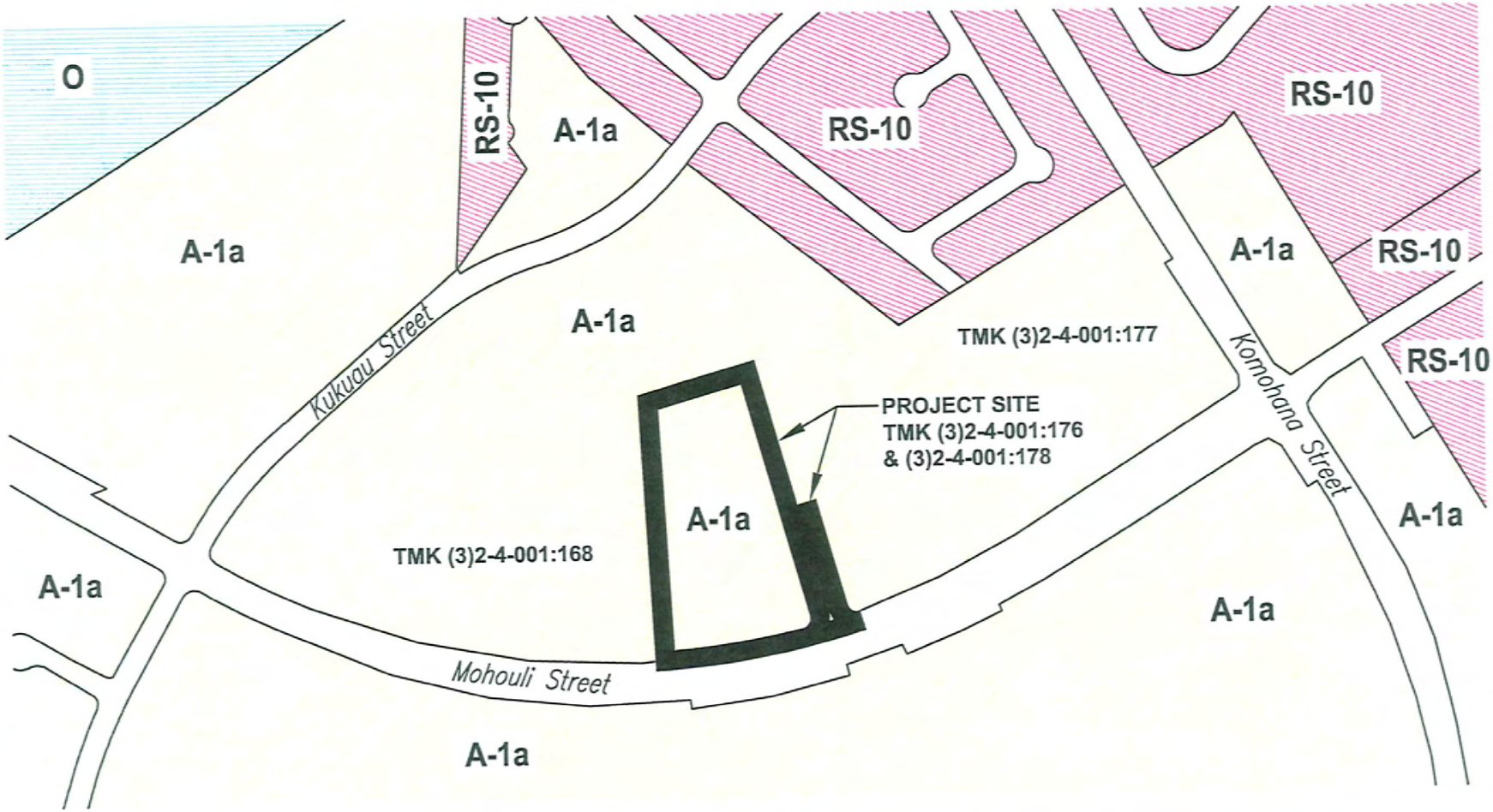

KEY

A-1A	AGRICULTURAL DISTRICT (MINIMUM BUILDING SITE OF 1 ACRE)
RS-10	SINGLE-FAMILY RESIDENTIAL DISTRICT (MINIMUM BUILDING SITE AREA OF 10,000 SQUARE FEET)
RS-7.5	SINGLE-FAMILY RESIDENTIAL DISTRICT (MINIMUM BUILDING SITE AREA OF 7,500 SQUARE FEET)
O	OPEN DISTRICT

SOURCE: HAWAII STATEWIDE GIS PROGRAM; COUNTY OF HAWAII DEPT. OF PLANNING

M&E Pacific, Inc.
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DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

COUNTY OF HAWAI'I ZONING

NOT TO SCALE

Figure 5.7
COUNTY OF HAWAI'I ZONING
Environmental Assessment for the
County of Hawaii Fire Department Administration Support Complex
June 2009

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Recreational Resources
Three County parks are located within about 1 mile from the project site. The proposed project is not anticipated to adversely impact the operation of or access to the County parks during or after the completion of construction. Access on all roads around the site will be maintained throughout the construction of the proposed project.

Historical Resources
The project site includes undeveloped land, which has been surveyed by an Archaeologist who concluded that no archaeological / historic sites or features are located on the project parcel. This report has been processed with the State DLNR-SHPD. Construction of the proposed facilities will not irrevocably commit to loss or destruction of natural or cultural resources. No cultural resources have been identified within the project site. If previously unknown resources are uncovered during the course of construction, the Contractor will stop work immediately and notify the SHPD who will determine the appropriate treatment.

Scenic and Open Space Resources
The FASC buildings and layout will be designed with an architectural style that is mindful of the immediate surroundings and will be consistent with other County projects that have been developed in the Hilo area. The buildings and layout of the complex will not adversely impact the aesthetics of the area. A radio tower may be installed at the site. The required height of the tower will depend on the line-of-sight restrictions based on the on-going project topographical survey. The radio tower could be stylized as a tree to help lessen its visual impact. Cell phone towers on O'ahu have been stylized as pine and palm trees to successfully lessen their visual impact.

Economical Uses
The site is undeveloped and has no direct economical uses. The site will allow for expansion in HFD and HPD staffing that results in the provision of increased employment.

Flooding Hazards
The portion of the parcel to be developed is designated as "Flood Zone A" as shown on the current Flood Insurance Rate Map (FIRM). The FIRM was updated on September 16, 1988, and was revised to reflect the Letter of Map Revision (LOMR), effective date December 21, 2006, as provided by the COH Department of Public Works. A designation of "Flood Zone A" indicates special flood hazard areas inundated by 100-year floods and no base flood elevation has been determined.

The development of the site will mitigate any possible hazards from flooding. Mitigative measures may include regarding of the site, rerouting confinement of flood water. Off-site finish drainage will not be increased from the existing condition. The amount of impermeable surface will be increased from pavement, concrete structures and buildings; however, any increase in surface runoff will be disposed of via dry wells and off-site drainage facilities.

Managing Development
The proposed improvements require more than two permits or approvals. The permits and approvals required include the following:

- Department of Health NPDES Permit (NOI-C),
- Department of Health UIC Permit,
- Department of Health Water Quality Certification (Section 401),

- County of Hawai'i Building Permit,
- County of Hawai'i Grading, Grubbing and Stockpiling Permit,
- County of Hawai'i Planning Department Plan Approval,
- County of Hawai'i Special Permit.

The project does not conform to designated agricultural State land use designations for the site; however will require a Special Permit from the County.

The public will be notified of this project via consultation letters, letter notifications, and the publication of the Draft and Final versions of this EA.

Public Participation
The public will be will be informed about this project via written requests for consultation, several public meetings, and this EA.

5.4.2 HAWAI'I STATE PLAN

Description:
Chapter 226 of the Hawai'i Revised Statutes provides for long-range planning for the State of Hawai'i. The portions of the Hawai'i State Plan which apply to the proposed FASC project site are as follows:

> **§226-14 Objectives and policies for facility systems — in general.**
> **(b)(1):** "Accommodate the needs of Hawai'i's people through coordination of facility systems capital improvement priorities in consonance with state and county plans."
>
> **§226-15 Objectives and policies for facility systems — solid and liquid wastes.**
> **(a)(1):** "Maintenance of public health and sanitation standards relating to treatment and disposal of solid and liquid wastes."
> **(a)(2):** "Provision of adequate sewerage facilities for physical and economic activities that alleviate problems in housing, employment, mobility, and other areas."
>
> **§226-16 Objectives and policies for facility systems — water.**
> **(b)(1):** "Coordinate development of land use activities with existing and potential water supply."

Impacts and Mitigative Measures:
The objectives of the Hawai'i State Plan are the maintenance and pursuit of improved quality in Hawai'i's water quality and the accommodation of Hawai'i's people through coordination of facility systems and capital improvement priorities in agreement with State and County Plans. The proposed actions are consistent with these objectives. Therefore, no mitigative measures are required.

5.4.3 STATE LAND USE LAW

Description:
The State Land Use Law, Chapter 205 of the HRS, classifies all State lands in one of four categories: Urban, Rural, Agricultural and Conservational. Permitted uses for each category are defined in the statute. The State assumes sole management responsibility in the Conservation District, County governments assume sole responsibility in the Urban District, and both share responsibilities in the Rural and Agricultural Districts.

The project site located at TMK: (3)2-4-001:176 & 178 (previously portion 168) and is within the Agricultural District, as classified by the State Land Use map. Use of this parcel is managed by both the State and County.

Impacts and Mitigative Measures:
The proposed action to develop the FASC is not consistent with the Hawai'i State Land Use Law. Therefore, as a Special Permit will be filed with the County as a mitigative measure.

5.4.4 COUNTY OF HAWAI'I

Description:
Under the County of Hawai'i's General Plan (2005), the main land use objectives are as follows:

(1) Designate and allocate land uses in appropriate proportions and mix and in keeping with the social, cultural, and physical environments of the County
(2) Protect and encourage the intensive and extensive utilization of the County's important agricultural lands
(3) Protect forest, water, natural and scientific reserves and open areas

The project area General Plan land use designation is "Medium Density Urban."

The project site is located within the County of Hawai'i Agricultural-1 acre (A-1a) zoning district, as shown on **Figure 5-5**. As described in the County of Hawai'i Zoning Code, the land within the agricultural zoning district is generally agricultural and very low density agricultural-based residential use. Additionally Section 25-5-72(c)(13) states "public uses and structures" are permitted uses in agricultural districts. Section 25-4-11(c) also states public uses, structures and buildings and community buildings are permitted in any district, provided the County has issued plan approval for such use.

Impacts and Mitigative Measures:
A Special Permit will need to be obtained from the County of Hawai'i to allow the construction of the proposed facilities within the agricultural district.

5.4.5 PROPERTY OWNERSHIP

Description:
The property affected by the installation of the proposed FASC is identified as 3rd Tax Division TMK 2-4-001:176 & 178 (previously portion 168). This parcel is owned by the State of Hawai'i.

Impacts and Mitigative Measures:
The State of Hawai'i currently owns the property identified by 3rd Tax Division 3rd Tax Division TMK 2-4-001:176 & 178 (previously portion 168). The proposed facility does not require the taking of any private lands. The County is in discussion with the State to transfer ownership a portion of the parcel to the County for their exclusive development and use. Transferal of the requested lands and extent of land to be transferred are still being coordinated and have not been finalized at the time this EA is written. No mitigative measures are required.

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SECTION 6

DETERMINATION WITH SUPPORTING FINDINGS AND REASONS

In accordance with Chapter 343, Hawai'i Revised Statutes and the National Environmental Policy Act, this Environmental Assessment characterizes the technical, social and environmental issues related to the FASC Improvements project. It identifies potential project impacts to the environment and their significance. It is anticipated that the proposed project will not exert any significant impacts to the environment. Therefore, the County of Hawai'i is issuing a Finding of No Significant Impact (FONSI).

This determination of the FONSI is based upon thirteen (13) significance criteria listed in HRS §11-200-12 of the Environmental Impact Statement Rules. The specific criteria used in making this determination are addressed below:

1. *Involves an irrevocable commitment to loss or destruction of any natural or cultural resource:*

   Construction of the proposed facilities will not irrevocably commit to loss or destruction of natural or cultural resources. No cultural resources have been identified within the project site. If previously unknown resources are uncovered during the course of construction, the Contractor will stop work immediately and notify the SHPD who will determine the appropriate treatment.

2. *Curtails the range of beneficial uses of the environment:*

   The proposed actions will not curtail the range of beneficial uses of the environment. The proposed actions to develop the FASC which will enhance the Fire Department's ability to serve and protect the community and environment.

3. *Conflicts with the State's long-term environmental policies or goals and guidelines as expressed in Chapter 344, HRS, and any revisions thereof and amendments thereto, court decisions or executive orders:*

   The proposed FASC facility is consistent with the State's goals and objectives as described in the previous sections of this EA.

4. *Substantially affects the economic or social welfare of the community or state:*

   The proposed actions will not adversely affect social welfare of the community. There will be no road or lane closures during the construction of the facilities. The proposed actions will improve the economic and social welfare of the affected communities by facilitating the public service the Fire Department provides. The site will allow for expansion in HFD and HPD staffing that results in the provision of increased employment.

5. *Substantially affects public health:*

   The proposed activities will not adversely affect public health. The public heath will benefit directly with improved public service provided by the Fire Department. During construction, environmental pollutants will be mitigated to regulated levels by using the appropriate BMPs and construction methods.

6. *Involves secondary impacts, such as population changes or effects on public facilities:*

The proposed FASC will not lead to secondary impacts such as population changes or adverse effects on public facilities beyond that of the County General Plan.

7. *Involves a substantial degradation of environmental quality:*

The proposed project will not significantly degrade the environmental quality of the area of the proposed project site.

8. *Is individually limited but cumulatively has considerable effect upon the environment or involves a commitment for larger action:*

Development of the proposed FASC will not have a cumulative effect on the environment. The facilities constructed with this project will not require commitment for larger action.

9. *Substantially affects a rare, threatened, or endangered species, or its habitat:*

The proposed project will not substantially affect any rare, threatened, or endangered species or its habitat. The project site is not a known critical or nesting or living habitat for rare, threatened, or endangered species.

10. *Detrimentally affects air or water quality or ambient noise levels:*

The proposed projects will not substantially degrade air and water quality or ambient noise levels. Any notable adverse effects on air and water quality and ambient noise levels will be short-term and construction-related only. Air quality and noise levels will not exceed State DOH standards. This project will not result in long-term adverse effects. Upon completion of construction activities, air and water qualities will revert to prior levels. Any increase in ambient noise levels is anticipated to be minor in comparison to the noise levels in the surrounding community, and is considered negligible.

11. *Affects or is likely to suffer damage by being located in an environmentally sensitive zone such as a flood plain, tsunami zone, beach, erosion-prone area, geologically hazardous land, estuary, fresh water, or coastal waters:*

The proposed project is located in an area defined by the FIRM to be undulated by 100-year rains. The proposed facilities may potentially be damaged should flooding occur. Damage to the building of the complex will be avoided by placing the building pad above the flood elevation. The project site is located in a volcanic hazard zone of 3 (areas with high risk), is in an area that may experience some seismic activity and may be susceptible to hurricanes and strong winds.

Although damage may occur to the facilities during occasions of severe hurricanes, earthquakes and lava flows, no practical mitigative measures are currently available for a project of this nature. The proposed project will comply

with the current regulatory design standards to mitigate any possible minor hurricanes or earthquakes.

12. *Substantially affects scenic vistas and view planes identified in County or State plans or studies:*

Activities associated with the installation of the proposed facilities will inherently and necessarily change or alter the character of the site, due to the undeveloped nature of the site. Heights of facilities will adhere to all government restrictions and requirements. Infringement upon view planes by construction will be temporary and short-term.

13. *Requires substantial energy consumption:*

The FASC facilities will not require substantial energy consumption. Energy will be required for site lighting and operation of the buildings on site. For first phase of the proposed complex, only a section of the Emergency Dispatch Building will be in continual 24-hour, 7-days-per-week, year-round operation. The remaining facilities will be primarily operated under typical 8-hour workday conditions. Monthly energy consumption for the first phase should typically be less than 230,000 kW-Hr.

Complete build-out of the site will ultimately encompass the Fire Administration Building, Emergency Dispatch Building, Fire Preparation & Training Building, Museum, Covered Training Area, Warehouse, Fire Station, Radio Tower for Emergency Dispatch Use, Site Infrastructure Utilities, Paved Parking Area, and Paved Access Roadway Within a 50'-wide ROW on the Eastern Boundary of the Site. The Emergency Dispatch Building will remain to be the only facility in continual 24-hour, 7-days-per-week, year-round operation. The remaining facilities will all be primarily operated under typical 8-hour workday conditions. Monthly energy consumption for the ultimate build-out of the site should typically be less than 388,000 kW-Hr.

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SECTION 7

PERMITS AND APPROVALS REQUIRED

FEDERAL

STATE

Department of Health NPDES Permit (NOI-C)
Department of Health UIC Permit
Department of Health Water Quality Certification (Section 401)

COUNTY OF HAWAI'I

Building Permit
Grading, Grubbing and Stockpiling Permit
Planning Department Plan Approval
Sewer Connection Permit
Special Permit

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SECTION 8

REFERENCES

1) *Agricultural Lands of Importance to the State of Hawai'i (ALISH) Maps*, website address: http://www.eHawaiigov.org/dbedt/op/html/gismapsalish.html, Department of Business, Economic Development, and Tourism, Office of Planning, State of Hawai'i.

2) *Census 2000*, Department of Business, Economic Development and Tourism, State of Hawai'i, 2000.

3) *County of Hawai'i, Annual Report, Fiscal Year 2006-2007*, pp. 62-73, County of Hawai'i, 2007.

4) *County of Hawai'i, Fire Department, Fire Administration Support Complex*, County of Hawai'i, 2007.

5) *County of Hawai'i General Plan 2005*, County of Hawai'i, 2005.

6) *Detailed Land Classification—Island of Hawaii*, L. S. Bulletin No. 6, Land Study Bureau, University of Hawai'i, State of Hawai'i, November 1965.

7) *Flood Insurance Rate Map, Hawai'i County, Hawai'i*, Federal Emergency Management Agency, 2004.

8) Foote, D.E., Hill, E.L., Nakamura, S., Stephens, F., *Soil Survey of the Islands of Kauai, Oahu, Maui, Molokai, and Lanai, State of Hawai'i*, U.S. Department of Agriculture, Soil Conservation Service, 1972.

9) *Hawaii County Code*, County of Hawai'i, website address: http://www.co.hawaii.hi.us/countycode.html, 1983 (revised and republished 1995; updated to include Supplement 6 [7-2008] and subsequent ordinances effective through 06-30-08).

10) Hawai'i Revised Statutes, State of Hawai'i.

11) *Island of Hawai'i Aquifer Map*, website address: http://www.Hawai'i.gov/dlnr/cwrm/data/gwHawai'i.pdf, October 10, 1995.

12) *National Wilderness Preservation System Database*, website address: http://www.wilderness.net/index.cfm?fuse=NWPS&sec=map, December 2004.

13) *Sole Source Aquifer Designations in EPA, Region 9*, U.S. Environmental Protection Agency, June 2000.

14) *State Historic Preservation Division Inventory of Historic Properties*, website address: http://www.state.hi.us/dlnr/hpd/register/reghaw.pdf, Department of Land and Natural Resources, State of Hawai'i, 2002.

15) *State of Hawai'i – Third Tax Division – Real Estate Handbook – Zones 1-9*, 38th Edition, Anaheim, CA, First American Real Estate Solutions, 2004.

16) *2004 Annual Summary Hawai'i Air Quality Data*, website address: http://www.Hawai'i.gov/health/environmental/air/cab/cabmaps/pdf/databook2004.pdf, Department of Health, State of Hawai'i, 2004.

17) *2006 State of Hawai'i Data Book A Statistical Abstract*, State of Hawai'i.

18) *U.S. Fish and Wildlife Service, Wetlands Online Mapper*, website address: http://wetlandsfws.er.usgs.gov/wtlnds/launch.html, September 2005.

19) *U.S. Fish and Wildlife Service Wilderness Areas*, website address: http://www.fws.gov/realty/table10.html, September 2002.

20) *Volcanic Hazard Zones of the Island of Hawai'i*, website address: http://pubs.usgs.gov/gip/hazards/maps.html, 1987.

21) *Water Quality Standards Map of the Island of Hawai'i*, website address: http://www.Hawai'i.gov/health/environmental/water/cleanwater/wqsmaps/pdf/Hawaii.pdf, October 1987.

APPENDIX A

PRE-ASSESSMENT CORRESPONDENCE AND DRAFT EA COMMENTS AND RESPONSES

- Pre-Assessment Request Letters
- Pre-Assessment Comments Received
- Draft EA Comments Received
- Responses to Comments

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Response Letter	Agency/Reviewer	Comments	Response/Follow-up
1 (12/20/07)	County Police Department—Lawrence K. Mahuna, Police Chief	Ensure adequate parking for staff as the plan calls for out Communications-Dispatch staff to be relocated to the Dispatch Building.	Parking requirements have been coordinated with the County of Hawai'i, Police Department and the attached conceptual site plan has been approved on 12/11/08. This comment is also presented in section 2.3.2 of the Draft Environmental Assessment (DEA) and will be included in section 2.3.2 of the Final Environmental Assessment (FEA).
2 (12/31/07)	State Office of Hawaiian Affairs (OHA)—Clyde W. Nāmu'o, Administrator	The Environmental Assessment ("EA"), in accordance with Chapter 343 of the Hawaii Revised Statu[t]es, should include a Cultural Impact Assessment ("CIA"). In accordance with the requirement of Act 50, Session Laws of Hawaii 2000, a CIA shall include information relating to the practices and beliefs of the Native Hawaiians who once inhabited the area(s), and it is recommended that community involvement be included in this assessment. We refer you to Lukela Ruddle, Cultural Resource Coordinator in OHA's Hilo office, who can be reached at (808) 920-6419, to further assist you in this project area.	This comment is presented in section 2.2.2 of the Draft Environmental Assessment (DEA) and will be included in section 2.2.2 of the Final Environmental Assessment (FEA). Lukela Ruddle was contacted and a summary of the CIA is contained in section 5.2.2 of the DEA and will be included in section 5.2.2 of the FEA.
		OHA asks that, in accordance with Section 6E-46.6, HRS and Chapter 13-300, Hawaii Administrative Rules, if the project moves forward, and if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD) shall be contacted. OHA would also like to be notified.	This requirement is presented in section 2.2.2 of the DEA and will be included in section 2.2.2 of the FEA. Additionally, a note summarizing this requirement will be included in the project design / construction plans.
		Upon completion of this vital segment to the project, OHA thanks you in advance and respectfully requests a hardcopy of an EA draft(s), if feasible, addressed to my attention. OHA hopes to be consulted on this matter in the future as more information becomes available and the project progresses.	A hardcopy of the DEA was sent to your attention at the OHA on March 3, 2008. Additionally, a hardcopy of the FEA will be sent to you upon its completion.

Response Letter	Agency/Reviewer	Comments	Response/Follow-up
3 (1/4/08)	County Department of Environmental Management (DEM)—Bobby Jean Leithead-Todd, Director	Wastewater Division: The County wastewater collection system is located on Kahikini Street.	This information is presented in section 2.3.2 of the Draft Environmental Assessment (DEA) and will be included in sections 2.3.2 and 5.2.3 of the Final Environmental Assessment (FEA). Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Wastewater Division: Please use the Wastewater Division Design Checklist as a guide should you decide to connect to our system.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Wastewater Division: A meeting with our Wastewater Division staff is highly recommended prior to the start of planning and design phases.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Wastewater Division: Please submit a wastewater master plan study for the entire parcel prior to the start of planning and design.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Solid Waste Division: Commercial operations, State and Federal agencies, religious entities and non-profit organizations may not use transfer stations for disposal.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Solid Waste Division: Aggregates and any other construction/demolition waste should be responsibly reused to its fullest extent.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Response Letter	Agency/Reviewer	Comments	Response/Follow-up
		Solid Waste Division: Ample and equal room should be provided for rubbish and recycling.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Solid Waste Division: Greenwaste may be transported to the green waste sites located at the Hilo transfer station, or other suitable diversion programs.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Solid Waste Division: Construction and demolition waste is prohibited at all County of Hawai'i Transfer Stations.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
		Solid Waste Division: Submit a Solid Waste Management Plan in accordance with the attached guidelines.	This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.
4 (1/4/08)	County Planning Department—Christopher J. Yuen, Planning Director	The subject property is located in the State Land Use (SLU) Agriculture District. The County zoning designation for the property is A-1a (Agriculture District, minimum building site of 1 acre). However, the property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawaii (ALISH). Moreover, Hawaii County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use.	These SLU and County zoning districts are contained in section 1 of the Draft Environmental Assessment (DEA) and will be included in section 1 of the Final Environmental Assessment (FEA). Additionally, this comment will be presented in section 2.3.2 of the FEA.
		A portion of the property appears to be within the FEMA flood zone. Contact the County of Hawaii, Department of Public Works, Engineering Division at (808) 961-8327 to verify if the proposed structure(s) will be located within the flood zone.	This comment and clarification that the site is within flood zones A and X will be located in section 2.3.2 of the FEA. Additionally, flood hazard discussion is contained in section 5.1.8.8 of the DEA and will be included in section 5.1.8.8 of the FEA.

Response Letter	Agency/Reviewer	Comments	Response/Follow-up
		Because of the property's proximity to residential development, please address the Environmental Assessment proposed mitigation of light and noise pollution, particularly from the open training area.	This comment will be presented in section 2.3.2 of the FEA. The project design / construction plans will contain requirements for the facility to adhere and conform to federal, State and County light and noise requirements both during and after construction (operation of the facility).
		Please provide this office with a copy of the draft EA upon its publication.	The DEA was published in the State of Hawai'i, Department of Health, Office of Environmental Quality Control (OEQC), Saturday, March 8, 2008, issue of the Environmental Notice and a hardcopy of the DEA was sent to the County of Hawai'i, Planning Department on March 3, 2008.
5 (1/7/08)	State Department of Transportation (SDOT)—Brennon T. Morioka, PH.D., P.E., Acting Director of Transportation	The proposal to develop the first phase of the Administration Support Complex (Fire Administration Building, Emergency Dispatch Building, Fire Preparation and Training Building, parking, open training area, and court yard area) is not anticipated to significantly impact any State transportation facilities. However, the Draft Environmental Assessment (Draft EA) should include a traffic assessment to evaluate and recommend any traffic mitigation measures or roadway improvements that may be needed with the full buildout of the master planned development. Copies of the Draft EA should be provided to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawaii District Office in Hilo for their review and comments.	This comment will be presented in section 2.2.2 of the Final Environmental Assessment (FEA). A TIAR was completed for the project and is included in the appendix of the Draft Environmental Assessment (DEA) and will be included in the appendix of the FEA. The DEA was published in the State of Hawai'i, Department of Health, Office of Environmental Quality Control (OEQC), Saturday, March 8, 2008, issue of the Environmental Notice and hardcopies of the DEA were sent to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawai'i District Office in Hilo for their review and comments on December 31, 2008.
6 (1/10/08)	County Hawai'i Fire Department—Darryl Oliveira, Fire Chief	We have no comments to offer at this time in reference to the above-mentioned environmental assessment.	This response is presented in section 2.3.2 of the Draft Environmental Assessment (DEA) and will be included in section 2.3.2 of the Final Environmental Assessment (FEA).
7 (1/10/08)	State Department of Health—Newton Inouye, Acting District Environmental Health Program Chief	There is no record of a radiation incident on the proposed site.	This response will be presented in section 2.3.2 of the Final Environmental Assessment (FEA).

Response Letter	Agency/Reviewer	Comments	Response/Follow-up
		The Hazard Evaluation and Emergency Response (HEER) office does not have records of any investigation or cleanup activities at the proposed site. This property was former agricultural land in sugar cane production, and lands formerly used for sugar cane production are now being developed into communities where residential homes, schools, and commercial businesses are being constructed. Chemicals associated with the sugar cane industry persist in soil today, and may be a threat to public health and the environment. Elevated arsenic levels were discovered in soil at former sugar cane production areas on the islands. The HEER office has identified former sugar cane production areas for assessment throughout the state, and plans to work with property owners to conduct environmental assessments to identify and address elevated soil arsenic levels prior to finalizing development plans for the properties.	This response will be presented in section 2.3.2 of the FEA.
8 (1/18/08)	US Department of the Interior-Fish and Wildlife Service, Pacific Islands Fish and Wildlife Office— Patrick Leonard, Field Supervisor	Based on the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and Hawaiian hawk (*Buteo solitarius*) occur in the project vicinity. In addition, the threatened Newell's shearwater (*Puffinus auricularis newelli*) and endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) (collectively referred to as seabirds) are known to traverse the project site. We recommend you address potential project impacts to these listed species and include measures to minimize adverse impacts in your environmental review document. The following recommendations are provided to assist you in your plan development: • Information about Hawaiian hoary bat use of the project area is incomplete. Bat surveys could be conducted in areas where cutting or removal of trees is proposed. If Hawaiian hoary bats are found in the project area, you should contact	This comment will be presented in section 2.1.2 of the Final Environmental Assessment (FEA). Coordination was done with the US DOI FWS (Jeff Zimpfer and Megan Laut). A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey. As much as practicable, project design / construction plans will call for disturbance to trees be avoided from April through August. Additionally, barbed wire fences will not be used by the project and will not be included in the project design / construction plans.

Response Letter	Agency/Reviewer	Comments	Response/Follow-up
		our office for additional information about how to address potential impacts to this species. Because bat pups are found in nursery trees during the April through August breeding season, it is particularly important to avoid disturbance to trees during this period in areas where bats occur. Because bats can be harmed by barbed wire fences, their use should be minimized.	
		• Where Hawaiian hawks occur, brush and tree clearing during the March through September breeding season may result in impacts to hawk nests. If biological surveys indicate the presence of nesting hawks in an area where March through September vegetation clearing is proposed, please contact our office for additional information about how to address potential impacts to this species.	This comment will be presented in section 2.1.2 of the FEA. Coordination was done with the US DOI FWS (Jeff Zimpfer). A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey. As much as practicable, project design / construction plans will call for vegetation (brush and tree) clearing to be avoided from March through September.
		• Potential impacts to seabirds could be minimized by shielding outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. Because communication towers may pose a flight hazard to seabirds, please contact our office for further assistance, if any towers will be constructed in association with this project.	This comment will be presented in section 2.1.2 of the FEA. A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey. The design / construction plans will call incorporate these lighting usage and requirements as much as practicable. Outdoor lights in the project footprint will be shielded throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. The project was further coordinated with the US DOI FWS

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			(Megan Laut) to determine the potential for and minimization of any adverse impacts of any proposed communication towers with that may pose a flight hazard to seabirds. The US DOI FWS has indicated that a bird survey in the area (near Hilo Harbor) has indicated a low passage rate of seabirds; thus, there is not a lot of concern for adverse impacts of the proposed tower on seabirds and their normal flight and migratory patterns, additionally since the project occurs in an urban location. The design of the microwave antenna tower will minimize its surface area and be in line with surrounding vegetation as much as practicable. The tower design will also conform to applicable County ordinances and guideline requirements / criteria for its proximity to the Hilo International Airport, as applicable. The County may consider coordinating a night-time, bird echo survey with the FWS later prior to construction of the microwave antenna tower.
9 (2/1/08)	County Building Division—Department of Public Works (DPW)—David Yamamoto, Project Manager	We have following comments to draft Environmental Assessment dated January 2008: 1. Page 1: Proposing Agency, delete Building Division, Contact David Yamamoto, Project Manager.	Revision will be made to the Final Environmental Assessment (FEA).
		2. Page 2: phase 1 will include construction of Fire Administration and Emergency Dispatch. Construction of remaining facilities are future phases.	Revision will be made to the FEA.
		3. Page 2: confirm 90-feet high radio tower required.	Height will be removed since the need for a tower and its height will be determined through radio line-of-sight study currently on-going for the project. Mentioning of radio tower will be kept in case tower is required. Revision will be made to the FEA.

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		4. 3.1 paragraph 3, suggest "dispersed" in place of "spread-out"	Revision will be made to the FEA.
		5. 3.1 paragraph 4, fragmented.	Revision will be made to the FEA.
		6. 3.1 paragraph 5, This environmental assessment represents the initial and future phases of the administration support complex development.	Revision will be made to the FEA.
		7. 3.2.2 paragraph 4, This environmental assessment will determine the impacts of the initial and future phases of the project.	Revision will be made to the FEA.
		8. Figure 3.1, include proposed subdivision	Revision will be made to the FEA.
		9. Figure 3.2, include proposed subdivision	Revision will be made to the FEA.
		10. Figure 3.3, radio tower should be located adjacent to radio room to minimize cable length. Also, proposed location highly visible and not appealing.	Figure will be revised to reflect approved conceptual site plan (12/11/08) and revision will be made to the FEA.
		11. Figure 3.3, Fire Station location at rear of site does not necessarily support quick egress objective.	Figure will be revised to reflect approved conceptual site plan (12/11/08) and revision will be made to the FEA.
		12. 3.3, budget for initial phase currently $14,600,000	Revision will be made to the FEA.
		13. 3.5.2, is this an alternative? Fire (Desmond) to provide order of priority for all facilities.	The order of priority for the build-out of the entire complex was provided by the County HFD (2/12/08) and will be included in sections 2.3.2 and 3.5.2 of the FEA.
		14. Section 3: include discussion on proposed subdivision	Revision will be made to the FEA.
		15. Figure 5.5, include proposed subdivision	Revision will be made to the FEA.
		16. 5.1.5, typically the agricultural capability subclass rating is described.	Revision will be made to the FEA.
		17. 5.1.8.3 paragraph 2, the lava hazard to the site is posed by Mauna Loa and is located on its northeast slope	Revision will be made to the FEA.
		18. 5.4, include description from County General Plan Land Use Pattern Allocation Guide Map (LUPAG), i.e., "important agricultural land"	Revision will be made to the FEA.
		19. Figure 5.5, include proposed subdivision	Revision will be made to the FEA.
		20. Figure 5.6, include proposed subdivision	Revision will be made to the FEA.
		21. Figure 5.7, include proposed subdivision	Revision will be made to the FEA.

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		22. Section 5, typically "scenic and open space resources" are discussed.	Revision will be made to the FEA.
10 (2/12/08)	County Hawai'i Fire Department—Desmond Wery, CIP Manager	After discussion with the fire Chief, the following order of priority [for the build-out of the entire complex] is being provided: 1) Emergency Dispatch 2) Fire Administration Building 3) Fire Preparation & Training 4) Warehouse 5) Covered Training 6) Museum 7) Dormitory Facility 8) Fire Station The addition of the dormitory facility was necessitated by eliminating the dormitory facilities from the Emergency Dispatch building, but we hope to build this as a future attachment to the communications building.	This order of priority for the build-out of the entire complex is included in sections 2.3.2 and 3.5.2 of the Final Environmental Assessment (FEA).
11 (3/25/08)	County Hawai'i Fire Department—Darryl Oliveira, Fire Chief	Fire apparatus access roads shall be in accordance with UFC Section 10.207: "**Fire Apparatus Access Roads** "**Sec. 10.207. (a) General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section. "**(b) Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building. "**EXCEPTIONS:** 1. When buildings are completely	These requirements will be noted in sections 2.3.2 and 5.2.3 of the Final Environmental Assessment (FEA) and will be included in the design / construction plans for the project.

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		protected with an approved automatic fire sprinkler system, the provisions of this section may be modified. "2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b). "3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired. "More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access. "For high-piled combustible storage, see Section 81.109. "**(c) Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction. "**(d) Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches. "**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.	

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		"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access. "(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons) "(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet) "(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus. "(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus. "(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%) "(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times. "(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."	

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		Water supply shall be in accordance with UFC Section 10.301: "(c) **Water Supply.** An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow. "Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable or providing the required fire flow. "The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207."	These requirements will be noted in sections 2.3.2 and 5.2.3 of the FEA and will be included in the design / construction plans for the project.
12 (4/1/08)	County Engineering Division—DPW—Kelly Gomes, Engineering Division	All development-generated runoff shall be disposed of on site. A drainage study shall be prepared and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.	These requirements will be noted in sections 2.3.2 and 5.1.7 of the Final Environmental Assessment (FEA) and will be included in the design / construction plans for the project.
		A portion of subject parcel is located within Flood Zone A as designated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Flood Zone A is the Special Flood Hazard Area inundated by the 100-year flood where base flood elevations have not been determined.	This comment and clarification that the site is within flood zones A and X will be located in section 2.3.2 of the FEA. Additionally, flood hazard discussion is contained in section 5.1.8.8 of the Draft Environmental Assessment (DEA) and will be included in section 5.1.8.8 of the FEA.
		Any construction within the designated FEMA flood zone shall comply with the requirements of Chapter 27, Floodplain Management, of the Hawaii County Code.	This requirement will be noted in sections 2.3.2 and 5.1.8.1 of the FEA and will be included in the design / construction plans for the project.

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		All earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawaii County Code.	This requirement will be noted in sections 2.3.2 and 5.1.7 of the FEA and will be included in the design / construction plans for the project.
		The Traffic Division has reviewed the *Traffic Impact Analysis Report* within the subject assessment and agrees with its conclusions.	This comment will be noted in section 2.3.2 of the FEA. The Traffic Impact Analysis Report (TIAR) is included in the appendix of the DEA, and will be included in the appendix of the FEA.
13 (4/2/08)	County Planning Department—Christopher J. Yuen, Planning Director	On March 7, 2008, Final Subdivision Approval No. SUB-08-000713 was granted to subdivide Tax Map Key 2-4-001:168 into Lots 1, 2, 3, and Road. An affordable, elderly rental housing project has been proposed for Lot 3, which is makai of the Fire Administrative Support Complex proposed for Lot 2. The Environmental Assessment should address the potential impacts of the Fire Administrative Support Complex on a development in Lot 3. Otherwise, we have no additional comments to offer regarding the Draft EA.	This clarification of revised TMK subdivision will be included in sections 2.3.2 and 3.2.2 of the Final Environmental Assessment (FEA). Potential impacts of the Fire Administration Support Complex on a development in Lot 3 will be discussed in section 5.1.1 of the FEA.
14 (4/3/08)	State Department of Land and Natural Resources (DLNR)—Land Division—Morris M. Atta, Administrator	The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment. Other than the comments from Engineering Division, Division of Aquatic Resources, Commission on Water Resource Management, Division of Forestry & Wildlife, the Department of Land and Natural Resources has no other comments to offer on the subject matter.	This response will be noted in section 2.2.2 of the Final Environmental Assessment (FEA).
	State DLNR—Commission on Water Resource Management	We have no comments.	This response will be noted in section 2.2.2 of the FEA.
	State DLNR—Division of Aquatic Resources	We have no comments.	This response will be noted in section 2.2.2 of the FEA.
	State DLNR—Division of Forestry & Wildlife	We have no objections.	This response will be noted in section 2.2.2 of the FEA.

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	State DLNR—Engineering Division	We confirm that part of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone A. The National Flood Insurance Program regulates developments within A as indicated in bold letters below. Please take note that the remainder of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X. Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards.	These requirements will be noted in sections 2.2.2 and 5.1.8.1 of the FEA. Additionally, the project design / construction plans will contain these requirements. Any construction within the designated FEMA flood zone shall comply with the requirements of either Chapter 27, *Floodplain Management*, of the *Hawai'i County Code*, or 44CFR, whichever is more restrictive.
15 (4/8/08)	County Department of Water Supply (DWS)—Milton D. Pavao, P.E., Manager	Water can be made available from the existing 12-inch waterline within Mohouli Street, fronting the proposed project site. Please be informed that our records do not show that there is an existing service lateral installed at the proposed project site. There is an existing pressure reducing station and valve box located near the project site, which may have been mistaken for a service lateral and meter box.	This comment will be noted in section 2.3.2 of the Final Environmental Assessment (FEA) and revision will be made to section 5.2.3 of the FEA. Additionally, the project design / construction plans will contain the installation of a new water service lateral for the site that connects directly to the existing 12-inch waterline in Mohouli Street.
		Prior to issuing a water commitment for the proposed project, the Department would request estimated maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for review and approval. After review of the calculations, the Department will determine the water commitment deposit amount, facilities charges due, and any water system improvements required for final approval.	This requirement will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this requirement.

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		Please be informed that the existing 12-inch waterline fronting the project site is adequate to provide the required 2,000 gallons per minute flow for fire protection, as per the Department's Water System Standards.	This information will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this information.
		Please also be informed that any meter(s) serving the proposed project will require the installation of a reduced pressure type backflow prevention assembly within five feet of the meter on private property. The Department must inspect and approve the installation before water service can be activated.	This requirement will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this requirement.
16 (4/14/08)	State DLNR-State Historic Preservation Division (SHPD)—Nancy McMahon, Acting Archaeology Branch Chief	We have reviewed the Draft Environmental Assessment prepared by M&E Pacific, Inc., for the County of Hawai'i. We appreciate the attention given in the document to consultation with Native Hawaiian groups and individuals in the community to be included in the Cultural Impact Assessment. However, we are unable to determine that no historic properties will be affected by this project. There is a potential for the presence of unidentified archaeological and historical resources in this area of upper Hilo. These concerns are not addressed in the current DEA. We recommend that an Archaeological Inventory Survey be prepared for the property, pursuant to Hawai'i Administrative Rules §13-275.	This comment will be noted in section 2.2.2 of the Final Environmental Assessment (FEA). An Archaeological Assessment (since no archaeological sites were identified during the project, an assessment rather than an inventory survey [AIS] was completed since no sites were recorded [inventoried]) was completed for the project and submitted to the DLNR-SHPD for review and processing in December 2008. There were no historic properties or cultural resources on the project parcel. A copy of the Archaeological Assessment and State of Hawai'i, Department of Land and Natural Resources State, Historic Preservation Division determination letter of concurrence (dated February 28, 2009) will be included in the appendix of the FEA.
17 (5/19/08)	State OHA—Clyde W. Nāmu'o, Administrator	OHA notes that the parcel is zoned as agricultural A-1 which requires that the greatest possible protection be given to these lands. (See Hawaii Revised Statutes (HRS) Section 205) There are a myriad of laws and legislation supporting a strong agricultural economic base and retention of these lands primarily in agricultural pursuits. (See HRS, Section 205, County General Plan Land Use Allocation Guide Map, mentioned on page 43 of the DEA; and the State Coastal Zone	This comment will be noted in section 2.2.2 of the Final Environmental Assessment (FEA). As discussed in section 5.4.1 of the Draft Environmental Assessment (DEA) and FEA, the improvements proposed under this project will require the filing of a Special Permit due to the parcel being zoned as agricultural (A-1a: Agriculture District, minimum building site of

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		Management Act, among many other citations) OHA stresses that only accessory agribusiness activities which meet the above intent are to be permitted in this area.	1 acre) by the County. The property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawai'i (ALISH). Moreover, Hawai'i County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use. The Special Permit will mitigate the inconsistency with the State Land Use "Agricultural" designation and the County General Plan Land Use Pattern Allocation Guide Map (LUPAG) designation "Important Agricultural Land." The improvement is consistent with the intended land uses under the County of Hawai'i General Plan "Medium Density Urban" designation. The project site is not located within or in the vicinity of a designated Wilderness area, as determined from a review of the Bureau of Land Management, US Fish and Wildlife Service, USDA Forest Service, and the National Park Service Wilderness databases.
		OHA is aware that the project site is located near two streams and we appreciate that the applicant intends to use best management practices (BMPs) to prevent storm water discharges into State waters. We also agree with the assessment that monitoring of water quality may be necessary as well as monitoring of the BMPs to ensure that they are achieving the intended result. OHA is also pleased to see that the applicant is discussing runoff from the site in ways that will utilize that resource rather than treat it as a nuisance to be channeled off and discharged as part of a design concept attempting to reduce or eliminate any demands on the municipal storm drainage system. This would help the project	This comment will be noted in section 2.2.2 of the FEA. These requirements will be included in the design / construction plans for the project.

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		to compliment State environmental standards and energy efficiency goals. (See, HRS Section 196-9)	
		OHA would also like to point out that the applicant should consider that by 2020, 20% of Hawai'i's electricity is to be from renewable sources. [See Act 95, Session Laws of Hawai'i which, in 2004 set that new original renewable portfolio standard goal.] Further, HRS Section 196-1 finds that: (1) The global demand for petroleum and its derivatives has caused severe economic hardships throughout the State and threatens to impair the public health, safety and welfare. The State of Hawaii, with its total dependence on imported fossil fuel, is particularly vulnerable to dislocations in the global energy market. This is an anomalous situation, as there are few places in the world so generously endowed with natural energy: geothermal, solar radiation, ocean temperature differential, wind, waves, and currents--all potential non-polluting power sources; (2) There is a real need for strategic comprehensive planning in the effort towards achieving full utilization of Hawaii's energy resource programs and the most effective allocation of energy resources throughout the State. Planning is necessary and desirable in order that the State may recognize and declare the major problems and opportunities in the field of energy resources. As such, OHA recommends the use of photovoltaic and small wind harvesting electrical generation for peripheral uses such as parking lot lighting. Solar energy should also be	This comment will be noted in section 2.2.2 of the FEA. Renewable energy sources will be considered in the design of the project. Photovoltaic and small, wind-harvesting electrical generation for peripheral uses, such as, parking lot lighting, will be considered in the design / construction plans as much as practicable. Solar energy will also be considered for incorporation into the building plans. Design / construction plans will also include the use of recyclable materials; steel studs and structural members; and, wood products from certified sustainable sources, as much as practicable.

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		incorporated into the building plans. During construction, OHA urges the use of recyclable materials: steel studs and structural members, and wood products from certified sustainable sources.	
		State standards and goals also reference the Leadership in Energy and Environmental Design (LEED) Green Building Rating System which is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.	This comment will be noted in section 2.2.2 of the FEA. The facility will be designed to LEED Silver compliance as contained in the design / construction plans.
		OHA notes that there were approximately 23 native plants found on the site and as such we recommend that they be incorporated into the landscaping design as much as possible. Additionally, OHA would also like to suggest that the project area be landscaped with drought tolerant native or indigenous species that are common to the area. Any invasive species should also be removed. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place. This would also help to reduce the amount of impervious surfaces in the project area, thereby reducing runoff as well. OHA also recommends tree and landscape planting to shade paved parking areas and provide shade and cooling to building elements and outdoor use areas.	This comment will be noted in section 2.2.2 of the FEA. The design / construction plans will incorporate existing native plants found on the site into the landscaping design as much as practicable. Additionally, consideration will be made to have the plans call for the removal of any invasive species of plants within the site, and include landscaping with drought-tolerant native or indigenous species of plants that are common to the area. Tree and landscape planting will provide shading for paved parking areas and cooling of building elements and outdoor-use areas as much as practicable.
		OHA also points out that the project site has not been surveyed by an archaeologist and that consultation with the State Historic Preservation Division is ongoing. (DEA, page 47) Due to this lack of information, OHA cannot fulfill our constitutionally mandated duties and comment on what is not known or presented in an environmental review document. We look forward to receiving more information regarding	This comment will be noted in section 2.2.2 of the FEA. An Archaeological Assessment (since no archaeological sites were identified during the project, an assessment rather than an inventory survey [AIS] was completed since no sites were recorded [inventoried]) was completed for the project and submitted to the DLNR-SHPD for

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		historical resources in the area, the potential for finding cultural deposits and the applicant's proposed plan regarding them.	their review and processing in December 2008. There were no historic properties or cultural resources on the project parcel. The report has been forwarded to OHA for review via email attachment on 1/2/09. A copy of the Archaeological Assessment will be included in the appendix of the FEA.
18 (1/28/09)	State Department of Transportation—Brennon T. Morioka, PH.D., P.E., Director of Transportation	DOT does not anticipate any adverse, significant impacts to State transportation facilities at present. However, to ensure acceptable levels-of-service, the DOT Highways Division will monitor the cumulative traffic impacts to the Komohana Street and Puainako Street (State Route 2000) intersection from the various existing and planned development projects including the FASC. Should the cumulative impacts significantly alter traffic flows, DOT may request an updated traffic analysis. Please note that the traffic analysis used in the subject DEA is dated and that a more recent 2006 traffic count is available.	This comment will be presented in section 2.2.2 of the Final Environmental Assessment (FEA). A TIAR was completed for the project and is included in the appendix of the Draft Environmental Assessment and will be included in the appendix of the FEA. Regarding the hourly and annual trend data 9 (figures 3 to 5) which went to 2004, the 2006 data that was taken under the DOT new counting program did not correspond with the old counts. Traffic counts were taken for the project in 2007 and forecasts were based on these counts. Counts taken in 2008 for the Mohouli Senior Citizen residences actually showed a decrease in traffic. The biggest potential traffic generator will be the UHH, which has sizeable projects planned but no definite schedule.

PRE-ASSESSMENT REQUEST LETTERS

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PRE-ASSESSMENT REQUEST LETTER RECIPIENTS

Federal
Natural Resource Conservation Service (NRCS)
U.S. Department of the Interior, U.S. Fish and Wildlife Service (FWS)
U.S. Environmental Protection Agency (EPA), Region 9

State of Hawai'i
Department of Business, Economic Development and Tourism (DBEDT), Office of Planning
Department of Hawaiian Home Lands (DHHL)
Department of Health (DOH), County of Hawai'i District Health Office
Department of Land and Natural Resources (DLNR), Historic Preservation Division (SHPD)
Department of Transportation (SDOT)
Office of Hawaiian Affairs (OHA)
State Office of Environmental Quality Control (OEQC)

County of Hawai'i
Civil Defense
Department of Environmental Management (DEM)
Department of Parks and Recreation
Department of Water Supply
Fire Department
Hawai'i County Council
Mayor Harry Kim
Police Department
Planning Department

Community
Hawaiian Telcom
Hawai'i Electric Light Company
Hawai'i Natural Heritage Foundation
Hawai'i's 1000 Friends
Historic Hawai'i Foundation
The Nature Conservancy
Oceanic Time Warner Cable
The Outdoor Circle
University of Hawai'i at Manoa Environmental Center
Mrs. Pualani "Pua" Kanaka'ole Kanahele
Mrs. Chiyomi Leina'ala Fukino, M.D.
Mr. Kepa Maly
Mr. Fred Cachola
Ms. Mikilani Ho
Mr. Robert "Sonny" & Mrs. Roberta Keakealani
Ms. Maria Kaimipono Orr
Edith Kanaka'ole Foundation / Halau O Kekuhi
Hilo Hawaiian Civic Club
Native Hawaiian Legal Corporation

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

December 17, 2007

Mr. Don Klima, OFAP Director
Advisory Council on Historic Preservation
1100 Pennsylvania Avenue, NW, Suite 803
Washington, DC 20004

Dear Mr. Klima,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

The first phase of the proposed County of Hawaii Fire Department Administration Support Complex includes a Fire Administration Building, an Emergency Dispatch Building, a Fire Preparation and Training Building, parking, open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be ADA accessible. A general location map and a schematic site map of the phase 1 facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have. No historical sites were found near the project site. Since the project site is undeveloped agricultural land, it is possible that historical or cultural materials may be discovered during construction activities. During the event that historical or cultural materials are discovered, work in the area will cease immediately and SHPD will be notified of the discovery and consulted as to the appropriate course of action. Burial finds will be treated in accordance with HAR 12-300 and HRS 6E-43.6. The SHPD will determine the appropriate treatment of the remains. A Finding of No Significant Impact (FONSI) is anticipated for the proposed project.

We are seeking your consultation on this project to identify potential impacts this project may have. We would appreciate any written comments within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Justin.Privett@m-e.aecom.com

METCALF & EDDY | AECOM

Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map

cc: Project File
David Yamamoto, County of Hawaii, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

December 17, 2007

Mr. Patrick Leonard, Field Supervisor
U.S. Fish & Wildlife Service, Pacific Region
300 Ala Moana Boulevard, #3-122
Honolulu, HI 96850

Dear Mr. Leonard,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

The first phase of the proposed County of Hawaii Fire Department Administration Support Complex includes a Fire Administration Building, an Emergency Dispatch Building, a Fire Preparation and Training Building, parking, open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be ADA accessible. A general location map and a schematic site map of the phase 1 facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have. In addition to the US Fish and Wildlife Service, we will also consult with the Hawaii Natural Heritage Program (HNHP) at the University of Hawaii at Manoa for information on threatened, rare, or endangered species in or near the project area. Based on our investigation and research, it is anticipated that the proposed project will have no adverse impacts on threatened, rare, or endangered species in the project area. If any threatened, rare, or endangered species are found in the project area, mitigative measures (i.e. using shielded, downward-facing lights) will be used to minimize impacts of the project to threatened, rare, or endangered species. Therefore, a Finding of No Significant Impact (FONSI) is anticipated for the proposed project.

Pursuant to Section 7, Endangered Species Act, we request a list of any threatened, rare, or endangered species in or near the project area and any comments regarding concerns towards the proposed project. We would appreciate any written comments within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Justin.Privett@m-e.aecom.com

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Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

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December 17, 2007

Mr. Dean Higuchi
Pacific Islands Contact Office
U.S. EPA, Region 9
P.O. Box 50003
Honolulu, HI 96850

Dear Mr. Higuchi,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation to identify any potential impacts or environmental concerns this project may have. We would appreciate any written comments regarding concerns towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Project Manager

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December 17, 2007

Mr. Clyde W. Namu'o, Administrator
Office of Hawaiian Affairs
711 Kapiolani Blvd., Suite 500
Honolulu, HI 96813

Dear Mr. Namu'o,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation on this project to identify potential impacts, if any, on Native Hawaiian people or practices. We would appreciate any written comments regarding any cultural concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

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December 17, 2007

Mr. Lawrence T. Yamamoto, Director
USDA Natural Resources Conservation Service
East Area Office
Prince Kuhio Federal Building
P.O. Box 50004
Honolulu, HI 96850

Dear Mr. Yamamoto,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Project Manager

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December 17, 2007

Mr. Theodore Liu, Director
Dept. of Business, Economic Development and Tourism
P.O. Box 2359
Honolulu, HI 96804

Dear Mr. Liu,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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Project Manager

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December 17, 2007

Mr. Micah Kane, Chairman
Dept. of Hawaiian Home Lands
1099 Alakea Street, Suite 2000
Honolulu, HI 96813

Dear Mr. Kane,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation on this project to identify potential impacts, if any, on Hawaiian Home Lands projects. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

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Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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December 17, 2007

Ms. Karleen Yoshioka, District Health Officer
Department of Health
Hawaii District Health Office
P.O. Box 916
Hilo, HI 96720

Dear Ms. Yoshioka,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation to identify potential concerns the Department of Health may have for this project. In addition to the Hawaii District Health Office, we will also be consulting with the Environmental Planning Office. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Project Manager

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December 17, 2007

Director
Department of Health
Environmental Planning Office
919 Ala Moana Blvd., Room 312
Honolulu, HI 96814

Dear Director,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation to identify potential concerns the Department of Health may have for this project. In addition to the Environmental Planning Office, we will also be consulting with the Hawaii District Health Office. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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December 17, 2007

Administrator
Dept. of Land and Natural Resources
State Historic Preservation Division (SHPD)
Kakuhihewa Building
601 Kamokila Blvd., Suite 555
Kapolei, HI 96707

Dear Administrator,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have. No historical sites were found near the project site. Since the project site is undeveloped agricultural land, it is possible that historical or cultural materials may be discovered during construction activities. During the event that historical or cultural materials are discovered, work in the area will cease immediately and SHPD will be notified of the discovery and consulted as to the appropriate course of action. Burial finds will be treated in accordance with HAR 12-300 and HRS 6E-43.6. The SHPD will determine the appropriate treatment of the remains. A Finding of No Significant Impact (FONSI) is anticipated for the proposed project.

