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APR 15 2010

TO: KATHERINE PUANA KEALOHA, ESQ.  
DIRECTOR OF OFFICE OF ENVIRONMENTAL QUALITY CONTROL

FROM: BRENNON T. MORIOKA, Ph.D., P.E.   
DIRECTOR OF TRANSPORTATION

SUBJECT: FINAL ENVIRONMENTAL ASSESSMENT/FINDING OF NO SIGNIFICANT  
IMPACT (FONSI), KEAAU-PAHOA ROAD, SHOULDER LANE  
CONVERSION, KEAAU BYPASS TO SHOWER DRIVE  
FEDERAL-AID PROJECT NO. STP-0130(28)  
KEAAU, PUNA DISTRICT, ISLAND OF HAWAII

The State of Hawaii Department of Transportation Highways Division is submitting two (2) copies of the Final Environmental Assessment/Finding of No Significant Impact (FONSI), for the Keaau-Pahoa Road, Shoulder Lane Conversion, Keaau Bypass to Shower Drive, Federal Aid Project No. STP-0130(28) Keaau, Puna District, Island of Hawaii project in compliance with requirements of Chapter 343, Hawaii Revised Statutes, and Hawaii Administrative Rules, Title 11, Department of Health, Chapter 200. The two copies will be submitted by Wilson Okamoto, our consultant.

A Finding of No Significant Impact (FONSI) is determined for this project. The basis for this determination is set forth in Chapter 5 of the Draft EA which follows the significance criteria set forth in Hawaii Administrative Rules, Title 11, State of Hawaii Department of Health Chapter 200, Environmental Impact Statement Rules, Section 12. See the attached.

Please publish the notice of availability of the Final EA in the next issue of the Environmental Notice.

Should you have any questions, please call Emilio Barroga at 692-7546, Highways Division, Design Branch, or Mr. John Sakaguchi of Wilson Okamoto Corporation at 946-2277.

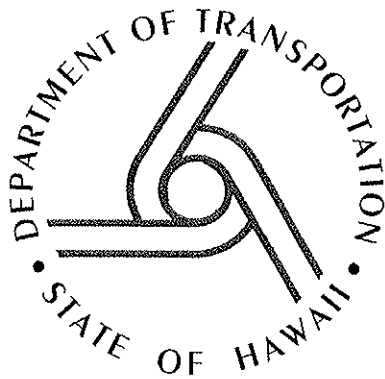
Enclosures

# Final Environmental Assessment

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## Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower Drive

Keaau, Puna District, Hawaii  
Project No. STP-0130(28)



Prepared for:  
**State of Hawaii**  
Department of Transportation  
Highways Division  
Honolulu, Oahu, Hawaii 96814

Prepared by:  
**Wilson Okamoto Corporation**  
Honolulu, Oahu, Hawaii 96826

April 2010

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HAWAII DIVISION

**Keaau-Pahoa Road, Shoulder Lane Conversion  
Keaau Bypass Road to Shower Drive**

**Keaau, District of Puna, Island of Hawaii  
Federal-Aid Project No. STP-0130(28)**

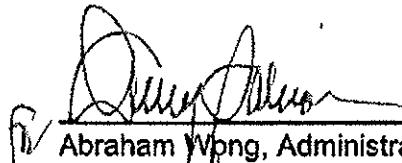
**FINAL  
ENVIRONMENTAL ASSESSMENT**

This Environmental Assessment (EA) has been prepared to meet the requirements of Chapter 343, Hawaii Revised Statutes, as amended, and Hawaii Administrative Rules Title 11, State of Hawaii Department of Health, Chapter 200, Environmental Impact Statement Rules, and the National Environmental Policy Act (NEPA) of 1969, as amended, (Pub. L. 91-190, 42 US Code 4321-4347, Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, (40 Code of Federal Regulations 1500-1508) and 23 Code of Federal Regulations 771, Environmental Impact and Related Procedures.



BRENNON T. MORIOKA, Ph.D., P.E.  
Director of Transportation  
State of Hawaii

3-29-10  
Date



Abraham Wong, Administrator  
Federal Highway Administration  
Hawaii Division

4/7/10  
Date

Prepared for:  
**State of Hawaii  
Department of Transportation  
Highways Division**

Prepared by:  
**Wilson Okamoto Corporation**

March 2010

## **SUMMARY**

<b>Proposing Agency:</b>	State of Hawaii Department of Transportation 869 Punchbowl Street Honolulu, Hawaii 96813
<b>Accepting Agency:</b>	State of Hawaii Department of Transportation 869 Punchbowl Street Honolulu, Hawaii 96813
<b>EA Preparer:</b>	Wilson Okamoto Corporation 1907 South Beretania Street, Suite 400 Honolulu, Hawaii 96826 Contact: John L. Sakaguchi, AICP, Senior Planner Tel: 808.946.2277; Fax: 808.946.2253
<b>Project Location:</b>	Keaau, Puna District, Hawaii
<b>Recorded Fee Owner:</b>	State of Hawaii and private landowners
<b>Tax Map Key:</b>	Within State of Hawaii right-of-way; TMK 1-6-003: 065, TMK 1-6-001: portion of 015; and TMK 1-5-036: portions of 116, 117, 119, 120, and 121; TMK: 1-5- 033:261 and TMK: 1-6-064:204
<b>Area:</b>	12,210 linear feet (2.31 miles approx); 4.476 acres right-of-way taking/acquisition
<b>State Land Use Classification:</b>	N/A; surrounding Agriculture
<b>County Zoning:</b>	N/A; surrounding Agriculture (A-20a)
<b>Proposed Action:</b>	The project limits extend along both sides of Keaau-Pahoa Road, State Route 130, from Keaau Bypass Road on the north to Shower Drive on the south, a total length of approximately 12,210 linear feet, 2.31 miles. On the east or makai side of the road, the improvements will convert the existing temporary 10-foot wide shoulder lane to a permanent 12-foot-wide northbound lane and add an 8-foot-wide paved shoulder between the project limits. On the west or mauka side, the improvements would convert the existing 10-foot wide shoulder to a temporary 10-foot-wide shoulder lane and add a 2-foot-wide paved shoulder. Construction will require the acquisition/

taking by the State of Hawaii Department of Transportation (HDOT) of approximately 4.476 acres of private property adjacent to the east (makai) side of Keaau-Pahoia Road. No acquisition/taking would occur on the west (mauka) side. The improvements would include: on the east or makai side, demolition of the existing northbound 10-foot wide shoulder lane; construction of a new northbound 12-foot wide travel lane and 8-foot wide shoulder for pedestrians and bicyclists; installation of 7,432 linear feet (1.40 miles) guardrails along the project limits; extension of 9 existing culverts and construction of new headwalls; relocation of an existing 12-inch water line; and relocation of utility poles and overhead electrical lines; on the west or mauka side; conversion of the existing 10-foot wide shoulder to a 10-foot-wide temporary shoulder lane and addition of a 2-foot wide paved shoulder; construction of one new multiple concrete pipe culvert beneath the road within the right-of-way to alleviate overtopping of the road during heavy rainfall events; widening of Waipahoehoe Bridge from 40 feet to 70 feet wide; and installation of a new traffic signal at the intersection of Keaau-Pahoia Road, Shower Drive /Pohaku Drive.

**Impacts:**

Widening of the shoulder lane will result in the acquisition/taking of approximately 4.476 acres of private land within the 2.31-mile long project limits. Short-term construction related impacts will be created by generation of dust and noise. Vegetation will be removed on the sides of the highway for road widening and construction access. During construction, the travel lanes will be shifted to one side to allow travel on two lanes. Traffic delays are anticipated during the construction period while the work area is closed to vehicle traffic. Once completed, no significant impacts are anticipated from the project.

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## **PREFACE**

Chapter 343, Hawaii Revised Statutes (HRS), as amended, Environmental Impact Statements, requires that a government agency or a private developer proposing to undertake a project consider the potential environmental impacts of the proposed project by preparing an assessment. Use of public funds for a project is among the criteria set forth in Chapter 343, HRS which requires preparation of an environmental assessment. The Keaau-Pahoa Road, Shoulder Lane Conversion will be constructed with funds provided by the State of Hawaii Department of Transportation and the US Department of Transportation Federal Highway Administration (FHWA).

This Environmental Assessment (EA) has been prepared to meet the requirements of Chapter 343, HRS, as amended, and Hawaii Administrative Rules Title 11, State of Hawaii Department of Health, Chapter 200, Environmental Impact Statement Rules, and the National Environmental Policy Act (NEPA) of 1969, as amended, (Pub. L. 91-190, 42 US Code 4321-4347, Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA, (40 Code of Federal Regulations 1500-1508) and 23 Code of Federal Regulations 771, Environmental Impact and Related Procedures. A Finding of No Significant Impact (FONSI) is determined for the project as shown in Chapter 5.

Compliance with various Federal environmental clearances are also included in this document meet Federal environmental documentation requirements.

## **1. INTRODUCTION**

### **1.1 Project Background**

The State of Hawaii Department of Transportation (HDOT) through its Highways Division is responsible for providing a safe, efficient and accessible highway system through the utilization of available resources in the maintenance, enhancement and support of land transportation facilities. The Highways Division is one of three divisions within the HDOT.

Keaau-Pahoa Road (State Route 130) is a two-lane undivided road generally oriented north-south which connects Keaau and Pahoa and serves the residential subdivisions of Hawaiian Paradise Park, Orchid Land, Hawaiian Acres, and Ainaloa, all located on either side of the road. Keaau-Pahoa Road has a functional classification of minor arterial on the State highway system and is not listed on the National Highway System (NHS). From Keaau Bypass to Shower Drive, Keaau-Pahoa Road is access controlled roadway with no parking permitted.

Historical research indicates that by the 1890s, most of the coastal lands of the Keaau area were abandoned as the more productive inland areas were put into agricultural production. Further, in the 1890s, large tracts of homestead land were opened throughout Puna. These agricultural parcels were located three or more miles inland and could be better accessed by a more direct inland route between Puna and Hilo. As a result, in the early 1890s, the basic alignment of Keaau-Pahoa Road was established and initial construction of the road began sometime around 1895.

### **1.2 Purpose and Need**

According to HDOT 24-hour traffic count data (Station C-2-F), during an 11-year period, traffic volumes on Keaau-Pahoa Road near the County of Hawaii refuse convenience center increased from about 19,700 vehicles in 1996 to about 25,200 per day in 2007, a growth of about 5,500 vehicles or 28.0 percent, approximately 2.26 percent per year. This steady growth in traffic on Keaau-Pahoa Road over the years has been such that, in July 1996, HDOT constructed a 10-foot wide northbound (makai) shoulder lane and extended the shoulder between the Keaau Bypass Road and Shower Drive for use by motorists between 6:00am to 8:00am to improve traffic flow in the morning peak period.

This northbound shoulder lane is posted for use only between 6:00am to 8:00am. However, current traffic volumes are such that, despite the posted sign for use between 6:00am to 8:00am, motorists use the shoulder lane throughout the day as a travel lane. Use of the shoulder lane as a travel lane by motorists prevents its use by pedestrians and bicyclists.

In addition, southbound traffic volumes in the afternoon period create backup conditions and congestion south of Keaau, where two lanes on the Keaau Bypass must merge into a one lane on Keaau-Pahoa Road.

There are a number of purposes for the Keaau-Pahoa Road Shoulder Lane Conversion project. First, there is a need to improve traffic conditions on Keaau-Pahoa Road between Keaau Bypass Road (milepost 1.9) on the north to Shower Drive (milepost 4.2) on the south, a distance of about 2.31 miles, or approximately 12,210 feet. Within these project limits, additional travel lanes are needed to improve traffic conditions for both northbound and southbound traffic. The additional travel lanes are intended to accommodate traffic from the residential areas along Keaau-Pahoa Road in the vicinity of Shower Drive and Pohaku Drive. These residential areas have experienced population growth in the past years and have been subdivided into lots which can accommodate additional residential development in the future. County of Hawaii Planning Department studies anticipate on-going and future development of lands along Keaau-Pahoa Road.

Second, the purpose of the Keaau-Pahoa Road, Shoulder Lane Conversion project is to improve the hydraulic conditions along the project limits by constructing a new multiple cell concrete pipe culvert system at a low point in the road north of the Waipahoehoe Bridge. The culvert will reduce the need to close the Road due to storm water runoff overtopping the road during heavy rainfall events.

Thirdly, the purpose of the Keaau-Pahoa Road, Shoulder Lane Conversion project is to improve traffic conditions by installing a traffic signal at the intersection of Keaau-Pahoa Road/Shower Drive. In June and July 2004 and in April 2005, traffic counts were conducted on Keaau-Pahoa Road and at the Keaau-Pahoa Road/Shower Drive intersection as part of a traffic warrant analysis to determine the need for construction of a traffic signal. The traffic warrant analysis recommended installation of a traffic signal at the intersection, based on the warrants and field observations of the delays

experienced by vehicles on the minor street approaches (Shower Drive and Pohaku Drive). The analysis showed both of these minor approaches at the intersection operated at Level of Service "F" during both morning and afternoon peak hours of traffic with constant queues present at the approaches.

Lastly, the purpose of the Shoulder Lane Conversion project is to design the improvement to be compatible with the HDOT Keaau-Pahoa Road Improvements Project (Project No. STP-0130(27)). The project's purpose involves improving highway safety, increasing roadway capacity, and modernizing the existing facility along Keaau-Pahoa Road between the Keaau Bypass and Pahoa-Kapoho Road. The alternatives being considered include 6, 4 and 2-lane sections. These alternatives are still being evaluated by the HDOT and a preferred alternative has not been selected at this time. See Section 3.3.3 and Sections 3.3.4 for discussion of other roads projects in the Puna area.

### **1.3 Project Location and Conditions**

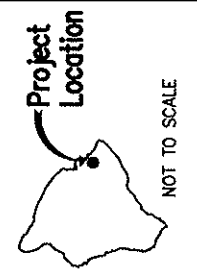
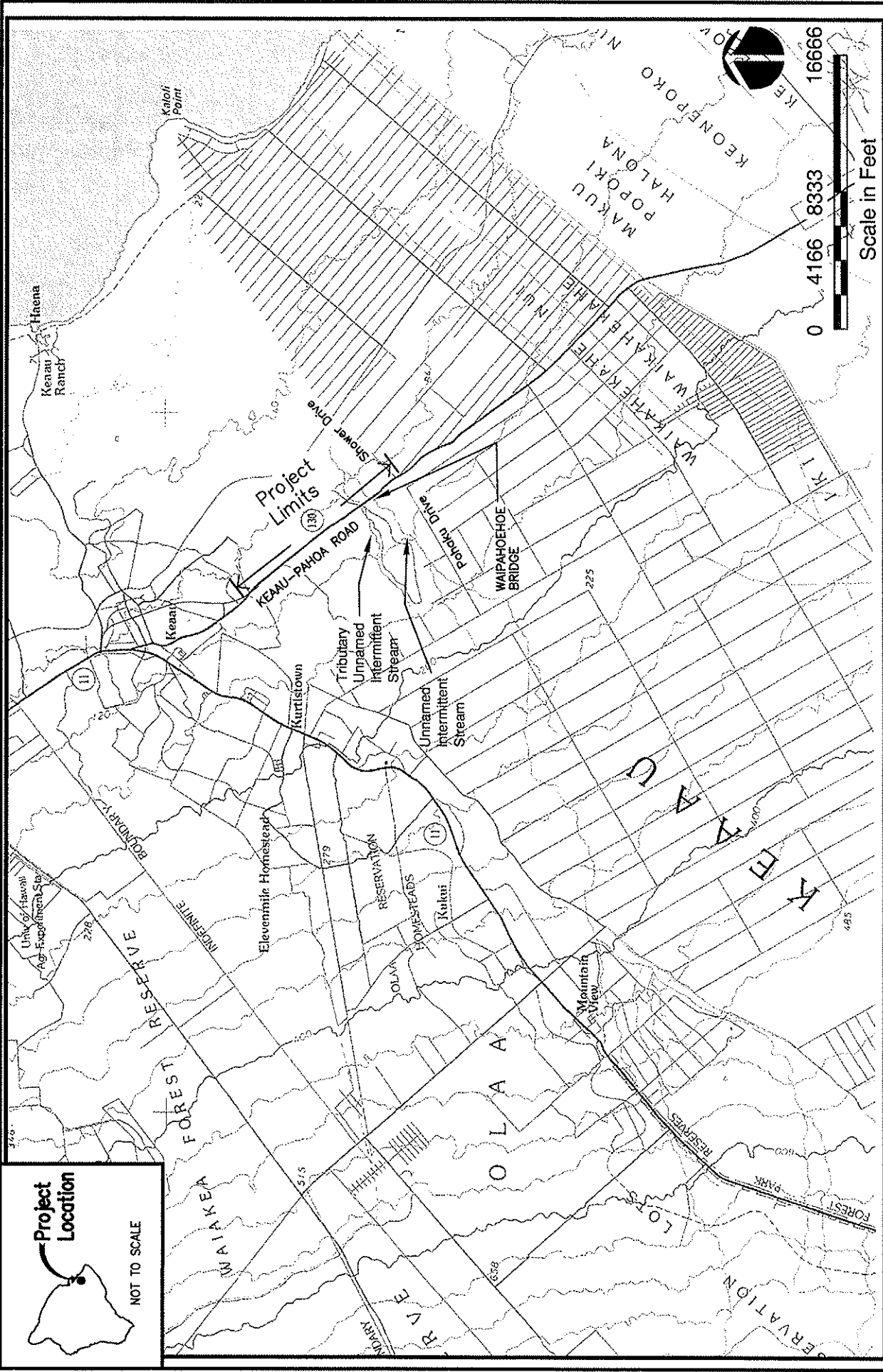
#### **1.3.1 Project Location**

The project limits are located along Keaau-Pahoa Road between the Keaau Bypass Road at the northern end (milepost 1.9) and the Keaau-Pahoa Road Shower Drive/Pohaku Drive intersection (milepost 4.2) at the southern end, a distance of about 2.31 miles, or approximately 12,210 feet. Shower Drive (TMK: 1-5-033:261) is a privately-owned roadway which starts at its intersection with Keaau-Pahoa Road and extends easterly, or makai. Pohaku Drive (TMK: 1-6-064:204) is also a privately-owned road which forms the opposite road of the intersection and extends westerly or mauka. On the mauka, or west side, the project limits begin about 1,250 feet north of the Humane Society entrance. On the makai, or east side, the project limits begin about 650 feet north of the Humane Society entrance. Figure 1.1 shows the project location map. Figure 1.2 shows the project site map. Figure 1.3 shows the project vicinity map. Figure 1.4 shows the project site photographs.

#### **1.3.2 Existing Project Site Conditions**

In 1968, the existing alignment of Keaau-Pahoa Road was constructed as part of Federal Aid Secondary Project No. S-0130(7), which included realignment of the

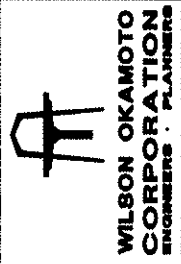
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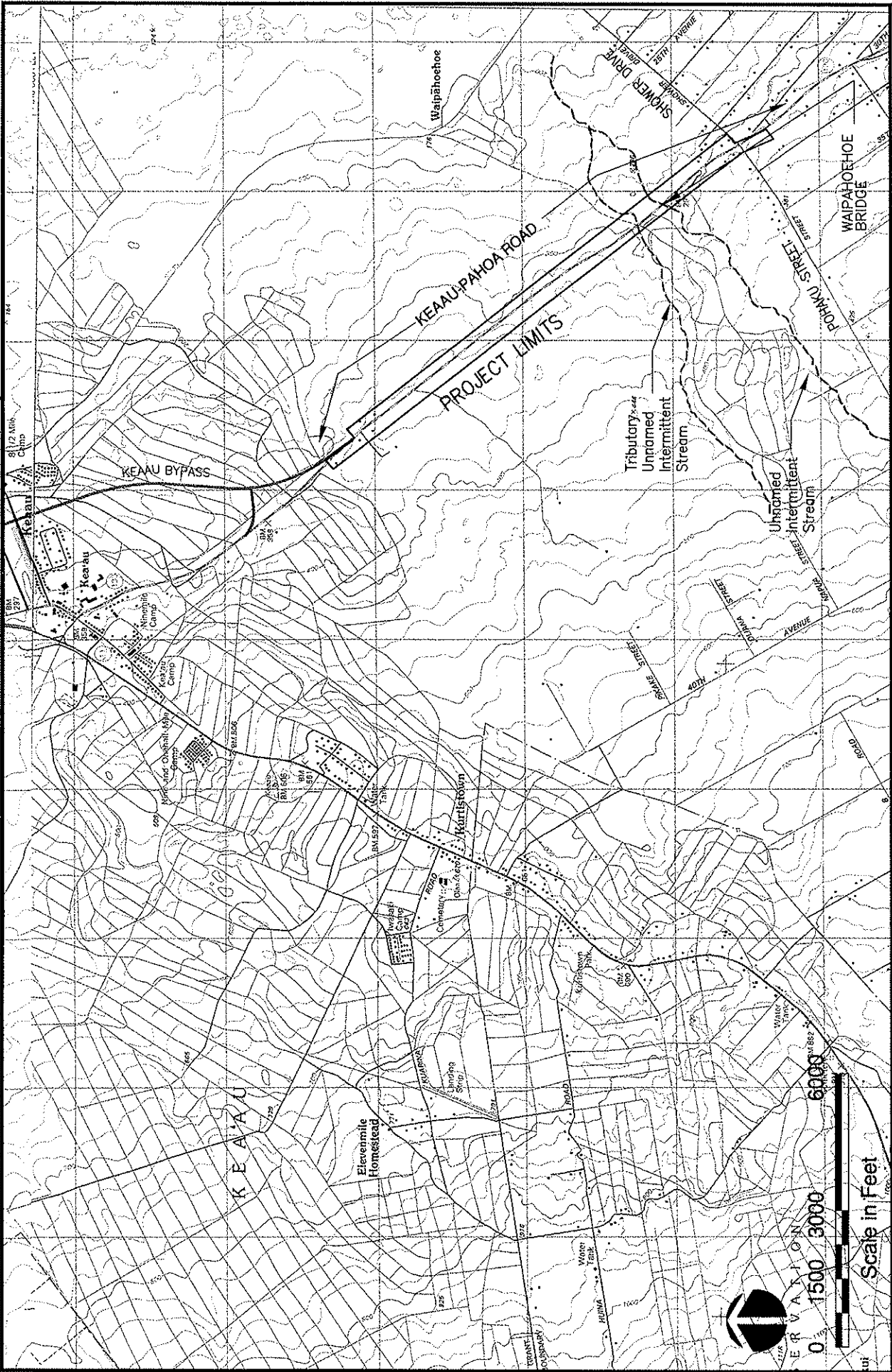
KEAU-PAHOA ROAD SHOULDER LANE CONVERSION (PROJ NO. 0130 (28))

PROJECT LOCATION MAP

FIGURE 1.1



WILSON OKAMOTO CORPORATION ENGINEERS & PLANNERS



KEAAU-PAHOA ROAD SHOULDER LANE CONVERSION [PROJ NO. 0190 (28)]

FIGURE

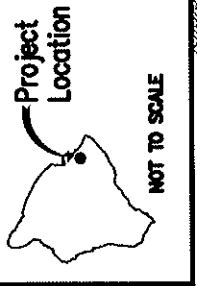
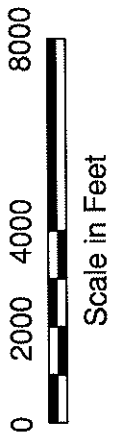
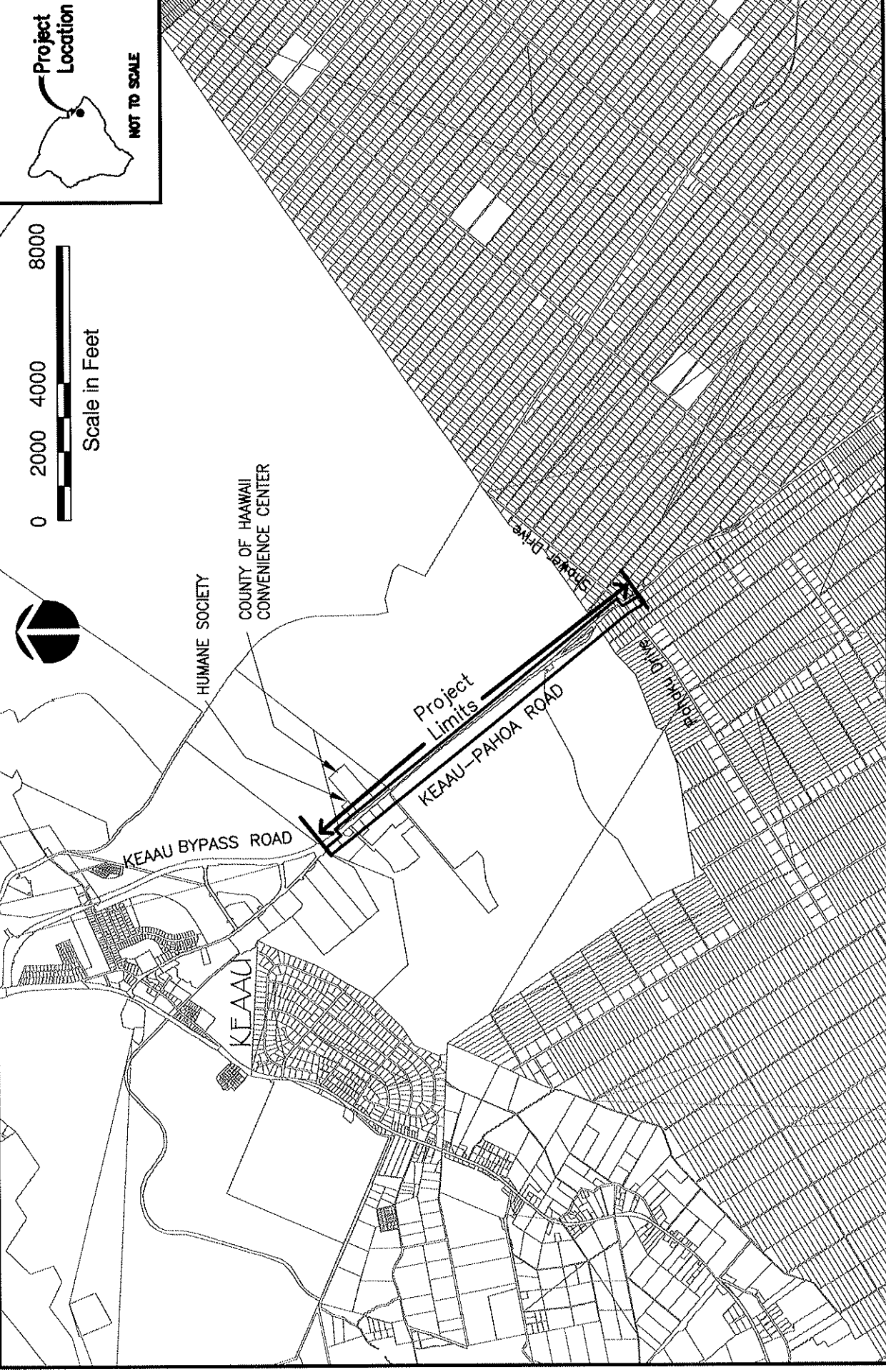
1.2

# PROJECT SITE MAP



**WILSON OKAMOTO CORPORATION**  
ENGINEERS · PLANNERS

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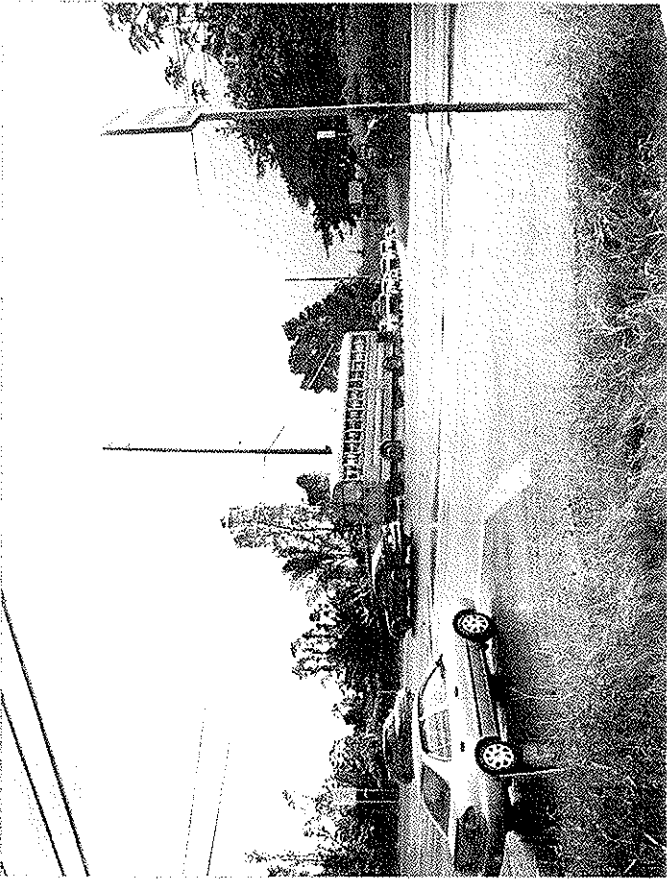
KEAAU-PAHOA ROAD SHOULDER LANE CONVERSION (PROJ NO. 0130 (28))

**PROJECT VICINITY MAP**

**FIGURE**

**1.3**

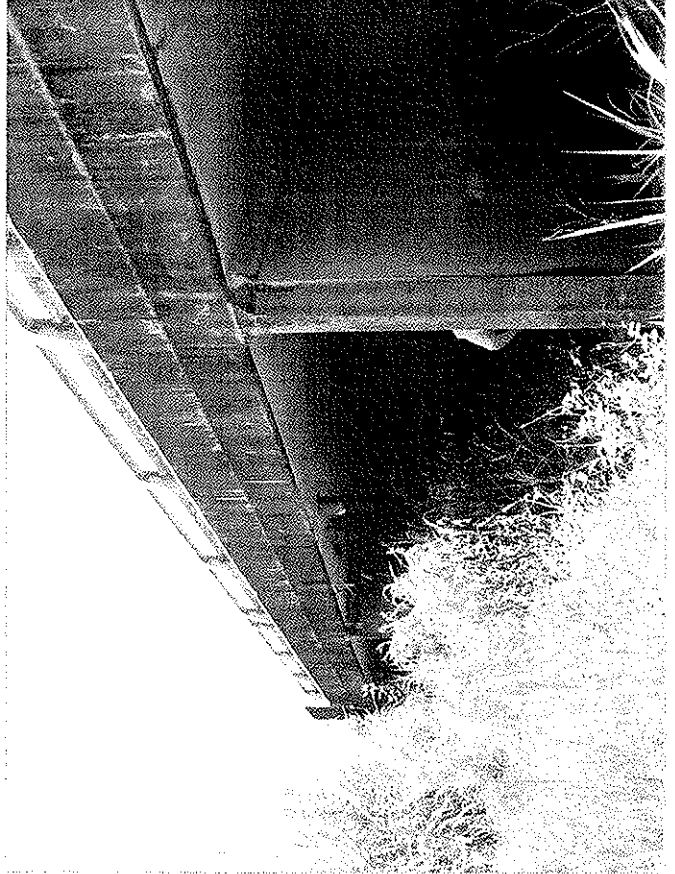




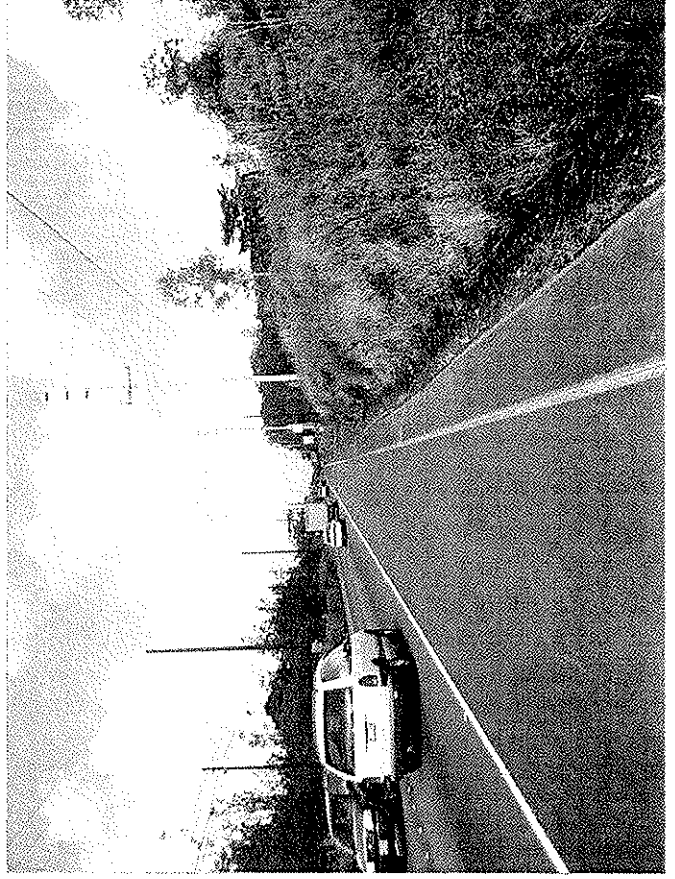
Morning peak hour traffic queue at Shower Drive



Keau-Pahoa Road showing shoulder lane



Waipahoehoe Bridge showing box culvert construction



Keau-Pahoa Road showing area of cut embankment

roadway between Waipahoehoe Bridge and Shower Drive, construction of Waipahoehoe Bridge at its current location, abandonment of the old roadway and bridge, and construction of the double 5-foot by 7-foot unlined box culverts north of the bridge.

Keaau-Pahoa Road currently has an 80-foot wide right-of-way (approximately 40 feet on the both sides of the road center line) along the project limits. Between Waipahoehoe Bridge and Shower Drive, there are remnant portions of the old State Highway which remain from the realignment of the road during the 1968 construction. The HDOT has retained ownership of these remnant lands. Access to the right-of-way is limited to specific access permitted points along the project limits. The access permitted points along the project limits will remain with no changes.

Within the project limits, Keaau-Pahoa Road currently consists of two 12-foot wide travel lanes, one in each direction, and on the makai side, one 10-foot wide northbound shoulder lane used as a travel lane, and a 4 foot wide shoulder with 2-foot paved, and on the mauka side, a 8-foot shoulder from the beginning of the project limits to the County convenience center and from there an 10-foot shoulder to Shower Drive. Elevations along the project limits range from about 334 feet mean sea level (msl) at the northern end to 322 feet msl at Shower Drive. The high point along the project limits is about 345 feet msl just south of the County refuse convenience center. The low point (297 feet msl) is located about 140 feet north of Waipahoehoe Bridge.

On the northbound lane, the posted speed limit is 45 miles per hour (mph) at the beginning of the project limits, and then becomes 55 mph south of the County convenience center until the end of the project limits at Shower Drive. A school crossing with advisory sign with a 25 mph limit located north of the Hawaii Island Humane Society entrance. Currently, between 6:00am to 8:00am, the speed limit on the northbound lanes is 45 mph. As part of the Shoulder Lane Conversion project, this speed limit will be removed. Thus, southbound, the speed limit will be 55 mph from south of the convenience center to Shower Drive.

A total of 9 drainage culverts (8 corrugated galvanized metal pipe (CGMP) culverts and one reinforced concrete double box culvert) are located within the project limits. There are 5 pipe culverts at 36 inches each; two at 30 inches each, and one at 24 inches. The double box culvert consists of two unlined 5-foot by 7-foot concrete structures. The nine

culverts within the project limits are generally in good condition, with good concrete headwalls and slight to moderate corrosion of the metal pipes. The areas makai of the outlets are relatively flat and densely vegetated, making it difficult to pass flows from one side of the road to the other.

Aside from the culverts, the project limits do not include subsurface drainage systems or catch basins. Runoff currently sheet flows to areas adjacent to Keaau-Pahoa Road.

An 8-inch waterline owned by the County of Hawaii Department of Water Supply (DWS) is located along the mauka side of the road at the beginning project limits for about 1,000 feet. From there, the line crosses under the road to the makai side and becomes a 12-inch line for the remaining 11,210 feet of the project limits. The waterline is about 20 feet from the makai right-of-way. The existing 12-inch waterline is hung on the makai side of the bridge.

Utility poles are located along both sides of Keaau-Pahoa Road. On the makai side a total of about 42 wooden utility poles, of which 38 support electrical distribution lines, and 4 poles, located near Shower Drive, support electrical distribution and high voltage transmission lines along the project limits. The utility poles are located between the existing shoulder lane and the edge of the existing right-of-way. On the mauka side a total of about 63 wooden utility poles and guy poles support high voltage electrical transmission lines. The utility poles are located between the existing shoulder and the edge of the existing right-of-way. The utility poles also support telephone, cable, and street light lines.

The existing Waipahoehoe Bridge, located about 0.40 miles (2,157 feet) north of Shower Drive, is 40 feet wide, rail to rail, and 78 feet long, abutment to abutment. The existing bridge has two 12-foot travel lanes and one 10-foot shoulder lane, roadside shoulders less than 4-feet wide on each side and a 4-foot 6-inch high railing. The bridge consists of three 26-foot long unlined bays. The deck bridge bottom is approximately 8.5 feet above the grade of the unnamed intermittent stream shown on the USGS topographic map. (See Figure 1.2)

HDOT plans show the existing Waipahoehoe Bridge was constructed in 1968 as part of the improvements to Keaau-Pahoa Road, Project No. S-0130(7).

[Note, although identified as a bridge, Waipahoehoe Bridge is an on-grade reinforced concrete culvert with deck slabs (the superstructure) that are integral with the abutments and interior walls. The bridge/culvert consists of three continuous deck slabs cast on top of concrete abutments and interior walls, with continuous concrete footings embedded in the rock stratum of the stream channel bed. A bridge typically consists of a separate superstructure and supporting substructure connected by isolation bearings that act to restrain the superstructure freedom of movement from the substructure.]

Information from HDOT Hawaii District indicates that Waipahoehoe Bridge has not overtopped, even during the November 1-2, 2000 storm event that affected the other highway bridges on the eastern part of the island of Hawaii. However, the HDOT Hawaii District has indicated that the roadway between Waipahoehoe Bridge and a culvert crossing north of the bridge has overtopped on three separate occasions in September 1994, November 2000, and in 2002. This drainage condition is caused by the road's low point being located 220 feet north of Waipahoehoe Bridge. As discussed below, adding another culvert at the roadway's low point is included in the project.

In 1996, as a follow up to a previous 1987 study (*Historic Bridge Inventory and Evaluation Island of Hawaii July 1987*) HDOT in conjunction with the State Historic Preservation Division, HDOT's district offices, and the counties, conducted an evaluation of all of the bridges in the state. The results of the 1996 study were published in draft by the HDOT as the Historic Bridge Inventory. (*State of Hawaii Historic Bridge Inventory and Evaluation May 1996.*) The 1996 draft study classified the state's bridges into three categories, Category I, II, and III. Category I bridges were determined eligible for the National Register of Historic Places. Category II bridges were determined to be potentially eligible for the National Register. Category III bridges were determined not eligible for the National Register.

A total of 18 criteria were used in the 1996 rating system. Of those, seven were integrity criteria: (location; design; setting; materials; workmanship; feeling; and association); nine were other National Register criteria: (events; persons; type; period; method of construction; work of a master; high artistic design; distinguishable entity; and information content); and two were Historic American Engineering Record (HAER) criteria: (early engineering structure and representative sample).

The abandoned bridge, located about 20 feet mauka (west) of the existing Waipahoehoe Bridge within State-owned land, is not listed in the 1987 and 1996 HDOT Historic Bridge Inventory studies. See also Section 2.11, Section 2.16.11 and Appendix D.

### **1.3.3 Other Project Site Data**

Land uses are vacant and undeveloped for most of the project limits on both sides of the road. The developed land uses on the makai side of the road occur at the beginning and end of the project limits and west, or outside of the makai right-of-way where active farming occurs. At the beginning of the project limits, the Hawaii Island Humane Society and the County of Hawaii refuse convenience center are located on the makai side. At the end of the project limits on the makai side, there are four residential parcels, which do not include agricultural uses, before the Shower Drive intersection with direct access to Keaau-Pahoa Road. The existing access permitted to these uses from Keaau-Pahoa Road, including to the farms, will remain with no changes.

On the mauka side, there are 4 residential lots at the beginning of the project limits near the Keaau Bypass. Other lands along the mauka side within the project limits are currently undeveloped up to Waipahoehoe Bridge, except east, or outside of the makai right-of-way, where active farming occurs. Residential lots are located on the remnant HDOT roadway, which was Keaau-Pahoa Road, between the bridge and Pohaku Drive. The existing access permitted to these uses from Keaau-Pahoa Road, including to the farms and to the County of Hawaii water spigot located on the remnant roadway, will remain with no changes.

Hawaiian Paradise Park is located at the makai terminus of the project limits of the Shoulder Lane Conversion project. As part of Draft EA review, Hawaiian Paradise Park Homeowners Association stated their group wishes to be notified of other projects along Highway 130.

The State Land Use Commission (LUC) designates the lands adjacent to Keaau-Pahoa Road as in the Agricultural District, one of four land use districts identified by the LUC.

The adjacent lands are designated Extensive Agricultural on the County of Hawaii General Plan Map. The County of Hawaii zoning designation on Keaau-Pahoa Road on both sides for most of the project limits is Agriculture (A-20a). On the makai side, the

zoning is Agriculture (A-1a) for the lots adjacent to Shower Drive. On the mauka side, the zoning is Agriculture (A-3a) for the lots near Pokahu Drive.

The project limits are not located within the County of Hawaii Special Management Area (SMA).

*Bike Plan Hawaii 2003* is the HDOT master plan to create a guide for enhancing the bicycling environment through a variety of channels - from grassroots initiatives to government actions. The Bike Plan recognizes that bicycle facilities have become an integral part of the State's transportation infrastructure. HDOT recognizes the need for safe, comfortable, and convenient travel alternatives that enhance the mobility of Hawaii's residents and visitors.

The Bike Plan shows the project limits as a proposed bicycle facility designated as a proposed "signed shared roadway". It should be noted, Keaau-Pahoa Road south from Shower Drive to Paradise Drive is shown on the Bike Plan as an existing bicycle facility designated as "signed shared roadway".

#### **1.4 Project Description**

The Keaau-Pahoa Road Shoulder Lane Conversion would occur on the both sides of Keaau-Pahoa Road between the project limits of Keaau Bypass Road on the north and the Shower Drive/Pohaku Drive intersection on the south. The existing center-line of the road will remain unchanged within the project limits. The Keaau-Pahoa Road Shoulder Lane Conversion project will meet the design guidelines of the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA). These design guidelines have been adopted by the Hawaii Department of Transportation (HDOT) for transportation and highway planning and design purposes. Adherence to these guidelines will ensure that the Shoulder Lane Conversion will be compatible with the HDOT project (Project No. STP 0130 (27)) or other future construction projects along Keaau-Pahoa Road.

The Keaau-Pahoa Road Shoulder Lane Conversion project will consist of the following:

1. Taking/acquisition of 10 to 20 feet of right-of-way along the makai side of the project limits. (No additional right-of-way will be needed on the mauka side.)

2. Cutting embankments or grading and vegetation removal outside the existing right-of-way to match existing conditions within the acquired right-of-way.
3. Relocation of about 42 wooden utility poles outside (makai) of the new 8-foot wide paved shoulder and behind the guardrail. The utility relocation would be done by Hawaii Electric Light Company (HELCO) under a Utility Agreement between HDOT and HELCO, and other private utility companies using the poles.
4. Relocation of the 12-inch waterline to the new 8-foot shoulder on the east side along the entire project limits. The waterline relocation will be done by HDOT under a utility agreement between the HDOT and the County of Hawaii Department of Water Supply (DWS).
5. Demolition of the existing northbound (makai side) 10-foot wide shoulder lane and the existing shoulder.
6. Construction of the second northbound 12-foot wide travel lane, including excavation of about 24 inches for placing the new sub base, base course, and pavement surface, plus an 8-foot wide paved shoulder, and a 4-foot wide drainage swale/concrete gutters on the excavation segments of the makai side.
7. Striping and markings, including construction of a milled rumble strip between the travel lane and shoulder on the makai side only.
8. Installation of a total of approximately 13,180 linear feet of guardrails (9,760 linear feet on the makai side and 3,420 linear feet on the mauaka side).
9. Installation of street lights at two intersections.
10. Demolition of the existing southbound (mauka side) 8 to 10-foot wide shoulder.
11. Construction of a 10-foot wide temporary southbound shoulder lane plus a 2-foot shoulder. (The temporary designation is to account for the HDOT Keaau-Pahoa Road Improvements Project (Project No. STP-0130(27)).
12. Demolition of the existing makai headwall on the existing 9 culverts and extension of the culvert and construction of new headwall within the right-of-way. Construction easements or acquisition of the adjacent land will be secured to allow equipment and contractor personnel onto the nearby lands.
13. Construction of a 4 pipe culvert about 140 feet north of the bridge within the proposed right-of-way. The culvert will consist of 4, 48-inch reinforced concrete pipes angled at about 40 degrees to the center line of the road. The pipes will vary from about 130 to 160 feet. (This pipe culvert was selected based on factors related to construction and the need to provide continuous use of the travel lanes.)

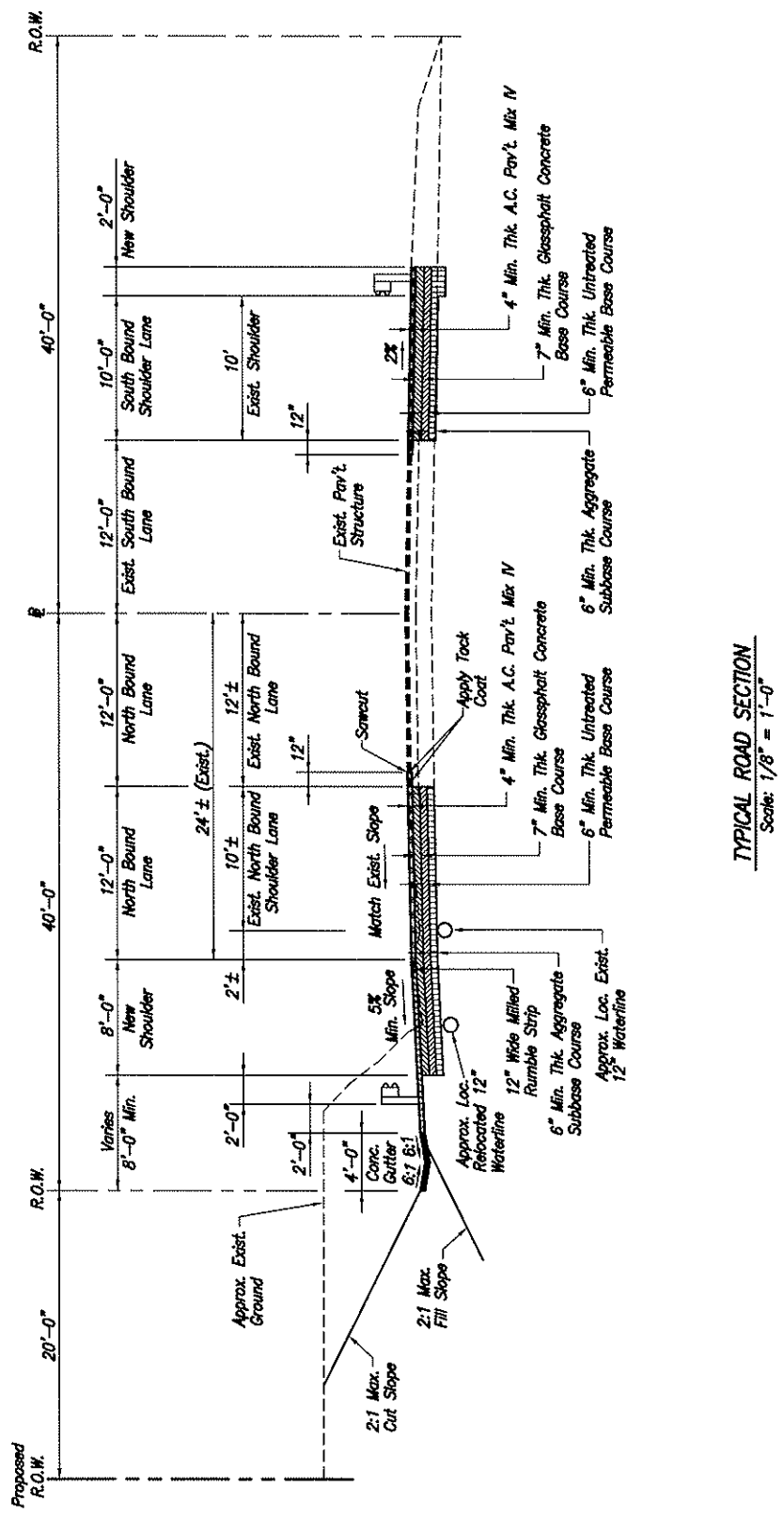
14. Widening of Waipahoehoe Bridge from 40 feet wide to 70 feet wide by extending the width of the structure on both sides by 15 feet and reconstructing the bridge railings which will be 4-foot 6-inches (54 inches) above the bridge deck and include 2-foot 5-inch reinforced concrete traffic barrier plus 2-foot 1-inch pipe railing.
15. Striping of the bridge deck will consist of an 11-foot wide makai shoulder, two 12-foot wide northbound travel lanes, one 12-foot wide southbound travel lane, one 10-foot wide southbound shoulder lane and a 13-foot mauka shoulder for a total width of 70 feet.
16. Demolition of the abandoned bridge located mauka of Waipahoehoe Bridge.
17. Installation of a traffic signal at the Keaau-Pahoa Road/Shower Drive/Pohaku Drive intersection, including necessary controls on Keaau-Pahoa Road, Shower Drive, and Pohaku Drive, signage, and striping improvements.
18. Installation of signs at designated locations.

Figure 1.5 shows the typical section for the roadway. Figures 1.5-0 to 1.5-9 at the end of this section show the project roadway plan and details, including the existing right-of-way (ROW) and the proposed ROW.