We are seeking your consultation on this project to identify potential impacts this project may have on historic sites in the area. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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December 17, 2007

Mr. Barry Fukunaga, Director
Dept. of Transportation
869 Punchbowl Street, Room 509
Honolulu, Hi 96813-5097

Dear Mr. Fukunaga,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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December 17, 2007

Ms. Genevieve Salmonson, Director
Office of Environmental Quality Control
235 South Beretania Street, Suite 702
Honolulu, HI 96813-5097

Dear Ms. Salmonson,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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METCALF & EDDY | AECOM

Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map

cc: Project File
David Yamamoto, County of Hawaii, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
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December 17, 2007

Ms. Bobby-Jean Leithead-Todd, Director
County of Hawaii
Dept. of Environmental Management
25 Aupuni Street
Hilo, HI 96720

Dear Ms. Leithead-Todd,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

The first phase of the proposed County of Hawaii Fire Department Administration Support Complex includes a Fire Administration Building, an Emergency Dispatch Building, a Fire Preparation and Training Building, parking, open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be ADA accessible. A general location map and a schematic site map of the phase 1 facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking consultation on this project to identify potential impacts or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Justin.Privett@m-e.aecom.com

Thank very much for your time and assistance.

Sincerely,
M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

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Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map

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David Yamamoto, County of Hawaii, Department of Public Works, Building Division
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December 17, 2007

Administrator
County of Hawaii
Civil Defense
920 Ululani Street
Hilo, Hi 96720

Dear Administrator,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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Michael S. Nishimura
Project Manager

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December 17, 2007

Ms. Patricia Engelhard, Director
County of Hawaii
Dept. of Parks and Recreation
101 Pauahi Street, Suite 6
Hilo, HI 96720

Dear Ms. Engelhard,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking consultation on this project to identify potential impacts to parks and recreation in the area or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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(2) Phase 1 Schematic Site Map

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David Yamamoto, County of Hawaii, Department of Public Works, Building Division
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December 17, 2007

Mr. Milton Pavao, Department Head
County of Hawaii
Dept. of Water Supply
345 Kekuanaoa Street, Suite 20
Hilo, HI 96720

Dear Mr. Pavao,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking consultation on this project to identify potential impacts to the water supply in the area or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Sincerely,
M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

Enclosures: (1) Location Map
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Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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December 17, 2007

Mr. Darryl J. Oliveria, Fire Chief
County of Hawaii
Fire Department
25 Aupuni Street
Hilo, HI 96720

Dear Mr. Oliveria,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking your consultation on this project to identify potential impacts, comments, or suggestions you may have on this project as your department will be using the facilities. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Justin.Privett@m-e.aecom.com

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Michael S. Nishimura
Project Manager

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David Yamamoto, County of Hawaii, Department of Public Works, Building Division
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December 17, 2007

Mr. Harry Kim, Mayor
County of Hawaii
Office of the Mayor
25 Aupuni Street
Hilo, HI 96720

Dear Mayor Kim,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have.

We are seeking consultation on this project to identify potential impacts to the public in the area or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

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December 17, 2007

Mr. Chris Yuen, Department Head
County of Hawaii
Planning Department
101 Pauahi Street, Suite 3
Hilo, HI 96720

Dear Mr. Yuen,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are seeking consultation on this project to identify potential impacts to development in the area or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

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December 17, 2007

Mr. Lawrence K. Mahuna, Police Chief
Police Department
349 Kapiolani Street
Hilo, HI 96720

Dear Mr. Mahuna,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are seeking consultation on this project to identify potential impacts to the Police Department or comments you may have on this project. We would appreciate any written comments regarding any concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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December 17, 2007

Mr. Pete Hoffmann, Council Chair
Hawaii County Council
25 Aupuni Street
Hilo, HI 96720

Dear Mr. Hoffmann,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Michael S. Nishimura
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December 17, 2007

Director
Hawaiian Telcom
1177 Bishop Street
Honolulu, HI 96813

Dear Director,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Project Manager

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December 17, 2007

Director
Hawaii Electric Light Company
1200 Kilauea Avenue
Hilo, HI 96720

Dear Director,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Project Manager

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December 17, 2007

Mr. Roy Kam, Database Manager
University of Hawaii at Manoa
Center for Conservation Research and Training
Hawaii Natural Heritage Program
3050 Maile Way, Gilmore Hall #406
Honolulu, Hawaii 96822

Dear Mr. Leonard,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). In preparing the EA we are consulting various State and Local Agencies, as well as various public organizations to determine if there are any potential impacts this project may have. In addition to the Hawaii Natural Heritage Program US Fish and Wildlife Service, we will also consult with the US Fish and Wildlife Service for information on threatened, rare, or endangered species in or near the project area. Based on our investigation and research, it is anticipated that the proposed project will have no adverse impacts on threatened, rare, or endangered species in the project area.

We are requesting a list of any threatened, rare, or endangered species in or near the project area and any comments regarding concerns towards the proposed project. We would appreciate any written comments within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Justin.Privett@m-e.aecom.com

METCALF & EDDY | AECOM

Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map

cc: Project File
David Yamamoto, County of Hawaii, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

December 17, 2007

Ms. Donna Wong, Executive Director
Hawaii's 1000 Friends
25 Maluniu Avenue
Suite 102#282
Kailua, HI 96734

Dear Ms. Wong,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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Michael S. Nishimura
Project Manager

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December 17, 2007

Ms. Kiersten Faulkner, Executive Director
Hawaii Historic Foundation
680 Iwilei Road, Suite 690
Honolulu, HI 96817

Dear Ms. Faulkner,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Justin.Privett@m-e.aecom.com

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Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map

cc: Project File
David Yamamoto, County of Hawaii, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

December 17, 2007

Mr. Jeff Mikulina, Director
The Nature Conservancy
923 Nuuanu Ave.
Honolulu, Hi 96817

Dear Mr. Mikulina,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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Justin.Privett@m-e.aecom.com

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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841 Bishop Street, Suite 1900
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T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

December 17, 2007

Director
Oceanic Time Warner Cable
1257 Kilauea Avenue
Hilo, HI 96720

Dear Director,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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David Yamamoto, County of Hawaii, Department of Public Works, Building Division
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December 17, 2007

Kathy Whitmire, President
The Outdoor Circle
1314 South King St., Suite 306
Honolulu, Hi 96814

Dear Ms. Whitmire,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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David Yamamoto, County of Hawaii, Department of Public Works, Building Division
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December 17, 2007

Dr. John T. Harrison, PhD, Environmental Coordinator
University of Hawaii at Manoa
Environmental Center
2500 Dole Street, Krauss Annex 19
Honolulu, Hi 96822

Dear Dr. Harrison,

Subject: **Request for Review of Proposed County of Hawaii Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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Justin.Privett@m-e.aecom.com

Thank very much for your time and assistance.

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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cc: Project File
David Yamamoto, County of Hawaii, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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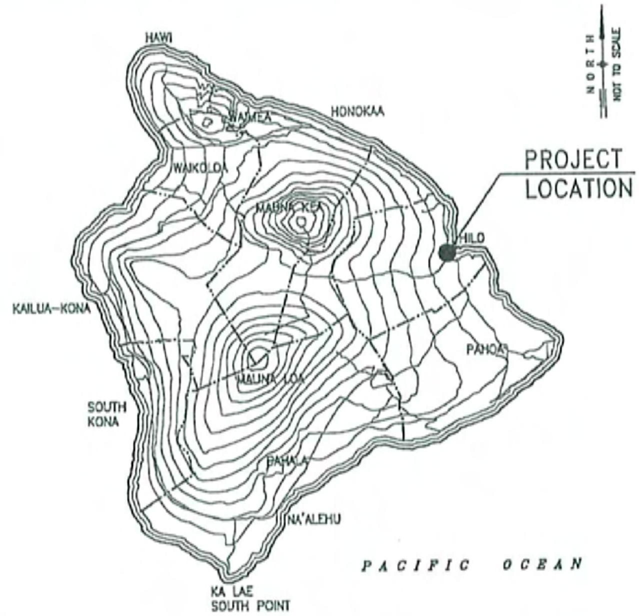
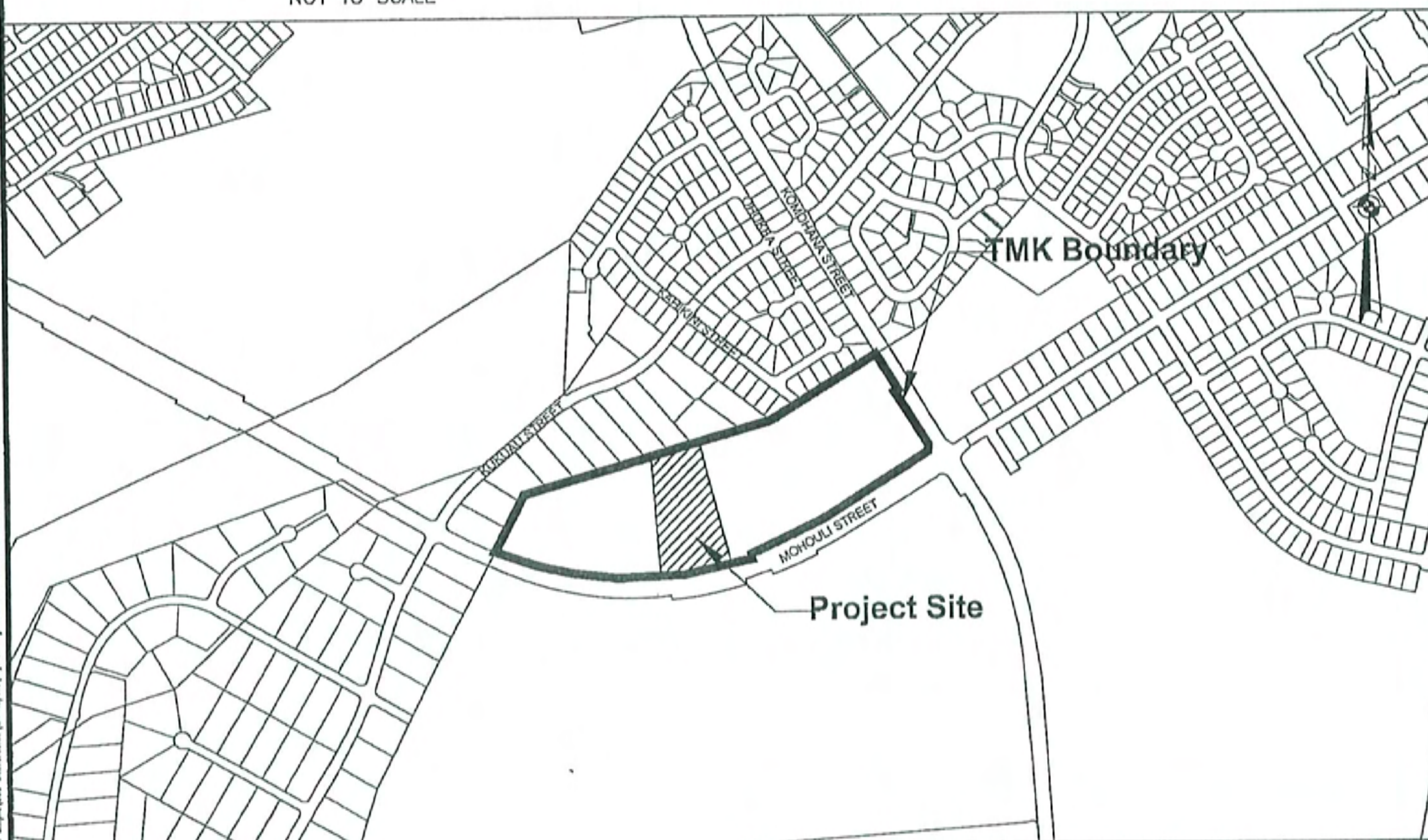


VICINITY MAP
NOT TO SCALE

ISLAND MAP
NOT TO SCALE



LOCATION MAP

SCALE: 1" = 1000'

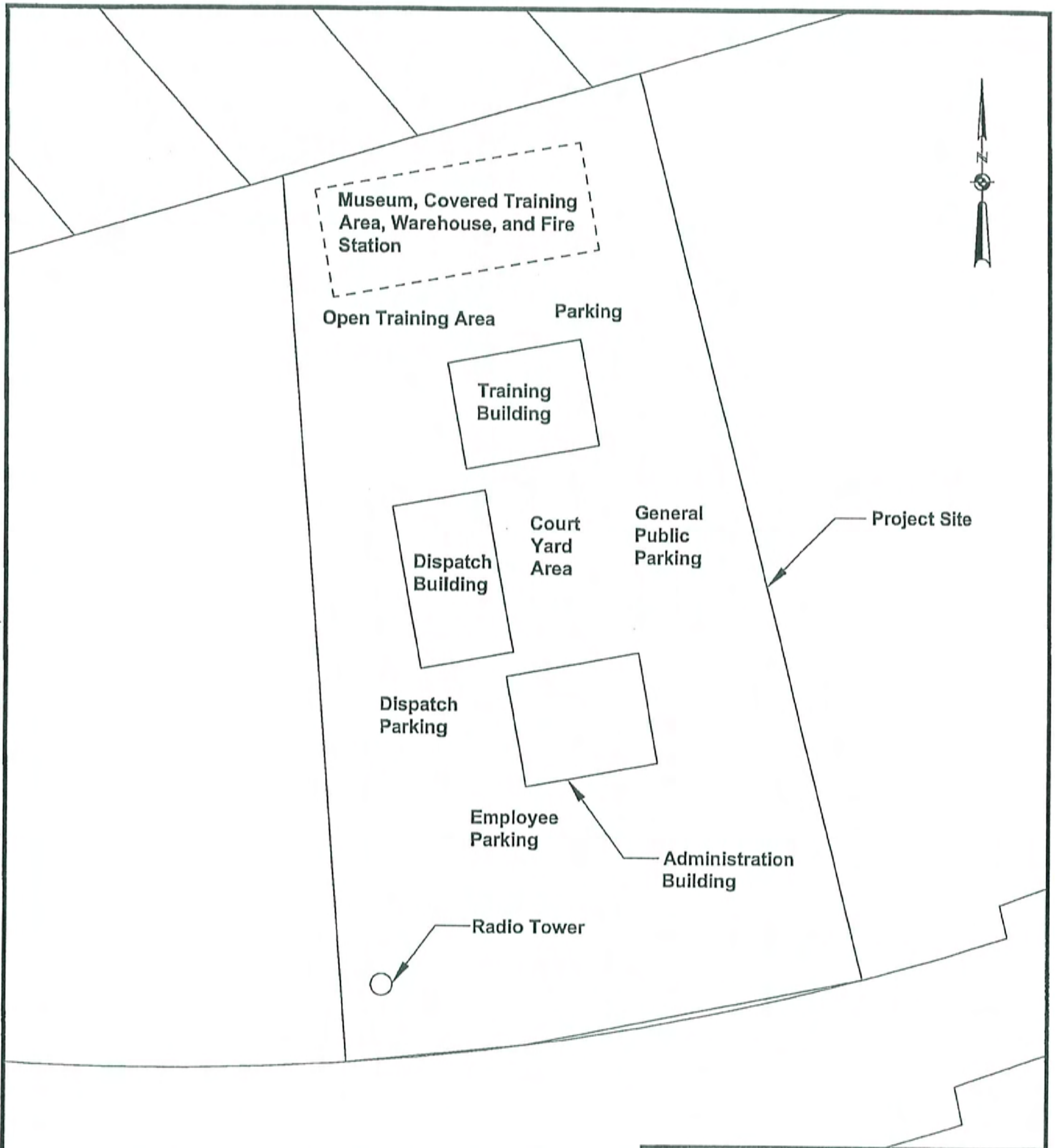
0 1000 2000 3000
1" = 1000' SCALE FEET

M&E Pacific, Inc.

METCALF & EDDY

DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

Figure 1
LOCATION MAP
Environmental Assessment for the
Fire Administration Support Complex
December 2007



SCHEMATIC SITE MAP

SCALE: 1" = 100'

0 100 200 300

1" = 100' SCALE FEET

M&E Pacific, Inc.

METCALF & EDDY

DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

Figure 2
SCHEMATIC SITE MAP
Environmental Assessment for the Fire Administration Support Complex
December 2007

PRE-ASSESSMENT COMMENTS RECEIVED

THIS PAGE INTENTIONALLY LEFT BLANK

Harry Kim
Mayor

Lawrence K. Mahuna
Police Chief

Harry S. Kubojiri
Deputy Police Chief

County of Hawaii

POLICE DEPARTMENT

349 Kapiolani Street • Hilo, Hawaii 96720-3998
(808) 935-3311 • Fax (808) 961-2865

December 20, 2007

Mr. Michael S. Nishimura
Project Manager
M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813

Dear Mr. Nishimura:

This responds to your December 17, 2007, request for comments on the proposed construction of the County of Hawai'i Fire Administration Support Complex on a property located at the corner of Mohouli Street, in Hilo.

This proposed project does not appear to impact any of our existing or proposed projects, plans, policies, or programs. The only concern we would have is to ensure adequate parking for staff as the plan calls for our Communications-Dispatch staff to be relocated to the Dispatch Building.

Thank you for providing us the opportunity to provide comments on this project. Should you have any questions, feel free to contact Assistant Chief Paul Ferreira of our Administrative Bureau at (808)961-2261.

Sincerely,

LAWRENCE K. MAHUNA
POLICE CHIEF

pkf

Hawai'i County is an Equal Opportunity Provider and Employer

PHONE (808) 594-1888

FAX (808) 594-1865

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

JAN 4 2008
M & E PACIFIC, INC.

HRD07/3441

December 31, 2007

Michael S. Nishimura, Project Manager
M&E PACIFIC, INC.
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813

RE: **Request for Review of Proposed County of Hawai'i Fire Administration Support Complex TMK: (3) 2-4-001:por. 168**

Aloha nō e Mr. Nishimura,

The Office of Hawaiian Affairs ("OHA") is in receipt of your December 17, 2007 transmittal request for review of the above-referenced project, and offers the following comments:

As you may already know, the Hawai'i State Constitution requires all local governmental entities to protect and preserve Native Hawaiian cultural assets and sites, burials and funerary objects, traditional practices and access rights, among other things. This mandate also constitutes one of OHA's primary kuleana.

The Environmental Assessment ("EA"), in accordance with Chapter 343 of the Hawaii Revised Statues, should include a Cultural Impact Assessment ("CIA"). In accordance with the requirement of Act 50, Session Laws of Hawaii 2000, a CIA shall include information relating to the practices and beliefs of the Native Hawaiians who once inhabited the area(s), and it is recommended that community involvement be included in this assessment. We refer you to Lukela Ruddle, Cultural Resource Coordinator in OHA's Hilo office, who can be reached at (808) 920-6419, to further assist you in this project area.

OHA asks that, in accordance with Section 6E-46.6, HRS and Chapter 13-300, Hawaii Administrative Rules, if the project moves forward, and if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD) shall be contacted. OHA would also like to be notified

Upon completion of this vital segment to the project, OHA thanks you in advance and respectfully requests a hardcopy of any EA draft(s), if feasible, addressed to my attention. OHA hopes to be consulted on this matter in the future as more information becomes available and the project progresses.

Thank you for the opportunity to comment. If you have any further questions, please contact Jerome Yasuhara, Policy Advocate in the Native Rights, Land and Culture Hale, at 594-0239 or via email at jeromey@oha.org.

'O wau iho nō, me ka ha'aha'a,

Clyde W. Nāmu'o
Administrator

C: Lukela Ruddle, OHA—Hilo Office

Harry Kim
Mayor

Bobby Jean Leithead-Todd
Director

Nelson Ho
Deputy Director

County of Hawai'i

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawai'i 96720
(808) 961-8083 · Fax (808) 961-8086
http://co.hawaii.hi.us/directory/dir_environ.htm

January 4, 2008

Mr. Michael S. Nishimura, P.E.
Project Manager
Metcalf & Eddy, Inc.
841 Bishop St., Suite 1900
Honolulu, HI 96813

SUBJECT: REQUEST FOR REVIEW OF PROPOSED COUNTY OF HAWAI'I FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: 2-4-001:PORTION 168

We have reviewed the subject request and have the following comments to offer:

Wastewater Division

1. The County wastewater collection system is located on Kahikini Street.
2. Please use the Wastewater Division Design Checklist as a guide should you decide to connect to our system.
3. A meeting with our Wastewater Division staff is highly recommended prior to the start of planning and design phases.
4. Please submit a wastewater master plan study for the entire parcel prior to the start of planning and design.

Should you have Wastewater questions, please call Bert Saito, Wastewater Division Chief at 808-961-8513 or Ms. Toni Nakatani at 808-961-8512.

Solid Waste Division

1. Commercial operations, State and Federal agencies, religious entities and non-profit organizations may not use transfer stations for disposal.
2. Aggregates and any other construction/demolition waste should be responsibly reused to its fullest extent.
3. Ample and equal room should be provided for rubbish and recycling.
4. Greenwaste may be transported to the green waste sites located at the Hilo transfer station, or other suitable diversion programs.
5. Construction and demolition waste is prohibited at all County of Hawai'i Transfer Stations.
6. Submit a Solid Waste Management Plan in accordance with the attached guidelines.

If these comments are addressed in the EA, it may save time during the planning permit process. If you require additional Solid Waste Division information or assistance, please contact Mike Dworsky, Solid Waste Division Chief at 808-961-8515.

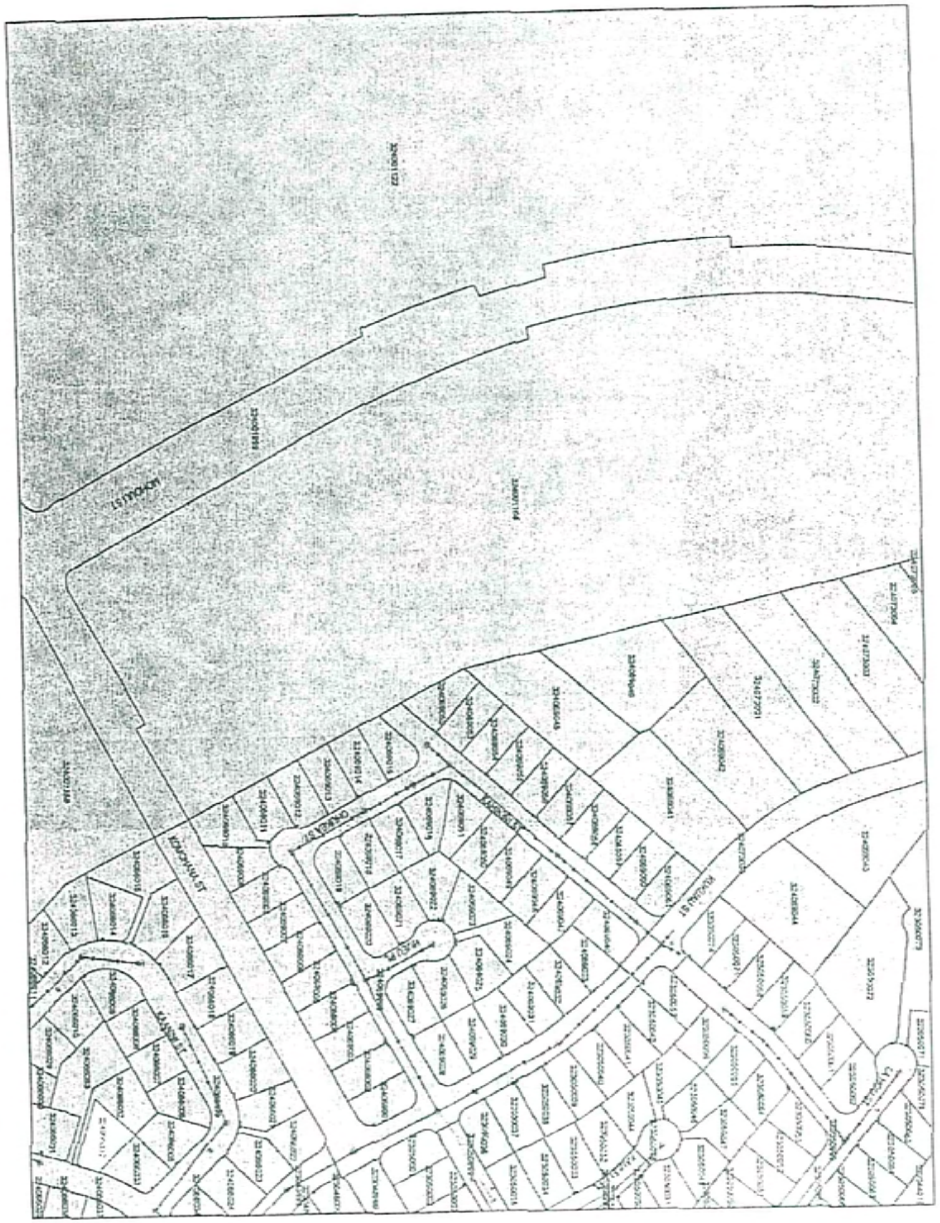
Thank you for allowing us the opportunity to provide comments on this project.

Sincerely,

Bobby Jean Leithead Todd
DIRECTOR

enclosures

cc: Bert Saito, P. E., WWD Chief
Mike Dworsky, P.E., SWD Chief



Design Plan Review Comments

Project: Name
TMK No.: TMK
Consultant: Name
Review Date: *Date*
Prior Review Date: N/A

Reference	Items	Comments
Application for Sewer Extension	1. Hawaii County Code Section 21-26 & 26.1 requires Sewer Extensions be approved by County Council. Review sewer extension application and copies of supporting materials.	
Preliminary Engineering Report	1. Review the report for a discussion on new sewer system capacity and downstream facilities and capacity.	
Hydraulic Calculations	1. Review the following hydraulic design parameters and compare against Chapter 20 of the "Design Standards of the Department of Wastewater Management, Volume 1, July 1993" • Design period • Average daily per capita flow • Maximum flow factor • Dry weather Infiltration • Wet weather infiltration • Design peak flow • Pipe capacity flowing full	
Soils Report	1. Review recommendations section for any geotechnical issues affecting new sewer installation. Verify that design plans incorporate steps towards carrying out these recommendations.	
Title Sheet	1. Project Name & Number.	
	2. DPW Folder Number (for projects not financed by the County).	
	3. Street or Location Name.	
	4. TMK Number.	
	5. Developer, Owner, & Engineer information.	
	6. Signature Approvals: • Director, Dept. of Public Works, County of Hawaii. • Director, Planning Dept., County of Hawaii. • Director, Dept. of Environmental Management, County of Hawaii. • Manager, Dept. of Water Supply, County of Hawaii. If County-financed project, include: • Mayor, County of Hawaii. • Chief, Environmental Management Division, Dept. of Health, State of Hawaii.	
	7. Island Map & Location Map.	
	8. Index of Sheets.	
	9. Legend.	
	10. Engineer Name, Stamp of Registration Seal & expiration date.	
	11. Title block with subdivision name & Sheet No. & Plan set date.	
	12. North arrow & scale on applicable sheets.	

Design Plan Review Comments (Cont.)

Sewer System Master Plan Sheet	1. If this is provided, verify pipe diameters and correct direction of flow.	
General Sheet Information	1. Check for benchmark information, basis of bearing, or any existing street monuments that serve as a reference(s) for the new design.	
	2. Check for current version of the sewer notes.	
	3. Traffic Control Plans/Traffic Notes/Notes within County ROW/Utility Notes provided	
Typical Road Sections	1. Show a minimum soil cover over sanitary sewer is 4' per "Design Standards of the Department of Wastewater Management, Vol. 1, July 1993". In the case where sewer is adjacent to water, current Department of Water Supply Standards for minimum soil cover governs.	
	2. Show a minimum of 18" vertical clearance at water and sewer main crossings with sewer underneath water.	
	3. Show a minimum horizontal separation of 8' between water and sewer mains per "Water System Standards, Department of Water Supply, County & State of Hawaii, 2002".	
Plans	1. Check plan sheets for correct scale.	
	2. Verify that pipe diameter size and flow direction are consistent with the sewer system master plan sheet and the profile. Minimum of 8" pipe diameter in roadway areas. Exception is 6" minimum in easements not serving more than 10 residential lots.	
	3. Minimum horizontal separation of 8' between water and sewer main. If not possible, Section 24.11.3 of the "Design Standards of the Department of Wastewater Management, Vol. 1, July 1993" applies.	
	4. Azimuths and lengths of sewer are shown.	
	5. Property boundaries, TMK's, and lot numbers for individual lots are shown and a lateral services each lot.	
	6. Minimum burial depth of 2' is required for ends of sewer laterals located at the property line.	
	7. All properties that are unsewerable by gravity should be noted on the plans.	
	8. For improvement plans, check condition of accessibility of existing sewer laterals located within the proposed limits of work boundary.	
	9. Sewer laterals are a minimum of 6" diameter, does not exceed 100 feet in length, and is installed 90 degrees to the sewer main. Sewer cleanouts are to be 6".	
	10. If street grade is steep, laterals should be set at low side of lot.	
	11. Sewer cleanout to be located within County Right-of-Way and within 1' of property line.	
	12. Sewer mains less than 36" diameter should be laid with straight alignment between manholes. Grades should be constant.	
	13. Sewer manhole inlet and outlet is equal to, or greater than 90 degrees to the sewer main.	
	14. Manholes locations are at the end of each line, at changes in grade, size, or alignment (except for curved sewers) and should not be located in low points. Manholes are typically spaced at a maximum of 350' apart in street areas.	

Design Plan Review Comments (Cont.)

	15. Drop manholes provided where a sewer enters a manhole at a height of 18" or more above the manhole invert.	
	16. All manholes are numbered and stationed and correspondingly numbered on the profile.	
	17. Verify DPW Standard Detail Number for new sewer manholes.	
	18. Manhole rim elevations and inlet/outlet invert elevations match information shown on profile.	
	19. Identify water and sewer main crossings.	
	20. Confirm matchlines are correct	
	21. Provide signature approval line for WW Division Chief	
	22. Show all Adjacent Utilities	
	23. Provide sewer and access easements in accordance with Section 21-19.	1.
Profiles	1. Check profiles for correct scale.	
	2. Verify pipe diameter size is consistent with plan view and pipe material (sewer mains and laterals) is called out as SDR-26.	
	2. All drop manholes, manholes with sewer pipes larger than or equal to 12-inches, and manholes located in commercial or industrial areas shall be Dura-Plate (or approved equal) lined.	
	4. Identify water and sewer main crossings and verify that a minimum vertical separation of 18" exists per "Water System Standards, Department of Water Supply, County & State of Hawaii, 2002". Where the required minimum cover is not achievable, reinforced concrete jacketing per DPW Standards shall be considered. Preferred is min. of 5 LF on either side, concrete jacketed sewer pipe below water with 6" clearance. If sewer must be above water, min. of 5 LF on either side of jacketing and 12" clearance.	
	5. Hydraulic data is shown on the profiles for each length of pipe between manholes. Clarification on nomenclature should be obtained if not already shown. At a minimum, data should consist of Design Peak Flow, Pipe Capacity Flowing Full, Velocity at Design Peak Flow, Velocity at Pipe Flowing Full, pipe slope and mannings coefficient.	
	6. Acceptable velocities are a minimum of 2 fps and a maximum of 10 fps at full flow conditions. Mannings is typically 0.015 for pipes up to and including 18" diameter. Minimum slopes for varying size pipes are shown in Chapter 20, Section 23.2 of the "Design *Standards of the Department of Wastewater Management*, Volume 1, July 1993".	
	7. Show Profiles of Adjacent Utilities	
	8. Provide signature approval line for WW Division Chief	
	9. Other	
Miscellaneous Sewer Details	1. Pipe to Manhole Connections: a. New sewer pipe to new manhole connections shall be cast-in-place manhole pipe adaptor such as A-LOK®, Econoseal or approved equal. b. Existing sewer pipe to new manhole connection shall be A-LOK®, or approved equal field sleeve. c. New sewer pipe to existing manhole connections shall be A-LOK ®, or approved equal field sleeve.	1.

Design Plan Review Comments (Cont.)

	2. Check for County Wastewater Division Standard Details WW-1 (Trench Detail), WW-2 (Sewer Lateral Detail) and WW-4 (Traffic-Rated Frame & Cover).	
	3. Check for schematic of typical layout of sewer lateral at property lines. See Detail S-6 of "Standard Details for Public Works Construction, County & State of Hawaii, September 1984" as an example.	
	4. Connection to existing sewer facilities.	
	5. Provide signature approval line for WW Division Chief	
NPDES	1. Location of General BMP's need to be shown. 2. Standard BMP's (silt fence requirements, snake bag, etc.) need to be provided.	
Traffic Control	Traffic Control Plans Provided and in accordance with MUTCD	
Other		

WASTEWATER COLLECTION SYSTEM NOTES

GENERAL REQUIREMENTS:

1. All construction details and specifications not shown on the plans shall conform to the Standard Details for Public Works Construction, September 1984, Wastewater Division Standard Details, and Standard Specifications for Public Works Construction, September 1986.
2. The Contractor shall furnish all materials, labor and equipment for all wastewater collection system work within the County's right-of-way.
3. The Contractor shall be responsible for the investigation, inspection and verification of all existing utilities supplemented by actual digging in the field if necessary, to determine the actual location of such utilities with their branch and service lines, whether indicated on plans or not.
4. The Contractor shall be required to take out and pay for all necessary permits and licenses required by local ordinances for the prosecution of this work.
5. Workmanship shall be first class. All work shall be performed by the respective trade person in accordance with applicable County Ordinance and State Regulation.
6. The Contractor shall notify the Wastewater Division (961-8338) at least forty-eight hours in advance of any work being done on, or any connections being made to the existing County wastewater collection system. Inspection shall be performed by an authorized representative of the Wastewater Division prior to backfilling or covering of the work and after all plumbing work in accordance with the plumbing permit is complete within the parcel.
7. The Contractor shall repair, at their expense, all damages sustained during the course of his work and leave completed work in its original or better condition.
8. No debris resulting from the construction work shall be allowed to enter the existing wastewater collection system. The Contractor shall provide the necessary barriers and collection devices to prevent debris from entering the system. The Contractor shall flush all newly constructed sewer pipes before connection to the existing wastewater collection system. The Contractor shall be responsible for removing all debris that enters the existing system as a result of the construction work.
9. The Contractor shall immediately notify the Wastewater Division (961-8338) should any existing wastewater collection system line be damaged. The Contractor shall repair the line and any rocks or debris that entered the system shall be physically removed from the system to the satisfaction of the Wastewater Division. The work may include flushing and/or use of a pipe pig.
10. Bypassing or spilling of sewage to the ground, drainage system or State waters is prohibited. The Contractor shall pay penalties, including legal fees and other costs as a result of the bypass or spill.
11. Private developments for dedication to the County of Hawaii shall be inspected and certified by an independent licensed engineer registered in Hawaii for compliance with approved plans, specifications and applicable documents. Prior to construction, submit to the Wastewater Division the name, affiliation, address and phone number of the Project Engineer/Inspector representing the owner for this purpose. The licensed engineer shall provide a stamped report upon completion of the project in accordance with HAR Title 16, Chapter 115 indicating that the project was completed in accordance with the project Plans and Specifications.

12. Before final project inspection approval by WWD personnel, submit One (1) set of "As-Built" plans on vellum, including two (2) copied sets and one set of electronic drawings in AutoCAD 2002 version. It is mandatory that the "As-Built" plans show correctly identified property TMK numbers and accurately located sewer manholes, laterals, cleanouts and all other major components of the wastewater collection system.
13. Before final project inspection approval by WWD personnel, submit documentation certified by a independent professional land surveyor duly registered with the Hawaii Board of Registration for Professional Engineers, Architects, Land Surveyors and Landscape Architects attesting to the location and elevation of all sewer manholes, sewer laterals, cleanouts and all other major components of the wastewater collection system as shown on "As Built" plans.
14. Before final project inspection approval by WWD personnel, submit copies of all testing/re-testing data (i.e., soil compaction, leak, mandrel, etc.). Testing shall be witnessed and certified by an independent licensed engineer and/or approved testing laboratory.

SEWER SYSTEM REQUIREMENTS:

1. Unless otherwise approved or noted, all sewer pipes and fittings shall be PVC SDR-26 bell(s) and spigot. Materials for Class B pipe bedding shall be 3/4" Aggregate Base Course placed in successive horizontal layers of loose material not to exceed 6 inches in depth, and shall be uniformly consolidated to 95 percent maximum dry density. Compaction testing for compliance shall be routinely performed and approved by the independent testing and quality control laboratory. All test results shall be submitted to the Engineer for final acceptance.
2. Sewer pipe connections to new manholes shall be with an approved cast-in-place manhole pipe adapter (A-lok, Econoseal, or approved equal). Sewer pipe connections to existing manholes shall be with an approved manhole pipe adapter (A-lok Field Sleeve or approved equal).
3. All drop manholes, manholes with sewer main pipe lines larger than or equal to 12-inches, and manholes located in commercial or industrial areas shall be lined with a PVC liner (Dura-Plate or equal) and benches shall be Saureisen F-120 corrosion resistant polymer concrete or approved equal.
4. The angle between the inlet and outlet sewers shall be a minimum of 90 degrees. New and existing manhole base sections shall channelized as necessary. Channels shall provide a smooth transition between inlet and outlet sewers.
5. Unless otherwise approved or noted, all manholes shall be provided "Eccentric" cone sections with Type SA frames and covers (Std. Detail S-22). All manholes less than 5'-0" deep shall be provided 22-inch "Concentric" cone sections with Type SB frames and covers (Std. Detail S-21).
6. All lateral connections to the sewer main shall be made with a wye fitting rotated 45 degrees above the sewer spring line.
7. When permitted by the Engineer, sewer lateral connections to an existing VCP or PVC sewer shall be made with a wye configured flexible saddle (DFW/HPI, or approve equal) rotated 45 degrees above the sewer spring line. The sewer main pipe saddle entry shall be neatly cored (saw cut).
8. When permitted by the Engineer, sewer lateral connections to existing RCP sewer main pipe lines shall be made with a tee configured pipe saddle rotated 45 degrees above the sewer spring line. The sewer lateral entry shall be core drilled perpendicular to the sewer pipe wall. Cored surface and any damaged internal pipe surface shall be coated with Saureisen F-120 corrosion resistant polymer concrete or approved equal, in accordance with the Manufacturer recommendations.

9. The sewer lateral saddle connection and cored sewer main pipe entry shall provide a smooth and unobstructed flow area. The sewer saddle shall completely overlay the cored entry area on the main sewer pipe. The sewer saddle shall be secured to the main sewer pipe with stainless steel straps and jacketed with Class B reinforced concrete (Std. Detail S-5). The reinforced concrete jacket shall completely encase the existing main sewer pipe, be a minimum 6-inches thick and extend a minimum of 6-inches beyond the sewer saddle in both directions along the existing sewer pipe.

10. Sewer cleanouts shall be located in the County Right-of-Way within one foot of the property line. The cleanout shall be easily accessible (i.e., not be buried or located under or close to rock walls, fences or other obstructions). If the cleanout is determined to be inaccessible, it shall be relocated at the Contractor's expense. The cleanout shall be of the same material and diameter (typical, 6-inch) as that of the sewer lateral provided. The cleanout shall be provided a brass countersunk cap and an 18"x18"x8" Class B concrete collar reinforced with 1-#3 reinforcement steel loop. The cleanout subject to vehicular or abnormal loading shall be provided a traffic rated frame/cover (Model SBF 1246 W, manufactured by South Bay Foundry, or approved equal) installed to grade with an 24"x24"x8" Class B concrete collar reinforced with 1-#3 reinforcement steel loop.

11. Sewer manholes located in unpaved areas shall be provided a concrete collar. The concrete collar shall be Class "B" concrete reinforced with 1-#3 reinforcement steel loop. The concrete collar shall be 42"x42"x6" for Type SA frames, 54"x54"x6" for Type SB frames.

12. Unless otherwise noted and locations detailed on approved plans, concrete jacketing of new or existing sewer mains and service laterals shall not be permitted.

13. Sewer laterals should be shown with correct locations and depths relative to property boundary pins and existing ground surface. Upon completion of the project, submit one (1) set of 8-1/2"x11" plot plans for each property TMK that contains this information.

14. WWD will perform CCTV inspection of the sewer line prior to acceptance of the system. Testing for deflection will be accomplished with the CCTV inspection. If the CCTV inspection reveals conditions such as sags, dents, out-of-round condition, etc., then mandrel testing in accordance with 21.3.E of the Standard Specifications will be required at which the cost will be borne by the Contractor. CCTV acceptance criteria is available at WWD. Initial CCTV inspection of the system will be provided at no cost to the contractor. CCTV cost for re-inspection and/or additional inspections are the responsibility of the Contractor.

FORCE MAIN SYSTEM REQUIREMENTS:

1. Force main piping shall be Ductile Iron Pipe (Cement or other approved lining and coated) or High Density Polyethylene HDPE Pipe.

2. Ductile iron pipe and fittings for buried service shall have a 1 mil asphalt coating conforming to ANSI/AWWA C151 applied at the factory. pipe and fittings shall be encased with polyethylene film as specified in AWWA C105. Note that polyethylene encasement is required regardless of the fact that buried piping will installed with a reinforced concrete jacket.

3. Cathodic protection shall be provided when pipe will be subjected to severe corrosion service when specified by the Wastewater Division.

4. High Density Polyethylene (HDPE) pipe shall utilize butt-fused joints. Approved mechanical joints may be utilized for connection of HDPE piping to existing dissimilar piping (Ductile Iron, Cast Iron, Reinforced Concrete Pressure Pipe). Electro-fusion joints may be utilized when authorized by the Wastewater Division. Plastic welding of joints shall not be allowed.

5. HDPE Force Mains for wastewater service shall be dark green in color.

6. Thrust blocks shall be provided for all fittings such as tees, plugs, caps, bends, offsets, reducers, and valves as well as all other pipeline appurtenances that are subject to unbalanced thrusts. Design of thrust blocks shall be in accordance with the current edition of the Water System Standards, Department of Water Supply, County of Hawai'i, State of Hawai'i.

7. Force mains shall be designed with a continuous upward slope to eliminate high points on the piping and the need for installation of air relief valves. Designs incorporating high points in the force main shall not be allowed unless specifically authorized by the Wastewater Division.

8. In the event that high points on the force main has been authorized by the Wastewater Division, sewage air relief valves shall be installed on the high points. Sewage air relief's shall be installed in reinforced concrete vaults and shall vented to an adjacent sewer system with drainage of the vault to the sewer system to the maximum extent possible.

9. All sewage air relief valves shall be Vent-O-Mat Series RGX air relief valves and shall be of Type 316 Stainless Steel and shall be provided with isolation valves to allow maintenance and repair of the air relief valve during periods when the force main is active.

10. Metallic tracer tape shall be installed above all buried piping. Tracer tape shall be acid and alkali-resistant, green or yellow, 6-inches (minimum) width, 9-mil (minimum) thickness and be reinforced for increased breaking strength. Metallic tracer tape to be similar or equal to THORTEC Detectable warning tape and shall have working similar to "CAUTION – Sewer Line Buried Below." Tracer tape to be installed at a depth of approximately 12-inches from grade with a minimum depth coverage of 6-inches. Tape shall be placed on compacted backfill and shall be laid in continuous lengths with wording facing upwards.

11. Scotchmark 3M Full Range Markers, 15-inches in diameter, Product Number 1253, color coded to APWA standards designed for maximum depth applications (up to eight feet depth) shall be installed above buried piping at a maximum depth of 6-feet. Markers shall be placed at all piping directional changes (horizontal and/or vertical) and at maximum intervals of 50-feet. Electronic Markers shall be installed with 12-inches (top, bottom, sides) of No. 4 crushed screening around the Marker to protect it from damage during backfilling operations. Electronic Markers shall be installed in the horizontal position to maximize locator efficiency.

12. Prior to excavation in the vicinity (within 6 feet) of active Force Mains, the Contractor shall purchase and have on-site the following repair items in the event of damage to the existing lines during the excavation work:

    a. Two (2) each Stainless Steel pipe repair clamps of appropriate size and pressure rating for each type of the existing Force Main where the excavation is taking place.

b. Two (2) each "Dresser" type couplings of the appropriate size and pressure rating for each type of the existing Force Main where the excavation is taking place.

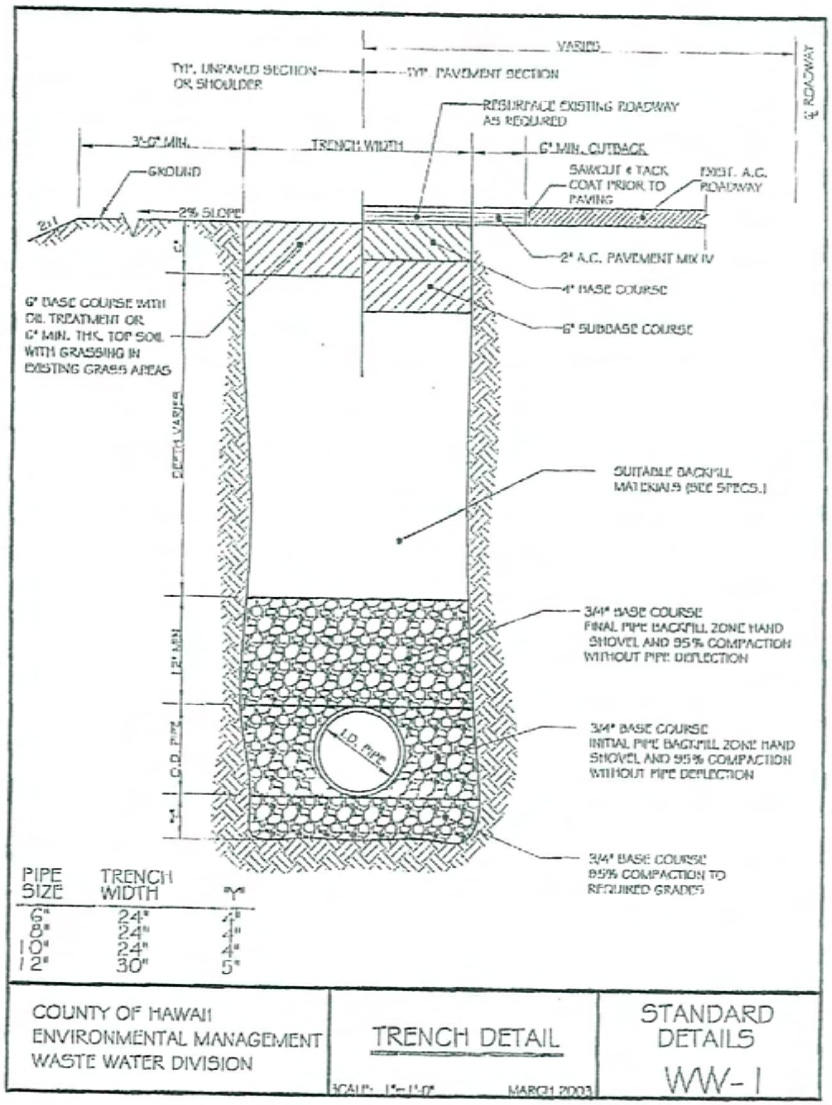
c. One (1) each length of the appropriate size and pressure rating for each type of the existing Force Main where the excavation is taking place. As an alternative, the Contractor may provide piping of different material (PVC, HDPE, Cast Iron, Ductile Iron) provided that appropriate adapters are utilized.

13. Hydrostatic pressure tests shall be conducted in accordance with Section 4 of AWWA C600. The test shall consist of holding the test pressure on the piping for a minimum period of 120 minutes at 150 psi pressure. No leakage allowed.

a. Only new piping installed per this section shall be hydrostatically tested for leakage. The new piping shall be disconnected from all existing piping prior to the test. *Install appropriate blinds to allow* testing of the new piping.

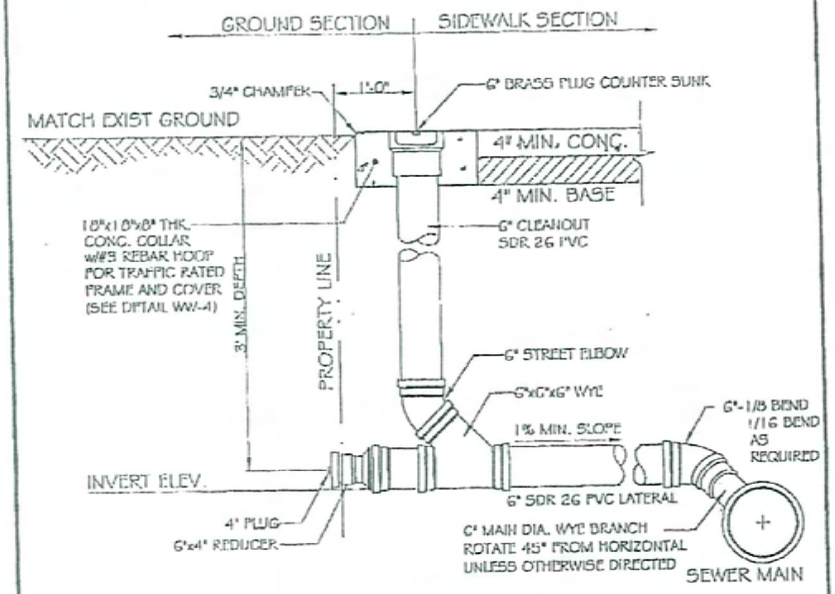
b. In the event that the test is not completed due to leakage, equipment failure, etc., depressurize the piping then allow it to "relax" for a minimum of eight (8) hours prior to re-performing the test.

c. The Contractor shall conduct the test in the presence of the Wastewater Division.



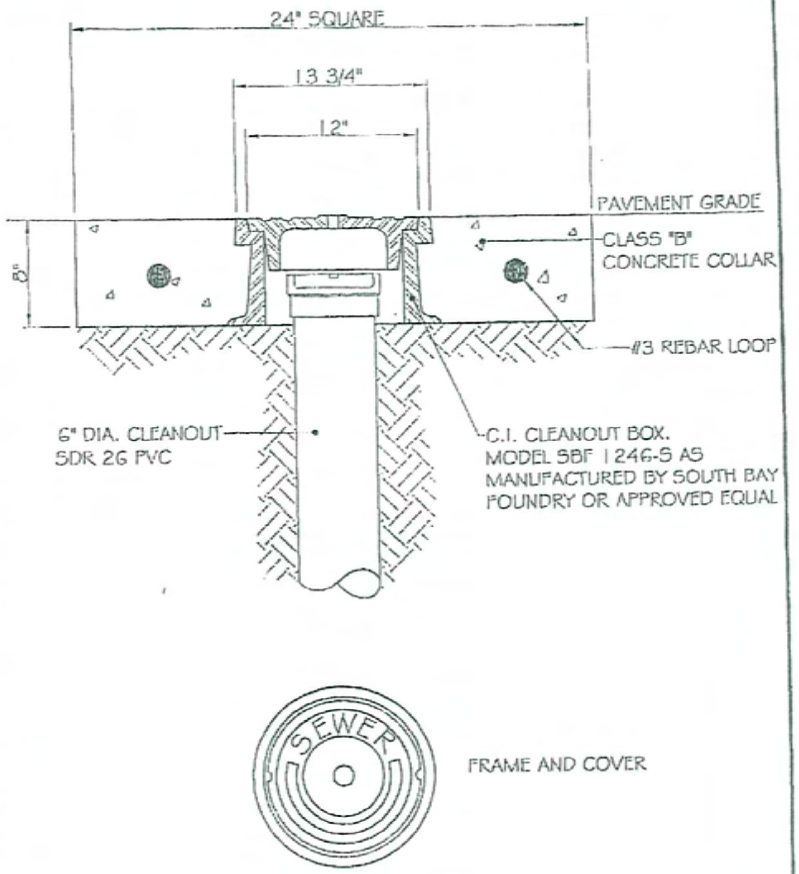
PIPE SIZE	TRENCH WIDTH	"Y"
6"	24"	4"
8"	24"	4"
10"	24"	4"
12"	30"	5"

COUNTY OF HAWAII ENVIRONMENTAL MANAGEMENT WASTE WATER DIVISION	TRENCH DETAIL SCALE: 1"=1'-0" MARCH 2003	STANDARD DETAILS WW-1



NOTE:
1. SEE SEWER CONSTRUCTION PLANS FOR LENGTH AND ELEVATION OF LATERAL.

COUNTY OF HAWAII ENVIRONMENTAL MANAGEMENT WASTE WATER DIVISION	TYPICAL LATERAL AT MAIN LINE SCALE: 3/4"=1'-0" DECEMBER 2002	STANDARD DETAILS WW-2



FRAME AND COVER

COUNTY OF HAWAII ENVIRONMENTAL MANAGEMENT WASTE WATER DIVISION	TRAFFIC RATED FRAME AND COVER SCALE: 1 1/2"=1'-0" APRIL 26, 2004	STANDARD DETAILS WW-4

Harry Kim
Mayor

Bobby Jean Leithead-Todd
Director

Nelson Ho
Deputy Director

County of Hawai'i
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT
25 Aupuni Street • Hilo, Hawai'i 96720-4252
(808) 961-8083 • Fax (808) 961-8086

September 14, 2007

SOLID WASTE MANAGEMENT PLAN
Guidelines

INTENT AND PURPOSE

This is to establish guidelines for reviewing solid waste management plans, for which special conditions are placed on developments. The solid waste management plan will be used to: (1) encourage recycling and recycling programs. (2) predict the waste generated by the proposed development to anticipate the loading on County transfer stations, landfills and recycling facilities, and (3) predict the additional traffic being generated because of waste and recycling transfers.

REPORT

The consultant's report will contain the following:

1. Description of the project and the potential waste it may be generating: i.e. analysis of anticipated waste volume and composition. This includes waste generated during the construction and operational phases. Greenwastes will be included in this report for both construction grubbing and future operational landscape maintenance.

2. Description and location of the possible sites for waste disposal or recycling. We will not allow the use of the County transfer stations for any commercial development; commercial development as defined under the policies of the Department of Environmental Management Solid Waste Division.

3. Since the Department of Environmental Management promotes recycling, indicate onsite source separation facilities by waste stream; i.e. source separation bins of glass, metal, plastic, cardboard, aluminum, etc. Provide ample and equal space for rubbish and recycling.

4. Identification of the proposed disposal site and transportation methods for the various components of the waste disposal and recycling system, including the number of truck traffic and the route that truck will be using to transport the waste and recycled materials.

5. The report will include any impacts to County waste and recycling facilities, and the appropriate mitigation measures. All recommendations and mitigation measures will be addressed.

6. Description of the waste reduction component that analyzes techniques to be employed to achieve a reduction goal.

7. Analysis will be based on the highest potential use or zoning of the development.

REQUIREMENTS AND CONDITIONS

1. A solid waste management plan will be done for all commercial developments, as defined under the policies of the Department of Environmental Management, Solid Waste Division.

2. We will require the developer to provide or resolve all recommendations and mitigation measures as outlined in the report; besides any conditions placed on the applicant by the Department of Environmental Management.

3. A licensed environmental or civil engineer will draft and certify the solid waste management plan.

If you have need additional information, please contact Michael Dworsky, P.E., Solid Waste Division Chief at 808-961-8515.

CONCUR:

B.J. Leithead-Todd

Bobby Jean Leithead-Todd
DIRECTOR

10/13/03
Revised 09/14/07

Harry Kim
Mayor

Christopher J. Yuen
Director

Brad Kurokawa, ASLA
LEED® AP
Deputy Director

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224
(808) 961-8288 • FAX (808) 961-8742

January 4, 2008

Mr. Michael S. Nishimura, Project Manager
M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, HI 96813

Dear Mr. Nishimura:

Subject: **Environmental Assessment (EA) Pre-Consultation**
Project: **County of Hawaii Fire Administration Support Complex**
Tax Map Key: **(3) 2-4-001: por. 168**

This is in response to your letter dated December 17, 2007, in which you requested consultation on the proposed development.