During construction, silt fences or silt barriers will be constructed around the work area to control surface runoff into adjacent areas. Construction will result in a total of 20 feet of impervious surface on the makai side and 12 feet on the mauka side. Since the existing makai roadway consists of a 10-foot travel lane and a 2-foot shoulder, there will be a net new 8-foot impervious area for the total project limits of 12,210 feet on the makai side plus about 4,300 feet of 4-foot wide drainage swale/concrete gutters on the excavation segments of the makai side. On the mauka side, there will be a net new 2 feet for 13,510 feet, which accounts for the lane tapering at the ends of the project limits. Thus, the total new impervious surface within the project limits will be about 138,300 square feet ( $8 \times 12,210 + 4 \times 4,300 + 2 \times 13,510 = 138,300$ ) or about 3.17 acres.

The improvements related to cutting slopes, constructing embankments, and grading to match existing grades would extend outside of the existing 80-foot wide right-of-way which runs for most of the project limits. This work would also include removal of vegetation to construct the improvements.





**WILSON OKAMOTO CORPORATION**  
ENGINEERS • PLANNERS

KEAAU-PAHOA ROAD SHOULDER LANE CONVERSION (PROJ. NO. 0130) (28)

TYPICAL ROAD SECTION

FIGURE 1.5

Preliminary estimates show that about 20,200 cubic yards of material will need to be removed for excavation for the sub base, base course, and pavement surface, and for cutting the embankments. The excavated material can be used for general fill.

#### 1.4.1 Right-of-Way Acquisition

The HDOT acquisition/taking of private property along almost the entire project limits on the makai side will be necessary to construct the northbound travel lane and shoulder, and to cut or grade the adjacent private parcels to match the grades of the shoulder. Depending on the location within the project limits, the taking of private property will require acquisition or purchase of 10 to 20 feet from the makai edge of the existing 80-foot right-of-way. The taking involves portions of a total of 9 privately-owned parcels plus a portion of one parcel owned by the County of Hawaii used for the County refuse convenience center plus two easements to be acquired. The total acquisition/taking will be approximately 4.476 acres, or 194,975 square feet. The affected parcels and approximate amount of taking are shown in Table 1.1.

Table 1.1  
Right-of-Way Taking by Parcel

TMK (from North to South)	TMK Parcel (Acres)	Right-of-Way Taking (approx. acreage)	TMK Remainder (Acres)	Ownership
1-6-003:065	19.493	0.215	19.278	Private
1-6-001:015	897.947	3.884	894.063	Private
1-5-036:117	1.408	0.022	1.386	Private
1-5-036:116	1.026	0.009	1.017	Private
1-5-036:119	0.565	0.102	0.463	Private
1-5-036:120	0.763	0.102	0.661	Private
1-5-036:121	0.768	0.075	0.693	Private
1-5-033:261	137.509	0.029	137.48	Shower Drive
1-5-064:204	5.070	0.038	5.032	Pokahu Drive
<b>Total Areas (*)</b>		<b>4.476</b>		

(\*) Excludes TMK: 1-5-036:118 0.074 acres owned by the State of Hawaii.

The HDOT taking involves the following:

1. Preparation of a right-of-way map to identify the parcels and areas of the taking;
2. HDOT appraisal of the affected areas;
3. Metes and bounds description of the taking;
4. Acquisition of the affected area.

In addition, it may be necessary to use adjacent properties during construction. If this is the case, the HDOT will execute a construction parcel agreement to use the adjacent lands during construction.

The existing culvert extensions will be constructed within the proposed makai right-of-way. The new pipe culvert will also be constructed within the proposed right-of-way.

The widening of Waipahoehoe Bridge will be constructed within the proposed right-of-way on the makai side and within the existing HDOT right-of-way on the mauka side.

Upon completion of the taking, the makai ROW would be about 60 feet from the center line of the road within the project limits. Thus the total ROW will be about 100 feet wide, with about 60 feet makai of the center line and 40 feet mauka of the center line.

#### **1.4.2 Construction Activities**

Relocation of the utility poles and overhead line will be undertaken along the makai side of the project limits. A total of 42 wooden utility poles will be relocated about 12 feet to about 14 feet within the proposed makai right-of-way. Relocation of the utility poles will require a Utility Agreement (UA) between HELCO and HDOT. According to Chapter 264.33 Hawaii Revised Statutes, the UA provides for equal cost sharing between HDOT and the private utility companies for the relocation, after the first \$10,000.00 less depreciation, salvage value, and betterments. No utility poles will be relocated on the mauka side.

Typically, the poles will be placed in 10-foot deep by 2-foot diameter holes which will be filled with concrete to anchor them in-place.

Relocation of the 12-inch water line will require construction of new 2-foot wide by 5 foot deep trench in the 8-foot wide makai shoulder along the project limits. Typically, construction will be done in segments so the new line can be hydrotested, which includes cleaning the line of debris, adding chlorine to disinfect the line, and testing to ensure the proper pressure can be maintained. This process may be repeated to ensure the line meets Department of Water Supply standards. Since the work can be done in segments, the effluent water from the testing can be placed in the next segment of trench or used for dust control. This will ensure the effluent water does not affect nearby areas. At this point, a hydrotest permit from the State of Hawaii Department of Health is not anticipated. (Note, although described as a relocation, a new water line will be constructed and the existing water line will remain in service until service is switched to the new line.) After the new water line has been placed in service, a trench will be dug and the old line removed and the trench backfilled.

The water line construction plans will be submitted to the Department of Water Supply (DWS) for review and approval before relocation of the waterline can begin. The existing service laterals from the existing 12-inch waterline will also need to be relocated and the location, size, and type of lateral will be shown on the construction plans. The existing 12-inch waterline will remain in service until the replacement waterline has been installed and tested.

On the makai side, the existing 10-foot wide travel lane and 2-foot wide paved shoulder will be demolished by removing the existing asphalt pavement, then excavating to a total depth of about 24 inches for placement of new sub base (6-inch minimum aggregate), plus new base course (6-inch minimum permeable base course, 7-inch minimum glassphalt concrete base course) and a 4-inch minimum asphalt concrete pavement will be used for the new 12-foot travel lane and 8-foot shoulder. The roadway will be sloped for drainage. The removed pavement material could be reused for the new surface.

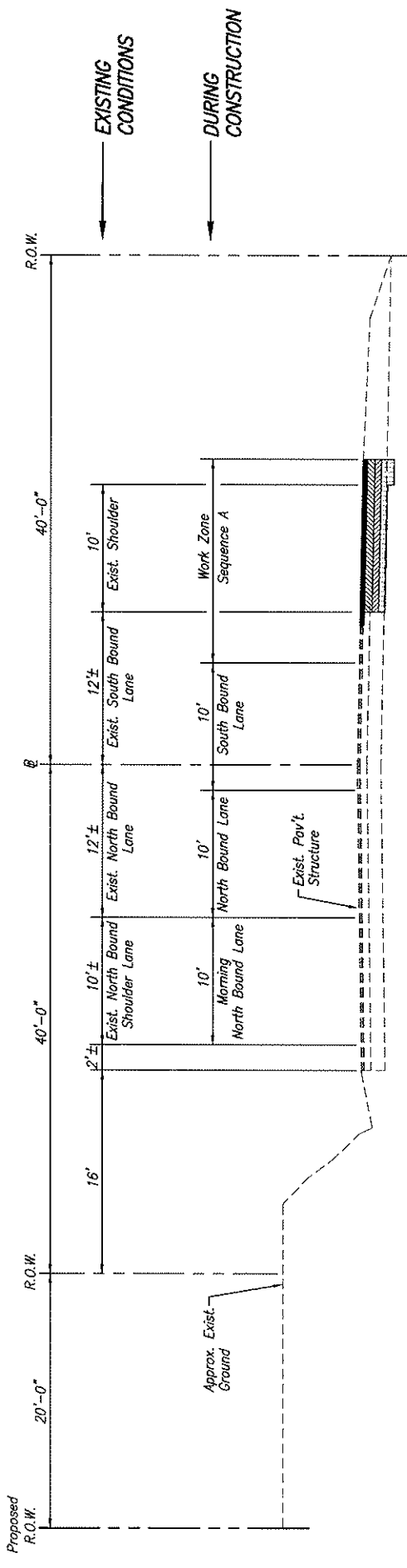
On the mauka side, the existing southbound (mauka side) 8 to 10-foot wide shoulder will be demolished by removing the existing asphalt pavement, then excavating to a total depth of about 22 inches, for placement of new sub-base, permeable base course, glassphalt concrete base course, and asphalt concrete pavement for the 10-foot wide southbound shoulder lane plus a 2-foot shoulder.

The Shoulder Lane Conversion will require shifting the travel lines to allow two 10-foot wide travel lanes, one in each direction, to be open to traffic at all times. During the morning peak travel period, an additional 10-foot wide northbound travel lane will be open to traffic. Work will initially proceed to construct the mauka shoulder lane, and mauka bridge widening, and convert the existing 12-foot wide travel lanes to 10-foot wide travel lanes and retaining the existing 10-foot wide northbound shoulder lane. The design drawings will include a construction traffic control plan showing two lanes will be available for travel at all times. Figure 1.6 shows the mauka construction travel lanes.

Once the mauka improvements are complete, work will proceed to construct the northbound shoulder lane, culvert extensions, waterline relocation and makai bridge widening. The travel lanes will be shifted to the mauka side using the new 10-foot wide shoulder lane as a temporary 10-wide southbound travel lane. A temporary 10-foot wide northbound travel lane will be provided along the current southbound travel lane. In addition, the work area will shift makai during morning peak travel periods to allow a temporary 10-foot wide morning northbound shoulder lane. After 8:30 a.m., the construction work area will be expanded and the morning shoulder lane removed. Utility trenches across the roadway will be completed in their respective work zone and will be covered with steel plates each day prior to re-opening the morning shoulder lane. The traffic control plan during construction is intended to allow the same travel lanes as currently used for northbound morning peak travel. Figure 1.7 shows the construction travel lanes.

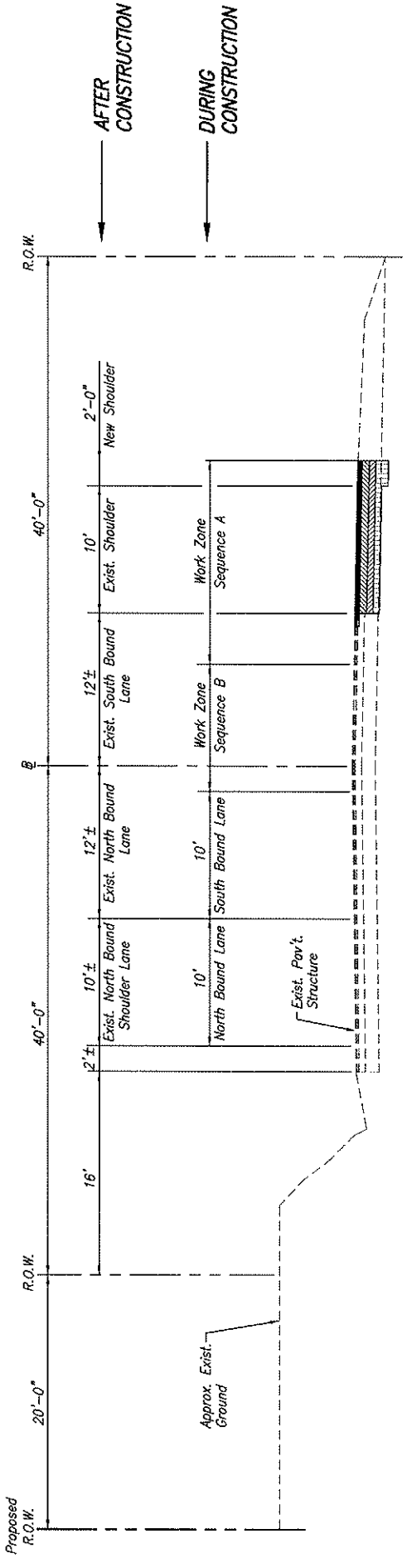
During the construction, the work area will be closed to travel to allow contractor access to the construction site. Since the surrounding land uses are not developed along most of the project limits, the contract documents would not preclude construction work at night. The contractor would make the decision related to night construction during the bidding.

Construction of the 4 pipe culvert will require excavation of an approximate 30 foot wide by 150 foot long trench across the roadway to allow placement of the 48-inch pipes. The 6 to 8 foot depth of the trench will include a 2-foot cover to meet HDOT design guidelines.



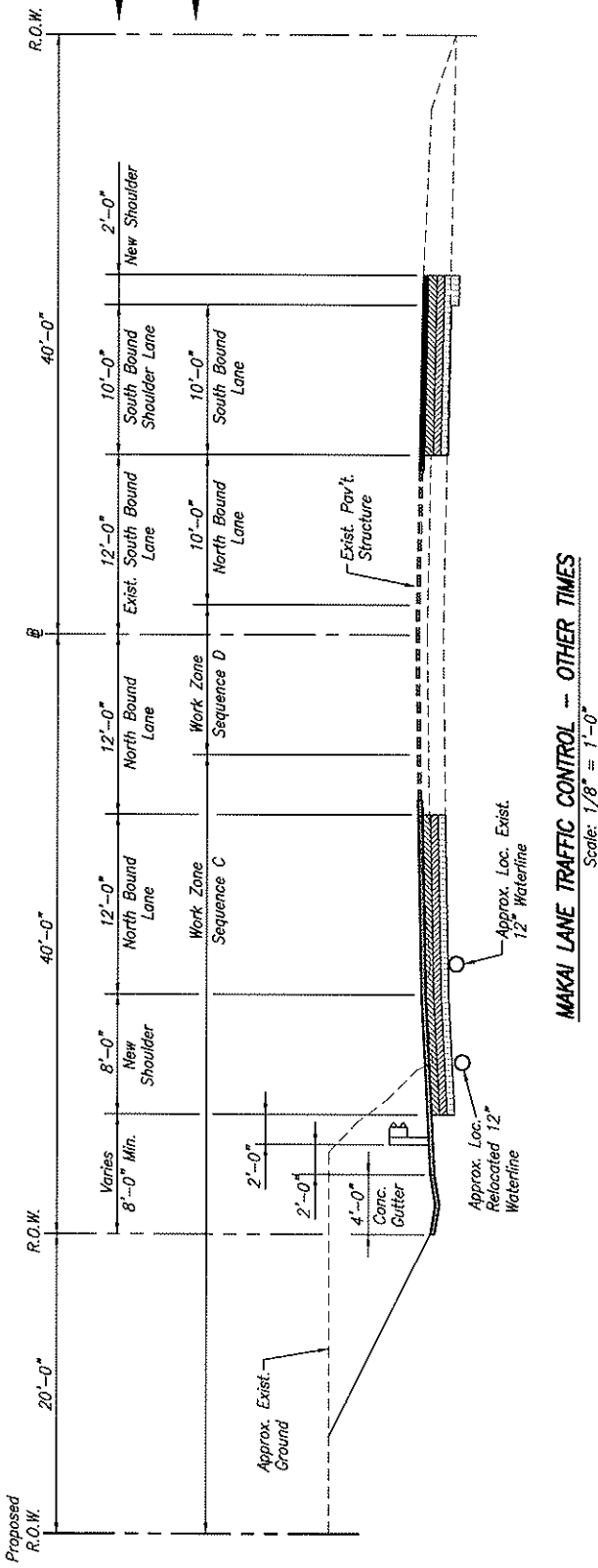
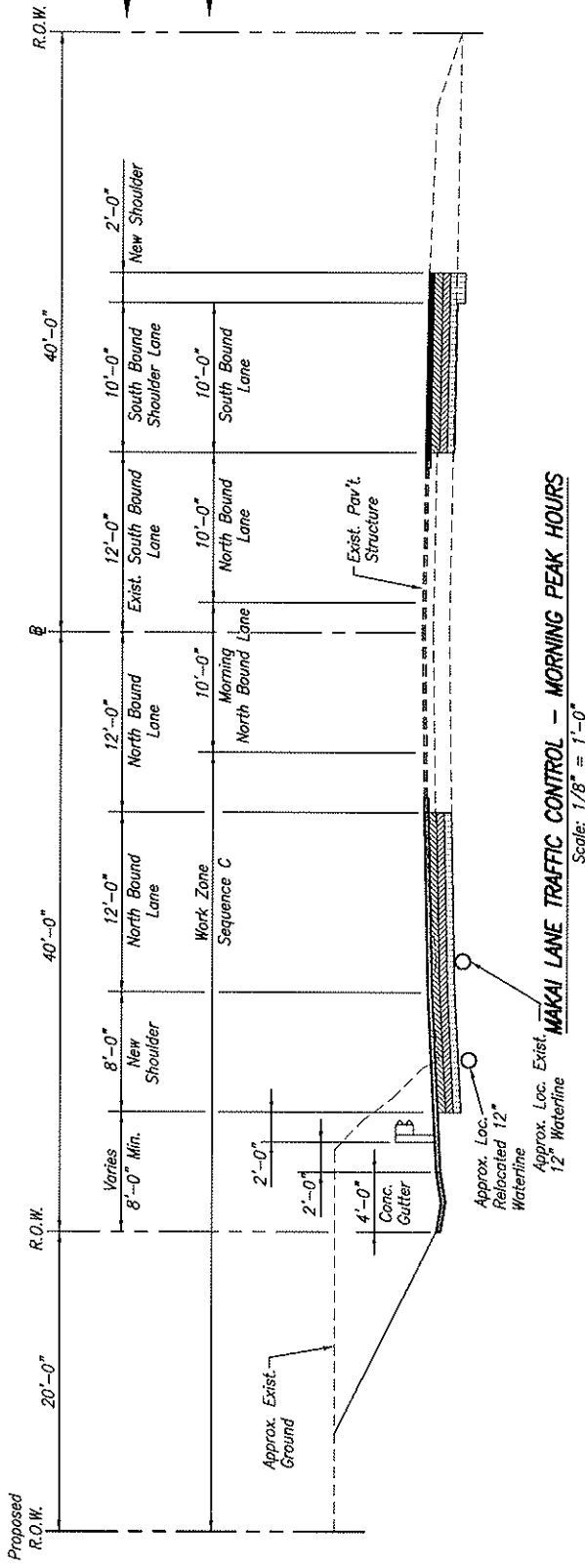
**MAUKA LANE TRAFFIC CONTROL - MORNING PEAK HOURS**

Scale: 1/8" = 1'-0"



**MAUKA LANE TRAFFIC CONTROL - OTHER TIMES**

Scale: 1/8" = 1'-0"



AFTER CONSTRUCTION  
DURING CONSTRUCTION

AFTER CONSTRUCTION  
DURING CONSTRUCTION

Construction of the culvert will follow the same traffic control sequence as the shoulders. Starting from the mauka side, construction of the culvert using precast sections will be done in sections to allow traffic on the travel lanes. Steel plates will be used to allow travel across the trench during construction. See Figures 1.6 and 1.7.

In addition to the roadway work, Waipahoehoe Bridge, located about 0.40 miles north of Shower Drive, will be widened from 40 feet wide to 70 feet wide by extending the width of the structure on both sides by 15 feet. The bridge will remain at its existing length of 78 feet. All four walls of the bridge structure will be extended 15 feet on both sides, plus adding wing walls on each end. The existing bridge railing will be removed along with a strip on the edge of the deck and the extension will then be joined to the existing bridge deck. Lastly, a 54-inch high replacement railing (4-foot 6-inch), the same height as the existing railing, will be added to both sides of the bridge. The four walls of the bridge are set on a rock surface. As such, a scour analysis will not be required.

The completed 70-foot wide (rail to rail) bridge deck will be able to accommodate a future 12-foot wide southbound lane after completion. The striping over the bridge for this project will reflect an 11-foot wide makai shoulder, two 12-foot wide northbound travel lanes, a 12-foot side southbound travel lane, a 10-foot wide afternoon southbound shoulder lane, and a 13-foot wide mauka shoulder for a total width of 70 feet.

The bridge extension will meet the April 2008 Design Criteria for Bridges and Structures issued by HDOT, including guide specifications for Load and Resistant Factor Design related to horizontal peak ground acceleration for Hawaii.

Two travel lanes will be allowed on the bridge during construction by shifting the work areas from one side to the other side.

As part of the bridge work, the existing County of Hawaii Department of Water Supply (DWS) 12-inch water line hung on the makai side will be relocated to the mauka edge of the widened bridge. The relocated water line will not extend below the bridge deck. No other utility lines are sited on the bridge.

The abandoned and closed bridge located approximately 20 feet west (mauka) of Waipahoehoe Bridge on State-owned land will be demolished and removed. As



previously discussed, this abandoned bridge is not listed on the 1987 or 1996 State Historic Bridge studies. See also Section 2.11, Section 2.16.11 and Appendix D.

In March 2007, the FHWA issued a memorandum related to Public Law 109-59, August 10, 2005, Section 1805, "Use of Debris From Demolished Bridges and Overpasses." The legislation directs the State to first make the debris from the demolition of such a structure available for beneficial use by a Federal, State, or local government, unless such use obstructs navigation. The "beneficial use" is defined as the use of the debris for purposes of shore erosion control or stabilization, ecosystem restoration, and marine habitat creation.

Concrete debris from the demolition of the abandoned bridge could be made available for re-use.

As part of the Draft EA review, State of Hawaii Department of Business, Economic Development, & Tourism Strategic Industries Division recommended to use recycled concrete aggregate as fill material and recycled asphalt pavement for surfacing.

The existing intersection of Keaau-Pahoa Road and Shower Drive/Pohaku Drive consists of left turn storage lanes in both the northbound and southbound directions on Keaau-Pahoa Road. Installation of the traffic signal will not change this configuration of the intersection. The traffic signal will be set with "left-turn on arrow" for turning movements onto Shower Drive and Pohaku Drive from Keaau-Pahoa Road.

Traffic signal detector loops and related controls will be installed, and signage and striping improvements will be made at the intersection. Detector loops will be installed on Shower Drive, Pohaku Drive, and in both directions on Keaau-Pahoa Road.

A review of the AASHTO and FHWA design guidelines show the design drawings do not need to include improvements on the northbound shoulder approaching Shower Drive. However, given local driving habits, the design plans will include delineator posts to prevent vehicles from entering into the new northbound lane before the Shower Drive intersection. The traffic signal should also improve conditions related to early entry into the shoulder lane south of the Shower Drive intersection.

Upon completion of the improvements, the two 12-foot northbound travel lanes will be open at all times and the posted speed limit will be 55 mph for the two northbound lanes between the County refuse convenience center entry and Shower Drive.

The southbound 10-foot shoulder lane will be limited to traffic from 3:00pm to 6:00pm and the posted speed limit will be 45 mph on both the 12-foot travel lane and the 10-foot shoulder lane during the afternoon period. During all other times, the posted speed limit will remain at 55mph.

## **1.5 Preliminary Cost Estimate**

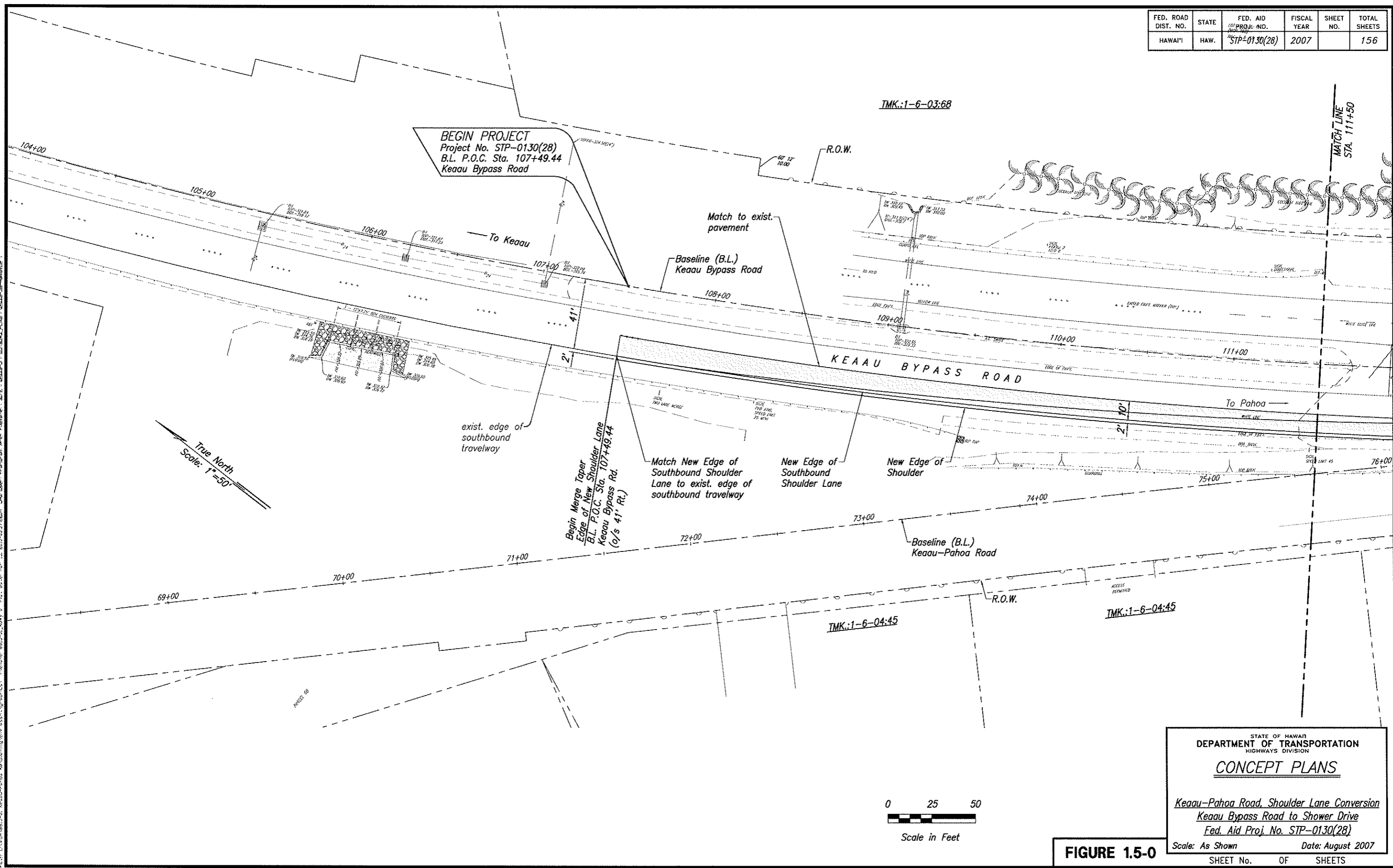
The budgeted construction cost, excluding the equipment, for the Keaau-Pahoa Road, Shoulder Lane Conversion project is approximately \$14.0 million, excluding right-of-way acquisition costs, which will be funded by HDOT and the Federal Highway Administration (FHWA).

The Shoulder Lane Conversion project is included for construction in FY 2010 in the Hawaii State Transportation Improvement Program (STIP) Revisions for 08-11 (+2) STIP, approved by the FHWA on February 10, 2010.

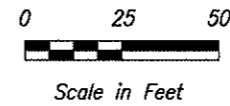
## **1.6 Project Schedule**

Construction is expected to start in February 2011 and should require about 24 months to complete. The roadway should be in operational by February 2013.

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(28)	2007		156



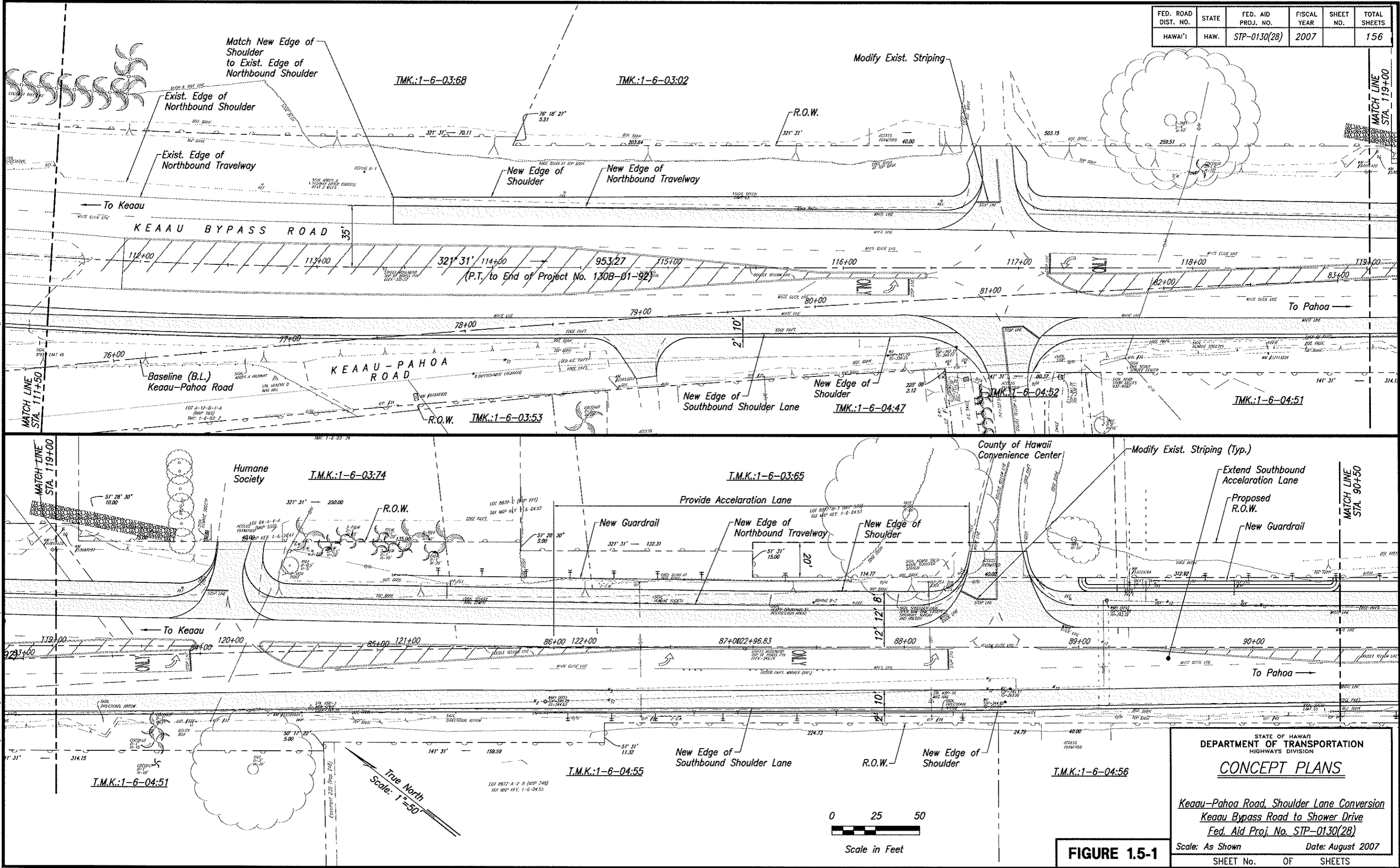
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**FIGURE 1.5-0**

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION  
**CONCEPT PLANS**  
 Keaau-Pahoa Road, Shoulder Lane Conversion  
 Keaau Bypass Road to Shower Drive  
 Fed. Aid Proj. No. STP-0130(28)  
 Scale: As Shown Date: August 2007  
 SHEET No. OF SHEETS

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(28)	2007		156



STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
HIGHWAYS DIVISION

**CONCEPT PLANS**

*Keau-Pahoa Road, Shoulder Lane Conversion  
Keau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)*

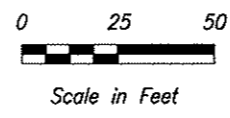
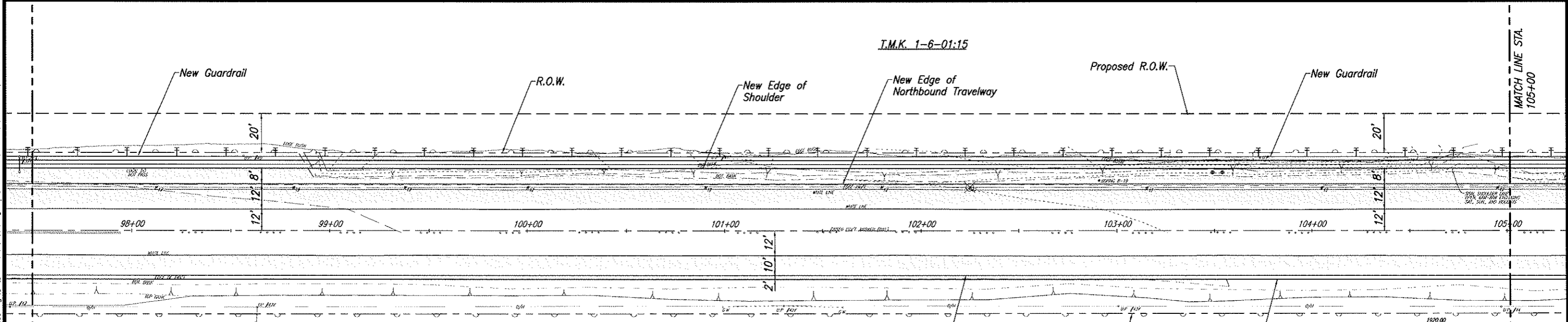
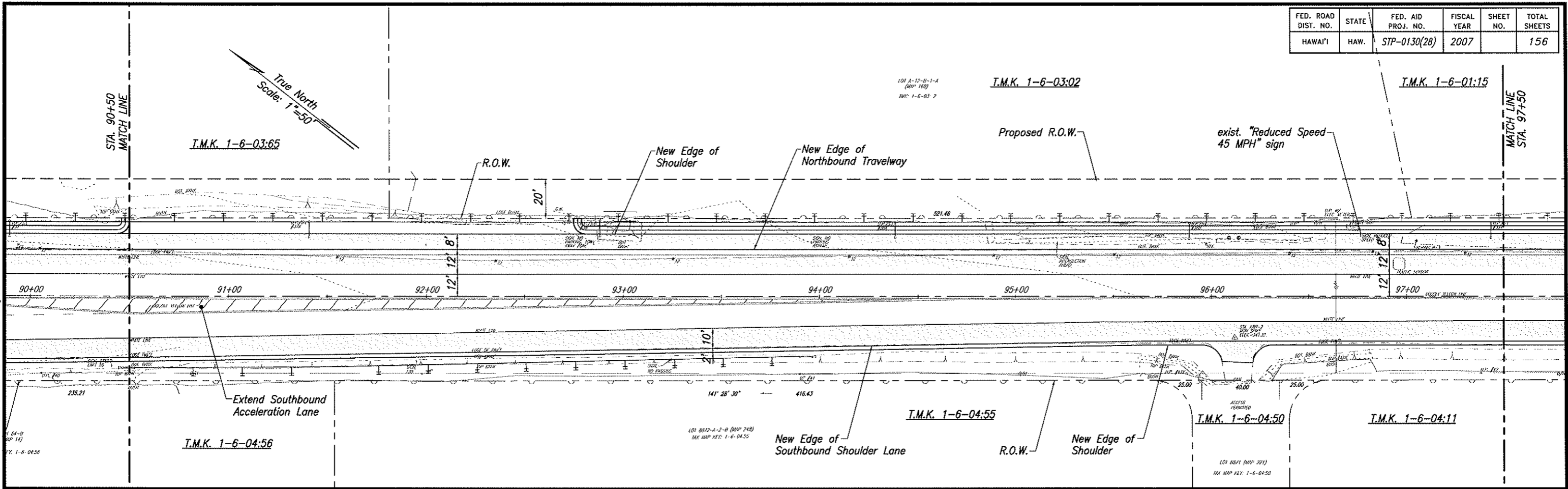
Scale: As Shown      Date: August 2007

SHEET No.      OF      SHEETS

**FIGURE 1.5-1**

Peter L. V. D. A. 6655-CI, Keau-Pahoa Road, Planning New, esst, Vg, AP/PC/CA, File Name: 6619-01-05wy, Plot Date: Mar 15, 2007, 09:37:29pm, CAD User: Fredman, Xref File Name: SITE, 1-0603-5, 1-07292-2, P.L.S.G, 1-02013-58-A, Advance

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(28)	2007		156



STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

**CONCEPT PLANS**

*Keaau-Paho Road, Shoulder Lane Conversion  
 Keaau Bypass Road to Shower Drive  
 Fed. Aid Proj. No. STP-0130(28)*

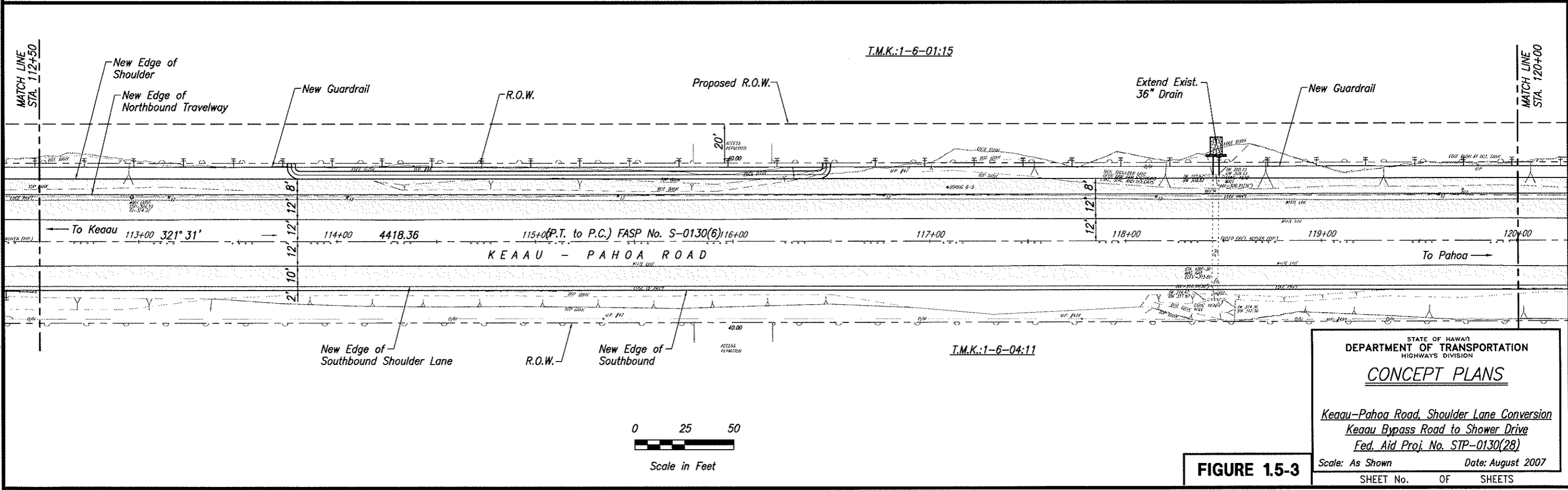
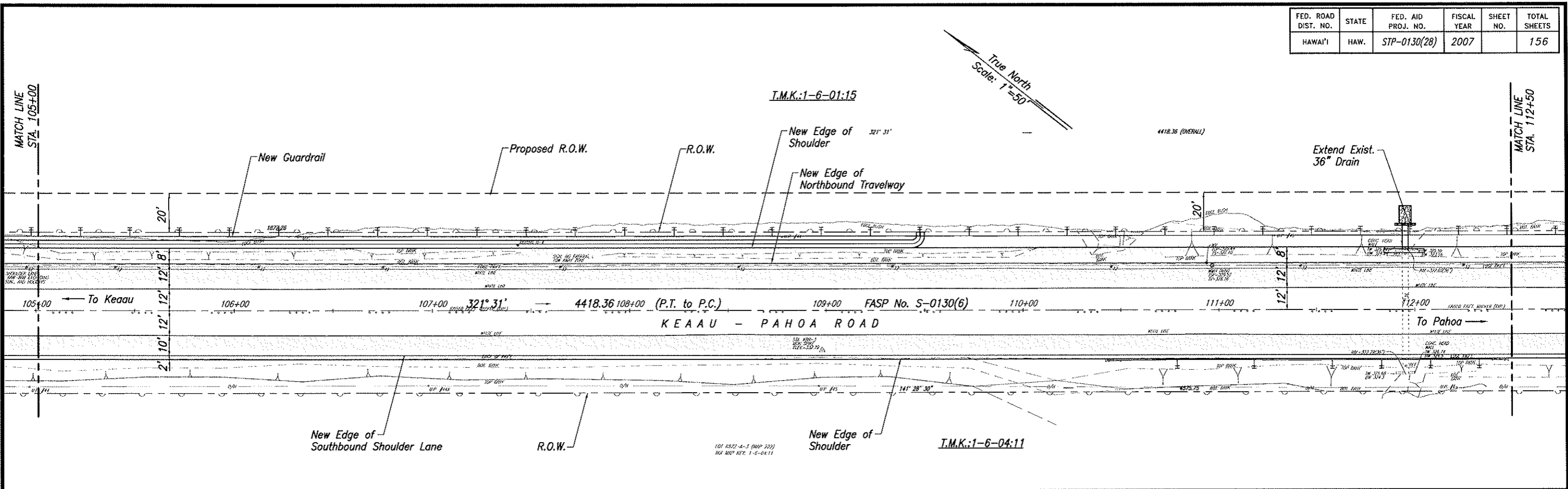
Scale: As Shown      Date: August 2007

SHEET No.      OF      SHEETS

**FIGURE 1.5-2**

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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
HAWAII	HAW.	STP-0130(28)	2007		156

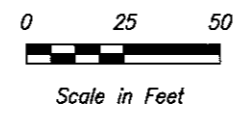
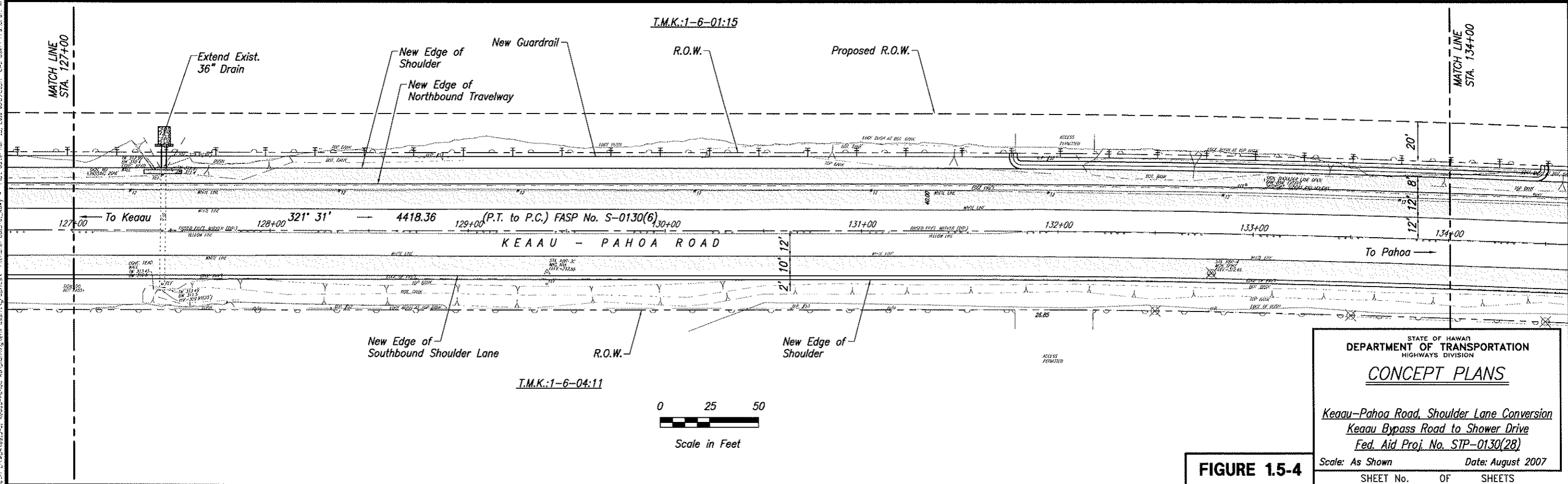
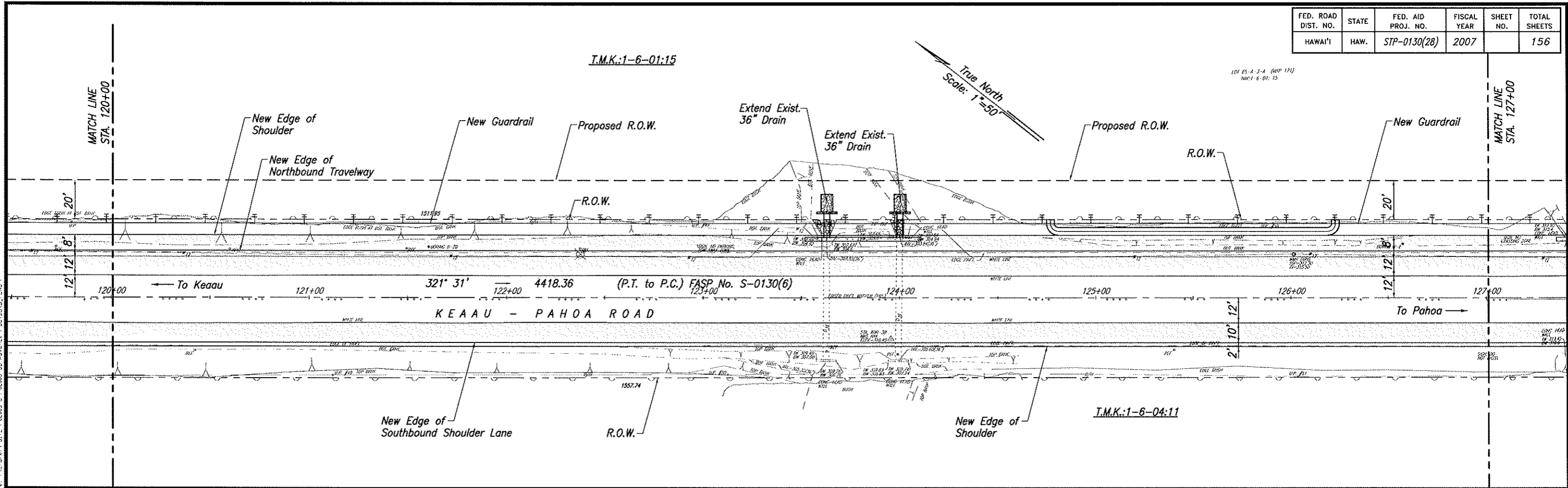


**FIGURE 1.5-3**  
 Scale: As Shown Date: August 2007  
 SHEET No. OF SHEETS

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION  
**CONCEPT PLANS**  
*Keaau-Pahoa Road, Shoulder Lane Conversion*  
*Keaau Bypass Road to Shower Drive*  
*Fed. Aid Proj. No. STP-0130(28)*  
 Scale: As Shown Date: August 2007  
 SHEET No. OF SHEETS

Path: L:\2007\156-01\Keaau-Pahoa\_Road\plan\new\concept\156-01-03.dwg Plot Date: Mar 15, 2007 10:30:56 AM User: ffranzen

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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**CONCEPT PLANS**

*Keaau-Pahoa Road, Shoulder Lane Conversion  
Keaau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)*

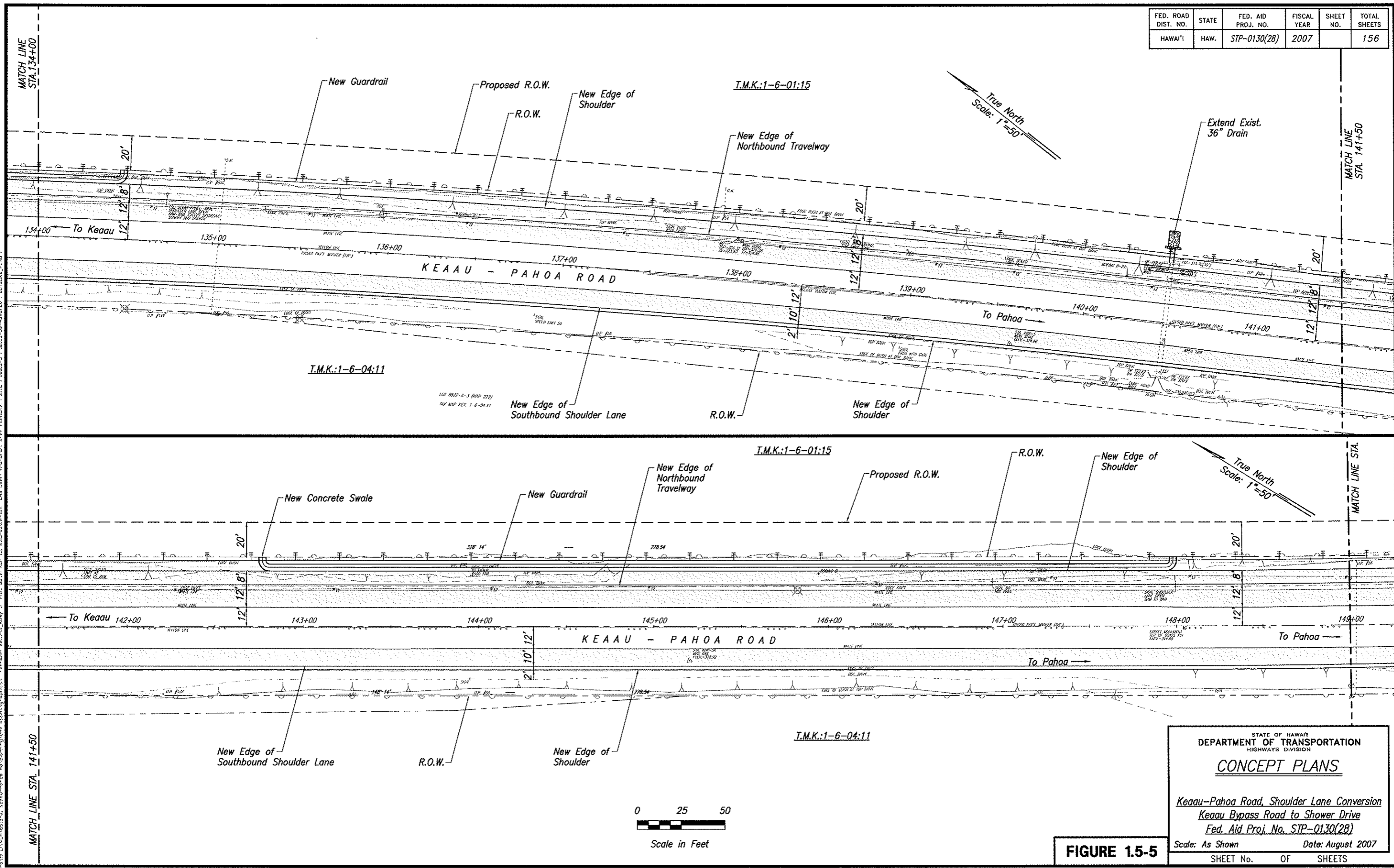
Scale: As Shown      Date: August 2007

SHEET No.      OF      SHEETS

**FIGURE 1.5-4**

Path: L:\V\4515-01\_Keaau-Pahoa\_Road\pennings\env\assets\graphics\Figures\6615-01\_Rev\_4\_Plan\_Scale\_Mar\_15\_2007-2009.dwg CAD User: Franzen, Xref Filename: 1:201203\_Plan\_1