The subject property is located in the State Land Use (SLU) Agriculture District. The County zoning designation for the property is A-1a (Agricultural District, minimum building site of 1 acre). However, the property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawaii (ALISH). Moreover, Hawaii County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use.

A portion of the property appears to be within the FEMA flood zone. Contact the County of Hawaii, Department of Public Works, Engineering Division at (808) 961-8327 to verify if the proposed structure(s) will be located within the flood zone.

Because of the property's proximity to residential development, please address in the Environmental Assessment proposed mitigation of light and noise pollution, particularly from the open training area.

Please provide this office with a copy of the draft EA upon its publication. Should you have questions, please contact Ron Whitmore of my staff at 961-8288, extension 250.

Sincerely,

CHRISTOPHER J. YUEN
Planning Director

RW:cd
P:\wpwin60\RWhitmore\EA-ENV\081 Fire Admin 2-4-1-168 Pre-cons.doc

cc: David Yamamoto, Department of Public Works-Building Division

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
ACTING DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI

IN REPLY REFER TO

STP 8.2737

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

January 7, 2008

Mr. Michael S. Nishimura
Project Manager
M & E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813

Dear Mr. Nishimura:

Subject: Hawaii Fire Administration Support Complex
Early Consultation
TMK: 2-4-001: por. 168

The proposal to develop the first phase of the Administration Support Complex (Fire Administration Building, Emergency Dispatch Building, Fire Preparation and Training Building, parking, open training area, and court yard area) is not anticipated to significantly impact any State transportation facilities.

However, the Draft Environmental Assessment (Draft EA) should include a traffic assessment to evaluate and recommend any traffic mitigation measures or roadway improvements that may be needed with the full buildout of the master planned development. Copies of the Draft EA should be provided to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawaii District Office in Hilo for their review and comments.

We appreciate the opportunity to provide comments.

Very truly yours,

for BRENNON T. MORIOKA, PH.D., P.E.
Acting Director of Transportation

c: Bruce McClure, Hawaii Department of Public Works
Christopher Yuen, Hawaii Department of Planning
Darryl Oliveira, Hilo Fire Department

Harry Kim
Mayor

Darryl J. Oliveira
Fire Chief

Glen P.I. Honda
Deputy Fire Chief

County of Hawai'i
HAWAI'I FIRE DEPARTMENT
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

January 10, 2008

Mr. Michael S. Nishimura
Metcalf & Eddy Pacific, Inc.
841 Bishop Street
Suite 1900
Honolulu, Hawaii 96813

SUBJECT: Environmental Assessment
Hawaii Fire Dept Administration Support Complex
TMK: (3) 2-4-001:por. 168.

We have no comments to offer at this time in reference to the above-mentioned environmental assessment.

DARRYL OLIVEIRA
Fire Chief

DJO:lpc

Hawai'i County is an Equal Opportunity Provider and Employer

LINDA LINGLE

CHIYOME L. FUKINO, M.D.

STATE OF HAWAII
DEPARTMENT OF HEALTH
P.O. BOX 916
HILO, HAWAII 96721-0916

January 10, 2008

Mr. Michael S. Nishimura
Project Manager
M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813

Dear Mr. Nishimura:

SUBJECT: Additional Comments to Request for Review of Proposed County of Hawaii Fire Administration Support Complex
TMK: (3) 2-4-001:por. 168

There is no record of a radiation incident on the proposed site.

The Hazard Evaluation and Emergency Response (HEER) office does not have records of any investigation or cleanup activities at the proposed site. This property was former agricultural land in sugar cane production, and lands formerly used for sugar cane production are now being developed into communities where residential homes, schools, and commercial businesses are being constructed. Chemicals associated with the sugar cane industry persist in soil today, and may be a threat to public health and the environment. Elevated arsenic levels were discovered in soil at former sugar cane production areas on the islands. The HEER office has identified former sugar cane production areas for assessment throughout the state, and plans to work with property owners to conduct environmental assessments to identify and address elevated soil arsenic levels prior to finalizing development plans for the properties.

Sincerely,

Newton Inouye
Acting District Environmental Health
Program Chief

United States Department of the Interior

FISH AND WILDLIFE SERVICE
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawaii 96850

In Reply Refer To:
2008-TA-0095

JAN 18 2008

RECEIVED
JAN 21 2008
M & E PACIFIC, INC.

Mr. Michael L. Nishimura
Project Manager
M & E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813

Subject: Preparation of an Environmental Assessment for Proposed County of Hawaii Fire Administration Support Complex in Hilo, Hawaii [TMK: (3) 2-4-001 (Por.) 168]

Dear Mr. Nishimura:

Thank you for your letter received on December 18, 2007, requesting information regarding potential impacts to threatened and endangered species from the above referenced project. The first phase of the proposed project is to construct a County of Hawaii Fire Administration Support Complex in Hilo that will include a Fire Administration Building, an Emergency Dispatch Building, a Fire Preparation and Training Building, parking, open training area and a courtyard area. Land cover information indicates the proposed project site is vegetated and is adjacent to a developed residential area on the outskirts of Hilo.

Based on the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (*Lasiurus cinereus semotus*) and Hawaiian hawk (*Buteo solitarius*) occur in the project vicinity. In addition, the threatened Newell's shearwater (*Puffinus auricularis newelli*) and endangered Hawaiian petrel (*Pterodroma phaeopygia sandwichensis*) (collectively referred to as seabirds) are known to traverse the project site. We recommend you address potential project impacts to these listed species and include measures to minimize adverse impacts in your environmental review document. The following recommendations are provided to assist you in your plan development:

- Information about Hawaiian hoary bat use of the project area is incomplete. Bat surveys could be conducted in areas where cutting or removal of trees is proposed. If Hawaiian hoary bats are found in the project area, you should contact our office for additional information about how to address potential impacts to this species. Because bat pups are found in nursery trees during the April through August breeding season, it is particularly

important to avoid disturbance to trees during this period in areas where bats occur. Because bats can be harmed by barbed wire fences, their use should be minimized.

- Where Hawaiian hawks occur, brush and tree clearing during the March through September breeding season may result in impacts to hawk nests. If biological surveys indicate the presence of nesting hawks in an area where March through September vegetation clearing is proposed, please contact our office for additional information about how to address potential impacts to this species.

- Potential impacts to seabirds could be minimized by shielding outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. Because communication towers may pose a flight hazard to seabirds, please contact our office for further assistance, if any towers will be constructed in association with this project.

To the best of our knowledge, no other federally listed or proposed threatened or endangered species or candidate species, or proposed or designated critical habitat occur within the proposed project footprint. We hope this information assists you in drafting the Environmental Assessment. If you have questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist, Consultation and Technical Assistance Program (phone: 808-792-9431; fax: 808-792-9581).

Sincerely,

for Patrick Leonard
Field Supervisor

cc:
Scott Fretz, Hawaii Department of Land and Natural Resources

BUILDING DIVISION – DPW

COUNTY OF HAWAI'I – 101 Pauahi Street, Suite 7 – Hilo, Hawai'i 96720
Hilo Office (808) 961-8331 • Fax (808) 961-8410 Kona Office (808) 327-3520 • Fax (808) 327-3509

February 1, 2008

Mr. Harold Y. Inouye, AIA
Senior Vice President
Anbe Aruga & Ishizu Architects, Inc
1441 Kapiolani Boulevard, Suite 206
Honolulu, Hawaii 96814

Re: Fire Administration Support Complex

We have following comments to draft Environmental Assessment dated January 2008:

1. Page 1: Proposing Agency, delete Building Division, Contact David Yamamoto, Project Manager.
2. Page 2: phase 1 will include construction of Fire Administration and Emergency Dispatch. Construction of remaining facilities are future phases.
3. Page 2: confirm 90-feet high radio tower required.
4. 3.1 paragraph 3, suggest "dispersed" in place of "spread-out"
5. 3.1 paragraph 4, fragmented.
6. 3.1 paragraph 5, This environmental assessment represents the initial and future phases of the administration support complex development.
7. 3.2.2 paragraph 4, This environmental assessment will determine the impacts of the initial and future phases of the project.
8. Figure 3.1, include proposed subdivision
9. Figure 3.2, include proposed subdivision
10. Figure 3.3, radio tower should be located adjacent to radio room to minimize cable length. Also, proposed location highly visible and not appealing.
11. Figure 3.3, Fire Station location at rear of site does not necessarily support quick egress objective.

12. 3.3, budget for initial phase currently $14,600,000

13. 3.5.2, is this an alternative? Fire (Desmond) to provide order of priority for all facilities.

14. Section 3: include discussion on proposed subdivision

15. Figure 5.5, include proposed subdivision

16. 5.1.5, typically the agricultural capability subclass rating is described.

17. 5.1.8.3 paragraph 2, the lava hazard to the site is posed by Mauna Loa and is located on its northeast slope

18. 5.4, include description from County General Plan Land Use Pattern Allocation Guide Map (LUPAG), i.e., "important agricultural land"

19. Figure 5.5, include proposed subdivision

20. Figure 5.6, include proposed subdivision

21. Figure 5.7, include proposed subdivision

22. Section 5, typically "scenic and open space resources" are discussed.

Draft EA to be forwarded to Fire Administration for comment.

Should there be any questions, I may be contacted at 961-8466 or email dyamamoto@co.hawaii.hi.us

David Yamamoto

Nishimura, Michael

From: Wery, Desmond [dwery@co.hawaii.hi.us]
Sent: Tuesday, February 12, 2008 9:29 AM
To: Nishimura, Michael
Cc: Yamamoto, David; harold.inouye@aai-architects.com; Oliveira, Darryl
Subject: EA comment

Good morning Mike. I understand from a past phone call from Justin that comments regarding the EA for the Fire Administration project should be forwarded to you. I've attached David Yamamoto's previous submittal of his comments. Item #13 of his comments references the order of priority for the entire complex that we anticipate building out. After discussion with the fire Chief, the following order of priority is being provided:

1) Emergency Dispatch
2) Fire Administration Building
3) Fire Preparation & Training
4) Warehouse
5) Covered Training
6) Museum
7) Dormitory Facility
8) Fire Station

The addition of the dormitory facility was necessitated by eliminating the dormitory facilities from the Emergency Dispatch building, but we hope to build this as a future attachment to the communications building.

Thank you,

Desmond Wery
CIP Manager
Hawaii Fire Department

DRAFT EA COMMENTS RECEIVED

THIS PAGE INTENTIONALLY LEFT BLANK

DRAFT ENVIRONMENTAL ASSESSMENT RECIPIENTS

State of Hawai'i
Department of Business, Economic Development and Tourism (DBEDT), Office of Planning
Department of Health (DOH), Environmental Planning Office
Department of Land and Natural Resources (DLNR), Commission on Water Resource Management (CWRM)
Department of Land and Natural Resources, Division of Aquatic Resources (DAR)
Department of Land and Natural Resources, Division of Forestry & Wildlife (DFW)
Department of Land and Natural Resources, Engineering Division (ED)
Department of Land and Natural Resources, Historic Preservation Division (SHPD)
Department of Land and Natural Resources, Land Division (LD)—Hawai'i District
Department of Transportation (SDOT)
Department of Transportation—Hawai'i District Office
Hilo Public Library
Office of Hawaiian Affairs (OHA)
State Office of Environmental Quality Control (OEQC)

County of Hawai'i
Department of Parks and Recreation (DPR)
Department of Public Works (DPW)
Department of Water Supply (DWS)
Fire Department
Police Department
Planning Department

Community
Anbe, Aruga & Ishizu Architects, Inc. (AAI)

THIS PAGE INTENTIONALLY LEFT BLANK

Harry Kim
Mayor

Darryl J. Oliveira
Fire Chief

Glen P. I. Honda
Deputy Fire Chief

County of Hawai'i
FIRE DEPARTMENT
25 Aupuni Street • Suite 103 • Hilo, Hawai'i 96720
(808) 981-8394 • Fax (808) 981-2037

March 25, 2008

Mr. Mike S. Nishimura
M&E Pacific, Inc.
Davies Pacific Center
841 Bishop Street, Suite 1900
Honolulu, HI 96813

RE: DRAFT ENVIRONMENTAL ASSESSMENT
COUNTY OF HAWAII, DEPARTMENT OF PUBLIC WORKS
FIRE DEPARTMENT SUPPORT COMPLEX
HILO, HAWAII
TMK: (3)2-4-001:168 (PORTION)

Fire apparatus access roads shall be in accordance with UFC Section 10.207:

"**Fire Apparatus Access Roads**

"**Sec. 10.207.** (a) **General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.

"(b) **Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.

"**EXCEPTIONS:** 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

"(c) **Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.

"(d) **Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.

"**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.

"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.

"(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)

"(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)

"(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.

"(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus.

"(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%)

"(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times.

"(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."

Water supply shall be in accordance with UFC Section 10.301:

"(c) **Water Supply.** An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county water requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow.

"Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable of providing the required fire flow.

"The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207."

DARRYL OLIVEIRA
Fire Chief

JP:lk

DEPARTMENT OF PUBLIC WORKS
COUNTY OF HAWAII
HILO, HAWAII

DATE: April 1, 2008

Memorandum

TO: David Yamamoto, Building Division

FROM: Kelly Gomes, Engineering Division

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT
Fire Department Support Complex
Tax Map Key: 2-4-01: 168 (portion)

We have reviewed the subject assessment and offer the following comments for your consideration.

All development-generated runoff shall be disposed of on site. A drainage study shall be prepared and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.

A portion of subject parcel is located within Flood Zone A as designated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Flood Zone A is the Special Flood Hazard Area inundated by the 100-year flood where base flood elevations have not been determined.

Any construction within the designated FEMA flood zone shall comply with the requirements of Chapter 27, Floodplain Management, of the Hawaii County Code.

All earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawaii County Code.

The Traffic Division has reviewed the *Traffic Impact Analysis Report* within the subject assessment and agrees with its conclusions.

Harry Kim
Mayor

County of Hawaii
PLANNING DEPARTMENT
101 Pauahi Street, Suite 3 • Hilo, Hawaii 96720-4224
(808) 961-8288 • FAX (808) 961-8742

Christopher J. Yuen
Director

Brad Kurokawa, ASLA
LEED® AP
Deputy Director

RECEIVED
M & E PACIFIC, INC.

April 2, 2008

Mr. Michael S. Nishimura, Project Manager
M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, HI 96813

Dear Mr. Nishimura:

Subject: Draft Environmental Assessment (EA)
Project: County of Hawaii Fire Administration Support Complex
Tax Map Key: (3) 2-4-001: por. 168

This is to acknowledge receipt of the Draft Environmental Assessment for the above-referenced project

On March 7, 2008, Final Subdivision Approval No. SUB-08-000713 was granted to subdivide Tax Map Key 2-4-001:168 into Lots 1, 2, 3, and Road. An affordable, elderly rental housing project has been proposed for Lot 3, which is makai of the Fire Administrative Support Complex proposed for Lot 2. The Environmental Assessment should address the potential impacts of the Fire Administrative Support Complex on a development in Lot 3.

Otherwise, we have no additional comments to offer regarding the Draft EA.

If you have questions, please feel free to contact Ron Whitmore of this office at 961-8288, Extension 250.

Sincerely,

CHRISTOPHER J. YUEN
Planning Department

RW:cs

Hawai'i County is an Equal Opportunity Provider and Employer.

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION
POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
M & E PACIFIC, INC.

April 3, 2008

M & E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813

Attention: Mr. Mike Nishimura

Gentlemen:

Subject: Draft Environmental Assessment for County of Hawaii, Department of Public Works, Fire Department Support Complex, Hilo, Hawaii, Tax Map Key: (3) 2-4-1:168

Thank you for the opportunity to review and comment on the subject matter. The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.

Other than the comments from Engineering Division, Division of Aquatic Resources, Commission on Water Resource Management, Division of Forestry & Wildlife, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

for Morris M. Atta
Administrator

LINDA LINGLE

LAURA H. THIELEN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2008 MAR 12 A 8:31

March 5, 2008

MEMORANDUM

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
_Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
_Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
x Land Division – Hawaii District

FROM: for Morris M. Atta *Charlene*
SUBJECT: Draft Environmental Assessment for Fire Department Support Complex
LOCATION: Hilo, Hawaii, TMK: (3) 2-4-1:portion 168
APPLICANT: M&E Pacific, Inc. on behalf of the County of Hawaii, Department of Public Works

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by April 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]
Date: 3/7/08

LINDA LINGLE

LAURA H. THIELEN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

RECEIVED
LAND DIVISION
2008 MAR 17 A 10:1?

AQUATIC RESOURCES 1461

DIRECTOR	
COMM...	
...	
AQ HLE	
PLANNER	
STAFF SVCS	
...	
STATISTICS	
... AID	
EDUCATION	
SECRETARY	
OFFICE SVCS	
TECH ASST	✓

March 5, 2008

MEMORANDUM

RECEIVED MAR 7 2008 AQUATIC RESOURCES

TO: **DLNR Agencies:**
x Div. of Aquatic Resources
_Div. of Boating & Ocean Recreation
x Engineering Division
x Div. of Forestry & Wildlife
_Div. of State Parks
x Commission on Water Resource Management
_Office of Conservation & Coastal Lands
x Land Division – Hawaii District

FROM: for Morris M. Atta *Charlene*
SUBJECT: Draft Environmental Assessment for Fire Department Support Complex
LOCATION: Hilo, Hawaii, TMK: (3) 2-4-1:portion 168
APPLICANT: M&E Pacific, Inc. on behalf of the County of Hawaii, Department of Public Works

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by April 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
(✓) We have no comments.
( ) Comments are attached.

Signed: [signature]
Date: 13 MAR 2008

LINDA LINGLE

LAURA H. THIELEN

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 5, 2008

MEMORANDUM

TO: DLNR Agencies:
- x Div. of Aquatic Resources
- _ Div. of Boating & Ocean Recreation
- x Engineering Division
- x Div. of Forestry & Wildlife
- _ Div. of State Parks
- x Commission on Water Resource Management
- _ Office of Conservation & Coastal Lands
- x Land Division – Hawaii District

FROM: for Morris M. Atta
SUBJECT: Draft Environmental Assessment for Fire Department Support Complex
LOCATION: Hilo, Hawaii, TMK: (3) 2-4-1:portion 168
APPLICANT: M&E Pacific, Inc. on behalf of the County of Hawaii, Department of Public Works

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by April 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

(X) We have no objections.
( ) We have no comments.
( ) Comments are attached.

Signed:
Date:

PAUL J. CONRY, ADMINISTRATOR
DIVISION OF FORESTRY AND WILDLIFE
APR - 7 2008

LINDA LINGLE

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
LAND DIVISION

POST OFFICE BOX 621
HONOLULU, HAWAII 96809

March 5, 2008

MEMORANDUM

TO: DLNR Agencies:
- x Div. of Aquatic Resources
- _ Div. of Boating & Ocean Recreation
- x Engineering Division
- x Div. of Forestry & Wildlife
- _ Div. of State Parks
- x Commission on Water Resource Management
- _ Office of Conservation & Coastal Lands
- x Land Division – Hawaii District

FROM: for Morris M. Atta
SUBJECT: Draft Environmental Assessment for Fire Department Support Complex
LOCATION: Hilo, Hawaii, TMK: (3) 2-4-1:portion 168
APPLICANT: M&E Pacific, Inc. on behalf of the County of Hawaii, Department of Public Works

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by April 1, 2008.

If no response is received by this date, we will assume your agency has no comments. If you have any questions about this request, please contact my office at 587-0433. Thank you.

Attachments

( ) We have no objections.
( ) We have no comments.
(✓) Comments are attached.

Signed:
Date: 3/28/08

DEPARTMENT OF LAND AND NATURAL RESOURCES
ENGINEERING DIVISION

LD/MorrisAtta
REF: DEAforFireDepartmentSupportComplex
Hawaii,003

COMMENTS

(X) We confirm that part of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone A. The National Flood Insurance Program regulates developments within A as indicated in bold letters below.

(X) Please take note that the remainder of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.

( ) Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is ___.

(X) Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken. If there are any questions, please contact the State NFIP Coordinator, Ms. Carol Tyau-Beam, of the Department of Land and Natural Resources, Engineering Division at (808) 587-0267.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards. If there are questions regarding the local flood ordinances, please contact the applicable County NFIP Coordinators below:

( ) Mr. Robert Sumimoto at (808) 523-4254 or Mr. Mario Siu Li at (808) 523-4247 of the City and County of Honolulu, Department of Planning and Permitting.

(X) Mr. Kelly Gomes at (808) 961-8327 (Hilo) or Mr. Kiran Emler at (808) 327-3530 (Kona) of the County of Hawaii, Department of Public Works.

( ) Mr. Francis Cerizo at (808) 270-7771 of the County of Maui, Department of Planning.

( ) Mr. Mario Antonio at (808) 241-6620 of the County of Kauai, Department of Public Works.

( ) The applicant should include project water demands and infrastructure required to meet water demands. Please note that the implementation of any State-sponsored projects requiring water service from the Honolulu Board of Water Supply system must first obtain water allocation credits from the Engineering Division before it can receive a building permit and/or water meter.

( ) The applicant should provide the water demands and calculations to the Engineering Division so it can be included in the State Water Projects Plan Update.

( ) Additional Comments: _____

( ) Other: _____

Should you have any questions, please call Mr. Dennis Imada of the Planning Branch at 587-0257.

Signed
ERIC T. HIRANO, CHIEF ENGINEER

Date 3/28/08

DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI'I
345 KEKŪANAŌ'A STREET, SUITE 20 • HILO, HAWAI'I 96720
TELEPHONE (808) 961-8050 • FAX (808) 961-8657

April 8, 2008

RECEIVED
APR 10
M & E PACIFIC, INC.

Mr. Mike S. Nishimura
M & E Pacific, Inc.
Davies Pacific Center
841 Bishop Street, Suite 1900
Honolulu, HI 96813

DRAFT ENVIRONMENTAL ASSESSMENT
FIRE ADMINISTRATION SUPPORT COMPLEX
TAX MAP KEY 2-4-001:168 (PORTION)

We have reviewed the subject Draft Environmental Assessment and have the following comments.

Water can be made available from the existing 12-inch waterline within Mohouli Street, fronting the proposed project site. Please be informed that our records do not show that there is an existing service lateral installed at the proposed project site. There is an existing pressure reducing station and valve box located near the project site, which may have been mistaken for a service lateral and meter box.

Prior to issuing a water commitment for the proposed project, the Department would request estimated maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for review and approval. After review of the calculations, the Department will determine the water commitment deposit amount, facilities charges due, and any water system improvements required for final approval.

Please be informed that the existing 12-inch waterline fronting the project site is adequate to provide the required 2,000 gallons per minute flow for fire protection, as per the Department's Water System Standards.

Please also be informed that any meter(s) serving the proposed project will require the installation of a reduced pressure type backflow prevention assembly within five feet of the meter on private property. The Department must inspect and approve the installation before water service can be activated.

Should there be any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at 961-8070, extension 255.

Sincerely yours,

Milton D. Pavao, P.E.
Manager

FM:dfg

copy - State of Hawai'i, Office of Environmental Quality Control
County of Hawai'i, Department of Public Works, Building Division

... Water brings progress...

LINDA LINGLE

LAURA H. THIELEN

RUSSELL Y. TSUJI

KEN C. KAWAHARA

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

April 14, 2008

LOG NO: 2008.0830
DOC NO: 0804TS08
Archaeology

Mike S. Nishimura
M&E Pacific, Inc.
Davies Pacific Center
841 Bishop Street, Suite 1900
Honolulu, HI 96813

RECEIVED
M & E PACIFIC, INC.

Dear Mr. Nishimura:

SUBJECT: Chapter 6E-42 Historic Preservation Review –
Draft EA for Fire Department Support Complex
Waiakea Ahupua'a, South Hilo District, Island of Hawai'i
TMK: (3) 2-4-001:168 (por.)

Thank you for the opportunity to comment on the aforementioned project, which we received on March 04, 2008, we apologize for the delay in our response.

We have reviewed the Draft Environmental Assessment prepared by M&E Pacific, Inc., for the County of Hawai'i. We appreciate the attention given in the document to consultation with Native Hawaiian groups and individuals in the community to be included in the Cultural Impact Assessment. However, we are unable to determine that no historic properties will be affected by this project. There is a potential for the presence of unidentified archaeological and historical resources in this area of upper Hilo. These concerns are not addressed in the current DEA.

We recommend that an Archaeological Inventory Survey be prepared for the property, pursuant to Hawai'i Administrative Rules §13-275. A list of permitted archaeological consultants can be found on our website: http://hawaii.gov/dlnr/hpd/archcon.htm.

If you have any questions or concerns regarding this letter please contact Assistant Hawaii Island Archaeologist, Tim Scheffler at (808) 981-2979 or, timothy.e.scheffler@hawaii.gov.

Aloha,

Nancy McMahon, Acting Archaeology Branch Chief
State Historic Preservation Division

TS

PHONE (808) 594-1888

FAX (808) 594-1865

RECEIVED
M & E PACIFIC, INC.

STATE OF HAWAI'I
OFFICE OF HAWAIIAN AFFAIRS
711 KAPI'OLANI BOULEVARD, SUITE 500
HONOLULU, HAWAI'I 96813

HRD08/3441B

May 19, 2008

Mike Nishimura
M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813

RE: Request for comments on the Draft Environmental Assessment (DEA) for the proposed fire administration support complex, Hilo, Hawai'i, TMK: 2-4-001:168.

Aloha e Mike Nishimura.

The Office of Hawaiian Affairs (OHA) is in receipt of the above-mentioned letter dated March 03, 2008. OHA has reviewed the project and offers the following comments.

OHA understands that the applicant wishes to consolidate its existing facilities to provide more efficient and centralized service for project area users. We recognize that the County of Hawai'i Fire Department (HFD) provides needed and valuable service in the area and we appreciate that.

Although we do support the HFD, we are mandated to point out some of the potential adverse effects to our beneficiaries that may result from this proposal. We would also like to offer some suggestions to help create the best possible project as well, should it go forward.

OHA notes that the parcel is zoned as agricultural A-1 which requires that the greatest possible protection be given to these lands. (See Hawaii Revised Statutes (HRS) Section 205) There are a myriad of laws and legislation supporting a strong agricultural economic base and retention of these lands primarily in agricultural pursuits. (See HRS, Section 205, County General Plan Land Use Allocation Guide Map, mentioned on page 43 of the DEA; and the State Coastal Zone Management Act, among many other citations) OHA stresses that only accessory agribusiness activities which meet the above intent are to be permitted in this area.

OHA is aware that the project site is located near two streams and we appreciate that the applicant intends to use best management practices (BMPs) to prevent storm water discharges into State waters. We also agree with the assessment that monitoring of water quality may be necessary as well as monitoring of the BMPs to ensure that they are achieving the intended result. OHA is also pleased to see that the applicant is discussing runoff from the site in ways that will utilize that resource rather than treat it as a nuisance to be channeled off and discharged into the sea. Surface runoff generated by the facility should be stored or re-used for on site needs as part of a design concept attempting to reduce or eliminate any demands on the municipal storm drainage system. This would help the project to compliment State environmental standards and energy efficiency goals. (See, HRS Section 196-9)

OHA would also like to point out that the applicant should consider that by 2020, 20% of Hawai'i's electricity is to be from renewable sources.[1] Further, HRS Section 196-1 finds that:

> (1) The global demand for petroleum and its derivatives has caused severe economic hardships throughout the State and threatens to impair the public health, safety and welfare.
>
> The State of Hawaii, with its total dependence on imported fossil fuel, is particularly vulnerable to dislocations in the global energy market. This is an anomalous situation, as there are few places in the world so generously endowed with natural energy: geothermal, solar radiation, ocean temperature differential, wind, waves, and currents--all potential non-polluting power sources;
>
> (2) There is a real need for strategic comprehensive planning in the effort towards achieving full utilization of Hawaii's energy resource programs and the most effective allocation of energy resources throughout the State. Planning is necessary and desirable in order that the State may recognize and declare the major problems and opportunities in the field of energy resources.

As such, OHA recommends the use of photovoltaic and small wind harvesting electrical generation for peripheral uses such as parking lot lighting. Solar energy should also be incorporated into the building plans. During construction, OHA urges the use of recyclable materials: steel studs and structural members, and wood products from certified sustainable sources.

State standards and goals also reference the Leadership in Energy and Environmental Design (LEED) Green Building Rating System which is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.

[1] See Act 95, Session Laws of Hawai'i which, in 2004 set that new original renewable portfolio standard goal.

OHA notes that there were approximately 23 native plants found on the site and as such we recommend that they be incorporated into the landscaping design as much as possible. Additionally, OHA would also like to suggest that the project area be landscaped with drought tolerant native or indigenous species that are common to the area. Any invasive species should also be removed. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place. This would also help to reduce the amount of impervious surfaces in the project area, thereby reducing runoff as well. OHA also recommends tree and landscape planting to shade paved parking areas and provide shade and cooling to building elements and outdoor use areas.

OHA also points out that the project site has not been surveyed by an archeologist and that consultation with the State Historic Preservation Division is ongoing. (DEA, page 47) Due to this lack of information, OHA cannot fulfill our constitutionally mandated duties and comment on what is not known or presented in an environmental review document. We look forward to receiving more information regarding historical resources in the area, the potential for finding cultural deposits and the applicant's proposed plan regarding them.

Thank you for the opportunity to comment. If you have further questions, please contact Grant Arnold (808) 594-0263 or e-mail him at granta@oha.org.

'O wau iho nō me ka 'oia'i'o,

Clyde W. Nāmu'o
Administrator

C: OHA Hilo CRC Office

LINDA LINGLE
GOVERNOR

BRENNON T. MORIOKA
DIRECTOR

Deputy Directors
MICHAEL D. FORMBY
FRANCIS PAUL KEENO
BRIAN H. SEKIGUCHI
JIRO A. SUMADA

STATE OF HAWAII
DEPARTMENT OF TRANSPORTATION
869 PUNCHBOWL STREET
HONOLULU, HAWAII 96813-5097

IN REPLY REFER TO:

STP 8.3108

January 28, 2009

Mr. Mike Nishimura
M & E Pacific Inc.
Davies Pacific Center
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813

Dear Mr. Nishimura:

Subject: Fire Administration Support Complex (FASC), Hilo, Hawaii
Draft Environmental Assessment (DEA)

Thank you for requesting the Department of Transportation's (DOT) review of the subject project.

DOT understands that the purpose of the proposed project is to consolidate Hawaii Fire Department facilities into the Fire Administration Support Complex (FASC) which includes the following; Fire Administration Building, Emergency Dispatch Building, Fire Preparation and Training Building, parking, open training area and court yard area. Access to the project will be from Mohouli Street and Komohana Street, which are under County of Hawaii jurisdiction.

DOT does not anticipate any adverse, significant impacts to State transportation facilities at present. However, to ensure acceptable levels-of-service, the DOT Highways Division will monitor the cumulative traffic impacts to the Komohana Street and Puanaiko Street (State Route 2000) intersection from the various existing and planned development projects including the FASC. Should the cumulative impacts significantly alter traffic flows, DOT may request an updated traffic analysis. Please note that the traffic analysis used in the subject DEA is dated and that a more recent 2006 traffic count is available.

DOT appreciates the opportunity to provide comments. If there are any questions, please contact Mr. David Shimokawa of the Statewide Transportation Planning Office at (808) 587-2356.

Very truly yours,

BRENNON T. MORIOKA, PH.D., P.E.
Director of Transportation

RESPONSES TO COMMENTS

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AECOM

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Lawrence K. Mahuna, Police Chief
County of Hawai'i
Police Department
349 Kapi'olani Street
Hilo, Hawai'i 96720-3998

June 3, 2009

Dear Mr. Mahuna,

Subject: Draft Environmental Assessment (DEA) Response to Comment and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comment via letter dated December 20, 2007. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *Ensure adequate parking for staff as the plan calls for out Communications-Dispatch staff to be relocated to the Dispatch Building.*

Response 1: Parking requirements have been coordinated with the County of Hawai'i, Police Department and the attached conceptual site plan has been approved on 12/11/08. This comment is also presented in section 2.3.2 of the Draft Environmental Assessment and will be included in section 2.3.2 of the Final Environmental Assessment (FEA).

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

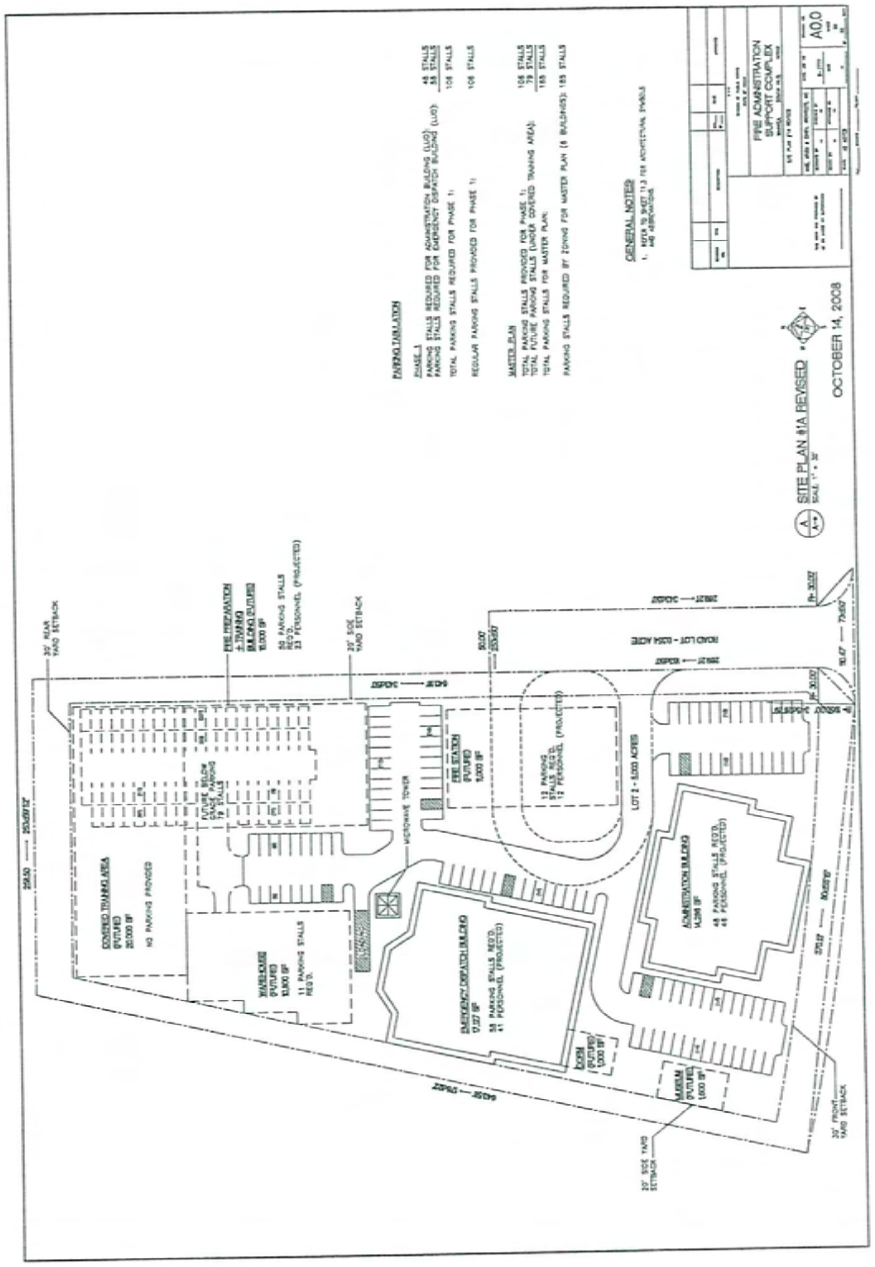
Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

Enclosures

cc: County of Hawai'i, Building Division



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Clyde W. Nāmu'o, Administrator
State of Hawai'i
Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawai'i 96813

June 3, 2009

Dear Mr. Nāmu'o,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated December 31, 2007. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *The Environmental Assessment ("EA"), in accordance with Chapter 343 of the Hawaii Revised Statu[t]es, should include a Cultural Impact Assessment ("CIA"). In accordance with the requirement of Act 50, Session Laws of Hawaii 2000, a CIA shall include information relating to the practices and beliefs of the Native Hawaiians who once inhabited the area(s), and it is recommended that community involvement be included in this assessment. We refer you to Lukela Ruddle, Cultural Resource Coordinator in OHA's Hilo office, who can be reached at (808) 920-6419, to further assist you in this project area.*

Response 1: This comment is presented in section 2.2.2 of the Draft Environmental Assessment and will be included in section 2.2.2 of the Final Environmental Assessment (FEA). Lukela Ruddle was contacted and a summary of the CIA is contained in section 5.2.2 of the DEA and will be included in section 5.2.2 of the FEA.

Comment 2: *OHA asks that, in accordance with Section 6E-46.6, HRS and Chapter 13-300, Hawaii Administrative Rules, if the project moves forward, and if any significant cultural deposits or human skeletal remains are encountered, work shall stop in the immediate vicinity and the State Historic Preservation Division (SHPD) shall be contacted. OHA would also like to be notified.*

Response 2: This requirement is presented in section 2.2.2 of the DEA and will be included in section 2.2.2 of the FEA. Additionally, a note summarizing this requirement will be included in the project design / construction plans.

Comment 3: *Upon completion of this vital segment to the project, OHA thanks you in advance and respectfully requests a hardcopy of an EA draft(s), if feasible, addressed to my attention. OHA hopes to be consulted on this matter in the future as more information becomes available and the project progresses.*

Response 3: A hardcopy of the DEA was sent to your attention at the OHA on March 3, 2008. Additionally, a hardcopy of the FEA will be sent to you upon its completion.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Bobby Jean Leithead-Todd, Director
County of Hawai'i
Department of Environmental Management
25 Aupuni Street
Hilo, Hawai'i 96720

June 3, 2009

Dear Ms. Leithead-Todd,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated January 4, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *Wastewater Division: The County wastewater collection system is located on Kahikini Street.*

Response 1: This information is presented in section 2.3.2 of the Draft Environmental Assessment and will be included in sections 2.3.2 and 5.2.3 of the Final Environmental Assessment (FEA). Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 2: *Wastewater Division: Please use the Wastewater Division Design Checklist as a guide should you decide to connect to our system.*

Response 2: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 3: *Wastewater Division: A meeting with our Wastewater Division staff is highly recommended prior to the start of planning and design phases.*

Response 3: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 4: *Wastewater Division: Please submit a wastewater master plan study for the entire parcel prior to the start of planning and design.*

Response 4: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 5: *Solid Waste Division: Commercial operations, State and Federal agencies, religious entities and non-profit organizations may not use transfer stations for disposal.*

Response 5: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 6: *Solid Waste Division: Aggregates and any other construction/demolition waste should be responsibly reused to its fullest extent.*

Response 6: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 7: *Solid Waste Division: Ample and equal room should be provided for rubbish and recycling.*

Response 7: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 8: *Solid Waste Division: Greenwaste may be transported to the green waste sites located at the Hilo transfer station, or other suitable diversion programs.*

Response 8: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 9: *Solid Waste Division: Construction and demolition waste is prohibited at all County of Hawai'i Transfer Stations.*

Response 9: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

Comment 10: *Solid Waste Division: Submit a Solid Waste Management Plan in accordance with the attached guidelines.*

Response 10: This requirement is presented in section 2.3.2 of the DEA and will be included in sections 2.3.2 and 5.2.3 of the FEA. Additionally, this information will be noted in and incorporated into the project design / construction plans.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Christopher J. Yuen, Planning Director
County of Hawai'i
Planning Department
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720-4224

June 3, 2009

Dear Mr. Yuen,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated January 4, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *The subject property is located in the State Land Use (SLU) Agriculture District. The County zoning designation for the property is A-1a (Agriculture District, minimum building site of 1 acre). However, the property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawaii (ALISH). Moreover, Hawaii County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use.*

Response 1: These SLU and County zoning districts are contained in section 1 of the Draft Environmental Assessment and will be included in section 1 of the Final Environmental Assessment (FEA). Additionally, this comment will be presented in section 2.3.2 of the FEA.

Comment 2: *A portion of the property appears to be within the FEMA flood zone. Contact the County of Hawaii, Department of Public Works, Engineering Division at (808) 961-8327 to verify if the proposed structure(s) will be located within the flood zone.*

Response 2: This comment and clarification that the site is within flood zones A and X will be located in section 2.3.2 of the FEA. Additionally, flood hazard discussion is contained in section 5.1.8.8 of the DEA and will be included in section 5.1.8.8 of the FEA.

Comment 3: *Because of the property's proximity to residential development, please address the Environmental Assessment proposed mitigation of light and noise pollution, particularly from the open training area.*

Response 3: This comment will be presented in section 2.3.2 of the FEA. The project design / construction plans will contain requirements for the facility to adhere and conform to federal, State and County light and noise requirements both during and after construction (operation of the facility).

Comment 4: *Please provide this office with a copy of the draft EA upon its publication.*

Response 4: The DEA was published in the State of Hawai'i, Department of Health, Office of Environmental Quality Control (OEQC), Saturday, March 8, 2008, issue of the Environmental Notice and a hardcopy of the DEA was sent to the County of Hawai'i, Planning Department on March 3, 2008.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Brennon T. Morioka, PH.D., P.E., Acting Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

June 3, 2009

Dear Mr. Morioka,

Subject: Draft Environmental Assessment (DEA) Response to Comment and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comment via letter dated January 7, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *The proposal to develop the first phase of the Administration Support Complex (Fire Administration Building, Emergency Dispatch Building, Fire Preparation and Training Building, parking, open training area, and court yard area) is not anticipated to significantly impact any State transportation facilities.*

However, the Draft Environmental Assessment (Draft EA) should include a traffic assessment to evaluate and recommend any traffic mitigation measures or roadway improvements that may be needed with the full buildout of the master planned development. Copies of the Draft EA should be provided to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawaii District Office in Hilo for their review and comments.

Response 1: This comment will be presented in section 2.2.2 of the Final Environmental Assessment (FEA). A TIAR was completed for the project and is included in the appendix of the Draft Environmental Assessment and will be included in the appendix of the FEA. The DEA was published in the State of Hawai'i, Department of Health, Office of Environmental Quality Control (OEQC), Saturday, March 8, 2008, issue of the Environmental Notice and hardcopies of the DEA were sent to the Highways Division Planning Branch in Honolulu and to the Highways Division Hawai'i District Office in Hilo for their review and comments on December 31, 2008.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Darryl Oliveira, Fire Chief
County of Hawai'i
Hawai'i Fire Department
25 Aupuni Street, Suite 103
Hilo, Hawai'i 96720

June 3, 2009

Dear Mr. Oliveira,

Subject: Draft Environmental Assessment (DEA) Response to Comment and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comment via letter dated January 10, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *We have no comments to offer at this time in reference to the above-mentioned environmental assessment.*

Response 1: This response is presented in section 2.3.2 of the Draft Environmental Assessment and will be included in section 2.3.2 of the Final Environmental Assessment (FEA).

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Newton Inouye, Acting District Environmental Health Program Chief
State of Hawai'i
Department of Health
PO Box 916
Hilo, Hawai'i 96721-0916

June 3, 2009

Dear Mr. Inouye,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated January 10, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *There is no record of a radiation incident on the proposed site.*

Response 1: This response will be presented in section 2.3.2 of the Final Environmental Assessment (FEA).

Comment 2: *The Hazard Evaluation and Emergency Response (HEER) office does not have records of any investigation or cleanup activities at the proposed site. This property was former agricultural land in sugar cane production, and lands formerly used for sugar cane production are now being developed into communities where residential homes, schools, and commercial businesses are being constructed. Chemicals associated with the sugar cane industry persist in soil today, and may be a threat to public health and the environment. Elevated arsenic levels were discovered in soil at former sugar cane production areas on the islands. The HEER office has identified former sugar cane production areas for assessment throughout the state, and plans to work with property owners to conduct environmental assessments to identify and address elevated soil arsenic levels prior to finalizing development plans for the properties.*

Response 2: This response will be presented in section 2.3.2 of the FEA.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Patrick Leonard, Field Supervisor
United States Department of the Interior
Fish and Wildlife Service
Pacific Islands Fish and Wildlife Office
300 Ala Moana Boulevard, Room 3-122, Box 50088
Honolulu, Hawai'i 96850

June 3, 2009

Dear Mr. Leonard,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated January 18, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *Based on the project information you provided and pertinent information in our files, including data compiled by the Hawaii Biodiversity and Mapping Program, and the Hawaii GAP Program, the endangered Hawaiian hoary bat (Lasiurus cinereus semotus) and Hawaiian hawk (Buteo solitarius) occur in the project vicinity. In addition, the threatened Newell's shearwater (Puffinus auricularis newelli) and endangered Hawaiian petrel (Pterodroma phaeopygia sandwichensis) (collectively referred to as seabirds) are known to traverse the project site. We recommend you address potential project impacts to these listed species and include measures to minimize adverse impacts in your environmental review document. The following recommendations are provided to assist you in your plan development:*

- *Information about Hawaiian hoary bat use of the project area is incomplete. Bat surveys could be conducted in areas where cutting or removal of trees is proposed. If Hawaiian hoary bats are found in the project area, you should contact our office for additional information about how to address potential impacts to this species. Because bat pups are found in nursery trees during the April through August breeding season, it is particularly important to avoid disturbance to trees during this period in areas where bats occur. Because bats can be harmed by barbed wire fences, their use should be minimized.*

Response 1: This comment will be presented in section 2.1.2 of the Final Environmental Assessment (FEA). Coordination was done with the US DOI FWS (Jeff Zimpfer and Megan Laut). A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey. As much as practicable, project design / construction plans will call for disturbance to trees be avoided from April through August. Additionally, barbed wire fences will not be used by the project and will not be included in the project design / construction plans.

Comment 2:

- *Where Hawaiian hawks occur, brush and tree clearing during the March through September breeding season may result in impacts to hawk nests. If biological surveys indicate the presence of nesting hawks in an area where March through September vegetation clearing is proposed, please contact our office for additional information about how to address potential impacts to this species.*

Response 2: This comment will be presented in section 2.1.2 of the FEA. Coordination was done with the US DOI FWS (Jeff Zimpfer). A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey. As much as practicable, project design / construction plans will call for vegetation (brush and tree) clearing to be avoided from March through September.

Comment 3:

- *Potential impacts to seabirds could be minimized by shielding outdoor lights in the project footprint throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. Because communication towers may pose a flight hazard to seabirds, please contact our office for further assistance, if any towers will be constructed in association with this project.*

Response 3: This comment will be presented in section 2.1.2 of the FEA. A Faunal Survey was conducted for the project and its report of findings will be included in the appendix of the FEA. Section 5.1.9 of the FEA will be revised to reflect findings of the Faunal Survey.

The design / construction plans will call incorporate these lighting usage and requirements as much as practicable. Outdoor lights in the project footprint will be shielded throughout the construction period and within the completed project area so the bulb can only be seen from below, by avoiding use of lights at night during the peak fallout period of September 15 through December 15, and by providing staff with information about seabird fallout. The project was further coordinated with the US DOI-FWS (Megan Laut) to determine the potential for and minimization of any adverse impacts of any proposed communication towers with that may pose a flight hazard to seabirds. The US DOI FWS has indicated that a bird survey in the area (near Hilo Harbor) has indicated a low passage rate of seabirds; thus, there is not a lot of concern for adverse impacts of the proposed tower on seabirds and their normal flight and migratory patterns, additionally since the project occurs in an urban location. The design of the microwave antenna tower will minimize its surface area and be in line with surrounding vegetation as much as practicable. The tower design will also conform to applicable County ordinances and guideline requirements / criteria for its proximity to the Hilo International Airport, as applicable. The County may consider coordinating a night-time, bird echo survey with the FWS later prior to construction of the microwave antenna tower.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Mr. David Yamamoto, Project Manager
County of Hawai'i
Department of Public Works—Building Division
101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720

February 24, 2009

Dear Mr. Yamamoto,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for Fire Administration Support Complex TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion]) Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comments via letter dated February 1, 2008. We would like to provide the following responses to your comments:

Comment 1: *We have following comments to draft Environmental Assessment dated January 2008:*

1. *Page 1: Proposing Agency, delete Building Division, Contact David Yamamoto, Project Manager.*

Response 1: Revision will be made to the Final Environmental Assessment (FEA).

Comment 2: 2. *Page 2: phase 1 will include construction of Fire Administration and Emergency Dispatch. Construction of remaining facilities are future phases.*

Response 2: Revision will be made to the FEA.

Comment 3: 3. *Page 2: confirm 90-feet high radio tower required.*

Response 3: Height will be removed since the need for a tower and its height will be determined through radio line-of-sight study currently on-going for the project. Mentioning of radio tower will be kept in case tower is required. Revision will be made to the FEA.

Comment 4: 4. *3.1 paragraph 3, suggest "dispersed" in place of "spread out".*

Response 4: Revision will be made to the FEA.

Comment 5: 5. *3.1 paragraph 4, fragmented.*

Response 5: Revision will be made to the FEA.

Comment 6: 6. *3.1 paragraph 5, This environmental assessment represents the initial and future phases of the administration support complex development.*

Response 6: Revision will be made to the FEA.

Comment 7: 7. *3.2.2 paragraph 4, This environmental assessment will determine the impacts of the initial and future phases of the project.*

Response 7: Revision will be made to the FEA.

Comment 8: 8. *Figure 3.1, include proposed subdivision*

Response 8: Revision will be made to the FEA.

Comment 9: 9. *Figure 3.2, include proposed subdivision*

Response 9: Revision will be made to the FEA.

Comment 10: 10. *Figure 3.3, radio tower should be located adjacent to radio room to minimize cable length. Also, proposed location highly visible and not appealing.*

Response 10: Figure will be revised to reflect approved conceptual site plan (12/11/08) and revision will be made to the FEA.

Comment 11: 11. *Figure 3.3, Fire Station location at rear of site does not necessarily support quick egress objective.*

Response 11: Figure will be revised to reflect approved conceptual site plan (12/11/08) and revision will be made to the FEA.

Comment 12: 12. *3.3, budget for initial phase currently $14,600,000*

Response 12: Revision will be made to the FEA.

Comment 13: 13. *3.5.2, is this an alternative? Fire (Desmond) to provide order of priority for all facilities.*

Response 13: The order of priority for the build-out of the entire complex was provided by the County HFD (2/12/08) and will be included in sections 2.3.2 and 3.5.2 of the FEA.

Comment 14: 14. *Section 3: include discussion on proposed subdivision*

Response 14: Revision will be made to the FEA.

Comment 15: 15. *Figure 5.5, include proposed subdivision*

Response 15: Revision will be made to the FEA.

Comment 16: *16. 5.1.5, typically the agricultural capability subclass rating is described.*

Response 16: Revision will be made to the FEA.

Comment 17: *17. 5.1.8.3 paragraph 2, the lava hazard to the site is posed by Mauna Loa and is located on its northeast slope*

Response 17: Revision will be made to the FEA.

Comment 18: *18. 5.4, include description from County General Plan Land Use Pattern Allocation Guide Map (LUPAG), i.e., "important agricultural land"*

Response 18: Revision will be made to the FEA.

Comment 19: *19. Figure 5.5, include proposed subdivision*

Response 19: Revision will be made to the FEA.

Comment 20: *20. Figure 5.6, include proposed subdivision*

Response 20: Revision will be made to the FEA.

Comment 21: *21. Figure 5.7, include proposed subdivision*

Response 21: Revision will be made to the FEA.

Comment 22: *22. Section 5, typically "scenic and open space resources" are discussed.*

Response 22: Revision will be made to the FEA.

Should you have any questions, please contact either Ming Ding or me at the telephone number below.

Thank you.

Yours sincerely,

Michael S. Nishimura, P.E.
Engineering, West Region
Mike.Nishimura@AECOM.Com

MSN:pi

cc: Harold Inouye, *Senior Vice President*—Anbe, Aruga & Ishizu, Architects, Inc.

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Desmond Wery, CIP Manager
County of Hawai'i
Hawai'i Fire Department
25 Aupuni Street, Suite 103
Hilo, Hawai'i 96720

June 3, 2009

Dear Mr. Wery,

Subject: Draft Environmental Assessment (DEA) Response to Comment and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the subject project and providing your comment via email on February 12, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *After discussion with the fire Chief, the following order of priority [for the build-out of the entire complex] is being provided:*

1) *Emergency Dispatch*
2) *Fire Administration Building*
3) *Fire Preparation & Training*
4) *Warehouse*
5) *Covered Training*
6) *Museum*
7) *Dormitory Facility*
8) *Fire Station*

The addition of the dormitory facility was necessitated by eliminating the dormitory facilities from the Emergency Dispatch building, but we hope to build this as a future attachment to the communications building.

Response 1: This order of priority for the build-out of the entire complex is included in sections 2.3.2 and 3.5.2 of the Final Environmental Assessment (FEA).

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Darryl Oliveira, Fire Chief
County of Hawai'i
Hawai'i Fire Department
25 Aupuni Street, Suite 103
Hilo, Hawai'i 96720

June 3, 2009

Dear Mr. Oliveira,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comments via letter dated March 25, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *Fire apparatus access roads shall be in accordance with UFC Section 10.207:*

*"**Fire Apparatus Access Roads***

*"**Sec. 10.207.** (a) **General.** Fire apparatus access roads shall be provided and maintained in accordance with the provisions of this section.*

*"(b) **Where Required.** Fire apparatus access roads shall be required for every building hereafter constructed when any portion of an exterior wall of the first story is located more than 150 feet from fire department vehicle access as measured by an unobstructed route around the exterior of the building.*

*"**EXCEPTIONS:** 1. When buildings are completely protected with an approved automatic fire sprinkler system, the provisions of this section may be modified.*

"2. When access roadways cannot be installed due to topography, waterways, nonnegotiable grades or other similar conditions, the chief may require additional fire protection as specified in Section 10.301 (b).

"3. When there are not more than two Group R, Division 3 or Group M Occupancies, the requirements of this section may be modified, provided, in the opinion of the chief, fire-fighting or rescue operations would not be impaired.

"More than one fire apparatus road may be required when it is determined by the chief that access by a single road may be impaired by vehicle congestion, condition of terrain, climatic conditions or other factors that could limit access.

"For high-piled combustible storage, see Section 81.109.

*"(c) **Width.** The unobstructed width of a fire apparatus access road shall meet the requirements of the appropriate county jurisdiction.*

*"(d) **Vertical Clearance.** Fire apparatus access roads shall have an unobstructed vertical clearance of not less than 13 feet 6 inches.*

*"**EXCEPTION:** Upon approval vertical clearance may be reduced, provided such reduction does not impair access by fire apparatus and approved signs are installed and maintained indicating the established vertical clearance.*

*"(e) **Permissible Modifications.** Vertical clearances or widths required by this section may be increased when, in the opinion of the chief, vertical clearances or widths are not adequate to provide fire apparatus access.*

*"(f) **Surface.** Fire apparatus access roads shall be designed and maintained to support the imposed loads of fire apparatus and shall be provided with a surface so as to provide all-weather driving capabilities." (20 tons)*

*"(g) **Turning Radius.** The turning radius of a fire apparatus access road shall be as approved by the chief." (45 feet)*

*"(h) **Turnarounds.** All dead-end fire apparatus access roads in excess of 150 feet in length shall be provided with approved provisions for the turning around of fire apparatus.*

*"(i) **Bridges.** When a bridge is required to be used as access under this section, it shall be constructed and maintained in accordance with the applicable sections of the Building Code and using designed live loading sufficient to carry the imposed loads of fire apparatus.*

*"(j) **Grade.** The gradient for a fire apparatus access road shall not exceed the maximum approved by the chief." (15%)*

*"(k) **Obstruction.** The required width of any fire apparatus access road shall not be obstructed in any manner, including parking of vehicles. Minimum required widths and clearances established under this section shall be maintained at all times.*

*"(l) **Signs.** When required by the fire chief, approved signs or other approved notices shall be provided and maintained for fire apparatus access roads to identify such roads and prohibit the obstruction thereof or both."*

Response 1: These requirements will be noted in sections 2.3.2 and 5.2.3 of the Final Environmental Assessment (FEA) and will be included in the design / construction plans for the project.

Comment 2: *Water supply shall be in accordance with UFC Section 10.301:*

*"(c) **Water Supply.** An approved water supply capable of supplying required fire flow for fire protection shall be provided to all premises upon which buildings or portions of buildings are hereafter constructed, in accordance with the respective county requirements. There shall be provided, when required by the chief, on-site fire hydrants and mains capable of supplying the required fire flow.*

"Water supply may consist of reservoirs, pressure tanks, elevated tanks, water mains or other fixed systems capable or providing the required fire flow.

"The location, number and type of fire hydrants connected to a water supply capable of delivering the required fire flow shall be protected as set forth by the respective county water requirements. All hydrants shall be accessible to the fire department apparatus by roadways meeting the requirements of Section 10.207."

Response 2: These requirements will be noted in sections 2.3.2 and 5.2.3 of the FEA and will be included in the design / construction plans for the project.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Kelly Gomes, Engineering Division
County of Hawai'i
Department of Public Works—Engineering Division
Aupuni Center, 101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720

June 3, 2009

Dear Mr. Gomes,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion]) Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comments via letter dated April 1, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *All development-generated runoff shall be disposed of on site. A drainage study shall be prepared and the recommended drainage system shall be constructed meeting the approval of the Department of Public Works.*

Response 1: These requirements will be noted in sections 2.3.2 and 5.1.7 of the Final Environmental Assessment (FEA) and will be included in the design / construction plans for the project.

Comment 2: *A portion of subject parcel is located within Flood Zone A as designated on the Flood Insurance Rate Map (FIRM) by the Federal Emergency Management Agency (FEMA). Flood Zone A is the Special Flood Hazard Area inundated by the 100-year flood where base flood elevations have not been determined.*

Response 2: This comment and clarification that the site is within flood zones A and X will be located in section 2.3.2 of the FEA. Additionally, flood hazard discussion is contained in section 5.1.8.8 of the Draft Environmental Assessment and will be included in section 5.1.8.8 of the FEA.

Comment 3: *Any construction within the designated FEMA flood zone shall comply with the requirements of Chapter 27, Floodplain Management, of the Hawaii County Code.*

Response 3: This requirement will be noted in sections 2.3.2 and 5.1.8.1 of the FEA and will be included in the design / construction plans for the project.

Comment 4: *All earthwork activity, including grading and grubbing, shall conform to Chapter 10, Erosion and Sedimentation Control, of the Hawaii County Code.*

Response 4: This requirement will be noted in sections 2.3.2 and 5.1.7 of the FEA and will be included in the design / construction plans for the project.

Comment 5: *The Traffic Division has reviewed the Traffic Impact Analysis Report within the subject assessment and agrees with its conclusions.*

Response 5: This comment will be noted in section 2.3.2 of the FEA. The Traffic Impact Analysis Report (TIAR) is included in the appendix of the DEA, and will be included in the appendix of the FEA.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Christopher J. Yuen, Planning Director
County of Hawai'i
Planning Department
101 Pauahi Street, Suite 3
Hilo, Hawai'i 96720-4224

June 3, 2009

Dear Mr. Yuen,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comment via letter dated April 2, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *On March 7, 2008, Final Subdivision Approval No. SUB-08-000713 was granted to subdivide Tax Map Key 2-4-001:168 into Lots 1, 2, 3, and Road. An affordable, elderly rental housing project has been proposed for Lot 3, which is makai of the Fire Administrative Support Complex proposed for Lot 2. The Environmental Assessment should address the potential impacts of the Fire Administrative Support Complex on a development in Lot 3.*

Otherwise, we have no additional comments to offer regarding the Draft EA.

Response 1: This clarification of revised TMK subdivision will be included in sections 2.3.2 and 3.2.2 of the Final Environmental Assessment (FEA). Potential impacts of the Fire Administration Support Complex on a development in Lot 3 will be discussed in section 5.1.1 of the FEA.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Morris M. Atta, Administrator
State of Hawai'i
Department of Land and Natural Resources
Land Division
Post Office Box 621
Honolulu, Hawai'i 96809

June 3, 2009

Dear Mr. Atta,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comments via letter dated April 3, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *The Department of Land and Natural Resources' (DLNR) Land Division distributed or made available a copy of your report pertaining to the subject matter to DLNR Divisions for their review and comment.*

Other than the comments from Engineering Division, Division of Aquatic Resources, Commission on Water Resource Management, Division of Forestry & Wildlife, the Department of Land and Natural Resources has no other comments to offer on the subject matter.

Response 1: This response will be noted in section 2.2.2 of the Final Environmental Assessment (FEA).

Comment 2: *We [State DLNR—Commission on Water Resource Management] have no comments.*

Response 2: This response will be noted in section 2.2.2 of the FEA.

Comment 3: *We [State DLNR—Division of Aquatic Resources] have no comments.*

Response 3: This response will be noted in section 2.2.2 of the FEA.

Comment 4: *We [State DLNR—Division of Forestry & Wildlife] have no objections.*

Response 4: This response will be noted in section 2.2.2 of the FEA.

Comment 5: *We [State DLNR—Engineering Division] confirm that part of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone A. The National Flood Insurance Program regulates developments within A as indicated in bold letters below.*

Please take note that the remainder of the project site, according to the Flood Insurance Rate Map (FIRM), is located in Flood Zone X. The National Flood Insurance Program does not have any regulations for developments within Zone X.

Please note that the project site must comply with the rules and regulations of the National Flood Insurance Program (NFIP) presented in Title 44 of the Code of Federal Regulations (44CFR), whenever development within a Special Flood Hazard Area is undertaken.

Please be advised that 44CFR indicates the minimum standards set forth by the NFIP. Your Community's local flood ordinance may prove to be more restrictive and thus take precedence over the minimum NFIP standards.

Response 5: These requirements will be noted in sections 2.2.2 and 5.1.8.1 of the FEA. Additionally, the project design / construction plans will contain these requirements. Any construction within the designated FEMA flood zone shall comply with the requirements of either Chapter 27, *Floodplain Management*, of the *Hawai'i County Code*, or 44CFR, whichever is more restrictive.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Milton D. Pavao, P.E., Manager
County of Hawai'i
Department of Water Supply
345 Kekūanaō'a Street, Suite 20
Hilo, Hawai'i 96720

June 3, 2009

Dear Mr. Pavao,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comments via letter dated April 8, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *Water can be made available from the existing 12-inch waterline within Mohouli Street, fronting the proposed project site. Please be informed that our records do not show that there is an existing service lateral installed at the proposed project site. There is an existing pressure reducing station and valve box located near the project site, which may have been mistaken for a service lateral and meter box.*

Response 1: This comment will be noted in section 2.3.2 of the Final Environmental Assessment (FEA) and revision will be made to section 5.2.3 of the FEA. Additionally, the project design / construction plans will contain the installation of a new water service lateral for the site that connects directly to the existing 12-inch waterline in Mohouli Street.

Comment 2: *Prior to issuing a water commitment for the proposed project, the Department would request estimated maximum daily water usage calculations prepared by a professional engineer licensed in the State of Hawai'i for review and approval. After review of the calculations, the Department will determine the water commitment deposit amount, facilities charges due, and any water system improvements required for final approval.*

Response 2: This requirement will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this requirement.

Comment 3: *Please be informed that the existing 12-inch waterline fronting the project site is adequate to provide the required 2,000 gallons per minute flow for fire protection, as per the Department's Water System Standards.*

Response 3: This information will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this information.

Comment 4: *Please also be informed that any meter(s) serving the proposed project will require the installation of a reduced pressure type backflow prevention assembly within five feet of the meter on private property. The Department must inspect and approve the installation before water service can be activated.*

Response 4: This requirement will be noted in sections 2.3.2 and 5.2.3 of the FEA. Additionally, the project design / construction plans will contain this requirement.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Nancy McMahon, Acting Archaeology Branch Chief
State of Hawai'i
Department of Land and Natural Resources
State Historic Preservation Division
601 Kamokila Boulevard, Room 555
Kapolei, Hawai'i 96707

June 3, 2009

Dear Mr. McMahon,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works, FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comment via letter dated April 14, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

Comment 1: *We have reviewed the Draft Environmental Assessment prepared by M&E Pacific, Inc., for the County of Hawai'i. We appreciate the attention given in the document to consultation with Native Hawaiian groups and individuals in the community to be included in the Cultural Impact Assessment. However, we are unable to determine that no historic properties will be affected by this project. There is a potential for the presence of unidentified archaeological and historical resources in this area of upper Hilo. These concerns are not addressed in the current DEA.*

We recommend that an Archaeological Inventory Survey be prepared for the property, pursuant to Hawai'i Administrative Rules §13-275.

Response 1: This comment will be noted in section 2.2.2 of the Final Environmental Assessment (FEA).

An Archaeological Assessment (since no archaeological sites were identified during the project, an assessment rather than an inventory survey [AIS] was completed since no sites were recorded [inventoried]) was completed for the project and submitted to the DLNR-SHPD for review and processing in December 2008. There were no historic properties or cultural resources on the project parcel. A copy of the Archaeological Assessment and State of Hawai'i, Department of Land and Natural Resources State, Historic Preservation Division determination letter of concurrence (dated February 28, 2009) will be included in the appendix of the FEA.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

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Clyde W. Nāmu'o, Administrator
State of Hawai'i
Office of Hawaiian Affairs
711 Kapi'olani Boulevard, Suite 500
Honolulu, Hawai'i 96813

June 3, 2009

Dear Mr. Nāmu'o,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comments via letter dated May 19, 2008. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following responses to your comments:

Comment 1: *OHA notes that the parcel is zoned as agricultural A-1 which requires that the greatest possible protection be given to these lands. (See Hawaii Revised Statutes (HRS) Section 205) There are a myriad of laws and legislation supporting a strong agricultural economic base and retention of these lands primarily in agricultural pursuits. (See HRS, Section 205, County General Plan Land Use Allocation Guide Map, mentioned on page 43 of the DEA; and the State Coastal Zone Management Act, among many other citations) OHA stresses that only accessory agribusiness activities which meet the above intent are to be permitted in this area.*

Response 1: This comment will be noted in section 2.2.2 of the Final Environmental Assessment (FEA). As discussed in section 5.4.1 of the DEA and FEA, the improvements proposed under this project will require the filing of a Special Permit due to the parcel being zoned as agricultural (A-1a: Agriculture District, minimum building site of 1 acre) by the County. The property is not prime or unique farmland and is not designated as Agricultural Lands of Importance to the State of Hawai'i (ALISH). Moreover, Hawai'i County Code Section 25-4-11 permits "public uses, structures and buildings" in any zoning district, provided that the Planning Director has issued plan approval for such use. The Special Permit will mitigate the inconsistency with the State Land Use "Agricultural" designation and the County General Plan Land Use Pattern Allocation Guide Map (LUPAG) designation "Important Agricultural Land." The improvement is consistent with the intended land uses under the County of Hawai'i General Plan "Medium Density Urban" designation.

The project site is not located within or in the vicinity of a designated Wilderness area, as determined from a review of the Bureau of Land Management, US Fish and Wildlife Service, USDA Forest Service, and the National Park Service Wilderness databases.

Comment 2: *OHA is aware that the project site is located near two streams and we appreciate that the applicant intends to use best management practices (BMPs) to prevent storm water discharges into State waters. We also agree with the assessment that monitoring of water quality may be necessary as well as monitoring of the BMPs to ensure that they are achieving the intended result. OHA is also pleased to see that the applicant is discussing runoff from the site in ways that will utilize that resource rather than treat it as a nuisance to be channeled off and discharged as part of a design concept attempting to reduce or eliminate any demands on the municipal storm drainage system. This would help the project to compliment State environmental standards and energy efficiency goals. (See, HRS Section 196-9)*

Response 2: This comment will be noted in section 2.2.2 of the FEA. These requirements will be included in the design / construction plans for the project.

Comment 3: *OHA would also like to point out that the applicant should consider that by 2020, 20% of Hawai'i's electricity is to be from renewable sources. [See Act 95, Session Laws of Hawai'i which, in 2004 set that new original renewable portfolio standard goal.] Further, HRS Section 196-1 finds that:*

(1) The global demand for petroleum and its derivatives has caused severe economic hardships throughout the State and threatens to impair the public health, safety and welfare. The State of Hawaii, with its total dependence on imported fossil fuel, is particularly vulnerable to dislocations in the global energy market. This is an anomalous situation, as there are few places in the world so generously endowed with natural energy: geothermal, solar radiation, ocean temperature differential, wind, waves, and currents--all potential non-polluting power sources;

(2) There is a real need for strategic comprehensive planning in the effort towards achieving full utilization of Hawaii's energy resource programs and the most effective allocation of energy resources throughout the State. Planning is necessary and desirable in order that the State may recognize and declare the major problems and opportunities in the field of energy resources.

As such, OHA recommends the use of photovoltaic and small wind harvesting electrical generation for peripheral uses such as parking lot lighting. Solar energy should also be incorporated into the building plans. During construction, OHA urges the use of recyclable materials: steel studs and structural members, and wood products from certified sustainable sources.

Response 3: This comment will be noted in section 2.2.2 of the FEA. Renewable energy sources will be considered in the design of the project. Photovoltaic and small, wind-harvesting electrical generation for peripheral uses, such as, parking lot lighting, will be considered in the design / construction plans as much as practicable. Solar energy will also be considered for incorporation into the building plans. Design / construction plans will also include the use of recyclable materials; steel studs and structural members; and, wood products from certified sustainable sources, as much as practicable.

Comment 4: *State standards and goals also reference the Leadership in Energy and Environmental Design (LEED) Green Building Rating System which is the nationally accepted benchmark for the design, construction, and operation of high performance green buildings. LEED promotes a whole-building approach to sustainability by recognizing performance in five key areas of human and environmental health: sustainable site development, water savings, energy efficiency, materials selection, and indoor environmental quality.*

Response 4: This comment will be noted in section 2.2.2 of the FEA. The facility will be designed to LEED Silver compliance as contained in the design / construction plans.

Comment 5: *OHA notes that there were approximately 23 native plants found on the site and as such we recommend that they be incorporated into the landscaping design as much as possible. Additionally, OHA would also like to suggest that the project area be landscaped with drought tolerant native or indigenous species that are common to the area. Any invasive species should also be removed. Doing so would not only serve as practical water-saving landscaping practices, but also serve to further the traditional Hawaiian concept of mālama 'āina and create a more Hawaiian sense of place. This would also help to reduce the amount of impervious surfaces in the project area, thereby reducing runoff as well. OHA also recommends tree and landscape planting to shade paved parking areas and provide shade and cooling to building elements and outdoor use areas.*

Response 5: This comment will be noted in section 2.2.2 of the FEA. The design / construction plans will incorporate existing native plants found on the site into the landscaping design as much as practicable. Additionally, consideration will be made to have the plans call for the removal of any invasive species of plants within the site, and include landscaping with drought-tolerant native or indigenous species of plants that are common to the area. Tree and landscape planting will provide shading for paved parking areas and cooling of building elements and outdoor-use areas as much as practicable.

Comment 6: *OHA also points out that the project site has not been surveyed by an archaeologist and that consultation with the State Historic Preservation Division is ongoing. (DEA, page 47) Due to this lack of information, OHA cannot fulfill our constitutionally mandated duties and comment on what is not known or presented in an environmental review document. We look forward to receiving more information regarding historical resources in the area, the potential for finding cultural deposits and the applicant's proposed plan regarding them.*

Response 6: This comment will be noted in section 2.2.2 of the FEA. An Archaeological Assessment (since no archaeological sites were identified during the project, an assessment rather than an inventory survey [AIS] was completed since no sites were recorded [inventoried]) was completed for the project and submitted to the DLNR-SHPD for their review and processing in December 2008. There were no historic properties or cultural resources on the project parcel. The report has been forwarded to OHA for review via email attachment on 1/2/09. A copy of the Archaeological Assessment will be included in the appendix of the FEA.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,

Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

AECOM
841 Bishop Street, Suite 1900, Honolulu, Hawaii 96813
T 808 521-3051 F 808 524-0246 www.aecom.com

Brennon T. Morioka, PH.D., P.E., Director of Transportation
State of Hawai'i
Department of Transportation
869 Punchbowl Street
Honolulu, Hawai'i 96813-5097

June 3, 2009

Dear Mr. Morioka,

Subject: Draft Environmental Assessment (DEA) Responses to Comments and Finding of No Significant Impact (FONSI) for
County of Hawai'i, Building Division, Department of Public Works,
FIRE ADMINISTRATION SUPPORT COMPLEX
TMK: (3)2-4-001:176 & 178 (previously parcel 168 [portion])
Waiākea, South Hilo, Island of Hawai'i, Hawai'i

Thank you for reviewing the Draft Environmental Assessment for the subject project and providing your comment via letter dated January 28, 2009. AECOM Pacific, Inc., acting on behalf of the County of Hawai'i (COH), Department of Public Works (DPW) as their authorized agent, would like to provide the following response to your comment:

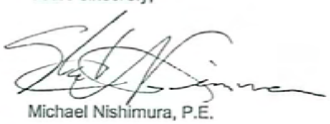
Comment 1: *DOT does not anticipate any adverse, significant impacts to State transportation facilities at present. However, to ensure acceptable levels-of-service, the DOT Highways Division will monitor the cumulative traffic impacts to the Komohana Street and Puainako Street (State Route 2000) intersection from the various existing and planned development projects including the FASC. Should the cumulative impacts significantly alter traffic flows, DOT may request an updated traffic analysis. Please note that the traffic analysis used in the subject DEA is dated and that a more recent 2006 traffic count is available.*

Response 1: This comment will be presented in section 2.2.2 of the Final Environmental Assessment (FEA). A TIAR was completed for the project and is included in the appendix of the Draft Environmental Assessment and will be included in the appendix of the FEA. Regarding the hourly and annual trend data 9 (figures 3 to 5) which went to 2004, the 2006 data that was taken under the DOT new counting program did not correspond with the old counts. Traffic counts were taken for the project in 2007 and forecasts were based on these counts. Counts taken in 2008 for the Mohouli Senior Citizen residences actually showed a decrease in traffic. The biggest potential traffic generator will be the UHH, which has sizeable projects planned but no definite schedule.

The County of Hawai'i, Department of Public Works, Building Division has reviewed the comments received during the 30-day public comment period that began on March 8, 2008. The agency has determined that this project will not have significant environmental effects and has issued a Finding of No Significant Impact (FONSI).

Should there be any questions, the COH-DPW Project Manager—Mr. David Yamamoto—may be contacted at (808) 961-8466, or emailed at DYamamoto@Co.Hawaii.HI.US.

Yours sincerely,



Michael Nishimura, P.E.
Project Manager
AECOM Pacific, Inc.

cc: County of Hawai'i, Building Division

APPENDIX B

CULTURAL IMPACT ASSESSMENT CONSULTATION

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813
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April 4, 2008

Edith Kanaka'ole Foundation
Ke Ana La'ahana
1500 Kalaniana'ole Avenue
Hilo, Hawai'i 96720-4914
(808) 961-5242

Gentlemen,

Subject: **County of Hawai'i, FIRE ADMINISTRATION SUPPORT COMPLEX**
Waiākea, South Hilo, Island of Hawai'i, Hawai'i
TMK: (3) 2-4-001: Portion 168
Cultural Impact Assessment for the Environmental Assessment
Request for Consultation Comments on the Proposed Subject Project Regarding Cultural Resources and Practices

The County of Hawai'i, Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project site is proposed for a 5-acre portion (middle) of Tax Map Key TMK (3)2-4-001:168.

The first phase of the proposed complex, which is anticipated for construction commencement in mid- to late-2008, includes a Fire Administration Building, Emergency Dispatch Building, site infrastructure utilities, paved parking area, and paved access roadway within a 50'-wide right-of-way (ROW) on the eastern boundary of the site. Future phases will involve construction of a Fire Preparation & Training Building, parking, an open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be in compliance with Americans with Disabilities Act (ADA, 1990) Accessibility Guidelines (ADAAG, collectively). The proposed project will centralize the administrative units, emergency dispatch, and personnel training for the Fire Department. A radio tower, roughly 50 to 100-feet or more tall, may also be required for use by the emergency dispatch. A general location map and a schematic site map of the initial phase facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing the Draft EA. We were recommended to you by other prospective Cultural Impact Assessment consultants (contained in the State of Hawai'i, Department of Health, Office of Environmental Quality Control [OEQC] Cultural Assessment Provider Lists) as a potential knowledgeable reference for assistance in completing a Cultural Impact Assessment, which is part of the EA process. We are asking for your help on this project to identify potential impacts, if any, on past and present Native Hawaiian people or cultural practices at or near the project site. A Cultural Assessment Interview Form and self-addressed, stamped envelope is attached for your use and guidance; however, please feel free to present to us any pertinent information in any format you feel most comfortable—such as, via letter, email, facsimile transmittal, etc.

We would appreciate any written comments regarding any cultural concerns you may have regarding and towards the proposed project within 30 days from the date of this letter. We will assume that your office has no comments on the proposed project if we receive no correspondence from you within 30 days from the date of this letter.

METCALF & EDDY | AECOM

Should you have any questions or comments, please contact either Shawn Butler or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

- Mike.Nishimura@M-E.AECOM.com
- Shawn.Butler@M-E.AECOM.com

Thank very much for your time and assistance regarding this matter.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Senior Project Manager

Enclosures: (1) Location Map
(2) First Phase Schematic Site Map
(3) Cultural Assessment Interview Form
(4) Self-Addressed, Stamped Envelope

cc: Project File
David Yamamoto, County of Hawai'i, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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Honolulu, Hawai'i 96813
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March 6, 2008

Maria Kaimipono Orr
95-230 Hokuloa Loop
Mililani, HI 96789

Dear Ms. Maria Kaimipono Orr,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawai'i Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5-acre portion of TMK (3)2-4-001: 168.

The first phase of the proposed complex, anticipated for construction commencement in mid- to late-2008, includes a Fire Administration Building, Emergency Dispatch Building, site infrastructure utilities, paved parking area, and paved access roadway within a 50'-wide right of way (ROW) on the eastern boundary of the site. Future phases will involve construction of a Fire Preparation & Training Building, parking, an open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. Site lighting, potable water, sewer, electrical service, telecommunications, and other miscellaneous fencing, signage, grading and drainage will be included in the design as required. The facilities will be designed to be ADA accessible. The proposed project will centralize the administrative units, emergency dispatch, and personnel training for the Fire Department. A radio tower may also be required for use by the emergency dispatch. A general location map and a schematic site map of the initial phase facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing the Draft EA. Your name was included in the State Office of Environmental Quality Control Cultural Assessment Provider List for the Island of Hawai'i. Please provide your help in completing a Cultural Impact Assessment which will be included in the EA. We are asking for your help on this project to identify potential impacts, if any, on past and present Native Hawai'ian people or practices at or near the project site. A Cultural Assessment Interview Form and self addressed, stamped envelope is attached for your use. *We would appreciate any written comments regarding any cultural concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.*

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Shawn.Butler@m-e.aecom.com

Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

Enclosures: (1) Location Map
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March 6, 2008

Robert "Sonny" & Roberta K. Keakealani
P.O. Box 6043
Kamuela, HI 96743

Dear Mr. Robert "Sonny" & Mrs. Roberta Keakealani,

Subject: **Request for Review of Proposed County of Hawai'i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawai'i Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5-acre portion of TMK (3)2-4-001: 168.

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Shawn.Butler@m-e.aecom.com

Thank very much for your time and assistance.

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

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March 6, 2008

Mikilani Ho
47-565 Hui Iwa Street
Kaneohe, HI 96744

Dear Mikilani Ho,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawai'i Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5-acre portion of TMK (3)2-4-001: 168.

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Shawn.Butler@m-e.aecom.com

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

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March 6, 2008

Fred Cachola
91-485 Kuhialoko Street
Ewa Beach, HI 96706

Dear Mr. Fred Cachola,

Subject: **Request for Review of Proposed County of Hawai'i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawai'i Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5-acre portion of TMK (3)2-4-001: 168.

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Sincerely,
M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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David Yamamoto, County of Hawai'i, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

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M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

March 6, 2008

Kepa Maly
554 Keonaona Street
Hilo, HI 96720

Dear Kepa Maly,

Subject: **Request for Review of Proposed County of Hawai'i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawai'i Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawai'i. M&E Pacific Inc. has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5-acre portion of TMK (3)2-4-001: 168.

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Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

Enclosures: (1) Location Map
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(3) Cultural Assessment Interview Form

cc: Project File
David Yamamoto, County of Hawai'i, Department of Public Works, Building Division
Harold Inouye, Anabe, Aruga & Ishizu, Architects, Inc.

1907 - 2007
We are still writing the book

M&E Pacific, Inc.
841 Bishop Street, Suite 1900
Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

January 11, 2008

Hilo Hawaiian Civic Club
PO Box 543
Hilo HI 96721
Dear Pelekikena of the Hilo Hawaiian Civic Club,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

The first phase of the proposed County of Hawai`i Fire Department Administration Support Complex includes a Fire Administration Building, an Emergency Dispatch Building, a Fire Preparation and Training Building, parking, open training area, and a court yard area. The master plan development also includes a museum, covered training area, warehouse, and fire station; however, the specifics of these facilities have not been finalized. A general location map and a schematic site map of the phase 1 facilities for the proposed project area are attached for your information and review.

We are currently in the process of preparing an Environmental Assessment (EA), and we ask for your assistance in completing a Cultural Impact Assessment which will be included in the EA. We are asking for your help on this project to identify potential impacts, if any, on past and present Native Hawaiian people or practices. A Cultural Assessment Interview Form and self addressed, stamped envelope is attached for your use. We would appreciate any written comments regarding any cultural concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

Should you have any questions or comments, please contact either Justin Privett or me via postal mail, electronic mail or facsimile. Electronic mailings should be sent to either of the following two addresses:

Mike.Nishimura@m-e.aecom.com
Justin.Privett@m-e.aecom.com

Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

Enclosures: (1) Location Map
(2) Phase 1 Schematic Site Map
(3) Cultural Assessment Interview Form

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January 11, 2008

Native Hawaiian Legal Corporation
1164 Bishop Street, Suite 1205
Honolulu, HI 96813

Dear Native Hawaiian Legal Corporation,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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M&E PACIFIC, INC.

Michael S. Nishimura
Project Manager

METCALF & EDDY | AECOM

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January 8, 2008

Chiyomi Leina'ala Fukino, M.D.
1250 Punchbowl St.
Honolulu, Hawaii 96813

Dear Dr. Chiyomi Fukino,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

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We are currently in the process of preparing an Environmental Assessment (EA), and we ask for your assistance in completing a Cultural Impact Assessment which will be included in the EA. We are asking for your help on this project to identify potential impacts, if any, on past and present Native Hawaiian people or practices. A Cultural Assessment Interview Form and self addressed, stamped envelope is attached for your use. We would appreciate any written comments regarding any cultural concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Michael S. Nishimura
Project Manager

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Honolulu, Hawaii 96813
T 808.521.3051 F 808.524.0246 www.m-e.aecom.com

January 8, 2008

Pualani Kanaka`ole Kanahele
Ke Po`ohala (Hawaiian Life Styles Department)
Hawai`i Community College
Building 380, Room 34
200 West Kāwili Street
Hilo, HI 96720

Dear Mrs. Pua Kanahele,

Subject: **Request for Review of Proposed County of Hawai`i Fire Administration Support Complex**
TMK: (3) 2-4-001: por. 168

The County of Hawaii Fire Department is proposing to develop an Administration Support Complex on Mohouli Street near the intersection with Kukuau Street in Hilo on the Island of Hawaii. M&E Pacific has been contracted to prepare an Environmental Assessment (EA) for this development. The project is a 5 acre portion of TMK (3)2-4-001: 168.

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We are currently in the process of preparing an Environmental Assessment (EA). Lukela Ruddle of the OHA Hilo office referred us to you for your help in completing a Cultural Impact Assessment which will be included in the EA. We are asking for your help on this project to identify potential impacts, if any, on past and present Native Hawaiian people or practices. A Cultural Assessment Interview Form and self addressed, stamped envelope is attached for your use. We would appreciate any written comments regarding any cultural concerns you may have towards the proposed project within 30 days from the date of this letter and will assume that your office has no comments on the proposed project if we receive no correspondence within 30 days from the date of this letter.

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Thank very much for your time and assistance.

Sincerely,

M&E PACIFIC, INC.

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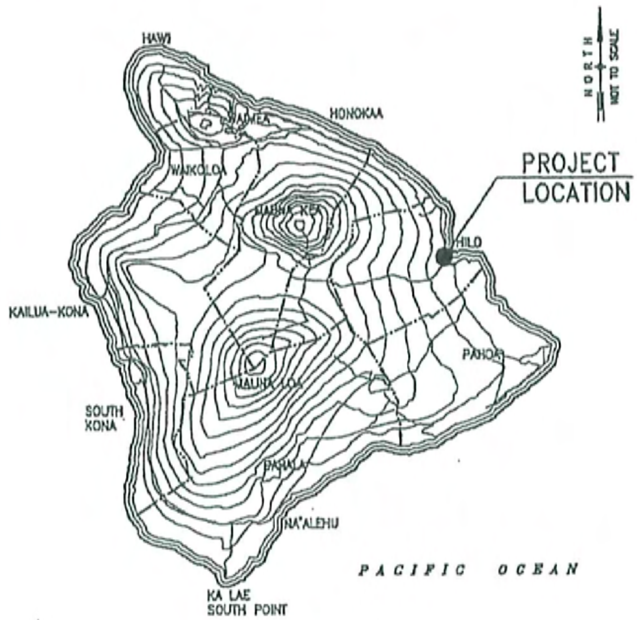
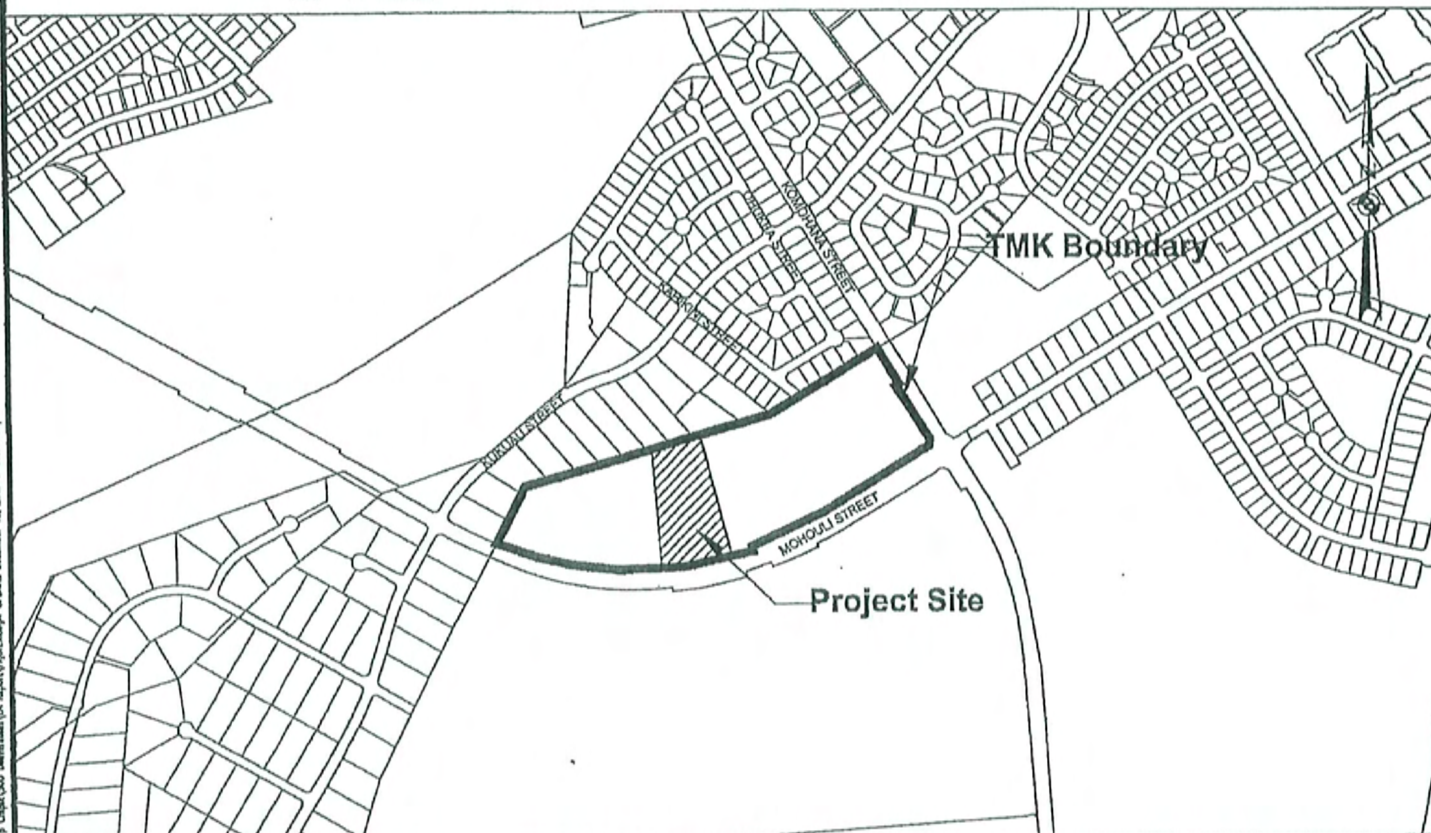


VICINITY MAP
NOT TO SCALE

ISLAND MAP
NOT TO SCALE



LOCATION MAP

SCALE: 1" = 1000'

0 1000 2000 3000

1" = 1000'

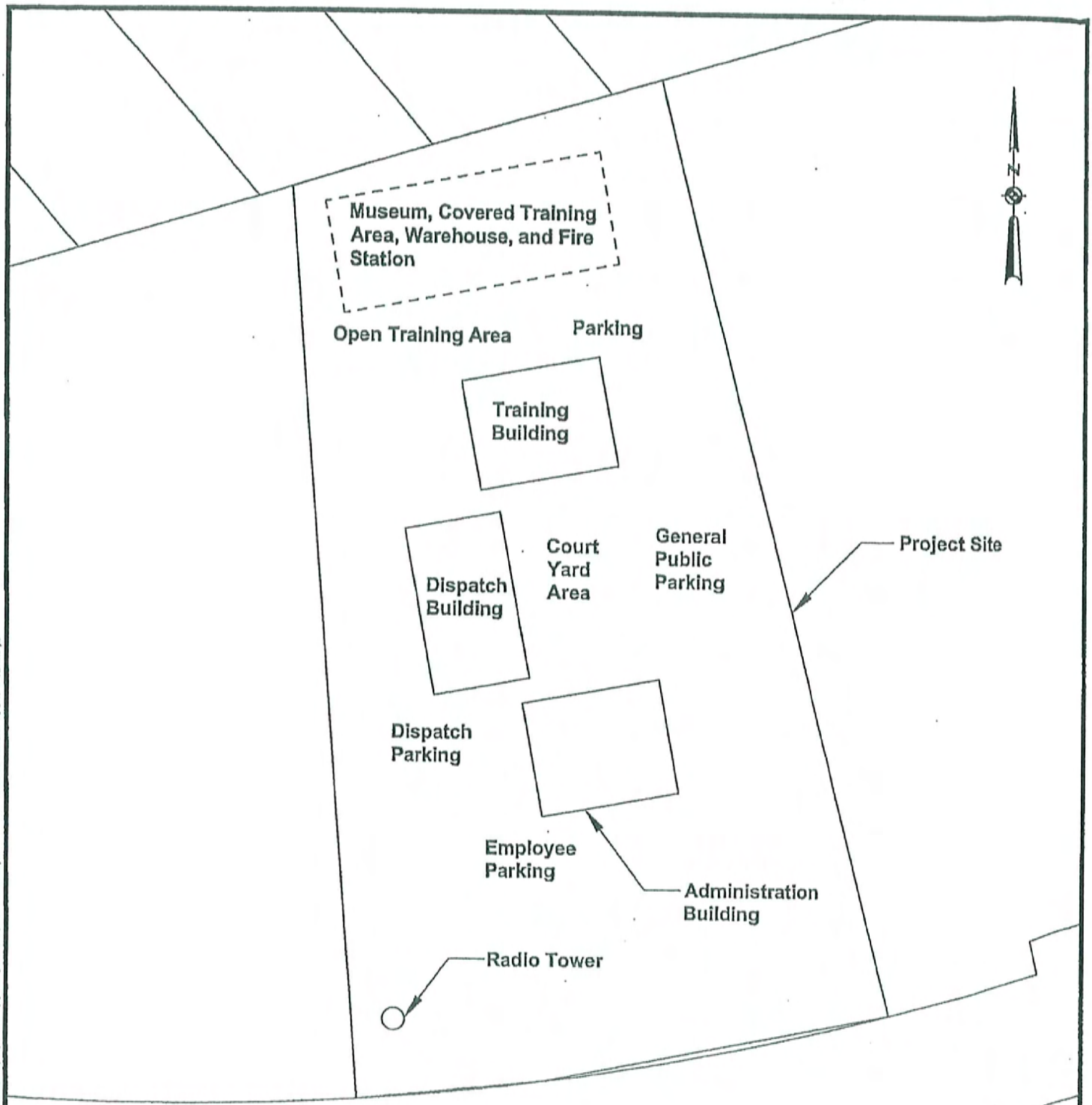
SCALE FEET

M&E Pacific, Inc.

METCALF & EDDY

DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

Figure 1
LOCATION MAP
Environmental Assessment for the
Fire Administration Support Complex
December 2007



SCHEMATIC SITE MAP

SCALE: 1" = 100'

1" = 100'

0 100 200 300

SCALE FEET

M&E Pacific, Inc.

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DAVIES PACIFIC CTR, STE 1900 · 841 BISHOP ST, HONOLULU, HAWAII 96813

Figure 2
SCHEMATIC SITE MAP
Environmental Assessment for the
Fire Administration Support Complex
December 2007

M&E Pacific, Inc.

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Cultural Assessment Interview Form

Name of Project:	TMK:
County of Hawai'i, Department of Public Works *Fire Administration Support Complex* *Hilo, Island of Hawai'i, Hawai'i*	(3)2-4-001:168 [portion]

Name of Interviewee(s):	Phone #(s):

Interviewer(s):	Date/Time:	
Justin K. Privett		Via Phone: _____ Via Mail: ✓ In Person: _____

A. Personal Information and Geographic Identity

	Geographic Identity
☐ Native Hawaiian ☐ Resident ☐ Agriculture ☐ Community Organizations ☐ Islandwide Organization ☐ Other (explain)	

A.1. Could you please provide some personal background information. (You do not have to answer if you are uncomfortable with the question.)

a. Where were you born?

b. How long have you lived on the Island of Hawai'i or in the vicinity of the subject property?

c. Could you tell us about your family?

A.2. Could you please tell us your connection to the subject property area?

A.3. Could you provide any other information that may be pertinent to the subject property, such as:
a. Membership in clubs or organizations.
b. Interest in or expertise in.

A.4. Do you have any strong memories or feelings with the subject property?

B. Activities on Project Site and Environs

B.1. Do you use the proposed project site or surrounding area(s)? If so, for what and how often?

B.2. Do you know of any cultural practices that are or have been carried out on or near the proposed project site?

C.2. If the proposed project proceeds, what cultural concerns should be considered in the development plans?

D. Other comments:

INTERVIEW SUMMARY AND CONSENT

Job Name: County of Hawai'i, Department of Public Works
Fire Administration Support Complex
Hilo, Island of Hawai'i

Person Interviewed: _____

Date of Interview: _____

Interviewer: Justin K. Privett

Purpose of Interview: Assess the cultural history of the project area.

I hereby give permission to M & E Pacific, Inc. to use the information from this interview in preparing a cultural impact assessment report for the subject project. I understand that appropriate credit will be provided in the cultural impact assessment report.

By: _____
Print Name

Signature: _____

Date: _____

County of Hawai'i, Department of Public Works
Fire Department Support Complex, Hilo, Island of Hawai'i, Hawai'i
Tax Map Key (3)2-4-001:176 & 178 (previously parcel 168 [portion])

SUMMARY OF CULTURAL IMPACT ASSESSMENT CONSULTATION

Unless otherwise mentioned here:

- No response was received from the prospective informant;
- The potential informant was not knowledgeable of any cultural or historic resources within or near the project area; or,
- The contacted persons declined to provide consultation.

1) Fred Cachola
Fred mentioned that he received the Cultural Impact Assessment request packet from M&E; however, he would like to decline the invitation to provide consultation due to his unfamiliarity of cultural resources in the project area. He contacted his sister who lives on Mohouli Street near the project area; however, she is also unknowledgeable of cultural practices and resources associated with the project area or potentially affected by the project's undertaking. Fred recommended that the Edith Kanaka'ole Foundation (http://www.edithkanakaolefoundation.org/) be contacted for Cultural Impact Assessment consultation requests. He pointed out that this foundation is very reputable and have been awarded accolades on their knowledgeable contributions to past and on-going Cultural Impact Assessments, primarily in the East Hawai'i region.

Edith Kanaka'ole Foundation
1500 Kalaniana'ole Avenue
Hilo, Hawai'i 96720-4914
T: 961-5242, F: 961-4789

2) Kekuhi Kanahele
I thank you for your invitation to do the CIA for your new complex. Unfortunately, I am in the middle of my doctoral program, among other things, and cannot commit to anything else. If you like, I have the names of several other qualified people who might be able to assist you.

Congratulations on your new building. Its about time!!! Much Mahalo, Kekuhi Kealiikanakaole

APPENDIX C

TRAFFIC IMPACT ASSESSMENT REPORT

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Traffic Impact Analysis Report

for

County of Hawai'i
Fire Administration Support Complex
Hilo, Island of Hawai'i, Hawai'i

Tax Map Key Number *(3)2-4-001: Por. 168*

FEBRUARY 2008

Prepared for:

County of Hawai'i
Department of Public Works, Building Division
Aupuni Center, 101 Pauahi Street, Suite 7
Hilo, Hawai'i 96720-4224

Prepared by:

M&E Pacific, Inc.

METCALF&EDDY | AECOM

Davies Pacific Center, 841 Bishop Street
Suite 1900, Honolulu, Hawai'i 96813

County of Hawai'i
Fire Administration Support Complex
Hilo, Island of Hawai'i, Hawai'i

Traffic Impact Analysis Report

TMK: (3)2-4-001: Por. 168

February 2008

Expiration Date:
April 30, 2008

This work was prepared by me or under my direct supervision.

Signature
M & E Pacific, Inc.
METCALF&EDDY | AECOM

13 FEB 2008
Date

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TRAFFIC IMPACT ANALYSIS REPORT
for the
COUNTY OF HAWAI'I
FIRE ADMINISTRATION SUPPORT COMPLEX

The County of Hawai'i Fire Department is proposing a Fire Administration Support Complex in Hilo, Hawai'i. This report documents a study that was conducted to identify the traffic impacts of the proposed project and to recommend any mitigating measures.

PROJECT DESCRIPTION

The County of Hawai'i Fire Department is proposing a Fire Administration Support Complex in Hilo, Hawai'i, to centralize its administrative units, safeguard the functions of emergency dispatch, and ensure the proper training of its personnel. The project site is on a 5.0 acre site on Mohouli Street mauka of Komohana Street, as shown on **Figure 1**. The proposed project site is identified as Tax Map Key (3)2-3-001: portion 168.

The primary complex would consist of three buildings:

1) Fire Support Building housing the personnel and staff of the Fire Chief, the Fiscal Division, Personnel Division, Fire Prevention Bureau, and the Emergency Medical Services Bureau.
2) Emergency Dispatch Building housing the personnel and equipment that provide for the receiving and dispatching of emergency calls to all fire units throughout the island and would be available 24/7.
3) Fire Preparation and Training Building with classrooms and offices for staffs of the Training Division, the Volunteer Training Division and the Water Safety Division.

In addition, the site is master planned for future development to include a museum, covered training area, warehouse, and fire station.

The proposed project is expected to be occupied in two years or sooner and would be expanded over a 20 year period. The proposed staffing and building area requirements are summarized on **Table 1**. Therefore, traffic forecasts were prepared for 2010, 2017 and 2027 study periods.

Access to the project site would be through a 50-foot roadway right of way on the eastern boundary of the site. Other roadways in the area include Komohana Street and Kukuau Street. The major intersections in the vicinity that would be affected by project generated traffic include the Komohana Street and Kukuau Street intersections with Mohouli Street, and the Komohana Street/Kukuau Intersection. **Figure 1**, Location Map, shows the project site in relationship to the three study intersections.

EXISTING CONDITIONS

A survey of the existing roadway and traffic conditions was made in December 2007.

Existing Roadways

The roadways of interest in the project area are Mohouli Street, Komohana Street, and Kukuau Street. Mohouli Street and Komohana Street are two-lane County roadways classified as major collectors while Kukuau Street is a minor collector roadway.

Mohouli Street provides mauka to makai access between Kaumana Drive and Kilauea Street. The older portion of roadway makai of Komohana Street runs through a residential neighborhood and has a posted speed limit of 35 miles per hour (mph). The roadway was extended mauka from Komohana Street to the Kaumana Drive/Ainako Avenue intersection in about 2002. The newer section of roadway has wide shoulders that could be used to widen Mohouli Street to four lanes and has a posted speed limit of 45 mph. The lands adjoining this section of roadway are currently mostly vacant. The new section of roadway provides residents of Kaumana and Ainako with an alternate access route to the south and west sections of Hilo.

Komohana Street runs in a general north to south direction between Waianuenue Avenue and Ainaola Drive. The portion of roadway south of Puainako Street generally passes through residential areas while the northern section adjoins vacant lands. The posted speed limit is 45 mph. Komohana Street serves as a commuter route for residents in the south and west sections of Hilo to reach downtown Hilo.

Kukuau Street is a two-lane County collector road. The older section of the roadway makai of Komohana Street dead-ends in a residential neighborhood area. The newer roadway section mauka of Komohana Street provides access to a mauka residential subdivision. The extension of Mohouli Street created a new intersection on this roadway. The posted speed limit on this roadway is 35 mph.

The Komohana Street/Mohouli Street intersection is signalized with protected left turn movements on the Mohouli Street approaches and protected/permitted left turns on the Komohana Street approaches. The northbound Komohana Street and eastbound Mohouli Street approaches have separate left turn, through, and right turn lanes. The southbound Komohana Street and westbound Mohouli Street approaches have separate left turn and shared through/right turn lanes.

The Komohana Street/Kukuau Street intersection has stop sign controls on the Kukuau Street approaches. Both Komohana Street approaches and the Kukuau Street westbound approach have separate left turn and shared through/right turn lanes. The Kukuau Street eastbound approach has a single shared lane.

The Mohouli Street/Kukuau Street intersection has stop sign controls on the Kukuau Street approaches. Both Mohouli Street approaches have separate left turn and shared through/right turn lanes while the Kukuau Street approaches are single shared lanes.

Traffic Volumes

Traffic turning movement counts were taken at the three study intersections from December 11-13, 2007, to determine existing traffic conditions. Traffic counts were taken during the morning (6:30 to 8:30 AM) and afternoon (3:30 to 5:30 PM) peak periods. Traffic turning movement counts require a traffic surveyor to observe traffic flow and record the movements of each vehicle crossing the intersection as through or turning movements by 15-minute intervals. The worksheets for these traffic counts are included in **Appendix A.**

The morning counts from 7:00 to 8:00 AM and afternoon counts from 4:15 to 5:15 (and 4:30 to 5:30) PM are shown on **Figure 2**, with volumes rounded to the nearest five vehicles per hour (vph) except for volumes less than five. The main direction of travel in the morning peak is northbound on Komohana Street and makai bound on Mohouli Street. The main directions of travel reverse in the afternoon peak hour. The morning northbound traffic flow on Komohana Street is currently constrained by the backup of traffic from the Ponahawai Street intersection, the next signalized intersection to the north.

The traffic volumes on the Kukuau Street approaches can be described as light. The main direction of travel in the morning is makai bound out of the subdivision. The afternoon direction of travel shifts to mauka bound into the subdivision. The current traffic operations at the three study intersections are discussed in the **Level of Service Analysis** section.

The State of Hawai'i Department of Transportation (State DOT) used to take traffic counts every two years at selected roadway sections on the island of Hawai'i under their previous counting program. One of these count stations is at the Puainako Street/Komohana Street intersection (Station 18-Z), about one-half mile south of the Mohouli Street intersection. Five daily traffic volumes were available for the ten year period from 1994 to 2004, with data for the year 2000 not reported. The data shown on **Figure 3** gives the historical trend of daily traffic at this location on the north leg of Komohana Street and the makai leg of Puainako Street. The graph shows a gradual

increase in traffic from 1994 to 2004. Daily two-way traffic volumes on Komohana Street increased 14.8% in 10 years for an annual compound growth rate of 1.39%, while daily traffic on Puainako Street increased 7.0% for an annual rate of 0.7%.

The pattern of hourly traffic volumes on Komohana Street on June 16, 2004, is shown in tabular and graph form on **Figure 4**. The morning northbound traffic flow has a steep one hour peak at 7:00 AM, and remains at a lower but relatively stable level until 6:00 PM. The southbound traffic shows a small morning peak, a moderate midday peak, and a high afternoon peak at 4:00 PM.

The State DOT also took a one time traffic count at the Komohana Street/Mohouli Street intersection on July 23, 2002. The pattern of hourly traffic volumes on Mohouli Street is shown in tabular and graph form on **Figure 5**. Like Komohana Street, there is a sharp makai bound peak in the morning and a sharp mauka bound peak in the afternoon.

PROPOSED ROADWAY IMPROVEMENTS

The County of Hawai'i has two roadway improvements planned in the study area. The County determined that traffic signals were warranted at the Mohouli Street/Kumukoa Street intersection (one block east of Komohana Street) and is in the process of installing them.

The County has included the improvement (widening) of Mohouli Street from Komohana Street to Kino'ole Street in the FY 2008-2013 Financially Constrained Statewide Transportation Improvement Program (STIP). The design is programmed for Fiscal Year (FY) 2009 and construction in FY 2013. Projects listed in FYs 2012 and 2013 are considered for information only.

The State DOT is also pursuing the realignment and widening of Puainako Street from Komohana Street to Kanoelehua Avenue. Their efforts are being expended in a generally mauka to makai direction. The first phase involves the realignment of Puainako Street between Komohana Street and Kawili Street to the north so that the new roadway would be north of residences lining the existing roadway, which would

then become a local street. The STIP shows right-of-way acquisition programmed in FY 2013. Future phases would involve widening Puainako Street makai of Kawili Street.

TRAFFIC FORECASTS

The proposed project is scheduled for occupancy in two years from 2007 and would be expanded over a 20-year planning horizon. During the 20-year period from the 2007 traffic count date to full development, ambient traffic on the area roadways can be expected to increase due to regional growth and new projects in the area. The traffic that would be generated from the proposed project was added to the ambient traffic forecast to obtain the total with project traffic forecasts for the three study forecast years.

Ambient Traffic Forecast

Ambient traffic on the study area roadways will increase due to regional growth in the adjoining areas and new projects in the study area. A two-step process was used to develop the ambient traffic forecasts. The first step developed a background traffic forecast based on regional traffic growth and committed projects. The second step added traffic which would be generated by proposed development on the University of Hawai'i at Hilo (UHH) mauka property.

For the first forecast year 2010, traffic growth was assumed to come from regional growth and three UHH projects. The existing traffic volumes shown on **Figure 2** were increased by 4.2% to represent regional growth. This number represents the 1.39% annual growth rate observed in traffic on Komohana Street as shown on **Figure 3** over a three year period. Traffic which would be generated onto Komohana Street by three proposed UHH projects as forecast by their traffic studies were included as listed below:

- China-U.S. Center
- U.S. Department of Agriculture Pacific Basin Agricultural Research Center
- UH-Hilo Ka Haka 'Ula O Ke'elikolani Hawaiian Language Building

The results of the forecasts are shown on **Figure 6** with volumes rounded to the nearest five vehicles per hour (vph) except for volumes less than five. It was assumed that development on the UHH mauka property will not begin by 2010; therefore this background forecast is also the ambient traffic forecast for 2010.

The background traffic for the second and third forecast years of 2017 and 2027, respectively, included the regional increase in traffic, the traffic from the three UHH projects listed above, and traffic generated by the fully developed UHH Research Park as forecast by its traffic study. The 2017 forecasts were obtained by increasing the existing traffic by 14.8% (1.39% over 10 years), adding the traffic generated by the three UHH projects, and including the traffic generated by a fully developed UHH Research Park. The results of the 2017 background forecasts are shown on **Figure 7** with volumes rounded to the nearest five vehicles per hour (vph) except for volumes less than five.

For the third forecast year 2027, the rate of general traffic growth was assumed to decrease to 1.0% annually, more in line with the population growth rate projected for South Hilo in the County of Hawaii General Plan. The 2017 traffic volumes were increased by 10.5% representing a 1% growth rate over ten years and traffic from the UHH projects added. The results of the 2027 background forecasts are shown on **Figure 8** with volumes rounded to the nearest five vehicles per hour (vph) except for volumes less than five.

The State of Hawai'i owns a 267 acre parcel across Mohouli Street from proposed project site known as the UH Hilo Mauka Lands. This parcel consists of 118 acres for the University Park Expansion, 122 acres for the Hawai'i Community College (HCC) Komohana Campus, and 28 acres for other University-related functions. A master plan has been developed for the University Park Expansion but no development timetable has been established. A traffic study was prepared for the HCC campus which assumed full development in 2025. The primary access points to the mauka lands would be from Komohana Street via Nowelo Street and from the Puainako Street Extension. A secondary access point would be from the Mohouli Street Extension. The

location of this access roadway has not been determined and its relative location to the proposed project access roadway is not known. Based on this information, preliminary traffic estimates were forecast based on the following assumptions for the development of this parcel:

1) The HCC campus would be fully developed by 2025. It would generate 60% of the fully developed traffic in 2017.
2) The University Park Expansion would continue the research park uses of the current University Park. It would begin development in 2010 and be fully developed by 2027. The property would be 42% developed (49 acres) by 2017.

The 2025 traffic assignment forecasts from the Traffic Impact Analysis Report University of Hawaii at Hilo Komohana-Mauka Hawaii Community College Komohana Campus, (August 2004) by Julian Ng, Inc., were used for the proposed HCC campus. For the 2017 forecast year, 60% of the 2025 forecasts were used.

The traffic that would be generated by the University Park Expansion was added to the above traffic assignments. The three-step process of trip generation, trip distribution, and trip assignment was used to forecast future traffic that would be generated by the University Park Expansion. The trip generation step forecasts the volume of vehicle trips that would be generated by the proposed project during the morning and afternoon peak periods. The Institute of Transportation Engineers Trip Generation (Seventh Edition, 2003) has trip generation equations or rates to calculate the number of AM and PM peak hour trips that would be generated by various land uses. The handbook also provides the percentage of inbound and outbound trips in each peak hour. The trip generation rate per acre for a research and development center (Land Use code 760) and inbound/outbound percentages are as follows:

	AM PEAK	PM PEAK
Trips/acre	16.77	15.44
Inbound %	84%	12%
Outbound %	16%	88%

The University Park Expansion is forecast to generate 822 AM trips and 757 PM trips in 2017, and 1,979 AM trips and 1,822 PM trips in 2017. The trip distribution step divides the generated trips by directions of travel to/from the project site(s). The trip distribution splits shown in the Ng report were assumed for the University Park Expansion and the proposed Fire Administration Support Complex, and are summarized on **Table 2**, Trip Generation and Trip Distribution Analysis for the proposed project. The project generated traffic volumes were assigned to the study area network based on the directions of travel. The traffic assignments for the University Park Expansion were added to the traffic assignments for the HCC campus to obtain the UHH Mauka Property Generated Traffic for 2017 (**Figure 9**) and for 2027 (**Figure 10**) with volumes rounded to the nearest five vph.