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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STATE OF HAWAII  
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**CONCEPT PLANS**

*Keau-Pahoa Road, Shoulder Lane Conversion  
 Keau Bypass Road to Shower Drive  
 Fed. Aid Proj. No. STP-0130(28)*

Scale: As Shown      Date: August 2007

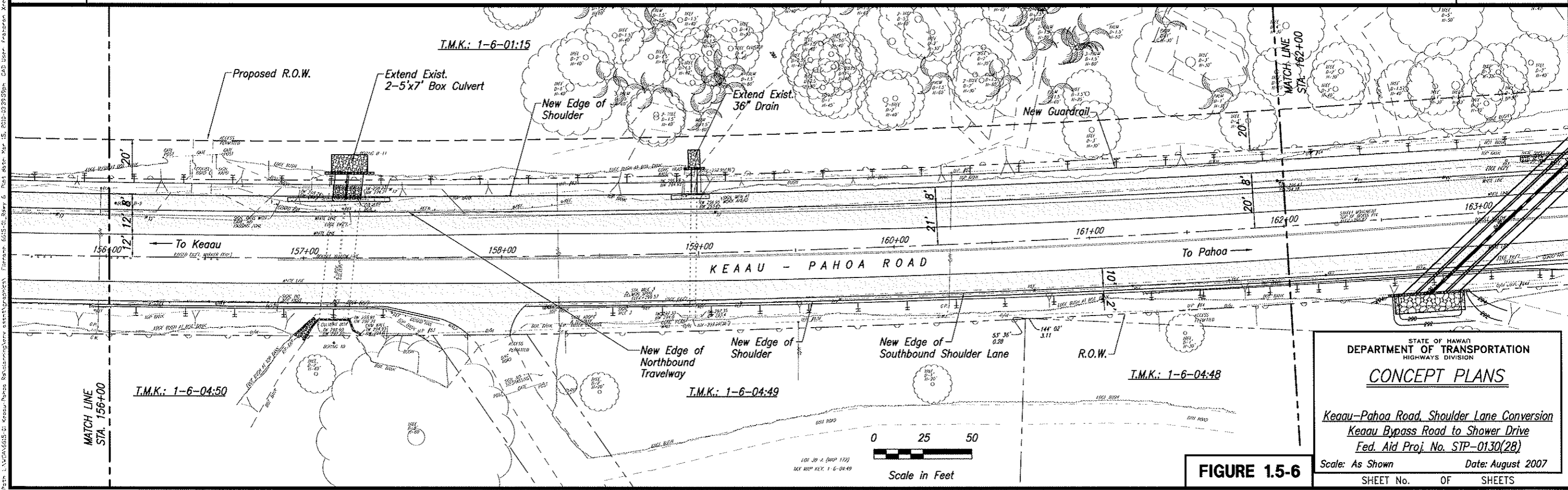
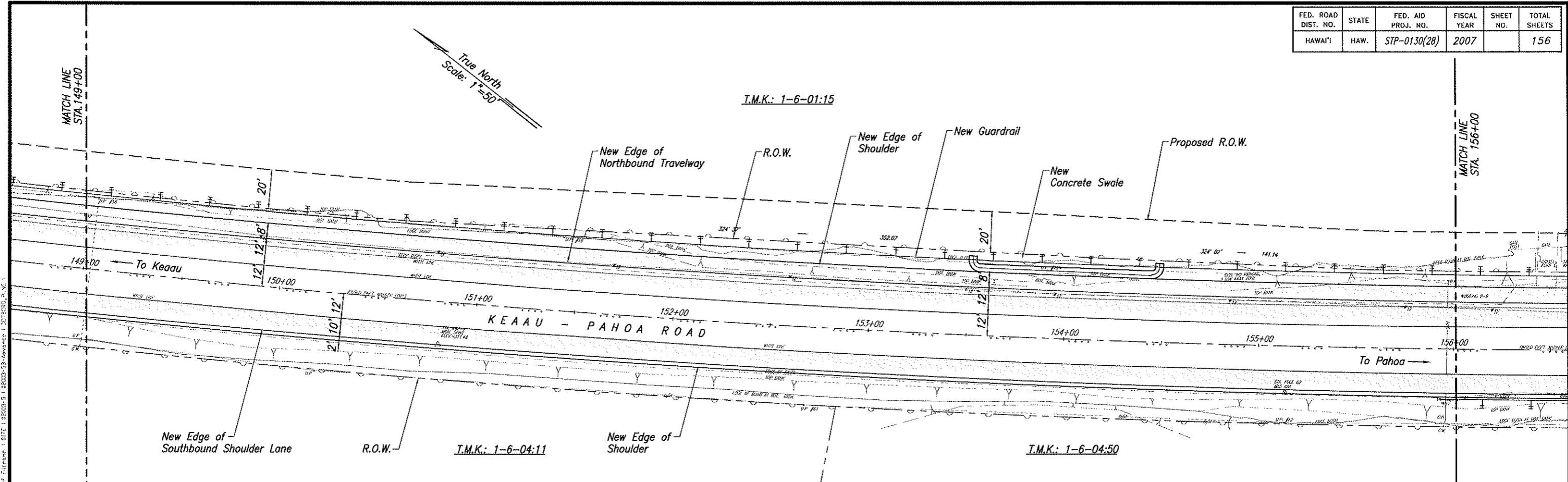
SHEET No.      OF      SHEETS

**FIGURE 1.5-5**

Path: L:\NVA\6515-01\_Keau-Pahoa\_Rev\dwg\1507-01.dwg    Plotted: 8/21/07 10:54:12 AM    User: ffranz    Plotter: HP DesignJet 500    Plot Size: 36" x 48"    Scale: 1"=50'    Sheet: 156 of 156



FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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**CONCEPT PLANS**

*Keau-Pahoa Road, Shoulder Lane Conversion  
Keau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)*

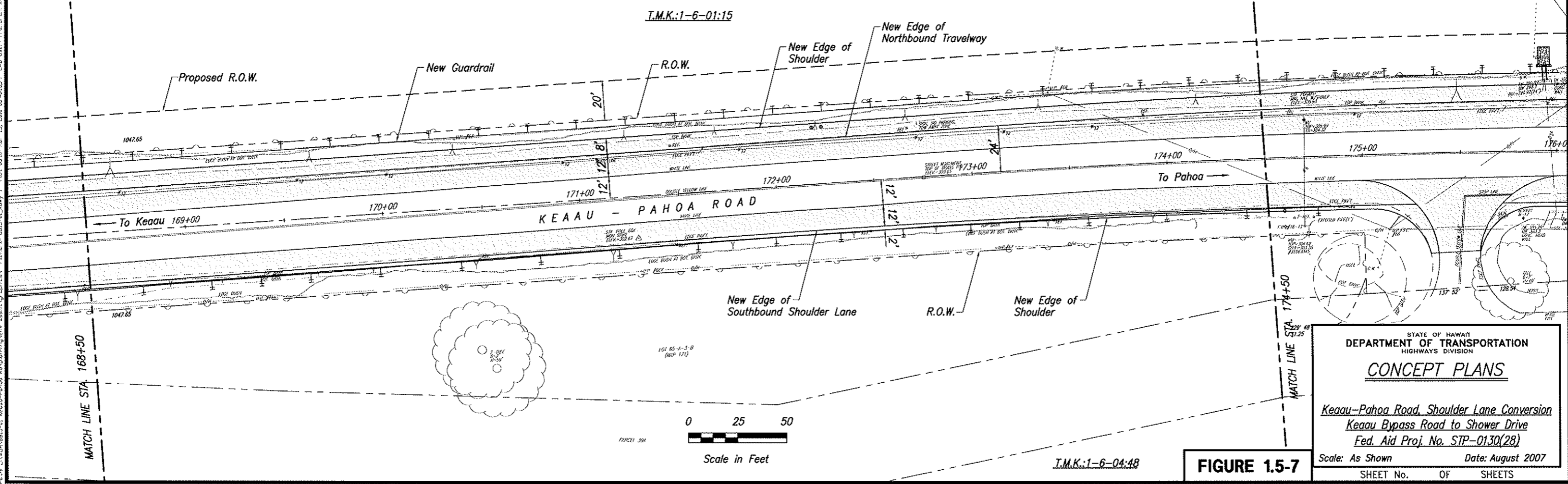
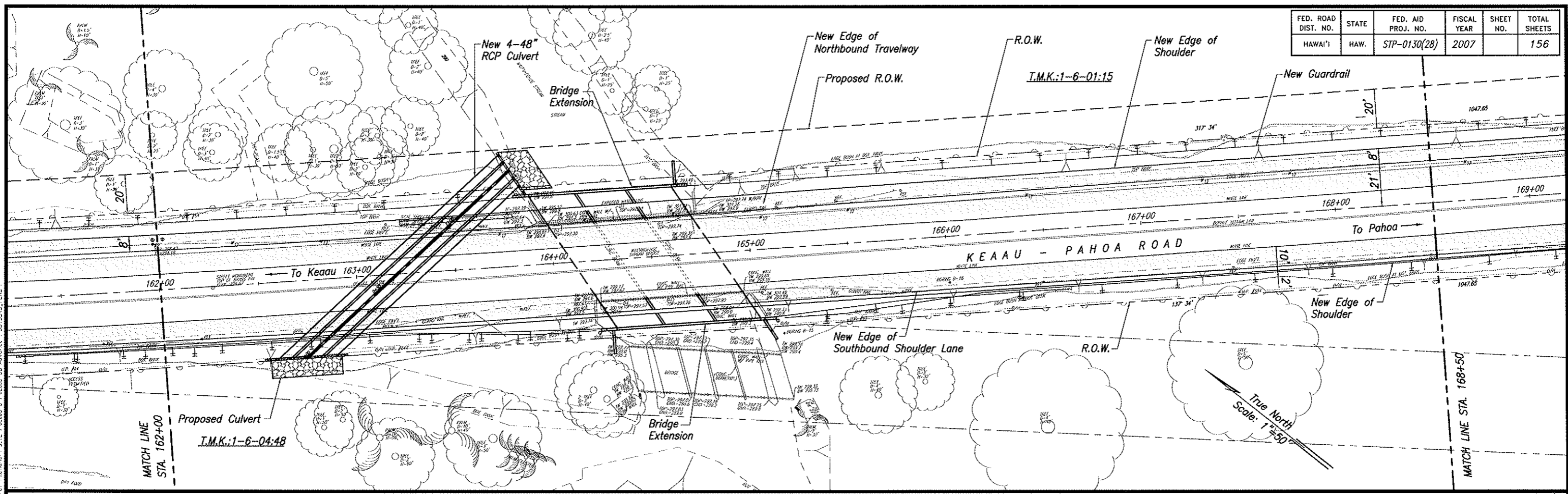
Scale: As Shown      Date: August 2007

SHEET No.      OF      SHEETS

**FIGURE 1.5-6**

Path: L:\NVA\665-01\Keau-Pahoa\_ShoulderLaneConversion\Drawings\156-162\156-162\_Plan\_1.dwg    Plot Date: 8/15/2007 10:30:59am    CAD User: Frederick\_Xuef    File Name: 156-162\_Plan\_1.dwg    Plot Scale: 1/8"=1'-0"

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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**CONCEPT PLANS**

*Keaau-Pahoa Road, Shoulder Lane Conversion  
Keaau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)*

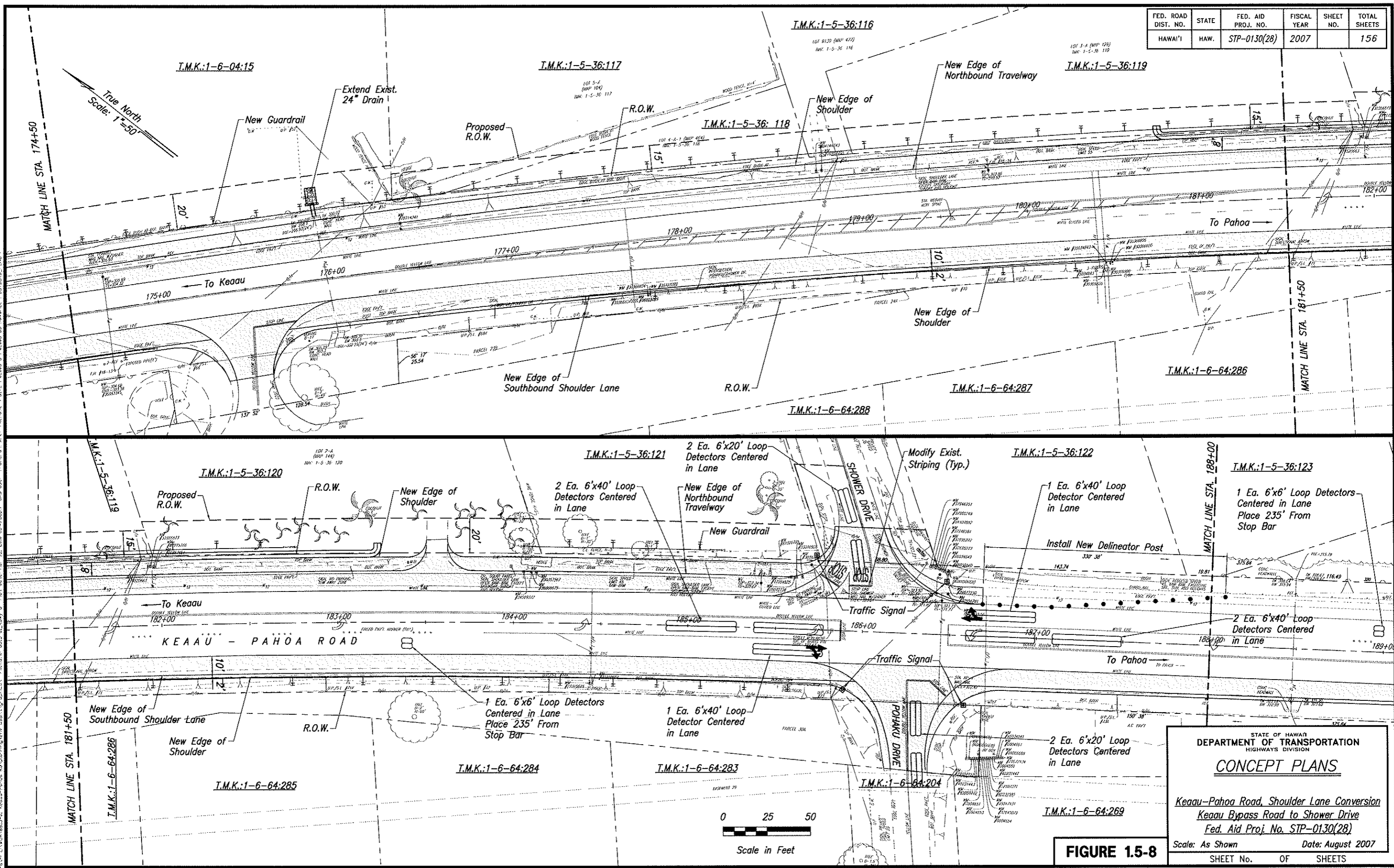
Scale: As Shown      Date: August 2007

SHEET No.      OF      SHEETS

**FIGURE 1.5-7**

Path: L:\V2\16515-01\_Keaau-Pahoa\_Road\plan\mxd\16515-01\_Keaau-Pahoa\_Road\_Sheet\_16515-01\_082007.dwg    Plot date: Mon 15 2:53:42 PM 2007    User: frcanran    Xref: 16515-01\_082007.dwg    File name: 16515-01\_082007.dwg

FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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STATE OF HAWAII  
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**CONCEPT PLANS**

Keaau-Pahoa Road, Shoulder Lane Conversion  
Keaau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)

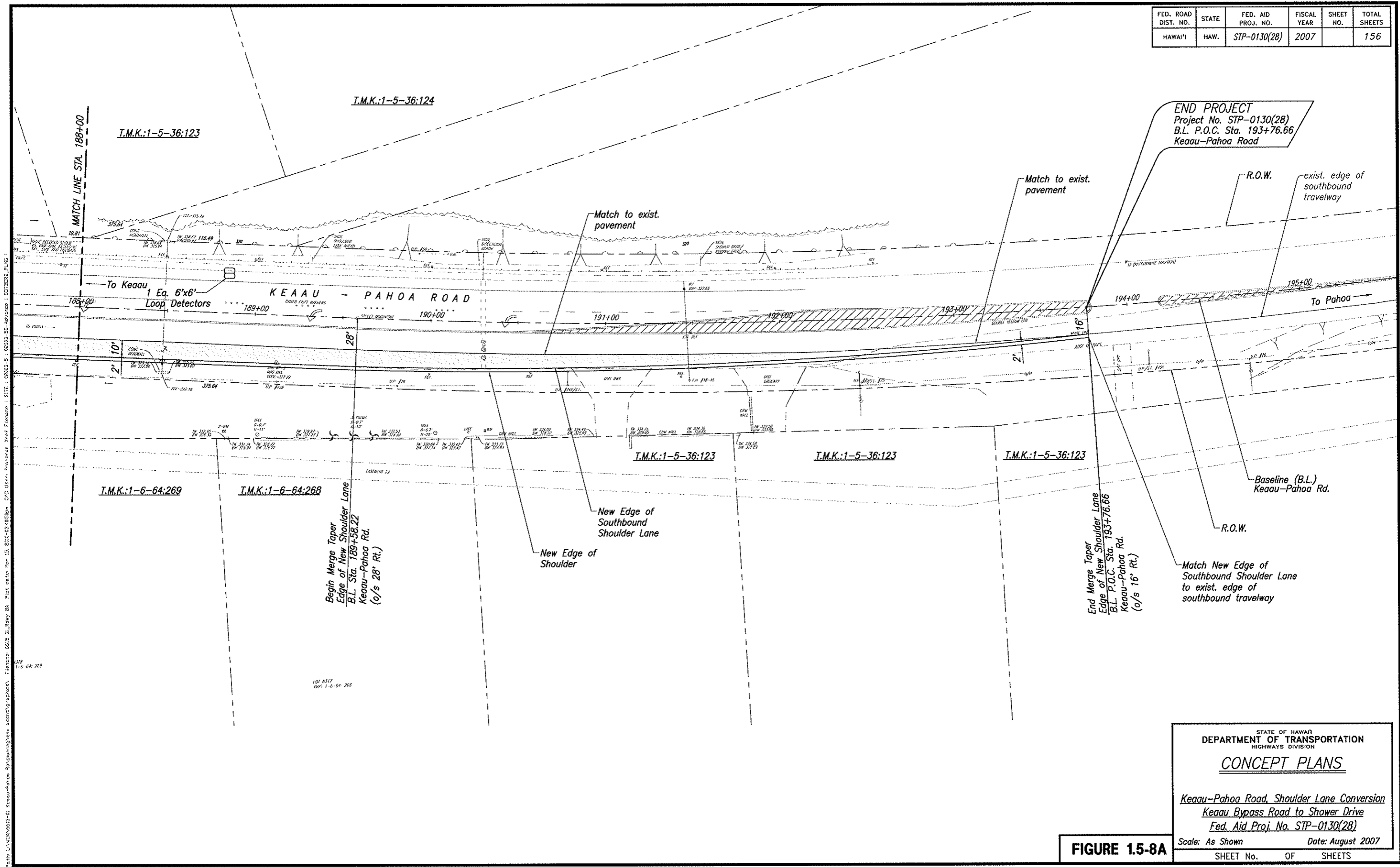
Scale: As Shown      Date: August 2007

SHEET No.      OF SHEETS

**FIGURE 1.5-8**

Path: L:\NAD\655-01\_Measu-Pahoa\_RoadShoulderLaneConversion.dwg    File name: 655-01\_Road 8    Plot date: Mar 15 2010 09:40:28am    CAD User: Franzen    Xref filename: 10735292.dwg  
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FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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**END PROJECT**  
 Project No. STP-0130(28)  
 B.L. P.O.C. Sta. 193+76.66  
 Keau-Pahoa Road

STATE OF HAWAII  
 DEPARTMENT OF TRANSPORTATION  
 HIGHWAYS DIVISION

**CONCEPT PLANS**

*Keau-Pahoa Road, Shoulder Lane Conversion  
 Keau Bypass Road to Shower Drive  
 Fed. Aid Proj. No. STP-0130(28)*

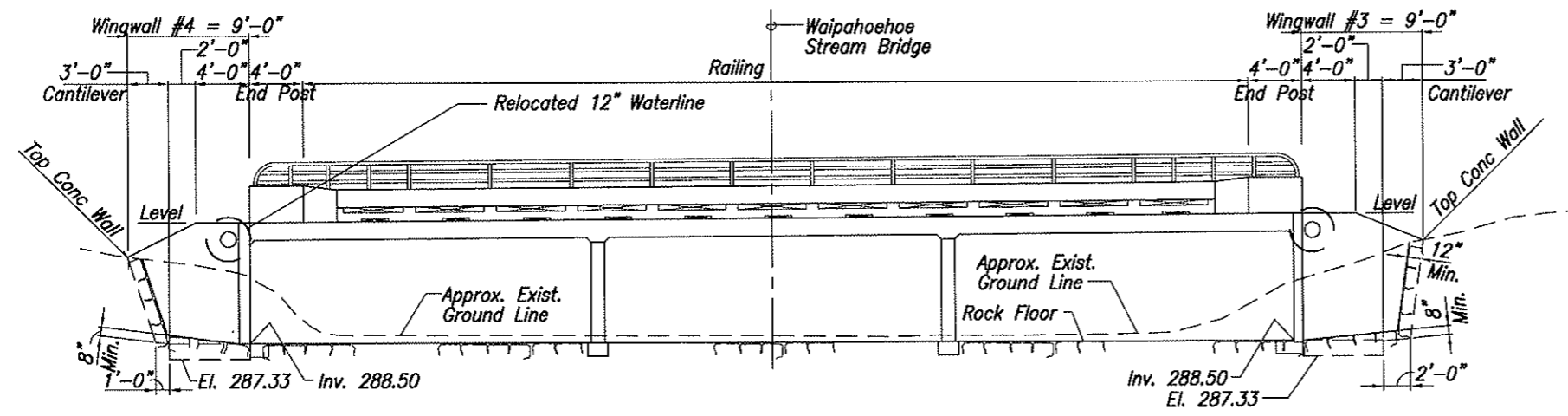
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SHEET No.      OF      SHEETS

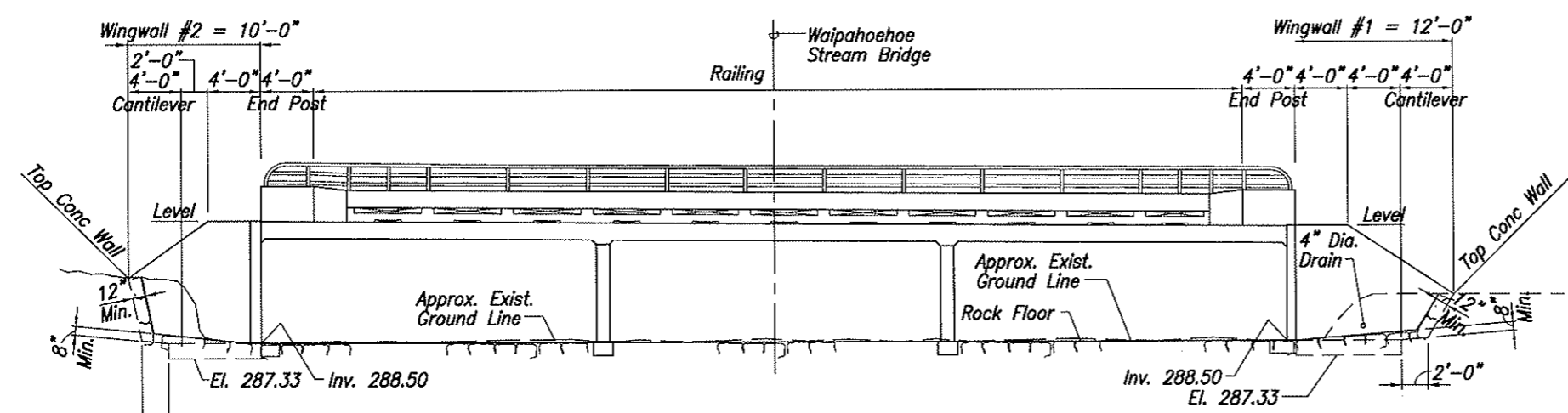
**FIGURE 15-8A**

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 File name: 6515-01.dwg  
 Date: 1-6-04-219  
 101 8317  
 100: 1-6-04-268

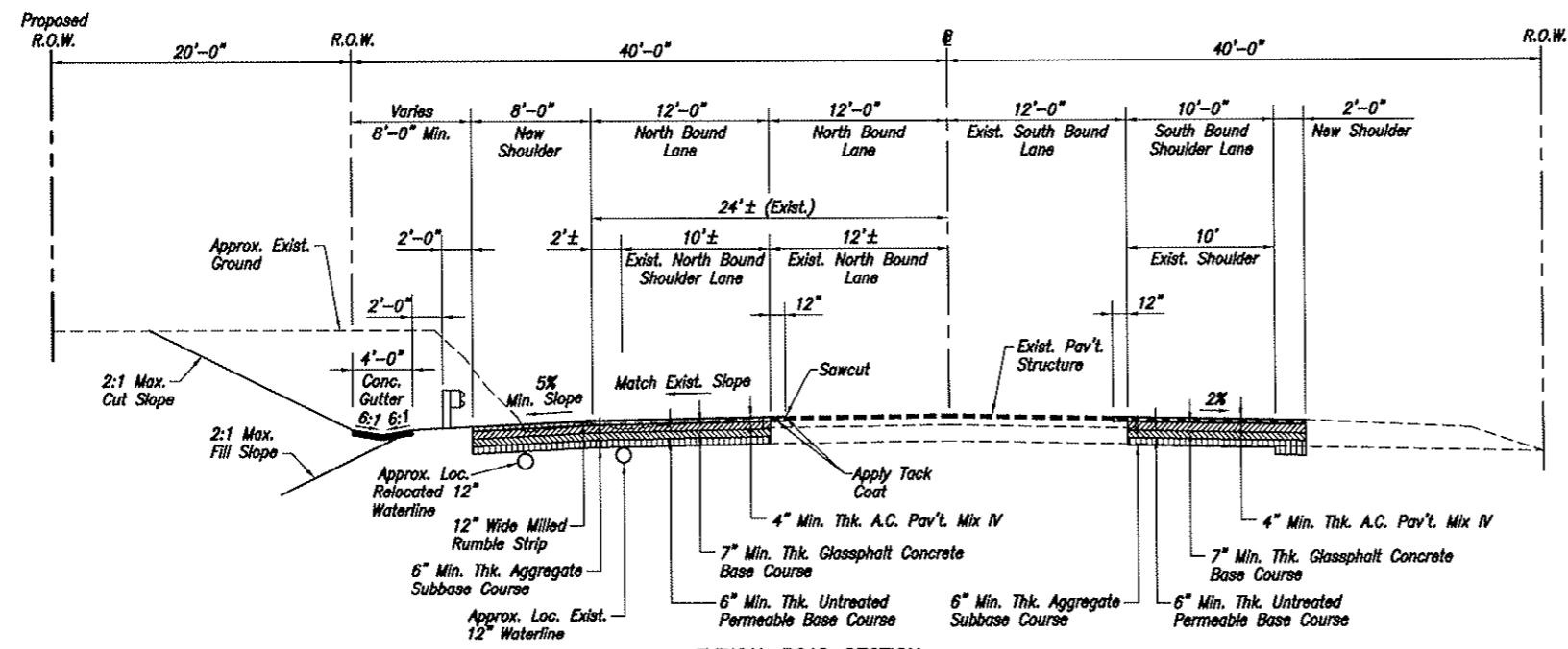
FED. ROAD DIST. NO.	STATE	FED. AID PROJ. NO.	FISCAL YEAR	SHEET NO.	TOTAL SHEETS
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ELEVATION - INLET END



ELEVATION - OUTLET END



TYPICAL ROAD SECTION  
Scale: 1/8" = 1'-0"

STATE OF HAWAII  
DEPARTMENT OF TRANSPORTATION  
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**CONCEPT PLANS**

Keaau-Paho Road, Shoulder Lane Conversion  
Keaau Bypass Road to Shower Drive  
Fed. Aid Proj. No. STP-0130(28)

Scale: As Shown Date: August 2007

SHEET No. OF SHEETS

FIGURE 1.5-9

Path: L:\VGA\615-01\_Keaau-Paho\_Road\working\env\asst\graphics\ File name: 615-01\_TypRdSec C-1D Plot date: Sep 02, 2005 09:48:47am CAD User: Fomomon, Xref Filename: 1 3073991.PLNG 1 3073991.PLNG 1

## **2. DESCRIPTION of EXISTING ENVIRONMENT, IMPACTS and MITIGATION MEASURES**

### **2.1 Geology and Soils**

#### **2.1.1 Existing Environment**

The Keaau-Pahoa Road Shoulder Lane Conversion project is located on the eastern slopes of the Mauna Loa and Kilauea shield volcanoes. Kilauea Volcano is currently active and lava has covered many acres of developed land in southern Puna over the last 30 years, including within the Hawaii Volcanoes National Park. Lava tubes and cave systems are also a common element in the area. There are estimates showing numerous lava tubes within the pahoehoe lava flows in this region. Some of the largest lava tube caves are considered important sites for scientific study. None of these important lava tube cave sites are within or near the project limits.

The Soil Survey of Island of Hawaii prepared by the US Department of Agriculture Soil Conservation Service (now Natural Resources Conservation Service) shows the soils on both sides of Keaau-Pahoa Road to be lava flows, pahoehoe. According to the Soil Survey, this soil type has no soil covering and is typically bare of vegetation except for mosses and lichens. In areas of higher rainfall, pahoehoe lava can support scattered Ohia trees, ohelo berry, and aalii.

Within the project limits, although the soil is classified as pahoehoe, both sides of Keaau-Pahoa Road are densely vegetated with patches of mostly introduced or alien trees, shrubs and grasses. However, there is still some evidence that the area was once covered by an Ohia lowland wet mesic forest, as evidenced by Ohia trees still present on both sides of Keaau-Pahoa Road.

The U.S. Geological Survey classifies the area that includes the project limits as Lava Flow Hazard Zone 3, on a scale of ascending risk from 9 to 1. Zone 3 is considered less hazardous than Zone 2 because of greater distance from recently active vents and/or the topography makes it less likely that flows will cover these areas. About 15 to 20 percent of Mauna Loa Zone 3 has been covered by lava in the past 750 years. The lava flow hazard to Keaau, although relatively severe, is among the lowest in Puna, equivalent to that of Hilo.

The first broadly recognized national standard for the design and construction of bridges in the US was published in 1931 by the American Association of State Highway Officials (AASHO), the predecessor to American Association of State Highway Transportation Officials (AASHTO). Currently, bridge design and construction in Hawaii relies on the design philosophy of load-and resistance factor design (LRFD) takes variability in the behavior of structural elements into account in an explicit manner. The latest version of the AASHTO LRFD is dated 2007.

### **2.1.2 Impacts and Mitigation Measures**

Construction of the Shoulder Lane Conversion project will require subsurface excavation to a depth of 24 inches to lay the sub base course, base course, plus 4 inches for the asphalt concrete pavement. Excavation to prepare the road surface will require the removal of about 20,200 cubic yards of material, some of which could be reused. Construction of the widened bridge will also require subsurface excavation for placement of the footings for the extended bridge bays. These activities will disturb surface and subsurface soils and displace the soils with new fill and footings. However, the total depth of these disturbances will not adversely affect the soils and geology of the project limits and surrounding area.

In terms of lava flow hazard, the Shoulder Lane Conversion project will be as exposed to lava flows as are other roads in the vicinity. The lava flow hazard would remain the same regardless of the improvements. The Shoulder Lane Conversion project will provide one more permanent 12-foot travel lane and a 10-foot shoulder lane which could increase the capacity to evacuate lower Puna in the event there is a need for an evacuation of the area.

The existing Waipahoehoe Bridge is the only major structure within the project limits. The Shoulder Lane Conversion will require that the bridge be widened from 40 feet wide to 70 feet wide by extending the width of the structure on both sides by 15 feet. The bridge will remain at its present length of 78 feet.

The bridge widening will be designed and constructed to meet the requirements of latest version of the AASHTO LRFD dated 2007. This will ensure that the geological conditions of the area do not adversely affect the bridge structure.

The bridge extension will also meet the April 2008 Design Criteria for Bridges and Structures issued by HDOT, including guide specifications for Load and Resistant Factor Design related to horizontal peak ground acceleration for Hawaii.

## **2.2 Surface Water Resources**

### **2.2.1 Existing Environment**

Few streams exist on the slopes of Mauna Loa or Kilauea volcanoes as the relatively young lava flows are too porous to support channelized water for any significant distance. The US Geological Survey (USGS) topographic map shows the only surface water source within the project limits is an unnamed intermittent stream which flows under Waipahoehoe Bridge. The USGS map shows that the unnamed intermittent stream starts near the 2,500-foot elevation, about 11.0 miles (57,500 feet) southwest of the bridge above Mountain View, and shows no further flow about 4,000 feet east (makai) of the bridge. Beyond this point, any stream flow would enter the permeable Kilauea lavas. Consequently, when flowing, this intermittent stream does not reach the shoreline and is considered an interrupted stream. Surface flows eventually occur as groundwater seeping to the surface at the coast.

The unnamed intermittent stream flows only for a short time after the heaviest rainfall, filling low spots until it encounters entry points into subsurface lava. However, since annual rainfall in this part of the island is between 150 and 200 inches, some pools of water in the stream bed are likely to be semi-permanent aquatic features.

The USGS topographic maps show no stream gage station on this unnamed intermittent stream. Further, since this stream is not perennial, it is not listed in the Hawaii Stream Assessment. The USGS maps show the unnamed intermittent stream under Waipahoehoe Bridge and the tributary of the unnamed intermittent stream join together about 2,300 feet east (makai) of the bridge and then end about 4,200 feet east of the bridge, or approximately 3.5 miles from the shoreline. See Figure 1.1.

In December 2008, a field survey was conducted at the approximate makai end of the unnamed intermittent stream. The survey at this location showed no evidence of stream or floodway of any kind. See Appendix B.



On October 23, 2009, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction. Thus, a stream channel alternation permit will not be required from the Commission on Water Resource Management.

The shoreline is about 4.2 miles east of Waipahoehoe Bridge. According to the State of Hawaii, Hawaii Administrative Rules Title 11, Department of Health Chapter 54 Water Quality Standards, the waters off the shoreline of the east coast of Hawaii are classified as Marine class AA, one of two classifications for marine waters. Under Chapter 54, the objective of class AA waters is that the waters remain in their natural pristine state as nearly as possible with an absolute minimum of pollution or alteration of water quality from any human-caused source or actions.

## **2.2.2 Impacts and Mitigation Measures**

The Federal Water Pollution Control Act was enacted in 1972 to control water pollution by regulating the discharges of pollutants into the waters of the US. As amended in 1977, this law became known as the Clean Water Act (33 USC 1251) and gave the US Environmental Protection Agency (EPA) the authority to implement pollution control programs. The Clean Water Act also established that a permit was required to discharge pollutants into navigable waters of the US. In Hawaii, the State of Hawaii Department of Health (DOH) acts to implement the provisions of the Clean Water Act.

The State of Hawaii Department of Health has jurisdiction to issue National Pollutant Discharge Elimination System (NPDES) permits under the Clean Water Act. The DOH issues the NPDES permit under Chapter 55, Water Pollution Control, Hawaii Administrative Rules, which requires NPDES permit for construction activities which result in disturbing more than a total area of one (1) acre or more.

To meet the conditions of a NPDES permit, the Shoulder Lane Conversion project will use temporary erosion control measures during construction to prevent runoff to nearby areas. These mitigation measures will include placement of silt fences and or silt barriers to prevent surface runoff from construction areas entering into adjacent areas. These measures will contain surface flows within areas of construction during the construction period.

The design drawings will include water pollution and erosion notes related to erosion and sediment control practices for exposed area and use of materials in the work areas. The contract specifications will also include sections on Environmental Controls and Pollution Control which set forth the requirements to be implemented during construction to protect adjacent areas from runoff and discharge of pollutants.

Regardless of NPDES permit coverage, all discharges related to the project construction or operation activities must comply with the Water Quality Standards set forth in State of Hawaii Department of Health Hawaii Title 11 Administrative Rules, Chapter 54, Water Quality.

One of the purposes of the Shoulder Lane Conversion project is to improve hydraulic conditions along the project limits by constructing a new reinforced concrete pipe culvert about 140 feet north of the bridge, a low point in the road north of the existing bridge. The culvert will reduce the need to close the Road due to storm water runoff overtopping the road during heavy rainfall events.

The culvert will consist of 4, 48-inch reinforced concrete pipes angled at about 40 degrees to the center line of the road. The pipes will vary from about 130 to 160 feet and have a 43-foot mauka headwall and 28-foot makai headwall. The culvert will direct drainage flows toward the unnamed intermittent stream to minimize the effects of storm runoff on the adjacent makai side properties. Since flows from the culvert will be directed to the unnamed stream, surface water drainage patterns will not be affected by the culvert. Also, the culvert will prevent back up of surface flows makai of the road. Based on these considerations, there will be no significant impact to surface water resources from the Shoulder Lane Conversion project.

## **2.3 Groundwater Resources**

### **2.3.1 Existing Environment**

There are no groundwater wells within the project limits. However, the project limits and surrounding areas are located within a groundwater recharge area. This area of Puna contains permeable soils which allow rapid infiltration of surface flows as groundwater. The aquifer consists primarily of fresh basal water overlying saline groundwater.

## **2.3.2 Impacts and Mitigation Measures**

The Shoulder Lane Conversion project includes: on the makai side, construction of a 12-foot travel lane; an 8-foot shoulder, and a 4-foot paved drainage swale/concrete gutter in the excavated portions of the project limits and on the mauka side, construction of a 10-foot shoulder lane and 2-foot paved shoulder. This will result in a total of 24 feet of impervious surface on the makai side and 12 feet on the mauka side. Since the existing makai roadway consists of a 10-foot travel lane and a 2-foot shoulder, there will be a net new 12-foot impervious area for the total project limits of 12,210 feet on the makai side and on the mauka side a net new 4-feet. Thus, the total new impervious surface within the project limits will be about 195,360 square feet ( $12 \times 12,210 + 4 \times 12,210 = 195,360$ ).

The impervious surface will accommodate maintenance of the swales. This increase of impervious surface would not be significant when compared to the total undeveloped vacant area along the project limits and the groundwater recharge area in the vicinity. Surface flows from the impervious surface will infiltrate to the groundwater through the permeable soils. Since the additional impervious area will not affect groundwater recharge, no significant impact on groundwater resources is anticipated.

## **2.4 Flood Hazard**

### **2.4.1 Existing Environment**

The Flood Insurance Rate Map of Hawaii County, Map Index, Panel Number 155166INDOA (see Panel 1551661125C), April 2, 2004, shows the area of the project limits is in Zone X, "area determined to be outside of the 0.2% annual chance floodplain."

As part of the Draft EA review, the U.S. Army Corps of Engineers, Honolulu District concurred with this flood hazard designation. See Appendix F.

As part of the Draft EA review, the Department Of Land And Natural Resources, Engineering Division confirmed that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The Flood Insurance Program does not have any regulations for developments within Zone X. See Appendix F.

During November 1-2, 2000, prolonged and intense rain fell over the eastern part of the island of Hawaii. In 2002, the USGS produced an extensive report titled “*Streamflow and Erosion Response to Prolonged Intense Rainfall of November 1-2, 2000, Island of Hawaii, Hawaii*”. The rainfall maps in the report show the Keaau area received 25 inches of rainfall during the period. The report indicates the nearest rain gage in the vicinity of the project limits is in Mountain View, about 6.6 miles from the bridge on Keaau-Pahoia Road. During the November 1-2, 2000 storm the rainfall depth at the Mountain View rain gage was 29.75 inches, or a greater than 100-year storm.

During this storm event, most of the rain fell in a 24-hour period duration with recurrence intervals equal to or greater than a 100-year flood event. Total rainfall amounts for the storm were historical maximums at many locations. A number of bridges and stream crossings were damaged or destroyed by the November 2000 storm event. Four bridges along Highway 11 near Pahala and the Komohana Street Bridge over Alenaio Stream in Hilo were among those damaged or destroyed bridges on Hawaii.

According to information from the HDOT Hawaii District, the Waipahoehoe Bridge did not overtop during this event, and no records show the bridge overtopping. However, the roadway between Waipahoehoe Bridge and the double box culvert crossing north of the bridge has overtopped on three separate occasions in September 1994, November 2000, and in 2002. This drainage condition is caused by the road's low point being located about 140 feet north of Waipahoehoe Bridge.

#### **2.4.2 Impacts and Mitigation Measures**

The Shoulder Lane Conversion project limits include a total of 9 culverts which carry flows from the west (mauka) to east (makai) sides of Keaau-Pahoia Road. These culverts will be extended about 15 feet, new headwalls construction, and clearing and grading will be done to carry flows into the areas makai of the culverts. These extensions will not change the surface flow patterns on the makai side. Thus, there will be no adverse effect to surface flows from the culvert extensions.

As previously discussed, one of the purposes of the Shoulder Lane Conversion project is to improve the hydraulic conditions along the roadway by constructing a multiple concrete pipe culvert about 140 feet north of the Waipahoehoe Bridge. The culvert will consist of 4, 48-inch reinforced concrete pipes angled at about 40 degrees to the center

line of the road. The pipes will vary from about 130 to 160 feet. The flows from the culvert enter the unnamed stream makai of the bridge.

The purpose of the culvert is to reduce flood hazard to the areas mauka of the road and to reduce the need to close Keaau-Pahoa Road from surface flows overtopping the road during heavy rainfall events. Reducing closures of the road will reduce inconvenience to residences of the Puna area and will allow travel on Keaau-Pahoa Road during high rainfall storm events. Based on these considerations, the Shoulder Lane Conversion project will not adversely affect flood hazards in the area.

## **2.5 Agricultural Lands**

### **2.5.1 Existing Conditions**

The Detailed Land Classification – Island of Hawaii classifies all land on the Big Island into one of five master productivity ratings based on soil characteristics, slope, rainfall and miscellaneous site conditions. The ratings range from “A” (very good) to “E” (very poor). Lands on either side of the Keaau-Pahoa Road are almost entirely assigned a productivity rating of “E”, with one small segment assigned productivity rating “C”.

In 1975, the US Department of Agriculture Soil Conservation Service (now Natural Resources Conservation Service) initiated a nationwide inventory of important farmlands. When completed, the inventory included three categories “prime”, “unique”, and “other farmlands of state-wide and local importance”. This classification was later adopted by the State of Hawaii Department of Agriculture under the title “Agricultural Lands of Importance to the State of Hawaii” (ALISH).

The ALISH system defines “prime agricultural land” as the best suited for food, forage, and timber crops. “Unique agricultural land” is defined as land other than prime, used for the production of high-value food crops. “Other agricultural land” is defined as land used for the production of food, feed, fiber and forage crops, but not classified as “prime” or “unique”.

According to the ALISH system, the lands along the project limits are classified as “other agricultural land”, indicating that the lands are not the highest classification for productivity and high yield.

Currently, the lands within the project limits are vacant and undeveloped. No agricultural production is occurring on these lands. However, west, or outside of the mauka right-of-way active farming occurs. Similarly, east, or outside of the makai right-of-way, active farming also occurs.

## **2.5.2 Impacts and Mitigation Measures**

The Shoulder Lane Conversion project limits extend for about 2.31 miles along Keaau-Pahoa Road. The HDOT will need to acquire about 4.476 acres of additional right-of-way area on the makai side of the road to account for the new permanent 12-foot travel lane, shoulder, and cut slope and grade adjustment purposes. This land within the right-of-way is currently vacant and undeveloped and does not include agricultural use. Use of this land for roadway purposes will not remove land from agricultural production. On the mauka side, the new 10-foot wide shoulder lane will involve land within the existing right-of-way which is not used for agricultural production. As previously discussed, the existing access permitted points to uses along Keaau-Pahoa Road will remain with no changes. Thus, the Shoulder Lane Conversion project will not have an adverse effect on agricultural production in the area.

## **2.6 Hazardous Waste**

### **2.6.1 Existing Environment**

Currently, the lands along the project limits are vacant and undeveloped. No agricultural production or other uses which may have resulted in generation of hazardous waste are occurring on these lands. No structures, buildings, facilities, or underground storage tanks (USTs) which might contain hazardous materials have been constructed on the lands along the project limits.

### **2.6.2 Impacts and Mitigation Measures**

The Shoulder Lane Conversion project would involve construction a permanent 12-foot northbound travel lane, a 10-foot southbound shoulder lane, shoulders on both sides, and widening the existing bridge. The primary construction materials used will be base course consisting of crushed rock material and asphalt used for paving the travel lanes and shoulders. Asphalt is the non-volatile compound which remains after refining crude

petroleum. Asphalt cement, one of three forms of asphalt used in paving applications, is a black, sticky, semisolid, highly viscous material at ambient temperatures. Asphalt cement is considered thermoplastic as it softens when heated and hardens as it cools.

Hot-mix asphalt is a mixture of asphalt cement and aggregate. To dry the aggregate and obtain sufficient fluidity of the asphalt cement, the mixture is heated prior to mixing. While hot, this mixture is transported to the construction site, where it will be placed on the base course and compacted. Upon cooling the mixture will harden.

The asphalt is considered an inert material. Although petroleum based, asphalt has not been shown to be a source of toxic substances which might leach into surrounding areas. Asphalt has been used as a liner in drinking water reservoirs. Based on these findings, use of asphalt for paving the Shoulder Lane Conversion project will not introduce a material which could be considered hazardous or toxic to the surrounding area.

Relocation of the 12-inch water line will require construction of new 2-foot wide by 5 foot deep trench in the 8-foot wide makai shoulder along the project limits. Typically, construction will be done in segments so the new line can be hydrotested, which includes cleaning the line of debris, adding chlorine to disinfect the line, and testing to ensure the proper pressure can be maintained. This process may be repeated to ensure the line meets Department of Water Supply standards. Since the work can be done in segments, the effluent water from the testing can be placed in the next segment of trench or used for dust control. This will ensure the effluent water does not affect nearby areas. At this point, a hydrotest permit from the State of Hawaii Department of Health is not anticipated.

## **2.7 Biological Resources**

### **2.7.1 Existing Environment**

#### **Flora**

In February 2004, a botanical survey was conducted on the makai side of the project limits to determine the vegetation within the project limits and on the adjacent makai side lands. The survey indicates the project limits and adjacent land is mostly introduced or alien trees, shrubs, and grasses. In addition, Ohia trees still exist and

intermittent areas of Ohia/Staghorn Fern are scattered among the predominantly introduced vegetation. See Appendix C.

In December 2008 a botanical survey was conducted mauka side of the project limits. The findings indicate a total of 11 native plants. Characteristic of the open native forest that once dominated the lava flows in this area are Ohia (*Metrosideros polymorpha*) and patches of uluhe or false staghorn fern (*Dicranopteris linearis*). None of the native species recorded is considered rare or unusual. Two additional species listed are early Polynesian introductions to the Hawaiian Islands: kukui (*Aleurites moluccana*) and kamole (*Ludwigia octovalvis*). Again, these are not species that would require special consideration.

In March 2004, a biological and water quality reconnaissance survey of the unnamed stream and area surrounding the bridge was conducted. As part of this survey, the vegetation near the unnamed stream was observed. The survey found a variety of grasses, sedges, and herbaceous weeds occur within the stream bed, but no hydrophytic (aquatic) vegetation. See Appendix B.

No listed, candidate, or proposed threatened or endangered botanical species as set forth by the US Department of the Interior Fish and Wildlife Service (USFWS) and the Department of Land Natural Resources (DLNR) were found during these surveys.

On June 10, 2009 in response to the Pre Assessment for this Draft EA, the USFWS replied that there is no Federally designated critical habitat in the vicinity of the project limits. See Appendix A.

Based on the improvements to the west (mauka) side, in December 2008, additional field surveys were conducted along the project limits and specifically near the Waipahoehoe Bridge. The field survey included the approximate makai end of the unnamed intermittent stream. The field survey at this location showed no evidence of stream or floodway of any kind.

Second, the December 2008 field survey identified an area west, or mauka of the road, between the bridge and double box culverts located north of bridge as being a suspected wetland. The field shows the area contains California grass, indications of



occasional flooding, and possibly hydric soil, although this has not been confirmed. No standing water or open water areas were observed in the area.

## **Fauna**

In February 2004, a fauna survey was conducted along the project limits to identify animal species present in the area. Although no rats or mice were noted during the survey, they can be assumed to be present as household rubbish is found along the project limits. Feral cats were noted during the survey.

A total of seven bird species were noted during the fauna survey, with Zebra Dove (*Geopelia striata*) and common mynas (*Acridotheres tristis*) being the most commonly seen birds. See Appendix C.

No listed, candidate, or proposed threatened or endangered bird species as set forth by the US Department of the Interior Fish and Wildlife Service (USFWS) under US Code 1531 and the Department of Land Natural Resources (DLNR) were found during the bird survey.