The 2017 UHH Mauka Lands generated traffic forecasts (**Figure 9**) were added to the 2017 background traffic forecasts (**Figure 7**) to obtain the 2017 ambient traffic forecast shown on **Figure 11**. Likewise, the 2027 UHH Mauka Lands generated traffic forecasts (**Figure 10**) were added to the 2027 background traffic forecasts (**Figure 8**) to obtain the 2027 ambient traffic forecast shown on **Figure 12**. The traffic operations for the ambient forecast conditions at the three study intersections are discussed in the **Level of Service Analysis** section.

Project Generated Traffic

The traditional three-step process of trip generation, trip distribution, and trip assignment was used to forecast future traffic that would be generated by the proposed project. The trip generation step forecasts the number of new trips that would be produced in each of the two study periods. The trip distribution step allocates these new trips by direction of travel. Finally, the trip assignment step assigns the trips to the specific turning movements at the study intersections.

The trip generation step forecasts the volume of vehicle trips that would be generated by the proposed project during the morning and afternoon peak periods. The trip generation rates for a government office complex (land use code 733) as found in the Institute of Transportation Engineers (ITE) Trip Generation report were used for the

proposed project. The number of trips generated in 2010, 2017, and 2027 based on projected floor area are shown on **Table 2**.

The proposed fire Administration Support Complex is forecast to generate 48 trips in the 2010 morning peak and 62 trips in the afternoon peak. The number of trips generated would increase to 57 in the morning peak and 73 in the afternoon peak when project is fully developed in 2027. The Trip Generation report also provides trip generation rates based on number of employees which resulted in a lower number of trips. The higher estimate based on building area was used in the traffic analysis.

The trip generation analysis did not include proposed future land uses: museum, covered training area, warehouse, and fire station. These land uses were master planned on the site but were not shown on the proposed plan. These types of land uses generally do not generate trips during the peak hours however result in trips that are more oriented to the business hours between the morning and afternoon peaks.

The trip distribution step the divides the generated trips by directions of travel to/from the project site(s). The trip distribution percentages used in the aforementioned Ng traffic study for HCC were utilized for this study and adopted to its study network, and are summarized on **Table 2**. Half of the trips are forecast to travel to/from the south approach of Komohana Street. The combined total volumes may not add up to the sum of the individual components of generated trips due to rounding.

The project generated traffic volumes were assigned to the study area network based on the directions of travel and the access routes. The results of the traffic assignment analysis are shown on **Figures 13** to **15** for 2010, 2017 and 2027, respectively, with the volumes not rounded.

Total Forecast Volumes

The project generated traffic assignment volumes were added to the ambient traffic forecasts to obtain the total with project traffic forecasts. The 2010 project generated traffic assignment volumes from **Figure 13** were added to the ambient traffic forecasts from **Figure 7** to obtain the 2010 total with project traffic forecasts shown on **Figure 16**.

The 2017 project generated traffic assignment volumes from **Figure 14** were added to the ambient traffic forecasts from **Figure 11** to obtain the 2017 total with project traffic forecasts shown on **Figure 17**. The 2027 project generated traffic assignment volumes from **Figure 15** were added to the ambient traffic forecasts from **Figure 12** to obtain the 2027 total with project traffic forecasts shown on **Figure 18**. The traffic volumes are rounded to the nearest five vph except for volumes less than five.

LEVEL OF SERVICE ANALYSIS

The concept of level of service is used to quantify the quality of traffic flow on roadway facilities. The Transportation Research Board (TRB) has developed procedures to calculate level of service value(s) by measuring traffic volumes against the capacities of different types of roadway facilities. Their Highway Capacity Manual 2000 (HCM2000) describes the various procedures developed for freeways, highways, signalized and unsignalized intersections, etc.

Two of the study intersections on Kukuau Street are currently unsignalized. The procedure used for analyzing unsignalized intersections calculates vehicle delays and levels of service based on the distribution of gaps in traffic on the major street and driver judgment in selecting gaps through which to execute turns. For two-way stop intersections where only the minor street traffic is controlled by a stop sign, levels of service are calculated for the critical turning movements including outbound movements from the stop-controlled approach, and left turns from the major street to the minor street. The procedure does not calculate an overall intersection level of service.

The Highway Capacity Manual defines the relationship between level of service and delay (in seconds/vehicle) for unsignalized intersections as shown below:

LEVEL OF SERVICE	DELAY (Seconds/Vehicle)
A	< 10.0
B	10.1 to 15.0
C	15.1 to 25.0
D	25.1 to 35.0
E	35.1 to 50.0
F	> 50.1

The County of Hawai'i considers levels of service A to D as acceptable for unsignalized intersections. Level of service F (with average delays longer than 50 seconds) is considered undesirable for unsignalized intersections and would indicate the possible need for mitigation. Level of service F conditions could be tolerated if the delays are not much higher than 60 seconds, traffic queues are short, and there are no reasonable mitigating measures available.

Table 3 summarizes the unsignalized intersection level of service analysis for the two study intersections on Kukuau Street for current conditions. The Mohouli Street/Kukuau Street intersection approaches are currently operating at acceptable levels of service in both peak hours due to the lower traffic volumes on Mohouli Street. The intersection is forecast to continue operating at acceptable levels of service in both 2010 peak hours. The proposed project would generate small volumes of traffic such that it would not affect traffic operations in 2010.

The traffic generated by the UHH Mauka Lands would affect traffic operations at this intersection in 2017 and 2027. The increase in traffic volumes on Mohouli Street would cause the Kukuau Street eastbound approach to operate at level of service F in the 2017 AM peak and the westbound approach at level of service E during the PM peak. The small number of trips generated by the proposed project would not cause any changes in delay, indicating it would have not an adverse traffic impact.

The ambient traffic volumes forecast for Mohouli Street in 2027 would require four through lanes. The level of service for the eastbound Kukuau Street approach would be at level F in the AM and PM peak periods with two through lanes on Mohouli Street, but would improve to level E in the PM peak if Mohouli Street were widened to four lanes. The westbound approach of Kukuau Street would also be at level of service F in the PM peak period. Again, the small number of trips generated by the proposed project in both peak periods would not cause any changes in delay, indicating it would have not an adverse traffic impact.

The above analysis indicates that Mohouli Street and the Kukuau Street intersection would require mitigating measures to accommodate increases in ambient traffic. Mohouli Street would eventually have to be widened to four lanes before 2027. Traffic signals probably would not be warranted at this intersection; therefore, the possibility of imposing left turn/through movement bans on the westbound approaches during peak hours should be considered. An alternate route is available via the Komohana Street/Mohouli Street signalized intersection.

The traffic exiting the Kukuau Street approaches at Komohana Street are currently operating at level of service E in the morning peak, indicating the possible existing need for mitigation. The same traffic movements in the afternoon peak are operating at an acceptable level of service D. Since the high traffic volumes on Komohana Street occur for only a short period of the day and there are no reasonable mitigating actions, the existing traffic operations could be tolerated.

The outbound movements from Kukuau Street are forecast to operate at levels of service F in the 2010 AM peak and level E in the afternoon peak. The small number of trips generated by the proposed project and driving though this intersection would not have any noticeable effect. The unacceptable levels of service and delay would continue to worsen with the 2017 forecasts due to the traffic increases on Komohana Street. Widening Komohana Street to four lanes would improve traffic operations on that street but would not improve traffic operations on Kukuau Street. Traffic mitigation

measures would be required at this intersection. Traffic signals could be warranted at this intersection in the future.

The proposed project access roadway intersection with Mohouli Street is expected to be stop sign controlled. The intersection movements are forecast to have acceptable level of service in 2010 and 2017, although the outbound left turn movement is forecast to be at level of service E in the 2017 PM peak. The intersection movements are forecast to be at acceptable levels in the 2027 AM peak since most of the traffic movements would be inbound. However, the outbound left turn movement is forecast to be at level of service F in the 2027 PM peak hour if Mohouli Street remains at two lanes. Widening Mohouli Street to four lanes would improve the outbound left turn movement to level of service E, which could be tolerated. Hence, mitigating measures are not foreseen at this intersection other than the widening of Mohouli Street to accommodate the through traffic volumes.

The Komohana Street/Mohouli Street intersection is currently signalized. The methodology for analyzing signalized intersections calculates the levels of service for individual movements, approaches and the intersection as a whole based on the average stopped delay per vehicle. The results range from level of service A (best with average delays less than ten seconds) to F (worst with average delays longer than 80 seconds), described as follows:

LEVEL OF SERVICE	CONTROL DELAY PER VEHICLE (Seconds/Vehicle)
A	< 10.0
B	10.1 to 20.0
C	20.1 to 35.0
D	35.1 to 55.0
E	55.1 to 80.0
F	> 80.1

The County of Hawai'i considers levels of service A to D as acceptable for signalized intersections, with levels of service E and F indicating the need for mitigating measures. For signalized intersections, the major streets can be designed to have a higher level of service than the minor streets or turning lanes. Level of service E conditions are sometimes tolerated for minor traffic movements such as left turn movements if they maintain acceptable levels of service on the major street.

The Komohana Street/Mohouli Street traffic signal presently runs on a 127 second cycle during the morning peak, and the signal is fully actuated in the afternoon peak. The northbound through traffic flow on Komohana Street is delayed in the morning peak by the traffic queue that forms from the Ponahawai Street signal to the north. The capacity for the northbound through movement was reduced from 1,500 to 1,200 vph to replicate the effects of this queuing.

The level of service analysis for this intersection is shown on **Table 4**. It is operating at a minimally acceptable level of service D in the morning peak. The two approaches with the highest volumes, Komohana Street northbound, and Mohouli Street eastbound, are operating at level of service E, indicating the possible need for mitigating measures. The northbound through movement is operating at level of service F due to the backup of traffic from the next traffic signal. The primary reasons for these poor levels of service are the high volumes of vehicles on a single lane of traffic.

The intersection is operating at level of service E in the afternoon peak due to two problem movements. The high volumes of vehicles making left turns from the westbound approach of Mohouli Street are operating at level of service F and require more green time or an additional traffic lane. The high volumes of southbound through vehicles on Komohana Street are operating at level of service E.

The intersection level of service is forecast to decrease to E in the 2010 AM peak hour with the current roadway system and increase in ambient traffic, indicating that the current problem movements would worsen. Although there are no roadway improvements planned for this intersection by 2010, the impacts of two separate

mitigating measures were analyzed. If Komohana Street were widened to four lanes, the intersection level of service would improve from E to D, northbound through movement would improve from F to D, Mohouli Street eastbound through movement would worsen from E to F, and Mohouli Street westbound left turn movement would improve from F to D. If the Mohouli Street approaches were widened to provide two eastbound through lanes and two westbound left turn lanes, the intersection level of service would improve from E to D, northbound through movement would improve from F to E, Mohouli Street eastbound through movement would remain at E, and the westbound left turn movement would improve from F to E.

The intersection is forecast to continue operating at level of service E in the 2010 PM peak without any roadway improvements. If Komohana Street were widened to four lanes the intersection level of service would improve from E to D, the southbound through movement would improve from F to D, and the Mohouli Street westbound left turn movement would remain at F. If Mohouli Street were widened to provide two eastbound through lanes and two westbound left turn lanes, the intersection level of service would improve from E to D, southbound through movement would improve from F to E, and Mohouli Street westbound left turn movement would improve from F to E.

The widening of Komohana Street has the greater benefits in terms of reducing overall delay in the morning peak hour but widening the Mohouli Street approaches has the bigger beneficial impact in the afternoon peak. The construction for the widening of Mohouli Street is programmed in FY 2013, which does not indicate any priority. The widening of Komohana Street is planned but not programmed, meaning it would take at least 10 years to be implemented unless special funding were provided. For both peak periods, the small amount of traffic generated by the proposed project has little impact on traffic operations as evidenced by the small increases in delay.

The large increases in ambient traffic forecast for 2017 would cause the intersection operations to fail (as evidenced by the intersection level of service F with the ambient forecasts) without any roadway improvements. Therefore, the total with project forecasts were not analyzed. Mitigating measures analyzed for 2017 included widening

Komohana Street to four lanes and combining the widening of Komohana Street and the Mohouli Street approaches.

With the widening of Komohana Street alone, the intersection would operate at level of service E in the AM peak and F in the PM peak, indicating unacceptable conditions. With the widening of both streets, the intersection would improve to an acceptable level of service D in the AM peak but several movements would remain at unacceptable levels. The Komohana Street southbound left turn movement and the Mohouli Street westbound left turn movement would operate at level of service E. The traffic generated by the proposed project would increase delay slightly on all but one of the affected traffic movements. Delay would increase by ten seconds on the northbound left turn movement and cause level of service to change from D to E.

The intersection would operate at level of service E in the 2017 PM peak hour with both roadway widening improvements. Three movements would be operating at level of service F including the Komohana Street southbound through, the Komohana Street northbound left turn and the Mohouli Street westbound left turn movements. Additional mitigating measures would be required to have acceptable operating conditions in the 2017 PM peak hour. The additional trips generated by the proposed project would not cause changes in levels of service on any movements at the intersection. This analysis indicates that additional mitigating measures would be required to meet the projected 2017 traffic volumes. However, only preliminary estimates of future land uses were available at the time of this study. Further traffic analyses would be required when more definite land uses become available.

The two previously described roadway widening improvements would not be able to accommodate the much higher ambient traffic volumes forecast for 2027. The intersection is forecast to operate at level of service E in the AM peak hour with level of service F on the Komohana Street northbound and southbound left turns, and the Mohouli Street westbound left turn. The intersection is forecast to operate at level of service F in the PM peak hour with level of service F on the Komohana Street northbound left and right turns, all the Mohouli Street westbound movements, and the

eastbound left turn movement. The additional trips generated by the proposed project would not cause changes in levels of service on any movements at the intersection. This analysis indicates that additional mitigating measures would be required to meet the projected 2027 traffic volumes. However, only preliminary estimates of future land uses were available at the time of this study. Further traffic analyses would be required when more definite land uses become available.

CONCLUSIONS

The proposed County of Hawai'i Fire Administration Support Complex is forecast to generate a relatively small number of trips during the morning and afternoon commuter peak hours over its 20-year development period. This additional traffic in itself would not require mitigating measures. However, traffic on Komohana Street is already congested during the morning peak hour and the Mohouli Street intersection is in need of mitigation.

Major roadway improvements would be needed to accommodate the future traffic which would be generated from the UHH Mauka Lands. Both Komohana Street and its Mohouli Street approaches would have to be widened to four lanes by 2017 to accommodate this future land use. The mauka portion of Mohouli Street would need to be widened to four lanes between 2017 and 2027.

The currently unsignalized intersections at Mohouli Street/Kukuau Street and Komohana Street/Kukuau Street would require mitigation in the future due to the increases in ambient traffic. The first intersection would probably not warrant traffic signals in the future and a peak period ban on left turns/through movements should be considered. Traffic signals may be warranted at the latter intersection in the future.

The large ambient traffic increases forecast for this study and its subsequent major impacts were based on preliminary estimates of development of the UHH Mauka Lands. The traffic impacts should be reevaluated when the UHH Mauka Lands development proposals are better defined.

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Figures

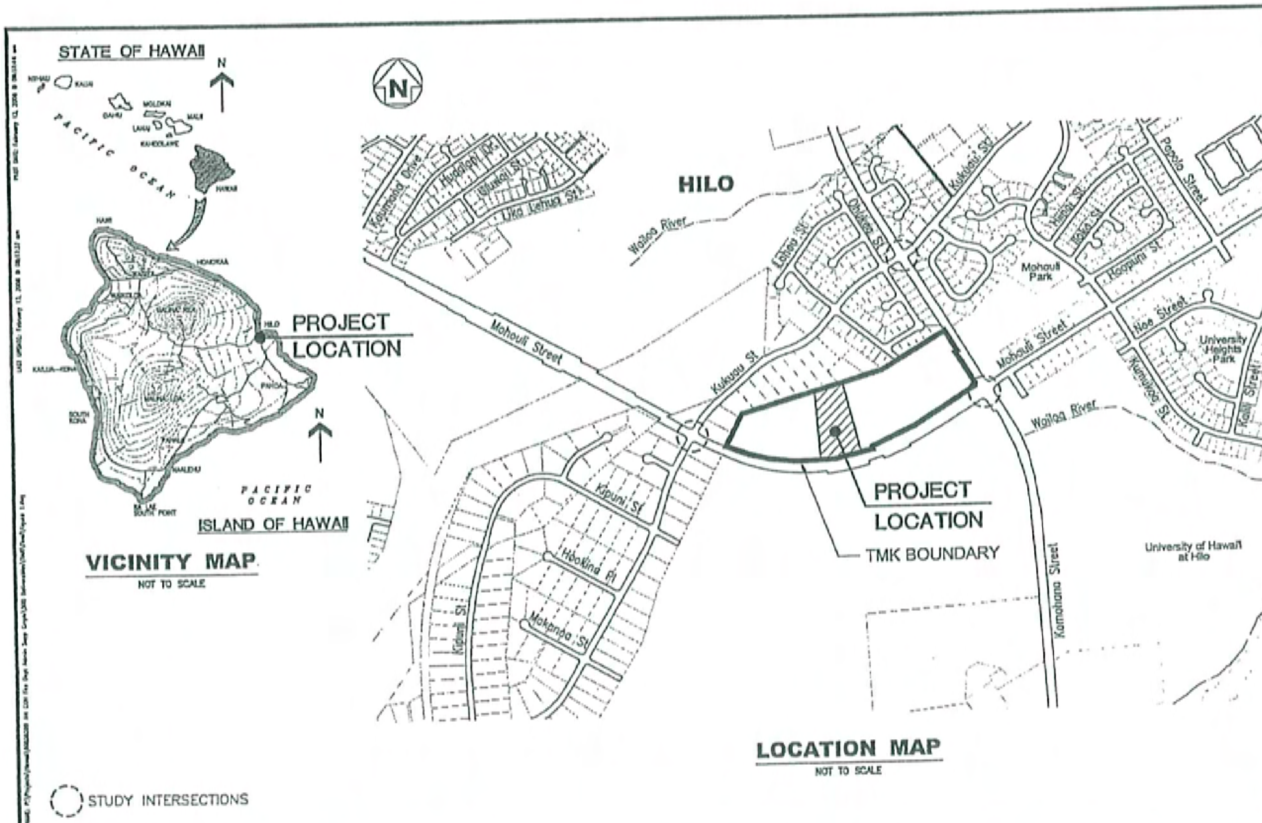

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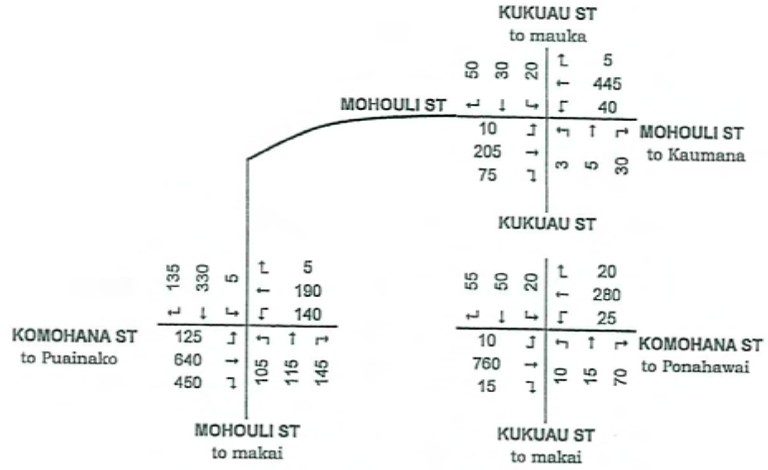
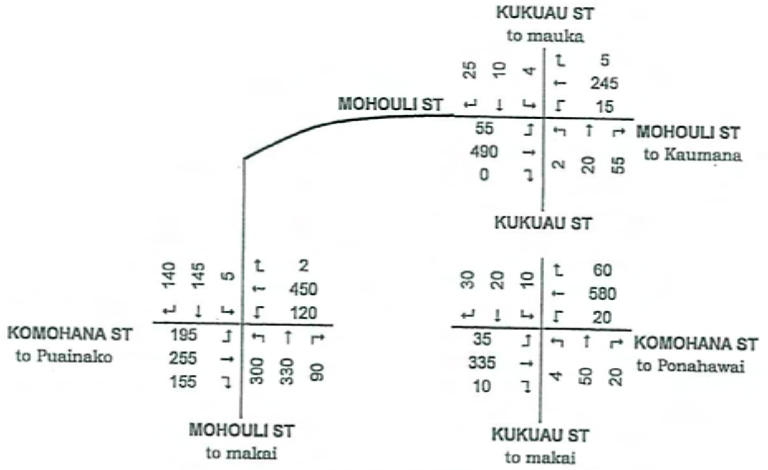
Figure 1
Location Map
Traffic Impact Assessment Report for the County of Hawaii Fire Department Administration Support Complex
February 2008



AM PEAK HOUR

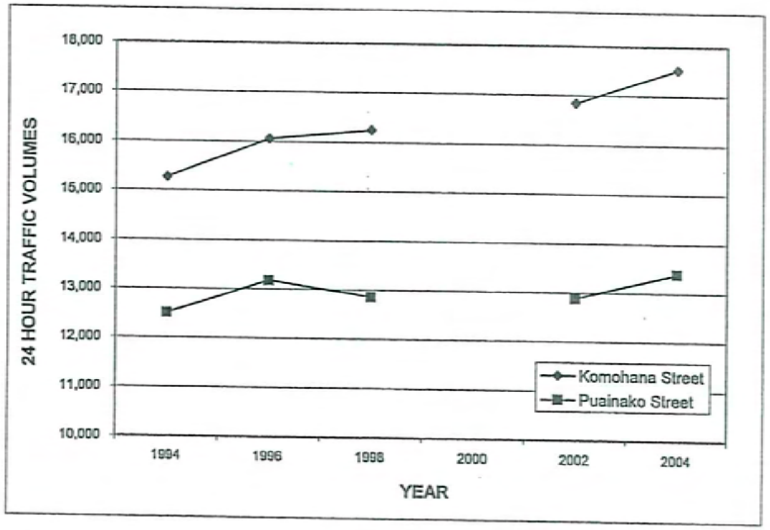


PM PEAK HOUR

EXISTING 2007 TRAFFIC VOLUMES
FIGURE 2

TWO-WAY DAILY TRAFFIC VOLUMES		
YEAR	Komohana North of Puainako	Puainako Makai of Komohana
1994	15,259	12,502
1996	16,060	13,179
1998	16,251	12,863
2000		
2002	16,850	12,885
2004	17,522	13,386

Source:
State of Hawaii Department of Transportation
Station 18-Z Puainako St at Komohana St



HISTORICAL TREND IN DAILY TRAFFIC VOLUMES
ON KOMOHANA STREET AT PUAINAKO STREET

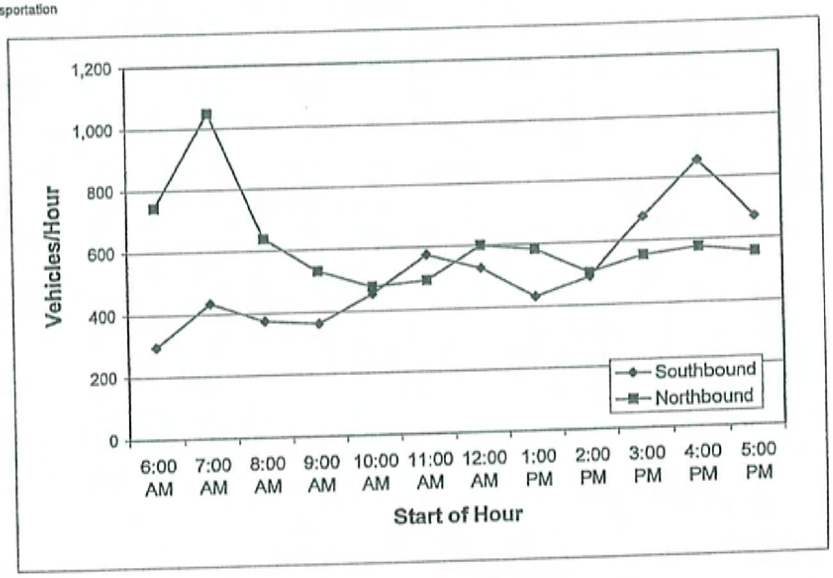
FIGURE 3

HOURLY TRAFFIC VOLUMES ON KOMOHANA STREET

North of Pualnako Street (station 18-Z) June 16, 2004

Source: State of Hawaii Department of Transportation

VEHICLES/HOUR		
Start of Hour	South Bound	North Bound
6:00 AM	296	743
7:00 AM	434	1,048
8:00 AM	375	637
9:00 AM	364	531
10:00 AM	454	476
11:00 AM	574	493
12:00 AM	527	599
1:00 PM	431	583
2:00 PM	490	504
3:00 PM	677	555
4:00 PM	855	576
5:00 PM	669	557



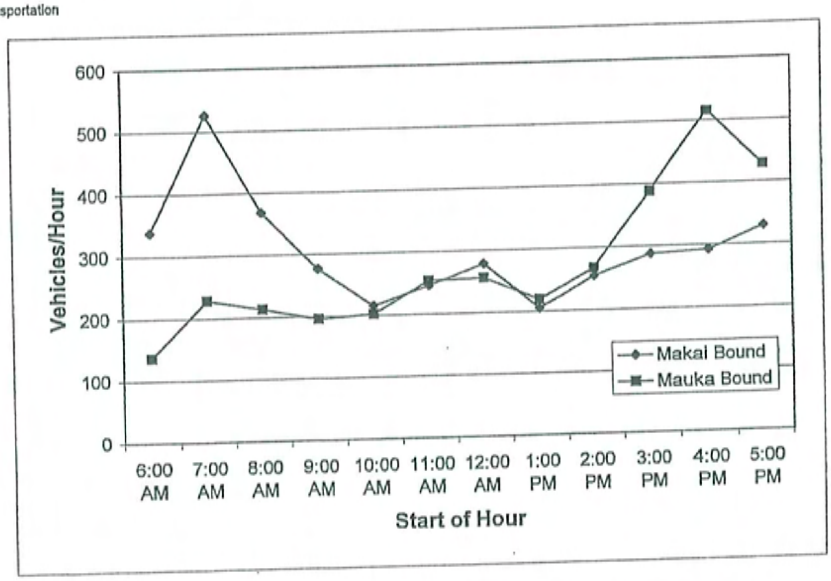
HOURLY TRAFFIC VOLUMES ON KOMOHANA STREET NORTH OF PUAINAKO STREET
FIGURE 4

HOURLY TRAFFIC VOLUMES ON MOHOULI STREET

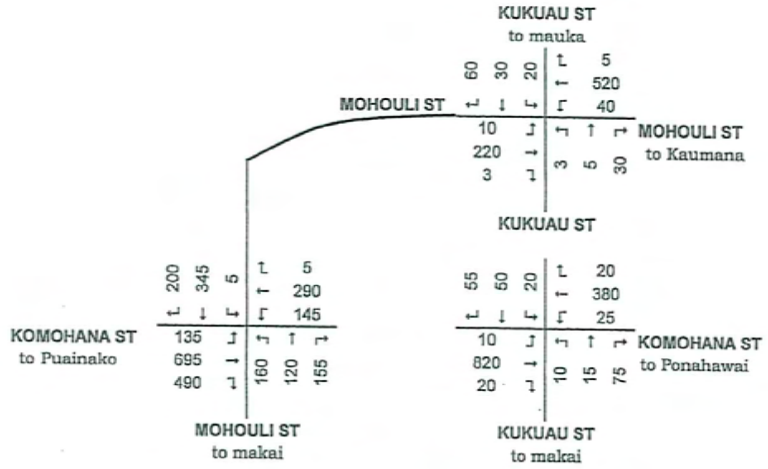
Mauka of Komohana Street (Station 19-D) July 23, 2002

Source: State of Hawaii Department of Transportation

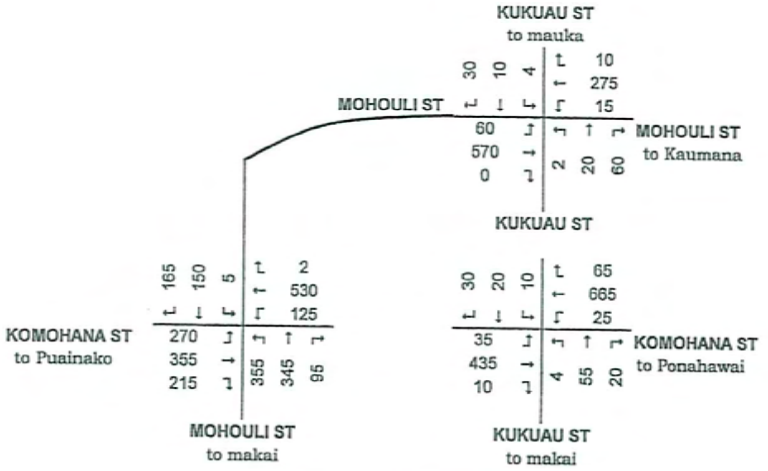
VEHICLES/HOUR		
Start of Hour	Makai Bound	Mauka Bound
6:00 AM	337	137
7:00 AM	526	228
8:00 AM	368	213
9:00 AM	276	196
10:00 AM	215	202
11:00 AM	245	253
12:00 AM	278	255
1:00 PM	205	219
2:00 PM	254	267
3:00 PM	287	388
4:00 PM	292	515
5:00 PM	328	428



HOURLY TRAFFIC VOLUMES ON MOHOULI STREET MAUKA OF KOMOHANA STREET
FIGURE 5

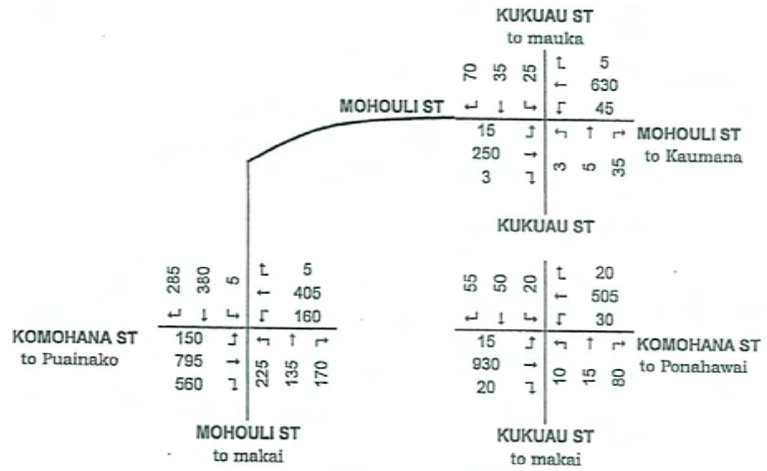


AM PEAK HOUR



PM PEAK HOUR

2010 AMBIENT TRAFFIC FORECAST
FIGURE 6



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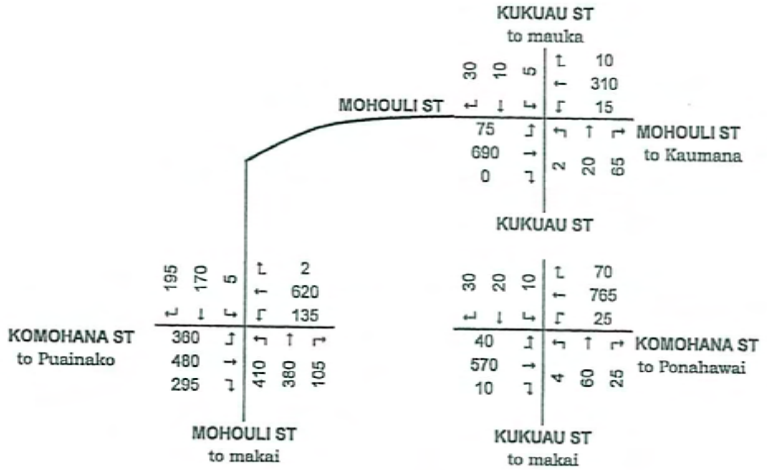
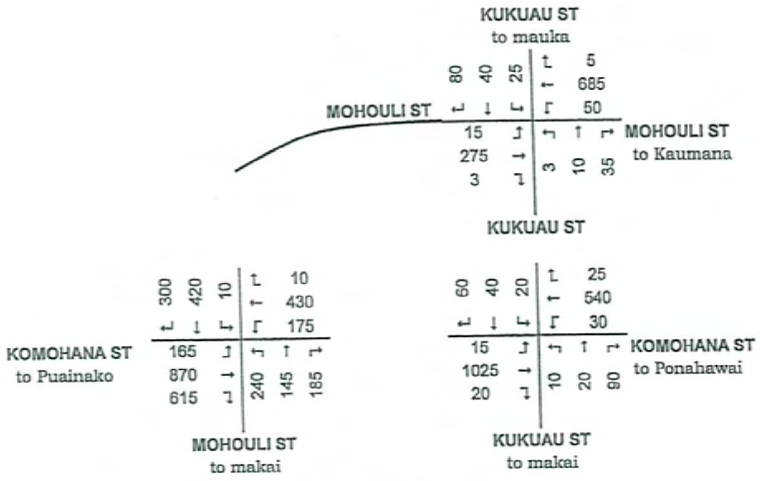
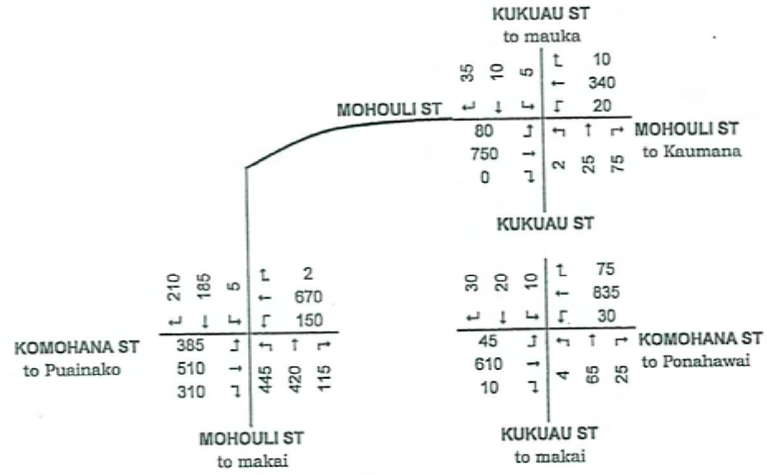


PM PEAK HOUR

2017 BACKGROUND TRAFFIC FORECAST
FIGURE 7

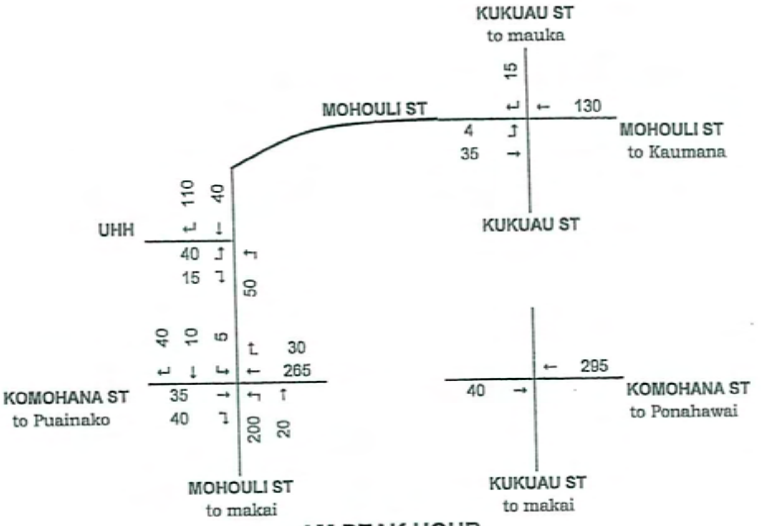


AM PEAK HOUR

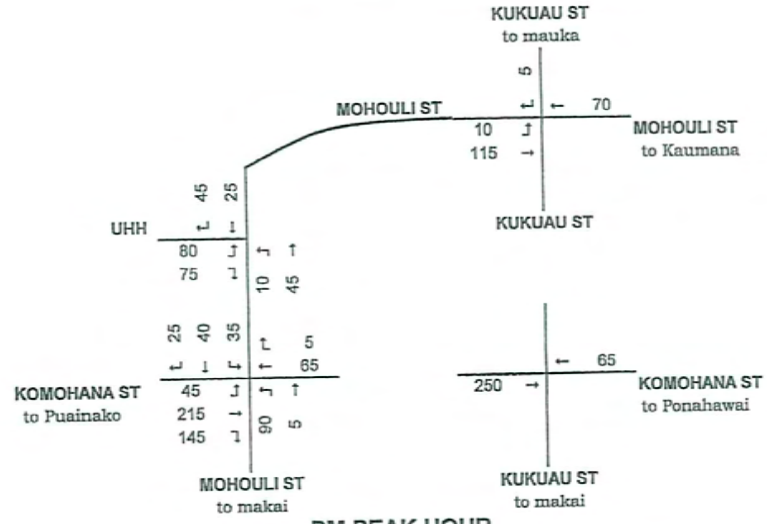


PM PEAK HOUR

2027 BACKGROUND TRAFFIC FORECAST
FIGURE 8

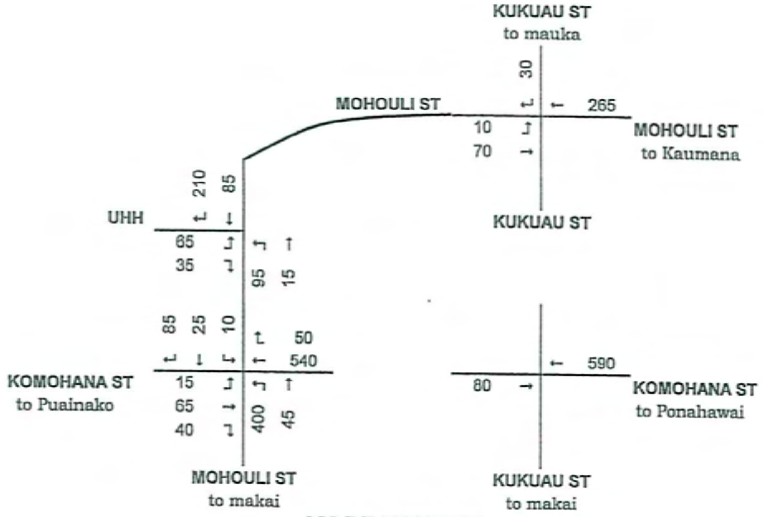


AM PEAK HOUR

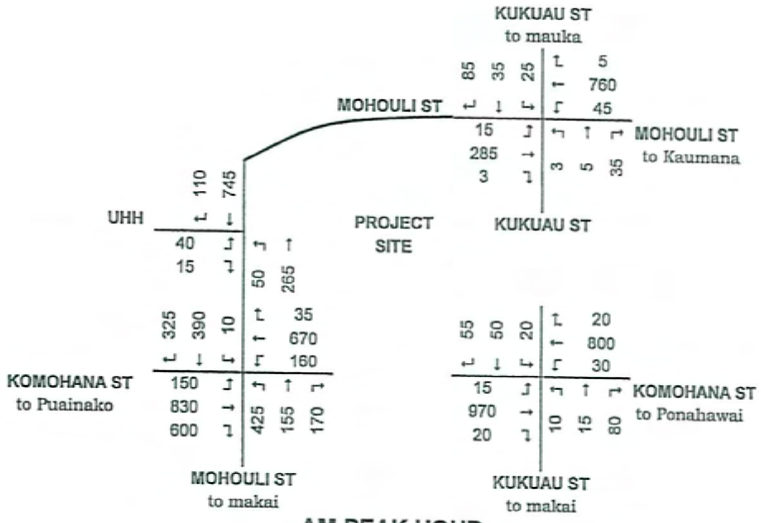


PM PEAK HOUR

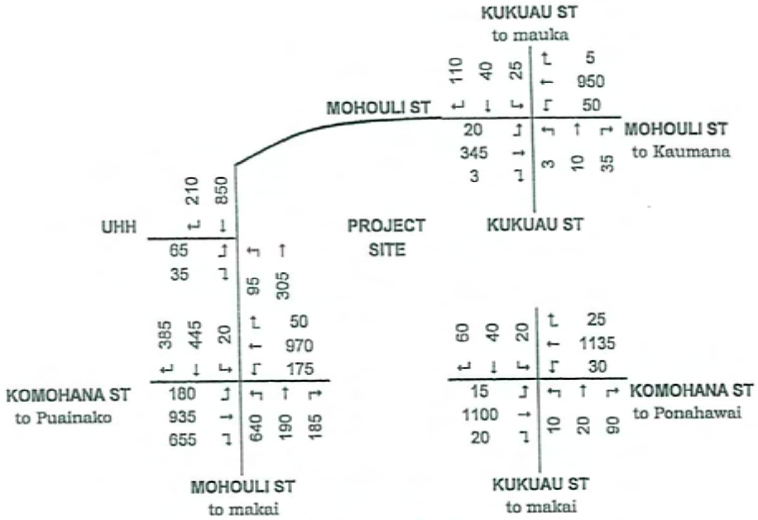
2017 UHH MAUKA PROPERTY GENERATED TRAFFIC
FIGURE 9



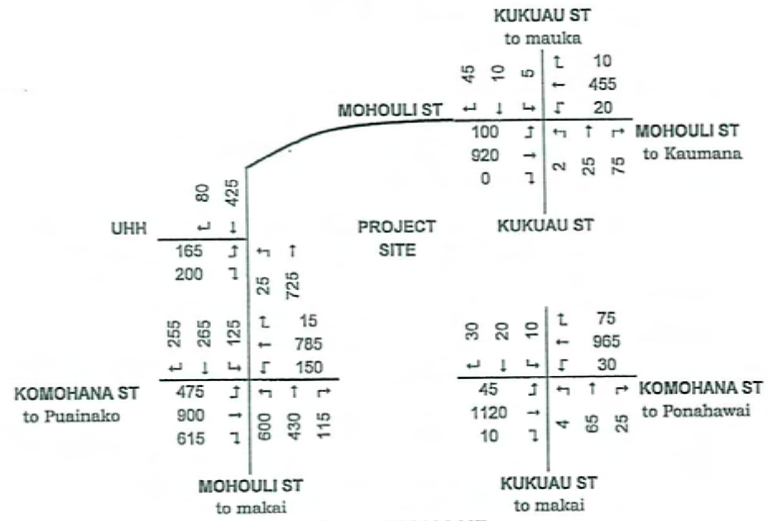
2027 UHH MAUKA PROPERTY GENERATED TRAFFIC
FIGURE 10



2017 AMBIENT TRAFFIC FORECAST
FIGURE 11

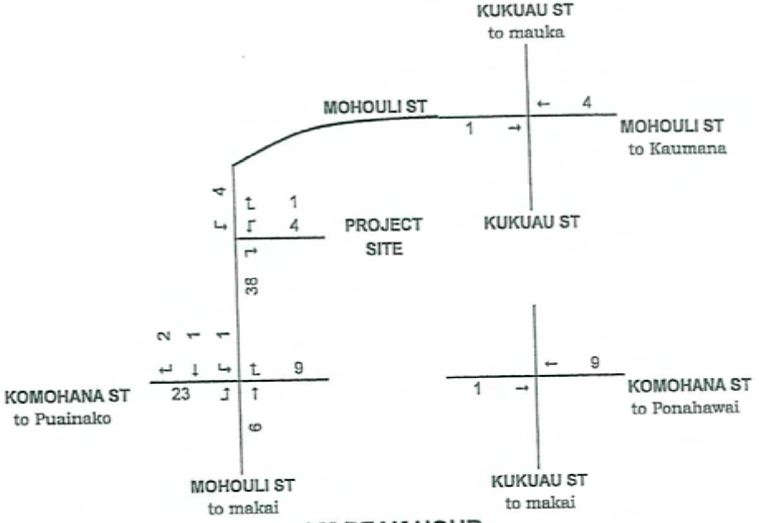


AM PEAK HOUR

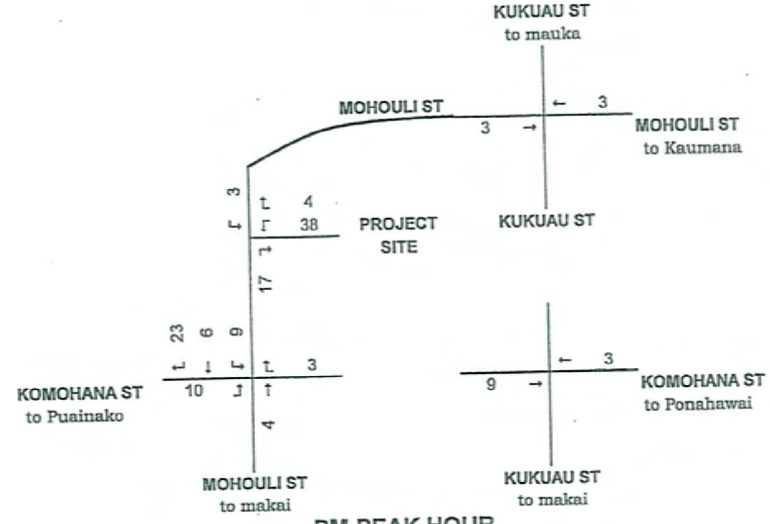


PM PEAK HOUR

2027 AMBIENT TRAFFIC FORECAST
FIGURE 12

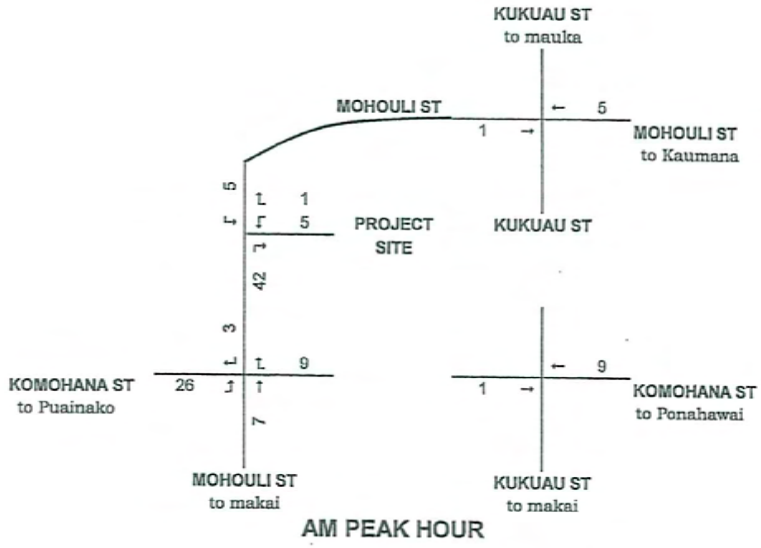


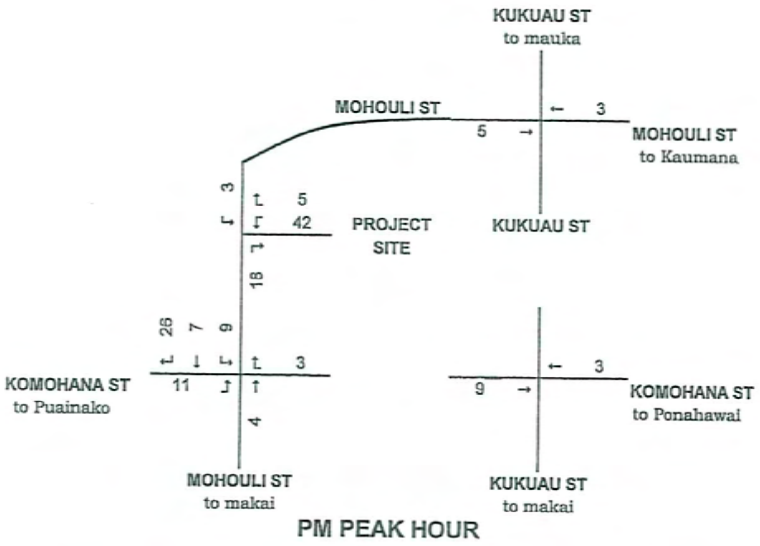
AM PEAK HOUR



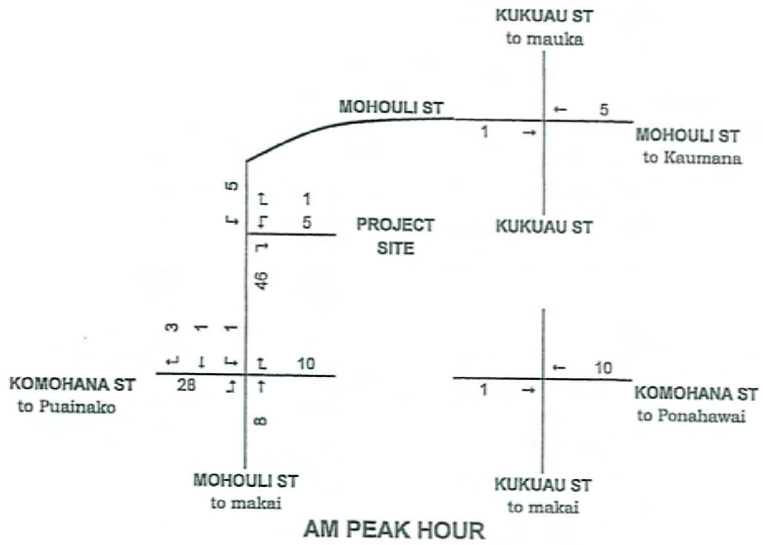
PM PEAK HOUR

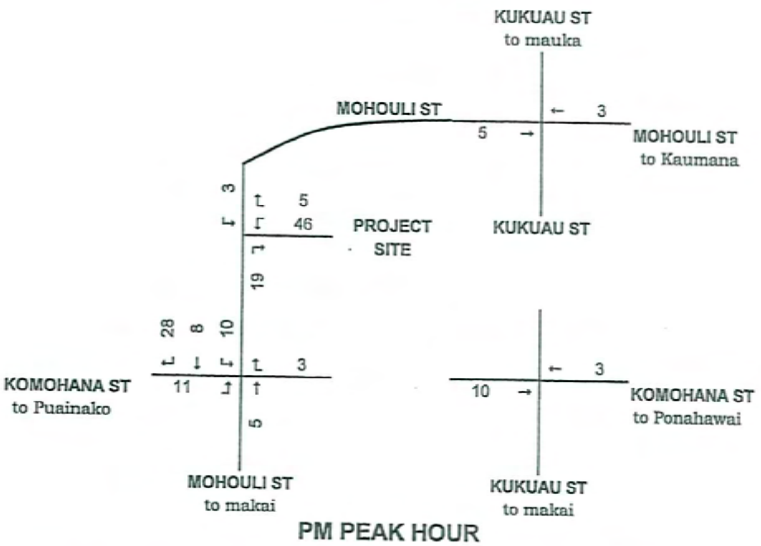
2010 (PHASE 1) PROJECT GENERATED TRAFFIC FORECAST
FIGURE 13



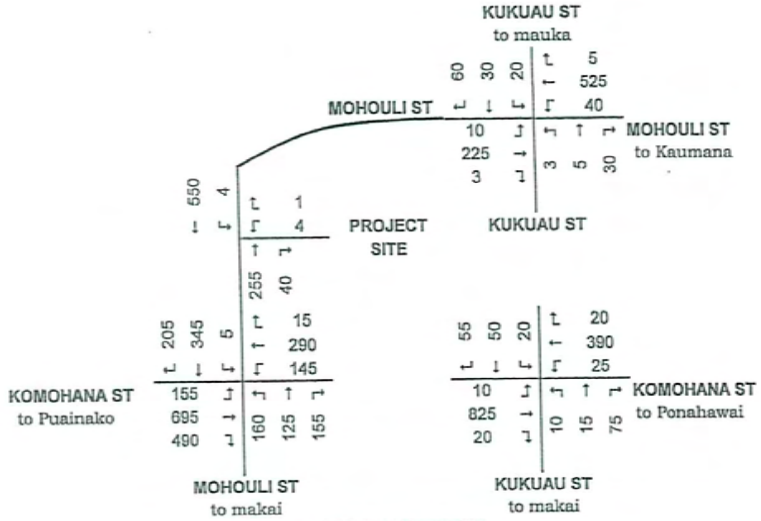


2017 (PHASE 2) PROJECT GENERATED TRAFFIC FORECAST
FIGURE 14

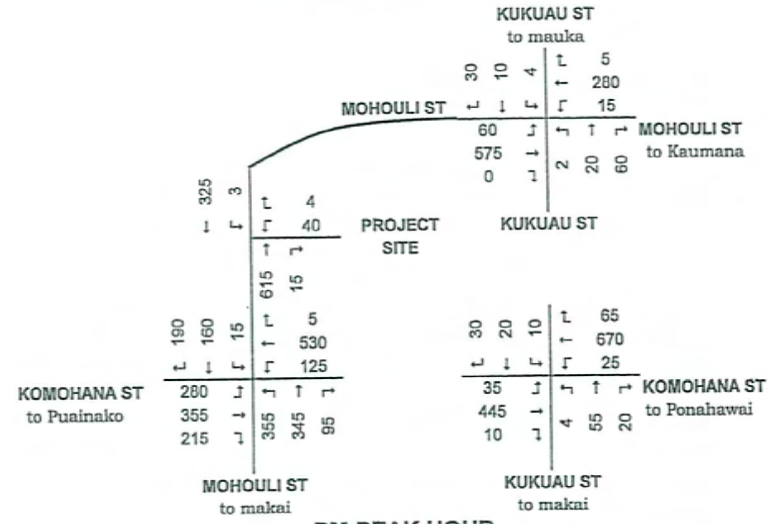




2027 (PHASE 3) PROJECT GENERATED TRAFFIC FORECAST
FIGURE 15

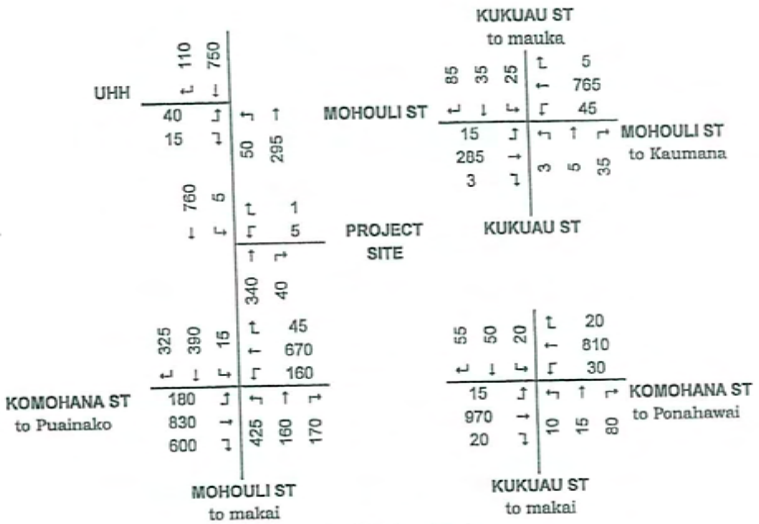


AM PEAK HOUR

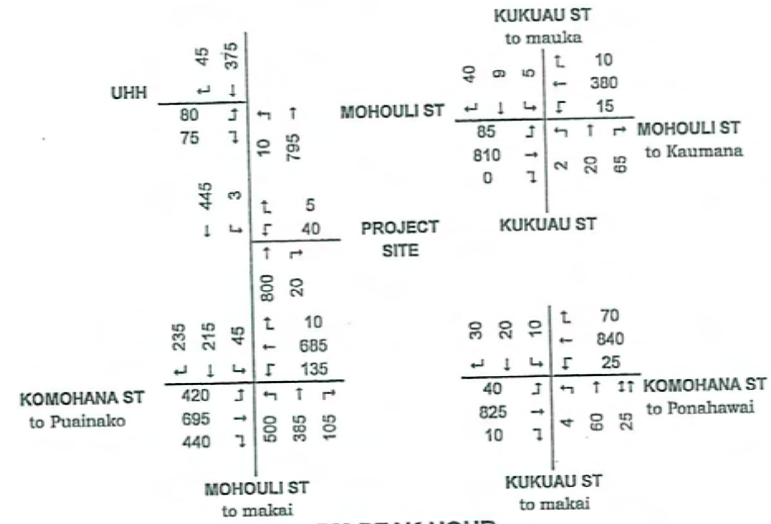


PM PEAK HOUR

2010 (PHASE 1) TOTAL WITH PROJECT TRAFFIC FORECAST
FIGURE 16

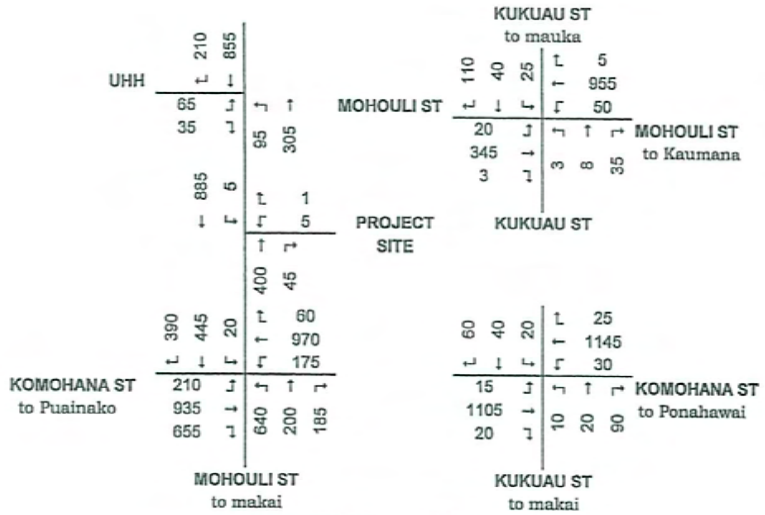


AM PEAK HOUR

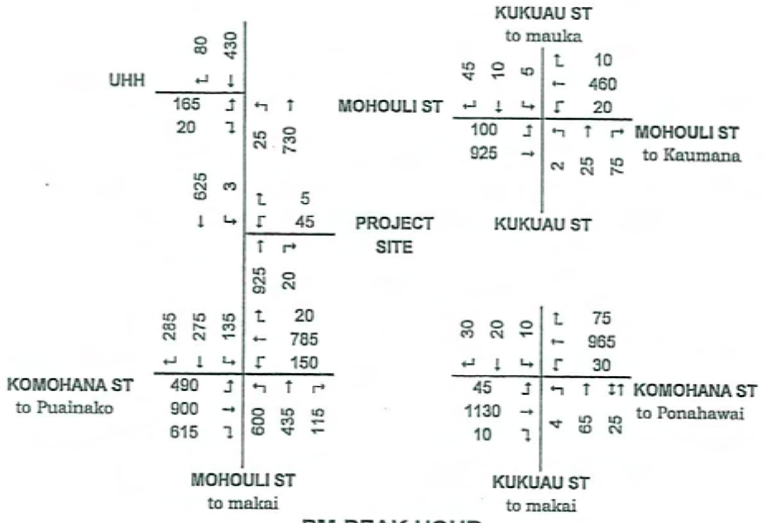


PM PEAK HOUR

2017 (PHASE 2) TOTAL WITH PROJECT TRAFFIC FORECAST
FIGURE 17



AM PEAK HOUR



PM PEAK HOUR

2027 (PHASE 3) TOTAL WITH PROJECT TRAFFIC FORECAST
FIGURE 18

TABLE 1
COUNTY OF HAWAII
FIRE DEPT FIRE ADMINISTRATION SUPPORT COMPLEX
SUMMARY OF EMPLOYEE AND SPACE REQUIREMENTS

	STAFF REQUIREMENTS			AREA REQUIRED (sf)		
COMPONENT	2007	2017	2027	2007	2017	2027
1a - Chief Officer	11	11	11	5,458	5,458	5,458
1b - Fiscal Division	8	10	12	1,487	1,719	1,913
1c - Personnel Division	3	5	7	1,033	1,249	1,465
1d - Prevention Bureau	3	10	12	1,061	1,590	1,812
1e - EMS Bureau	2	6	6	565	949	949
SUBTOTAL	27	42	48	9,604	10,965	11,597
2 - Emergency Disp	25	31	36	12,094	13,107	14,120
TOTAL	52	73	84	21,698	24,072	25,717