On June 10, 2009 in response to the Pre Assessment for this Draft EA, the USFWS stated that their files show two listed species as having been observed in the vicinity of the Shoulder Lane Conversion project: (1) the endangered Hawaiian hawk (*Buteo solitarius*); a bird species and (2) the endangered Hawaiian hoary bat, (*Lasiurus cinereus semotus*), the only mammal endemic to Hawaii.

## **Aquatic**

In March 2004, a biological and water quality reconnaissance survey was conducted in the area around the existing bridge and the twin 5'x7' box culverts north of the bridge. The purpose of the survey was to identify aquatic biota, collect water quality samples for analysis in the laboratory, and make water quality measurements in the field. At the time of sampling, the weather was sunny and winds were calm. It had rained lightly earlier that morning or the previous evening. Appendix B contains the 2004 survey.

At the time of the survey, the stream was dry at both the bridge and culvert and only a few small pools were observed between approximately 80 m and 100 m (260 to 330 ft) downstream from the bridge. The dimension of the largest pool was approximately 1 x 1

m (3 x 3 ft) and no more than 10 cm (4 in) deep. A single, much smaller pool (1 x 0.3 m or 3 x 1 ft) was observed in a small depression underneath the bridge.

During the survey, only one aquatic animal, an indigenous dragonfly nymph, was observed in the stream in a pool about 300 feet downstream from the bridge. Also, although not an aquatic species, several cannibal snail shells (*Euglandina rosea*) were observed throughout the stream bed downstream from the bridge. See Appendix B.

No listed, candidate, or proposed threatened or endangered aquatic species as set forth by the USFWS and the DLNR were found during any of the surveys.

### **2.7.2 Impacts and Mitigation Measures**

The Shoulder Lane Conversion will require removal of the surface vegetation along the project limits and grading for construction of the permanent 12-foot travel lane, the 10-foot shoulder lane, and 8-foot paved shoulder. Based on the survey results, removal of the surface vegetation will not create an adverse impact to the flora or fauna of this area of the island of Hawaii.

The project site contains no listed or candidate threatened or endangered botanical species as set forth by the USFWS. Thus, construction of the Shoulder Lane Conversion project will not have an adverse impact to threatened or endangered species.

The USFWS provided the following mitigation measures to minimize potential impacts to listed species. Since Hawaiian hoary bats nest in both exotic and native woody vegetation, to minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15-feet (4.6 meters) tall should not be disturbed, removed or trimmed during the bat birthing and pup rearing season (May 15 through August 15). If there is a need to disturb, remove or trim woody vegetation greater than 15 feet tall during the Hawaiian hoary bat pupping season, the USFWS recommend conducting biological surveys to determine if bats are present.

The USFWS also indicated Hawaiian hawks nest in both exotic and native woody vegetation which occurs along the project limits. To avoid impacts to Hawaiian hawks the USFWS recommend avoiding tree clearing during their breeding season (March

through September). If there is a need to clear the construction area during the Hawaiian hawk breeding season, the USFWS recommend conducting additional biological surveys to determine if hawk nests are present. Typically, this would involve a visual survey prior to the breeding season to determine the presence of hawk nests.

At this time, the construction schedule for the Shoulder Lane Conversion project has not been determined, especially for work related to vegetation removal. However, to ensure the contractor does not disturb vegetation which might be used by Hawaiian hoary bat, the HDOT contract documents will include a provision that woody plants greater than 15 feet (4.6 meters) tall should not be disturbed, removed or trimmed during the bat birthing and pup rearing season (May 15 through August 15).

The HDOT contract documents will include a provision, if vegetation and tree clearing is to be done during the Hawaiian hawk breeding season (March through September), the contractor will be responsible to conduct additional biological surveys, as directed by the USFWS.

These mitigation measures will ensure the Hawaiian hoary bat and Hawaiian hawk will not be adversely affected by the Shoulder Lane Conversion project. These mitigation measures will be required for the HDOT to meet its responsibilities pursuant to the Endangered Species Act of 1973, as amended, if a listed species may be affected by the Shoulder Lane Conversion project.

The December 2008 survey included the makai end of the unnamed intermittent stream under Waipahoehoe Bridge and its tributary located north of the bridge. The survey also included a low area between the unnamed intermittent stream and its tributary. This area between the two stream beds along the west side of the Keaau-Pahoia Road is a depression subject to flooding and over topping the road during storm events. The depressed area shows potential wetland characteristics: with positive vegetation (dominated by California grass, *Urochloa mutica*, a facultative wetland or FACW species) and hydrology indicators (occasional flooding), and possibly hydric soil, although this has not been confirmed. No standing water or open water areas were observed in the low area. Further study would be needed to establish if this area does contain a wetland.

Although a nexus with the unnamed stream can probably be demonstrated, if the stream itself is declared isolated (not jurisdictional), then the wetland would not be jurisdictional, even should it prove to be a wetland by Federal definition. The subjective significant nexus consideration of ecologic factors precludes anyone other than the USACE and/or EPA from declaring an aquatic feature as not waters of the U.S. Although not a factor in establishing federal jurisdiction of wetland features, the National Wetlands Inventory map (USFWS, 2009) shows no wetlands in the project area.

In the case of the unnamed stream and its small tributary, all evidence indicates that this stream system is isolated from the ocean, is intermittent, and flow contributes only to the general groundwater aquifer of the Puna District. In Federal parlance, this stream system is non-navigable and not relatively permanent (NRP). It does not contribute flow to and is not connected to the nearest traditional navigable waters (TNW), which is the Pacific Ocean. Therefore, this entire stream system should not be jurisdictional under Federal definition. However, in the final analysis, Federal jurisdiction over intermittent streams (and adjacent wetlands) rests on a "significant nexus" standard. While this standard includes whether non-permanent flow reaches a traditionally navigable waters, other "ecological factors" may be included, so the local office of the USACE must make the final determination.

On October 23, 2009, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction.

## **2.8 Traffic**

### **2.8.1 Existing Environment**

Between 1996 and 2007, the HDOT has collected 24-hour traffic two direction count data on Keaau-Pahoa Road at Station at (C-2-F), located approximately 850 feet south of the County convenience center entrance. The 24-hour volume has shown an increase from about 19,700 vehicles in 1996 to about 25,200 per day in 2007, a growth of about 5,500 vehicles or 28.0 percent, approximately 2.26 percent per year. (Note, 2007 is the latest data available from the HDOT traffic counts.) The traffic count data is shown below.

24-hour Traffic Counts*	
Station C-2-F (Approximately 850 feet South of Waste Station Road)	
DATE	TOTAL
2007	25,200
06/21-22/04	23,752
10/22/02	23,591
07/09/02	22,349
06/26-27/02	22,082
06/09/00	22,001
05/09/00	21,104
04/13-14/00	21,447
09/14-15/98	20,534
07/09/98	19,709
04/23/98	20,180
08/08/96	18,910
07/08-09/96	19,339
04/11/96	19,914
1/18/96	19,686

\*Source: State of Hawaii Department of Transportation

The 10-foot wide northbound shoulder lane, constructed in 1996, provides an additional travel lane between the Keaau Bypass and Shower Drive during only the morning peak hours of 6:00am to 8:00am. However, despite the posted hours, the shoulder lane is used throughout the day. Also, there are reports that motorists frequently access the Keaau-bound shoulder lane prior to the Shower Drive intersection whether or not the shoulder lane is to be used. In addition, due to backups along the Keaau-Pahoa Road during peak traffic periods and since Keaau-Pahoa Road is the only route connecting Keaau and Pahoa, motorists use Hawaiian Paradise Park subdivision roads in an attempt to avoid the congestion that occurs between Maku'u Drive and Shower Drive.

Given the traffic volumes in Hawaiian Paradise Park and Orchidland, a traffic signal warrant study was conducted to determine the need for a traffic signal at the Keaau-Pahoa Road and Shower Drive/ Pohaku Drive intersection. As part of the study, manual traffic counts were conducted at the intersection during the morning peak hours of 5:30am to 8:30am and the afternoon peak hours of 3:00 pm to 6:00pm on June 3-4 and July 20-21, 2004, and April 13-14, 2005. In addition, 24-hour mechanical counts were

taken along Keaau-Pahoa Road in the vicinity of the Shower Drive/Pohaku Drive intersection.

The counts showed the AM peak hour of traffic generally occurs between 6:45am and 7:45am in the vicinity of the Shower Drive/Pohaku Drive intersection. In the afternoon, the PM peak hour of traffic generally occurs between the hours of 5:00pm and 6:00pm.

In June 2004, at the Shower Drive/Pohaku Drive intersection, Keaau-Pahoa Road carried a total of 2,008 vehicles, 1,515 vehicles northbound and 493 vehicles southbound during the AM peak hour of traffic. During the PM peak hour, the overall traffic volume was heavier with a total of 2,153 vehicles, 526 vehicles traveling northbound and 1,627 vehicles traveling southbound.

A highway capacity analysis was performed based upon procedures presented in the "Highway Capacity Manual", Transportation Research Board, 2000, and the "Highway Capacity Software", developed by the Federal Highway Administration. The analysis is based on the concept of Level of Service (LOS) to identify the traffic impacts associated with traffic demands during peak hours of traffic.

LOS is a quantitative and qualitative assessment of traffic operations. Levels of Service are defined by LOS "A" through "F"; LOS "A" representing ideal or free-flow traffic operating conditions and LOS "F" unacceptable or potentially congested traffic operating conditions.

The critical traffic movement of the Keaau-Pahoa Road approaches is the northbound left-turn traffic movement onto Pohaku Drive which operates at LOS "A" and LOS "C" during the AM and PM peak periods, respectively, and the southbound left-turn traffic movement onto Shower Drive which operates at LOS "B" and LOS "A" during the AM and PM peak periods, respectively.

The Pohaku Drive approach of this intersection carries 56 vehicles and 24 vehicles eastbound during the AM and PM peak periods, respectively, while the Shower Drive approach carries 488 vehicles and 53 vehicles westbound during the AM and PM peak periods, respectively. Both of these approaches operate poorly at LOS "F" during both peak periods of traffic. The most significant queuing at this intersection occurred on the Shower Drive approach primarily during the AM peak period when vehicles on the

approach had to wait for adequate gaps in the heavy northbound traffic stream. During that peak period, average queue lengths of 5 vehicles and maximum queue lengths of approximately 10 vehicles were observed during the survey.

The installation of a traffic signal at an intersection may be justified by one or more of the eight warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," Millennium Edition (MUTCD). These warrants take into account factors such as 8-hour vehicular volumes (Warrant 1), 4-hour vehicular volumes (Warrant 2), peak hour volumes (Warrant 3), pedestrian volumes (Warrant 4), the presence of a school crossing or coordinated signal system (Warrants 5 and 6), crash experience (Warrant 7), and other characteristics of the roadway network (Warrant 8). Due to the existing low pedestrian volumes, lack of a school crossing or coordinated signal system, and absence of other unusual roadway characteristics at the Shower Drive intersection, Warrants 1, 2, 3, and 7 were the only applicable warrants assessed to determine if a traffic signal system was warranted.

Traffic conditions at the intersection of Keaau-Pahoa Road with Pohaku Drive and Shower Drive satisfy several of the traffic signal warrants outlined in the "Manual on Uniform Traffic Control Devices for Streets and Highways," Millennium Edition (MUTCD). Although historical data at the intersection indicates that Warrant 7 is not satisfied at the intersection, traffic volumes were high enough to satisfy Warrant 1, (8-hour vehicular volumes), Warrant 2 (4-hour vehicular volumes) and Warrant 3 (peak hour volumes). Since two of the warrants were satisfied, a traffic signal is warranted at the intersection.

The Traffic Warrant Study recommended installation of a traffic signal system at the intersection of Keaau-Pahoa Road with Pohaku Drive and Shower Drive. In addition, based upon field observations and intersection analyses, a traffic signal system at this intersection would serve to alleviate the existing delays experienced by vehicles on the minor street approaches (Shower Drive and Pohaku Drive). The eastbound and westbound approaches of the intersection currently operate poorly at an unacceptable LOS "F" during both peak hours of traffic with constant queues present on both approaches. The installation of a traffic signal system at this intersection would provide vehicles on the minor street approaches adequate opportunities to traverse the intersection. The complete traffic signal warrant study is on file with the HDOT.

Note, although the Traffic Warrant Study was conducted in 2005, since an updated study would, most likely, result in similar findings, another study is not necessary.

## **2.8.2 Impacts and Mitigation Measures**

During the construction period, the project is expected to result in traffic delays related to construction activities while equipment and materials are moved to the work areas. Construction work related to the new 12-foot travel lane and new 8-foot shoulder on the makai and 10-foot shoulder lane and 2-foot shoulder on the mauka will be done so that the project limits will be open to traffic during the AM and PM peak traffic periods. Work on the 12-foot travel lane and 8-foot shoulder on the makai and 10-foot shoulder lane and 2-foot shoulder on the mauka could be done at night, if elected by the contractor. Since most of the project limits consists of vacant and undeveloped land, construction work could be done at night without disturbance to adjacent residences.

The Shoulder Lane Conversion project would be designed to meet the guidelines of the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA), which have been adopted by the HDOT for transportation and highway planning and design purposes. In addition, as previously discussed, the Shoulder Lane Conversion project will be designed to be compatible with the HDOT Keaau-Pahoa Road Improvements Project (Project No. STP-0130(27)). The project's purpose involves improving highway safety, increasing roadway capacity, and modernizing the existing facility along Keaau-Pahoa Road between the Keaau Bypass and Pahoa-Kapoho Rd. The alternatives being considered include 6, 4 and 2-lane sections. These alternatives are still being evaluated by the HDOT and a preferred alternative has not been selected at this time.

AASHTO engineering design guidelines are intended to provide a smooth flowing highway alignment for minor arterials, the designation for Keaau-Pahoa Road. The guidelines indicate changes in horizontal alignment should be so gradual that they will not surprise the driver. One of the most important methods to aid drivers is to develop designs in accordance with driver expectancies. Further, the design elements for a roadway should be applied consistently throughout a highway segment. Roads with adequate alignment usually operate more efficiently and safely than roads with poor alignment, even where specific signing and pavement markings have been provided to enhance safety.



The Shoulder Lane Conversion project is intended to construct a new permanent 12-foot northbound travel lane and 10-foot southbound shoulder lane on Keaau-Pahoa Road between Keaau Bypass and Shower Drive. The 12-foot travel lane and 8-foot shoulder would replace the existing 10-foot shoulder lane and 2-foot shoulder on the makai side and a 10-foot shoulder lane and 2-foot shoulder on the mauka side. In addition, about 7,432 feet of guardrails would be installed along project limits as part of the construction. The 12-foot lane would be similar to the existing northbound lane and would provide motorists a more consistent driving condition than the 10-foot travel lane. The 10-foot southbound shoulder lane would allow 2 lanes of travel during the afternoon peak period from 3:00pm to 6:00pm.

The Shoulder Lane Conversion project would also improve conditions for police, fire and emergency vehicles to travel within the project limits.

As part of the Draft EA review, the County of Hawaii Police Department indicated they had reviewed the document and visited the project site and do not anticipate any significant impact to traffic and/or other public safety concerns. Also, the Police Department supports efforts to improve traffic flow along Highway 130, Keaau-Pahoa Road. See Appendix F.

Installation of the traffic signal at the Keaau-Pahoa Road Shower Drive intersection would improve traffic operations by allowing motorists to make turning movements, including left turns onto and from Keaau-Pahoa Road to the two side streets. The traffic signal would facilitate these turning movements during peak periods when Keaau-Pahoa Road is heavily used. The traffic signal at the Keaau-Pahoa Road Shower Drive intersection would not create adverse impacts to traffic along Keaau-Pahoa Road.

The Shoulder Lane Conversion project would construct a 12-foot wide travel lane to provide two northbound lanes which would be open to motorists at all times. The additional 12-foot wide travel lane is consistent with HDOT's plans to increase roadway capacity between the Keaau Bypass and Pahoa-Kapoho Road by constructing a roadway with 4 to 6 travel lanes.

The Puna area encompasses about 500 square miles (about 320,000 acres) composed primarily of lands considered agricultural. A large portion of this land has been subdivided into 1-acre or smaller parcels and used for residential purposes. An area of

about 0.92 square miles (about 600 acres) has been designated as commercial, industrial, or industrial commercial mixed uses. This means residents of the Puna area must drive outside the area to reach places of employment, shopping, schools (kindergarten to high school), and other higher educational resources. Currently, Keaau-Pahoia Road is the only roadway which can provide residents with access to the employment centers and shopping areas of Hilo. Further, although County public transportation is available, the large geographic area means that buses can only serve a limited number of residents. Thus, there is a need for roadways to accommodate the travel needs of the Puna area.

## **2.9 Air Quality**

### **2.9.1 Existing Environment**

The project limits are located in the Puna District, an area characterized by a growing, although relatively low level of residential and commercial development and almost no industrial facilities. A low level of development generally indicates an absence of stationary sources of emissions which could affect ambient air quality.

The State of Hawaii Department of Health, Clean Air Branch, maintains three air quality monitoring stations in the Puna region, near Lava Tree State Park, Leilani Subdivision, and Lanipuna Subdivision. These stations are located approximately 4 miles southeast of the southern end of the project limits. These stations only monitor for hydrogen sulfide (H<sub>2</sub>S) and sulfur dioxide (SO<sub>2</sub>) (Leilani Subdivision only), out of concern for the air quality impact from nearby volcanic activity. An annual summary of the most recent (2005) air quality monitoring data from these stations showed no exceedances for any of the pollutants monitored, either as monthly means or as peak values.

### **2.9.2 Impacts and Mitigation Measures**

Potential short-term adverse air-quality impacts during the construction phase include: 1) generation of fugitive dust from vehicle movements and soil excavation; and 2) exhaust emissions from on-site construction equipment and vehicles. These adverse impacts will be short-term during the period of construction.

Construction activities must comply with provisions of Chapter 11-60.1, Hawaii Administrative Rules (DOH), "Air Pollution Control" and, with respect to fugitive dust, shown in Section 11-60.1-33. Under air pollution control, the Environmental Controls specifications include the provision that the contractor must maintain the areas within and without the project limits free from dust that would cause hazards to workers and to other persons or property. The specifications also state the contractor will be permitted to use accepted methods for dust control such as enclosures and filtering. It is expected that the contractor will comply with State regulations and provide adequate means to control dust during the various phases of construction. Dust control measures and BMPs such as water sprinkling and mulching will be applied during construction to maintain air quality.

Once construction has been completed, air quality in the area will be affected by vehicles traveling along the project limits. In February 2006, the FHWA issued interim guidance related to analysis of air quality impact from roadway projects. In September 2009, the FHWA updated these interim guidelines. The FHWA guidance relates to Mobile Source Air Toxics (MSAT), which is based on an assessment from the Environmental Protection Agency (EPA) list of 21 mobile source air toxics, set forth in an EPA final rule, Control of Emissions of Hazardous Air Pollutants from Mobile Sources (66 FR 17235). The EPA extracted a subset of this list of 21 mobile source air toxics that it now labels as the six priority MSATs. These are *benzene, formaldehyde, acetaldehyde, diesel particulate matter/diesel exhaust organic gases acrolein, and 1,3-butadiene*. While these MSATs are considered the priority transportation toxics, the EPA stresses that the lists are subject to change and may be adjusted in future rules.

The EPA has issued a number of regulations that will dramatically decrease MSATs through cleaner fuels and cleaner engines. On February 26, 2007 the EPA issued their latest rule on the Control of Hazardous Air Pollutants from Mobile Sources (Federal Register, Vol. 72, No. 37, page 8430, February 26, 2007) and identified a group of 93 compounds emitted from mobile sources that are listed in their Integrated Risk Information System (IRIS). The 2007 EPA rule requires controls that will dramatically decrease MSAT emissions through cleaner fuels and cleaner engines. According to an FHWA analysis using EPA's MOBILE6.2 model, even if vehicle activity (vehicle-miles travelled, VMT) increases by 145 percent as assumed, a combined reduction of 72 percent in the total annual emission rate for the priority MSAT is projected from 1999 to 2050.

Given the emerging state of the science and of project-level analysis techniques, there are no established criteria for determining when MSAT emissions should be considered a significant issue. Therefore, the FHWA has established a range of responses may be appropriate for addressing this issue, including a qualitative analysis of emissions.

The FHWA has developed a tiered approach for analyzing MSATs effects. One of the tiers included in the FHWA guidance is Projects with Low Potential MSAT Effects. The types of projects included in this category are those that serve to improve operations of highway, transit or freight without adding substantial new capacity or without creating a facility that is likely to meaningfully increase emissions. These types of projects include minor widening projects and new interchanges, such as those that replace a signalized intersection on a surface street or where design year traffic is not projected to meet 140,000 to 150,000 average annual average daily traffic (AADT) volume.

The Keaau-Pahoa Road Shoulder Lane Conversion would fall into the category of Projects with Low Potential MSAT Effects. The HDOT traffic counts show AADT is 25,200 vehicles. Since the Shoulder Lane Conversion project will not affect the traffic volumes, vehicle miles traveled (VMT), and vehicle mix, the adverse effects of MSATs toxics would not be expected to be significant.

Moreover, as previously discussed, national trends show substantial overall reductions in emissions due to stricter engine and fuel regulations issued by EPA. Since the emission effects of these projects are low, there would be no appreciable change in overall MSAT emissions.

In addition, since much of the data related MSATs is incomplete or unavailable for a project specific assessment, analysis of MSAT impacts is an emerging field and current scientific techniques tools and data are not sufficient to accurately estimate human health impacts that would result from a project such as the Shoulder Lane Conversion project.

## **2.10 Noise**

### **2.10.1 Existing Environment**

The area surrounding the project limits is primarily vacant and undeveloped, except for the Humane Society and the Country refuse convenience center at the beginning of the project limits and residences near Shower Drive. This area of Puna does not include major commercial or industrial developments which could be major stationary noise sources.

Noise from vehicle traffic along Keaau-Pahoa Road is the major ambient noise source within the project limits. Since Keaau-Pahoa Road is the only major road connecting Keaau and Pahoa, the road carries all types of vehicles, including heavy trucks.

### **2.10.2 Impacts and Mitigation Measures**

Construction activities such as excavating for the base course, culvert extensions, and the bridge footings, grading and cutting the embankments, laying the asphaltic concrete paving will create noise. The equipment used for these activities typically include excavators, loaders, graders, vibratory rollers, backhoes, concrete delivery trucks, water tank trucks, hydraulic cranes, pickup trucks and forklifts. Noise generated by this equipment will be short-term during the period of construction. Although the construction period is expected to be about 24 months, construction activities at a specific site may only be several weeks. Once construction has been completed, the noise impact will no longer occur.

Once construction has been completed, noise from vehicle traffic will continue to be the primary noise source along the project limits. However, since the Shoulder Lane Conversion project would not generate additional traffic, there should be no significant adverse noise effects from project.

## **2.11 Archaeological and Cultural Resources**

### **2.11.1 Existing Environment**

The project limits consists of previously disturbed land that has been disrupted during the original construction and subsequent repaving of Keaau-Pahoa Road. In March, 2004, an archaeological field survey was conducted for the makai project limits. The objective of the survey was to satisfy historic preservation regulatory review requirements of the State of Hawaii Department of Land and Natural Resources Historic Preservation Division (SHPD), as contained within Hawaii Administrative Rules, Title 13, DLNR, Subtitle 13, State Historic Preservation Rules.

The March 2004 archaeological field investigation consisted of a 100 percent surface examination with the surveyors walking transects at 3-meter intervals, oriented parallel to Highway 130. No archaeological sites or features were identified during the survey. See Appendix D.

In July 2009, an archaeological inventory survey was conducted of the mauka project limits which amounted to about 8-acre strip of land (30 ft wide by 2.4 mi long) extending along Keaau-Pahoa Road. The objective of the survey was to satisfy historic preservation regulatory review inventory requirements of the DLNR-SHPD. See Appendix D.

The July 2009 archaeological survey identified one site, an abandoned historic bridge spanning an unnamed intermittent stream near the existing Waipahoehoe Bridge. The abandoned bridge is constructed of mortared stone and formed concrete and was potentially constructed in the 1930s. The site is assessed as solely significant under Criterion "d". The site has yielded information important for understanding the historic land use in the project area. The mapping, written description and photography at this site adequately documented it and no further work or preservation is recommended.

The abandoned bridge, located mauka (west) of the existing Waipahoehoe Bridge, is not listed in the 1987 and 1996 HDOT Historic Bridge Inventory studies.

## **2.11.2 Impacts and Mitigation Measures**

Nearly half of the project limits was altered by previous highway-related construction activity. Much of the remainder was probably modified by sugar cane cultivation because most of the land is owned by W.H. Shipman Ltd. and is dominated by secondary vegetation. Based on the results of the archaeological field survey, construction of the Keaau-Pahoa Road Shoulder Lane Conversion project should have no adverse impacts to historic sites. The results of the field survey indicate no further archaeological work is recommended for the project. See Appendix D.

On March 22, 2010, as of the Draft EA review, the State Historic Preservation Division reviewed the Archaeological Inventory Survey Report dated July 2009. The findings of the Report were that the abandoned bridge adjacent to the existing Waipahoehoe Bridge was constructed in the 1930s. The abandoned bridge was assessed under Criterion D. After mapping, written description and photographic documentation, the Report recommended that "no further work or preservation is recommended".

The State Historic Preservation Division concurred with the recommendation of the Report and the mitigation of mapping, written description and photographic documentation in the Report was satisfactory and the abandoned bridge may be removed. See Appendix F.

Further, the State Historic Preservation Division stated, in the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

## **2.12 Cultural Impact Assessment**

### **2.12.1 Existing Environment**

House Bill No. 2895 H.D.1 was approved by the Governor on April 26, 2000 as Act 50 which amended Chapter 343 Hawaii Revised Statutes to require a cultural impact assessment be included in the preparation of an Environmental Assessment.

## **2.12.2 Impacts and Mitigation Measures**

A Cultural Impact Assessment/Study (CIS) was undertaken to gather information about traditional cultural practices, ethnic cultural practices, and pre-historic and historic cultural remains that might be affected by the Keaau-Pahoa Road Shoulder Lane Conversion project. Appendix E shows a summary of the Cultural Impact study. The complete report is on file with the HDOT, the State Historic Preservation Division office, and the Office of Environmental Quality Control.

The Cultural study found that at one time the lands of Keaau were part of an ancient Hawaiian life system. However, whatever occurred in the area between the Keaau Bypass and Shower Drive is no longer evident, as the area was heavily modified during the sugar plantation era of the late 1800s/early 1900s, as well as during construction of the current Keaau-Pahoa Road. See Appendix E.

The Cultural study found that, since there are no resources within the area between the Keaau Bypass Road and Shower Drive, there will be no adverse effects to cultural practices. See Appendix E.

The Cultural study identified an indirect effect to cultural practices related to the teaching of cultural practices at Aha Punana Leo. This site is located along Opukahaia Street, an intersecting street mauka of Keaau-Pahoa Road near the beginning of the project limits. Since the Shoulder Lane Conversion construction would occur primarily within the project limits, the construction should not adversely affect the activities at Aha Punana Leo. See Appendix E.

## **2.13 Socio-economic Considerations**

### **2.13.1 Existing Conditions**

The population of the Puna District has grown, and continues to grow, at a rapid rate. According to U.S. Census data, the 1980 population of 11,751 grew to 20,781 in 1990, and to 31,335 in 2000. These are increases of 76.8 percent and 50.8 percent, respectively. This growth of approximately 10,000 persons every decade is attributed primarily to the availability of inexpensive residential parcels, and the district's proximity



to the urban center of Hilo. Residents commute to Hilo for employment, shopping, entertainment, medical care, and school.

The recently published Puna Community Development Plan (PDCP) Working Paper No. 1, "Elements of a Growth Management Strategy", notes that 4,521 building permits for new dwellings in Puna were issued between the beginning of January 2000 and the end of October 2006. To estimate current population of the Puna District, these building permit records were cross-checked with real property tax records to estimate the number of new dwellings that were assumed to have been built and occupied as of March 2007. The number of new dwelling units plus the total number of households reported in the 2000 Census were then multiplied by the projected average household size (2.596 persons) in the district. Using this methodology, the Puna District had an estimated population of 43,071 in March 2007.

By comparison, projected population estimates by year 2020 for the Puna District range from 57,105 to 63,491, as listed in the County of Hawaii General Plan (2005).

The Puna region's main economic base is agriculture in the form of truck farming in the Volcano area, papaya in the Kapoho area, and flowers in Mountain View, Pahoia, and Kapoho. Tourism is also prevalent in the region as tourists visit Hawaii Volcanoes National Park and seek accommodations at bed and breakfast establishments.

The Shoulder Lane Conversion project will affect Keaau and Hawaiian Paradise Park, both areas identified as a Census Designated Place (CDP). The 2000 Census provides information about the CDPs, which is a designation used by the US Census Bureau to collect data on a community or smaller area basis. The 2000 Census is the most recent data available for CDPs.

A comparison between the Keaau and Hawaiian Paradise Park CDPs and the County of Hawaii shows: 1) The combined Keaau and Hawaiian Paradise Park CDPs represents about 6.2 percent of the total County population; 2) The average total percentage of population in the labor force is slightly higher in Keaau/ Hawaiian Paradise Park than in the County. 3) The percentage of White and Native Hawaiian population in the Keaau/ Hawaiian Paradise Park CDPs is slightly lower than the County; 4) The percentage of Asian population in the Keaau/ Hawaiian Paradise Park CDPs is slightly higher than in

the County; 5) The median family income for the Keaau/ Hawaiian Paradise Park CDP is about 12.2% lower, on average, than for the rest of the County. See below.

Subject	County of Hawaii	Keaau CDP	Hawaiian Paradise Park CDP	Average/ Total (1)	Percent CDP
Population	146,677	2,010	7,051	9,061	6.2%
% in Labor Force	61.7	63.5%	62.5%	62.4%	-----
Race					
% White	31.5%	11.3%	32.7%	28.0%	-----
% Asian	26.7%	57.7%	21.8%	29.8%	-----
% Native Hawaiian	9.7%	4.0%	8.9%	7.8%	-----
Median Family Income	\$46,480	\$43,347	\$38,312	\$40,829	(12.2%)

(1) Average total Keaau and Hawaiian Paradise Park

As part of the Draft EA review, the County of Hawaii Planning Department noted the information as to the total population maybe low as the Puna area has experienced population growth since 2000.

### 2.13.2 Impacts and Mitigation Measures

The historic residential and population growth and the projected trends for future development indicate the Puna region will need upgraded road access to Hilo and other parts of Hawaii. Within the short-term, the still undeveloped lots within the Hawaiian Paradise Park and Orchidland areas show these two areas will continue to develop with new residences. Improved road access will be needed for residents to reach places of employment outside the Puna region and to reach commercial areas for shopping and services. In addition, improved road access within the Puna region will be needed for residents to have better access schools and recreation sites.

The Keaau-Paho Road Shoulder Lane Conversion project will construct a permanent second 12-foot wide northbound travel lane for motorists to use at all times between the Keaau Bypass Road and Shower Drive and a 10-foot shoulder lane for use in the afternoon from 3:00pm to 6:00pm. The Shoulder Lane Conversion project will also install a traffic signal at the Keaau-Paho Road/Shower Drive intersection which will ease access to Hawaiian Paradise Park and Orchidland.

The Shoulder Lane Conversion project will involve take or acquisition of privately-owned land for additional right-of-way for the necessary easements adjacent to the existing right-of-way on the makai side of Keaau-Pahoa Road. As previously discussed, the HDOT acquisition/taking involves the following:

1. Preparation of a right-of-way map to identify the parcels and areas of the taking;
2. HDOT appraisal of the affected areas;
3. Metes and bounds description of the taking;
4. Acquisition of the affected area.

The HDOT appraisal will be based on the fair market value for the affected area. HDOT will contract with an appraiser to ensure that the appraisal process is equitable to the landowner and the HDOT.

The survey of the project limits shows most of the affected land is undeveloped and vacant. However, the five relatively small parcels near Shower Drive (TMK 1-5-036:116, 117, 119, 120, and 121) have fences and walls along the edge of the highway that will need to be relocated. The smallest of these parcels, TMK 1-5-036:119, is 0.565 acres in size. The right-of-way taking of this parcel will result in taking up to about 18 percent of the total parcel area. In addition, two easements will be acquired by HDOT.

#### Right-of-Way Taking by Parcel

TMK (from North to South)	TMK Parcel (Acres)	Right-of-Way Taking (approx. acreage)	TMK Remainder (Acres)	% of Total Parcel	Ownership
1-6-003:065	19.493	0.215	19.287	1.10%	Private
1-6-001:015	897.947	3.884	894.063	0.43%	Private
1-5-036:117	1.408	0.022	1.386	1.56%	Private
1-5-036:116	1.026	0.009	1.017	0.88%	Private
1-5-036:119	0.565	0.102	0.463	18.05%	Private
1-5-036:120	0.763	0.102	0.661	13.37%	Private
1-5-036:121	0.768	0.075	0.693	9.77%	Private
1-5-033:261	137.509	0.029	137.480	0.021	Shower Drive
1-6-064:024	5.07	0.038	5.032	0.75	Pohaku Drive

Executive Order 12898, Environmental Justice, was signed on February 11, 1994. The intent of Executive Order 12898 (full title Federal Actions to Address Environmental Justice to Minority and Low Income Populations) is to avoid disproportionately high adverse human health or environmental effects of projects on minority and low income populations. Executive Order 12898 also requires Federal agencies to ensure that minority and low income communities have adequate access to public information related to health and the environment.

The comparison between the combined Keaau and Hawaiian Paradise Park CDP and the County using the 2000 Census, the latest source of detail population and demographic data for a small area, shows the population of the combined Keaau and Hawaiian Paradise Park is a relatively small portion of the County's total population. Median family income is lower in the district as a whole, perhaps due to the lower paying agricultural jobs, although overall employment is slightly higher. Ethnically, the district is similar to the County as a whole. Thus, based on these data and since the Shoulder Lane Conversion project is intended to benefit the entire district without impacting a specific group or population, the shoulder land conversion project will not result in a disproportionately high adverse human health or environmental effect on minority and low income populations.

## **2.14 Public Facilities**

### **2.14.1 Schools and Medical Facilities**

#### **Existing Conditions**

The Keaau-Pahoa Road serves as the primary access to schools near the project limits. Keaau Elementary, Intermediate and High School are located near the Keaau Bypass Road in Keaau. Residents in the area also use Keaau-Pahoa Road to travel to Keaau and Hilo to access schools and other higher educational resources.

There are no hospitals Puna. Residents must travel to Hilo for hospital medical care, although facilities have recently opened in the Puna area. In 2008, the Hilo Urgent Care Center located in Keaau was opened and, in January 2009, the Puna Medical Center located at the Pahoa Marketplace opened to provide medical center service to the Puna area.

## **Impacts and Mitigation Measures**

Construction of the Shoulder Lane Conversion project will provide a permanent 12-foot travel lane for northbound (Keaau-bound) vehicles. The permanent lane will provide an additional travel lane which can be used at all times for access to the schools in Keaau and to medical facilities in Hilo. Thus, the Shoulder Lane Conversion project will have a beneficial impact on access to schools and medical facilities in Hilo.

### **2.14.2 County Refuse Convenience Center**

#### **Existing Conditions**

The County of Hawaii does not provide refuse service to single-family residential parcels in the county. Residents must dispose of refuse at County-operated convenience center/ transfer stations, including at the Keaau Convenience Center located about 1,300 feet from the beginning of the project limits. The Convenience Center is operated by the County of Hawaii Department of Environmental Management Solid Waste Division and operates daily from 6:30am to 6:30pm.

The Convenience Center site also houses a water spigot used by residences to collect potable water.

An approximately 175-foot long left-turn storage lane provides entry into the Convenience Center for southbound vehicles. An acceleration lane provides access to Keaau-Paho Road for southbound vehicles exiting the convenience center. This configuration of the ingress and egress from the convenience center will not be affected by the Shoulder Lane Conversion project.

The largest County-owned vehicle currently using the convenience center is a truck with a 40-foot trailer, similar in size and length to a 'Matson' container. Other County-owned vehicles accessing the Convenience Center include trucks with 20-foot trailers, pick up trucks and dump trucks. A 40-foot trailer is equivalent to a WB-40 design vehicle. Typically, the truck and 40-foot trailer vehicles are dispatched to the Convenience Center twice each day from for a total of 4 trips. In the morning, the County truck usually arrives at the Convenience Center from Hilo after 8:00am. The arrival is timed to avoid the typically heavy morning northbound traffic along Keaau-Paho Road. However, the left turn is typically difficult for the County truck and 40-foot trailer, the

average wait time to safely turn left ranges from two to five minutes. Typically, the trucks arrive empty and leave full.

The County has indicated most private vehicle traffic typically travels from Pahoa to the Keaau convenience center. Some private vehicles also come from Keaau or Mountain View to the Keaau convenience center. Private vehicles are used typically for disposing unwanted goods or to fill containers with water using the available DWS spigots.

### **Impacts and Mitigation Measures**

The Shoulder Lane Conversion project will require the taking of about 5,000 SF (0.116 acre) of the convenience center property. The taking will not affect use of the convenience center parcel or the configuration of the existing left-turn storage lane and acceleration lane. In addition, there will be no change to the existing posted speed limit of 45 mph on the northbound travel lanes. Thus, the project should have no adverse effect to the County convenience center.

The County of Hawaii Department of Environmental Management will continue to expand the convenience center to utilize the available land to provide additional services in the future. As the population along the Keaau-Pahoa Road increases, additional traffic should be anticipated to use the existing convenience center. Further, the Department of Environmental Management anticipates reducing hours of operation, so the same or growing number of people will utilize the Convenience Center in a more concentrated period of hours per day, including during high traffic periods. The County has submitted an application to the State Department of Health to change the Solid Waste Permit for the Keaau Convenience Center to the Keaau Transfer Station. Changing the designation to a Transfer Station will allow non-residential vehicles to utilize the Keaau facility. Based on these factors, the County believes that the usage of the Keaau facility will increase.

To mitigate the expected increase in usage of the County facility, a short shelter lane could be added for northbound (toward Hilo) vehicles exiting the facility. A full length acceleration lane would conflict with adjacent driveways to the north (Human Society). The left turn storage lane into the County facility will not be extended at this time due to its proximity to the Humane Society driveway.

Lastly, to mitigate increase use of the facility for southbound (toward Pahoa) vehicles, the existing center shelter lane will be extended to allow easier exiting for vehicles bound in the Pahoa direction.

Regarding expansion of the convenience center and potential road easement for the adjacent W.H. Shipman property, the County Solid Waste Division should conduct a traffic study and signal warrant study to identify the needed improvements. The County is also considering a consolidation of all three driveways with the transfer station driveway.

## **2.15 Infrastructure**

### **2.15.1 Water**

#### Existing Conditions

The County of Hawaii Department of Water Supply (DWS) has an 8-inch and a 12-inch water line, located along the makai side of Keaau-Pahoa Road. These lines provide service to portions of Hawaiian Paradise Park and to the Pahoa area.

In addition, as previously discussed, the DWS provides a potable water spigot within the Keaau Convenience Center for use by households not served by the DWS system. This spigot provides potable water for households using catchments as a source for other water needs.

#### Impacts and Mitigation Measures

The existing 8-inch and 12-inch water line located on the makai side of the road will be relocated and replaced with a 12-inch line, including relocation of the line to the mauka side of Waipahoehoe Bridge. After the replacement line has been constructed, a hydrostatic pressure test of the line will be conducted according to standards set by the County of Hawaii Department of Water Supply (DWS). This includes: (1) pressure testing the integrity of the line; (2) flushing the line to remove sediment and debris accumulated during construction; (3) disinfecting the line by injecting a chlorine solution into the line; (4) flushing the chlorine solution; (5) repeating the process of injecting and flushing until acceptable standards are met for drinking water. As previously

discussed, the existing 12-inch waterline must remain in service until the replacement waterline has been installed and tested.

As previously discussed, typically, the construction will be done in segments so the new line can be hydrottested, which includes cleaning the line of debris, adding chlorine to disinfect the line, and testing to ensure the proper pressure can be maintained. This process may be repeated to ensure the line meets Department of Water Supply standards. Since the work can be done in segments, the effluent water from the testing can be placed in the next segment of trench or used for dust control. This will ensure the effluent water does not affect nearby areas. At this point, a hydrotest permit from the State of Hawaii Department of Health is not anticipated. (Note, although described as a relocation, a new line will be constructed and the existing line will remain in service until service is switched to the new line.) After the new line has been placed in service, a trench will be dug and the old line removed and the trench backfilled.

The project will not create a need for potable water on the project site. The Shoulder Lane Conversion project construction will be coordinated with the Department of Water Supply to ensure that water infrastructure is not impacted and that service is not interrupted. Thus, the project will not have an adverse effect on the County's water system.

## **2.15.2 Sewer**

### Existing Conditions

There are no County of Hawaii wastewater facilities within the project limits. The Keaau-Pahoa Road Shoulder Lane Conversion project will not require wastewater services from the County of Hawaii.

### Impacts and Mitigation Measures

The Keaau-Pahoa Road Shoulder Lane Conversion project will not have an adverse affect to the County's wastewater system.



### **2.15.3 Drainage**

#### Existing Conditions

The HDOT has installed nine culverts to transport surface flows from the mauka to makai side of Keaau-Pahoa Road. The culverts prevent flows from overtopping the road during storm events.

#### Impacts and Mitigation Measures

The Shoulder Lane Conversion project will construct a wider travel lane and shoulder. As a result, the headwalls of these culverts will be extended to ensure that flows will not be affected. Since the culverts will not be increased in diameter and since the culverts will not be relocated, there will be no change to drainage patterns at the existing culverts. One new reinforced concrete pipe culvert will be constructed 140 feet north of the Waipahoehoe Bridge to prevent the road from overtopping during high rainfall events in this location, and runoff through the culvert will be directed to the unnamed intermittent stream makai of the bridge. Thus, the Shoulder Lane Conversion project will not have a significant adverse effect to the drainage patterns in the area.

### **2.15.4 Electrical**

#### Existing Conditions

Hawaii Electrical Light Company (HELCO) provides commercial electrical power to the Keaau area. HELCO provides existing electrical service via utility poles and overhead lines located on the makai and mauka sides of the Keaau-Pahoa Road. A total of 42 utility poles are located within the project limits.

#### Impacts and Mitigation Measures

The Shoulder Lane Conversion project will include relocation of the 20 utility poles to meet HDOT design guidelines for the location of poles relative to the travel lane and shoulder. This relocation will require a utility agreement (UA) between HELCO and the HDOT. The UA will provide for equal cost sharing for these relocations.

The Shoulder Lane Conversion project will also include installation of the traffic signal which will require electrical power for operation of the signals. This level of electrical power will not create an adverse effect to the HELCO system.

## **2.16 COMPLIANCE WITH FEDERAL AUTHORITIES**

This project will be funded partially by Federal funds through the US Department of Transportation Federal Highway Administration (FHWA). This document includes the environmental information required for compliance with the FHWA program.

### **2.16.1 Archaeological and Historic Preservation Act of 1974 (16 USC Section 461)**

16 USC 461, declaration of national policy, states, "It is declared that it is a national policy to preserve for public use historic sites, buildings, and objects of national significance for the inspiration and benefit of the people of the United States. "

As discussed in Section 2.11, in March 2004 archaeological field investigation consisted of a 100 percent surface examination with the surveyors walking transects at 3-meter intervals, oriented parallel to Highway 130. No archaeological sites or features were identified during the survey. See Appendix D.

In July 2009, an archaeological inventory survey was conducted of the mauka project limits. The survey area was 30 ft wide by 2.4 mi long which amounted to about an 8-acre strip of land extending along Keaau-Pahoa Road. The objective of the survey was to satisfy historic preservation regulatory review inventory requirements of the DLNR-SHPD,

The July 2009 archaeological survey identified one site, an abandoned historic bridge spanning unnamed stream. The bridge is constructed of mortared stone and formed concrete and was potentially constructed in the 1930s. The site is assessed as solely significant under Criterion "d". The site has yielded information important for understanding the historic land use in the project area. The mapping, written description and photography at this site adequately documented it and no further work or preservation is recommended.

The abandoned bridge, located mauka (west) of the existing Waipahoehoe Bridge is not listed in the 1987 and 1996 HDOT Historic Bridge Inventory studies.

On March 22, 2010, as of the Draft EA review, the State Historic Preservation Division reviewed the Archaeological Inventory Survey Report dated July 2009. The findings of the Report were that the abandoned bridge adjacent to the existing Waipahoehoe Bridge was constructed in the 1930s. The abandoned bridge was assessed under Criterion D. After mapping, written description and photographic documentation, the Report recommended that “no further work or preservation is recommended”.

The State Historic Preservation Division concurred with the recommendation of the Report and the mitigation of mapping, written description and photographic documentation in the Report was satisfactory and the abandoned bridge may be removed. See Appendix F.

Further, the State Historic Preservation Division stated, in the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

### **2.16.2 Clean Air Act (42 USC § 7506 (C))**

During the late 1940s serious smog incidents in Los Angeles, California and Donora, Pennsylvania raised public awareness and concern about this issue once again. In 1955, the government decided that this problem needed to be dealt with on a national level. The Air Pollution Control Act of 1955 was the first in a series of clean air and air quality control acts which are still in effect and continue to be revised and amended.

Among the purposes of the Clean Air Act was (1) to protect and enhance the quality of the Nation's air resources so as to promote the public health and welfare and the productive capacity of its population; (2) to initiate and accelerate a national research and development program to achieve the prevention and control of air pollution; (3) to provide technical and financial assistance to State and local governments in connection with the development and execution of their air pollution prevention and control programs; and (4) to encourage and assist the development and operation of regional air pollution prevention and control programs.

As discussed in Section 2.9, air quality in the State of Hawaii Department of Health, Clean Air Branch, maintains three air quality monitoring stations in the Puna region,

near Lava Tree State Park, Leilani Subdivision, and Lanipuna Subdivision. These stations are located approximately 4 miles southeast of the southern end of the project limits.

Potential short-term adverse air-quality impacts during the construction phase include: 1) generation of fugitive dust from vehicle movements and soil excavation; and 2) exhaust emissions from on-site construction equipment and from construction worker's vehicles traveling to and from the project site. These adverse impacts will be short-term during the period of construction. The direction of the prevailing tradewinds will help to minimize potential impacts from fugitive dust on neighboring land uses.

Construction activities must comply with provisions of Chapter 11-60.1, Hawaii Administrative Rules (DOH), "Air Pollution Control" and, with respect to fugitive dust, Section 11-60.1-33. A dust control management plan will be developed which identifies and addresses all activities that have the potential to generate fugitive dust. It is expected that the contractor will comply with State regulations and provide adequate means to control dust during the various phases of construction. In order to control fugitive dust during construction, mitigation measures may include some or all of the following: 1) phasing of construction, 2) centralizing vehicular traffic routes, 3) frequent spraying of construction vehicles, construction debris, and bare areas, and 4) rapid covering of bare areas.

Upon completion of the project, air quality can be expected to improve to the extent that the Shoulder Lane Conversion project improves traffic flow in both directions within the project limits. Normally, long queues of slow-moving or idling vehicles have a negative effect on air quality, especially in the afternoon periods. Currently, idling or slow moving vehicles tend to concentrate emissions in a small area of the merging vehicles which creates localized negative effects on air quality.

Over the long-term, some of this immediate improvement will diminish as the population of the region continues to grow and contribute more vehicles to the Keaau-Pahoa Road. However, these vehicle increases may be offset yet again by improvements in vehicle emissions and conversion to more fuel efficient or greener vehicle types. See also Section 2.9.

### **2.16.3 Coastal Barrier Resources Act, (16 USC 1451)**

In 1982, the US Congress passed the Coastal Barrier Resources Act (CBRA) (16 USC 3501) which established the John H. Chafee Coastal Barrier Resources System (CBRS), comprised of undeveloped coastal barriers along the Atlantic, Gulf, and Great Lakes coasts. The law encourages the conservation of hurricane prone, biologically rich coastal barriers by restricting Federal expenditures that encourage development, such as Federal flood insurance through the National Flood Insurance Program

The Coastal Barrier Resources Reauthorization Act of 2000 reauthorized the Coastal Barrier Resources Act (CBRA) and directed the U.S. Fish and Wildlife Service to complete a Digital Mapping Pilot Project that includes digitally produced draft maps for up to 75 John H. Chafee Coastal Barrier Resources System (CBRS) areas and a report to Congress that describes the feasibility and costs for completing digital maps for all CBRS areas.

The purpose of the CBRA is to minimize the loss of human life, wasteful expenditure of Federal revenues, and the damage to fish, wildlife, and other natural resources associated with the coastal barriers along the Atlantic and Gulf coasts and along the Great Lakes by restricting future Federal expenditures and financial assistance which have the effect of encouraging development along coastal barriers.

The Shoulder Lane Conversion project limits are located about 4.2-miles inland from the shoreline on the northern coast of Hawaii. Thus, the Shoulder Lane Conversion project will not involve construction of facilities along coastal barriers.

### **2.16.4 Coastal Zone Management Act (16 USC § 1456(C)(1))**

In 1972, the US Congress enacted the Federal Coastal Zone Management Act to ensure that each Federal agency undertaking an activity within or outside the coastal zone that affects any land or water use or natural resource of the coastal zone shall be carried out in a manner which is consistent to the maximum extent practicable with the enforceable policies of approved State management programs. Each Federal agency carrying out an activity subject to the Act shall provide a consistency determination to the relevant State agency designated under section 1455(d)(6) of this title at the earliest practicable time.

In 1977, Hawaii enacted Chapter 205A, Hawaii Revised Statutes, the Hawaii Coastal Zone Management (CZM) Program. The CZM area encompasses the entire state, including all marine waters seaward to the extent of the state's police power and management authority, including the 12-mile U.S. territorial sea and all archipelagic waters.

The Hawaii Coastal Zone Management Program focuses on ten policy objectives:

- Recreational Resources. To provide coastal recreational opportunities accessible to the public and protect coastal resources uniquely suited for recreational activities that cannot be provided elsewhere.
- Historic Resources. To protect, preserve, and where desirable, restore those natural and manmade historic and prehistoric resources in the coastal zone management area that are significant in Hawaiian and American history and culture.
- Scenic and Open Space Resources. To protect, preserve, and where desirable, restore or improve the quality of coastal scenic and open space resources.
- Coastal Ecosystems. To protect valuable coastal ecosystems, including reefs, from disruption and to minimize adverse impacts on all coastal ecosystems.
- Economic Uses. To provide public or private facilities and improvements important to the State's economy in suitable locations; and ensure that coastal dependent development such as harbors and ports, energy facilities, and visitor facilities are located, designed, and constructed to minimize adverse impacts in the coastal zone area.
- Coastal Hazards. To reduce hazard to life and property from tsunami, storm waves, stream flooding, erosion, subsidence, and pollution.
- Managing Development. To improve the development review process, communication, and public participation in the management of coastal resources and hazards.

- Public Participation. To stimulate public awareness, education, and participation in coastal management; and maintain a public advisory body to identify coastal management problems and provide policy advice and assistance to the CZM program.
- Beach Protection. To protect beaches for public use and recreation; and locate new structures inland from the shoreline setback to conserve open space and to minimize loss of improvements due to erosion.
- Marine Resources. To implement the State's ocean resources management plan.

Other key areas of the CZM program include: a permit system to control development within a Special Management Area (SMA) managed by each County and the Office of Planning; a Shoreline Setback Area which serves as a buffer against coastal hazards and erosion, and protects view-planes; and marine and coastal resources. Finally, a Federal Consistency provision requires that Federal activities, permits and financial assistance be consistent with the Hawaii CZM program.

The Shoulder Lane Conversion project limits are located about 4.2 miles inland from the coastline and not within the County of Hawaii SMA. The Shoulder Lane Conversion project does not involve the placement, erection, or removal of materials near the coastline. Activities at the Shoulder Lane Conversion project limits do not have the potential to significantly affect coastal resources. Finally, it is consistent with the CZM objectives that are relevant to this type of project.

A copy of this Draft EA was sent to the State of Hawaii Department of Business, Economic Development, and Tourism.

#### **2.16.5 Endangered Species Act (16 USC 1536(A)(2) and (4))**

The Endangered Species Act (16 U.S.C. Section 1531-1544, as amended) provides broad protection for species of fish, wildlife, and plants that are listed as threatened or endangered in the U.S. or elsewhere. The Act mandates that Federal agencies seek to conserve endangered and threatened species and use their authorities in furtherance of

the Act's purposes. Provisions are made for listing species, as well as for recovery plans and the designation of critical habitat for listed species.

16 USC Section 1536, Interagency Cooperation, states each Federal agency shall, in consultation with and with the assistance of the Secretary, insure that any action authorized, funded, or carried out by such agency (an "agency action") is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species which is determined by the Secretary, after consultation as appropriate with affected States, to be critical, unless such agency has been granted an exemption for such action.

As discussed in Section 2.7, the Shoulder Lane Conversion project limits does not contain US Fish and Wildlife Service or Department of Land and Natural Resources listed or proposed threatened or endangered species of flora and does not include lands designated as critical habitat. See Appendix A.

On June 10, 2009 in response to the Pre Assessment for this Draft EA, the USFWS stated that their files show two listed species as having been observed in the vicinity of the Shoulder Lane Conversion project: (1) the endangered Hawaiian hawk (*Buteo solitarius*); a bird species and (2) the endangered Hawaiian hoary bat, (*Lasiurus cinereus semotus*), the only mammal endemic to Hawaii.

The USFWS provided the following mitigation measures to minimize potential impacts to listed species. Since Hawaiian hoary bats nest in both exotic and native woody vegetation, to minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 15-feet (4.6 meters) tall should not be disturbed, removed or trimmed during the bat birthing and pup rearing season (May 15 through August 15). If there is a need to disturb, remove or trim woody vegetation greater than 15 feet tall during the Hawaiian hoary bat pupping season, the USFWS recommend conducting biological surveys to determine if bats are present.

The USFWS also indicated, Hawaiian hawks nest in both exotic and native woody vegetation which occurs along the project limits. To avoid impacts to Hawaiian hawks the USFWS recommend avoiding tree clearing during their breeding season (March through September). If there is a need to clear the construction area during the Hawaiian hawk breeding season, the USFWS recommend conducting additional



biological surveys to determine if hawk nests are present. Typically, this would involve a visual survey prior to the breeding season to determine the presence of hawk nests.

At this time, the construction schedule for the Shoulder Lane Conversion project has not been determined, especially for work related to vegetation removal. However, to ensure the contractor does not disturb vegetation which might be used by Hawaiian hoary bat, the HDOT contract documents will include a provision that the vegetation should not be removed during the bat birthing and pup rearing season (May 15 through August 15).

The HDOT contract documents will include a provision, if vegetation and tree clearing is to be done during the Hawaiian hawk breeding season (March through September), additional biological surveys will be required, as directed by the USFWS.

These mitigation measures will ensure the Hawaiian hoary bat and Hawaiian hawk will not be adversely affected by the Shoulder Lane Conversion project. These mitigation measures will be required for the HDOT to meet its responsibilities pursuant to the Endangered Species Act of 1973, as amended, if a listed species may be affected by the Shoulder Lane Conversion project.

Copies of the Draft EA were provided to the U.S. Fish and Wildlife Service and to the State of Hawaii Department of Land and Natural Resources (DLNR) for review and comment. On November 12, 2009, as part of the Draft EA review, the DLNR Division of Aquatic Resources replied that they had no objections to the Shoulder Lane Conversion project. See Appendix F.

### **2.16.6 Environmental Justice, Executive Order 12898**

Executive Order 12898, Environmental Justice, was signed on February 11, 1994. The intent of Executive Order 12898 (full title Federal Actions to Address Environmental Justice to Minority and Low Income Populations) is to avoid disproportionately high adverse human health or environmental effects of projects on minority and low income populations. Executive Order 12898 also requires Federal agencies ensure that minority and low income communities have adequate access to public information related to health and the environment.

As previously discussed in Section 2.13, construction of the Shoulder Lane Conversion project will not result in adverse effects to the environment near the project limits, including on adjacent properties or minority and low income populations. Copies of the Draft EA will be sent to the Keaau Public and School Library to inform the local area community about the Shoulder Lane Conversion project and to solicit comments.

### **2.16.7 Floodplain Management, Executive Order 11988 as amended by Executive Order 12148**

Executive Order 11988, Floodplain Management, dated May 24, 1977 requires Federal agencies to take action to reduce the risk of flood loss, restore the natural and beneficial values of floodplains, and minimize the impacts of floods on human safety, health, and welfare. Executive Order 12148, July 20, 1979, amended Executive Order 11988. The main feature of the amendment added that agencies with responsibilities for Federal real estate properties and facilities shall, at a minimum, require the construction of Federal structures and facilities to be in accordance with the criteria of the National Flood Insurance Program.

As discussed in Section 2.4, the Shoulder Lane Conversion project limits are shown in the Federal Emergency Management Agency Flood Insurance Rate Map (FIRM) Community Panel Number 155166INDOA (see Panel 1551661125C), April 2, 2004. The FIRM shows the area of the project limits is in Zone X, "area determined to be outside of the 0.2% annual chance floodplain."

As previously discussed, one of the purposes of the Shoulder Lane Conversion project is to improve the hydraulic conditions along the roadway by constructing a multiple concrete pipe culvert about 140 feet north of the Waipahoehoe Bridge. The culvert will consist of 4, 48-inch pipes angled at about 40 degrees to the center line of the road. The pipes will vary from about 130 to 160 feet. The flows from the culvert enter the unnamed intermittent stream makai of the bridge.

The purpose of the culvert is to reduce flood hazard to the areas mauka of the road and to reduce the need to close Keaau-Pahoa Road from surface flows overtopping the road during heavy rainfall events. Reducing closures of the road will reduce inconvenience to residences of the Puna area and will allow travel on Keaau-Pahoa Road during high

rainfall storm events. Based on these considerations, the Shoulder Lane Conversion project will not adversely affect flood hazards in the area.

### **2.16.8 Protection of Wetlands Executive Order 11990**

Executive Order 11990, Protection of Wetlands, dated 1977 requires Federal agencies to avoid, preserve, or mitigate effects of new construction projects on lands which have been designated wetlands.

As discussed in Section 2.7, the December 2008 survey included the makai end of the unnamed intermittent stream under Waipahoehoe Bridge and its tributary located north of the bridge. The survey also included a low area between the unnamed intermittent stream and its tributary. This area between the two stream beds along the west side of the Keaau-Pahoa Road is a depression subject to flooding and over topping the road during storm events. The depressed area shows potential wetland characteristics with positive vegetation (dominated by California grass, *Urochloa mutica*, a facultative wetland or FACW species) and hydrology indicators (occasional flooding), and possibly hydric soil, although this has not been confirmed. No standing water or open water areas were observed in the low area. Further study would be needed to establish if this area does contain a wetland.

Although a nexus with the unnamed stream can probably be demonstrated, if the stream itself is declared isolated (not jurisdictional), then the wetland would not a jurisdictional, even should it prove to be a wetland by Federal definition. The subjective significant nexus consideration of ecologic factors precludes anyone other than the USACE and/or EPA from declaring an aquatic feature as not waters of the U.S. Although not a factor in establishing federal jurisdiction of wetland features, the National Wetlands Inventory map (USFWS, 2009) shows no wetlands in the project area.

Copies of the Draft EA were sent to the administrator of the Pacific Island Eco-Region, US Fish and Wildlife Service and to the US Army Corps Engineers Honolulu District to ensure adequate consideration of this topic in the environmental review for this project.

### **2.16.9 Farmland Protection Policy Act (7 USC § 4202(8))**

The US Congress adopted the Farmland Protection Policy Act (FPPA) (Public Law 97-98) on December 22, 1981. The US Department of Agriculture (USDA), Natural Resources Conservation Service (NRCS) has national leadership for administering the FPPA. The effective date of the FPPA rule (Part 658 of Title 7 of the Code of Federal Regulations) is August 6, 1984.

The stated purposes of the FPPA are to:

- Minimize the extent to which Federal programs contribute to the unnecessary and irreversible conversion of farmland to nonagricultural uses.
- Assure that Federal programs are administered in a manner that, to the extent practicable, will be compatible with State, unit of local government, and private programs and policies to protect farmland.

“Farmland”, as used in the FPPA, includes prime farmland, unique farmland, and land of statewide or local importance. “Farmland” subject to FPPA requirements does not have to be currently used for cropland.

The Detailed Land Classification – Island of Hawaii classifies all land on the Big Island into one of five master productivity ratings based on soil characteristics, slope, rainfall and miscellaneous site conditions. The ratings range from “A” (very good) to “E” (very poor). Lands on either side of the Keaau-Pahoa Road are almost entirely assigned a productivity rating of “E”, with one small segment assigned productivity rating “C”.

According to the ALISH system, the lands along the project limits are classified as “other agricultural land”, indicating that the lands are not the highest classification for productivity and high yield.

Currently, the lands along the project limits are vacant and undeveloped. No agricultural production is occurring on these lands. Consequently, the Shoulder Lane Conversion project is in substantial compliance with FPPA.

## **2.16.10 Fish and Wildlife Coordination Act (16 USC § 661-666)**

The Fish and Wildlife Coordination Act, as amended, authorizes the Secretaries of Agriculture and Commerce to require consultation with the Fish and Wildlife Service and the fish and wildlife agencies of States where the “waters of any stream or other body of water are proposed or authorized, permitted or licensed to be impounded, diverted... or otherwise controlled or modified” by any agency under a Federal permit or license. Consultation is to be undertaken for the purpose of “preventing loss of and damage to wildlife resources.”

As discussed in Section 2.2, an unnamed stream starts near the 2,500-foot elevation, about 11.0 miles (57,500 feet) southwest of the Waipahoehoe bridge above Mountain View, and shows no further flow about 4,000 feet east (makai) of the bridge. Beyond this point, any stream flow would enter the permeable Kilauea lavas. Consequently, when flowing, this intermittent stream does not reach the shoreline and is considered an interrupted stream. Surface flows eventually occur as groundwater seeping to the surface at the coast.

The USGS topographic maps show no stream gage station on this unnamed intermittent stream. Further, since this stream is not perennial, it is not listed in the Hawaii Stream Assessment.

The unnamed intermittent stream flows only for a short time after the heaviest rainfall, filling low spots until it encounters entry points into subsurface lava.

On October 23, 2009, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction.

During the 2004 aquatic survey, only one aquatic animal, an indigenous dragonfly nymph, was observed in the stream in a pool about 300 feet downstream from the bridge. Also, although not an aquatic species, several cannibal snail shells (*Euglandina rosea*) were observed throughout the stream bed downstream from the bridge. See Appendix C.

No listed, candidate, or proposed threatened or endangered aquatic species as set forth by the USFWS and the DLNR were found during any of the surveys. Thus, construction of the Shoulder Lane Conversion project will not result in a diversion of any water body and will not result in impacts on fish or wildlife resources.

### **2.16.11 National Historic Preservation Act of 1966 (16 USC § 470 (F))**

Section 106 of the National Historic Preservation Act of 1966 (PL 89-665, codified as 16 USC 470f) requires that Federal agencies consider the effects of their projects on historic properties and allow the Advisory Council on Historic Preservation a reasonable opportunity to comment on such projects. The Section 106 review regulations are set forth in CFR 800. In most cases, the State of Hawaii Department of Land and Natural Resources Historic Preservation Division acts for the Advisory Council to undertake this review process. The Historic Preservation Division must concur that the proposed project will have "no effect" on historic properties.

As discussed in Section 2.11, in March 2004 archaeological field investigation consisted of a 100 percent surface examination with the surveyors walking transects at 3-meter intervals, oriented parallel to Highway 130. No archaeological sites or features were identified during the survey. See Appendix D.

In July 2009, an archaeological inventory survey was conducted of the mauka project limits which amounted to about 8-acre strip of land (30 ft wide by 2.4 mi long) extending along Keaau-Pahoa Road. The objective of the survey was to satisfy historic preservation regulatory review inventory requirements of the DLNR-SHPD. See Appendix D.

The July 2009 archaeological inventory survey identified one site, a historic bridge spanning the unnamed stream. The abandoned bridge is constructed of mortared stone and formed concrete and was potentially constructed in the 1930s. The site is assessed as solely significant under Criterion "d". The site has yielded information important for understanding the historic land use in the project area. The mapping, written description and photography at this site adequately documented it and no further work or preservation is recommended.

The abandoned bridge, located mauka (west) of the existing Waipahoehoe Bridge is not listed in the 1987 and 1996 HDOT Historic Bridge Inventory studies.

On March 22, 2010, as of the Draft EA review, the State Historic Preservation Division reviewed the Archaeological Inventory Survey Report dated July 2009. The findings of the Report were that the abandoned bridge adjacent to the existing Waipahoehoe Bridge was constructed in the 1930s. The abandoned bridge was assessed under Criterion D. After mapping, written description and photographic documentation, the Report recommended that “no further work or preservation is recommended”.

The State Historic Preservation Division concurred with the recommendation of the Report and the mitigation of mapping, written description and photographic documentation in the Report was satisfactory and the abandoned bridge may be removed. See Appendix F.

Further, the State Historic Preservation Division stated, in the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

#### **2.16.12 Wild and Scenic Rivers Act (16 USC 1271-1287)**

The Wild and Scenic Rivers Act was first passed in October 1968 and has been amended a number of times. (16 U.S.C. §§ 1271-1287, October 2, 1968, as amended 1972, 1974-1976, 1978-1980, 1984, 1986-1994 and 1996.)

This Act established a National Wild and Scenic Rivers System for the protection of rivers with important scenic, recreational, fish and wildlife, and other values. Rivers are classified as wild, scenic or recreational. The Act also designated specific rivers for inclusion in the System and prescribes the methods and standards by which additional rivers may be added. The Act contains procedures and limitations for control of lands in federally administered components of the System and for disposition of lands and minerals under Federal ownership. Hunting and fishing are permitted in components of the System under applicable federal and state laws.

The purpose of this act, as stated in Section (b) of its preamble is as follows:

*It is hereby declared to be the policy of the United States that certain selected rivers of the Nation which, with their immediate environments, possess outstandingly remarkable scenic, recreational, geologic, fish and wildlife, historic, cultural, or other similar values, shall be preserved in free-flowing condition, and that they and their immediate environments shall be protected for the benefit and enjoyment of present and future generations. The Congress declares that the established national policy of dam and other construction at appropriate sections of the rivers of the United States needs to be complemented by a policy that would preserve other selected rivers or sections thereof in their free-flowing condition to protect the water quality of such rivers and to fulfill other vital national conservation purposes.*

There are no rivers in Hawaii designated as wild and scenic as part of the Wild and Scenic Rivers Act.

As discussed in Section 2.2, an unnamed stream starts near the 2,500-foot elevation, about 11.0 miles (57,500 feet) southwest of the bridge above Mountain View, and shows no further flow about 4,000 feet east (makai) of the bridge. Beyond this point, any stream flow would enter the permeable Kilauea lavas. Consequently, when flowing, this intermittent stream does not reach the shoreline and is considered an interrupted stream. Surface flows eventually occur as groundwater seeping to the surface at the coast.

The USGS topographic maps show no stream gage station on this unnamed intermittent stream. Further, since this stream is not perennial, it is not listed in the Hawaii Stream Assessment.

The unnamed intermittent stream flows only for a short time after the heaviest rainfall, filling low spots until it encounters entry points into subsurface lava. Thus, the Shoulder Lane Conversion project is consistent with the provisions of the Wild and Scenic Rivers Act.



### **2.16.13 Fishery Conservation and Management, Magnuson-Stevens Fishery Conservation and Management Act (16 USC Sec. 1801)**

The Congress found and declared the following:

(1) The fish off the coasts of the United States, the highly migratory species of the high seas, the species which dwell on or in the Continental Shelf appertaining to the United States, and the anadromous species which spawn in United States rivers or estuaries, constitute valuable and renewable natural resources. (2) Certain stocks of fish have declined to the point where their survival is threatened, and other stocks of fish have been so substantially reduced in number that they could become similarly threatened (3) Commercial and recreational fishing constitutes a major source of employment and contributes significantly to the economy of the Nation. (4) International fishery agreements have not been effective in preventing or terminating the overfishing of these valuable fishery resources. (5) Fishery resources are finite but renewable. If placed under sound management before overfishing has caused irreversible effects, the fisheries can be conserved and maintained so as to provide optimum yields on a continuing basis. (6) A national program for the conservation and management of the fishery resources of the United States is necessary to prevent overfishing, to rebuild overfished stocks, to insure conservation, to facilitate long-term protection of essential fish habitats, and to realize the full potential of the Nation's fishery resources. (7) A national program for the development of fisheries which are underutilized or not utilized by the United States fishing industry, including bottom fish off Alaska, is necessary to assure that our citizens benefit from the employment, food supply, and revenue which could be generated thereby. (8) The collection of reliable data is essential to the effective conservation, management, and scientific understanding of the fishery resources of the United States. (9) One of the greatest long-term threats to the viability of commercial and recreational fisheries is the continuing loss of marine, estuarine, and other aquatic habitats. (10) Pacific Insular Areas contain unique historical, cultural, legal, political, and geographical circumstances which make fisheries resources important in sustaining their economic growth.

The Shoulder Lane Conversion project limits do not include water resources which supports fishery resources. Thus, the Shoulder Lane Conversion project will not have an adverse effect on fishery resources.

### 3. RELATIONSHIP to PLANS, POLICIES and CONTROLS

#### 3.1 Hawaii State Plan

The Hawaii State Plan, adopted in 1978 and revised in 1988, establishes the overall theme, goals, objectives, and priority guidelines to guide the future long-range development of the State. The Keaau-Pahoa Road Shoulder Lane Conversion project supports and is consistent with the following State Plan objectives and policies:

##### Section 226-6 Objectives and policies for the economy - in general.

*(b) (6) Strive to achieve a level of construction activity responsive to, and consistent with, state growth objectives.*

The Keaau-Pahoa Road Shoulder Lane Conversion project will involve demolition of the existing shoulder lane and culvert headwalls and construction of a new travel lane and shoulder lane, culvert extensions, one new multiple pipe culvert, widening of Waipahoehoe Bridge, and installation of a new traffic signal. The Shoulder Lane Conversion project will increase the level of construction activity in the County of Hawaii during the period of construction which will enhance the state's growth objectives.

##### Section 226-14 Objectives and policies for the facility systems – in general.

*(b) (1) Accommodate the needs of Hawaii's people through coordination of facility systems and capital improvements priorities in consonance with State and County plans.*

The Keaau-Pahoa Road Shoulder Lane Conversion project is a recommended action of the Puna Regional Circulation Plan, 2005. Highway 130 between the Pahoa Bypass and the Keaau Bypass is identified as a "Primary Arterial to be Widened" in the Puna Community Development Plan (1995). The County of Hawaii General Plan contains language recognizing that Highway 130 is congested during the work week for Hilo-bound traffic as the population in the Puna district continues to grow. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project is a capital improvement project which is in consonance with State and County plans.

## Section 226-17 Objectives and policies for facility systems – transportation.

*(b) (6) Encourage transportation systems that serve to accommodate present and future development needs of communities.*

The Shoulder Lane Conversion project is necessary to accommodate future development needs of the Puna district, one of the fastest growing district's in the State.

### **3.2 Hawaii Statewide Transportation Improvement Plan**

Safe, Accountable, Flexible, Efficient Transportation Equity Act – A Legacy for Users (SAFETEA-LU), was enacted August 10, 2005, as Public Law 109-59. The SAFETEA-LU maintains the structure and funding balance established in 1991's Intermodal Surface Transportation Efficiency Act (ISTEA) and continued in Transportation Equity Act for the 21<sup>st</sup> Century (TEA-21). SAFETEA-LU was designed to improve and maintain the transportation infrastructure in the United States, especially the highway and interstate road system.

The Hawaii Statewide Transportation Improvement Program (STIP) provides a multi-year listing of the State and County projects and identifies those projects slated for Federal funding. It is a multi-modal transportation improvement program that is developed utilizing existing transportation plans and policies, and current highway, transit and transportation programming processes. The STIP delineates the funding categories and the federal and local share required for each project. Although projects are on the STIP, it does not necessarily mean those projects will be planned, designed, or constructed within the fiscal period due to unforeseen occurrences such as project readiness or project priorities.

With the passage of SAFETEA-LU, the STIP is now a four-year programming implementation document that identifies State and County transportation projects statewide, to be funded, in part, with Federal Highway and Transit funds.

Regionally significant projects requiring an action by the Federal Highway Administration or the Federal Transit Administration should be included in the STIP, even when Federal Highway or Transit funds are not used.

The Shoulder Lane Conversion project is included for construction in FY 2010 in the Hawaii State Transportation Improvement Program (STIP) Revisions for 08-11 (+2) STIP, approved by the FHWA on February 10, 2010.

### **3.3 Land Use Plans and Policies**

#### **3.3.1 State Land Use District**

The Hawaii Land Use Law of Chapter 205, Hawaii Revised Statutes, classifies all land in the State into four land use districts: Urban, Agriculture, Conservation, and Rural. The Shoulder Lane Conversion project is located in the Agricultural District classification.

#### **3.3.2 County of Hawaii General Plan**

The County of Hawaii General Plan is a policy document for the long-range comprehensive development of the island of Hawaii and also provides the direction for future growth of the County. The current General Plan was adopted as Ordinance 05 25 on February 9, 2005.

Among its various sections, the County of Hawaii General Plan contains a series of policies for the long-range comprehensive development of the county and statements of development standards and principles with respect to the most desirable use of land within the county.

With regard to roadway transportation in the Puna District, the General Plan contains the following relating to Highway 130:

*“As the only two primary routes serving the district, Highway 130 and Highway 11 are congested during the work week for Hilo-bound traffic as the population in the district continues to grow.” (p. 13-7)*

The goals, policies and standards from Section 13 of the General Plan applicable to the Shoulder Lane Conversion project are set forth below.

*I. Roadways*

*Goal: Provide a system of roadways for the safe, efficient and comfortable movement of people and goods.*

*Policy: The County shall coordinate with appropriate State agencies and for the provision of public facilities to serve the needs of the community.*

The Shoulder Lane Conversion project along the remaining portion of Keaau-Pahoa Road is the primary access between Keaau and Pahoa, and to the residential areas along the road. The Shoulder Lane Conversion project will provide a permanent second northbound travel lane which can be used at all times for motorists to reach Keaau and a shoulder lane to reach Pahoa.

In addition, the Shoulder Lane Conversion project will install a traffic signal at the Shower Drive/Pohaku Drive intersection. The traffic signal will allow motorists to make left-turn movements from and onto Keaau-Pahoa Road without long queues, especially during the peak morning and afternoon travel times. The traffic signal will also allow access into the residential areas of Hawaiian Paradise Park and Orchidland, both of which have growing population bases. Thus, the Shoulder Lane Conversion project will be consistent with the County General Plan.

### **3.3.3 Puna Community Development Plan**

The County of Hawai'i General Plan, approved in 2005, established the Community Development Plan Program (CDP). Community Development Plans are intended to translate broad General Plan Goals, Policies, and Standards into Implementation Actions as they apply to specific geographical regions around the Island. CDPs are also intended to serve as a forum for community input into land-use, delivery of government services and any other matters relating to the planning area.

The Puna CDP was completed in September 2008 and adopted by Ordinance No. 08 116. The plan addresses 13 elements contained within the General Plan as they relate to Puna. The transportation portion of the plan is broken into four sections which include an Overview and three subgroup reports covering Mass Transit, Existing Roadways, and New Alternative Roadways. The Existing Roadways subgroup report contains recommendations that pertain to the Shoulder Lane Conversion project. The recommendations are found in two of four priority areas on Safety and Traffic Congestion.

### *Priority #1 Safety*

The CDP Existing Roadways report notes that, in terms of road safety, the Shower Drive/ Pohaku Drive intersection is unsafe for merging and left turns. The report recommends the installation of a traffic roundabout or, as a last resort, a traffic signal at the intersection.

Given the design guidelines for roundabouts from the Federal Highway Administration and the space constraints at the intersection, a roundabout is considered an infeasible alternative. The Shoulder Lane Conversion project will include installation of a traffic signal at the intersection which will improve safety for merging and left-turn traffic movements. A more detailed discussion of the roundabout option is contained in Section 4.3.

The report also notes that there are no dedicated routes for non-motorized traffic along Highway 130 and recommends that the State DOT conduct a study to determine how to modify Highway 130 to accommodate such traffic. The Shoulder Lane Conversion project will include an 8-foot wide paved shoulder for use by pedestrians and bicyclists.

### *Priority #2: Traffic Congestion*

The Existing Roadways report notes that peak demand exceeds roadway capacity on Highway 130. The report recommends the widening of Highway 130 by constructing a reversible middle lane that will carry a second lane of traffic northbound during the morning rush hour and southbound during the evening rush hour. The Shoulder Lane Conversion project will provide a permanent third lane within the project limits that can be coned and/or striped such that the middle lane can be used as a reversible lane.

Resolution No. 573-08 by the Hawai'i County Council requested cooperation between the County of Hawaii, Department of Public Works and the State Department of Transportation in recommending interim traffic pattern options to alleviate the PM southbound congestion at the south end of the Keaau Bypass. This resolution is consistent with Priority #2 in the Puna CDP Existing Roadways Working Group Report.

Objective 4.4.2 of the Puna CDP included:

- a. Make intersection improvements along highways that allow for safer access from intersecting streets as a priority over traffic speed on the highway, giving preference to the use of roundabouts;
- b. Consider roundabouts as a means to control private driveway access to major highways with higher traffic volumes, such as Highway 130; and
- d. Incorporate traffic-calming features into highway design in preference to signage and signalization, where possible. "

Action 4.4.3: of the Puna CDP also included:

- a. Reduce speed limit on Highway 130 to 45 mph between the Kea 'au Bypass and Ainaloa Boulevard.

As previously discussed, the Shoulder Lane Conversion project will provide a 10-foot temporary shoulder lane for southbound traffic along the project limits. The additional southbound lane is needed to improve traffic conditions for southbound traffic.

Roundabouts have been considered as an alternative at the Keaau-Pahoa Road/ Shower Drive intersection. See Section 4.3.

### **3.3.4 Puna Regional Circulation Plan**

The Puna Regional Circulation Plan (Final Report dated November 2005) addresses future automobile, bicycle, pedestrian and transit corridors of the Puna District. The Plan was initiated to evaluate existing regional transportation systems and proposed future transportation corridors in Puna until the year 2030. The Plan was developed in close coordination with County officials, staff, an advisory group, and interested citizens. Recommendations of the PRCP include the proposed widening of Highway 130 from two to four lanes from Keaau to Pahoa, a distance of about 8 miles. This proposal includes the approximately 2.31 mile segment of Keaau-Pahoa Road from the Keaau Bypass Road to Shower Drive.

### **3.3.5 County of Hawaii Zoning**

The County of Hawaii zoning designation for the lands adjacent to the project limits is Agricultural District, A-20a. According to Hawaii County Code Chapter 25, Zoning, the



Agricultural District provides for agriculture and very low density agricultural-based residential use, encompassing rural areas of good to marginal agricultural and grazing land, forest land, game habitats, and areas where urbanization is not found to be appropriate.

### **3.3.6 County of Hawaii Special Management Area**

The Coastal Zone Management Act contains the general objectives and policies upon which all counties within the State have structured specific legislation which created Special Management Areas (SMA). Any development within the Special Management Area boundary requires a SMA Use permit which is administered by the County of Hawaii.

The Keaau-Pahoa Road Shoulder Lane Conversion project site is not located within the County's SMA.

## **4. ALTERNATIVES TO THE PROPOSED ACTION**

### **4.1 No Action Alternative**

Under the No Action alternative, the 2.31 mile segment of Keaau-Pahoa Road between the Keaau Bypass Road and Shower Drive would remain unchanged without improvements. The additional 12-foot travel lane for northbound traffic would remain as a 10-foot shoulder lane and the 2-foot shoulders would remain. There would be no reduction of traffic congestion related to vehicles traveling southbound near Keaau. In addition, a traffic signal would not be installed at the Keaau-Pahoa Road Shower Drive/Pohaku Drive intersection. Lastly, drivers would continue to use secondary streets through Hawaiian Paradise Park subdivision in an attempt to bypass congestion.

This alternative would have no short-term, construction related environmental impact with regard to soils, flora and fauna, noise, and air quality. However, in the long-term, the No Action alternative would have adverse air quality impacts due to decreased traffic movement. Most importantly, as transportation becomes increasingly difficult, the No Action alternative would have significant adverse social and economic impacts for the residents of the Puna District.

For all of these reasons, the No Action alternative is not considered a feasible alternative.

### **4.2 Alternate Route to Highway 130**

The Puna Regional Circulation Plan (PRCP) considered a total of six alternatives to evaluate the best solution for improving transportation throughout the district. The alternatives incorporated various combinations of land use type, bus only lanes, percentages of transit and bike ridership, reuse of an existing railroad path, connectivity projects, and road widening. Of the six alternatives, only one alternative (Alternative D) excluded the eventual widening of Highway 130 to four lanes, while the preferred plan included the widening of Highway 130 to four lanes. The Shoulder Lane Conversion project is an integral part of the HDOT plan to widen Keaau-Pahoa Road to four travel lanes.

Also included in the Puna Regional Circulation Plan was an examination of several proposed alternative routes from Hilo to Puna Makai. Known as Puna Makai Alternative Route (PMAR), the two-lane PMAR would be an alternative to the increased use and reliance on Keaau-Pahoa Road for access to Hilo. However, the selection of a route, the need to acquire the right-of-way, and the unknown source of funds for the Puna Makai Alternative Route makes this alternative a long-term proposal which would not meet the current transportation needs of the residents of the Puna district. Therefore, the PMAR is not considered a feasible alternative to the proposed project.

### **4.3 Roundabout at Shower Drive**

Use of a roundabout at the Keaau-Pahoa Road Shower Drive/Pohaku Drive intersection can be considered an alternative to use of a traffic signal. A roundabout is a type of circular intersection with specific design features which include: 1) yield control of all entering traffic; 2) channelized approaches; and 3) geometric design of the curvature to ensure travel speed is less than 30 mph on the circular roadway. Roundabouts have been used in other parts of the US and have long been used on many roads in Europe. To date, roundabouts have not been used on rural roads under the control of the HDOT in the State of Hawaii or in the County of Hawaii.

The major advantage of a roundabout is that traffic on the through road (Keaau-Pahoa Road) does not need to come to a complete stop to exit onto a side street (Shower Drive or Pohaku Drive). All motorists must slow down when approaching the roundabout. Through motorists would continue circulating and others would exit as appropriate.

Information developed by the US Department of Transportation Federal Highway Administration (FHWA) indicates injury crash rates for vehicle occupants are generally lower for roundabouts, although the proportion of single vehicle crashes is typically higher. Also, bicyclists and pedestrians are involved in a relatively higher proportion of injury accidents at roundabouts than they are at other intersections. The advantages of a roundabout include reduction in potential conflicts at the intersection and related reduction in crashes. The FHWA information also shows most modern roundabouts have resulted in an overall reduction in the number and severity of accidents, especially as the design of roundabouts reduces entering and circulating speeds to about 20 to 25 miles per hour. However, as stated by the FHWA, some of this crash reduction

decreases when multiple lane roundabouts are used. Double lane roundabouts often cannot achieve the same level of crash reduction due to the circulating and exiting movements needed at all times. Further, pedestrians crossing double lane roundabouts are exposed for a longer time and can be obscured from, or not see, approaching vehicles in adjacent lanes if vehicles in the nearest lane yield to them.

When operating within their capacity, roundabouts typically operate with lower vehicle delays than other intersection forms. When there are queues on one or more approaches, traffic within the queues usually continues to move. The movements for circulating and exiting a double lane roundabout could add to the delays which might occur at an intersection.

Roundabouts treat all movements at an intersection equally with each approach required to yield to circulating traffic, regardless to whether the approach is a local street or major arterial. Thus, vehicles entering the roundabout must yield to already circulating vehicles at all times. This may result in more delay to the major movements than otherwise might be desired. This problem is exacerbated when a high volume major street intersects a low volume minor street.

A comparison of costs shows traffic signals have costs associated with power requirements and maintenance associated with controllers and detection systems. The roundabouts have costs associated with signing and pavement marking maintenance and with landscaping maintenance.

A key dimension of a roundabout is the size of the circular area needed for construction. A roundabout includes the travel lanes plus an inner circle to separate the vehicles. For a four-lane road such as is planned for Keaau-Pahoa Road, the diameter for the inscribed circle is recommended to be 180 to 200 feet. This roundabout inscribed diameter, 200 feet, is the minimum needed for the travel lane with entry and circulating speed of 20 to 25 miles per hour. Additional land would also be needed to accommodate a shoulder and setbacks. Thus, the land area needed would be greater than the 200-foot diameter and could be up to 240 to 260 feet, when accounting for shoulders and setbacks.

The existing right-of-way of Keaau-Pahoa Road at the Shower Drive intersection is 80 feet. Thus, to construct a roundabout at the intersection, the right-of-way would require

a minimum of an additional 100 to 120 feet of land area, or 50 to 60 feet on each side of the existing right-of-way. The roundabout land area would be an addition to the proposed right-of-way needed for the additional travel lanes.

A roundabout with a 200-foot inscribed circle diameter would place the roundabout travel lane about 65 feet from the residence at the southwest corner to the Keaau-Pahoa Road/Shower Drive/Pohaku Drive intersection and about 50 feet from the residence at the northwest corner of the intersection. A 260-foot diameter inscribed circle would place the roadway about 45 feet from southwest corner residence and 30 feet from the northwest corner residence.

At this time, the shoulder lane conversion would relocate the northbound travel lane about 2 feet closer to the southwest corner residence and the southbound travel lane about 10 feet closer to the northwest corner residence.

Lastly, based on the current design within the project limits, the AASHTO and FHWA guidelines do not provide information on the use of a roundabout with a one lane approach and a two lane exit or a two lane approach and one lane exit such as would occur at the Keaau-Pahoa Road/Shower Drive intersection. Further, since the center line of Shower Drive approach is not located at 90 degrees to Keaau-Pahoa Road, or does not line up directly across from the center line of Pohaku Drive, any roundabout would require realignment of Shower Drive and reconfiguration of the intersection to provide a balanced roundabout.

As part of the Draft EA review, the County of Hawaii Planning Department has proposed that the HDOT acquire portions of parcels TMK: 1-5-036:122 and 1-6-064:269 and realign the intersection approaches to Shower Drive and Pohaku Drive and construct a roundabout at the intersection. The County Planning Department parcel acquisition proposal would need additional planning and design to relocate the intersection, especially as both side street approaches would also have to be realigned to provide a 90 degree entry to the roundabout. The side approach realignment would take this additional land as the Shoulder Lane Conversion project would be needed to provide travel lanes on Keaau-Pahoa Rod.

The HDOT policy (DEP-HY 08.010) has generally limited roundabouts to single lane roundabouts. Thus, use of a roundabout in lieu of a traffic signal at the Keaau-Pahoa

Road Shower Drive/ Pohaku Drive intersection would not be compatible with the HDOT project which would construct 4 lanes or 6 lanes of travel lanes along Keaau-Pahoa Road.

The additional land area needed, unfamiliarity of motorists with roundabouts, and the one lane to two and two lane to one lane issue make use of a roundabout an infeasible alternative.

Use of roundabouts to control private driveway access has not been considered as part of the Shoulder Lane Conversion project. First, since all movement at an intersection are treated equally with each approach required to yield to circulating traffic, regardless to whether the approach is a local street or major arterial, vehicles entering the roundabout must yield to already circulating vehicles at all times. This may result in more delay to the major movements than otherwise might be desired. This problem is exacerbated when a high volume major street intersects a low volume minor street, such as a private driveway access.

#### **4.4 Transportation Systems Management**

Use of Transportation Systems Management (TSM) in lieu of the shoulder lane conversion can be considered. The TSM alternative would not construct the Shoulder Lane Conversion project and would use the existing 3 travel lanes to provide a reversible lane for travel during the peak afternoon traffic period. Based on the existing roadway section of two 12-foot and one 10-foot travel lane, each lane would about 11 feet wide with a 1-foot separation. Although 11-foot lanes exist on a number of roadways on Hawaii, use of TSM with the current roadway section would be temporary short-term solution without gaining the advantages of the Shoulder Lane Conversion project.

## 5. DETERMINATION

Short-term construction impacts include disruption along the project limits and surrounding areas during construction, decline in air quality from construction activities, and increase in noise levels. Once construction has been completed, the short-term adverse impacts will no longer occur.

Based on analysis of the probable impacts, a Finding of No Significant Impact (FONSI) is determined for the Keaau-Pahoa Road Shoulder Lane Conversion project. The significance criteria to make this determination are set forth below and in Hawaii Administrative Rules Title 11, State of Hawaii Department of Health, Chapter 200, Environmental Impact Statement Rules.

- 1) *Involve an irrevocable commitment to loss or destruction of any natural or cultural resources;*

The Keaau-Pahoa Road Shoulder Lane Conversion project site does not provide habitat for Federal or State of Hawaii listed or candidate threatened or endangered species of flora or fauna.

The archaeological survey found nearly half of the project limits was altered by previous highway-related construction activity. Much of the remainder was probably modified by sugar cane cultivation. Based on the results of the archaeological field survey, construction of the Keaau-Pahoa Road Shoulder Lane Conversion project should have no adverse impacts to historic sites.

The Cultural study found that, since there are no cultural resources within the area between the Keaau Bypass Road and Shower Drive, there will be no adverse effects to cultural practices.

- 2) *Curtail the range of beneficial uses of the environment;*

The Keaau-Pahoa Road Shoulder Lane Conversion project will use lands that are currently vacant and undeveloped. The Keaau-Pahoa Road Shoulder Lane Conversion project will require the taking of approximately 4.476 acres right-of-way which is a minor

portion of available developable land area in the Puna region. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project will not curtail the beneficial uses of the environment.

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

The Keaau-Pahoa Road Shoulder Lane Conversion project will not involve actions or activities which would adversely affect natural resources within the project area. The Keaau-Pahoa Road Shoulder Lane Conversion project will be consistent with the guidelines of Chapter 344, HRS, as it will provide a public transportation infrastructure improvement to support the population and economic growth of the Puna region. As such, the Keaau-Pahoa Road Shoulder Lane Conversion project will not conflict with the State's long-term environmental policies or goals as expressed in Chapter 344, HRS.

- 4) *Substantially affect the economic or social welfare of the community or state;*

The Keaau-Pahoa Road Shoulder Lane Conversion project is expected to result in decreased travel times between Pahoa, Keaau, and Hilo, especially during the morning and afternoon peak periods. In addition, the new culvert is intended to decrease the need to close the Keaau-Pahoa Road during heavy rain storm events. Therefore, there will be a positive impact on the economic and social welfare of the community.

- 5) *Substantially affect public health;*

An efficient transportation system is needed to protect the public health of the residents and visitors on Hawaii. The Keaau-Pahoa Road Shoulder Lane Conversion project will improve emergency vehicle access and travel times between Puna and the hospitals in Hilo. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project will not have an adverse effect on public health.

- 6) *Involve substantial secondary impacts, such as population changes or effects on public facilities;*



The Keaau-Pahoa Road Shoulder Lane Conversion project is a planned infrastructure improvement that responds to population growth that has already occurred in the Puna region. As such, it will not contribute to population changes or other secondary impacts.

7) *Involve a substantial degradation of environmental quality;*

The Keaau-Pahoa Road Shoulder Lane Conversion project is anticipated to result in short-term impacts to noise, air quality and traffic in the immediate vicinity of the project limits during the period of construction. The Shoulder Lane Conversion project limits does not contain Federal or State listed or candidate threatened or endangered species of flora or fauna.

The archaeological survey found nearly half of the project limits was altered by previous highway-related construction activity. Much of the remainder was probably modified by sugar cane cultivation. Based on the results of the archaeological field survey, construction of the Keaau-Pahoa Road Shoulder Lane Conversion project should have no adverse impacts to historic sites.

The Cultural study found that, since there are no cultural resources within the area between the Keaau Bypass Road and Shower Drive, there will be no adverse effects to cultural practices.

Based on the above findings, the Keaau-Pahoa Road Shoulder Lane Conversion project will not result in a substantial degradation of environmental quality.

8) *Have a cumulative effect upon the environment or involves a commitment for larger actions;*

The Keaau-Pahoa Road Shoulder Lane Conversion project does not involve a commitment to further actions to other State of Hawaii related projects on Hawaii. As a result, the Keaau-Pahoa Road Shoulder Lane Conversion project will not have a cumulative effect upon the environment or involve a commitment by the State to larger actions on Hawaii.

9) *Affect a rare, threatened or endangered species;*

The Keaau-Pahoa Road Shoulder Lane Conversion project site does not contain Federal or State listed or candidate threatened or endangered species of flora or fauna. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project will not affect threatened or endangered species.

At this time, the construction schedule for the Shoulder Lane Conversion project has not been determined, especially for work related to vegetation removal. However, to ensure the contractor does not disturb vegetation which might be used by Hawaiian hoary bat, the HDOT contract documents will include a provision that the vegetation greater than 15 feet tall should not be removed during the bat birthing and pup rearing season (May 15 through August 15).

The HDOT contract documents will include a provision, if vegetation and tree clearing is to be done during the Hawaiian hawk breeding season (March through September), additional biological surveys will be required, as directed by the USFWS.

These mitigation measures will ensure the Hawaiian hoary bat and Hawaiian hawk will not be adversely affected by the Shoulder Lane Conversion project. These mitigation measures will be required for the HDOT to meet its responsibilities pursuant to the Endangered Species Act of 1973, as amended, if a listed species may be affected by the Shoulder Lane Conversion project.

10) *Detrimentially affect air or water quality or ambient noise levels;*

Operation of construction equipment will increase short-term noise and exhaust emission levels in the immediate vicinity of the Keaau-Pahoa Road Shoulder Lane Conversion project limits. Once operational, the Shoulder Lane Conversion project should result in decreased travel times which should improve air quality in the immediate vicinity. There will be no impact on water quality from the project.

11) *Affects or likely to suffer damage by being located in an environmentally sensitive area such as a floodplain, tsunami zone, beach, erosion-prone*

*area, geographically hazardous land, estuary, fresh water or coastal water;*

According to the Flood Insurance Rate Map (FIRM), the Keaau-Pahoa Road Shoulder Lane Conversion project is located in an area not subject to flood hazards, a hazardous floodplain or a tsunami zone. The project will improve the hydraulic conditions along the road by constructing a new multi-celled reinforced concrete pipe culvert system about 140 feet north of the existing Waipahoehoe Bridge where the road currently overtops during heavy rainfall events.

The Keaau-Pahoa Road Shoulder Lane Conversion project site is also not within the County of Hawaii Special Management Area. In addition, the Keaau-Pahoa Road Shoulder Lane Conversion project site is not within the coastal shoreline area. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project site is not located in an environmentally sensitive area.

12) *Substantially affect scenic vistas and viewplanes identified in county or state plans or studies;*

The County of Hawaii General Plan 2005 identifies sites of natural beauty in the Puna district and the goals, policies and standards for their protection. Chief among the policies for protecting sites of natural beauty are access to lands that have scenic value, and the protection of important viewplanes from obstruction.

One of the sites identified on the list of natural beauty sites is the view of Mauna Kea and Mauna Loa from Keaau-Pahoa Road. The Keaau-Pahoa Road Shoulder Lane Conversion project will not result in any obstruction of views of these mountains and may actually result in an expanded viewplane due to the widening on the makai side of the highway. Thus, the project will not create a significant adverse impact to scenic vistas or viewplanes.

13) *Require substantial energy consumption.*

Construction of the Keaau-Pahoa Road Shoulder Lane Conversion project will require the short-term use of energy resources associated with construction equipment, but in the long-term, no new demand for energy consumption will result. Thus, the Keaau-Pahoa Road Shoulder Lane Conversion project will not create a substantial increase in energy consumption.

Based on these findings and the assessment of potential impacts from the Keaau-Pahoa Road Shoulder Lane Conversion project, a Finding of No Significant Impact (FONSI) is determined.

## **6. LIST OF PERMITS**

### State

- National Pollutant Discharge Elimination System Storm Water Associated with Construction Activities

## 7. CONSULTED PARTIES

### 7.1 Pre-Assessment Consultation

The following agencies were consulted during the pre-assessment phase of the Draft Environmental Assessment. Each agency was sent a copy of a project summary and a request for their written comments on the project. All written comments and responses are reproduced in Appendix A.

US Department of the Army, Honolulu District Engineer  
US Fish and Wildlife Service  
State of Hawaii Department of Land and Natural Resources  
State of Hawaii DLNR – Historic Preservation Division  
State of Hawaii DLNR - Water Resources Management  
State of Hawaii Department of Health  
State of Hawaii Department of Health – Environmental Management Division  
County of Hawaii Environmental Management Department  
County of Hawaii Department of Parks and Recreation  
County of Hawaii Planning Department  
County of Hawaii Department of Research and Development  
County of Hawaii Department of Public Works  
Hawaii Electric Light Company

### 7.2 Agencies and Organizations to be Consulted on the Draft EA

The following is a list of agencies and organizations to be consulted during the Draft Environmental Assessment 30-day comment period. Copies of the comments (▲), substantive comments received (✘), and responses are included in the Appendix F.

#### Federal

- ✘ Department of the Army, US Army Engineer District, Honolulu
- US Department of the Interior of the Fish and Wildlife Service
- ▲ US Department of the Interior Geological Survey

State Agencies

- Department of Agriculture
- Department of Business, Economic Development and Tourism
  - ▲ DBED&T – Strategic Industries Division
  - ✘ Department of Defense
- Department of Hawaiian Home Lands
  - ✘ Department of Health
- Department of Health - Environmental Management Division
  - ▲ Department of Land and Natural Resources – Aquatic Resources Division
  - ✘ Department of Land and Natural Resources – Engineering Division
  - ✘ Department of Land and Natural Resources Historic Preservation Division
  - ✘ Department of Land and Natural Resources - Water Resource Management
- Office of Hawaiian Affairs
- Office of Environmental Quality Control
- University of Hawaii Water Resources Research Center
- University of Hawaii Environmental Center
- Keaau Public and School Library

County of Hawaii Agencies

- County of Hawaii Civil Defense
  - ▲ County of Hawaii Department of Environmental Management
- County of Fire Department
- County of Hawaii Department of Parks and Recreation
  - ✘ County of Hawaii Planning Department
  - ✘ County of Hawaii Police Department
- County of Hawaii Department of Research and Development
- County of Hawaii Department of Public Works
  - ✘ County of Hawaii Department of Water Supply

Officials

- Senator Russell S. Kokubun
  - ▲ Representative Faye P. Hanohano
- Representative Robert N. Herkes
- Councilmember Emily I. Naeole

Public Utilities

Hawaii Electric Light Company, Inc.

Hawaiian Telcom

Oceanic Time Warner Cable

Organizations

Hawaii Humane Society

✘ W.H. Shipman, Limited

✘ Friends of Puna's Future

✘ Hawaiian Paradise Park Homeowners Association

Other Comments

✘ Kazue Makino/Gerald Makino

✘ James Weatherford, PhD

Kevin Lewis

✘ Cornelia Radich



## **8. REFERENCES**

American Association of State Highway Officials (AASHO). *LRFD Bridge Design Specifications, Customary US Units, 4<sup>th</sup> Edition*. 2007.

Community Management Associates, Inc. *Puna Community Development Plan*. Prepared for County of Hawaii Planning Department. October 1995.

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Federal Emergency Management Flood Insurance Rate Map Community Panel Number 155166 INDOA. April 2, 2004 (Revised).

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Puna Community Development Plan team. *Working Paper No. 1, Elements of a Growth Management Strategy*. 2007.

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State of Hawaii Department of Transportation, Subject: Modern Roundabout Policy Guideline. DEP-HY 08-010, December 19, 2008.

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*The Hawaii State Plan Chapter 226, Hawaii Revised Statutes*. Office of the Governor, Office of State Planning. 1988.

Title 11 Hawaii Administrative Rules State of Hawaii Department of Health Chapter 46 Community Noise Control. September 23, 1996.