TABLE 2
TRIP GENERATION AND TRIP DISTRIBUTION ANALYSIS

TRIP GENERATION ANALYSIS			TRIP DISTRIBUTION Direction of Travel			
			Mohouli Mauka	Mohouli Makai	Komohana North	Komohana South
Phase 1- 21,698 sf Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 2.21X					
	T =	48	10%	15%	20%	55%
	89% in	43	4	6	9	23
			15%	20%	15%	50%
	11% out	5	1	1	1	3
PM PEAK HOUR	T = 2.85X					
	T =	62	15%	20%	15%	50%
	31% in	19	3	4	3	10
			10%	15%	20%	55%
	69% out	43	4	6	9	23
Phase 2 - 24,072 sf Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 2.21X					
	T =	53	10%	15%	20%	55%
	89% in	47	5	7	9	26
			15%	20%	15%	50%
	11% out	6	1	1	1	3
PM PEAK HOUR	T = 2.85X					
	T =	69	15%	20%	15%	50%
	31% in	21	3	4	3	11
			10%	15%	20%	55%
	69% out	47	5	7	9	26
Phase 3- 25,717 sf Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 2.21X					
	T =	57	10%	15%	20%	55%
	89% in	51	5	8	10	28
			15%	20%	15%	50%
	11% out	6	1	1	1	3
PM PEAK HOUR	T = 2.85X					
	T =	73	15%	20%	15%	50%
	31% in	23	3	5	3	11
			10%	15%	20%	55%
	69% out	51	5	8	10	28

TABLE 2
TRIP GENERATION AND TRIP DISTRIBUTION ANALYSIS

TRIP GENERATION ANALYSIS			TRIP DISTRIBUTION Direction of Travel			
			Mohouli Mauka	Mohouli Makai	Komohana North	Komohana South
Phase 1 - 52 Employee Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 0.61X					
	T =	32	10%	15%	20%	55%
	89% in	28	3	4	6	16
			15%	20%	15%	50%
	11% out	3	0	1	0	2
PM PEAK HOUR	T = 0.79X					
	T =	41	15%	20%	15%	50%
	31% in	13	2	3	2	6
			10%	15%	20%	55%
	69% out	28	3	4	6	16
Phase 2 - 73 Employee Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 0.61X					
	T =	45	10%	15%	20%	55%
	89% in	40	4	6	8	22
			15%	20%	15%	50%
	11% out	5	1	1	1	2
PM PEAK HOUR	T = 0.79X					
	T =	58	15%	20%	15%	50%
	31% in	18	3	4	3	9
			10%	15%	20%	55%
	69% out	40	4	6	8	22
Phase 3 - 84 Employee Fire Support Complex [LU 733]						
AM PEAK HOUR	T = 0.61X					
	T =	51	10%	15%	20%	55%
	89% in	46	5	7	9	25
			15%	20%	15%	50%
	11% out	6	1	1	1	3
PM PEAK HOUR	T = 0.79X					
	T =	66	15%	20%	15%	50%
	31% in	21	3	4	3	10
			10%	15%	20%	55%
	69% out	46	5	7	9	25

TABLE 3
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

INTERSECTION/PEAK HOUR	EXISTING		2010					2017					2027					2027 w/ Mohouli 4 Lanes				
Approach/Movement			Ambient		Total			Ambient		Total			Ambient		Total			Ambient		Total		
	LOS	Delay	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay	
MOHOULI ST/ KUKUAU ST																						
AM PEAK HOUR																						
Kukuau St Westbound	B	12.4	B	13.3	B	13.3		C	18.0	C	18.5		D	31.4	D	31.9		C	21.0	C	21.1	
Kukuau St Eastbound	C	18.9	C	22.4	C	22.6		F	61.1	F	62.5		F	>100	F	>100		F	>100	F	>100	
Mohouli St Northbound LT	A	8.4	A	8.7	A	8.7		A	9.7	A	9.7		B	10.6	B	10.7		B	10.7	B	10.7	
Mohouli St Southbound LT	A	7.8	A	7.9	A	7.9		A	8.1	A	8.1		A	8.3	A	8.3		A	8.3	A	8.3	
PM PEAK HOUR																						
Kukuau St Westbound	C	17.4	C	20.8	C	21.0		E	44.1	E	44.1		F	98.0	F	>100		F	62.1	F	63.7	
Kukuau St Eastbound	C	15.1	C	16.9	C	17.0		D	33.4	D	33.4		F	79.3	F	82.3		E	36.8	E	37.5	
Mohouli St Northbound LT	A	8.0	A	8.1	A	8.1		A	8.5	A	8.5		A	8.9	A	8.9		A	8.9	A	8.9	
Mohouli St Southbound LT	A	8.7	A	9.0	A	9.1		B	10.2	B	10.2		B	10.9	B	10.9		B	10.9	B	11.0	

INTERSECTION/PEAK HOUR	EXISTING		2010					2017					2017 w/ 4 lanes				
Approach/Movement			Ambient		Total			Ambient		Total			Ambient		Total		
	LOS	Delay	LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay		LOS	Delay	LOS	Delay	
KOMOHANA ST/ KUKUAU ST																	
AM PEAK HOUR																	
Kukuau St Westbound Thru	C	21.6	D	26.4	D	26.7		F	67.5	NA			E	45.0	NA		
Kukuau St Westbound LT	E	44.0	F	72.9	F	75.1											
Kukuau St Eastbound	E	44.0	F	90.9	F	94.9		F	>100				F	>100			
Komohana St Northbound LT	A	7.9	A	8.3	A	8.3		A	9.9				A	10.0			
Komohana St Southbound LT	A	9.6	A	10.0	A	10.0		B	10.8				B	10.8			
PM PEAK HOUR																	
Kukuau St Westbound Thru	D	27.4	E	40.7	E	41.3		F	>100	NA			F	>100	NA		
Kukuau St Westbound LT	D	32.3	E	45.9	E	46.4		F	>100				F	84.0			
Kukuau St Eastbound	D	27.3	E	41.0	E	41.6		F	78.3				F	68.5			
Komohana St Northbound LT	A	9.0	A	9.4	A	9.4		B	10.2				B	10.3			
Komohana St Southbound LT	A	8.1	A	8.4	A	8.4		A	9.8				A	9.9			

TABLE 3 (continued)
UNSIGNALIZED INTERSECTION LEVEL OF SERVICE ANALYSIS

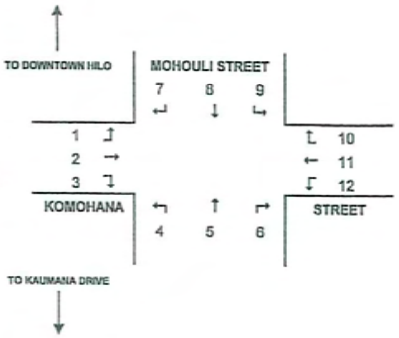
INTERSECTION/PEAK HOUR	EXISTING		2010				2017				2027				2027 w/ Mohouli 4 Lanes			
Approach/Movement			Ambient		Total		Ambient		Total		Ambient		Total		Ambient		Total	
	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay	LOS	Delay
MOHOULI ST/ PROJECT ACCESS																		
AM PEAK HOUR																		
Project Access RT					A	9.9			B	10.6			B	11.1			A	9.8
Project Access LT					C	17.3			C	24.8			D	31.9			C	19.9
Mohouli St Eastbound LT					A	7.9			A	8.2			A	8.4			A	8.4
AM PEAK HOUR																		
Project Access RT					B	13.2			C	15.9			C	18.2			B	12.4
Project Access LT					C	22.8			E	37.8			F	79.5			E	48.6
Mohouli St Eastbound LT					A	9.1			A	9.9			B	10.5			B	10.5

Appendix A

Traffic Turning Movement Counts

TRAFFIC TURNING MOVEMENT COUNT
COUNTY OF HAWAII FIRE ADMINISTRATION BUILDING

LOCATION: Komohana Street/Mohouli Street
DATE: December 11, 2007, Tuesday
TIME: 6:30a-8:30a / 3:30p-5:30p
WEATHER: Clear
RECORDER: Robert Miguel (1-6)/Carole Darby (7-12)

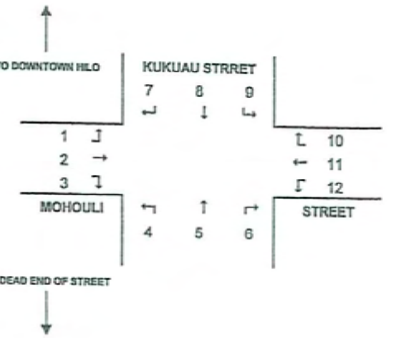


TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
6:30-6:45a	15	38	0	0	72	37	18	18	10	44	118	24	394
6:45-7:00a	20	39	0	0	89	70	19	12	16	52	127	25	469
7:00-7:15a	25	52	1	1	81	36	20	24	23	103	141	31	538
7:15-7:30a	31	47	0	1	67	31	37	31	23	115	171	22	576
7:30-7:45a	46	40	2	1	89	31	47	40	29	136	162	36	659
7:45-8:00a	37	51	3	3	93	35	43	21	29	97	167	34	613
8:00-8:15a	39	60	1	3	82	37	25	36	33	66	124	20	526
8:15-8:30a	20	38	0	0	50	23	24	24	19	45	98	17	358
6:30-8:30a	233	365	7	9	623	300	233	206	182	658	1108	209	4133
7:00-8:00a	139	190	6	6	330	133	147	116	104	451	641	123	2386
PHF	0.92			0.895			0.791			0.909			

TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
3:30-3:45p	31	121	1	1	46	31	32	65	37	41	94	36	536
3:45-4:00p	26	93	1	3	39	21	26	56	42	33	99	42	481
4:00-4:15p	30	111	1	1	41	28	26	80	50	36	85	43	532
4:15-4:30p	25	101	0	1	36	40	23	55	58	39	60	38	474
4:30-4:45p	27	122	1	4	29	31	18	100	92	40	72	67	603
4:45-5:00p	35	117	1	0	42	35	26	87	76	35	57	48	559
5:00-5:15p	31	111	0	0	39	35	24	87	76	42	67	40	552
5:15-5:30p	17	98	1	0	23	31	20	75	59	35	51	37	447
3:30-5:30p	222	874	6	10	295	252	195	605	488	301	585	351	4184
4:15-5:15p	118	451	2	5	146	141	91	329	300	156	256	193	2188
PHF	0.933			0.948			0.857			0.845			

TRAFFIC TURNING MOVEMENT COUNT
COUNTY OF HAWAII FIRE ADMINISTRATION BUILDING

LOCATION: Kukuau Street/Mohouli Street
DATE: December 12, 2007, Wednesday
TIME: 6:30a-8:30a / 3:30p-5:30p
WEATHER: Clear
RECORDER: Robert Miguel (1-6)/Carole Darby (7-12)

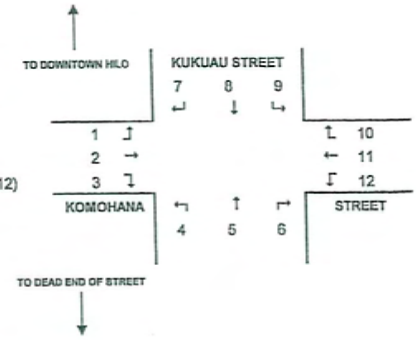


TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
6:30-6:45a	7	108	0	1	2	7	0	0	2	0	33	0	160
6:45-7:00a	2	155	1	2	1	9	4	1	1	1	35	3	215
7:00-7:15a	3	126	0	3	6	9	6	4	2	0	39	4	202
7:15-7:30a	14	130	2	8	9	15	5	1	0	0	56	1	241
7:30-7:45a	14	99	0	5	8	14	8	1	1	2	54	4	210
7:45-8:00a	9	89	3	4	7	13	10	0	0	1	58	2	196
8:00-8:15a	5	88	1	2	5	10	4	4	0	1	66	6	192
8:15-8:30a	3	73	3	4	5	6	5	3	0	0	42	5	149
6:30-8:30a	57	868	10	29	43	83	42	14	6	5	383	25	1565
7:00-8:00a	40	444	5	20	30	51	29	6	3	3	207	11	849
PHF	0.837									0.921			

TIME PERIOD	MOVEMENT NUMBER 1	2	3	4	5	6	7	8	9	10	11	12	TOTAL
3:30-3:45p	4	67	1	2	6	8	5	6	1	1	79	6	186
3:45-4:00p	1	55	0	0	4	4	11	4	0	1	86	13	179
4:00-4:15p	2	55	4	0	2	5	5	4	0	1	93	6	177
4:15-4:30p	1	46	3	1	3	5	8	4	0	1	108	12	192
4:30-4:45p	2	56	1	0	1	6	14	7	0	0	143	18	248
4:45-5:00p	3	65	2	2	2	6	14	4	2	0	119	13	232
5:00-5:15p	5	65	3	2	2	6	15	2	0	0	124	9	233
5:15-5:30p	5	61	1	0	3	7	14	6	0	0	104	13	214
3:30-5:30p	23	470	15	7	23	47	86	37	3	4	856	90	1661
4:30-5:30p	15	247	7	4	8	25	57	19	2	0	490	53	927
PHF	0.921									0.843			

TRAFFIC TURNING MOVEMENT COUNT
COUNTY OF HAWAII FIRE ADMINISTRATION BUILDING

LOCATION: Kukuau Street/Komohana Street
DATE: December 13, 2007, Thursday
TIME: 6:30a-8:30a / 3:30p-5:30p
WEATHER: Clear
RECORDER: Robert Miguel (1-6)/Carole Darby (7-12)



TIME PERIOD	MOVEMENT NUMBER												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
6:30-6:45a	1	42	2	3	8	5	2	1	1	1	127	0	193
6:45-7:00a	1	57	2	6	3	5	10	1	1	1	149	0	236
7:00-7:15a	2	70	4	3	11	9	8	4	3	3	173	2	292
7:15-7:30a	11	74	1	7	10	13	18	3	1	6	188	4	336
7:30-7:45a	9	63	8	6	13	18	22	5	2	4	190	1	341
7:45-8:00a	3	71	5	5	15	14	22	3	2	4	210	4	358
8:00-8:15a	10	75	6	7	5	6	6	5	1	2	170	2	295
8:15-8:30a	2	72	6	6	5	2	3	1	0	7	111	5	220
6:30-8:30a	39	524	34	43	70	72	91	23	11	28	1318	18	2271
7:00-8:00a	25	278	18	21	49	54	70	15	8	17	761	11	1327
PHF	0.933									0.905			

TIME PERIOD	MOVEMENT NUMBER												TOTAL
	1	2	3	4	5	6	7	8	9	10	11	12	
3:30-3:45p	6	161	10	2	7	6	5	12	1	4	104	5	323
3:45-4:00p	5	129	10	6	7	4	7	10	2	5	105	9	299
4:00-4:15p	4	153	13	1	3	4	6	4	2	1	89	4	284
4:15-4:30p	2	125	15	3	7	8	4	9	1	5	68	7	254
4:30-4:45p	6	165	17	2	5	5	7	16	0	2	90	10	325
4:45-5:00p	7	146	15	2	7	7	4	10	2	1	102	7	310
5:00-5:15p	7	145	14	3	1	8	6	17	1	2	75	10	289
5:15-5:30p	7	102	14	2	7	4	5	11	3	6	80	10	251
3:30-5:30p	44	1126	108	21	44	46	44	89	12	26	713	62	2335
4:15-5:15p	22	581	61	10	20	28	21	52	4	10	335	34	1178
PHF	0.883									0.861			

Appendix B

Unsignalized Intersection Level of Service (LOS) Calculations

CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	12/25/200
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	EX AM 2007	Minor Street	KUKUAU ST
Comment	2007 EXISTING AM		

Site Information

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	207	3	40	444	5	3	6	29	20	30	51
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	13	246	4	43	483	5	3	7	32	22	33	57
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	42	527	.08	<1	12.4	B	12.4
	2								B
	3								
EB	1	LTR	112	369	.303	1	18.9	C	18.9
	2								C
	3								
	①		13	1070	.012	<1	8.4	A	
	④		43	1310	.033	<1	7.8	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB AM 2010	Minor Street	KUKUAU ST
Comment	2010 AMBIENT AM		

Site Information

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	222	3	42	520	5	3	6	29	21	31	59
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	13	264	4	46	565	5	3	7	32	23	34	66
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	42	476	.088	<1	13.3	B	13.3
	2								B
	3								
EB	1	LTR	123	328	.375	2	22.4	C	22.4
	2								C
	3								
	①		13	997	.013	<1	8.7	A	
	④		46	1290	.035	<1	7.9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT AM 2010	Minor Street	KUKUAU ST
Comment	2010 TOTAL AM		

Site Information

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	223	3	42	524	5	3	6	29	21	31	59
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	13	265	4	46	570	5	3	7	32	23	34	66
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	42	474	.089	<1	13.3	B	13.3
	2								B
	3								
EB	1	LTR	123	325	.378	2	22.6	C	22.6
	2								C
	3								
	①		13	993	.013	<1	8.7	A	
	④		46	1289	.035	<1	7.9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB AM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT AM		

Site Information

Input Data

Lane Configuration	NB			SB			WB			EB		
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	17	284	3	46	762	6	3	7	33	23	35	87
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	20	338	4	50	828	7	3	8	37	26	39	97
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	47	324	.145	1	18	C	18
	2								C
	3								
EB	1	LTR	162	213	.76	5	61.1	F	61.1
	2								F
	3								
	①		20	794	.025	<1	9.7	A	
	④		59	1212	.041	<1	8.1	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT AM 2017	Minor Street	KUKUAU ST
Comment	2017 TOTAL AM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)				
Lane 2	L	L		
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	17	285	3	46	767	6	3	7	33	23	35	87
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	20	339	4	50	834	7	3	8	37	26	39	97
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	48	314	.153	1	18.5	C	18.5
	2								C
	3								
EB	1	LTR	162	211	.767	5	62.5	F	62.5
	2								F
	3								
	①		20	791	.026	<1	9.7	A	
	④		50	1211	.041	<1	8.1	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB AM 2027	Minor Street	KUKUAU ST
Comment	2027 AMBIENT AM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)				
Lane 2	L	L		
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	22	344	3	51	950	7	3	8	36	25	39	108
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	26	410	4	55	1033	8	3	9	40	28	43	120
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	52	188	.277	1	31.4	D	31.4
	2								D
	3								
EB	1	LTR	191	146	1.312	12	239.7	F	239.7
	2								F
	3								
	①		26	665	.039	<1	10.6	B	
	④		55	1140	.049	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT AM 2027	Minor Street	KUKUAU ST
Comment	2027 TOTAL AM W/1LANE		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)				
Lane 2	L	L		
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	22	345	3	51	955	7	3	8	36	25	39	108
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	26	411	4	55	1038	8	3	9	40	28	43	120
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	52	185	.281	1	31.9	D	31.9
	2								D
	3								
EB	1	LTR	191	144	1.325	12	245.2	F	245.2
	2								F
	3								
	①		26	661	.04	<1	10.7	B	
	④		55	1139	.049	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB AM 2027	Minor Street	KUKUAU ST
Comment	2027 AMBIENT AM W/4LANES		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)				
Lane 2	T	T		
Lane 3	L	L		

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	22	344	3	51	950	7	3	8	36	25	39	108
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	26	410	4	55	1033	8	3	9	40	28	43	120
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	52	277	.188	1	21	C	21
	2								C
	3								
EB	1	LTR	191	182	1.05	9	133.5	F	133.5
	2								F
	3								
	①		26	658	.04	<1	10.7	B	
	④		55	1135	.049	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT AM 2027	Minor Street	KUKUAU ST
Comment	2027 TOTAL AM W/4LANES		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	T			T								
Lane 3	L			L								
	NB			SB			WB			EB		
Movement	1 (L)	2 (T)	3 (R)	4 (L)	5 (T)	6 (R)	7 (L)	8 (T)	9 (R)	10 (L)	11 (T)	12 (R)
Volume (veh/h)	22	345	3	51	955	7	3	8	36	25	39	108
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	26	411	4	55	1038	8	3	9	40	28	43	120
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 ____ ft Movement 5 ____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	52	275	.189	1	21.1	C	21.1
	2								
	3								C
EB	1	LTR	191	180	1.06	9	136.9	F	136.9
	2								
	3								F
		①	26	655	.04	<1	10.7	B	
		④	55	1134	.049	<1	8.3	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	11/25/200
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	EX PM 2007	Minor Street	KUKUAU ST
Comment	2007 EXISTING PM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (L)	2 (T)	3 (R)	4 (L)	5 (T)	6 (R)	7 (L)	8 (T)	9 (R)	10 (L)	11 (T)	12 (R)
Volume (veh/h)	53	490	0	15	247	7	2	19	57	4	8	25
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	63	583	0	16	268	8	2	21	63	4	9	28
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 ____ ft Movement 5 ____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	86	375	.229	1	17.4	C	17.4
	2								
	3								C
EB	1	LTR	41	399	.103	<1	15.1	C	15.1
	2								
	3								C
		①	63	1281	.049	<1	8	A	
		④	16	986	.017	<1	8.7	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB PM 2010	Minor Street	KUKUAU ST
Comment	2010 AMBIENT PM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)	TR			TR			LTR			LTR		
Lane 2	L			L								
Lane 3												
	NB			SB			WB			EB		
Movement	1 (L)	2 (T)	3 (R)	4 (L)	5 (T)	6 (R)	7 (L)	8 (T)	9 (R)	10 (L)	11 (T)	12 (R)
Volume (veh/h)	61	571	0	16	275	7	2	20	59	4	8	28
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	73	680	0	17	299	8	2	22	66	4	9	31
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 ____ ft Movement 5 ____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	90	317	.284	1	20.8	C	20.8
	2								
	3								C
EB	1	LTR	44	347	.127	<1	16.9	C	16.9
	2								
	3								C
		①	73	1248	.058	<1	8.1	A	
		④	17	908	.019	<1	9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT PM 2010	Minor Street	KUKUAU ST
Comment	2010 TOTAL PM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)	L	L		
Lane 2				
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	61	574	0	16	278	7	2	20	59	4	8	28
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	73	683	0	17	302	8	2	22	66	4	9	31
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	90	314	.286	1	21	C	21
	2								C
	3								
EB	1	LTR	44	344	.128	<1	17	C	17
	2								C
	3								
		①	73	1245	.059	<1	8.1	A	
		④	17	905	.019	<1	9.1	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB PM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT PM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)	L	L		
Lane 2				
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	87	803	0	17	376	8	2	22	66	5	9	38
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	104	956	0	18	409	9	2	24	73	6	10	42
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	99	187	.53	3	44.1	E	44.1
	2								E
	3								
EB	1	LTR	58	184	.316	1	33.4	D	33.4
	2								D
	3								
		①	104	1136	.091	<1	8.5	A	
		④	18	715	.026	<1	10.2	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT PM 2017	Minor Street	KUKUAU ST
Comment	2017 TOTAL PM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)	L	L		
Lane 2				
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	87	808	0	17	379	8	2	22	66	5	9	38
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	104	962	0	18	413	9	2	24	73	6	10	42
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	99	185	.536	3	45	E	45
	2								E
	3								
EB	1	LTR	58	181	.32	1	34	D	34
	2								D
	3								
		①	104	1133	.091	<1	8.5	A	
		④	18	711	.026	<1	10.2	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB PM 2027	Minor Street	KUKUAU ST
Comment	2027 AMBIENT PM		

Input Data

	NB	SB	WB	EB
Lane Configuration	TR	TR	LTR	LTR
Lane 1 (curb)	L	L		
Lane 2				
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	100	923	0	19	457	9	2	24	73	6	10	47
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	119	1098	0	21	497	10	2	27	81	7	11	52
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	110	135	.817	5	98	F	98
	2								F
	3								
EB	1	LTR	70	112	.623	3	79.3	F	79.3
	2								F
	3								
		①	119	1053	.113	<1	8.9	A	
		④	21	632	.033	<1	10.9	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT PM 2027	Minor Street	KUKUAU ST
Comment	2027 TOTAL PM W/2 LANE		

Input Data

	NB			SB			WB			EB		
Lane Configuration		TR			TR			LTR			LTR	
Lane 1 (curb)												
Lane 2		L			L							
Lane 3												
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	100	927	0	19	460	9	2	24	73	6	10	47
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	119	1104	0	21	500	10	2	27	81	7	11	52
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	110	133	.827	5	100.8	F	100.8
	2								F
	3								
EB	1	LTR	70	110	.635	3	82.3	F	82.3
	2								F
	3								
		①	119	1050	.113	<1	8.9	A	
		④	21	629	.033	<1	10.9	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	AMB PM 2027	Minor Street	KUKUAU ST
Comment	2027 AMBIENT PM W/4LANES		

Input Data

	NB			SB			WB			EB		
Lane Configuration		TR			TR			LTR			LTR	
Lane 1 (curb)												
Lane 2		T			T							
Lane 3		L			L							
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	100	922	0	19	457	9	2	24	73	6	10	47
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	119	1098	0	21	497	10	2	27	81	7	11	52
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	110	165	.667	4	62.1	F	62.1
	2								F
	3								
EB	1	LTR	70	181	.386	2	36.8	E	36.8
	2								E
	3								
		①	119	1047	.114	<1	8.9	A	
		④	21	626	.033	<1	10.9	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	MOHOULI ST
Analysis Period/Year	TOT PM 2027	Minor Street	KUKUAU ST
Comment	2027 TOTAL PM W/4 LANES		

Input Data

	NB			SB			WB			EB		
Lane Configuration		TR			TR			LTR			LTR	
Lane 1 (curb)												
Lane 2		T			T							
Lane 3		L			L							
	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	100	927	0	19	460	9	2	24	73	6	10	47
PHF	.84	.84	.84	.92	.92	.92	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	119	1104	0	21	500	10	2	27	81	7	11	52
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	LTR	110	163	.674	4	63.7	F	63.7
	2								F
	3								
EB	1	LTR	70	179	.392	2	37.5	E	37.5
	2								E
	3								
		①	119	1045	.114	<1	8.9	A	
		④	21	623	.033	<1	11	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	12/25/200
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	EX AM 2007	Minor Street	KUKUAU ST
Comment	2007 EXISTING AM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)				TR			TR			LTR		
Lane 2				L			L					
Lane 3												

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	761	17	25	278	18	8	15	70	21	49	54
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	12	810	18	28	309	20	9	17	78	23	54	60
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	95	311	.306	1	21.6	C	23.6
	2	L	9	101	.089	<1	44	E	C
	3								
EB	1	LTR	137	223	.615	4	44	E	44
	2								E
	3								
		①	12	1246	.009	<1	7.9	A	
		④	28	812	.034	<1	9.6	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB AM 2010	Minor Street	KUKUAU ST
Comment	2010 AMBIENT AM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)				TR			TR			LTR		
Lane 2				L			L					
Lane 3												

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	822	18	26	380	19	8	16	73	21	51	55
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	12	874	19	29	422	21	9	18	81	23	57	61
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	99	265	.373	2	26.4	D	30.3
	2	L	9	62	.146	<1	72.9	F	D
	3								
EB	1	LTR	141	165	.853	6	90.9	F	90.9
	2								F
	3								
		①	12	1111	.011	<1	8.3	A	
		④	29	755	.038	<1	10	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	TOT AM 2010	Minor Street	KUKUAU ST
Comment	2010 TOTAL AM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)				TR			TR			LTR		
Lane 2				L			L					
Lane 3												

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	11	823	18	26	389	19	8	16	73	21	51	55
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	12	876	19	29	432	21	9	18	81	23	57	61
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	99	263	.376	2	26.7	D	30.7
	2	L	9	60	.15	<1	75.1	F	D
	3								
EB	1	LTR	141	163	.867	6	94.9	F	94.9
	2								F
	3								
		①	12	1102	.011	<1	8.3	A	
		④	29	754	.038	<1	10	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB AM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT AM		

Input Data

	NB			SB			WB			EB		
Lane Configuration												
Lane 1 (curb)				TR			TR			LTR		
Lane 2				L			L					
Lane 3												

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	13	971	20	29	801	21	9	17	80	21	51	57
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	14	1033	21	32	890	23	10	19	89	23	57	63
Flare storage (# of vehs)									0			0
Median storage (# of vehs)							0			0		

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	108	157	.689	4	67.5	F	67.5
	2	L	10			<1			F
	3								
EB	1	LTR	143	55	2.59	15	879.6	F	879.6
	2								F
	3								
		①	14	742	.019	<1	9.9	A	
		④	32	657	.049	<1	10.8	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB AM W/MIT 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT AM W/MITIGATION		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	R
Lane 2	L	L	L	LT
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	13	971	20	29	801	21	9	17	80	21	51	57
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	14	1033	21	32	890	23	10	19	89	23	57	63
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	108	157	.689	4	67.5	F	67.5
	2	L	10			<1			F
	3								
EB	1	R	120	93	1.289	9	271.8	F	520.5
	2	LT	80	33	2.402	9	893.7	F	F
	3								
		①	14	742	.019	<1	9.9	A	
		④	32	657	.049	<1	10.8	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB AM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT AM W/ 4 LANES		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	T	T	L	
Lane 3	L	L		

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	13	971	20	29	801	21	9	17	80	21	51	57
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	14	1033	21	32	890	23	10	19	89	23	57	63
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	99	185	.536	3	45	E	45
	2	L	10			<1			E
	3								
EB	1	LTR	143	82	1.749	12	468.9	F	468.9
	2								F
	3								
		①	14	736	.019	<1	10	A	
		④	32	650	.05	<1	10.8	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	12/25/200
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	EX PM 2007	Minor Street	KUKUAU ST
Comment	2007 EXISTING PM		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	L	L	L	
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	34	335	10	22	581	61	4	52	21	10	20	28
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	36	356	11	24	646	68	4	58	23	11	22	31
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	81	240	.337	1	27.4	D	27.6
	2	L	4	136	.029	<1	32.3	D	D
	3								
EB	1	LTR	64	224	.285	1	27.3	D	27.3
	2								D
	3								
		①	36	935	.039	<1	9	A	
		④	24	1197	.02	<1	8.1	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB PM 2010	Minor Street	KUKUAU ST
Comment	2010 AMBIENT PM		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	L	L	L	
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	35	437	10	23	667	64	4	54	22	10	20	29
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	37	465	11	26	741	71	4	60	24	11	22	32
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	84	182	.462	2	40.7	E	41
	2	L	4	92	.043	<1	45.9	E	E
	3								
EB	1	LTR	65	163	.399	2	41	E	41
	2								E
	3								
		①	37	861	.043	<1	9.4	A	
		④	26	1091	.023	<1	8.4	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2009
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	TOT PM 2010	Minor Street	KUKUAU ST
Comment	2010 TOTAL PM		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	L	L	L	
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	35	440	10	23	670	64	4	54	22	10	20	29
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	37	468	11	26	744	71	4	60	24	11	22	32
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	84	180	.466	2	41.3	E	41.5
	2	L	4	91	.044	<1	46.4	E	E
	3								
EB	1	LTR	65	161	.403	2	41.6	E	41.6
	2								E
	3								
		①	37	859	.043	<1	9.4	A	
		④	26	1088	.023	<1	8.4	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2009
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB PM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT PM		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	L	L	L	
Lane 3				

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	39	818	11	25	837	70	4	60	24	10	21	30
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	41	870	12	28	930	78	4	67	27	11	23	33
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	94	77	1.221	7	269.3	F	265.4
	2	L	4	25	.159	<1	173.7	F	F
	3								
EB	1	LTR	66	110	.602	3	78.3	F	78.3
	2								F
	3								
		①	41	731	.057	<1	10.2	B	
		④	28	770	.036	<1	9.8	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2009
Agency or Company	M&E	Major Street	KOMOHANA ST
Analysis Period/Year	AMB PM 2017	Minor Street	KUKUAU ST
Comment	2017 AMBIENT PM W/4LANES		

Input Data

Lane Configuration	NB	SB	WB	EB
Lane 1 (curb)	TR	TR	TR	LTR
Lane 2	T	T	L	
Lane 3	L	L		

	NB			SB			WB			EB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)	39	818	11	25	837	70	4	60	24	10	21	30
PHF	.94	.94	.94	.9	.9	.9	.9	.9	.9	.9	.9	.9
Proportion of heavy vehicles, HV	3	3	3	3	3	3	3	3	3	3	3	3
Flow rate	41	870	12	28	930	78	4	67	27	11	23	33
Flare storage (# of vehs)									0			0
Median storage (# of vehs)								0			0	

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
WB	1	TR	94	78	1.211	7	264.8	F	257.4
	2	L	4	49	.081	<1	84	F	F
	3								
EB	1	LTR	66	118	.558	3	68.5	F	68.5
	2								F
	3								
		①	41	725	.057	<1	10.3	B	
		④	28	764	.036	<1	9.9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT AM 2010	Minor Street	PROJECT ACCESS
Comment	2010 TOTAL AM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2		L	L	
Lane 3				

Movement	WB 1 (LT)	WB 2 (TH)	WB 3 (RT)	EB 4 (LT)	EB 5 (TH)	EB 6 (RT)	SB 7 (LT)	SB 8 (TH)	SB 9 (RT)	NB 10 (LT)	NB 11 (TH)	NB 12 (RT)
Volume (veh/h)		255	40	4	550		4		1			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		283	44	4	611		4		1			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ R Movement 5 _____ R

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	1	732	.001	<1	9.9	A	15.8 C
	2	L	4	296	.014	<1	17.3	C	
	3								
NB	1								
	2								
	3								
		①							
		④	4	1226	.004	<1	7.9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT AM 2017	Minor Street	PROJECT ACCESS
Comment	2017 TOTAL AM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2		L	L	
Lane 3				

Movement	WB 1 (LT)	WB 2 (TH)	WB 3 (RT)	EB 4 (LT)	EB 5 (TH)	EB 6 (RT)	SB 7 (LT)	SB 8 (TH)	SB 9 (RT)	NB 10 (LT)	NB 11 (TH)	NB 12 (RT)
Volume (veh/h)		340	40	5	760		5		1			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		378	44	6	844		6		1			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ R Movement 5 _____ R

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	1	648	.002	<1	10.6	B	22.8 C
	2	L	6	187	.032	<1	24.8	C	
	3								
NB	1								
	2								
	3								
		①							
		④	6	1132	.005	<1	8.2	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT AM 2027	Minor Street	PROJECT ACCESS
Comment	2027 TOTAL AM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2		L	L	
Lane 3				

Movement	WB 1 (LT)	WB 2 (TH)	WB 3 (RT)	EB 4 (LT)	EB 5 (TH)	EB 6 (RT)	SB 7 (LT)	SB 8 (TH)	SB 9 (RT)	NB 10 (LT)	NB 11 (TH)	NB 12 (RT)
Volume (veh/h)		400	45	5	885		5		1			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		444	50	6	983		6		1			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ R Movement 5 _____ R

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	1	592	.002	<1	11.1	B	28.9 D
	2	L	6	140	.043	<1	31.9	D	
	3								
NB	1								
	2								
	3								
		①							
		④	6	1064	.005	<1	8.4	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information

Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT AM 2027	Minor Street	PROJECT ACCESS
Comment	2027 TOTAL AM W/4 LANES		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2	T	T	L	
Lane 3		L		

Movement	WB 1 (LT)	WB 2 (TH)	WB 3 (RT)	EB 4 (LT)	EB 5 (TH)	EB 6 (RT)	SB 7 (LT)	SB 8 (TH)	SB 9 (RT)	NB 10 (LT)	NB 11 (TH)	NB 12 (RT)
Volume (veh/h)		400	45	5	885		5		1			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		444	50	6	983		6		1			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ R Movement 5 _____ R

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	1	730	.001	<1	9.8	A	18.5 C
	2	L	6	247	.024	<1	19.9	C	
	3								
NB	1								
	2								
	3								
		①							
		④	6	1058	.005	<1	8.4	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT PM 2010	Minor Street	PROJECT ACCESS
Comment	2010 TOTAL PM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2		L	L	
Lane 3				

	WB			EB			SB			NB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		615	15	3	325		40		4			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		683	17	3	361		44		4			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	4	442	.009	<1	13.2	B	22
	2	L	44	246	.179	1	23.8	C	C
	3								
NB	1								
	2								
	3								
	①								
	④		3	892	.004	<1	9.1	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT PM 2017	Minor Street	PROJECT ACCESS
Comment	2017 TOTAL PM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2		L	L	
Lane 3				

	WB			EB			SB			NB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		800	20	3	445		40		5			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		889	22	3	494		44		6			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	6	336	.018	<1	15.9	C	35.1
	2	L	44	153	.288	1	37.8	E	E
	3								
NB	1								
	2								
	3								
	①								
	④		3	744	.004	<1	9.9	A	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT PM 2027	Minor Street	PROJECT ACCESS
Comment	2027 TOTAL PM		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2	T	T	L	
Lane 3		L		

	WB			EB			SB			NB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		925	20	3	625		45		5			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1028	22	3	694		50		6			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	6	279	.022	<1	18.2	C	72.9
	2	L	50	95	.529	2	79.5	F	F
	3								
NB	1								
	2								
	3								
	①								
	④		3	659	.005	<1	10.5	B	

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CHAPTER 17 - TWSC - UNSIGNALIZED INTERSECTIONS WORKSHEET

Analysis Summary

General Information		Site Information	
Analyst	WY	Jurisdiction/Date	2/6/2008
Agency or Company	M&E PACIFIC	Major Street	MOHOULI STREET
Analysis Period/Year	TOT PM 2027	Minor Street	PROJECT ACCESS
Comment	2027 TOTAL PM W/4 LANES		

Input Data

Lane Configuration	WB	EB	SB	NB
Lane 1 (curb)	TR	T	R	
Lane 2	T	T	L	
Lane 3		L		

	WB			EB			SB			NB		
Movement	1 (LT)	2 (TH)	3 (RT)	4 (LT)	5 (TH)	6 (RT)	7 (LT)	8 (TH)	9 (RT)	10 (LT)	11 (TH)	12 (RT)
Volume (veh/h)		925	20	3	625		45		5			
PHF		.9	.9	.9	.9		.9		.9			
Proportion of heavy vehicles, HV		3	3	3	3		3		3			
Flow rate		1028	22	3	694		50		6			
Flare storage (# of vehs)									0			
Median storage (# of vehs)							0					

Signal upstream of Movement 2 _____ ft Movement 5 _____ ft

Length of study period (h) .25

Output Data

	Lane	Movement	Flow Rate (veh/h)	Capacity (veh/h)	v/c	Queue Length (veh)	Control Delay (s)	LOS	Approach Delay and LOS
SB	1	R	6	495	.012	<1	12.4	B	44.7
	2	L	50	131	.382	2	48.6	E	E
	3								
NB	1								
	2								
	3								
	①								
	④		3	653	.005	<1	10.5	B	

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Appendix C

Signalized Intersection Level of Service (LOS) Calculations

CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: EX AM W/LOW 2007
Comment: 2007 EXISTING AM W/LOWER NB THRUPU

Jurisdiction/Date: 12/27/2007
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	6	330	133	104	116	147	123	641	451	139	190	6
RTOR volume (veh/h)			25			10			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	LTR	R					
SB	L	LTR						
Green (s)	10	56	7	6	32			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 128 — Lost time per cycle (s): 15 — Critical v/c Ratio: .564

Intersection Performance

Lane group configuration	EB			WB			NB			SB		
	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	1	1	1	1	
Flow rate (veh/h)	8	413	135	116	281		134	697	436	153	215	
Capacity (veh/h)	41	466	594	138	562		612	643	804	235	811	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1711		1770	1471	1583	1770	1854	
v/c ratio	.181	.886	.227	.836	.501		.218	1.083	.542	.651	.266	
g/C ratio	.023	.25	.375	.078	.328		.563	.438	.508	.563	.458	
Average back of queue (veh)	3	17	3.5	5	8.6		2.4	36.4	11.4	4.2	5.1	
Uniform delay (d)	61.3	46.2	27.3	58.2	34.6		13.7	35	21.4	23.6	22.9	
Incremental delay (d2)	0	18.2	0	33.8	.7		0	60	.8	6.3	0	
Initial queue delay (d3)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	61.3	64.4	27.3	92	35.3		13.7	96	22.2	29.9	22.9	
LOS	E	E	C	F	D		B	F	C	C	C	
Approach delay (d)/LOS	55.4	/	E	51.8	/	D	61.9	/	E	25.8	/	C
Intersection delay (d)/ LOS	53.8			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB AM W/LOW 2010
Comment: 2010 AMB AM W/LOWER NB THRUPU

Jurisdiction/Date: 1/24/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	6	344	202	159	121	153	134	697	490	145	288	6
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	LTR	R					
SB	L	LTR						
Green (s)	10	51	5	6	47			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 170 — Lost time per cycle (s): 18 — Critical v/c Ratio: 1.08

Intersection Performance

Lane group configuration	EB			WB			NB			SB		
	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	1	1	1	1	
Flow rate (veh/h)	8	430	190	177	282		146	758	478	159	323	
Capacity (veh/h)	52	515	587	125	576		522	701	857	197	885	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1716		1770	1471	1583	1770	1857	
v/c ratio	.144	.835	.324	1.414	.49		.279	1.081	.558	.811	.365	
g/C ratio	.029	.276	.371	.071	.335		.571	.476	.541	.571	.476	
Average back of queue (veh)	4	21.8	6.8	15.7	11.3		3.6	48.8	16	6.9	10.2	
Uniform delay (d)	80.4	57.9	38.3	79	44.9		18.4	44.5	25.6	33.1	28.2	
Incremental delay (d2)	0	11.4	0	226.9	.6		0	58.1	.8	22	0	
Initial queue delay (d3)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	80.4	69.3	38.3	305.9	45.5		18.4	102.6	26.4	55.1	28.2	
LOS	F	E	D	F	D		B	F	C	E	C	
Approach delay (d)/LOS	60	/	E	145.8	/	F	67.4	/	E	37.1	/	D
Intersection delay (d)/ LOS	73			/			E					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/27/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: TOT AM W/ LOW 2010 | NB/SB Street: KOMOHANA S
Comment: 2010 TOTAL AM W/LOWER NB THRU/PU

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	7	345	204	159	127	153	157	697	490	145	288	15
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L,TR	TR			
NB	L	L,TR	R					
SB	L	L,TR						
Green (s)	10	81	5	6	47			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 170 | Lost time per cycle (s): 18 | Critical v/c Ratio: 1.083

Intersection Performance

	EB			WB			NB			SB	
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR
No. of lanes	1	1	1	1	1		1	1	1	1	1
Flow rate (veh/h)	9	431	193	177	289		171	758	478	159	333
Capacity (veh/h)	52	515	587	125	577		514	701	857	197	881
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1720		1770	1471	1583	1770	1849
v/c ratio	.168	.837	.328	1.414	.501		.332	1.083	.558	.813	.378
g/C ratio	.029	.276	.371	.071	.335		.571	.476	.541	.571	.476
Average back of queue (veh)	.4	21.9	6.9	15.7	11.6		4.4	48.8	16	6.9	10.6
Uniform delay (s)	80.5	57.9	38.3	79	45.1		18.8	44.5	25.6	33.1	28.4
Incremental delay (s)	0	11.6	0	226.9	.7		0	58.1	.8	22	0
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0
Delay (s)	80.5	69.5	38.3	305.9	45.8		18.8	102.6	26.4	55.1	28.4
LOS	F	E	D	F	D		B	F	C	E	C
Approach delay (s)/LOS	60.2 / E			144.5 / F			66.5 / E			37.1 / D	
Intersection delay (s)/ LOS	72.5 / E										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/28/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: TOT AM W/4 L 2010 | NB/SB Street: KOMOHANA S
Comment: 2010 TOTAL AM W/4 LANES

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	7	345	204	159	127	153	151	697	490	145	288	15
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L,TR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	15	29	8	8	24			
Yellow + All red (s)	5	6	1	5	6			

Cycle (s): 107 | Lost time per cycle (s): 18 | Critical v/c Ratio: .803

Intersection Performance

	EB			WB			NB			SB	
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR
No. of lanes	1	1	1	1	1		1	2	1	1	2
Flow rate (veh/h)	9	431	193	177	289		164	758	478	159	333
Capacity (veh/h)	132	418	666	281	595		248	961	636	248	954
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1720		1770	3547	1583	1770	3520
v/c ratio	.066	1.032	.289	.628	.486		.662	.788	.752	.642	.349
g/C ratio	.075	.224	.421	.159	.346		.14	.271	.402	.14	.271
Average back of queue (veh)	.3	18.7	4	5.5	7.3		5.2	12.6	13.8	5	4.5
Uniform delay (s)	46	41.5	20.4	42	27.5		43.6	36.2	27.4	43.5	31.4
Incremental delay (s)	0	52.6	0	4.4	.6		6.4	4.5	5	5.6	0
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0
Delay (s)	46	94.1	20.4	46.4	28.1		50	40.7	32.4	49.1	31.4
LOS	D	F	C	D	C		D	D	C	D	C
Approach delay (s)/LOS	71 / E			35.1 / D			38.9 / D			37.1 / D	
Intersection delay (s)/ LOS	44.8 / D										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/28/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: AMB AM W/4 L 2010 | NB/SB Street: KOMOHANA S
Comment: 2010 AMBIENT AM W/4 LANES

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	6	344	202	159	121	153	134	697	490	145	288	6
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L,TR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	15	29	8	8	24			
Yellow + All red (s)	5	6	1	5	6			

Cycle (s): 107 | Lost time per cycle (s): 18 | Critical v/c Ratio: .799

Intersection Performance

	EB			WB			NB			SB	
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR
No. of lanes	1	1	1	1	1		1	2	1	1	2
Flow rate (veh/h)	8	430	190	177	282		146	758	478	159	323
Capacity (veh/h)	132	418	666	281	594		248	961	636	248	958
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1716		1770	3547	1583	1770	3536
v/c ratio	.057	1.029	.285	.628	.475		.587	.788	.752	.642	.337
g/C ratio	.075	.224	.421	.159	.346		.14	.271	.402	.14	.271
Average back of queue (veh)	.2	18.5	4	5.5	7.1		4.5	12.6	13.8	5	4.3
Uniform delay (s)	46	41.5	20.4	42	27.4		43.1	36.2	27.4	43.5	31.3
Incremental delay (s)	0	51.7	0	4.4	.5		3.6	4.5	5	5.6	0
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0
Delay (s)	46	93.2	20.4	46.4	27.9		46.7	40.7	32.4	49.1	31.3
LOS	D	F	C	D	C		D	D	C	D	C
Approach delay (s)/LOS	70.6 / E			35 / C			38.4 / D			37.2 / D	
Intersection delay (s)/ LOS	44.5 / D										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/27/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: AMB AM W/MW 2010 | NB/SB Street: KOMOHANA S
Comment: 2010 AMB AM W/MOHOULI WIDE

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	6	344	202	159	121	153	134	697	490	145	288	6
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT Pr: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L,TR	TR			
NB	L	L,TR	R					
SB	L	L,TR						
Green (s)	10	81	5	6	47			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 170 | Lost time per cycle (s): 18 | Critical v/c Ratio: .91

Intersection Performance

	EB			WB			NB			SB	
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR
No. of lanes	1	2	1	2	1		1	1	1	1	1
Flow rate (veh/h)	8	430	190	177	282		146	758	478	159	323
Capacity (veh/h)	88	554	406	515	472		569	744	940	241	940
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1716		1770	1471	1583	1770	1857
v/c ratio	.085	.776	.468	.343	.598		.256	1.018	.509	.662	.344
g/C ratio	.05	.156	.256	.15	.275		.606	.506	.594	.606	.506
Average back of queue (veh)	.3	11	7.6	3.8	11.8		3.1	43.3	13.3	5.1	9.1
Uniform delay (s)	72.5	64.8	50.3	60.9	50.3		14.6	39.5	18.9	26.9	23.6
Incremental delay (s)	0	6.9	.7	0	2.1		0	37.5	.5	6.6	0
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0
Delay (s)	72.5	71.7	51	60.9	52.4		14.6	77	19.4	33.5	23.6
LOS	E	E	D	E	D		B	E	B	C	C
Approach delay (s)/LOS	65.4 / E			55.7 / E			50.5 / D			26.9 / C	
Intersection delay (s)/ LOS	50.6 / D										

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: TOT AM W/M/W 2010
Comment: 2010 TOT AM W/MOHOULI WIDE

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	7	345	204	159	127	153	157	697	490	145	288	15
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (b/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L-TR	TR			
NB	L	L-TR	R					
SB	L	L-TR						
Green (s)	10	81	8	15	25			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 160 | Lost time per cycle (s): 18 | Critical v/c Ratio: .913

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	1	1	1	1	
Flow rate (veh/h)	9	431	193	177	289		171	758	478	159	333	
Capacity (veh/h)	88	554	406	515	473		561	744	940	241	936	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1720		1770	1471	1583	1770	1849	
v/c ratio	.099	.778	.474	.343	.611		.304	1.018	.509	.662	.356	
g/C ratio	.05	.156	.256	.15	.275		.606	.506	.594	.606	.506	
Average back of queue (veh)	.4	11.1	7.7	3.8	12.1		3.8	43.3	13.3	5.1	9.4	
Uniform delay (d)	72.6	64.8	50.4	60.9	50.5		14.8	39.5	18.9	26.9	23.8	
Incremental delay (d)	0	7	.7	0	2.3		0	37.5	.5	6.6	0	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	72.6	71.8	51.1	60.9	52.8		14.9	77	19.4	33.5	23.8	
LOS	E	E	D	E	D		B	E	B	C	C	
Approach delay (d)/LOS	65.5	/	E	55.9	/	E	49.9	/	D	26.9	/	C
Intersection delay (d)/ LOS	50.4			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB AM W/LOW 2017
Comment: 2017 AMB AM W/LOWER NB THRUFU

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	12	390	323	427	153	169	152	828	600	160	670	37
RTOR volume (veh/h)			50			20			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (b/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	L-TR	TR			
NB	L	L-TR	R					
SB	L	L-TR						
Green (s)	18	83	5	20	47			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 194 | Lost time per cycle (s): 18 | Critical v/c Ratio: 1.495

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	1	1	1	1	
Flow rate (veh/h)	15	488	341	474	336		165	900	598	176	777	
Capacity (veh/h)	46	451	579	237	631		203	629	767	203	791	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1725		1770	1471	1583	1770	1848	
v/c ratio	.329	1.08	.589	2	.532		.815	1.43	.779	.868	.983	
g/C ratio	.026	.242	.366	.134	.366		.552	.428	.485	.552	.428	
Average back of queue (veh)	.9	35.4	16	56.1	15.2		8.5	84.9	29.6	9.8	50.3	
Uniform delay (d)	92.9	73.5	49.7	84	48.4		63.6	55.5	41.4	88.6	54.8	
Incremental delay (d)	0	65.6	1.6	464.9	.9		22.1	202.8	5.2	30.6	27.6	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	92.9	139.1	51.3	548.9	49.3		85.7	258.3	46.6	119.2	82.4	
LOS	F	F	D	F	D		F	F	D	F	F	
Approach delay (d)/LOS	102.8	/	F	341.9	/	F	165.1	/	F	89.2	/	F
Intersection delay (d)/ LOS	169.4			/			F					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB AM W/4 L 2017
Comment: 2017 AMB AM W/4 LANES

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	12	390	323	427	153	169	152	828	600	160	670	37
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (b/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	16	38	8	20	28			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 131 | Lost time per cycle (s): 18 | Critical v/c Ratio: 1.158

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	2	1	1	2	
Flow rate (veh/h)	15	488	341	474	347		165	900	598	176	777	
Capacity (veh/h)	108	398	604	392	683		216	1029	628	216	1021	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1720		1770	3547	1583	1770	3519	
v/c ratio	.139	1.224	.565	1.211	.508		.764	.875	.951	.813	.761	
g/C ratio	.061	.214	.382	.221	.397		.122	.29	.397	.122	.29	
Average back of queue (veh)	.6	31.2	10.6	29.9	10.2		6.8	19.4	26.4	7.4	15.2	
Uniform delay (d)	58.2	51.5	31.9	51	29.8		55.7	44.2	38.5	56	42.4	
Incremental delay (d)	0	121.5	1.2	116.5	.6		15	8.5	24.4	20.7	3.4	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	58.2	173	33.1	167.5	30.4		70.7	52.7	62.7	76.7	45.8	
LOS	E	F	C	F	C		E	D	E	E	D	
Approach delay (d)/LOS	114.4	/	F	109.6	/	F	58.3	/	E	51.5	/	D
Intersection delay (d)/ LOS	77.6			/			E					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: TOT AM W/4 L 2017
Comment: 2017 TOT AM W/4 LANES

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	13	391	326	427	160	169	178	828	600	160	670	46
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (b/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	16	38	8	20	28			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 131 | Lost time per cycle (s): 18 | Critical v/c Ratio: 1.152

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	2	1	1	2	
Flow rate (veh/h)	16	489	345	474	354		193	900	598	176	787	
Capacity (veh/h)	108	398	604	392	684		216	1029	628	216	1019	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1723		1770	3547	1583	1770	3513	
v/c ratio	.15	1.228	.571	1.211	.518		.895	.875	.951	.813	.772	
g/C ratio	.061	.214	.382	.221	.397		.122	.29	.397	.122	.29	
Average back of queue (veh)	.6	31.4	10.8	29.9	10.5		8.7	19.4	26.4	7.4	15.6	
Uniform delay (d)	58.3	51.5	32	51	30		56.7	44.2	38.3	56	42.5	
Incremental delay (d)	0	122.8	1.3	116.5	.7		34.4	8.5	24.4	20.7	3.7	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (d)	58.3	174.3	33.3	167.5	30.7		91.1	52.7	62.7	76.7	46.2	
LOS	E	F	C	F	C		F	D	E	E	D	
Approach delay (d)/LOS	114.9	/	F	109	/	F	60.6	/	E	51.8	/	D
Intersection delay (d)/ LOS	78.6			/			E					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	AMB AM W/MIT 2017	NB/SB Street	KOMOHANA S
Comment	2017 AMB AM W/MITIGATION		

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	12	390	323	427	153	169	152	828	600	160	670	37
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (ped/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	16	35	8	8	28			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 116 | Lost time per cycle (s): 12 | Critical v/c Ratio: .677

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	15	488	341	474	347		165	900	598	176	777	
Capacity (veh/h)	122	856	682	504	593		244	1070	669	244	1062	
Adjusted saturation flow (veh/h)	1770	3547	1583	3457	1720		1770	3547	1583	1770	3519	
v/c ratio	.123	.569	.5	.942	.584		.677	.841	.894	.72	.732	
g/C ratio	.069	.241	.431	.147	.345		.138	.302	.422	.138	.302	
Average back of queue (veh)	.5	7.9	8.6	10.3	10		5.7	16.7	21.6	6.2	13.3	
Uniform delay (d)	50.7	38.7	23.9	49	31.2		47.5	37.9	31.1	47.9	36.3	
Incremental delay (d)	0	.9	.6	26.3	1.5		7.3	6.2	14.5	9.9	2.6	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	50.7	39.6	24.5	75.3	32.7		54.8	44.1	45.6	57.8	38.9	
LOS	D	D	C	E	C		D	D	D	E	D	
Approach delay (s)/LOS	33.7	/	C	57.3	/	E	45.7	/	D	42.4	/	D
Intersection delay (s)/ LOS	44.8			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	TOT AM W/MIT 2017	NB/SB Street	KOMOHANA S
Comment	2017 TOT AM W/MITIGATION		

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	13	391	326	427	160	169	178	828	600	160	670	46
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.8	.8	.8	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (ped/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	16	35	8	8	28			
Yellow + All red (s)	4	6	1	4	6			

Cycle (s): 116 | Lost time per cycle (s): 12 | Critical v/c Ratio: .68

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	16	489	345	474	354		193	900	598	176	787	
Capacity (veh/h)	122	856	682	504	594		244	1070	669	244	1060	
Adjusted saturation flow (veh/h)	1770	3547	1583	3457	1723		1770	3547	1583	1770	3512	
v/c ratio	.133	.571	.506	.942	.596		.793	.841	.894	.72	.742	
g/C ratio	.069	.241	.431	.147	.345		.138	.302	.422	.138	.302	
Average back of queue (veh)	.5	7.9	8.7	10.3	10.3		7.2	16.7	21.6	6.2	13.5	
Uniform delay (d)	50.7	38.7	24	49	31.5		48.4	37.9	31.1	47.9	36.4	
Incremental delay (d)	0	.9	.6	26.3	1.6		16.2	6.2	14.5	9.9	2.9	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	50.7	39.6	24.6	75.3	32.9		64.6	44.1	45.6	57.8	39.3	
LOS	D	D	C	E	C		E	D	D	E	D	
Approach delay (s)/LOS	33.7	/	C	57.2	/	E	47	/	D	42.7	/	D
Intersection delay (s)/ LOS	45.4			/			D					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	AMB AM W/MIT 2027	NB/SB Street	KOMOHANA S
Comment	2027 AMB AM W/MITIGATION		

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	20	443	387	639	191	187	182	937	655	177	971	50
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.9	.9	.9	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (ped/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	15	63	8	16	28			
Yellow + All red (s)	5	6	1	5	6			

Cycle (s): 153 | Lost time per cycle (s): 12 | Critical v/c Ratio: .827

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	22	492	374	710	409		198	1018	658	195	1122	
Capacity (veh/h)	93	649	507	562	554		173	1460	797	173	1450	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1728		1770	3547	1583	1770	3521	
v/c ratio	.24	.758	.738	1.264	.739		1.14	.697	.825	1.121	.774	
g/C ratio	.052	.183	.32	.163	.32		.098	.412	.503	.098	.412	
Average back of queue (veh)	1	11.8	15.8	36.9	17.2		13.2	20.5	27	12.7	24.1	
Uniform delay (d)	69.6	59.3	46.3	64	46.3		69	37.1	32.3	69	38.9	
Incremental delay (d)	0	5.2	5.7	132.7	5.2		111.1	1.5	7.1	104.6	2.7	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	69.6	64.5	52	196.7	51.5		180.1	38.6	39.4	173.6	41.6	
LOS	E	E	D	F	D		F	D	D	F	D	
Approach delay (s)/LOS	59.4	/	E	143.6	/	F	53.8	/	D	61.1	/	E
Intersection delay (s)/ LOS	75.9			/			E					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	TOT AM W/MIT 2027	NB/SB Street	KOMOHANA S
Comment	2027 TOT AM W/MITIGATION		

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	21	444	390	639	199	187	210	937	655	177	971	60
RTOR volume (veh/h)			50			10			50			0
Peak-hour factor	.9	.9	.9	.9	.9	.9	.92	.92	.92	.91	.91	.91
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (ped/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R		L		TR			
WB			L	LTR	TR			
NB	L	TR	R					
SB	L	TR						
Green (s)	15	63	8	16	28			
Yellow + All red (s)	5	6	1	5	6			

Cycle (s): 153 | Lost time per cycle (s): 12 | Critical v/c Ratio: .833

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	23	493	378	710	418		228	1018	658	195	1133	
Capacity (veh/h)	93	649	507	562	554		173	1460	797	173	1448	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1731		1770	3547	1583	1770	3516	
v/c ratio	.252	.76	.745	1.264	.754		1.316	.697	.825	1.121	.783	
g/C ratio	.052	.183	.32	.163	.32		.098	.412	.503	.098	.412	
Average back of queue (veh)	1	11.8	16	26.9	17.7		17.7	20.5	27	12.7	24.5	
Uniform delay (d)	69.6	59.3	46.4	64	46.6		69	37.1	32.3	69	39.1	
Incremental delay (d)	0	5.2	5.9	132.7	5.8		176.8	1.5	7.1	104.6	2.9	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	69.6	64.5	52.3	196.7	52.4		245.8	38.6	39.4	173.6	42	
LOS	E	E	D	F	D		F	D	D	F	D	
Approach delay (s)/LOS	59.5	/	E	143.2	/	F	63.7	/	E	61.2	/	E
Intersection delay (s)/ LOS	79.4			/			E					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: EX PM 2007
Comment: 2007 EXISTING PM

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5	146	141	300	329	91	193	256	156	118	451	2
RTOR volume (veh/h)			25			10			50			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.95	.95	.95
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	10	5	30	3	12	30		
Yellow + All red (s)	1	4	6	1	4	6		

Cycle (s): 112 — Lost time per cycle (s): 13 — Critical v/c Ratio: .758

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	1	1	1	1	1	1	1	1	1
Flow rate (veh/h)	5	154	122	349	477	227	301	125	127	487
Capacity (veh/h)	47	499	650	253	742	319	649	551	503	499
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1808	1770	1863	1583	1770	1862
v/c ratio	.111	.308	.188	1.38	.642	.711	.464	.226	.252	.977
g/C ratio	.027	.268	.411	.143	.411	.464	.348	.348	.411	.268
Average back of queue (veh)	.2	4	2.6	24	13	6.4	7.8	2.9	2.7	20
Uniform delay (s)	53.2	32.7	21.1	48	26.4	25.4	28.4	25.8	20.9	40.7
Incremental delay (s)	0	0	0	193.8	1.9	7.2	.4	0	0	34.5
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	53.2	32.7	21.1	241.8	28.3	32.6	28.8	25.8	20.9	75
LOS	D	C	C	F	C	C	C	C	C	E
Approach delay (s)/LOS	28 / C			118.5 / F		29.5 / C			63.8 / E	
Intersection delay (s)/ LOS	69.2 / E									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB PM 2010
Comment: 2010 AMBIENT PM

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5	152	167	354	343	95	268	355	217	123	531	2
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	11	5	30	3	16	30		
Yellow + All red (s)	1	4	6	1	4	6		

Cycle (s): 127 — Lost time per cycle (s): 7 — Critical v/c Ratio: .809

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	1	1	1	1	1	1	1	1	1
Flow rate (veh/h)	5	160	134	412	486	315	418	208	132	573
Capacity (veh/h)	223	352	474	390	557	296	723	623	446	557
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1813	1770	1863	1583	1770	1862
v/c ratio	.024	.455	.282	1.055	.873	1.067	.569	.334	.397	1.029
g/C ratio	.126	.189	.299	.22	.307	.48	.394	.394	.409	.299
Average back of queue (veh)	.2	5.4	3.8	21	19.3	16.3	12.4	5.4	3.2	27.8
Uniform delay (s)	48.7	45.7	34.1	49.5	41.7	40	30.1	26.9	23.9	44.5
Incremental delay (s)	0	.6	9	60.8	14.3	71.2	1.1	0	0	45.7
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	48.7	46.3	34.1	110.3	56	111.2	31.2	26.9	23.9	90.2
LOS	D	D	C	F	E	F	C	C	C	F
Approach delay (s)/LOS	40.9 / D			80.9 / F		57 / E			77.8 / E	
Intersection delay (s)/ LOS	68 / E									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: TOT PM 2010
Comment: 2010 TOTAL PM

Site Information

Jurisdiction/Date: 1/27/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	8	156	178	354	347	95	278	355	217	123	531	5
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	8	8	38	16	11	24		
Yellow + All red (s)	1	4	6	1	4	6		

Cycle (s): 127 — Lost time per cycle (s): 1 — Critical v/c Ratio: .1049

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	1	1	1	1	1	1	1	1	1
Flow rate (veh/h)	8	164	145	412	491	327	418	208	132	576
Capacity (veh/h)	223	352	474	390	557	296	733	623	446	557
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1813	1770	1863	1583	1770	1860
v/c ratio	.038	.466	.307	1.055	.883	1.107	.569	.334	.297	1.036
g/C ratio	.126	.189	.299	.22	.307	.48	.394	.394	.409	.299
Average back of queue (veh)	.3	5.5	4.2	21	19.6	17.8	12.4	5.4	3.2	28.2
Uniform delay (s)	48.7	45.8	34.3	49.5	41.8	40	30.1	26.9	23.9	44.5
Incremental delay (s)	0	.7	0	60.8	15.2	84.1	1.1	0	0	47.6
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	48.7	46.5	34.3	110.3	57	124.1	31.2	26.9	23.9	92.1
LOS	D	D	C	F	E	F	C	C	C	F
Approach delay (s)/LOS	41 / D			81.3 / F		62.1 / E			79.4 / E	
Intersection delay (s)/ LOS	70 / E									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB PM W/4L 2010
Comment: 2010 AMBIENT PM W/4 LANES

Site Information

Jurisdiction/Date: 1/28/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5	152	167	354	343	95	268	355	217	123	531	2
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	15	5	23	5	20	24		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 116 — Lost time per cycle (s): 12 — Critical v/c Ratio: .734

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	1	1	1	1	1	2	1	1	2
Flow rate (veh/h)	5	160	134	412	486	315	418	208	132	573
Capacity (veh/h)	76	385	614	397	766	320	1009	450	229	703
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1813	1770	2547	1583	1770	3545
v/c ratio	.069	.415	.218	1.038	.635	.984	.414	.462	.578	.815
g/C ratio	.043	.207	.388	.224	.422	.181	.284	.284	.129	.198
Average back of queue (veh)	.2	4.8	3	19.2	13.5	13.8	6.3	6	4.4	10.9
Uniform delay (s)	53.3	39.9	23.7	45	26.4	47.3	33.7	34.2	47.5	44.5
Incremental delay (s)	0	.3	0	55.3	1.7	45.8	.1	.6	3.6	7.4
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	53.3	40.2	23.7	100.3	28.1	93.1	33.8	34.8	51.1	51.9
LOS	D	D	C	F	C	F	C	C	D	D
Approach delay (s)/LOS	33.1 / C			61.2 / E		53.9 / D			51.7 / D	
Intersection delay (s)/ LOS	53.5 / D									

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/28/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	TOT PM W/4L 2010	NB/SB Street	KOMOHANA S
Comment	2010 TOTAL PM W/4 LANES		

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	8	156	178	354	347	95	278	355	217	123	531	5
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Lot/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	15	5	23	5	20	24		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 116 — Lost time per cycle (s): 12 — Critical v/c Ratio: .749

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	2	1	1	2	
Flow rate (veh/h)	8	164	145	412	491		327	418	208	132	576	
Capacity (veh/h)	76	383	614	397	766		329	1009	450	229	702	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1813		1770	3547	1583	1770	3542	
v/c ratio	.11	.426	.236	1.038	.641		1.021	.414	.462	.578	.821	
g/C ratio	.043	.207	.388	.224	.422		.181	.284	.284	.129	.198	
Average back of queue (veh)	.3	4.9	3.3	19.2	13.7		15.1	6.1	.6	4.4	11	
Uniform delay (d)	53.4	40	23.9	45	26.5		47.5	33.7	34.2	47.5	44.5	
Incremental delay (d)	0	.4	0	55.3	1.8		55.7	.1	.6	3.6	7.7	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	53.4	40.4	23.9	100.3	28.3		103.2	33.8	34.8	51.1	52.2	
LOS	D	D	C	F	C		F	C	C	D	D	
Approach delay (s)/LOS	33.2 / C			61.3 / E			57.8 / E			52 / D		
Intersection delay (s)/ LOS	54.7 / D											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/28/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	AMB PM W/MW 2010	NB/SB Street	KOMOHANA S
Comment	2010 AMBIENT PM W/MOHOULI WIDENING		

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	5	152	167	354	343	95	268	355	217	123	531	2
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Lot/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	5	10	35	7	8	24		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 115 — Lost time per cycle (s): 5 — Critical v/c Ratio: .812

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	1	1	1	1	
Flow rate (veh/h)	5	160	134	412	485		315	418	208	132	573	
Capacity (veh/h)	110	753	490	487	594		317	824	701	428	577	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1813		1770	1863	1583	1770	1862	
v/c ratio	.048	.212	.273	.846	.819		.996	.507	.297	.309	.994	
g/C ratio	.062	.212	.31	.142	.327		.504	.442	.442	.407	.31	
Average back of queue (veh)	.2	2.3	3.4	7.9	16.3		13.5	10.1	4.5	2.9	24.1	
Uniform delay (d)	49.9	36.7	29.4	47.3	34.9		34.6	22.6	20.2	21.5	38.9	
Incremental delay (d)	0	0	0	13	8.9		48.5	.5	0	0	35.8	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	49.9	36.7	29.4	60.3	43.8		84.1	23.1	20.2	21.5	74.7	
LOS	D	D	C	E	D		F	C	C	C	E	
Approach delay (s)/LOS	33.7 / C			51.4 / D			42.9 / D			64.7 / E		
Intersection delay (s)/ LOS	50 / D											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/28/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	TOT PM W/MW 2010	NB/SB Street	KOMOHANA S
Comment	2010 TOTAL PM W/MOHOULI WIDENING		

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	8	156	178	354	347	95	278	355	217	123	531	5
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Lot/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	5	10	35	7	8	24		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 115 — Lost time per cycle (s): 6 — Critical v/c Ratio: .855

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	1	1	1	1	
Flow rate (veh/h)	8	164	145	412	491		327	418	208	132	576	
Capacity (veh/h)	110	753	490	487	594		317	824	701	428	576	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1813		1770	1863	1583	1770	1860	
v/c ratio	.077	.218	.296	.846	.827		1.033	.507	.297	.309	1	
g/C ratio	.062	.212	.31	.142	.327		.504	.442	.442	.407	.31	
Average back of queue (veh)	.3	2.4	3.7	7.9	16.5		14.7	10.1	4.5	2.9	24.5	
Uniform delay (d)	50	36.8	29.6	47.3	35		34.7	22.6	20.2	21.5	39	
Incremental delay (d)	0	0	0	13	9.4		59.5	.5	0	0	37.6	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	50	36.8	29.6	60.3	44.4		94.2	23.1	20.2	21.5	76.6	
LOS	D	D	C	E	D		F	C	C	C	E	
Approach delay (s)/LOS	33.9 / C			51.7 / D			46.9 / D			66.3 / E		
Intersection delay (s)/ LOS	51.7 / D											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information — **Site Information**

Analyst	WY	Jurisdiction/Date	1/27/2008
Agency or Company	M&E	EB/WB Street	MOHOULI ST
Analysis Period/Year	AMB PM 2017	NB/SB Street	KOMOHANA S
Comment	2017 AMBIENT PM		

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	37	208	217	499	313	105	408	694	440	136	683	7
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Lot/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	LTR					
SB	L		LTR					
Green (s)	6	12	62	16	11	24		
Yellow + All red (s)	1	4	6	1	4	6		

Cycle (s): 153 — Lost time per cycle (s): 7 — Critical v/c Ratio: 1.086

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	1	1	1	1	
Flow rate (veh/h)	39	219	186	530	544		480	816	471	146	742	
Capacity (veh/h)	185	292	373	324	462		268	950	807	366	754	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1812		1770	1863	1583	1770	1860	
v/c ratio	.21	.749	.5	1.792	1.178		1.788	.86	.583	.4	.984	
g/C ratio	.105	.157	.235	.183	.255		.569	.51	.51	.484	.405	
Average back of queue (veh)	1.6	10.3	7.4	57.8	36.5		47.7	34.7	15.1	4.1	39.1	
Uniform delay (d)	62.7	61.6	50.7	62.5	57		52.9	32.7	26.2	22.3	45	
Incremental delay (d)	0	10.3	1.1	368.4	100.7		369.2	8.1	1.1	.2	22.8	
Initial queue delay (d)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	62.7	71.9	51.8	430.9	157.7		422.1	40.8	27.3	22.5	73.8	
LOS	E	E	D	F	F		F	D	C	C	E	
Approach delay (s)/LOS	62.7 / E			298.7 / F			140.8 / F			65.4 / E		
Intersection delay (s)/ LOS	158.7 / F											

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/28/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: AMB PM W/4L 2017 | NB/SB Street: KOMOHANA S
Comment: 2017 AMBIENT PM W/4 LANES

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	38	208	217	499	383	105	408	694	440	136	683	7
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing/Timing

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	10	30	35	5	35	20		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 159 | Lost time per cycle (s): 12 | Critical v/c Ratio: 1.002

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	2	1	1	2	
Flow rate (veh/h)	40	219	186	580	544		480	816	471	146	742	
Capacity (veh/h)	56	234	358	456	684		456	1561	697	111	780	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1812		1770	3547	1583	1770	3541	
v/c ratio	.719	.934	.52	1.272	.796		1.053	.523	.675	1.314	.952	
g/C ratio	.031	.126	.226	.258	.377		.258	.44	.44	.063	.22	
Average back of queue (veh)	2.1	12.1	7.8	43.6	34		28.9	14.7	18.3	11.7	21.1	
Uniform delay (s)	76.3	68.9	53.9	59	44.1		59	32.4	35.4	74.5	61.2	
Incremental delay (s)	36.1	41.1	1.4	198.5	6.5		56.4	3	2.6	191.3	21.3	
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	112.4	110	55.3	197.5	50.6		115.4	32.7	38	265.8	82.5	
LOS	F	F	E	F	D		F	C	D	F	F	
Approach delay (s)/LOS	87.5	/	F	126.4	/	F	56.6	/	E	112.7	/	F
Intersection delay (s)/ LOS	90.2			/						F		

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/27/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: TOT PM W/4L 2017 | NB/SB Street: KOMOHANA S
Comment: 2017 TOTAL PM W/4 LANES

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	47	215	233	499	387	105	419	694	440	136	683	10
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing/Timing

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	10	30	35	5	35	20		
Yellow + All red (s)	1	4	6	1	4	6		

Cycle (s): 157 | Lost time per cycle (s): 12 | Critical v/c Ratio: 1.024

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	1	1	1	1		1	2	1	1	2	
Flow rate (veh/h)	49	226	203	580	549		493	816	471	146	745	
Capacity (veh/h)	56	257	363	462	681		462	1559	696	113	789	
Adjusted saturation flow (veh/h)	1770	1863	1583	1770	1812		1770	3547	1583	1770	3539	
v/c ratio	.878	.954	.56	1.256	.806		1.067	.524	.676	1.297	.945	
g/C ratio	.032	.127	.229	.261	.376		.261	.439	.439	.064	.223	
Average back of queue (veh)	2.8	12.6	8.5	42.6	24.2		29.8	14.5	17.9	11.5	20.8	
Uniform delay (s)	75.7	68	53.5	58	43.9		58	32	35.1	73.5	60	
Incremental delay (s)	77.2	45.5	2	131.7	7.1		60.8	.3	2.6	184.4	19.8	
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	152.9	113.5	55.5	189.7	51		118.8	32.3	37.7	257.9	79.8	
LOS	F	F	E	F	D		F	C	D	F	E	
Approach delay (s)/LOS	93	/	F	122.3	/	F	57.7	/	E	109.1	/	F
Intersection delay (s)/ LOS	89.4			/						F		

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/28/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: AMB PM W/MIT 2017 | NB/SB Street: KOMOHANA S
Comment: 2017 AMBIENT PM W/MITIGATION

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	38	208	217	499	383	105	408	694	440	136	683	7
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing/Timing

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	12	19	29	8	12	30		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 134 | Lost time per cycle (s): 11 | Critical v/c Ratio: .876

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	40	219	186	580	544		480	816	471	146	742	
Capacity (veh/h)	106	794	567	539	636		423	1403	626	158	766	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1812		1770	3547	1583	1770	3541	
v/c ratio	.379	.276	.329	1.077	.856		1.136	.582	.751	.923	.968	
g/C ratio	.06	.224	.358	.157	.351		.239	.396	.396	.09	.216	
Average back of queue (veh)	1.6	3.7	5.3	16.6	21.9		28.1	13.5	16.9	7.1	18.6	
Uniform delay (s)	60.6	43	31.3	56.5	40.4		51	31.8	34.8	60.5	52	
Incremental delay (s)	.3	0	0	61.3	11.2		86.3	.6	5.1	49.3	24.8	
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	60.9	43	31.3	117.8	51.6		137.3	32.4	39.9	109.8	76.8	
LOS	E	D	C	F	D		F	C	D	F	E	
Approach delay (s)/LOS	39.7	/	D	85.7	/	F	62.9	/	E	82.3	/	F
Intersection delay (s)/ LOS	70.6			/						E		

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information | **Site Information**

Analyst: WY | Jurisdiction/Date: 1/28/2008
Agency or Company: M&E | EB/WB Street: MOHOULI ST
Analysis Period/Year: TOT PM W/MIT 2017 | NB/SB Street: KOMOHANA S
Comment: 2017 TOTAL PM W/MITIGATION

Intersection Data

Area type: Other | Analysis period: .25 h | Signal type: Actuated-Field | % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	47	215	233	499	387	105	419	694	440	136	683	10
RTOR volume (veh/h)			40			20			40			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bic/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing/Timing

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	12	19	29	8	12	30		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 134 | Lost time per cycle (s): 11 | Critical v/c Ratio: .833

Intersection Performance

	EB			WB			NB			SB		
Lane group configuration	L	T	R	L	TR		L	T	R	L	TR	
No. of lanes	1	2	1	2	1		1	2	1	1	2	
Flow rate (veh/h)	49	226	203	580	549		493	816	471	146	745	
Capacity (veh/h)	106	794	567	539	636		423	1403	626	158	766	
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1812		1770	3547	1583	1770	3539	
v/c ratio	.468	.285	.358	1.077	.863		1.166	.582	.751	.923	.973	
g/C ratio	.06	.224	.358	.157	.351		.239	.396	.396	.09	.216	
Average back of queue (veh)	2	3.9	5.9	16.6	22.3		29.9	13.5	16.9	7.1	18.8	
Uniform delay (s)	60.9	43.1	31.7	56.5	40.5		51	31.8	34.8	60.5	52.1	
Incremental delay (s)	2.5	0	0	61.3	11.8		97.8	.6	5.1	49.3	25.9	
Initial queue delay (s)	0	0	0	0	0		0	0	0	0	0	
Delay (s)	63.4	43.1	31.7	117.8	52.3		148.8	32.4	39.9	109.8	78	
LOS	E	D	C	F	D		F	C	D	F	E	
Approach delay (s)/LOS	40.4	/	D	86	/	F	66.6	/	E	83.2	/	F
Intersection delay (s)/ LOS	72.2			/						E		

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: AMB PM W/MIT 2027
Comment: 2027 AMBIENT PM W/MITIGATION

Site Information

Jurisdiction/Date: 1/28/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	126	266	257	602	432	116	477	902	617	150	786	15
RTOR volume (veh/h)			60			20			60			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (p/h)		0			0			0			0	
Approach bicycle volume (bc/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	20	18	38	5	15	30		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 130 — Lost time per cycle (s): 11 — Critical v/c Ratio: 1.043

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	2	1	2	1	1	2	1	1	2
Flow rate (veh/h)	133	280	207	700	614	561	1061	655	161	861
Capacity (veh/h)	59	709	591	481	604	460	1442	644	236	896
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1812	1770	3547	1583	1770	3537
v/c ratio	2.248	.395	.351	1.455	1.017	1.22	.736	1.018	.684	.961
g/C ratio	.033	.2	.373	.14	.333	.26	.407	.407	.133	.253
Average back of queue (veh)	15	5.7	6.6	30.3	33.5	38.7	21.7	35.7	7.2	23.4
Uniform delay (s)	72.5	52.1	33.9	64.5	50	55.5	37.7	44.5	62	55.3
Incremental delay (s)	612.3	.1	0	216.1	40.8	117.2	2	40	7.9	21.2
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	684.8	52.2	33.9	280.6	90.8	172.7	39.7	84.5	69.9	76.5
LOS	F	D	C	F	F	F	D	F	E	E
Approach delay (s)/LOS	181.4	/	F	191.9	/	F	85.3	/	F	75.4	/	E
Intersection delay (s)/ LOS	121.5			/			F					

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CHAPTER 16 - OPERATIONAL ANALYSIS - SUMMARY WORKSHEET

General Information

Analyst: WY
Agency or Company: M&E
Analysis Period/Year: TOT PM W/MIT 2027
Comment: 2027 TOTAL PM W/MITIGATION

Site Information

Jurisdiction/Date: 1/28/2008
EB/WB Street: MOHOULI ST
NB/SB Street: KOMOHANA S

Intersection Data

Area type: Other — Analysis period: .25 h — Signal type: Actuated-Field — % Back of queue: 95

	EB			WB			NB			SB		
	LT	TH	RT	LT	TH	RT	LT	TH	RT	LT	TH	RT
Volume (veh/h)	136	274	285	602	437	116	488	902	617	150	786	18
RTOR volume (veh/h)			60			20			60			0
Peak-hour factor	.95	.95	.95	.86	.86	.86	.85	.85	.85	.93	.93	.93
Heavy vehicles (%)	2	2	2	2	2	2	2	2	2	2	2	2
Start-up lost time, l_1 (s)	2	2	2	2	2	2	2	2	2	2	2	2
Extension of effective green, e (s)	2	2	2	2	2	2	2	2	2	2	2	2
Arrival type, AT	3	3	3	3	3	3	3	3	3	3	3	3
Approach pedestrian volume (v/h)		0			0			0			0	
Approach bicycle volume (bc/h)		0			0			0			0	
Left/right parking (Y or N)	N	/	N	N	/	N	N	/	N	N	/	N

Signal Phasing Plan

L: LT T: TH R: RT P: Peds

	Phase 1	Phase 2	Phase 3	Phase 4	Phase 5	Phase 6	Phase 7	Phase 8
EB	R			L		TR		
WB				L	LTR	TR		
NB	L	LTR	TR					
SB	L		TR					
Green (s)	20	18	38	5	15	30		
Yellow + All red (s)	1	5	6	1	5	6		

Cycle (s): 130 — Lost time per cycle (s): 11 — Critical v/c Ratio: 1.07

Intersection Performance

	EB			WB		NB			SB	
Lane group configuration	L	T	R	L	TR	L	T	R	L	TR
No. of lanes	1	2	1	2	1	1	2	1	1	2
Flow rate (veh/h)	143	288	237	700	620	574	1061	655	161	865
Capacity (veh/h)	59	709	591	481	604	460	1442	644	236	895
Adjusted saturation flow (veh/h)	1770	3547	1583	3437	1812	1770	3547	1583	1770	3535
v/c ratio	2.427	.407	.401	1.455	1.026	1.248	.736	1.018	.684	.965
g/C ratio	.033	.2	.373	.14	.333	.26	.407	.407	.133	.253
Average back of queue (veh)	16.8	5.8	7.7	30.3	34.2	40.7	21.7	35.7	7.2	23.6
Uniform delay (s)	72.5	52.2	34.6	64.5	50	55.5	37.7	44.5	62	55.4
Incremental delay (s)	690.4	.1	.1	216.1	43.4	128.6	2	40	7.9	22
Initial queue delay (s)	0	0	0	0	0	0	0	0	0	0
Delay (s)	762.9	52.3	34.7	280.6	93.4	184.1	39.7	84.5	69.9	77.4
LOS	F	D	C	F	F	F	D	F	E	E
Approach delay (s)/LOS	198.3	/	F	192.7	/	F	88.7	/	F	76.2	/	E
Intersection delay (s)/ LOS	126			/			F					

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APPENDIX D

SITE PHOTOS

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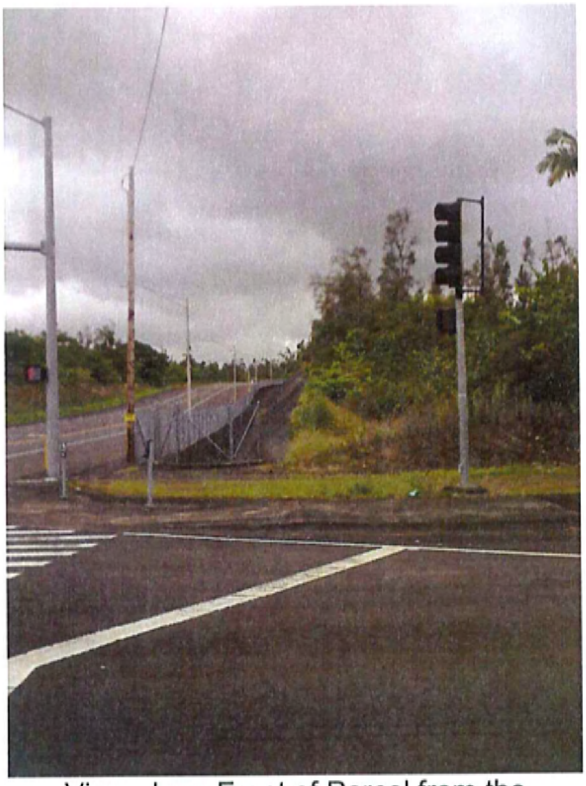

View along Front of Parcel from the
Intersection of Mohouli and Komohana Streets (10/18/07)

Detail of Rocky Soil
on Proposed Site (10/18/07)

Grated Inlet Drywell in County ROW
fronting the Proposed Site on Mohouli Street (10/18/07)

Existing Vegetation
at the Proposed Site (10/18/07)

Fence Around County Lined Open Ditch
along Mohouli Street (10/18/07)

Existing Utility Laterals
fronting the Proposed Site (10/18/07)

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APPENDIX E

ARCHAEOLOGICAL ASSESSMENT REPORT

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SCS 961 FINAL APPROVAL

LINDA LINGLE
GOVERNOR OF HAWAII

LAURA H. THIELEN
CHAIRPERSON
BOARD OF LAND AND NATURAL RESOURCES
COMMISSION ON WATER RESOURCE MANAGEMENT

RUSSELL Y. TSUJI
FIRST DEPUTY

KEN C. KAWAHARA
DEPUTY TO THE CHAIRPERSON

STATE OF HAWAII
DEPARTMENT OF LAND AND NATURAL RESOURCES
STATE HISTORIC PRESERVATION DIVISION
601 KAMOKILA BOULEVARD, ROOM 555
KAPOLEI, HAWAII 96707

February 28, 2009

Glenn G. Escott, M.A., Hawaii Island Project Manager
Scientific Consulting Services, Inc.
PO Box 155
Kea'au, Hawaii 96749

LOG NO: 2009.0734
DOC NO: 0902MD51
Archaeology

Dear Mr. Escott:

SUBJECT: **Chapter 6E-42 Historic Preservation Review –**
Archaeological Assessment of 5 Acres with No New Sites
Waiakea Ahupua`a, South Hilo District, Island of Hawaii
TMK: (3) 2-4-001:176

This letter reviews the report first received by our office on November 24, 2008 (*Escott 2008; Archaeological Assessment of the Five-Acre Hilo Fire Department Administration Site in Waiakea Ahupua`a, South Hilo District, Hawaii Island, Hawaii [TMK: (3) 2-4-01:176]; SCS Project Number 961-1*). This project covers the area proposed for the new Hilo Fire Department Administration Building. The site is currently vacant, with no evidence of any past or present use. The report found no historic properties on this parcel, and we concur with that assessment.

In our review (*Log No. 2008.5412, Doc No. 0901MD06*) we requested minor revisions. The revisions we requested have been made, and we find this report acceptable and accept it as final pursuant to HAR §13-276. Upon receipt of this letter please submit one paper copy of your report marked "Final" to our Kapolei office along with a CD containing a searchable pdf version of the final report and a copy of this approval letter, marked to the attention of the "**Kapolei Library.**"

If you have questions about this letter please contact Morgan Davis of our Hawaii Island Section at (808) 933-7650.

Aloha,

Nancy A. McMahon

Nancy McMahon, Deputy SHPO/State Archaeologist
and Historic Preservation Manager
State Historic Preservation Division

ARCHAEOLOGICAL ASSESSMENT OF THE FIVE-ACRE HILO FIRE DEPARTMENT ADMINISTRATION SITE IN WAIĀKEA AHUPUA`A, SOUTH HILO DISTRICT, HAWAI`I ISLAND, HAWAI`I [TMK: (3) 2-4-01:176]

Prepared By:
Glenn G. Escott, M.A.
November 2008

Prepared for:
M&E Pacific, Inc.
METCALF & EDDY| AECOM
Davies Pacific Center
841 Bishop Street, Suite 1900
Honolulu, Hawai'i 96813

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ABSTRACT

At the request of Metcalf & Eddy| AECOM (M&E Pacific, Inc.), Scientific Consultant Services, Inc. (SCS) conducted an archaeological assessment of a 5-acre parcel [TMK: (3)-2-4-01:176] located in the *ahupua'a* of Waiākea, South Hilo District, Island of Hawai'i. The project area is situated approximately three kilometers southwest of Hilo Bay and is bounded by Mohouli Street extension to the south, the Sunrise Ridge residential subdivision to the north, and by undeveloped land to the east and west. The parcel is the location for the proposed construction of a Hilo Fire Department Administration buildings site.

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, and archaeological reports was conducted. Extensive archival research and oral interviews were also carried out as part of the inventory survey work. The project area was found to exist within the northern boundary of an approximately 500-acre parcel known historically as the Waiākea Pastureland. A pedestrian survey was carried out from June 24th to June 28th by Glenn Escott M.A. A series of east/west traverses spaced ten meters apart area were walked across the entire project area. Ground visibility was limited in some areas by dense mats of *uluhe* fern (*Dicranopteris linearis*). Intervals were reduced to as much as five meters in areas of thick ground cover.

No archaeological sites or features were located on the current project area parcel. The entire 5-acre parcel is completely covered by pahoehoe lava from the 1880 to 1881 flow. Any traditional cultural resources constructed prior to that flow are no longer visible. The recent flow lava also prevented any modern sugar cane or other agricultural pursuits. At present, there are no cultural resources, modern structures, or modern disturbance on the study parcel.

This report contains background information outlining the project area environmental and cultural contexts, a presentation of previous archaeological work within the study area and in the immediate vicinity, an assessment of expected archaeological patterns, an explanation of project methods, and a finding of no historic properties, cultural resources, or artifacts within the project area.

INTRODUCTION

PROJECT AREA DESCRIPTION

At the request of M&E Pacific, Inc., Scientific Consultant Services, Inc. (SCS) conducted an archaeological assessment of a 5-acre parcel [TMK: (3)-2-4-01:176] located in the *ahupua'a* of Waiākea, South Hilo District, Island of Hawai'i (Figure 1). The project area is situated approximately three kilometers southwest of Hilo Bay and is bounded by Mohouli Street extension to the south, the Sunrise Ridge residential subdivision to the north, and by undeveloped land to the east and west (Figure 2 and Figure 3). The parcel is the location for the proposed construction of a Hilo Fire Department Administration buildings site.

SCOPE OF WORK

The archaeological inventory survey was undertaken in accordance with draft Hawai'i Administrative Rules 13§13-284 and was performed in compliance with the Rules Governing Minimal Standards for Archaeological Inventory Surveys and Reports contained in draft Hawai'i Administrative Rules 13§13-276. The investigation included the following procedures:

1. SCS conducted extensive historical and archaeological archival research including a search of historic maps, aerial photos, written records, Land Commission Award documents, and State and County Planning Division documents.

2. SCS carried out a 100% pedestrian survey of the project area.

3. SCS made contacted community members regarding their recollections of land-use and activities known to have occurred within the study area.

METHODS

Prior to fieldwork, a search of geological maps, aerial photos, historical maps, historical documents, and archaeological reports was conducted. Extensive archival research and oral interviews were also carried out as part of the inventory survey work. The project area was found to exist within the northern boundary of an approximately 500-acre parcel known historically as the Waiākea Pastureland.

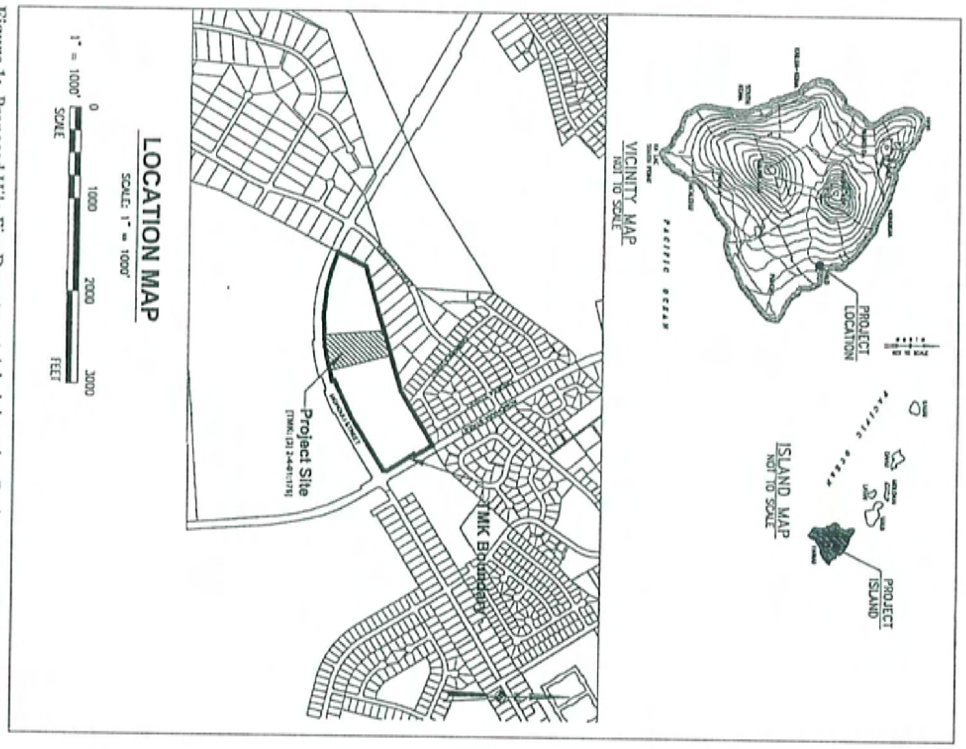

Figure 1: Proposed Hilo Fire Department Administration Project Area [TMK: (3) 2-4-01:176].

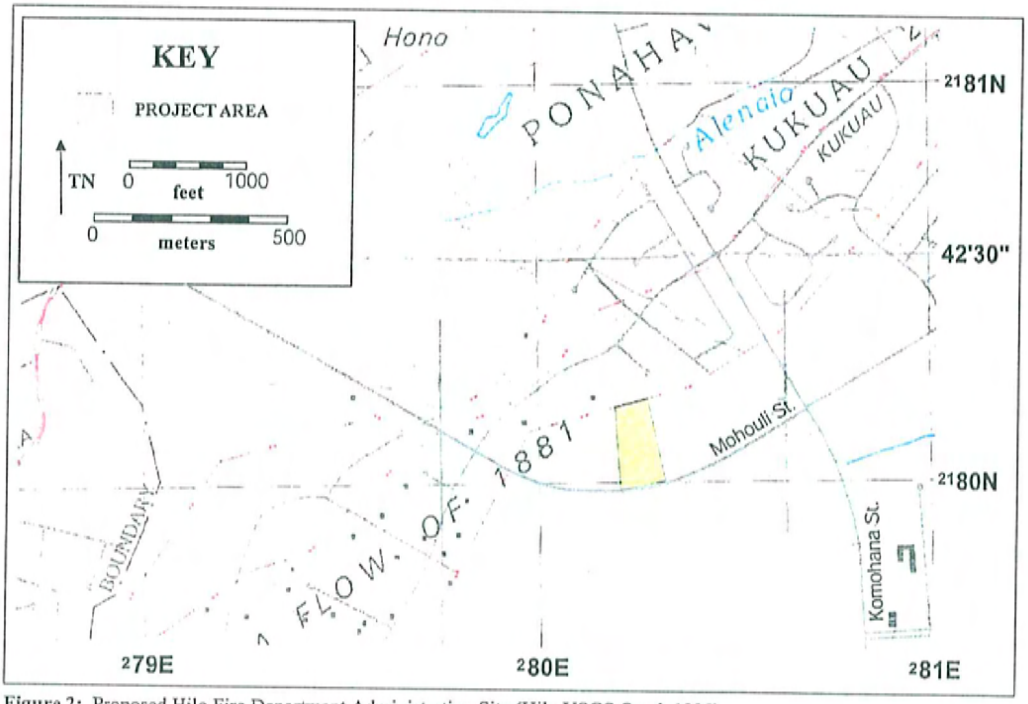

Figure 2: Proposed Hilo Fire Department Administration Site (Hilo USGS Quad, 1995).

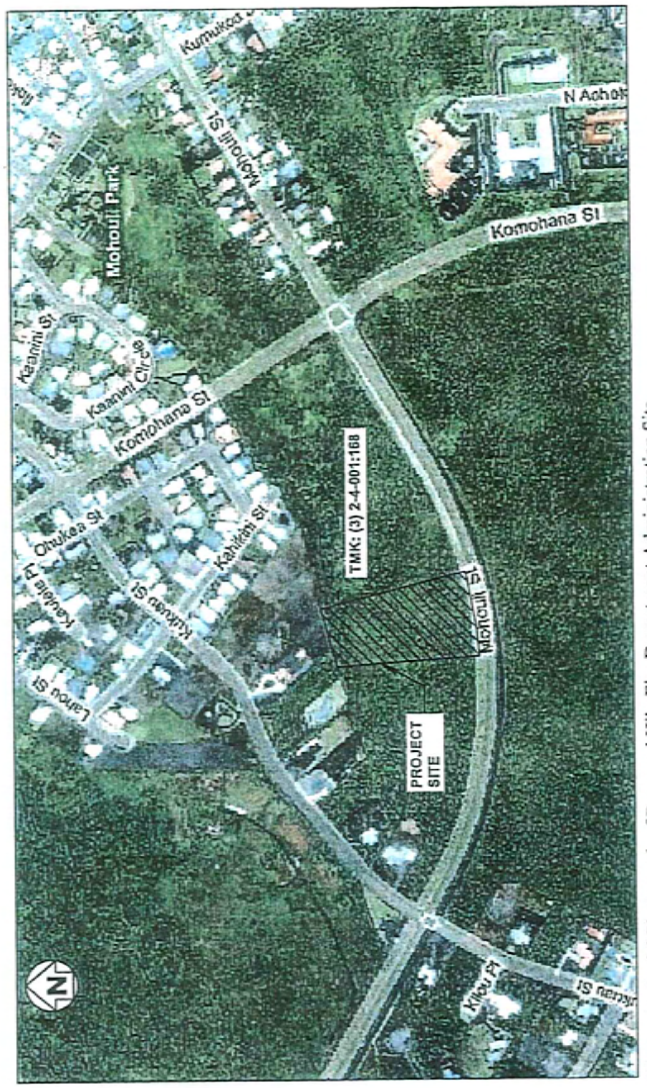

Figure 3: Aerial Photograph of Proposed Hilo Fire Department Administration Site.

A pedestrian survey was carried out from June 24th to June 28th by Glenn Escott M.A. A series of east/west traverses spaced ten meters apart area were walked across the entire project area. Ground visibility was limited in some areas by dense mats of *uluhe* fern (*Dicranopteris linearis*). Intervals were reduced to as much as five meters in areas of thick ground cover. The project area did not contain any archaeological or cultural resources. Fieldwork and the inventory survey report production were completed under the overall direction of Robert L. Spear, PhD. (Principal Investigator).

This report contains background information outlining the project area environmental and cultural contexts, a presentation of previous archaeological work within the study area and in the immediate vicinity, and current survey expectations based on that previous work, as well as an explanation of project methods.

ENVIRONMENTAL SETTING

LAVA FLOWS

The current project area consists of a single undeveloped five-acre parcel [TMK: (3)-2-4-01:176] situated on gently sloping to level land at 350 feet (107 m) above mean sea level (amsl). A single Mauna Loa *pāhoehoe* flow within the project area dictates soil conditions, drainage, and vegetation (Wolfe and Morris 1996) (Figure 4). The single lava flow is the historic 1880-1881 flow and is bare *pāhoehoe* overlain in places by a thin layer of organic duff and soil. The flow is hummocky and primarily exposed.

SOILS

Soil in the project area is Pana'ewa very rocky silty clay loam (Sato 1973) and is characterized as poorly suited or unsuited to mechanized-farming (Soil Survey of the Territory of Hawaii 1955). The Waiākea Mill Company cultivated sugar cane in fields located roughly one mile south of the project area where deeper pockets of well-developed organic soil exist. However, the no cultivation of any kind is known to have occurred in lands of the current project area.

RAINFALL AND DRAINAGE

Rainfall in the project area is high, ranging between 150 and 200 inches per year (Kelly *et al*. 1981). Natural drainage in the area runs from southwest to northeast and from west to east (see Figure 3). The majority of runoff enters the Waiākea Stream to the east.

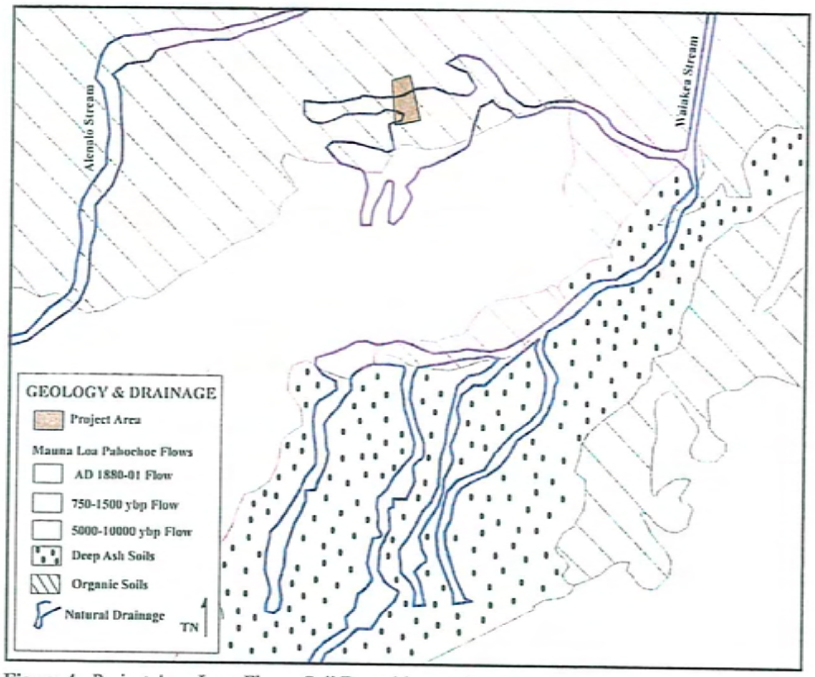

Figure 4: Project Area Lava Flows, Soil Deposition, and Drainage.

VEGETATION

Plant communities in the wettest areas of the project are dominated by *waivi* (*Psidium cattleianum*), common guava (*Psidium guajava*), *ohi'a* (*Metrosideros polymorpha*), *uluhe* (*Dicranopteris linearis*), and *rhododendron sp.* Vegetation within the project ranges from sparse open forest on the bare *pāhoehoe* to extremely dense and hard to move through in areas with soil deposition.

Gerrish (2000) divides plant communities in the region of the UH current project into four groups:

I. The *ohi'a* and *uluhe* (*Metrosideros/Dicranopteris*) fern forest

The *ohi'a and uluhe* (*Metrosideros/Dicranopteris*) fern forest is the original natural vegetation and is an open forest of *ohi'a* (*Metrosideros polymorpha*) with thick, often impenetrable thickets of *uluhe* (*Dicranopteris linearis*). The fern forest is not a diverse plant community. Native plants such as *'ahaniu* (*Machaerina mariscoides*), *pukiawe* (*Styphelia tameiameiae*), *neneleau* (*Rhus sandwicensis*), *wawai-'iole* (*Lycopodium cernuum*), *hapu'u* (*Cibotium ssp.*), *papala-kepau* (*Pisonia umbellifera*), and *kawa'u* (*Ilex anomala*), and non-indigenous plants such as bamboo orchid (*Arundinia bambusifolia*), melastoma (*Melastoma candidum*), *waivi* (*Psidium cattleianum*), broomsedge (*Andropogon virginicus*), and swordfern ((*Nephrolepsis hirsutula*) are sometimes found dispersed throughout the fern forest.

II. The closed *ohi'a* forest

The closed-canopy forest is dominated by three varieties of *ohi'a* (*Metrosideros polymorpha*): *icana*, *glaberrima*, and *macrophylla*. Native plant communities in the closed *ohi'a* forest are more diverse and include *kopiko* (*Pychotria hawaiiense*), *pilo* (*Coprosma sp.*), *hapu'u* (*Cibotium ssp.*), Kahili ginger (*Hedychium gardnerianum*), *ie'ie* (*Freycinetia arborea*), *'ekaha* (*Elaphoglossum lanceolatum*), *wawai-'iole* (*Lycopodium cernuum*), *palai-lau-li'i* (*Spaerocionium lanceolatum*). Introduced tree species include thickets of *waivi* (*Psidium cattleianum*) and common guava (*Psidium guajava*), and occasionally individual African tulip trees (*Spathodea campanulata*), albizia (*Paraserianthes falcataria*), and Alexandria palms (*Archontophoenix alexandrae*).

III. Savanna

Savannas of widely scattered trees and grasses are dominant in areas south of the project area that have been cleared for roads and possibly as a by-product of cattle grazing. The most common grasses within the savanna include Wainuku grass (*Panicum repens*), California grass (*Brachiaria mutica*), little bluestem (*Schizachyrium condensatum*), and broomsedge (*Andropogon virginicus*). Several tree species growing in savanna areas include albizia (*Paraserianthes falcataria*), *waivi* (Psidium cattleianum), common guava (*Psidium guajava*), melochia (*Melochia umbellata*), and gunpowder tree (*Trema orientalis*).

IV. The mixed *ohi'a* and *waiwi* shrubland

In many areas of the project with shallow soils, a mixed *ohi'a* and *waiwi* shrubland has developed. A large area of mixed *ohi'a* and *waiwi* shrubland has developed along the

eastern edge of the project where the land is dominated by *waivi* thickets. Plant communities in the mixed *ohi'a* and *waiwi* shrubland often contain members from the other three major plant communities.

The current project area is primarily composed of groups I and IV type species (Figure 5). The recent lava flow does not have sufficient soil deposition to support Type II forest, and no Type III vegetation exists due to the lack of land disturbance within the current project area.

Figure 5: Project Area Vegetation.

HISTORICAL AND CULTURAL CONTEXTS

Hilo was, by most estimates, one of the first settlements on the Island of Hawai'i and was settled between AD 300 and 600. The rich marine resources of Hilo Bay and the gently sloping forests of Mauna Loa and Mauna Kea provided abundant resources. Fresh water was available from the Wailoa and Wailuku rivers and smaller streams such as Waiākea, Waiolama, Pukihae, and 'Alenaio. The current project area is located on and near the former *'ili* lands of Pū'āinakō, Kāwili, and Mohouli, in the *ahupua'a* of Waiākea, Hilo Hanakāhi *'okana*, in the *moku-o-loko* (district) of Hilo (Maly 1996:4-5) (Figure 6). Waiākea Stream flows south of the present study area. The *ahupua'a* of Waiākea is large – approximately 95,000 acres from the coastline to the slopes of Mauna Kea – and was regarded as a region of abundant natural resources and numerous fishponds.