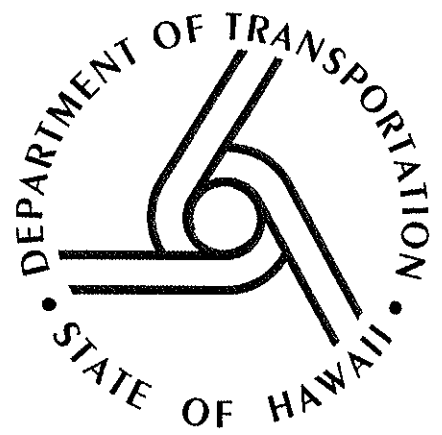
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US Department of Transportation Federal Highway Administration. Memorandum. Use of Debris from Demolished Bridges and Overpasses. March 7, 2006.

Wilson Okamoto Corporation. *Traffic Signal Warrant Study – Keaau-Pahoa Road, Pohaku Drive and Shower Drive Intersection*. Prepared for State Department of Transportation. May 2005 (Revised).



**APPENDIX A**

Mr. John Sakaguchi

If you have questions regarding this letter, please contact Dr. Jeff Zimpfer, Fish and Wildlife Biologist at (808)792-9400.

Sincerely,

Gina Shultz  
Acting Field Supervisor

In Reply Refer To:  
2009-TA-0267

John Sakaguchi, AICP  
Senior Planner  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

JUN 09 2009

Subject: Comments for Draft Environmental Assessment for Keau-Paho Road, Shoulder Lane Conversion, Puna District, Island of Hawaii

Dear Mr. Sakaguchi:

Thank you for your April 20, 2009, letter requesting our comments for Draft Environmental Assessment for Keau-Paho Road, Shoulder Lane Conversion, Puna District, Island of Hawaii. Based on the information you provided and pertinent information in our files, the following listed species have been observed in the vicinity of the proposed project: (1) the endangered Hawaiian hawk (*Buteo solitarius*); and (2) the endangered (*Lasiurus cinereus semotus*). There is no federally designated critical habitat in the vicinity of this proposed project. We recommend the following measures be incorporated into the Draft Environmental Assessment to minimize potential impacts to listed species. These recommendations do not alleviate your responsibilities pursuant to the Endangered Species Act of 1973, as amended, if a listed species may be affected by the proposed action.

- Hawaiian hoary bats nest in both exotic and native woody vegetation. To minimize impacts to the endangered Hawaiian hoary bat, woody plants greater than 1.5-feet (4.6-meters) tall should not be disturbed, removed or trimmed during the bat birthing and pup rearing season (May 15 through August 15). If you must disturb, remove or trim woody vegetation greater than 1.5 feet tall during the Hawaiian hoary bat pupping season, we recommend conducting biological surveys to determine if bats are present. Please contact our office regarding survey methodology.
- Hawaiian hawks nest in both exotic and native woody vegetation. To avoid impacts to Hawaiian hawks we recommend avoiding tree clearing during their breeding season (March through September). If you must clear the property during the Hawaiian hawk breeding season, we recommend conducting biological surveys to determine if hawk nests are present.

6/15/09  
6/11/09

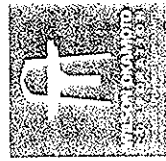


United States Department of the Interior

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



TAKE PRIDE  
IN AMERICA



6615-01  
September 1, 2009

Mr. Loyal Mehrhoff, PhD, Field Supervisor  
Fish and Wildlife Service  
Pacific Islands Fish and Wildlife Office  
U.S. Department of the Interior  
300 Ala Moana Boulevard, Suite 3108  
Honolulu, Hawaii 96813

Attention: Dr. Jeff Zimpfer, Fish and Wildlife Biologist  
Subject: Draft Environmental Assessment, Pre-Assessment Consultation,  
Keaau-Pahoia Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive, Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

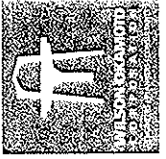
Dear Dr. Mehrhoff,

Thank you for your June 10, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Pahoia Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that Fish and Wildlife Service files show the following listed  
species have been observed in the vicinity of the project limits: (1) the endangered Hawaiian  
hawk (*Buteo solitarius*); and (2) the endangered Hawaiian hoary bat (*Lasiurus cinereus  
semotus*). Also, there is no Federally designated critical habitat in the vicinity of the project  
limits.

The Draft Environmental Assessment will include the following mitigation measure to  
minimize potential impacts to listed species. To minimize impacts to the endangered  
Hawaiian hoary bat, woody plants greater than 15-feet (4.6meters) tall should not be  
disturbed, removed or trimmed during the bat birthing and pup rearing season (May 15  
through August 15).

At this time, the construction schedule for the Shoulder Lane Conversion project has not  
been determined, especially for work related to vegetation removal. However, to ensure the  
contractor does not disturb vegetation which might be used by Hawaiian hoary bat, the DOT  
contract documents will include a provision that woody plants greater than 15-feet



6615-01  
Letter to Mr. Loyal Mehrhoff, PhD, Field Supervisor  
Page 2  
September 1, 2009

(4.6 meters) tall should not be disturbed, removed or trimmed during the bat birthing and  
pup rearing season (May 15 through August 15).

The DOT contract documents will include a provision, if vegetation and tree clearing is to be  
done during the Hawaiian hawk breeding season (March through September), the contractor  
will be responsible to conduct additional biological surveys, as directed by the USFWS.

These mitigation measures will ensure the Hawaiian hoary bat and Hawaiian hawk will not  
be adversely affected by the Shoulder Lane Conversion project.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT

Laura E. Walker  
Division Administrator  
Department of Land and Natural Resources



2009 APR 27 12:34

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
POST OFFICE BOX 501  
HONOLULU, HAWAII 96809

Laura E. Walker  
Division Administrator  
Department of Land and Natural Resources



April 23, 2009

MEMORANDUM

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

RECEIVED  
LAND DIVISION  
2009 MAY 11 A 10:09

FROM: Morris M. Atta  
SUBJECT: Pre-Assessment for Keaau-Pahoia Road, Shoulder Lane Conversion, Keaau Bypass to Shower Drive  
LOCATION: Keaau, Hawaii  
APPLICANT: Wilson Okamoto Corporation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 15, 2009.  
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.

- ( ) We have no objections.
- (x) We have no comments.
- ( ) Comments are attached.

Signed: [Signature]  
Date: 5/8/09

Attachments

Laura E. Walker  
Division Administrator  
Department of Land and Natural Resources



2009 MAY 13 10:14

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

Laura E. Walker  
Division Administrator  
Department of Land and Natural Resources



May 18, 2009

Wilson Okamoto Corporation  
1907 South Beretania Street Suite 400  
Honolulu, Hawaii 96826

Attention: Mr. John L. Sakaguchi, AICP, Senior Planner

Ladies and Gentlemen:

Subject: Pre-Assessment for Draft Environmental Assessment for Keaau-Pahoia Road, Shoulder Lane Conversion, Keaau Bypass to Shower Drive

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 Division of Aquatic Resources, Division of Forestry & Wildlife, Land Division-Hawaii District, 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,

[Signature]  
Morris M. Atta  
Administrator

LINDA LINGLE  
OFFICE OF PLANNING



LINDA LINGLE  
OFFICE OF PLANNING



RECEIVED  
LAND DIVISION  
2009 MAY 11 10 07  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION  
POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

April 23, 2009

MEMORANDUM

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

LINDA LINGLE  
OFFICE OF PLANNING



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

April 23, 2009

MEMORANDUM

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

FROM: *for* Morris M. Ata *Mata*  
SUBJECT: Pre-Assessment for Keaanu-Pahoia Road, Shoulder Lane Conversion, Keaanu Bypass to Shower Drive  
LOCATION: Keaanu, Hawaii  
APPLICANT: Wilson Okamoto Corporation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 15, 2009.

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: *21 APR 2009*

RECEIVED  
APR 29 2009  
DAR - M.L.

FROM: *for* Morris M. Ata *Mata*  
SUBJECT: Pre-Assessment for Keaanu-Pahoia Road, Shoulder Lane Conversion, Keaanu Bypass to Shower Drive  
LOCATION: Keaanu, Hawaii  
APPLICANT: Wilson Okamoto Corporation

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by May 15, 2009.

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.

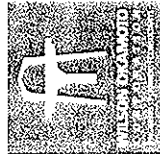
Attachments

We have no objections.  
 We have no comments.  
 Comments are attached.

Signed: \_\_\_\_\_  
Date: *APR 27 2009*

PAUL J. CONRY, ADMINISTRATOR  
DIVISION OF FORESTRY AND WILDLIFE





6615-01  
August 29, 2009

Mr. Morris Atta, Administrator  
Land Division  
Department of Land and Natural Resources  
State of Hawaii  
1151 Punchbowl Street, Room 220  
Honolulu, Hawaii 96813

Attention: Land Division -- Hawaii District

Subject: Draft Environmental Assessment, Pre-Assessment Consultation;  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Atta:

Thank you for your May 8, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that the Department of Land and Natural Resources Land Division  
Hawaii District had no comments.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barraga, DOT



6615-01  
August 29, 2009

Mr. Morris Atta, Administrator  
Land Division  
Department of Land and Natural Resources  
State of Hawaii  
1151 Punchbowl Street, Room 220  
Honolulu, Hawaii 96813

Attention: Mr. Paul Conry, Administrator Division of Forestry and Wildlife

Subject: Draft Environmental Assessment, Pre-Assessment Consultation;  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Conry:

Thank you for your April 27, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

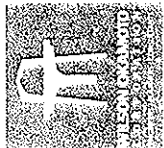
The Draft EA will include that the Department of Land and Natural Resources Land Division  
of Forestry and Wildlife no objections.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barraga, DOT



8615-01  
August 29, 2009

Mr. Morris Alta, Administrator  
Land Division  
Department of Land and Natural Resources  
State of Hawaii  
1151 Punchbowl Street, Room 220  
Honolulu, Hawaii 96813

Attention: Division of Aquatic Resources

Subject: Draft Environmental Assessment, Pre-Assessment Consultation,  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive, Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Alta:

Thank you for your April 29, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that the Department of Land and Natural Resources Land Division  
of Aquatic Resources no comments.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 671  
HONOLULU, HAWAII 96809

NOI IYO 20280 OIOWYKO NOSTIWA

6002 8 1 NDI

3 A 1 3

LAWRENCE THOMAS  
HONOLULU, HAWAII 96813  
HONOLULU, HAWAII 96813

RUSSELL Y. TSEH  
DIRECTOR

MRS. C. KAWAHARA  
DEPUTY DIRECTOR

STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
HONOLULU, HAWAII 96813

June 15, 2009

John L. Sakaguchi, AICP, Senior Planner  
Wilson Okamoto Corp.  
1907 South Beretania Street  
Artesian Plaza, Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

**SUBJECT:** National Historic Preservation Review (NHPA) Section 106 Review –  
Section 106 Historic Preservation Review Pre-Assessment Consultation for the  
Keaau-Paho Road, Federal Aid Project No. STP-130 (028)  
Kea au Ahupua'a Puna District, Island of Hawaii  
IMKS: (3) I (var.)

Thank you for the opportunity to comment on the aforementioned undertaking, which we received on  
April 27, 2009. We apologize for the delay in our reply. Repair work will entail widening of both sides of  
the highway for a total of 30-70 feet enlargement including culvert repairs/construction of stream tunnels.

We do not have records of archaeological surveys for these particular locations, but are aware of lava tube  
complexes (including many with associated burials) that cross under these stretches of the highway. For  
this reason we request you have a qualified archaeologist assess the area and include their report in the  
draft environmental assessment. Should archaeological sites or historic properties be noted during that  
assessment we will require an archaeological inventory survey of the project area.

Please contact Morgan Davis at (808) 933-7650 if you have any questions or concerns regarding this  
letter.

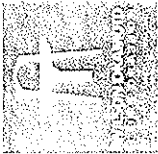
Aloha.

Nancy McMahon, Deputy SHPO/State Archaeologist  
and Historic Preservation Manager  
State Historic Preservation Division

LOG NO.: 2009.1481  
DOC NO.: 0906MD13  
Archaeology

cc: DOT  
A. Harris / J. Davis

6615-01  
6/15/09



6615-01  
August 31, 2009

Ms. Nancy McMeHon, Deputy SHPO/State Archaeologist  
Historic Preservation Division  
State of Hawaii  
Department of Land and Natural Resources  
601 Kamokila Boulevard  
Kapolei, Hawaii 96707

Attention: Ms. Morgan Davis

Subject: Draft Environmental Assessment, Pre-Assessment Consultation:  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Ms. McMeHon:

Thank you for your June 15, 2009 comment letter (LOG NO: 2009.1481, DOC No. 0906M/D13) on the Draft Environmental Assessment/ Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Two archaeological surveys, an Archaeological Assessment on the east (makai) side and an Archaeological Inventory Survey on the west (mauka) side, were conducted along the project limits. Both documents are enclosed and will also be included in the Draft Environmental Assessment.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT

Enclosures

William P. Kenoi  
Mayor



County of Hawaii

POLICE DEPARTMENT  
349 Kapiolani Street • Hilo, Hawaii 96720-3993  
(808) 935-3111 • Fax: (808) 961-8865

6615-01  
Always! Harry S. Kubojiri  
Police Chief  
Paul K. Ferreira  
Deputy Police Chief

cc: DOT Hwy/Jan

April 24, 2009

RECEIVED

APR 28 2009

HAWAIIAN TELEPHONE CORPORATION

Mr. John L. Sakaguchi, AICP  
Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania St., Suite 400  
Honolulu, HI 96828

Dear Mr. Sakaguchi:

Subject: Draft Environmental Assessment, Pre-Assessment  
Consultation; Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive; Federal Aid Project No. STP-130  
(028); Keaau, Puna District, Island of Hawaii

Staff, upon reviewing the project summary report involving the proposed shoulder lane conversion for Keaau-Paho Road between the Keaau Bypass and Shower Drive to improve traffic flow, does not anticipate any significant law enforcement and/or public safety concerns at this time.

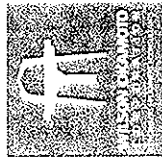
Thank you for allowing us the opportunity to comment.

If you have any questions, please contact Captain Steven Guillermo of the Puna District at 966-5635.

Sincerely,

DEREK D. PACHECO  
ASSISTANT POLICE CHIEF  
AREA I OPERATIONS

SG/ST-III



6615-01  
August 28, 2009

Chief Derek D. Pacheco, Assistant Police Chief  
Area 1 Operations  
Police Department  
County of Hawaii  
349 Kapiolani Street  
Hilo, Hawaii 96720

Subject: Draft Environmental Assessment, Pre-Assessment Consultation;  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Chief Pacheco:

Thank you for your April 24, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that the County of Hawaii Police Department does not anticipate  
any significant law enforcement and/or public safety concerns at this time.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT

William P. Kenoi  
Mayor



County of Hawaii  
FIRE DEPARTMENT  
25 Aupuni Street • Suite 102 • Hilo, Hawaii 96720  
(808) 981-8394 • Fax (808) 981-2037

6615-01

Darryl J. Oliveira  
Fire Chief

Glen P. I. Honda  
Deputy Fire Chief

5/15/09 BL  
cc: [Handwritten initials]

April 30, 2009

RECEIVED

MAY 04 2009

48100 HAWAII COMMUNICATIONS

Mr. John L. Sakaguchi, AICP, Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, HI 96826

Dear Mr. Sakaguchi,

SUBJECT: DRAFT ENVIRONMENTAL ASSESSMENT, PRE-ASSESSMENT  
CONSULTATION  
KEAAU-PAHOA ROAD, SHOULDER LANE CONVERSION, KEAAU  
BYPASS TO SHOWER DRIVE  
FEDERAL AID PROJECT NO. STP-130 (028)  
KEAAU, PUNA DISTRICT, ISLAND OF HAWAII

The Hawaii Fire Department does not have any comments to offer at this time regarding the above-  
referenced draft Environmental Assessment.

Thank you for the opportunity to comment.

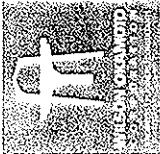
Sincerely,

DARRYL OLIVEIRA  
Fire Chief

RP:ik



Hawaii County is an Equal Opportunity Provider and Employer.



6615-01  
August 29, 2009

Fire Chief Darryl J. Oliveria, Fire Chief  
County of Hawaii  
Fire Department  
25 Aupuni Street, Suit 103  
Hilo, Hawaii 98720

Subject: Draft Environmental Assessment, Pre-Assessment Consultation;  
Keaau-Pāhoā Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Chief Oliveria:

Thank you for your April 30, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Pāhoā Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that the County of Hawaii Fire Department does not have any  
comments at this time.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT

William P. Kenai  
Mayor



County of Hawaii  
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT  
25 Aupuni Street • Hilo, Hawaii 98720  
(808) 961-8083 • Fax: (808) 961-8086  
[http://eo.hawaii.hi.us/directors/for\\_environment.htm](http://eo.hawaii.hi.us/directors/for_environment.htm)

Ivan M. Torjose  
Deputy Director

cc: DOT-Hwy-5em

IS

1/2

April 27, 2009

Mr. John L. Sakaguchi, AICP  
Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania St.  
Artesian Plaza, Suite 400  
Honolulu, HI 96826

R.E.: Draft EA Pre-Assessment Consultation  
Kea'au-Pāhoā Road, Shoulder Lane Conversion, Kea'au Bypass to Shower Drive  
Federal Aid Project No. STP-130 (028)  
Kea'au, Puna District, Island of Hawaii

Dear Mr. Sakaguchi,

We have enclosed our comments.

Thank you for allowing us to review and comment on this project.

Sincerely,

Lono A. Tyson  
DIRECTOR

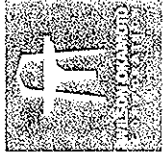
enclosure: Solid Waste Division Comment Memo

cc: SWD

7615-01  
AICP  
Lono A. Tyson  
Director

RECEIVED  
APR 29 2009

ENVIRONMENTAL MANAGEMENT



6615-01  
August 31, 2009

Mr. Lono Tyson, Director  
Department of Environmental Management  
County of Hawaii  
25 Aupuni Street  
Hilo, Hawaii 96720



Subject: Draft Environmental Assessment, Pre-Assessment Consultation,  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive, Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Tyson:

Thank you for your April 30, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will include that the County of Hawaii Department of Environmental  
Management will continue to expand the Convenience Center to utilize the available land to  
provide additional services in the future. As the population along the Keaau-Paho Road  
increases, additional traffic should be anticipated to use the existing convenience center.  
Further, the Department of Environmental Management anticipates reducing hours of  
operation, so the same or growing number of people will utilize the Convenience Center in a  
more concentrated period of hours per day, including during high traffic periods. The Draft  
EA will also note the County has submitted an application to the State Department of Health  
to change the Solid Waste Permit for the Keaau Convenience Center to the Keaau Transfer  
Station. Changing the designation to a Transfer Station will allow non-residential vehicles to  
utilize the Keaau facility. Based on these factors, the County believes that the usage of the  
Keaau facility will increase.

The Draft EA will note, to mitigate the expected increase in usage of the County facility, a  
short shelter lane could be added for northbound (toward Hilo) vehicles exiting the facility.  
The Draft EA will add a full length acceleration lane would conflict with adjacent driveways  
to the north (Human Society). The left turn storage lane into the County facility will not be  
extended at this time due to its proximity to the Humane Society driveway.

	
<b>SOLID WASTE DIVISION</b>	
DEPARTMENT OF ENVIRONMENTAL MANAGEMENT	
COUNTY OF HAWAII - 108 RAILROAD AVENUE - HILO, HI 96720	
HILO (808) 961-5514 WAIMEA (808) 887-3016 KONA (808) 327-3507	
FAX: 961-8553 887-3025 327-3506	

April 26, 2009

TO: Lono Tyson, Director

FROM: Mike Dworsky, SWD Chief

RE: Comments on Draft EA - Pre-Assessment Consultation  
Federal Aid Project No. STP-130 (028)

We have read the Project Summary provided and offer the following comments:

- We note that the consultant is aware of the County of Hawaii's Refuse Transfer Station (Kea'au Convenience Center) located on the makai side of the Kea'au-Paho Road at the beginning of the project limits.
- The Department of Environmental Management will continue to expand the Convenience Center to utilize the available land that will provide additional services in the future. As the population along the Kea'au-Paho Road increases, we anticipate additional traffic utilizing of the existing access road. We also anticipate reducing hours of operation, so the same or growing number of people will utilize the Convenience Center in a more concentrated period of hours per day, including your high traffic usage. We have also made application to the State Department of Health to change the Solid Waste Permit for the Kea'au Convenience Center to the Kea'au Transfer Station. Changing the designation to a Transfer Station will allow non-residential vehicles to utilize the Kea'au facility. For all the above reasons we believe that the usage will increase.
- There are also plans by the Department of Water Supply to construct a spigot facility off the Convenience Center access road as indicated in the Final Environmental Assessment Construction of Island-wide Spigot Facilities prepared by M&E Pacific as amended April 2006.
- Finally, W.H. Shipman, property owner, has requested an easement through the Kea'au Transfer Station access road to gain access to property located behind the convenience center. We require that any widening or modifications of the Kea'au-Paho Road comply with the State of Hawaii Department of Transportation (DOT) requirements. The Solid Waste Division utilizes large tractor-trailer compactor trucks and large roll-on trailers at our convenience center/transfer station. Appropriate access for our vehicles must be provided. For more information about the vehicles that utilize the site, please contact Bobby Gonsalves, Solid Waste Superintendent at 961-8514.

Hawaii's County is an equal opportunity provider and employer.

2/2



6615-01

Letter to Mr. Lono Tyson, Director

Page 2

August 31, 2009

Lastly, to mitigate increase use of the facility for southbound (toward Pahoa) vehicles, the existing center shelter lane will be extended to allow easier exiting for vehicles bound in the Pahoa direction.

Regarding expansion of the transfer station and potential road easement for W.H. Shipman property, a traffic study and signal warrant study should be included at that time. A consolidation of all three driveways with the transfer station driveway and the addition of a traffic signal should also be included at that time. These two changes will not be part of the Shoulder Lane Conversion project.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT



DEPARTMENT OF WATER SUPPLY, COUNTY OF HAWAII  
345 KEĀĀNAHĀ STREET, SUITE 20, HILLO, HAWAII 96720  
TELEPHONE (808) 961-8050, FAX (808) 961-8587

May 20, 2009

RECEIVED  
MAY 22 2009

Mr. John L. Sakaguchi  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, HI 96826

PRE-ENVIRONMENTAL ASSESSMENT CONSULTATION  
KEAAU-PAHOA ROAD SHOULDER LANE CONVERSION, KEAAU BYPASS  
TO SHOWER DRIVE.  
TAX MAP KEY 1-5 AND 1-6

This is in response to your Pre-Environmental Assessment Consultation letter dated April 20, 2009.

Please be informed that there is an existing 12-inch waterline within Keau-Pahoa Road in the proposed project area. The 12-inch waterline is located mostly on the makai side of the road. We have no objection to the proposed project with the condition that the applicant/contractor will be responsible for the cost of relocating or modifying any of our water system facilities within the project area, should it be necessary.

Should you have any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at (808) 961-8070, extension 255.

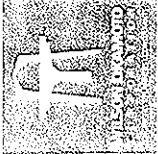
Sincerely yours,

Milton D. Pavao, P.E.  
Manager

FM:dfg

... Water brings progress...

This Department of Water Supply is an Equal Opportunity provider and employer. To file a complaint of discrimination, write: USDA, Director, Office of Civil Rights, Room 3289-N, Wilson Building, 14th and Independence Avenue, SW, Washington DC 20250-8410. Or call: (202) 726-5884 (voice and TDD)



6615-01  
August 29, 2009

Mr. Milton Pavao, PE, Manager  
Department of Water Supply  
County of Hawaii  
345 Kekuanoa Street, Suite 20  
Hilo, Hawaii 96720

Subject: Draft Environmental Assessment, Pre-Assessment Consultation;  
Keaau-Paho Road, Shoulder Lane Conversion, Keaau Bypass to Shower  
Drive; Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Pavao:

Thank you for your May 20, 2009 comment letter on the Draft Environmental Assessment/  
Pre-Assessment Consultation on the Keaau-Paho Road, Shoulder Lane Conversion,  
Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Draft EA will note an 8-inch waterline owned by the County of Hawaii Department of  
Water Supply (DWS) is located along the mauka side of the road at the beginning project  
limits for about 1,000 feet. From there, the line crosses under the road to the makai side  
and becomes a 12-inch line for the remaining 1,210 feet of the project limits. The waterline  
is about 20 feet from the makai right-of-way. The existing 12-inch waterline is hung on the  
makai side of the bridge.

The Draft EA will also state the Shoulder Lane Conversion project includes relocation of the  
12-inch waterline to the new 8-foot shoulder on the east side along the entire project limits.  
The waterline relocation will be done by HDOT under a utility agreement between the HDOT  
and the County of Hawaii Department of Water Supply (DWS).

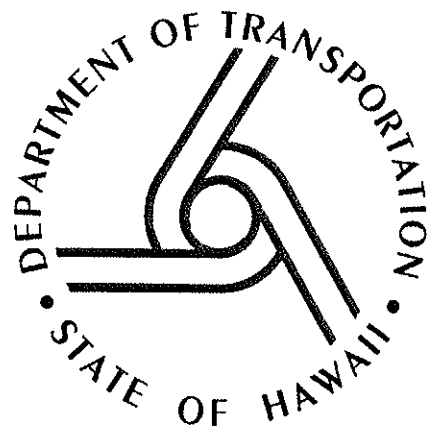
We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP  
Senior Planner

cc: E. Barroga, DOT





**APPENDIX B**

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**Biological and water quality  
reconnaissance survey of an unnamed  
stream along the Keaau-Pahoia Road,  
Puna District, Island of Hawai`i**

---



*AECOS, Inc.*, 45-939 Kamehameha Hwy., No. 104  
Kane`ohe, Hawai`i 96744

April 2004

---

# Biological and water quality reconnaissance survey of an unnamed stream along the Keaau-Pahoia Road, Puna District, Island of Hawai`i<sup>1</sup>

---

April 20, 2004

AECOS No. 1054

Susan Burr  
AECOS, Inc. 45-939 Kamehameha Hwy, Suite 104  
Kaneohe, Hawai`i 96744  
Phone: (808) 234-7770 Email: aecos@aecos.com

---

## Introduction

This report provides a description of an unnamed stream near Kea`au of the Big Island for the purpose of assessing impacts of a proposed shoulder lane conversion project on Keaau-Pahoia Road between Keaau Bypass Road and Shower Lane. The project will create a new permanent northbound lane and improve the existing drainage structures (one bridge and six culverts) to alleviate flooding conditions. Two branches of the terminal end of this unnamed stream flow beneath the bridge and one of the culverts. Biologists from AECOS, Inc. visited the site on March 4, 2004 and conducted a reconnaissance survey of the area immediately around the existing road bridge and large culvert next to the bridge. The biologists collected one water quality sample for analysis in the laboratory, made two sets of water quality measurements in the field, and identified aquatic biota present.

## Stream Description

The unnamed stream is part of an intermittently flowing stream system that arises around the 730 to 760 m (2400 to 2500 ft) elevation on the east slope of Mauna Loa above Mountain View (Figure 1). This is an area marked by an extensive deposit of Pahala ash (Macdonald and Abbott, 1970), a weathered material resembling tuff, which accounts for the presence of surface streams here in contrast to the fact that very few streams exist anywhere else on Mauna Loa or Kilauea volcanoes because youthful lavas of these mountains are too porous to support channelized water flow for any significant

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<sup>1</sup> Report prepared for Wilson Okamoto Corporation for their project: "Keaau-Pahoia Road, Shoulder Land Conversion." This report will become part of the public record.

permeable Kilauea lavas. Consequently, when flowing, this stream does not empty into the ocean and is considered an interrupted stream. Whatever water it does carry arrives at the coast after dispersing underground. Because this stream system is not perennial, it is not listed in the Hawaii Stream Assessment (Hawaii Cooperative Park Service Unit, 1990).

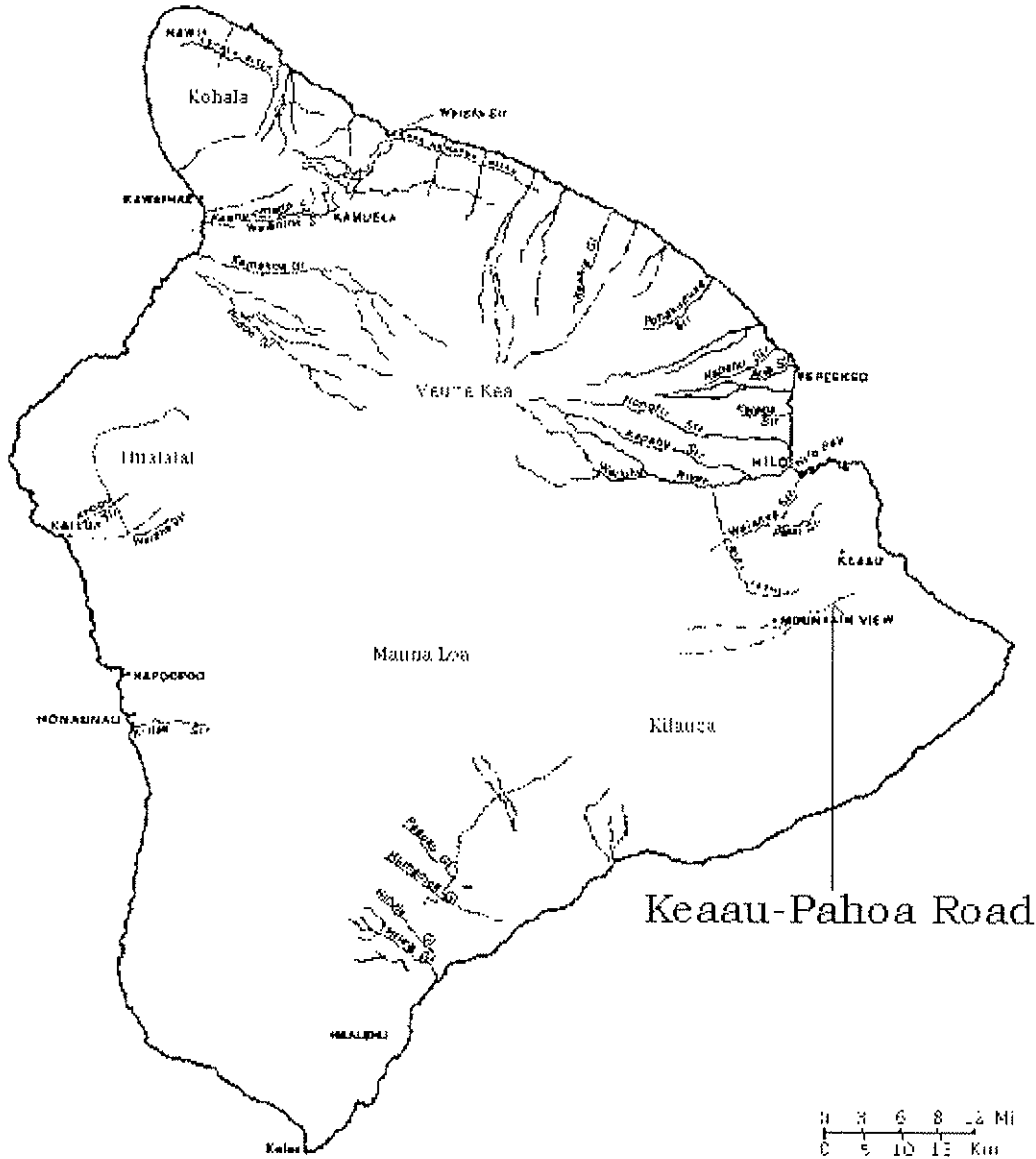


Figure 1. Approximate location of the Keaau-Paho Road and the unnamed stream on a map of the Big Island (Hawai`i) showing distribution of streams and diversion ditches.

The elevation in the project area is approximately 100 m (330 ft). Upstream from the road, the unnamed stream has eroded downward only a couple of meters relative to the surrounding land (Figure 2). Downstream from the road, the stream bed is much less distinct as it merges with the

floodplain and soon thereafter disappears completely. The stream bed in the immediate vicinity of the road consists of basalt bedrock and scattered rough, blocky basalt boulders (Figure 3). During the survey on March 4, 2004, the stream was dry at both the bridge and culvert and only a few small pools were observed between approximately 80 m and 100 m (260 to 330 ft) downstream from the bridge. The dimension of the largest pool was approximately 1 x 1 m (3 x 3 ft) and no more than 10 cm (4 in) deep (Figure 4). A single, much smaller pool (1 x 0.3 m or 3 x 1 ft) was observed in a small depression underneath the bridge.

## Water Flow and Water Quality

There was no water flowing in the stream on the day of the survey and only a small amount of water, remnants of earlier rainfall, was present in ponds. Flow beneath the bridge could be occurring in the porous bed material and therefore not readily observable. Given that annual rainfall in this part of the Big Island is between 3810 and 5080 mm (150 and 200 in) (Taliaferro, 1959), some pools of water in the stream bed are likely to be semi-permanent aquatic features.

A water sample was collected from the largest pool located approximately 100 m (330 ft) downstream from the bridge (Pool No. 1). Some water quality parameters were measured *in situ* in this pool and in a smaller one underneath the bridge (Pool No. 2). These waters were analyzed for the water quality parameters indicated in Table 1. At the time of sampling (09:45 AM), the weather was sunny and winds were calm. It had rained lightly earlier that morning or the previous evening.

Table 2 presents the *in situ* and laboratory measurements taken from the unnamed stream near Keaau-Pahoia Bypass Road. The results of the *in situ* measurements (temperature, pH, and DO) indicated relatively good water quality, considering the site was an isolated pond. Water quality might be expected to be better if measurements had been made when the stream was flowing. Total nitrogen levels were moderately high, but nitrate + nitrite and ammonia levels are low; indicating most of the pond nitrogen is organic nitrogen. Turbidity, TSS, and total phosphorus levels are all normal or low. The measurements taken on March 4, 2004 do not reveal any obvious water quality problems, and in fact, water quality is indicated as very good, perhaps reflecting a relatively constant turnover of the water in the isolated pools due to regular rainfall inputs.



*Figure 2. Slightly downward-cut stream bed upstream from the culvert on Keaau-Pahoa Road.*



*Figure 3. Stream bed in the vicinity of the Keaau-Pahoa Road, consisting of basalt bedrock and boulders.*



*Figure 4. Small pool downstream from the Keaau-Pahoa Road from which Pool #1 water quality sample was collected.*

Table 1. Analytical methods and instruments used for the March 4, 2004 water quality sampling of an unnamed stream on the Keaau-Pahoia Bypass Road in Kea`au, Puna District, Hawai`i.

Analysis	Method	Reference	Instrument
Ammonia	alkaline phenol	Karoleff in Grasshoff et al. (1986)	Technicon AutoAnalyzer II
Dissolved Oxygen	EPA 360.1	EPA (1979)	YSI Model 550 DO meter
Nitrate + Nitrite	EPA 353.2	EPA (1993)	Technicon AutoAnalyzer II
pH	EPA 150.1	EPA (1993)	SA 250
Temperature	thermister calibrated to NBS cert. thermometer (EPA 170.1)	EPA (1979)	YSI Model 550 DO meter
Total Nitrogen	persulfate digestion/EPA 353.2	D'Elia et al. (1977) / EPA (1993)	Technicon AutoAnalyzer II
Total Phosphorus	persulfate digestion/EPA 365.1	Koroleff in Grasshoff et al. (1986)/EPA (1993)	Technicon AutoAnalyzer II
Total Suspended Solids	Method 2540D (EPA 160.2)	Standard Methods 18th Edition (1992); EPA (1979)	Mettler H31 balance
Turbidity	Method 2130B (EPA 180.1)	Standard Methods 18th Edition (1992); EPA (1993)	Hach 2100P Turbidimeter

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Table 2. Water quality characteristics on March 4, 2004 of an unnamed stream near the Keaau-Pahoia Bypass Road, Keaau, Puna District, Hawai'i.

	Time sampled	Temp. (°C)	DO (mg/l)	DO (% Sat.)	pH (pH units)	
Pool # 1	0945	23.2	6.0	70	6.87	
Pool # 2	1005	22.5	4.3	50	5.73	
	Turbidity (ntu)	TSS (m/l)	Ammonia (µg N/l)	Nitrate + nitrite (µg N/l)	Total N (µg N/l)	Total P (µg P/l)
Pool # 1	2.32	6.2	<1	1	462	23
Pool # 2	---	--	--	--	--	--

## Biota

The area surrounding the bridge project is former sugar cane land. Today, diversified crops are being grown on some of the surrounding parcels. A variety of grasses, sedges, and herbaceous weeds occur within the stream bed. No hydrophytic (aquatic) vegetation was observed. Only one aquatic animal, an indigenous dragonfly nymph, was observed in the stream, in the pool approximately 100 m (330 ft) downstream from the bridge in a pool (see Table 3). Though not an aquatic species, several *Euglandina rosea* (cannibal snail) shells were observed throughout the stream bed downstream from the bridge.

In 1998, AECOS, Inc. conducted a survey of this same stream for a similar road project at approximately the 595 m (1950 ft) elevation (AECOS, 1998). At the time of that survey there was also no flowing water in the stream, but there were several larger pools present in the area. A large plunge pool supported small numbers of guppies (*Poecilia reticulata*) and American bullfrog adult and tadpoles (*Rana catesbeiana*). In smaller, isolated pools downstream of the road, a dragonfly nymph, which may have been the giant Hawaiian dragonfly (*Anax* sp.), was collected, as were several individuals of two species of small pond snails, *Physa* sp. and *Pseudosuccinea columella*. No other reports providing data on stream biota from this system were located.



Table 3. Checklist of aquatic biota observed on March 4, 2004 in an unnamed stream at Keaau-Pahoa Road, Kea`au, Puna District, Hawai`i.

Species	Common name	Status	QC Code	Abundance
<b>INVERTEBRATES</b>				
ARTHROPODA, INSECTA				
ODONATA, LIBELLULIDAE				
	(dragonfly)			
<i>Pantala flavescens</i> (Fabricius)	nymph	ind.	20	P

KEY TO SYMBOLS USED:

Status:

nat. - naturalized. An introduced or exotic species.

**ind.** - indigenous. A native species also found elsewhere in the Pacific.

**end.** - endemic - A native species found only in the Hawaiian Islands.

**pol.** - Polynesian introduction.

QC Code:

10 - Observed and identified in the field.

20 - Collected; identified in the laboratory; specimen(s) not saved.

21 - Collected; identified in the laboratory; voucher specimen(s) saved.

† - Identified from non-living material (e.g., shell), sign, or call.

Abundance at survey location:

P - present; not common, but unable to assess abundance.

R - rare; only one or two individuals seen.

U - uncommon; several individuals seen, in some habitat places visited.

C - common; numerous individuals seen, or seen in most habitat places visited.

A - abundant; numerous in most habitat places visited

## Assessment

The quality of the small amount of water that was present near the Keaau-Pahoa Bridge and culvert at the time of sampling was good. Regular rainfall is responsible for regular turnover of the water in these pools. The only native aquatic organisms observed within 100 m (330 ft) of the existing bridge on Keaau-Pahoa Road was the dragonfly nymph, *Pantala flavescens*. No threatened or endangered species were observed in the stream.

The unnamed stream flows only intermittently, although the isolated pools downstream from the bridge may be semi-permanent aquatic features. Isolated pools will support a variety of aquatic insects, perhaps including native species, although only one dragonfly was collected during the field reconnaissance. The stream does not open to the ocean, precluding recruitment of Hawaiian diadromous<sup>2</sup> stream fauna. Aquatic habitat is very limited in the vicinity of the road and absent during dry periods. Reconstruction of the bridge on Keaau-Pahoa Road will have no adverse impacts on aquatic resources in the area.

<sup>2</sup> Diadromous – aquatic species that regularly migrate between the ocean and freshwater streams. In Hawai`i, native aquatic species, including `o`opu (fishes), hihiwai (snail), and `opae (prawns), develop as larvae in the ocean, then migrate as juveniles into streams.

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# Supplemental surveys for the Kea'au-Paho Road, Shoulder Lane Conversion Project, Puna District, Island of Hawai'i

CC: DOT/em

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August 20, 2009

AECOS No. 1054B

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## Introduction

This report<sup>1</sup> supplements descriptions of the natural environment along Kea'au-Paho highway between Kea'au Bypass Road/Keaau-Paho Road intersection and Shower Drive (State Route 130) on the Island of Hawai'i (Fig. 1) for the purpose of assessing impacts of a proposed shoulder lane conversion project. This project will create a new permanent northbound lane and improve the existing drainage structures (one bridge and six culverts) to alleviate flooding conditions. Two branches of an unnamed stream<sup>2</sup> Stream flow beneath a bridge at project survey point 164+60 and a culvert at project survey point 157+20. Biologists from AECOS, Inc. originally visited the project site on March 4, 2004 and conducted a reconnaissance survey of the area immediately around the existing road bridge and large culvert north of the bridge (see AECOS, 2004). For this report, a second visit was made on December 9, 2008 to conduct a botanical survey of the entire mauka (west) side of the road for the length of the project (the east side and part of the west side had been surveyed previously; Funk, 2004) and to investigate the lower course of the unnamed stream to confirm that no outlet to the ocean exists for this stream system arising around the 2500-ft (760-m) elevation in the Twentytwo Mile Road area above Mountain View.

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<sup>1</sup> Report prepared for Wilson Okamoto Corporation for their project: "Keaau-Paho Road, Shoulder Land Conversion." This report will become part of the public record.  
<sup>2</sup> "Waipāhoehoe" is marked on the bridge of the larger branch, but may be only a reference to the old village (site) by that name located roughly 0.9 mi to the east of the bridge. There is a Waipāhoehoe Stream on the Island of Hawai'i in the Kaumana area above Hilo, a stream that also terminates far back from the coastline in the lava flow of 1881.

## Botanical Survey

### Methods

The west side of the highway right-of-way was surveyed by traversing on foot the entire distance (twice) between the Kea'au-Pahoia Bypass intersection on the south side of Kea'au town to a point approximately 1.0 mi (1.6 km) south of Pōhaku Drive while recording all plants as they were encountered. In general, the survey area was limited to the highway verge and a distance of approximately 50 ft (15 m) distant from the highway edge, although this varied somewhat dependent upon access. For example, where houses and landscaped yards occurred adjacent to the roadway, a narrower area was surveyed.

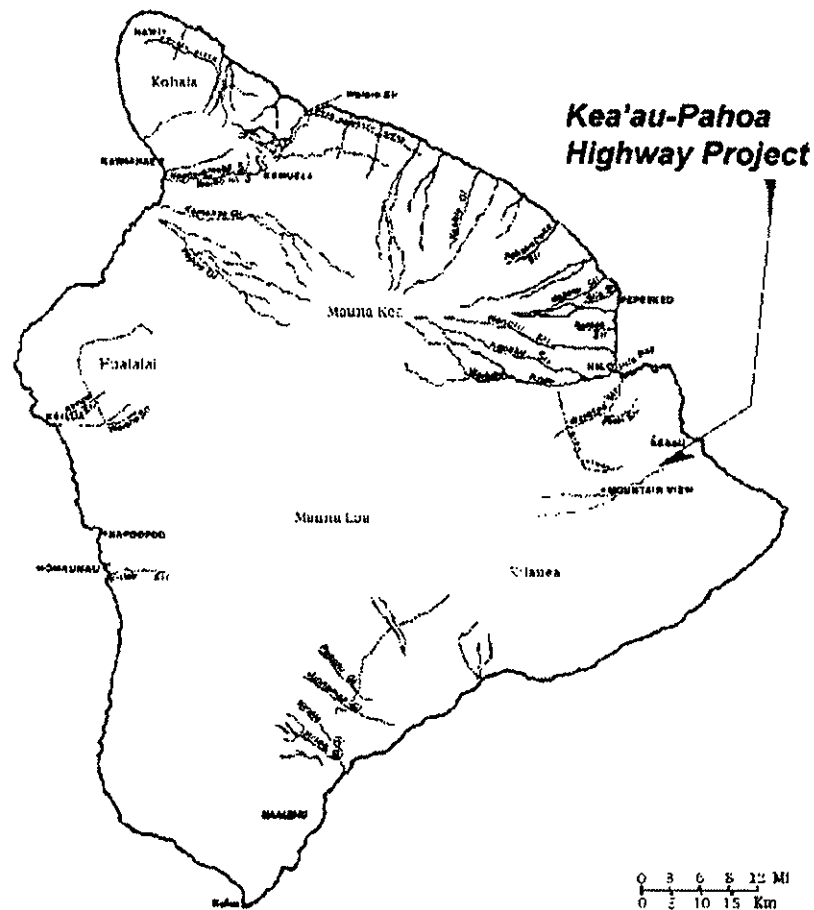
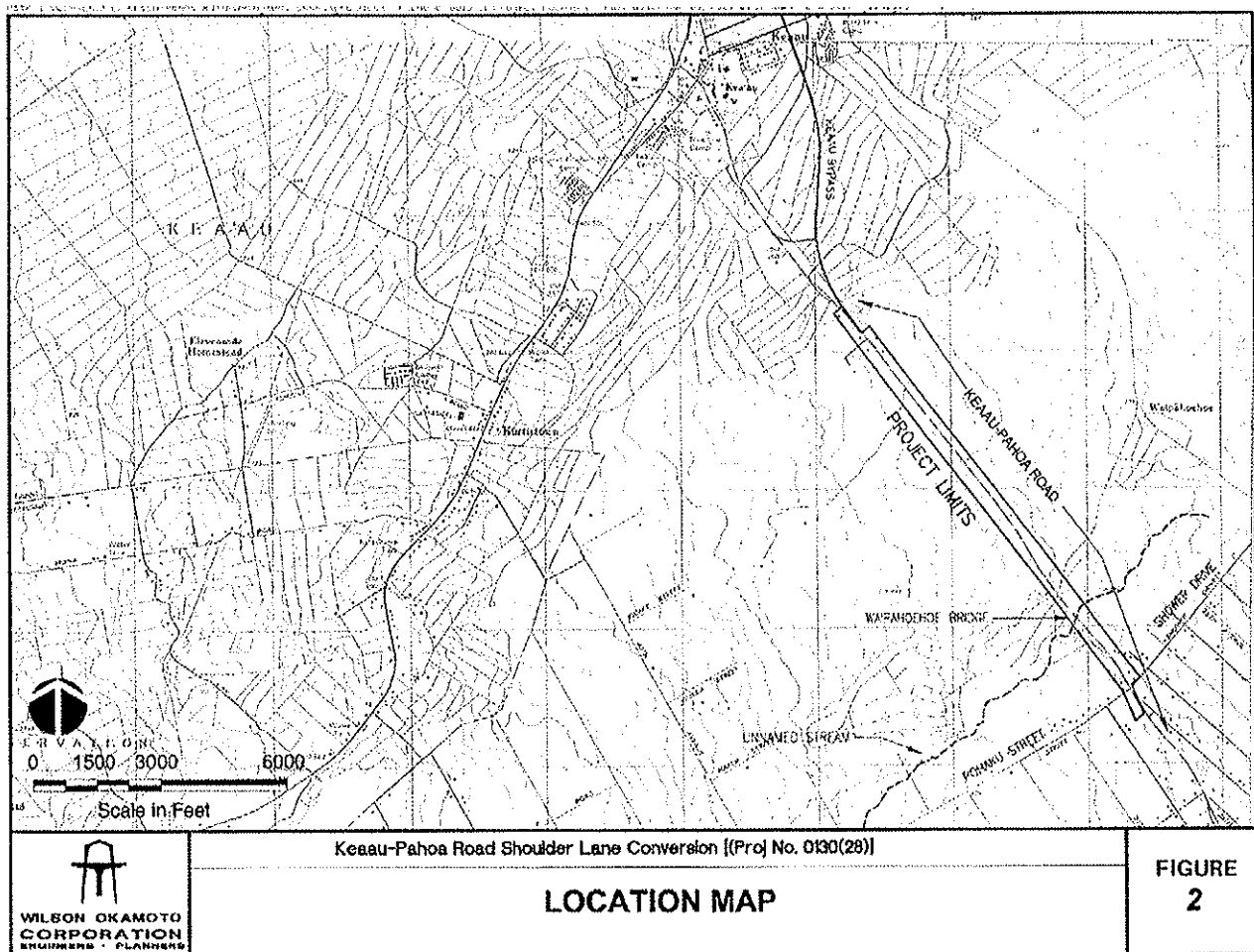


Figure 1. Location of Kea'au-Pahoia Highway project on the Island of Hawai'i.



## Results

The result of the botanical survey is a listing of the species encountered (Table 1). Semi-quantitative abundance estimates of the plants divided between verge and "interior" areas is provided in the table. In addition, all of the species observed by Funk (2004) along this same highway corridor are included, marked by note <1> in the last column.

A total of 140 species of flowering plants and ferns have now been identified from along the stretch of highway extending south from Kea'au to 1 mi south of Pōhaku Drive. This number reflects the results of two independent surveys conducted in the project area. The species lists from the two surveys are very similar, differing mostly in the large number of ornamentals (23) identified in 2008 (only 4 were listed in 2004, either because ornamentals were ignored, or the slightly different survey areas covered fewer house lots). Other differences in the species lists are clearly explained in the Funk report as reflecting true differences in the flora on the east versus west sides of the highway.