PRE-CONTACT ACCOUNTS OF HILO

The earliest account of Hilo appears in 'Umi-a-Liloa's (1600–1620) conquest of the Island of Hawai'i, which establishes Hilo as a royal center by the sixteenth century. In the account, 'Umi-a-Liloa began his conquest of the Island of Hawai'i by defeating chief Kulukulu'ā, who lived in Waiākea, and the other chiefs of Hilo (Kamakau 1992:16–17). 'Umi-a-Liloa's second son, Keawe-nui-a-'Umi, ruled Hamākua, Hilo, and Puna from his residence at Hilo (*ibid*: 34). It was from Hilo that he waged war on the Kona chiefs and unified the island. Keawe-nui-a-'Umi's descendants single handedly continued rule for many generations from Hilo. After the death of Keawe-nui-a-'Umi the kingdom was divided into three parts and was established under warring chiefs; Hilo was ruled by Kumalae-nui-pu'awa-lau and his son Makua *(ibid*: 45). It was during the period of time that Kamehameha I was born. Kalani'ōpu'u's grandson, Keoua Kuahu'ula and nephew Kamehameha vied for control over the six chiefdoms constituting the island kingdom and Keoua conquered Hilo chief Keawe-mau-hili and harvested the benefits for a short time only to be killed by Kamehameha late in 1791. Kamehameha's son Liholiho was born in Hilo in November 1797 (Kamakau 1992:22). Waiākea was inherited by Lihiliho after Kamehameha's death. The *'ili kūpono* of Pi'opi'o and its royal fishpond were given to his favorite wife, Ka'ahumanu (Figure 7).

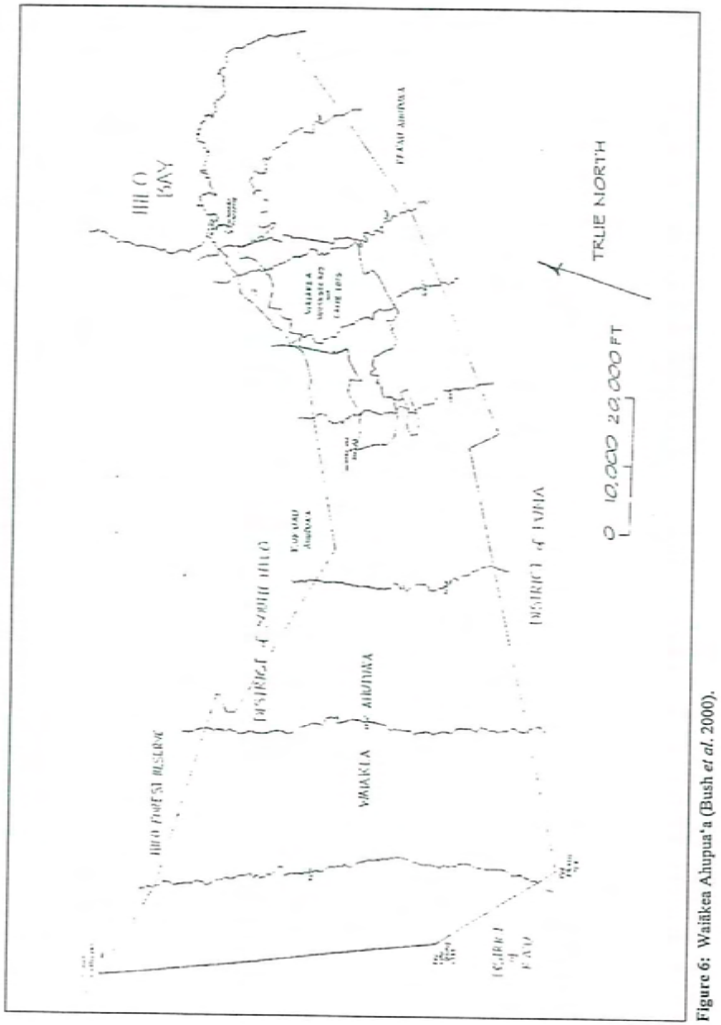

Figure 6: Waiākea Ahupua'a (Bush *et al.* 2000).

TRADITIONAL SETTLEMENT PATTERNS, SUBSISTENCE, AND LAND-USE

Historical accounts and archaeological/cultural studies pertaining to the *ahupua'a* of Waiākea (Bingham 1969; Bird 1974; Ellis 1963; Handy and Handy 1972; Kelly *et al.* 1981; Maly 1996; McEldowney 1979) provide a wealth of information on traditional residence patterns, land-use, and subsistence horticulture of the area. It is widely held that these historical accounts of residence patterns, land-use, and subsistence horticulture indicative of traditional practices developed long before contact with Europeans (McEldowney 1979). These are synthesized below in order to explain the types of cultural resources possibly located within the current project area.

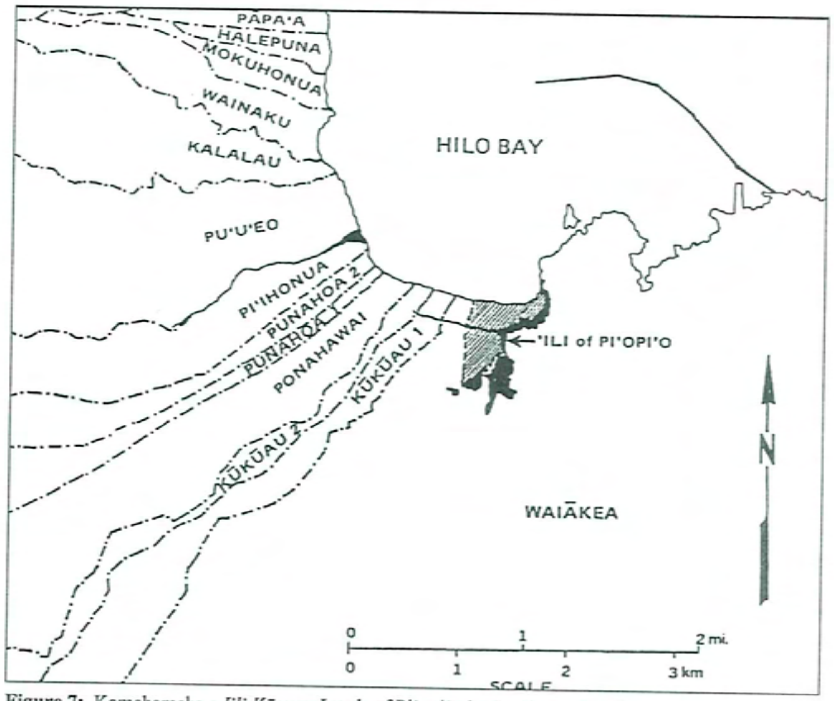

Figure 7: Kamehameha,s *Iili Kūpono* Lands of Pi'opi'o in the *Ahupua'a* of Waiākea (Kelly *et al.* 1981).

Early accounts of Waiākea portray it as divided into several distinct environmental regions. From the coast to a distance of five or six miles scattered subsistence agriculture was evident, followed by a region of tall fern and bracken, flanked at higher elevations by a forest region between 10 and 20 miles wide, beyond which was an expanse of grass and lava (Ellis 1969:403). The American Missionary C.S. Stewart wrote, "the first four miles of the country is open and uneven, and beautifully sprinkled with clumps, groves, and single trees of the bread-fruit, pandanus, and candle tree (Stewart 1970:361-363). The majority of Waiākea's estimated 2,000 inhabitants (in 1825) lived within this coastal region (Ellis1969: 253). Taro, plantains, bananas, coconuts, sweet potatoes, and breadfruit were grown individually or in small garden plots. Fish, pig, dog, and birds were also raised and captured for consumption.

The present study area is situated along the upper reaches of the open coastal region and the lower reaches of the tall fern and bracken zone. It is located in McEldowney's upland agricultural zone (See Previous Archaeology section below) consisting of "scattered huts" amidst "garden "plots" created through "shifting agriculture" (McEldowney 1979:18-19). Wood, such as *ohi'a* and *koa* for house construction, canoe building, and fires was obtained from this upland agricultural zone, and from the dense forests above (Ellis 1963:236). *Hala* for thatching was also known to be plentiful along the lava flows of eastern Waiākea (Ellis 1917, cited in Kelly *et al.* 1981:20). Of particular interest is a description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6-8).

THE MĀHELE OF 1848 AND LAND COMMISSION AWARDS

The *ahupua'a* of Waiākea became Crown Lands during the Māhele of 1848 and in the following years twenty-five Land Claims were awarded within the *ahupua'a* of Waiākea (Table 1). The awards were small in area, 24 of which went to native claimants. No Land Commission awards were made within the project area, and all but two were located near the coast. A five-acre parcel was awarded to Keaniho (LCA 2402) approximately one kilometer east of the present study area. The parcel contained a house and three cultivation fields. Keaniho's parcel bordered *kalo* fields to the west according to testimony given in support of the claim (Maly 1996:22).

Table 1. Land Commission Awards in Waiākea *Ahupua'a*.

Grantee	LCA	Acreage
Barenaba	2327	12.25
Halai, L.K.	1279	0.60
Hale	40004	4.25
Kahue	2663	3.75
Kaiana, J.B.	2281	10.25
Kaihenui	11050-B	5.19
Kalolo	1333	2.25
Kalua	8854	3.40
Kaluhikaua	1738	2.98
Kamamalu, V.	7713	*'ili 'aina*
Kamanuhaka	8803	1.02
Kapu	1-F	1.60
Kealiko	11174	1.00
Keaniho	2402	5.00
Keawe	5018	0.24
	10505	
Kuaio	4344	1.22
Leoi	9982	0.80
Lolo	4738-B	1.27
Mahoe	1-E	4.46
Mocaloha	4737	1.03
Nakai	4785	1.05
Napeahi	2603	1.30
Wahine	4737-B	1.01
Wahinealua	11173	2.50
Wahinenohoihilo	10004	1.69

CHANGING RESIDENTIAL AND LAND-USE PATTERNS (1845-1865)

Between 1845 and 1865 traditional land-use and residential patterns underwent a change. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns (Kelly *et al.* 1981). Hilo became the center of population and settlements in outlying regions declined or disappeared. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements, respectively.

WAIĀKEA MILL COMPANY

On July 15, 1861, S. Kipi leased the Crown Land of Waiākea from Kamehameha IV to be used as pastureland for an annual amount of $600 (Kelly *et al.* 1981:89). In 1874, Rufus A. Lyman was granted a 25-year property lease (General Lease 124-A) within Waiākea, on land encompassing the Government pastureland (Maly 1996:26). The lease granted Lyman all privileges of land use including the cutting of firewood and the use of fishponds. The newly established Waiākea Mill Company, founded by Alexander Young and Theo H. Davies, acquired Rufus A. Lyman's General Lease 124-A in 1879 (with an extension of terms until June 1, 1918) (Maly 1996:27).

By the early 1900s, Waiākea plantation was cultivating sugar cane on over 6,000 acres of government land (Kelly *et al.* 1981:89, 120). While sugar cane was cultivated in fields surrounding lands of the present project area, the shallow soils and the 1880-1881 lava flow on and adjacent to the project area made agriculture impossible.

In 1911, the Waiākea Mill Company applied for fee simple title to several portions of its leased land, but was rejected by the Board of Public Lands. Rather than renew the lease with the Waiākea Mill Company, the government of Hawaii implemented a plan to sell homestead lots and lease sugar cane lots to the public. By 1919 two hundred and thirty acres of land was returned for house lots and 5,300 acres was returned for cane field lease (Maly 1996:27-28).

The current project area is a small portion of a single government parcel once known as the "Waiākea Pasture Land" (Figure 8). That larger parcel, approximately 500 acres covered under General Lease 2751, was leased to Kazuo Miyasaki in 1939 for pasturing his dairy cattle. The lease then passed to John Matson in 1942. During World War II, the parcel covered under General Lease 2751 and known as "Waiākea Pasture Land" was used for training by the U.S. Army Corps (Maly 1996:34). By 1946, the Army was clearing the property of barbed wire, unexploded ordinance, three Quonset buildings, and two latrines.

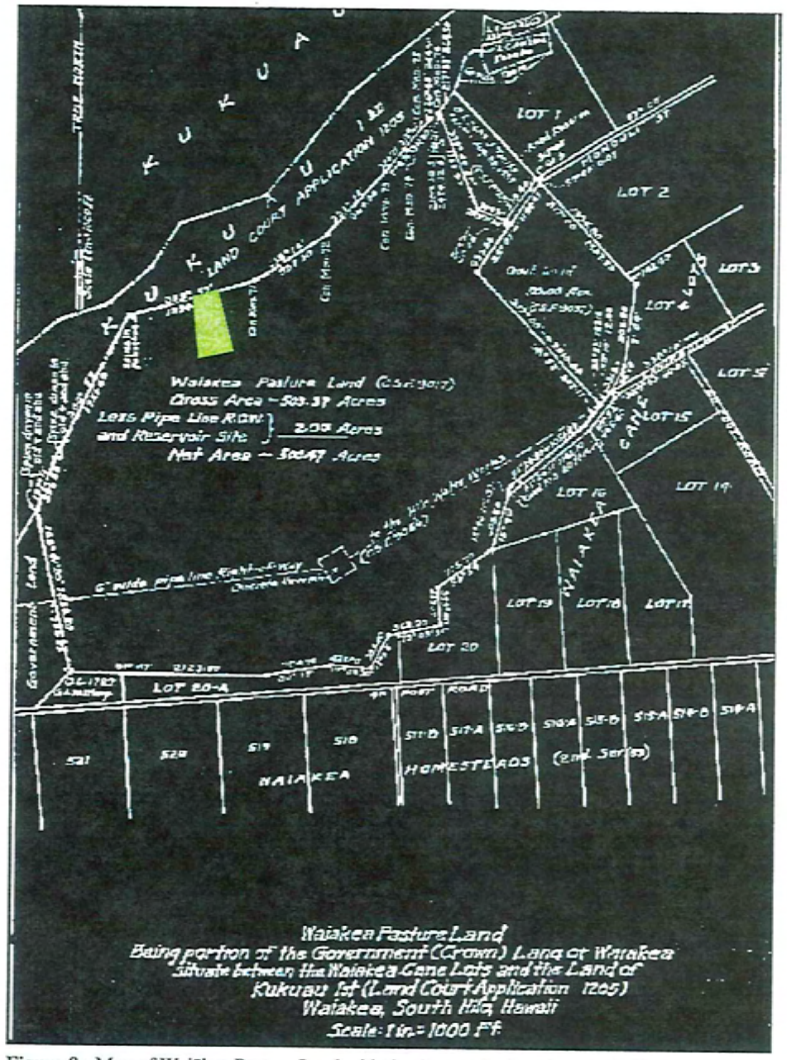

Figure 8: Map of Waiākea Pasture Land with the Current Project Area in Yellow.

PREVIOUS ARCHAEOLOGICAL INVESTIGATIONS

Numerous archaeological investigations have been carried out in the Hilo area and within the *ahupua'a* of Waiākea over the last 95 years. Many of the research projects are located adjacent to or in the immediate vicinity of the current study area. Table 2 below summarizes major findings and Figure 9 shows the location of archaeological investigations near the current project area.

Table 2. Previous Archaeological Research in Waiākea *Ahupua'*.

Reference	Location	Description & Results
Thrum 1907	Waiākea *Ahupua'a heiau* sites	List of *heiau* in Waiākea — none located near present project area.
Thrum 1908	Waiākea *Ahupua'a*	List and description of *heiau* in Waiākea —none located near present project area.
Hudson 1932	East Hawaii Island	Detailed description of various sites in the Hilo area.
McEldowney 1979	Hilo Bay area	Zonal Characteristics—Land –use study
Kelly, Nakamura, and Barrère 1981	Hilo Bay area	History of Hilo Bay
Jensen 1991	AIS in Ponahawai *Ahupua'a* TMK: (3) 2-3-044:09	Site 14946, an early historic house and sugar cane site. Site 14947, the Hilo Boarding School and Old Mission Ditch
Smith 1991	Waiākea *Ahupua'a*, South Hilo, Hawaii Island TMK: 3-2-4-01:7	List and description of sites on the 4000+BP and 1500-750BP lava flows. Inventory survey recommended.
Stokes and Dye 1991	Hawaii Island	List and description of heiau of Hawaii Island
Smith 1992	Waiākea Cane Lots, Waiākea *Ahupua'a*, South Hilo, Hawaii Island TMK: 3-2-4-56:1	Numerous cane field features including walls, clearing mounds, a large rectangular enclosure, and c-shaped enclosures.

Reference	Location	Description & Results
Moniz 1992	Waiākea *Ahupua'a*, Hilo Hawaii	A listing of 1979-1992 inventory survey results within Waiākea *Ahupua'a* that document walls, mounds, platforms, and faced terraces.
Hunt 1992	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai *ahupua'a*, South Hilo District, Hawaii (Puainako Street Extension Project)	Interim inventory survey report listing 31 cane field features including walls, clearing mounds, platforms, and faced terraces.
Spear 1993	Pi'ihonua *Ahupua'a*, South Hilo TMK: 2-3-32:4	Inventory survey report of a 5-acre parcel that documents an historic oven and a trash dump. No further work recommended.
Borthwick, Collins, Folk, and Hammatt 1993	Waiākea *Ahupua'a* TMK: 2-4-01:7 and 41	Inventory survey of 163 acres of UH property along and east of Komohana Street. Documents four historic sites associated with sugar cane agriculture. No further work recommended.
Hunt and McDermott 1994	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai *ahupua'a*, South Hilo District, Hawaii (Puainako Street Extension Project)	Inventory survey final report (completion of Hunt 1992) documenting 13 historical sites associated with sugar cane agriculture.
Maly, Walker, and Rosendahl 1994	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Inventory survey of 4.5 acres in the Waiākea Cane Lots documenting four sites associated with historical sugar cane agriculture. Forty-seven features were recorded including walls, clearing mounds, and terraces. One radiocarbon date and recovered artifacts suggest prehistoric land-use in the project area. Data recovery recommended.

Reference	Location	Description & Results
Spear 1995	Lands of Waiākea, South Hilo TMK: 2-4-57:01	Data recovery report of Maly *et al.* (1994) parcel documenting historic sugar cane agricultural features and a few temporary habitations. No further archaeological work recommended.
Maly 1996	Waiākea Cane Lots (12, 13, 17, 18, 19, 20 & 20-A, District of South Hilo, Island of Hawaii	Oral interviews and archival research pertaining to Waiākea Cane Lots. Provides background of pre-Contact land-uses in the area and description of sugar cane agricultural features, their construction, and uses.
Robins and Spear 1996	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Inventory survey of proposed realignment of Puainako Street Extension Corridor documenting 30 new features at 3 sites (Hunt and McDermott 1994), and one new site containing 16 features. Sites and features are associated with historic sugar cane agriculture.
Eblé, Denham, and Pantaleo 1997	Lands of Waiākea, Kukuau 1 & 2, and Ponahawai *ahupua'a*, South Hilo District, Hawaii (Puainako Street Extension Project)	Supplemental testing of features (six sites) documented in Hunt and McDermott (1994). Features associated with historic sugar cane agriculture. Recommended preservation of several sites within the project area.
Spear 1998	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Reconnaissance-level survey of proposed realignment of Puainako Street Extension Corridor documenting 27 new features associated with historical sugar cane agriculture.

Reference	Location	Description & Results
McGerty and Spear 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Inventory survey of Spear (1998) parcel documenting 17 features: 15 historic sugar cane agriculture features and two features associated with a modern pig farm. All features were added to site 18921. Data Recovery recommended.
Dega and Benson 1999	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Reconnaissance-level survey of proposed realignment of Puainako Street Extension Corridor documenting eight sites containing 18 features including 12 clearing mounds, two platforms, two walls, a rock alignment, and an *'auwai*. All but the *'auwai* were associated with historic sugar cane cultivation. The *'auwai* was described as a pre-Contact feature likely also utilized in historic cane field agriculture.
Dega 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Inventory survey of Dega and Benson (1999) parcel documenting eight new features (at Site 18921) associated with sugar cane agriculture.
Dega and Spear 2000	Lands of Waiākea, Kukua 1 & 2, and Ponahawai, South Hilo District, Island of Hawaii (Puainako Street Realignment/Extension Project)	Preservation plan for sites 18914, 18915, 18917 and a boulder path/alignment recorded by Eblé *et al.* (1997).

Reference	Location	Description & Results
Bush, McDermott, and Hammatt 2000	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai'i Island (USDA Pacific Basin Agricultural Center Project)	Inventory survey of 20 acres along western edge of Komohana Street, and adjacent to east-central portion of current project area. Documents one skylight (site 22080) containing a single human femur. Preservation recommended.
McDermott and Hammatt 2001	Lands of Waiākea, South Hilo TMK: 2-4-01: 122, South Hilo, Hawai'i Island (USDA Pacific Basin Agricultural Center Project)	Inventory survey of 10 acres adjacent (west) to Bush *et al.* (2000) documenting two historic sites (one feature each), including a modified outcrop and a stone causeway. No further work recommended.
Haun 2002	Archaeological Field Inspection of eight acres in Ponahawai *Ahupua'a* TMK: (3) 2-3-037:001	Historic sugar cane agricultural features and house site
Escott 2004	AIS of 258 Acres, Waiākea *Ahupua'a* [TMK: 3-2-4-01:122].	Sixteen sites associated with sugar cane agriculture, ranching, and WWII training

The above listed archaeological and historical investigations are instrumental to understanding broad patterns of land-use in the Hilo area (see McEldowney 1977, Kelly *et al.* 1981, Maly 1996), general trends in the distribution of formal archaeological features in the Hilo area (see Thrum 1907 and 1908, Hudson 1930, Smith 1991, Moniz 1992, Spear 1993), and to formulating archaeological expectations at the present project area (see Jensen 1991, Borthwick *et al.* 1993, Hunt and McDermott 1994, Spear 1995, Robins and Spear 1996, McGerty and Spear 1999, Dega 2000, Bush *et al.* 2000, McDermott and Hammatt 2001, Haun 2002, and Escott 2004).

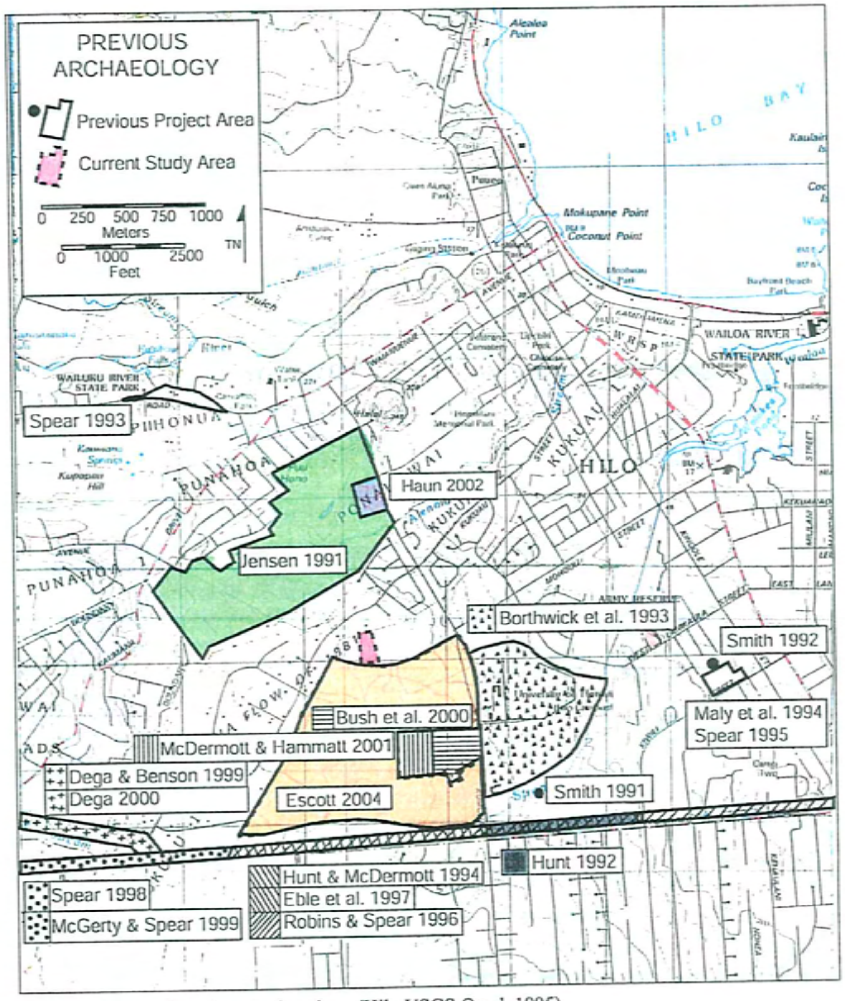

Figure 9: Map of Previous Archaeology (Hilo USGS Quad, 1995).

REGIONAL ARCHAEOLOGICAL STUDIES

McEldowney (1979)

McEldowney (1979) provides an overview of changing land-use patterns in the Hilo area based on early historic accounts. She proposes that Hawaiians utilized land in accordance to five elevation zones (1979:14). Land-use zones are classified as (I) coastal, (II) upland agricultural, (III) lower forest, (IV) rainforest, and (V) sub alpine, or montane. The inhabitants of Waiākea *Ahupua'a* had access to resources in all five of McEldowney's zones.

The present project is situated in the upland agricultural zone (50 to 1,500 feet) described as unwooded grasslands and extensive dryland cultivation plots. McEldowney suggests this region was likely deforested prior to European contact through shifting agricultural practices such as swiddening. Site types consist of scattered houses adjacent to garden and arboreal plots on older *pāhoehoe* and *'a'ā* flows with well-developed soils. Modified lava tubes and tubes used for cultural practices are also common in the upland agricultural zone.

Smith (1991)

Smith (1991) also comments on site distribution in the *ahupua'a* of Waiākea based on Mauna Loa lava flows, including a portion of the 1880-1881 *pāhoehoe* flow, a *pāhoehoe* flow dating to 750-1,500 ybp, and a *pāhoehoe* flow dating to 5,000-10,000 ybp. He notes that the majority of sites are located on the older lava flow, which has deeper, more developed soils.

Kelly *et al.* (1991)

Kelly *et al.* (1991) also contributes to an historical understanding of changing land-use patterns following European involvement in the economy of Hawaii. In particular, the regular use of Hilo Bay by foreign vessels, the whaling industry, the establishment of missions in the Hilo area, the introduction of the sandalwood trade, the legalization of private land ownership, the introduction of cattle ranching, and the introduction of sugar cane cultivation all brought about changes in settlement patterns and long-established land-use patterns. Hilo became a population center and settlements in outlying regions declined. While food was still grown for consumption, greater areas of land were continually given over to the specialized cultivation and processing of commercial foodstuffs for export. Sugar cane plantations and industrial facilities were established in areas that were once upland agricultural areas and coastal settlements.

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991)

Thrum (1907 and 1908), Hudson (1932), and Stokes and Dye (1991) represent early archaeological efforts to document site distribution pertinent to the greater Hilo area. Hudson notes there were already no archaeological sites remaining in the city of Hilo by the early 1930s (Hudson 1932:236). All three authors note the dismantling of well-known heiau in the Hilo area (Thrum 1908:240, Hudson 1932:236, Stokes and Dye 1991:152).

INVESTIGATIONS SPECIFIC TO STUDY AREA

Several recent archaeological and historical investigations completed in the immediate vicinity of the present project area have direct bearing on the types and distribution of expected sites and features. The majority of these reports document historic-era sites on well-developed ash and organic soils overlaying a Mauna Loa *pāhoehoe* flow dating to 5,000-10,000 ybp (see Figure 4). Sites are primarily the remains of sugar cane field clearing and in-field collection and processing architecture. Two recent reports (Bush *et al.* 2000, McDermott and Hammatt 2001) provide insight into predicting the types of sites located on the nearby *pāhoehoe* flow dating to 750-1,500 ybp south of the project area. Two studies document historic-era sugar cane agricultural sites on deep soils north of the present project area (Jensen 1991 and Haun 2002).

Jensen 1991

PHRI conducted an archaeological inventory survey north of the present project area and identified only two sites. Only one of the two sites, SIHP 14947, the Hilo Boarding School and Old Mission Ditch, was recommended for further documentation and preservation. The second site, SIHP, is an historic-era house site associated with sugarcane agriculture.

Haun 2002

Haun conducted a field inspection north of the present project and identified 15 sites with 25 component features. There were 19 rock mounds, a road, a low wall, a retaining wall, a terrace, and two platforms. The features all appear to be historic and related to sugar cane agriculture.

Hunt and McDermott (1994)

The initial archaeological investigations south and southeast of the present project area was an Archaeological Inventory Survey of the Pu'ainako Street Extension within Waiākea, Kūkūau 1 and 2, and Ponahawai *ahupua'a* conducted by Hunt and McDermott (1994) in 1992 and 1993. The study entailed historical background research, pedestrian survey, and limited subsurface testing.

The inventory survey report documents 13 sites (SIHP Sites 50-10-35-18911 to -18923) comprised of 88 individual features. All features were interpreted as dating from A.D. 1880 to 1950, and were interpreted as features associated with the cultivation and processing of sugar cane. Five test-units were excavated within several features and it was concluded that the lack of prehistoric artifacts and traditional subsurface features within them supported the interpretation that the features were historic in origin (Hunt and McDermott 1994:104). The inventory survey report recommended that data recovery be carried out at site complexes as additional excavation work "could potentially yield isolated traces of prehistoric use of the area, presumably for dryland agriculture" (Hunt and McDermott 1994:109-113). The report also recommended extensive archival research, a task later undertaken by Maly (1996).

Borthwick, Collins, Folk, and Hammatt (1993)

Cultural Surveys Hawaii conducted an archaeological survey and limited testing on a 163-acre UH Hilo parcel adjacent to and southeast of the present study area. The report documents four historic sugar cane cultivation sites (SIHP Sites 18667 through 18670) comprised of seven features (one feature contains 25 clearing mounds), including walls, clearing mounds, enclosures, and a remnant sugar cane field. Test-units contained no cultural material or traditional Hawaiian feature components confirming their association with more recent sugar cane cultivation. Sites were situated on older *pāhoehoe* flows with well-developed soils. No further work was recommended.

Maly (1996)

Kepa Maly's report combines the results of McEldowney (1979) with traditional Hawaiian history, early European accounts, previous archaeological work, and oral histories to document cultural and agricultural practices in Hilo and the *ahupua'a* of Waiākea. The report focuses on Hawaiian settlement and population expansion in the region of the present study area. Of particular interest is the description of bird snaring and mention of banana growing in the area of the present study (Maly 1996:6-8). Maly

also documents the effect of sugar cane cultivation (Waiākea Mill Company operations from the 1870s to 1940s) on pre-Contact archaeological remains within the present project area. While some components of early Hawaiian sites might be incorporated in more modern archaeological features, the clearing of fields and the construction of collection and processing facilities have dismantled or obscured older archaeological sites (Kenneth Bell in Maly 1996:57). Informants who remembered the Waiākea sugar cane plantation fields stated that features such as stone mounds, ramped platforms, terraces, walls, enclosures, and berms (railway berms) were built in order to facilitate sugar cane cultivation and ranching.

Robins and Spear (1996)

Following Maly's (1996) work, SCS (Robins and Spear 1996) conducted an inventory survey on a narrow parcel of land south of the present study area. The project area covered four proposed road alignments for the Pu'ainako Street Extension project and reflected both an elongation and a lateral expansion of the original road alignment study (Hunt and McDermott 1994) from a 120 to 300-foot wide corridor.

The Robins and Spear survey documented the 30 architectural features associated with sites previously reported by Hunt and McDermott (SIHP Sites 18912, 18914, and 18919) as well as 16 additional features that were combined, with features taken by SHPD from SIHP Site 18919, to form a new site (SIHP Site 20681). Robins and Spear (1996:49-52) concluded that all 46 features, representing four sites, were associated with historic sugar cane activities based on the fact that all of the sites are located within or adjacent to known sugar cane fields, all features are representative of formal sugar cane field features, site structure is comparable to other known plantation sites and is atypical of traditional Hawaiian structures, and the documented sites contain historic-era artifacts that are specific to sugar plantation or ranching activities. No traditional Hawaiian components of modern features or pre-Contact artifacts were discovered during the inventory survey work. Robins and Spear (1996:53-56) recommended data recovery for eight sites within the corridor and concurred with SHPD in the preservation of several other sites.

Eblé, Denham, and Pantaleo (1997)

At the request of the Ho' oikaika Hawaiian Club (HHC), Garcia and Associates (Ganda) conducted supplemental archaeological excavations (reported in Eblé *et al.* 1997) at sites previously identified by Hunt and McDermott (1994). The purpose of the

additional work was "to aid in the interpretation of site function and chronology, and to ensure that all cultural remains in the area have been sufficiently identified" (Eblé *et al.* 1997:1). The Hunt and McDermott survey had excavated only five units within 88 features and the sponsoring Ho' oikaika group deemed additional excavations necessary to support or refute the report's site age and function determinations. The supplemental archaeological work performed by Ganda was not considered an official stage in the State of Hawai'i historic preservation process but was deemed a supplemental aid to the previous study.

Seven test-units (typically 1.0 m by 1.0 m) were excavated within six sites previously mapped and recorded by Hunt and McDermott (1994). The sites included SIHP Site 18916, 18911, 18912, 18914, 18915, and 18917. The excavation units yielded historic artifacts such as metal and midden. Three samples of wood charcoal were submitted for radiocarbon testing and were dated to pre-Contact (traditional) and early historic times. The samples were considered problematic since they did not precisely date the architectural structures themselves but were taken from the soil matrix below features and were not associated with any subsurface features such as *'imu* or discrete hearths, for example. The report further concluded that all "intact evidence of pre-Contact occupation and/or activity in the project area has been disturbed or destroyed as a result of post-Contact period activity" (Eblé *et al.* 1997:53). The archaeological features examined as part of this supplemental project were interpreted as associated with sugar cane cultivation and processing, and reinforced the interpretations offered by Hunt and McDermott (1994), Maly (1996), and Robins and Spear (1996). The supplemental testing report recommended preservation for several sites (discussed below) (Eblé *et al.* 1997:56).

Spear (1998)

The following year an archaeological reconnaissance-level investigation was carried out by SCS along the western (*mauka*) portion of the Pu'ainako Street Extension, located to the south of the present study area. While reconnaissance surveys are not recognized by the SHPD as a stage in the historic preservation process, reconnaissance surveys provide a rapid means of assessing the cultural resources within a given project area. A formal report of a reconnaissance survey is not generally submitted to SHPD because the results are usually incorporated into an inventory survey reports. Twenty-seven features were recorded during the reconnaissance survey and were associated with SIHP Site

18921 previously recorded by Hunt and McDermott (1994). Spear (1998) recommended that an inventory survey be conducted.

McGerty and Spear (1999)

The inventory survey work (McGerty and Spear 1999) generated as a result of the previous reconnaissance survey (Spear 1998) was listed as an addendum to the inventory survey report completed by Robins and Spear (1996). McGerty and Spear (1999) re-identified the features documented by Spear (1998) and recorded a total of 17 features. The number of features was reduced from 27 to 17 because several of the features documented during the reconnaissance survey were combined into more discrete feature designations or were assessed as not being archaeological features. All 17 features were assigned to SIHP Site 18921 and 15 of them were interpreted as features associated with historic sugar cane activities cultivation and processing. The inventory survey report notes that SIHP Site 18921 is located on former Waiākea Sugar Company cane fields (Conde and Best 1973:120, as cited in McGerty and Spear 1999:23).

Based on information provided in an interview, two features (Feature 1 and Feature 11) were interpreted as remnants of a modern pasture or piggery. The inventory survey report (McGerty and Spear 1999:25) concurred with Hunt and McDermott (1994:112) that the site was significant under Criterion D and recommended a data recovery investigation.

Dega and Benson (1999)

In August 1999, SCS conducted a reconnaissance-level survey (Dega and Benson 1999) southwest of the UH Hilo Mauka lands project. The survey was performed within a short, expanded section of the highway (western end) occurring just to the south, and partially overlapping the reconnaissance survey area documented in Spear (1998), and the inventory survey work reported in McGerty and Spear (1999). The project area was approximately 1.0 mile long (east-west) and 300 feet wide (north-south) and was situated from 0.40 km to 2.5 km south of Kaumana Drive at the study corridor's western and eastern termini.

Eight archaeological sites were identified within the western border of the project area. Eighteen features were documented including 12 rock mounds, two platforms, two walls, one alignment, and one stone-lined *'auwai,* or water channel. Seventeen features were interpreted as related to historic sugar cane cultivation and processing, a similar

interpretation to that presented previously (Hunt and McDermott 1994, Robins and Spear 1996, McGerty and Spear 1999).

One feature, a rock-lined *'auwai* or water channel, was interpreted as traditional (pre-Contact). The *'auwai* is situated parallel to and between several rock mounds associated with sugar cane cultivation but is suggestive of a traditional water channel because its width (0.80 m) is much smaller than channels typically used for sugar cane field irrigation. Secondly, the gravity-fed system was lined with small cobbles and not metal, as is commonly used in the construction of sugar cane water channels. Thirdly, the channel itself was not deep (average 0.10 m below rock surface) and had not been maintained for some time. Finally, the channel emptied onto a small alluvial plain that would have been well suited to small-scale irrigated taro cultivation. The Dega and Benson (1999) reconnaissance survey report recommended inventory survey work be carried out, including test-excavations within and near the *'auwai* feature.

Dega (2000)

SCS conducted an inventory survey to complete the reconnaissance-level survey reported by Dega and Benson (1999) at SIHP Site 18921. Eight features were documented, two previously recorded by Spear (1998) or during the Dega and Benson (1999) reconnaissance survey. Features included walls, clearing mounds, rock alignments, a platform, and a stone-lined *'auwai*. Four stratigraphic trenches were mechanically excavated in and around the *'auwai* feature. Trenches were typical 1.80 meters wide and totaled 17 meters in length. The *'auwai* was reinterpreted as an historical sugar cane field irrigation ditch due to a lack of stones lining its bottom as is common in traditional Hawaiian *'auwai*. No evidence was found to substantiate the presence of a *lo'i* associated with the irrigation ditch.

Bush, McDermott, and Hammatt (2000)

Cultural Surveys Hawaii carried out an inventory survey of a 20-acre parcel for the proposed USDA Pacific Basin Research Center. The project is located on a parcel along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava flow dated to between 750 and 1,500 ybp. A single human femur located in an overhang within a shallow skylight. The site (SIHP Site 22080) was designated a burial and recommended for preservation.

McDermott and Hammatt (2001)

Cultural Surveys Hawaii carried out an additional inventory survey of a 10-acre parcel (adjacent to and west of the 2000 study area) for the proposed USDA Pacific Basin Research Center. The project was also located along the western-central edge of the UH Hilo Mauka Lands project area on a Mauna Loa *pāhoehoe* lava flow dated to between 750 and 1,500 ybp. Two post-Contact sites comprised of two features were documented. SIHP Site 22734 consisted of a modified outcrop and SIHP Site 22735 consisted of a stacked stone causeway. No further work was recommended at both sites.

Escott 2004

Sixteen new sites (80 features) and three previously recorded sites were recorded during inventory survey work conducted on lands just south of the present project area. Eleven of the sites on the project area were associated with Historic-era sugarcane agriculture, three were associated with WWII military training activities, one was associated with Historic-era ranching, and four were associated with Historic-era dirt roads. None of the sites were recommended for preservation, two of the military sites were recommended for data recovery, and the seventeen remaining sites required no further work.

EXPECTED ARCHAEOLOGICAL PATTERNS

Based on previous archaeological studies, geological studies, historical research, interviews, and County Planning Department records it is expected that any archaeological sites located on the current project area will be related to historic period ranching activities within. The present project area is located on the 1880-1881 lava flow in an area known as the Waiākea Pasturelands.

PREHISTORIC SITES

Historical accounts of Waiākea *ahupua'a* describe the region of the present project as unwooded grasslands and extensive dryland cultivation plots. McEldowney suggests this region was likely deforested prior to European contact through shifting agricultural practices such as swiddening. Site types in the region likely consist of scattered temporary habitation sites adjacent to garden and arboreal plots on older *pāhoehoe* and *'a'ā* flows with well-developed soils. It is not likely these types of features will be located on the 1880-1881 lava flow within the project area. Modified lava tubes and tubes used for cultural practices are possible in this upland agricultural zone. A

single human femur located in an overhang within a shallow skylight (SIHP Site 22080) was discovered south of the current study area (Bush *et al.* 2000).

SUGAR CANE CULTIVATION SITES

According to Smith (1991) the majority of sites in the region are located on the older lava flow, south of the project area. Archaeological investigations and historical documentation have shown that the predominant site type in this area is associated with Waiākea Mill Company plantation fields. Pre-Contact sites are infrequently documented and were likely dismantled or obscured by cane field clearing (Maly 1996). It is not expected that sugar cane field features will be encountered within the current study area because of the lack of soil and the modern lava flow.

RANCHING AND MILITARY SITES

The majority of the project area is situated on the historic 1880-1881 flow. Soil deposition on the flow is nonexistent to thin and is poorly suited to traditional or modern agriculture. While traditional pre-Contact horticultural practices (planting in pockets of soil in bedrock depressions and mulching with rocks) may have been practiced in the area, it is expected that they will not be encountered on the recent lava flow. Arboreal agriculture is also unexpected in the thin soil of the project area. If traditional agriculture was not practiced in the area, it is unlikely that temporary habitation and associated features will be located in the central and northern portions of the project area. It is primarily expected that sites related to historic period ranching, and less likely, to military training (pertaining to General Lease 2741) will be encountered.

TRANSPORTATION ROUTES

It is possible, though unlikely, that transportation routes will be located within the project area. Historic maps of the area show Mohouli Street and Pu'ainako Street as the only two Historic-era points of access to this undeveloped area. It is known that a trail (Maly 1996) and several dirt roads (Robert Steamy Chow interview) ran between these two streets, under and *mauka* of Komohana Street. Two separate dirt roads are evident in aerial photos south of the project area (taken 1950, 1952, 1964). Within the current study area, no trails or dirt roads are documented on historic maps, nor are any evident in aerial photographs. It is still possible that trail segments or old dirt roads might exist within the study parcel.

RESULTS OF FIELDWORK

No archaeological sites or features were located on the current project area parcel. The entire 5-acre parcel is completely covered by pahoehoe lava from the 1880 to 1881 flow. Any possible traditional cultural resources constructed prior to that flow are no longer visible. The recent flow lava also prevented any modern sugar cane or other agricultural pursuits. At present, there are no cultural resources, modern structures, or modern disturbance on the study parcel.

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APPENDIX F

VERTEBRATE FAUNAL SURVEY REPORT

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AVIFAUNAL AND FERAL MAMMAL SURVEY OF PROPERTY PROPOSED FOR A FIRE ADMINISTRATION SUPPORT COMPLEX AT WAIAKEA, SOUTH HILO, ISLAND OF HAWAII

M & E Pacific, Inc.

AECOM

Honolulu, Hawaii

Survey and Report by:

Phillip L. Bruner
Environmental Consultant
Faunal (Bird & Mammal) Surveys
#1775 BYUH
55-220 Kulanui Street
Laie, HI 96762

17 February 2009

INTRODUCTION

The purpose of this report is to provide the findings of a two day (14,15 February 2009) field survey of property proposed for a Fire Administration Support Complex at Waiakea, South Hilo, Island of Hawaii TMK (3)2-4-001:176 & 178. In addition to the data obtained from the field survey, relevant published and unpublished sources are also noted in the report. These resources add a broader perspective of the wildlife resources in this region of the island. The goals of the survey were:

1- Document the species of birds and mammals observed on or near the property.

2- Devote special attention to documenting the presence and possible use of this property by native and migratory species particularly those that are listed as threatened or endangered.

SITE DESCRIPTION

The proposed project site is a relatively flat property. Ohia (*Metrosideros polymorpha*) with an understory of Uluhe or False Staghorn Fern (*Dicranopteris lineris*) are the dominant vegetation. Property on either side and across Mohouli Street contain the same vegetation. Relatively new residential properties occur to the rear (north) and nearby.

SURVEY PROTOCOL

The field survey was conducted over two consecutive days (14, 15 February 2009). Avian data were collected in the early morning and late in the day when birds and mammals are most active and more easily detected. Previously marked survey transects allowed foot access to the site. Observations of mammals were limited to visual sightings. The evening of 14 February 2009 was devoted to a search for the presence of the endangered Hawaiian Hoary Bat (*Lasiurus cinereus semotus*). A Petterson Electronic AB Ultrasound Detector D 100 was used to listen for echolocating bats at several sites on and near the property.

Weather during the survey was mixed with relatively calm mornings and windy afternoons and evening with light passing showers. Scientific and common vernacular names used in this report follow Honacki et al. (1982), Pratt (1998) and Pyle (2002).

RESULTS AND DISCUSSION

Native Land Birds:

No native land birds were observed on this survey. The only species that might on occasion occur in this area are the endangered Hawaiian Hawk or 'Io (*Buteo solitarius*) and the Hawaiian Short-eared Owl or Pueo (*Asio flammeus sandwichensis*) (Pratt et al. 1987, Hawaii

Audubon Society (2005). Pueo are not listed as endangered or threatened on the island of Hawaii, however, the State of Hawaii does list the Pueo population on Oahu as endangered. The abundance of mosquitoes and the low elevation of this site likely precludes foraging by native forest birds such as Apapane (*Himatione sanguinea*) and Hawaii Amakihi (*Hemignathus virens*).

Native Waterbirds:

No native waterbirds were observed. No wetlands or land suitable for waterbirds occurs on this property.

Seabirds:

No seabirds were seen on, or flying over the property. Some species such as Newell Shearwater (*Puffinus auriacularis newelli*) and Hawaiian Petrel (*Pterodroma sandwichensis*) likely do fly over this locality as they make their way from their mountain nesting sites to forage at sea. If lights are used during construction or as a security measure after the project has been completed the lights should be equipted with shields that direct the light downwards to avoid attracting and confusing seabirds particularly from September to November (the period when juveniles are leaving their mountain nests on their first journey out to sea).

Migratory Birds:

No migratory shorebirds were observed. No habitat suitable for shorebirds currently occurs on the property. If the proposed development includes large lawn areas then Pacific Golden-Plover (*Pluvialis fulva*) will likely establish territories on the lawn. This species is the most abundant migratory shorebird that spends its non-breeding season in Hawaii. It is not threatened or endangered.

Alien (Introduced) Birds:

Only seven alien species were detected on the survey. This relatively low number of species is due to the homogenous habitat of the site. A greater array of species would be expected if there were a wider variety of habitats on the property. Table One notes the alien birds observed. None of these species are listed as threatened or endangered.

Mammals:

The only feral mammals observed were two cats (*Felis catus*) and one Small Indian Mongoose (*Herpestes javanicus*). Rats (*Rattus spp.*) and Mice (*Mus musculus*) likely occur on the site. No endangered Hawaiian Hoary Bats were detected by the ultrasound device during an evening search of the property on 14 February 2009. The Hawaiian Hoary Bat generally roosts solitarily in trees. They forage for flying insects in a wide variety of habitats including forests, agricultural lands, urban areas, as well as over bays and ponds (Tomich 1986, Kepler and Scott 1990, Jacobs 1991, 1993, Reynolds et al. 1998, and Bonaccorso 2008 pers. com.) Strong wind

and /or rain can create conditions that can inhibit bats from foraging. In addition, at this time of year Big Island bats move to higher elevations to forage and roost. Thus the absence of bat detections on 14 February 2009 was not unexpected due to time of year and the windy, rainy weather. Bonaccorso (2008 pers. com.) reported bats can commonly be seen at the Hilo High School Track during summer months. The project property could contain foraging and perhaps roosting bats during the summer months.

EXCECUTIVE SUMMARY AND CONCLUSIONS

The only birds and mammals found on the survey were alien species. No migratory shorebirds or seabirds were observed nor expected on this property, however, Newell Shearwater and Hawaiian Petrel might be observed flying over the site as they move between their mountain nesting areas and the sea. Outside lights should contain shields that direct the light downwards to minimize distracting these birds from March to September. Juvenile Shearwaters and Petrels are particularly prone to disorientation by lights and can fly into power lines or fall prey to dogs, cats or be struck by vehicles. The endangered 'Io and the non-endangered Pueo occur in man-altered as well as native habitats throughout the Big Island. None were recorded on this survey but may on occasion forage in this area. No 'Io nests were found. The endangered Hawaiian Hoary Bat is more often seen on the Island of Hawaii and Kauai but is much less common on the other islands. No bats were detected on the survey due to time of year and

adverse (wind, rains) foraging conditions for bats. They utilize a wide spectrum of habitats from native forest to urban and agricultural lands. The breeding season runs from April to August. Trees should not be cut or disturbed during this period as young bats that are still dependent on the mother and are confined to roosting trees. Barbed wire fences are also a threat to both adult and juvenile bats (Bonaccorso 2008 pers. com).

TABLE ONE

Alien (Introduced Birds) found on a 14, 15 February 2009 field survey of TMK (3)2-4-001:176 & 178 proposed for a Fire Administration Support Complex at Waiakea, South Hilo, Island of Hawaii.

Common Name	Scientific Name
Spotted Dove	*Streptopelia chinensis*
Zebra Dove	*Geopelia striata*
Barn Owl	*Tyto alba*
Hwamei	*Garrulax canorus*
Japanese White-eye	*Zosterops japonicus*
Northern Cardinal	*Cardinalis cardinalis*
House Finch	*Carpodacus mexicanus*

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APPENDIX G

CONCEPTUAL MICROWAVE ANTENNA TOWER

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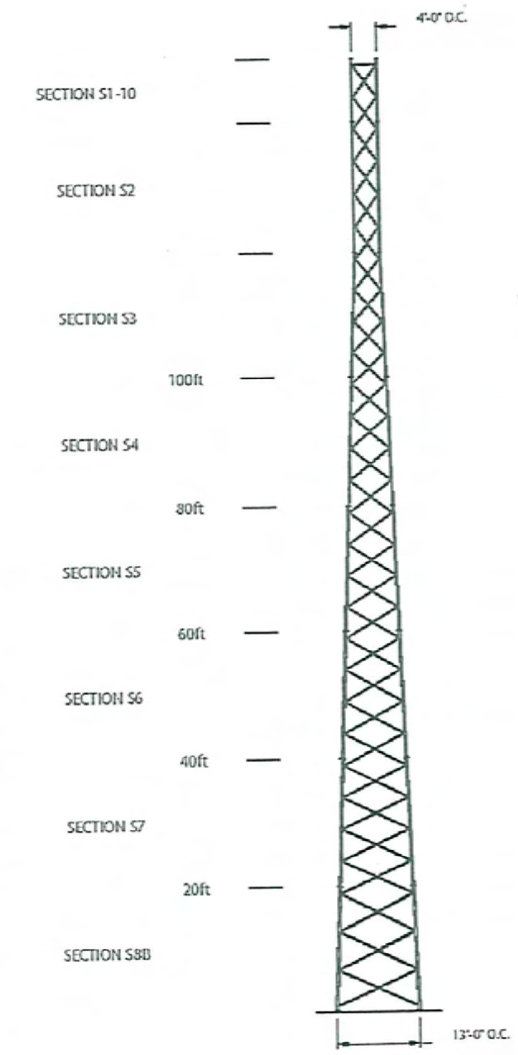
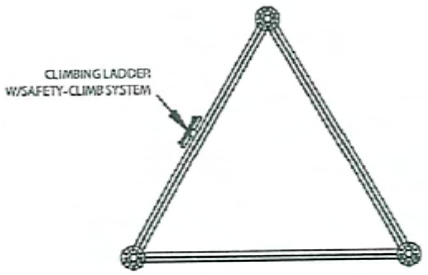
LET	REVISION	DATE	APP'D
-	INITIAL RELEASE	12/28/04	D.S.



ELEVATION



PLAN VIEW

LEGS	5" SCH 80 PIPE	4" SCH 80 PIPE	3 1/2" SCH 80 PIPE	3" SCH 80 PIPE	2 1/2" SCH 80 PIPE	2" SCH 80 PIPE	A53 Gr B (50ksi)
DIAGONALS	2 1/2"x2 1/2"x1/4" L	2"x2"x1/4" L	1-3/4 x 1-3/4 x 1/8 L			A	A36 (36ksi)
HORIZONTALS	NONE					B	A36 (36ksi)
BRACE BOLTS	(1) 3/4"Ø B.O.T	(1) 5/8"Ø BOLT PER CONNECTION	(1) 1/2"Ø BOLT PER CONNECTION				ASTM-A325
LEG-SPLICE BOLTS	(6) 1"Ø/LEG	(6) 3/4"Ø/LEG	(6) 5/8"Ø BLTS PER LEG				ASTM-A325

A = 2" SCH 40 PIPE
B = 1-3/4" x 1-3/4" x 1/8" L, @ TOP ONLY

NOTES:

1. TOWER IS DESIGNED TO CONFORM TO THE REQUIREMENTS OF EIA/TIA-222-F-1996, WITH CONSIDERATIONS OF 100mph WIND VELOCITY AND 1/2" RADIAL ICE, CONCURRENTLY.
2. TOWER LOADING CRITERIA IS AS FOLLOWS:
   A. 35sq.ft., 240lbs. ANTENNA AT THE 150ft TOWER ELEVATION, WITH (2) 7/8" FEEDLINES
   B. OSHA COMPLIANT EXTERNAL CLIMBING LADDER WITH SAFETY-CLIMB SYSTEM
   C. TOWER LIGHTNING PROTECTION/GROUNDING KIT
3. ALL STRUCTURAL STEEL PIPE LEG MATERIALS SHALL CONFORM TO THE REQUIREMENTS OF ASTM-A53, GRADE B (50ksi YIELD STRENGTH MATERIAL); ALL ADDITIONAL STRUCTURAL STEEL PLATES, BARS, RODS, ANGLES, SHAPES, ETC., SHALL CONFORM TO THE REQUIREMENTS OF ASTM-A36 (36ksi YIELD STRENGTH MATERIAL).
4. ALL STRUCTURAL STEEL TOWER MEMBERS SHALL BE HOT-DIPPED GALVANIZED, AFTER FABRICATION, AND CONFORM TO THE REQUIREMENTS OF ASTM-A123.
5. ALL BOLTS AND BOLTED CONNECTIONS SHALL BE HOT-DIPPED GALVANIZED AND CONFORM TO THE REQUIREMENTS OF ASTM-A325.
6. ALL WELDED CONNECTIONS SHALL CONFORM TO THE LATEST REVISED CODE OF THE AMERICAN WELDING SOCIETY: A.W.S. D1.1-96.
7. CUSTOM DESIGNS ARE AVAILABLE. PLEASE CONTACT THIS OFFICE FOR FURTHER DETAILS.
8. AS SITE & SOIL CONDITIONS MAY VARY, FOUNDATION DESIGN SHOULD BE DETERMINED ON A BY-SITE BASIS. IT IS STRONGLY RECOMMENDED THAT SOIL COMPOSITION TESTS BE PERFORMED PRIOR TO TOWER PURCHASE.

BASE REACTIONS:
TOTAL SHEAR = 25kips
AXIAL LOAD = 17kips
UPLIFT/LEG = 165kips
COMPRESSION/LEG = 176kips
OVERTURN MOMENT = 1913 ft-kips

SWAGER COMMUNICATIONS INC.
FREMONT, INDIANA 46737

STANDARD DRAWING	SCALE	DWN	J.NEFF
		APP'D	D.SWAGER

TITLE: MODEL: PA9L-150SS
TOWER ELEVATION

DATE: 12/28/04
DRAWING NUMBER: PA9L-150-01

SOURCES: ANBE, ARUGA & ISHIZU ARCHITECTS, INC.; SWAGER COMMUNICATIONS, INC.

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