**Table 1. Flora listing for the Kea'au-Pahoia Highway  
Shoulder Lane Conversion Project.**

Species listed by family	Common name	Status	Abundance		Notes
			VERGE/INTERIOR		
<b>FERNS AND FERN ALLIES</b>					
GLEICHENIACEAE					
<i>Dicranopteris linearis</i> (Burm. f.) Underw.	<i>uluhe</i>	<b>Ind</b>	--	A	<1>
NEPHROLEPIDACEAE					
<i>Nephrolepis exaltata</i> (L.) Schott	<i>kupukupu</i>	<b>End</b>	--	--	<1>
<i>hawaiiensis</i> W. H. Wagner					
<i>Nephrolepis multiflora</i> (Roxb.) F.M. Jarrette ex C. V. Morton	---	Nat	O	C	
POLYPODIACEAE					
<i>Lepisorus thunbergianus</i> (Kaulf.) Ching	<i>pākahakaha</i>	<b>Ind</b>	--	R	
<i>Phlebodium aureum</i> (L.) J. Sm.	rabbit's foot fern	Nat	--	R	
<i>Phymatosorus grossus</i> (Langsd. & Fisch.) Brownlie	<i>laua'e</i>	Nat	--	U2	<1>
PSILOTAECAE					
<i>Psilotum nudum</i> (L.) P. Beauv.	<i>moa</i>	<b>Ind</b>	--	R	<1>
THELYPTERIDACEAE					
<i>Christella parasitica</i> (L.) Lév	oak fern	Nat	P	--	
<b>FLOWERING PLANTS</b>					
<i>Dicotyledons</i>					
ACANTHACEAE					
<i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	Nat	--	--	<1>
<i>Justicia betonica</i> L.	white shrimp plant	Nat		R3	<1>
<i>Thunbergia fragrans</i> Roxb.	white thunbergia	Nat	R	--	<1>
ANACARDIACEAE					
<i>Mangifera indica</i> L.	mango	Nat	--	O	<1>
APIACEAE					
<i>Centella asiatica</i> (L.) Urb.	Asiatic pennywort	Nat	--	--	<1>
APOCYNACEAE					
<i>Allamanda cathartica</i> L.	allamanda	Orn	--	U	
<i>Nerium oleander</i> L.	oleander	Orn	--	U	
<i>Plumeria rubra</i> L.	frangipani	Orn	--	U	
ARALIACEAE					
<i>Schefflera arboricola</i> (Hayata) Merr.	dwarf umbrella tree	Orn	--	R	
<i>Schefflera actinophylla</i> (Endl.) Harms	octopus tree	Nat	--	O	
ASTERACEAE (COMPOSITAE)					
<i>Ageratum conyzoides</i> L.	<i>maile hohono</i>	Nat	A	--	<1>
<i>Ageratum houstonianum</i> Mill.	<i>maile hohono</i>	Nat	R	--	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance		Notes
			VERGE	INTERIOR	
ASTERACEAE (continued)					
<i>Bidens alba</i> (L.) DC	beggartick	Nat	--	--	<1>
<i>Bidens pilosa</i> L.	beggartick	Nat	C	--	
<i>Crassocephalum crepidioides</i> (Benth.) S. Moore	---	Nat	R	--	
<i>Emilia fosbergii</i> Nicolson	Flora's paintbrush	Nat	R	--	
<i>Emilia sonchifolia</i> (L.) DC	Flora's paintbrush	Nat	--	--	<1>
<i>Pluchea carolinensis</i> (Jacq.) G. Don	sourbush	Nat	--	U	
<i>Pluchea indica</i> (L.) Less.	Indian fleabane	Nat	--	--	<1>
<i>Sphagneticola trilobata</i> (L.) Pruski	wedelia	Nat	--	R2	<1>
<i>Cyanthillium cinereum</i> (L.) H. Rob.	little ironweed	Nat	C	--	
BALSAMINACEAE					
<i>Impatiens walleriana</i> J. D. Hooker	impatiens	Nat	--	R	
BEGONIACEAE					
<i>Begonia hirtella</i> Link	begonia	Nat	R	--	<1>
BIGNONIACEAE					
<i>Spathodea campanulata</i> P. Beauv.	African tulip tree	Nat	--	--	<1>
BRASSICAEAE					
<i>Coronopus didymus</i> (L.) Sm.	swinecress	Nat	O	--	
BUDDLEJACEAE					
<i>Buddleja asiatica</i> Lour.	dog tail	Nat	--	R	<1>
CAMPANULACEAE					
<i>Hippobroma longiflora</i> (L.) G. Don	star of Bethlehem	Nat	U	--	
CASURINACEAE					
<i>Casuarina equisetifolia</i> L.	ironwood	Nat	--	U	<1>
CAPRIFOLIACEAE					
<i>Sambucus mexicana</i> K. Presl. ex A. DC	Mexican elder	Nat	--	--	<1>
CECROPIACEAE					
<i>Cecropia obtusifolia</i> Bertol.	guarumo	Nat	--	C	<1>
CLUSIACEAE					
<i>Clusia rosea</i> Jacq.	autograph tree	Nat	--	--	<1>
CONVOLVULACEAE					
<i>Ipomoea cairica</i> (L.) Sweet.	koali 'ai	<b>Ind</b>	--	--	<1>
<i>Ipomoea obscura</i> (L.) Ker-Gawl.	morning glory	Nat	--	--	<1>
<i>Ipomoea triloba</i> L.	little bell	Nat	--	--	<1>
EUPHORBIACEAE					
<i>Acalypha</i> sp.	---	Orn	--	R	
<i>Acalypha wilkesiana</i> Müller	beefsteak plant	Orn	--	R	
<i>Aleurites moluccana</i> (L.) Willd.	kukui	<b>Pol</b>	--	--	<1>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance		Notes
			VERGE	INTERIOR	
<b>EUPHORBIACEAE (continued)</b>					
<i>Chamaesyce hirta</i> (L.) Millsap.	garden spurge	Nat	A	--	
<i>Chamaesyce hypericifolia</i> (L.) Millsp.	graceful spurge	Nat	U	--	
<i>Chamaesyce prostrata</i> (Aiton) Small	prostrate spurge	Nat	--	--	<1>
<i>Euphorbia heterophylla</i> L.	<i>kaliko</i>	Nat	R	--	
<i>Phyllanthus debilis</i> Klein ex Willd.	niuri	Nat	O	--	<1>
<b>FABACEAE</b>					
<i>Bauhinia</i> sp.	orchid tree	Orn	--	R	
<i>Centrosema</i> sp.	white butterfly pea	Nat	R	--	
<i>Chamaecrista nictitans</i> (L.) Moench	partridge pea	Nat	O	--	<1>
<i>Crotalaria incana</i> L.	fuzzy rattlepod	Nat	U	--	<1>
<i>Crotalaria pallida</i> Aiton	smooth rattlepod	Nat	U	--	
<i>Crotalaria retusa</i> L.	rattlepod	Nat	R	--	
<i>Desmodium incanum</i> DC	Spanish clover	Nat	--	U	
<i>Desmodium triflorum</i> (L.) DC	---	Nat	U	--	<1>
<i>Desmodium tortuosum</i> (Sw.) DC	Florida beggarweed	Nat.	R	--	
<i>Erythrina crista-galli</i> L.	cock's-spur coral tree	Orn	--	R	
<i>Falcataria moluccana</i> (Miq.) Barneby & Grimes	albizia (juv)	Nat	--	R	
<i>Leucaena leucocephala</i> (Lam.) de Wit	<i>koa haole</i>	Nat	--	U3	<1>
<i>Macroptilium atropurpureum</i> (DC) Urb.	---	Nat	R	--	
<i>Mimosa pudica</i> L.	sensitive plant	Nat	U	U	<1>
<i>Senna alata</i> (L.) Roxb.	candle bush	Nat	--	--	<1>
<b>LAMIACEAE</b>					
<i>Hyptis pectinata</i> (L.) Poit.	comb hyptis	Nat	O	--	<1>
<b>LAURACEAE</b>					
<i>Persea americana</i> Mill.	avocado	Nat	--	U	<1>
<b>LYTHRACEAE</b>					
<i>Cuphea carthagenensis</i> (Jacq.) Macbr.	tarweed	Nat	--	--	<1>
<b>MALVACEAE</b>					
<i>Hibiscus furcellatus</i> Desr.	<i>'akiohala</i>	<b>Ind</b>	--	R	
<i>Hibiscus tiliaceus</i> L.	<i>hau</i>	<b>Ind</b>	--	U	<1>
<i>Sida rhombifolia</i> L.	---	Nat	R	--	
<b>MELASTOMATACEAE</b>					
<i>Clidemia hirta</i> (L.) D. Don	Koster's curse	Nat	--	U	<1>
<i>Dissotis rotundifolia</i> (Sm.) Triana	---	Nat	U	U	<1>
<i>Heterocentron subtriplinervium</i> (Link & Otto) A. Braun & C. Bouché	pearl flower	Nat	--	R	
<i>Melastomia candidum</i> D. Don	---	Nat	--	--	<1>
<i>Tibouchina herbacea</i> (DC) Cogn.	glory bush	Nat	--	R	



Table 1 (continued).

Species listed by family	Common name	Status	Abundance		Notes
			VERGE	INTERIOR	
<b>MORACEAE</b>					
<i>Ficus elastic</i> var. 'Rubra'	Indian rubber tree	Orn	--	R	
<i>Ficus microcarpa</i> L. fil.	Chinese banyan	Nat	--	U	<1>
<i>Ficus pumila</i> L.	climbing fig	Orn	--	R3	
<i>Ficus</i> sp.	banyan	Orn	--	--	<1>
<b>MYRSINACEAE</b>					
<i>Ardisia elliptica</i> Thunb.	shoebutton ardisia	Nat	R	C	
<b>MYRTACEAE</b>					
<i>Metrosideros polymorpha</i> Gaud.	'ōhi'a	<b>End</b>	--	C	<1>
<i>Psidium cattleianum</i> Sabine	strawberry guava	Nat	--	A	<1>
<i>Psidium guajava</i> L.	common guava	Nat	--	U	<1>
<i>Syzygium jambos</i> (L.) Alton	rose apple	Nat	--	--	<1>
<b>NYCTAGINACEAE</b>					
<i>Bougainvillea</i> cf. <i>spectabilis</i> Willdenow	bougainvillea	Orn	--	U	
<b>ONAGRACEAE</b>					
<i>Ludwigia octovalvis</i> (Jacq.) Raven	primrose willow	<b>Pol</b>	--	--	<1>
<b>PASSIFLORACEAE</b>					
<i>Passiflora foetida</i> L.	running pop	Nat	R	--	
<b>POLYGALACEAE</b>					
<i>Polygala paniculata</i> L.	---	Nat	A	--	<1>
<b>ROSACEAE</b>					
<i>Eriobotrya japonica</i> (Thunb.) Lindl.	loquat	Orn	--	--	<1>
<b>RUBIACEAE</b>					
<i>Paederia foetida</i> L.	<i>maile pilau</i>	Nat	U	--	<1>
<i>Richardia brasiliensis</i> Gomes	---	Nat	R	--	
<i>Spermacoce assurgens</i> Ruiz & Pav.	buttonweed	Nat	O	--	<1>
<b>SOLANACEAE</b>					
<i>Solanum americanum</i> Mill.	<i>pōpolo</i>	<b>Ind?</b>	R	--	<1>
<b>STERCULIACEAE</b>					
<i>Melochia umbellata</i> (Houtt.) Stapf	---	Nat	--	U	<1>
<i>Waltheria indica</i> L.	'uhaloa	<b>Ind?</b>	--	--	<1>
<b>TURNERACEAE</b>					
<i>Turnera ulmifolia</i> L.	yellow alder	Nat	R	--	
<b>ULMACEAE</b>					
<i>Trema orientalis</i> (L.) Blume	gunpowder tree	Nat	--	U	<1>
<b>VERBENACEAE</b>					
<i>Stachytarpheta australis</i> Moldenke	---	Nat	O	--	
<i>Stachytarpheta cayennensis</i> (Rich.) Vahl.	---	Nat	--	U	<1>
<i>Stachytarpheta jamaicensis</i> (L.) Vahl	Jamaican vervain	Nat	--	--	<1>

Table 1 (continued).

Species listed by family	Common name	Status	Abundance		Notes
			VERGE	INTERIOR	
<b>FLOWERING PLANTS</b>					
<b>Monocotyledons</b>					
<b>AGAVACEAE</b>					
<i>Cordyline fruticosa</i> (L.) A. Chev..	ti, ki	Nat	--	O	
<i>Dracaena marginata</i> Lam.	money tree	Orn	--	R	
<i>Dracaena sanderiana</i> M.T. Masters	sanderiana	Orn	--	R	
<b>ARACEAE</b>					
<i>Caladium</i> sp.	green w/white blotches	Orn	R	--	
<i>Monstera delicosa</i> Liebm.	monstera	Orn	--	R	
<b>ARECACEAE</b>					
<i>Archontophoenix alexandrae</i> (F. v. Mueller) Wendl. & Drude	Alexandria palm	Nat	--	U	
<i>Areca catechu</i> L.	betel nut	Orn	--	--	<1>
<i>Cocos nucifera</i> L.	coconut	Nat	--	R	<1>
<i>Dypsis lutescens</i> (H. Wendl.) Beentje & Dransfield	golden-fruited palm	Orn	--	R	
<i>Roystonea regia</i> (Kunth) O.F. Cook	royal palm	Orn	--	R	
<i>Veitchia merrillii</i> (Becari) H.E. Moore	Manila palm	Orn	--	R	
<b>COMMELINACEAE</b>					
<i>Commelina diffusa</i> N. L. Burm.	day flower	Nat	U	--	<1>
<b>CYPERACEAE</b>					
<i>Cyperus polystachyos</i> Rottb.	---	<b>Ind</b>	O	--	<1>
<b>HELICONIACEAE</b>					
<i>Heliconia psittacorum</i> L.	rhizomatosa heliconia	Orn	--	R2	
<b>ORCHIDACEAE</b>					
<i>Arundina graminifolia</i> (D. Don) Hochr.	bamboo orchid	Nat	--	C	<1>
<b>POACEAE</b>					
<i>Andropogon virginicus</i> L.	broomsedge	Nat	--	U	<1>
<i>Axonopus fissifolius</i> (Raddi) Kuhlmann	narrow-lvd carpetgrass	Nat	U	--	<1>
<i>Chloris divaricata</i> R. Br.	---	Nat	U	--	<1>
<i>Coix lacryma-jobi</i> L.	Job's tears	Nat	--	R	
<i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Nat	--	--	<1>
<i>Dichanthium</i> sp.	---	Nat	U	--	
<i>Eleusine indica</i> (L.) Gaertn.	wire grass	Nat	O	--	<1>
<i>Eragrostis cilianensis</i> (All.) Link	stinkgrass	Nat	R	--	
<i>Eragrostis pectinacea</i> (Michx.) Nees	Carolina lovegrass	Nat	O	--	
<i>Melinis minutiflora</i> P. Beauv.	molasses grass	Nat	A	A	<1>
<i>Melinis repens</i> (Willd.) Zizka	Natal redtop	Nat	A	--	<1>
<i>Panicum repens</i> L.	wainaku grass	Nat	--	U3	

Table 1 (continued).

Species listed by family	Common name	Status	Abundance		Notes
			VERGE	INTERIOR	
POACEAE (continued)					
<i>Paspalum conjugatum</i> Bergius	Hilo grass	Nat	--	--	<1>
<i>Paspalum urvillei</i> Steud.	Vasey grass	Nat	R	--	<1>
<i>Pennisetum purpureum</i> Schumach.	elephant grass	Nat	--	U3	<1>
<i>Saccharum officinarum</i> L.	sugar cane	Orn	R	--	<1>
<i>Sacciolepis indica</i> (L.) Chase	Glenwood grass	Nat	A	--	
<i>Setaria parviflora</i> (Poir.) Kerguelen	yellow foxtail	Nat	C	--	<1>
<i>Setaria palmifolia</i> (J. König) Stapf	palmgrass	Nat	R	--	<1>
<i>Sporobolus</i> sp.	dropseed	Nat	O	--	<1>
<i>Themeda villosa</i> (Poir.) A. Camus	Lyon's grass	Nat	--	--	<1>
<i>Urochloa maxima</i> (Jacq.) R. Webster	Guinea grass	Nat	O	O	<1>
<i>Urochloa mutica</i> (Forssk.) T.Q. Nguyen	California grass	Nat	--	U3	
ZINGIBERACEAE					
<i>Hedychium flavescens</i> N. Carey ex Roscoe	yellow ginger	Nat	--	U3	<1>

## Legend to Table 1

## STATUS = distributional status for the Hawaiian Islands:

- End** = endemic; native to Hawaii and found naturally nowhere else.  
**Ind** = indigenous; native to Hawaii, but not unique to the Hawaiian Islands.  
**Nat** = naturalized, exotic, plant introduced to the Hawaiian Islands since the arrival of Cook Expedition in 1778, and well-established outside of cultivation.  
**Orn** = exotic, ornamental or cultivated; plant not naturalized (not well-established outside of cultivation).  
**Pol** = Polynesian introduction before 1778.

## ABUNDANCE = occurrence ratings for plants by area:

- R - Rare                    seen in only one or perhaps two locations.  
U - Uncommon-        seen at most in several locations  
O - Occasional        seen with some regularity  
C - Common            observed numerous times during the survey  
A - Abundant          found in large numbers; may be locally dominant.

Numbers following an occurrence rating indicate clusters within the survey area. The ratings above provide an estimate of the likelihood of encountering a species within the specified survey area; numbers modify this if abundance, where encountered, tends to be greater than the occurrence rating:

- 1 - several plants present  
2 - many plants present  
3 - abundant over a localized area

## NOTES:

<1> - Previously recorded by Funk (2004).

Observed in this area were a total of 11 native plants (8% indigenous or endemic species), with only a minor disagreement between the two survey reports regarding identification of the common sword fern (*Nephrolepis*; both species given in Table 1 might well be present in this area). Characteristic of the open native forest that once dominated the lava flows in this area are 'ōhi'a (*Metrosideros polymorpha*) and patches of uluhe or false staghorn fern (*Dicranopteris linearis*). None of the native species recorded is considered rare or unusual. Two additional species listed are early Polynesian introductions to the Hawaiian Islands: kukui (*Aleurites moluccana*) and kamole (*Ludwigia octovalvis*). Again, these are not species that would require special consideration.

Vegetation in the survey area consists mainly of mixed forested areas interspersed with maintained landscapes in the built up sections. Built up areas occur at the Kea'au end and at the southern end beginning a short distance south of the Waipāhoehoe Bridge and continuing south. Former agriculture areas occupied both sides of the highway for about mile from the project start. Another agriculture area is found around the unnamed stream (west side of highway). In these areas, not even remnants of an original forest are present. In the remainder of the project area, the forest varies with respect to degree of disturbance although nearly everywhere the 'Ōhi'a (*Metrosideros*) Lowland Wet Forest (Gagne and Cuddihy, 1999) that once covered the area is heavily invaded by non-native shrubs and trees. In a number of areas, strawberry guava (*Psidium cattleianum*) forms nearly impenetrable stands.

The highway verge is maintained by mowing, and supports mostly ruderal herbaceous species. The timing of our survey was fortunate (in as much as mowed plants are difficult to identify) to coincided with maintenance activities that were just starting on the makai (east) side of the highway during the early part of the survey and moved to the mauka side shortly after the first walk through of the site was completed (Fig. 3). The roadway cuts across an undulating plain of pāhoehoe flows, creating cuts and fills on the mauka side particularly. Even the cut areas that rise well above the highway verge are maintained due to power lines in this area.

## Discussion

The survey undertaken by Funk (2004) encompassed the east (makai) side of the highway from Kea'au town to Waipāhoehoe Stream, and both sides of the highway between Waipāhoehoe Stream and Shower Dr. (Pōhaku Dr.), a distance of about 2.2 miles. The present survey encompassed all of the west (mauka) side of the highway from Kea'au town to 1 mi south of Pōhaku Dr.; thus, the combined surveys fully cover the project area (Fig. 2).

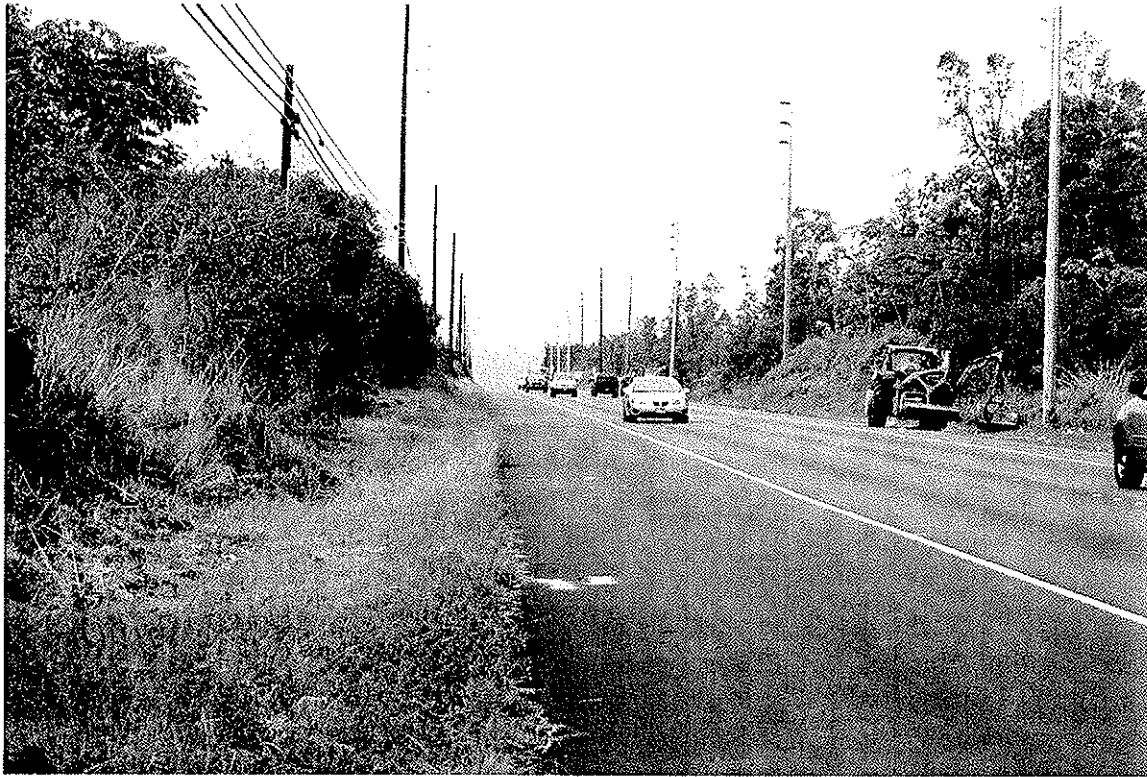


Figure 3. View looking north of survey area (typical highway verge and adjacent forest) along state Route 130 south of Kea'au.

No species of plants that are listed (USFWS, 2009a) or of concern have been identified from the Project area as surveyed on two separate occasions (2004 and 2008).

## Federal Jurisdiction Assessment

The proposed project area between Kea'au Road/Kea'au Bypass intersection includes culverts and a bridge that carry a small tributary and the unnamed stream beneath the Highway 130. Both streams are intermittently flowing at the highway, but have well defined stream bed characteristics. This unnamed stream system appears not to be listed on the State of Hawai'i list of impaired waters (HDOH, 2008) or the Hawaii Stream Assessment (Hawaii Cooperative Park Service Unit, 1990) which only lists perennial streams in the state.

As noted in *AECOS* (2004), a few, isolated pools are present in the stream channels, but these appear to be ephemeral features that may support aquatic insect biota, perhaps including native species. These pools, however, are located some distance from the highway and are likely absent some or much of the time dependent upon rainfall and rainfall generated stream flow. Water, when flowing in these channels, appears not to reach the ocean, precluding recruitment of diadromous stream fauna, such as native 'o'opu (gobiid fishes) or 'opae (freshwater shrimp).

## Field Survey

On December 9, 2008, *AECOS* biologists explored the area around Waipāhoehoe (site) via Railroad Avenue to assess whether the unnamed, intermittent stream present at the highway could be traced downslope into this area located 0.9 mi (1.4 km) downslope of the highway bridge and 3.5 mi (5.6 km) from the ocean. At Railroad Avenue there is no evidence of a stream or floodway of any kind. Isolated depressions (*kipuka*) are present. The ground is a very low-sloping, undulating surface of *pāhoehoe* lava flows. The dominant vegetation (Fig. 4) consists of grasses and ferns—mostly broom sedge (*Andropogon virginicus*), molasses grass (*Melinis minutiflora*), and 'ōali or Cretan brake (*Pteris cretica*)—with scattered 'ōhi'a and scrubby growth of melastomes (*Melastomia candidum*). Bamboo orchid (*Arundina graminifolia*), lichens (*Usnea* sp. and *Cladonia* sp.), and autograph trees (*Clusia rosea*) are common. This area of more open growth on relatively recent lava gives way to a dense scrub and mixed forest a short distance upslope, where strawberry guava (*Psidium cattleianum*), mango (*Mangifera indica*), Chinese banyan (*Ficus microcarpa*), and guarumo (*Cecropia obtusifolia*) are particularly common with an abundance of shoebutton ardisia (*Ardisia elliptica*) in the understory. Native 'ōhi'a and *uluhe* are present. Most noticeable change moving upslope towards the stream is an increase in the relief of the undulating surface to 6 ft (2 m) or more. Depression areas are not clearly interconnected, but appear to serve as catchments for stormwater flows carried in by the unnamed stream: these freshet flows spread out across the lava field into small and large depressions that enhance infiltration via the multitude of fractures in the lava surface.

## Discussion

A joint memorandum (USEPA/USACE, 2008; attached) addresses jurisdictional issues in light of recent Supreme Court decisions (*Rapanos vs. United States*). As a general rule, drainage ditches are not regarded as jurisdictional waters. While the relevant federal agencies under the Clean Water Act (USEPA and USACE) will assert jurisdiction over wetlands adjacent to more or less permanently flowing tributaries, and may assert jurisdiction over waters and "wetlands

adjacent to non-navigable tributaries that are not relatively permanent”, the agencies “generally will not assert jurisdiction over... [d]itches (including roadside ditches) excavated wholly in and draining only uplands and that do not carry a relatively permanent flow of water” (USEPA/USACE, 2008, p. 1). Thus, drainage structures associated with the highway widening project would not qualify as waters of the U.S.—that is, these features are very likely not jurisdictional under federal statutes in the Clean Water Act or the Rivers and Harbors Act as implemented by the U.S. Army Corps of Engineers.



Figure 3. Vegetated pāhoehoe flow above Railroad Avenue downslope of the unnamed stream.

The two stream crossings (1.8 and 1.9 mi southeast of Kea'au) and a low area with a suspected “wetland” (see AECOS, 2009) between these streams are geographic features that might qualify as jurisdictional. In the case of the unnamed stream and its small tributary, all evidence indicates that this stream system is isolated from the ocean, is intermittent, and flow contributes only to the general groundwater aquifer of the Puna District. In federal parlance, this stream system is non-navigable and not relatively permanent (NRP). It does not contribute flow and is not connected to the nearest traditional navigable waters (TNW), which is the Pacific Ocean. Therefore, we would conclude that this

entire stream system is not jurisdictional under federal law. In the final analysis, however, federal jurisdiction over intermittent streams (and adjacent wetlands) rests on a "significant nexus" standard. While this standard includes whether non-permanent flow reaches a traditionally navigable waters, other "ecological factors" may be included, so the local office of the Department of the Army, Corps of Engineers (USACE) must make the final determination. Presumably, the stream crossings are subject to some state and county regulations concerned with flood hydrology and stream bed alterations.

An area between the two stream beds along the west side of the highway is a depression subject to flooding and overflowing onto the Kea'au-Pahoia Highway. The proposed project includes a drain running diagonally under the highway from the south end of the depression, to a discharge point on the left bank of the unnamed stream a short distance downstream from the highway bridge. The depressed area shows potential wetland characteristics (USACE, 1987): with positive vegetation (dominated by California grass, *Urochloa mutica*, a facultative wetland or FACW species) and hydrology indicators (occasional flooding), and suggestion of a hydric soil (AECOS, 2009). Further study would be needed to establish if this area does contain a wetland. No standing water or open water areas were observed at this location.

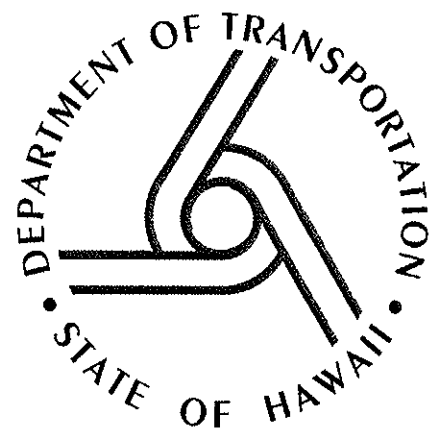
Although a nexus with the unnamed stream can probably be demonstrated, if the stream itself is declared isolated (not jurisdictional), then the wetland would not a jurisdictional, even should it prove to be a wetland by federal definition (USACE, 1987). Again, however, the subjective significant nexus consideration of ecologic factors precludes anyone other than the USACE and/or EPA from declaring an aquatic feature as not waters of the U.S. Although not a factor in establishing federal jurisdiction of wetland features, the National Wetlands Inventory map (USFWS, 2009) shows no wetlands in the project area.

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**APPENDIX C**

6615-01

3/17/04

BT

FILE

FLORA/FAUNA SURVEY REPORT FOR THE PROPOSED KEAAU-PAHOA  
ROAD SHOULDER LANE CONVERSION PROJECT

CC: DOT HWY  
VIA DEL  
3/17/04  
CC: ASCOS } em  
3/11/04

FOR  
WILSON OKAMOTO AND ASSOCIATES  
1907 SOUTH BERITANIA STREET, SUITE 400  
HONOLULU, HAWAII 96826

BY  
EVANGELINE J. FUNK, PHD  
BOTANICAL CONSULTANTS  
HONOLULU, HAWAII



## INTRODUCTION

The proposed Keaau-Pahoia Road Shoulder Lane Conversion Project site is located in the Puna District of the Island of Hawaii between Keaau Town and Shower Drive to the west, a distance of 2.2 miles. The state designation of this road is Highway 130. The survey area covered about twenty feet from the edge of the paved makai shoulder and area 200 feet wide from the centerline of the highway on both sides of the road from the Waipahoehoe Stream Bridge to Shower Drive.

A Flora/Fauna survey of this proposed project site was carried out on February 25, 26, and 27, 2004 by a two-person field team. The results of these surveys are presented below.

## THE FLORA SURVEY

The walk through method of data collection was used during this survey and all parts of the site were visited. The purpose of the survey was to describe the vegetation in the project area, to prepare an inventory of all the plants in the area and most importantly to ascertain if any threatened or listed endangered species or species of concern are growing on the proposed lane conversion project site.

## RESULTS

The vegetation of the study site is a changing mosaic of mostly introduced or alien trees, shrubs and grasses. Still there is some evidence that this area was once covered by an 'Ohi'a (Metrosideros) Lowland Wet Mesic Forest (Gagne' Chuddihy in Wagner, Herbst & Sohmer 1990). There are still 'Ohi'a trees to be found on both sides of the highway and intermittent enclaves of 'Ohi'a/Staghorn Fern scattered among the predominantly introduced vegetation.

Beginning at Shower Drive on both sides of Highway 130 for approximately one hundred feet the area has been developed and the yards have been landscaped. All along the north or mauka side of the highway from Shower Drive to Waipahoehoe Stream Bridge there is a remnant of the old highway. From the developed area to the bridge, between the old and new highways can be found a mix of ironwood (*Casuarina equisetifolia*), Banyan (*Ficus microcarpa*), Trumpet (*Cecropia obtusifolia*), Gun powder (*Trema orientalis*) and Melochia trees that are twenty to forty feet in height with an understory of mixed grasses, ferns and herbs.

Between the old and new bridges is a tangle of Koa haole (*Leucaena leucocephala*), yellow ginger (*Hedychium flavescens*), vervain (*Stachytarpheta*), tulip trees (*Spathodea campanulata*), Kukui trees (*Aleurites moluccana*), Melochia umbellata trees and big grasses such as Guinea grass (*Panicum maximum*) and Elephant grass (*Pennisetum purpureum*). Mauka or up hill of the old bridge is found similar vegetation and in addition there persists scattered sugar plants (*Saccharum officinarum*) which indicates that the area mauka side of Highway 130 was at one time used to grow sugar.

On the makai or downhill side of the highway from Shower Drive to the bridge, past the houses the tree cover is made up of both red and yellow guava trees (*Psidium cattleianum*, *P. guajava*), Scotch attorney tree (*Clusia rosea*), and some false staghorn fern (*Dicranopteris linearis*). The understory is made up of mixed grasses and herbs some of which have been treated with herbicide. Beginning just north of Waipahoehoe Stream Bridge on the makai side of Highway 130 is a tall dense stand of rose apple trees (*Syzygium jambos*) that extends inland for two to three hundred feet. The understory is

composed of elephant grass, yellow ginger, natal red top grass (*Rhynchelytrum repens*), and similar grasses and herbs.

Along this part of the roadway about fifteen feet from the verge of the highway is a deep narrow ditch that carries the water from several culverts to Waipahoe Stream.

Beyond the stand of rose apple trees is an equally dense stand of young, very close together strawberry guava trees forming an almost impenetrable pole forest. Most of the trees are fifteen to twenty feet in height. The understory is composed of sword fern (*Nephrolepis exaltata*), false staghorn fern, and big, coarse lion grass (*Themeda villosa*).

North of the guava trees there is an open area where native vegetation predominates. There are widely separated ‘‘Ohi’a trees fifteen to twenty feet in height with an understory of false staghorn fern. The area is being invaded by the very aggressive shrub downy rose myrtle (*Rhodomyrtus tomentosa*)

There is a long stretch of highway where the roadbed has been built up and the resulting steep shoulder has been covered with flat lava rocks one to two feet in diameter. In addition there are several places along the right-of-way where the shoulder consists of dense pahoehoe lava outcroppings.

In the area near the waste transfer station driveway there are several garden escapees growing among the expected grasses and herbs. These include loquat trees (*Eriobotrya japonica*), some candle bush (*Senna alata*), elderberry bushes (*Sambucus mexicana*), and bamboo orchids (*Arundina graminifolia*).

From the Humane Society driveway to the Protea farm at the end of the project site there is broom grass (*Andropogon virginicus*), and Melochia trees.

## SPECIES LIST OF THE PLANTS FOUND ON THE PROPOSED KEAAU-PAHOA SHOULDER LANE CONVERSION PROJECT SITE

The plant families in the following species list have been alphabetically arranged within three groups, Ferns and Fern Allies, Monocotyledons, and Dicotyledons. The genera and species are arranged alphabetically within families. The taxonomy and Nomenclature follows that of Wagner, Herbst, and Sohmer (1990). For each taxon the following information is provided:

1. An asterisk before the plant name indicates a plant introduced to the Hawaiian Islands since Cook or by the aborigines.
2. The scientific name of the plant.
3. The Hawaiian name or the most widely used common name of the Plant.
4. Abundance ratings are for this site only and they have the following Meanings:
  - Uncommon = a plant that was found less than five times.
  - Occasional = a plant that was found between five and ten times.
  - Common = a plant considered an important part of the vegetation.
  - Locally abundant = plants found in large numbers over a limited area. For example the plants found in grassy patches.

This species list is the result of an extensive survey of this site during a very wet season (February 2004) and it reflects the vegetation composition of the flora during a single season. Minor changes in the vegetation will occur due to introductions and losses and a slightly different species list would result from a survey conducted during a different growing season.



Scientific Name	Common Name	Abundance
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### FERNS AND FERN ALLIES

#### PSILOACEAE – Psilotum Family

<i>Psilotum nudum</i> (L.) Griseb.	Moa	Uncommon
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#### GLEICHENIACEAE – Vine fern Family

<i>Dicranopteris linearis</i> (Burm.) Underw.	False staghorn fern	Locally Abundant
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#### POLYPODIACEAE - Common Fern Family

* <i>Nephrolepis exaltata</i> (L.) Schott	Sword fern	Common
* <i>Polypodium scolopendrium</i> Burm. F.	Laua'e	Locally abundant

### MONOCOTYLEDONS

#### ARECACEAE - Palm Family

* <i>Areca catechu</i> L.	Betel nut palm	locally abundant
* <i>Cocos nucifera</i> L.	Coconut palm	Uncommon
*		

#### COMMELINACEAE - Spiderwort Family

* <i>Commelina diffusa</i> N. L. Burm.	Honohono	Locally abundant
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#### CYPERACEAE - Sedge Family

* <i>Cyperus rotundus</i> L.	Nut grass	Occasional
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#### ORCHIDACEAE – Orchid Family

* <i>Arundina graminifolia</i> (D. Don) Hochr.	Bamboo orchid	Occasional
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#### POACEAE - Grass Family

* <i>Andropogon virginicus</i> L	Broomsedge	Locally abundant
* <i>Axonopus fissifolius</i> (Raddi) Kuhim	Carpet grass	Locally abundant
* <i>Chloris divaricata</i> R. Br.	Star grass	Locally abundant
* <i>Cynodon dactylon</i> (L.) Pers.	Bermuda grass	Locally abundant
* <i>Eleusine indica</i> (L.) Gaertn.	Wiregrass	Locally abundant
* <i>Melinis minutiflora</i> P. Beauv.	Molasses grass	Locally abundant
* <i>Panicum maximum</i> Jacq.	Guinea grass	Common

Scientific Name	Common Name	Abundance
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POACEAE CON'T.

* <i>Paspalum conjugatum</i> Bergius	Hilo grass	Locally abundant
* <i>Paspalum Orville</i> Steud.	Vaseygrass	Occasional
* <i>Pennisetum purpureum</i> Schumach.	Elephant grass	Common
* <i>Rhynchelytrum repens</i> (Willd.) Hubb.	Natal redbtop	Common
* <i>Saccharum officinarum</i> L.	Ko	Occasional
* <i>Setaria gracilis</i> Kunth	Perennial foxtail	Locally abundant
* <i>Setaria palmifolia</i> (J. Konig) Stapf	Palm grass	Common
* <i>Sporobolus indicus</i> (L.) R. Br.	Smutgrass	Occasional
* <i>Themeda villosa</i> (Poir.) A. Camus	Lyon's grass	Common

ZINGIBERACEAE – Ginger Family

* <i>Hedychium flavescens</i> Carey ex Roscoe	Yellow ginger	Locally abundant
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DICOTYLEDONES

ACANTHACEAE – Acanthus Family

* <i>Asystasia gangetica</i> (L.) T. Anderson	Chinese violet	Occasional
* <i>Justicia betonica</i> L.	White shrimp plant	Uncommon
* <i>Thunbergia fragrans</i> Roxb.	White Thunbergia	Occasional

ANACARDIACEAE – Mango Family

* <i>Mangifera indica</i> L.	Mango	Occasional
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APIACEAE – Parsley Family

* <i>Centella asiatica</i> (L.) Urb.	Asiatic pennywort	Uncommon
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ASTERACEAE – Sunflower Family

* <i>Ageratum conyzoides</i> L.	Maile hohono	Locally abundant
* <i>Bidens alba</i> (L.) DC		Occasional
* <i>Bidens cynapiifolia</i> Kunth		Locally abundant
* <i>Emilia sonchifolia</i> (L.) DC	Flora's paintbrush	Occasional
* <i>Pluchea indica</i> (L.) Less.	Indian fleabane	Occasional
* <i>Pluchea symphytifolia</i> (Mill.) Gillis	Sourbush	Common
* <i>Wedelia trilobata</i> (L.) Hitchc.	Wedelia	Locally abundant

Scientific Name	Common Name	Abundance
BEGONIACEAE – Begonia Family		
<i>*Begonia hirtella</i> Link		Locally abundant
BIGNONIACEAE – Bignonia Family		
<i>*Spathodea campanulata</i> P. Beauv.	African tulip tree	Occasional
BUDDLEIACEAE – Butterfly bush Family		
<i>*Buddleia asiatica</i> Lour.	Dog tail	Occasional
CASUARINACEAE – She-oak Family		
<i>*Casuarina equisetifolia</i> L.	Ironwood	Occasional
CAPRIFOLIACEAE – Honeysuckle Family		
<i>*Sambucus mexicana</i> K. Presl ex A. DC	Mexican elder	Rare
CECROPIACEAE – Cecropia Family		
<i>*Cecropia obtusifolia</i> Bertol.	Trumpet tree	Occasional
CLUSIACEAE – Mangosteen Family		
<i>*Clusia rosea</i> Jacq.	Autograph tree	Uncommon
CONVOLVULACEAE – Morning glory Family		
<i>*Ipomoea cairica</i> (L.) Sweet	Koali 'ai	Uncommon
<i>*Ipomoea obscura</i> (L.) Ker-Gawl.		Occasional
<i>*Ipomoea triloba</i> L.	Little bell	Occasional
EUPHORBIACEAE – Spurge Family		
<i>*Aleurites moluccana</i> (L.) Willd	Kukui	Occasional
<i>*Chamaesyce prostrata</i> (Aiton) Small	Prostrate spurge	Occasional
<i>*Phyllanthus debilis</i> Klein ex Willd.	Niruri	Occasional
FABACEAE – Bean Family		
<i>*Chamaecrista nictitans</i> (L.) Moench	Partridge pea	Occasional
<i>*Crotalaria incana</i> L.	Fuzzy rattlepod	Occasional

Scientific Name	Common Name	Abundance
FABACEAE – Bean Family con't.		
<i>*Crotalaria micans</i> Link		Occasional
<i>*Crotalaria spectabilis</i> Roth	Kolomona	Occasional
<i>*Desmodium triflorum</i> (L.) DC		Occasional
<i>*Leucaena leucocephala</i> (Lam.) de Wit	Koa haole	Common
<i>*Mimosa pudica</i> L.	Sensitive plant	Common
<i>*Senna alata</i> (L.) Roxb.	Candle bush	Uncommon
LAMIACEAE –Mint Family		
<i>*Hyptis pectinata</i> (L.) Poit.	Comb hyptis	Occasional
LAURACEAE – Laurel Family		
<i>*Persea americana</i> Mill.	Avocado	Occasional
LYTHRACEAE – Loosestrife Family		
<i>*Cuphea carthagenensis</i> (Jacq.) Macbr.	Tarweed	Uncommon
MALVACEAE – Mallow Family		
<i>Hibiscus tiliaceus</i> L.	Hau	Locally abundant
MELASTOMATACEAE – Melastoma Family		
<i>*Clidemia hirta</i> (L.) D. Don	Koster's curse	Occasional
<i>*Dissotis rotundifolia</i> (Sm.) Triana		Common
<i>*Melastoma candidum</i> D. Don		Occasional
MORACEAE – Fig Family		
<i>*Ficus microcarpa</i> L. fil	Chinese banyan	Occasional
<i>*Ficus retusa</i> L.	Banyan	Occasional
MYRTACEAE – Myrtle Family		
<i>Metrosideros polymorpha</i> Gaud.	'Ohi'a	Common
<i>*Psidium cattleianum</i> Sabine	Strawberry guava	locally abundant
<i>*Psidium guajava</i> L.	Common guava	Common
<i>*Rhodomyrtus tomentosa</i> (Aiton) Hassk.	Downy myrtle	Occasional
<i>*Syzygium jambos</i> (L.) Alton	Rose apple	Locally abundant

Scientific Name	Common Name	Abundance
ONAGRACEAE – Evening Primrose Family		
* <i>Ludwigia octovalvis</i> (Jacq.) Raven	Primrose willow	Uncommon
POLYGALACEAE – Milkwort Family		
* <i>Polygala paniculata</i> L.		Locally abundant
ROSACEAE – Rose Family		
* <i>Eriobotrya japonica</i> (Thunb.) Lindl.	Loquat	Occasional
RUBIACEAE – Coffee Family		
* <i>Paederia scandens</i> (Lour.) Merr.	Maile pilau	Occasional
* <i>Spermacoce assurgens</i> Ruiz & Pav.	Buttonweed	Locally abundant
SOLANACEAE – Nightshade Family		
* <i>Solanum americanum</i> Mill.	Popolo berry	Occasional
STERCULIACEAE Cacao Family		
* <i>Melochia umbellata</i> (Houtt.) Stapf.		Common
<i>Waltheria indica</i> L.	‘Uhaloa	Rare
ULMACEAE – Elm Family		
* <i>Trema orientalis</i> (L.) Blume	Gunpowder tree	Occasional
VERBENACEAE – Verbena Family		
* <i>Stachytarpheta jamaicensis</i> (L.) Vahl	Vervain	Occasional
* <i>Stachytarpheta urticifolia</i> (Salisb.) Sims		Occasional

## THE FAUNA.

### INTRODUCTION AND METHODS

This report summarizes the results of a fauna survey of the proposed Keaau-Pahoa Shoulder Lane Conversion project site located between Keaau town and Shower Drive in the Puna district on the Island of Hawaii. This survey was carried out on February 25, 26, and 27, 2004 during the early daylight hours, to take advantage of the higher activity levels of both birds and mammals and to make observations while the weather was dry. Observations were made from two fixed stations along the old road near two public water stations where considerable household rubbish has been discarded. These rubbish heaps appeared to be very attractive to birds and homeless cats. In addition to fixed station observations, a walking tally was kept along the highway shoulder.

The study site is made up of approximately 2.2 miles of road right-of-way between Keaau town on the north and Shower Drive on the south. It consisted only the makai or western shoulder of the roadway and a much wider area on both sides of the highway between Waipahoehoe Stream Bridge and Shower Drive.

### RESULTS

**MAMMALS** – Although no rats or mice were seen during this survey they can be assumed to be present on this site because of the household rubbish that has been discarded and the number of houses found near the Shower Drive end of the study site. The only mammals seen during this study were two feral cats (*Felis domestica*) that appeared to be living in one of the rubbish piles.

## AVIFAUNA – Gallinaceous Birds

A large flock of twenty-five to thirty chickenlike birds appear to be living in and around the largest rubbish pile. The flock consists of domestic chickens, jungle fowl, and others that appear to be a cross between the two types

### Family Zosteropidae: White-eyes

*Zosterops japonicus* (Japanese white eyes)

These small, active birds were seen around the public water sources and in the trees along the right-of-way.

### Family Passeridae: Old World Sparrows

*Passer domesticus* (House sparrow)

These small streaky brown and gray house sparrows are a familiar commensal species. Several individuals were feeding near the rubbish dump and in the tall grasses.

### Family – Emberizidae: Emberizine Finches

*Cardinalis cardinalis* (Northern cardinal)

A total of four northern cardinals were present near the public water fountains. The bright red males are easy to spot but the dull gray females are difficult to spot although both sexes have a similar call.

### FAMILY – Fringillidae: Cardueline Finches

*Carpodacus mexicanus* (House finch)

Both male and female finches inhabit the area around the houses and near the water sources. These are small, gray birds. The males have red to yellow heads while the females are all gray.

Family Columbidae: Pigeons and Doves

*Geopelia striata* (Zebra Dove)

One of the most commonly seen and heard birds on this site. Birds are especially common near the houses.

Family Sturnidae: Starlings and Mynas

*Acridotheres tristis* (Common myna)

Mynas were seen along the old road and flying over the right-of way. They appeared to be as plentiful as the doves.

CONCLUSIONS

The flora of this site is composed largely of alien or introduced species. There are some common native species such as 'Ohi'a trees, false staghorn fern, and moa (*Psilotum nudum*). Because of its abundance on the study site only the false staghorn fern will probably be affected if this project goes forward. It is a very commonly found vine fern and will undoubtedly re-establish itself when the project is completed

This survey was carried out during rainy weather and although a survey during dry weather may have recorded a greater number of birds the species composition would probably be similar. The shoulder conversion will probably have little effect on the fauna of this site

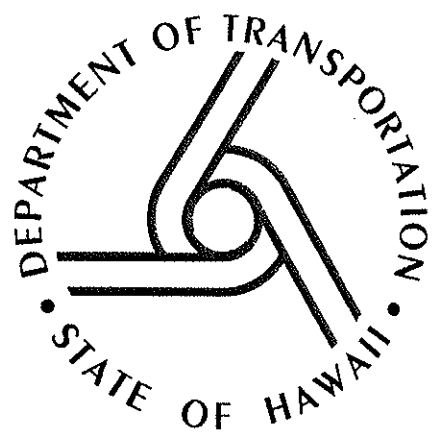
ENDANGERED SPECIES

No candidate, proposed, or listed threatened or endangered species as set forth in the Endangered Species Act of 1973, as amended (16 U.S.C. 1531-1543) are known from this site and none were found during this survey.



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**APPENDIX D**

**ARCHAEOLOGICAL ASSESSMENT SURVEY**  
**KEAAU-PAHOA ROAD SHOULDER LANE CONVERSION**  
**LAND OF KEAAU, PUNA DISTRICT**  
**ISLAND OF HAWAII**

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June 2004

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## Introduction

At the request of Wilson Okamoto Corporation, Haun & Associates conducted an archaeological survey of the c. 2.2 mile (3.5 km) long Keaau-Pahoia Road Shoulder Lane Conversion project area located in the Land of Keaau, Puna District, Island of Hawaii (Portions of TMK: 1-5-036:117-122; 1-6-001:15, 21; 1-6-003:2, 65, 68, 74; 1-6-004:11, 45, 47-51, 53-56; and 1-6-064:269, 283-289; *Figure 1*). The objective of the survey was to satisfy historic preservation regulatory review requirements of the Department of Land and Natural Resources-Historic Preservation Division (DLNR-SHPD), as contained within Hawaii Administrative Rules, Title 13, DLNR, Subtitle 13, State Historic Preservation Rules (2003).

No archaeological sites or features were identified during the survey, therefore the project is documented as an archaeological assessment pursuant to Chapter 13-284-5(5A). As required, this report contains a description of the project area and field methods.

## Project Area Description

The project area consists of a c. 2.0 m (3.2 km) long corridor that extends along the northeast and portions of the southwestern side of Highway 130 (*Figure 2*). The area examined varies in elevation from 290 to 350 ft. The northwest end of the project area is located 120.0 m northwest of the entrance to the Hawaii Island Humane Society facility and 20.0 m northwest of an unnamed paved road. The southeastern end is situated 26.0 m southeast of the Shower Drive/Pohaku Drive intersection. The entire northeast side of Highway 130 was examined, with only selected areas along the southwestern side subjected to investigation.

The majority of the project area consists of a 5.4 m (18.0 ft) wide strip on the seaward side of the road. Additional areas surveyed consist of a 185 m (607 ft) long (northwest by southeast) by 22.2 (70 ft) wide section located at the northwestern end of the project area, in the area of the Hawaii Island Humane Society; and areas adjoining culverts and several driveway and road intersections

A 2.0 to 3.0 m (6.6 to 9.8 ft) wide swath that parallels both sides of the highway has been altered during past road construction activity. Ornamental vegetation and planted coconut (*Cocos nucifera* L.) are present adjacent to several of the driveways, although the majority of the vegetation consists of secondary vegetation including guava (*Psidium cattleianum* Sabine), and low *ohia* trees (*Metrosideros polymorpha*), with scattered java plum (*Eugenia cuminii* L.), rose apple (*Eugenia jambos* L.), mango (*Mangifera indica* L.) and ferns and grasses. Examples of the project area vegetation are presented in *Figures 3 and 4*.

The soil within the project area consists predominately of Pahoehoe lava flows with isolated pockets of Hilo silty clay loam (0-10% slopes). According to Sato et al., the pahoehoe lava is characterized by a smooth, billowy surface with some areas of rough,

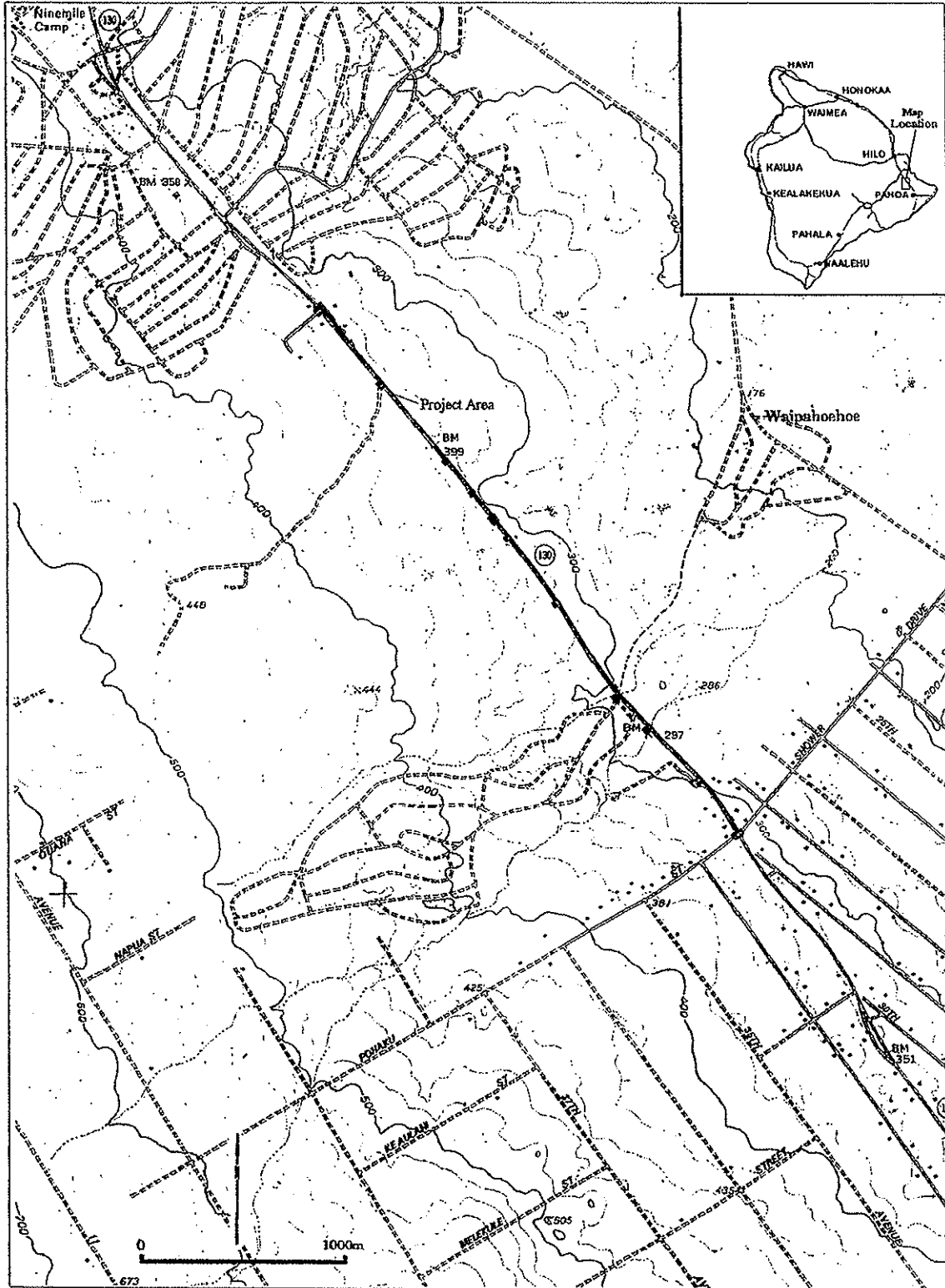


Figure 1. Portion of Mountain View Quadrangle showing Project Area

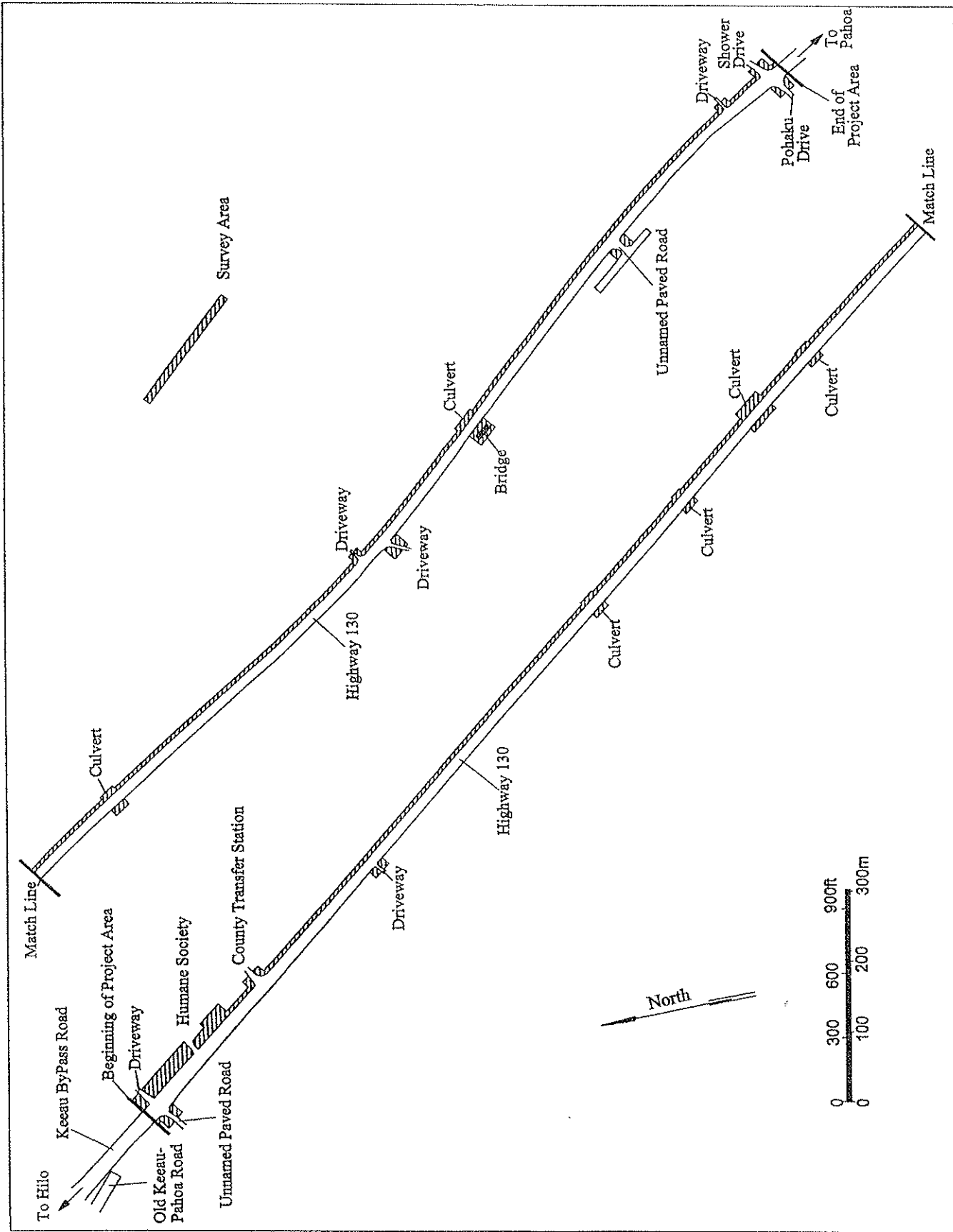


Figure 2. Project Area Map

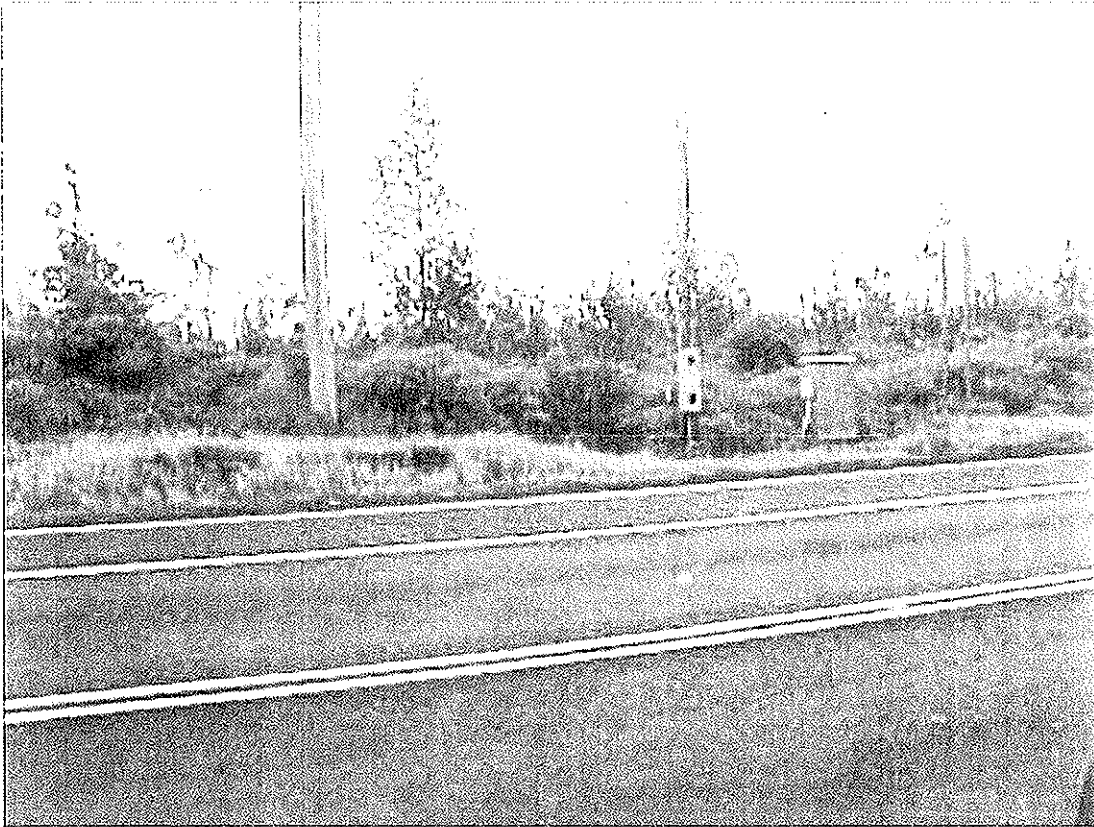


Figure 3. Project Area Overview, view to northeast

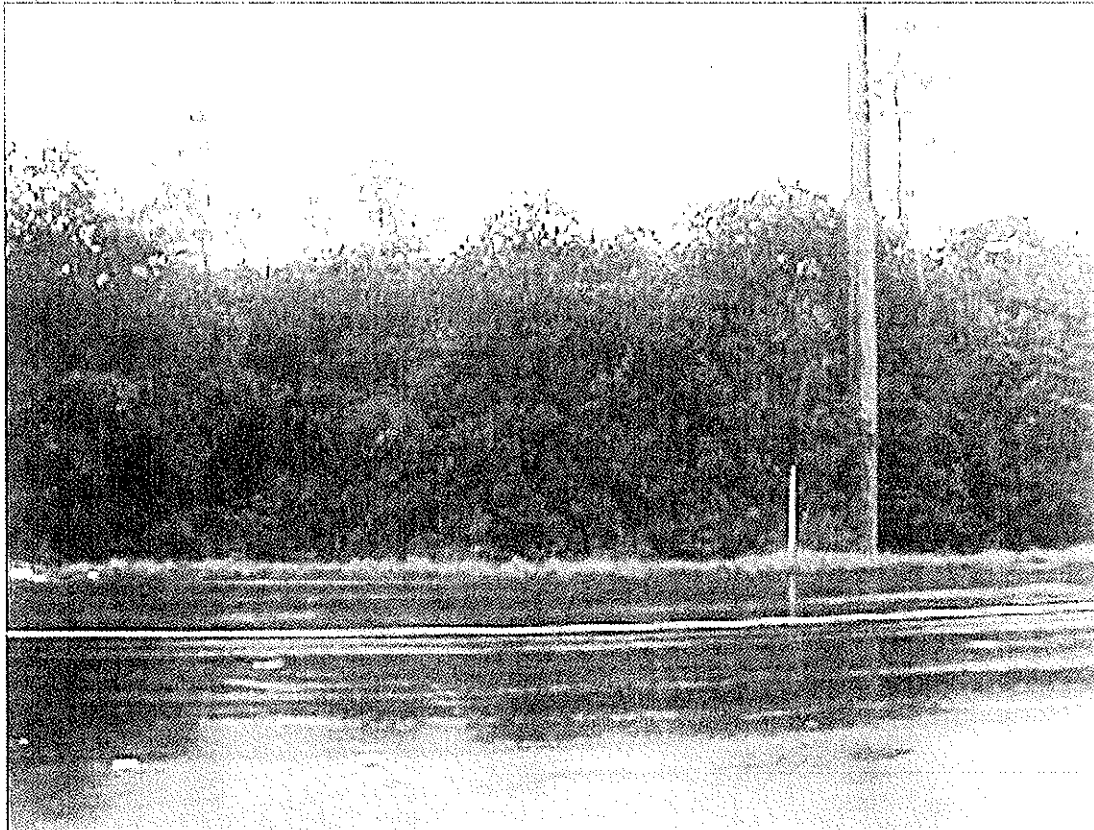


Figure 4. Project Area Overview, view to northeast

broken surface (1973:34). Little soil is present, although in wet areas (like the project area) vegetation has taken hold within the cracks and crevices. According to Juvik and Juvik 1998:57, rainfall in the area averages 160-180 inches per year. The Hilo silty clay soil (0-10% slopes) is characterized by a surface layer of dark brown silty clay loam, over a dark brown to very dark grayish brown silty clay loam subsoil, over pahoehoe bedrock (Sato et al. (1973:17). This soil evidences a rapid permeability, a slow runoff and a slight erosional hazard and is classified as suitable for sugarcane, orchard, truck crops and pasture (1973:18). According to Wolfe and Morris (2001), the lava flows in this area originated from Kilauea Volcano from 200 to 750 years ago.

## Field Methods

The survey fieldwork was conducted by a crew of two on March 29, 2004, under the direction of Dr. Alan Haun. Approximately 16 labor-hours were required to complete the fieldwork portion of the project. The archaeological investigation of the project area consisted of a 100% surface examination with the surveyors walking transects at 3-meter intervals, oriented parallel to Highway 130. Ground surface visibility was fair to excellent.

## Findings

No archaeological sites or features were identified during the survey, and there are no Land Commission Awards present within the project area. Nearly half of the project area was altered by previous highway-related construction activity. Much of the remainder was probably modified by sugar cane cultivation because most of the land is owned by W.H. Shipman Ltd. and is dominated by secondary vegetation. No further archaeological work is recommended for the project based on the survey results.

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**ARCHAEOLOGICAL INVENTORY SURVEY**  
**PORTIONS OF TMK: (3) 1-6-04: 11, 47-53, 55, 56**  
**AND 1-6-64:266-269, 283-286**  
**LAND OF KEA'AU**  
**PUNA DISTRICT**  
**ISLAND OF HAWAII**

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**PUNA DISTRICT, ISLAND OF HAWAII**

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# SUMMARY

At the request of Wilson Okamoto Corporation, Haun & Associates conducted an archaeological inventory survey of portions of TMK: (3) 1-6-04:11, 47-53, 55, 56 and 1-6-64:266-269, 283-286 that comprise c. 8-acre strip of land (30 ft wide by 2.4 mi long) extending along the inland side of Keaau-Pahoa Road, located in the Land of Keaau, Puna District, Island of Hawai'i. The objective of the survey was to satisfy historic preservation regulatory review inventory requirements of the Department of Land and Natural Resources-Historic Preservation Division (DLNR-SHPD), as contained within Hawaii Administrative Rules, Title 13, DLNR, Subtitle 13, State Historic Preservation Rules.

The archaeological survey identified one site, an historic bridge spanning Waipahoe Stream. The bridge is constructed of mortared stone and formed concrete and was potentially constructed in the 1930s. The site is assessed as solely significant under Criterion "d". The site has yielded information important for understanding the historic land use in the project area. The mapping, written description and photography at this site adequately documented it and no further work or preservation is recommended.

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## INTRODUCTION

At the request of Wilson Okamoto Corporation, Haun & Associates conducted an archaeological inventory survey of portions of TMK: (3) 1-6-04:11, 47-53, 55, 56 and 1-6-64:266-269, 283-286 that comprise c. 8-acre strip of land (30 ft wide by 2.4 mi long) extending along the inland side of Keaau-Pahoa Road, located in the Land of Keaau, Puna District, Island of Hawai'i (*Figures 1-3*). The objective of the survey was to satisfy historic preservation regulatory review requirements of the Department of Land and Natural Resources-Historic Preservation Division (DLNR-SHPD), as contained within Hawaii Administrative Rules, Title 13, DLNR, Subtitle 13, State Historic Preservation Rules (2003).

The survey fieldwork was conducted by a crew of two archaeologists on June 12 and July 14, 2009 under the direction of Dr. Alan Haun. Approximately four person days of labor were required to complete the field work portion of the project. Described in this final report are the project scope of work, field methods, background information, survey findings, and significance assessments of the sites with recommended further treatments.

## Scope of Work

Based on DLNR-SHPD rules for inventory surveys, the following specific tasks were determined to constitute an appropriate scope of work for the project:

1. Conduct background review and research of existing archaeological and historical documentary literature relating to the project area and its immediate vicinity--including examination of Land Commission Awards, *ahupua'a* records, historic maps, archival materials, archaeological reports, and other historical sources;
2. Conduct a high intensity, 100% pedestrian survey coverage of the project area;
3. Conduct detailed recording of all potentially significant sites including scaled plan drawings, written descriptions, and photographs, as appropriate;
4. Conduct subsurface testing (manual excavation) at selected sites as necessary to determine site function;
5. Analyze background research and field data; and
6. Prepare and submit Final Report.

## Project Area Description

The project area consists of a linear strip of land located along the inland side of the Keaau-Pahoa Road, measuring 30 feet wide (9.1 m) and 2.4 miles long (3.8 km). It originates at the southern end of the Keaau Bypass and extends to the southeast where it terminates approximately 1,200 ft southeast of the Pohaku Drive-Shower Drive intersection. It extends through the 18 Tax Map Key (TMK) parcels listed above as well as a County of Hawaii easement that parallels the Keaau-Pahoa Road (see *Figure 3*). The project area varies from c. 290 to 345 ft elevation with rainfall ranging from 160 to 200 inches per year (Juvik and Juvik 1998:57). The temperature in the area varies from 70 to 75 degrees (Armstrong 1983).

Two branches of the Waipahoe Stream extend through the southeastern end of the project area corridor (see *Figure 1*). A modern concrete culvert passes beneath the Keaau-Pahoa Road at the northernmost stream (*Figure 4*) and a modern concrete bridge is located at the southern stream. An historic bridge is located inland of the modern bridge on the southern stream drainage (Site 26874 discussed in Findings section).

The project area evidences areas of significant disturbance. The northern end of the corridor was recently bulldozed in conjunction with the construction of the Keaau Bypass road and is currently com-

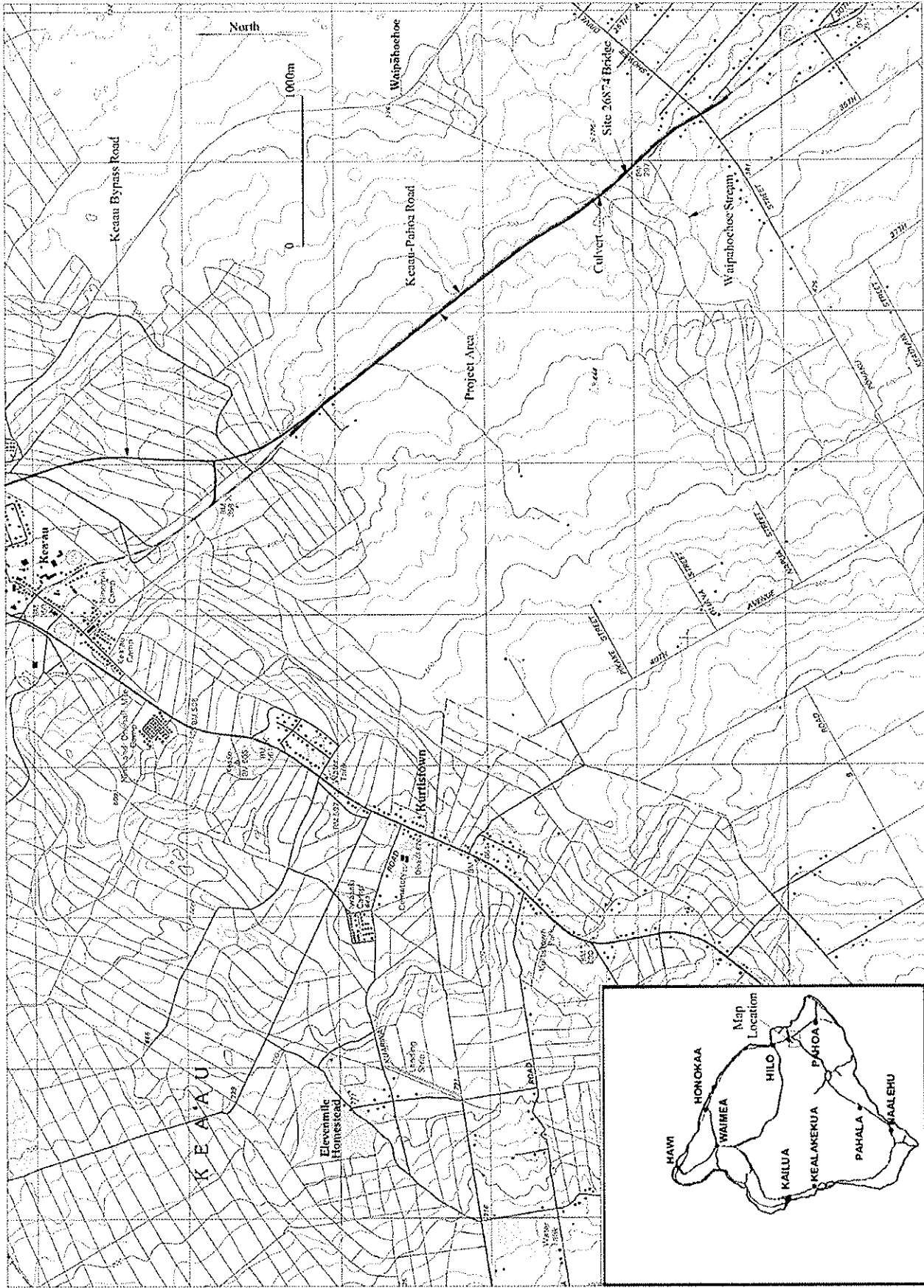


Figure 1. Portion of USGS Mountainview Quadrangle showing Project Area

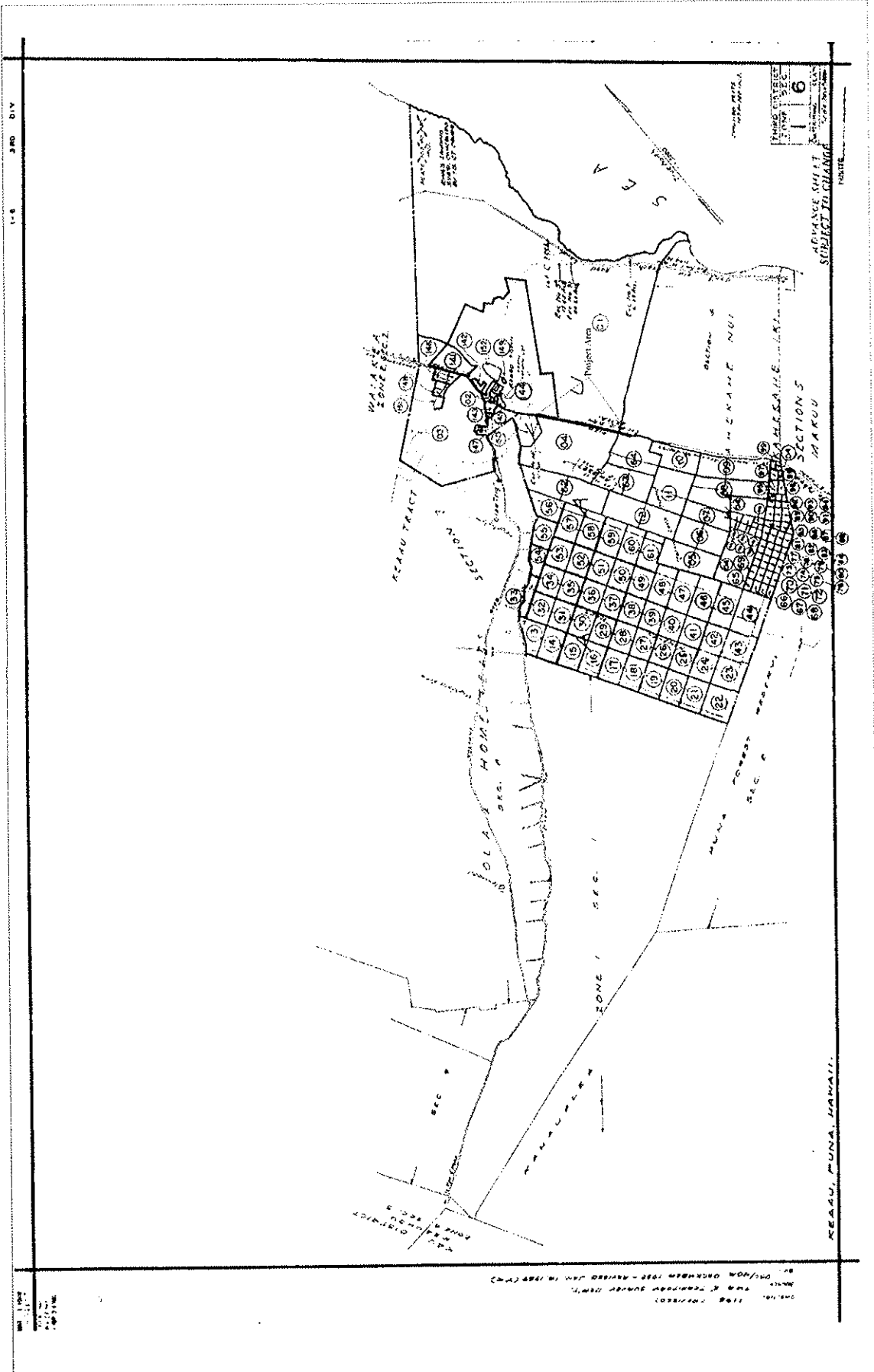


Figure 2. Tax Map Key 1-6 showing Project Area

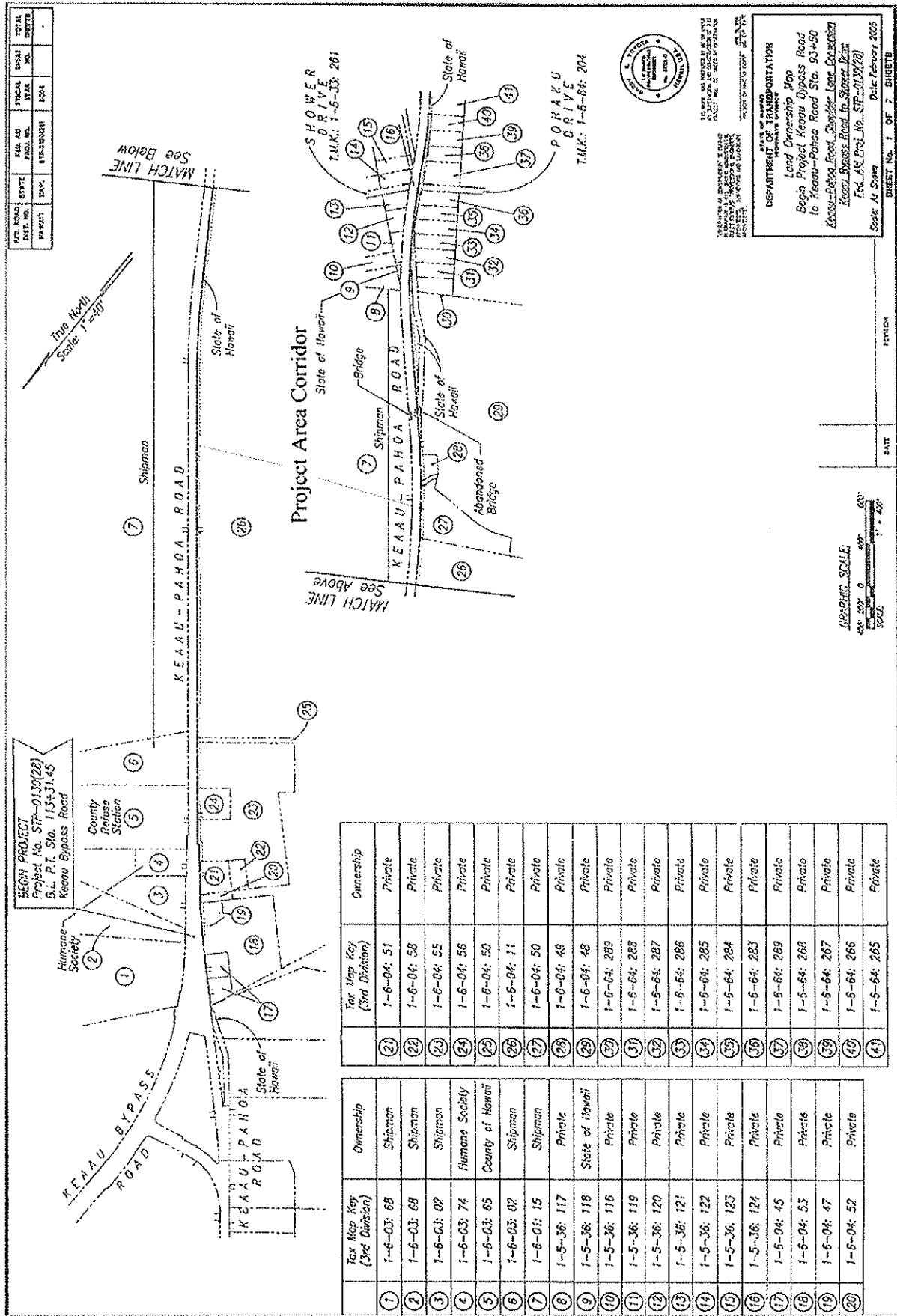


Figure 3. Land Ownership Map showing Project Area Corridor





Figure 4. Modern Culvert, view to northeast

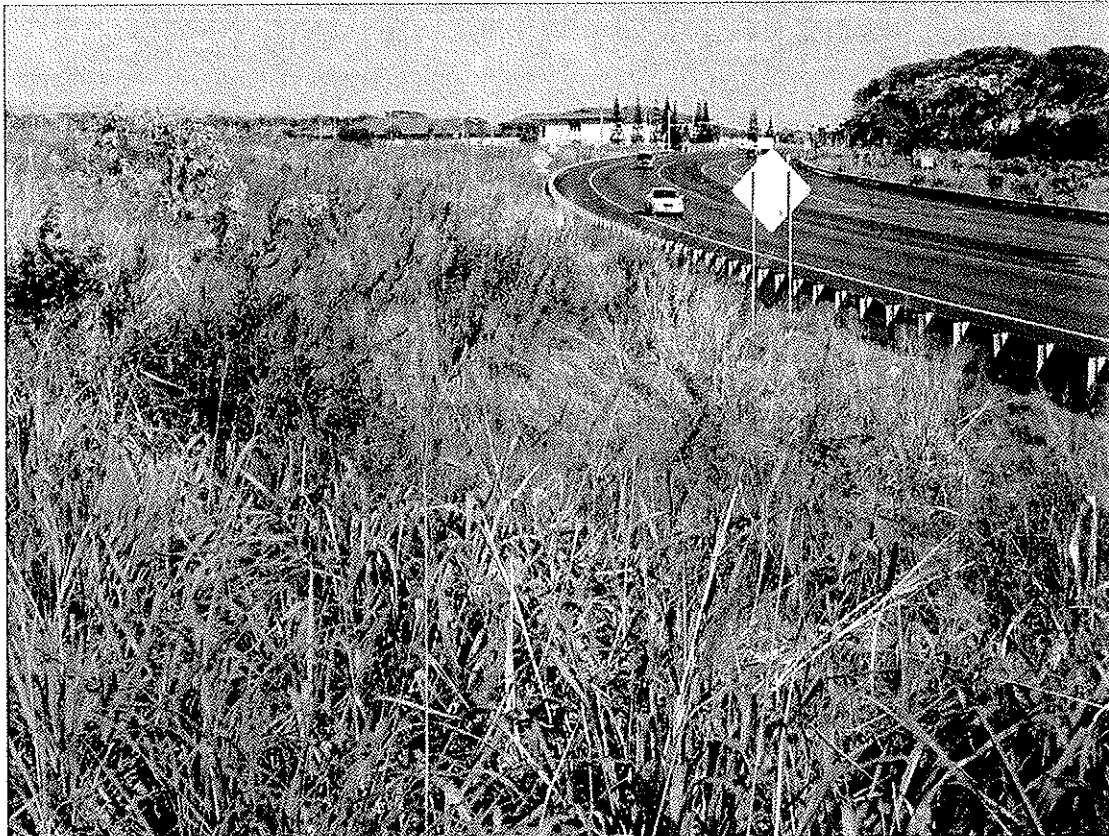


Figure 5. Bulldozed Area at North End of Project Area, view to north

prised of a grass-covered field (Figure 5). The remainder of the corridor is densely vegetated with secondary growth species including strawberry guava (*Psidium cattleianum* Sabine), Indian rhododendron (*Melastoma candidum*), ginger (*Zingiberaceae*), trumpet tree (*Cecropia obtusifolia*), and vines and ferns. Examples of this vegetation are depicted in Figures 6 and 7.

The soil throughout the majority of the project area is comprised of pahoehoe lava, which is defined by Sato et al. (1973:34) as “a billowy glassy surface that is relatively smooth”. In many areas, pahoehoe lava has no soil covering with limited vegetation; however in areas with significant rainfall, like the project area, plant species become established and a humus layer of decaying vegetation can develop. Sato et al. (1973:34) indicates that in high rainfall areas, pahoehoe lava “contributes to the ground water supply”.

There is an isolated area of Hilo silty clay loam (0-10% slopes) located in the southeastern portion of the project area corridor, north of the Pohaku Drive-Shower Drive intersection. This soil consists of a surface layer of dark brown silty clay loam (12 inches) over a thick (48 inches) subsoil of silty clays loams of various colors (Sato et al. 1973:17). This soil evidences a rapid permeability, a slow runoff and a slight erosional hazard and is classified as suitable for sugarcane with small areas used for truck crops, orchards and pastures. There are two underlying lava flows in the project area, both deposited from Kilauea volcano (Wolfe and Morris 2001:10). The flow in the northern half of the project area (Unit p4) was deposited from 200 to 750 years ago with the lava substrate in the southern half deposited more recently (Unit p40 – 400 to 750 years ago).

## Field Methods

The project area was subjected a 100% surface examination with surveyors spaced at 5 m intervals. The survey transects were oriented in a northeast by southwest direction, parallel to the long axis of the parcel. The structures identified during the present project were subjected to detailed recording including the preparation of scaled plan maps, the completion of standardized site/feature forms, and photographic documentation. No cultural remains were recovered for analysis.

## ARCHAEOLOGICAL AND HISTORICAL BACKGROUND

### *Historical Documentary Research*

The project area is located within the *ahupua'a* of Kea'au in the Puna District, a district nearly as large as the entire island of Oahu (Juvik and Juvik 1998:22). Puna was once comprised of six chiefdoms created by the son of 'Umi-a-Liloa. According to Orr, the district, “lies between Hilo to the north and Ka'u to the south; from Kapoho the most easterly point to the uplands that extend to the great central heights of Mauna Loa to the coastal shores of Kea'au (2004:46).

The Puna District was traditionally referenced as “Puna *paia`ala i ka hala*” or “Puna hedged with fragrant *hala*” (Handy and Handy 1978:200) and was considered an important place for the cultivation of *awa* (1978:192). According to Emerson (1915) as cited in Handy and Handy (1978):

Manu'u-ke-eu was the name of a mythical *hala* tree that once grew in Puna. The seed was brought from Kahiki by Ka-moho-ali'i when he came to Hawaii with Pele. They ate the blossom with salt and sugar cane, and then Ka-moho-ali'i planted the seed. The tree thereafter was regarded as a *kupua* (nature spirit) (1978:199).

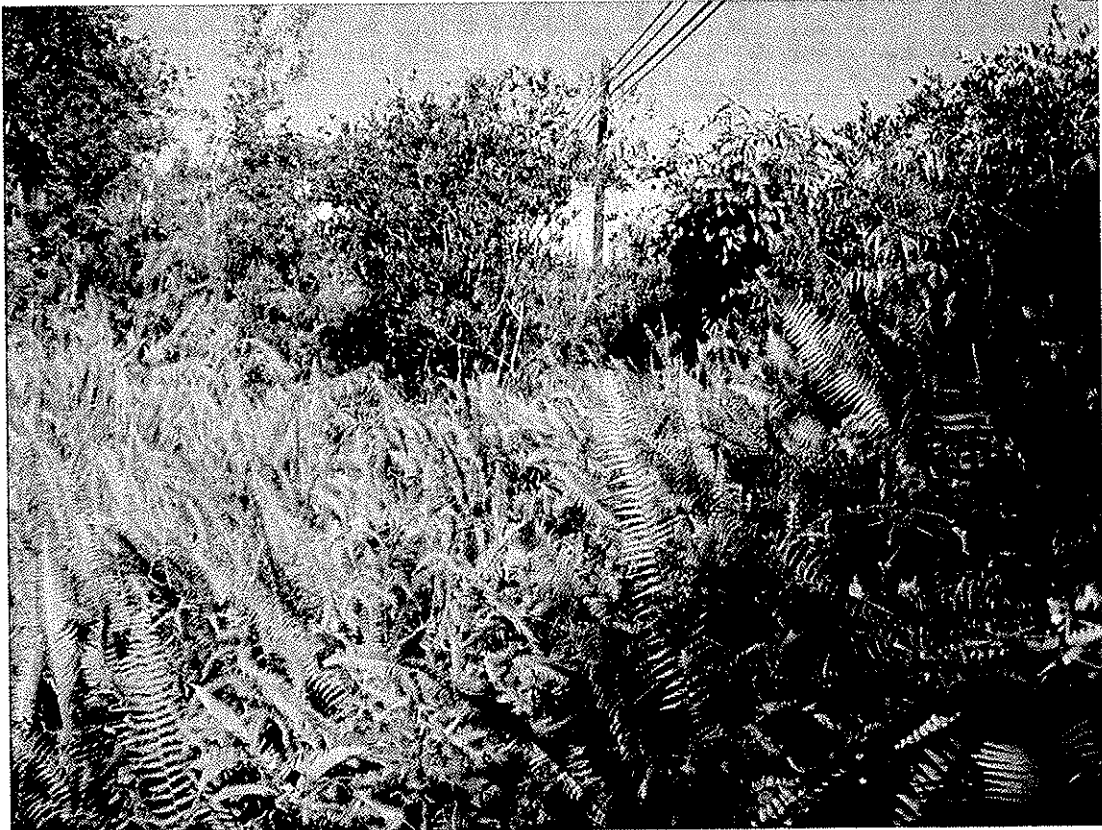


Figure 6. Secondary Growth Vegetation, view to north

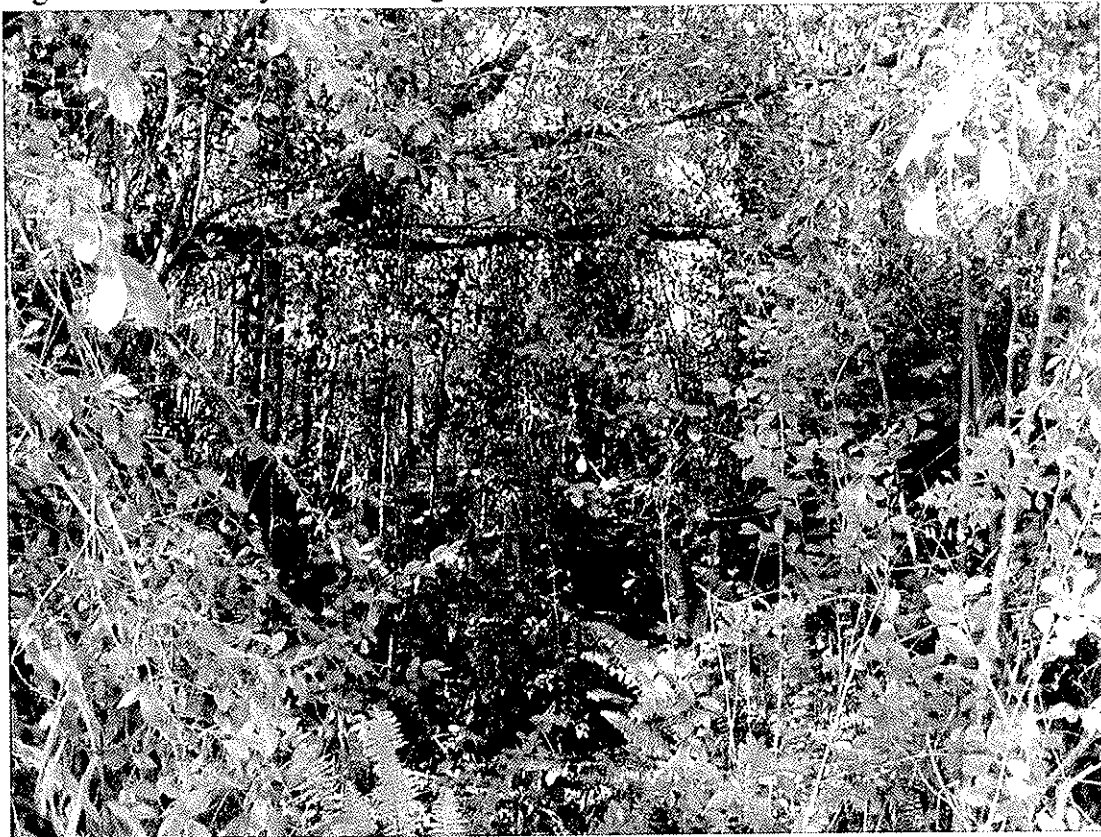


Figure 7. Secondary Growth Vegetation, view to west

A number of traditional sayings or proverbs (*'Ōlelo no'eau*) make specific mentions of Kea'au. These *'Ōlelo no'eau* were compiled by Pukui between 1910 and 1960 (Pukui, 1983:vii), and are presented in Orr (2004: 37). A selection of these *'Ōlelo no'ea* are presented below.

*'Ōlelo no'eau:* *He iki hala au no Kea'au, `a`ohe pohaku `alā e nahā `ai.*  
 Translation: I am a small *hala* fruit of Kea'au, but there is no rock hard enough to smash me.  
 Meaning: The boast of a Puna man--I am small, perhaps, but mighty (#624, p 71).

*'Ōlelo no'eau:* *Ka ua kāhiko hala o Kea'au.*  
 Translation: The rain that adorns the pandanus trees of Kea'au.  
 Meaning: Refers to the pandanus grove of Kea'au, Puna, Hawaii (#1560, p 168).

*'Ōlelo no'eau:* *Mai ke kai kuwā e nū ana i ka ulu hala a Kea'au a ka `āina kā`ili lā o lalo o ka Waikū`auhoe.*  
 Translation: From the noisy sea that moans to the *hala* groves of Kea'au, to the land that snatches away the sun, below Waikū`auhoe.  
 Meaning: From Puna, Hawai`i, where the sun was said to rise, to Lehua, beyond Waikū`auhoe, where it vanishes out of sight (#2070, p 225).

*'Ōlelo no'eau:* *Ka makani hali `ala o Puna.*  
 Translation: The fragrance-bearing wind of Puna.  
 Meaning: Puna, Hawai`i, was famed for the fragrance of *maile*, *lehua*, and *hala*. It was said that when the wind blew from the land, fishermen at sea could smell the fragrance of these leaves and flowers (#1458, p 158).

*'Ōlelo no'eau:* *Ka ua moaniani lehua o Puna.*  
 Translation: The rain that brings the fragrance of the *lehua* of Puna.  
 Meaning: Puna is known as the land of fragrance (#1587, p 172).

The missionary, William Ellis (1963) described a visit to the Puna District. He describes Kea'au (or Kaau) as "the last village in the division of Puna. It was extensive and populous, abounding with well cultivated plantations of taro, sweet potatoes, and sugar cane, and probably owes its fertility to a fine, rapid stream, which, descending from the mountains, runs through it into the sea" (1963: 60).

During the Great Mahele, the *ahupua`a* of Kea'au was claimed by Charles Kanaina, on behalf of his son William C. Lunalilo. Lunalilo was also the grand nephew of Kamehameha I and he would eventually become King, though only reigning for one year (Orr 2004:48). This claim was awarded as LCA 8559B and Royal Patent 7223 (Figure 8).

A *kuleana* claim was made by Hewahewa for a 13.64-acre parcel in Kea'au (LCA 8081, Royal Patent 4360). The claim indicated that the land was unfenced with no house and coffee was being cultivated within it. (Hurst 1994). This parcel was reported sold to the Roman Catholic Church in 1865 (Masterson and Hammatt 1998). According to Orr (2004: 48), the parcel was situated in the *ili* of Halauloa and was bordered by:

On the west by the konohiki  
 On the north by Keawemakalio's land  
 On the east by the konohiki and  
 By Meaula's land on the south.

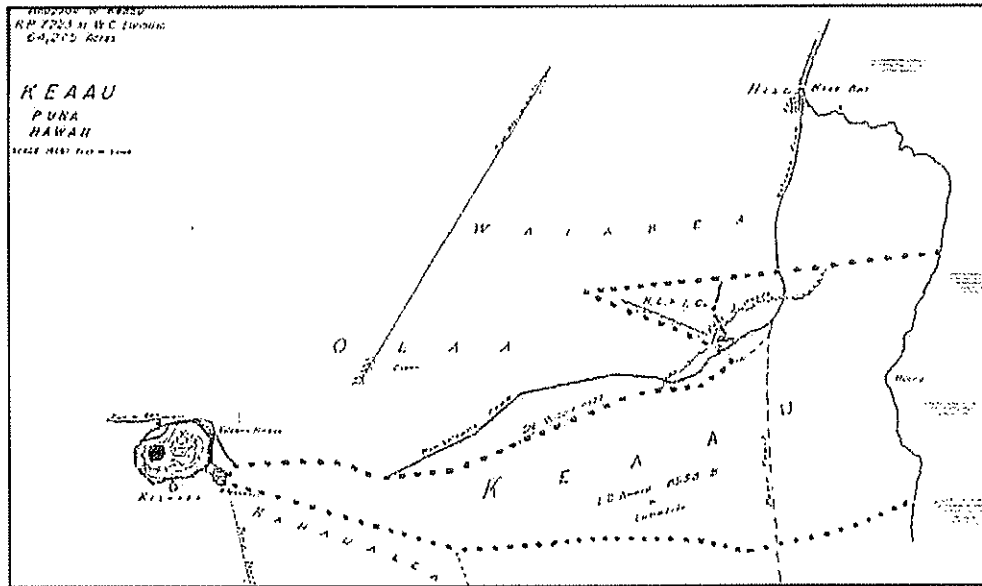


Figure 8. Royal Patent 7223 (Cahill 1996:166)

The first sugar plantation was established in the Hawaiian Islands on Kauai in 1836 (Kent 1983:22, 23, 29). However, sugar cane was cultivated on all the islands at the time of Cook's arrival in 1778. According to Orr (2004:14), the Chinese on Lanai are credited with first producing sugar as early as 1802. The commercial cultivation of sugarcane occurred in 1835 to replace the declining sandalwood industry (Kuykendall and Day 1976:92).

In the 1860's Kea'au Ahupua'a was mortgaged to Honolulu Banker Charles Bishop by the guardians of the Lunalilo estate (Hurst and Schilz 1994). In 1872, more than 60,000 acres of Kea'au were leased for ten years by O.B. Spencer. This lease was subsequently reassigned to Rufus Lyman in 1874. In 1882, the ahupua'a of Kea'au was sold by the estate of King Lunalilo to William H. Shipman, J. Eldarts and S. Damon. Two years later, William Shipman had bought out his partners' and became the sole owner of the Lands of Kea'au. He constructed a house at Haena Beach in 1904 and expanded his family's ranching operations on his newly acquired land (WHSL 2000).

Maly (1999) cites additional changes that occurred in Kea'au in the 1890s:

By the 1890s, most of the coastal portion of Kea'au had been abandoned. The few remaining native families of coastal Kea'au worked for and moved into housing provided by W.H. Shipman, or moved further inland. In the 1890s, the Government was also opening up large tracts of Homestead lands throughout Puna, which were sold for residential and agricultural use. Because the rich agricultural parcels were generally situated three or more miles inland, above the 400 foot elevation Homestead lands could be better accessed, and their produce better transported by a new and more direct inland route between Puna and Hilo. As a result, the basic alignment of the Kea'au-Pahoa Highway (now Highway 130) was established and construction underway in 1895. Though sugar plantations were established in the Hilo and Kohala Districts by the 1860s, it wasn't until 1899 that a plantation was established in Puna. This consisted of the Puna Sugar Company (Figure 9 - #50) founded by Benjamin Dillingham, Lorrin Thurston and James Castle (Dorrance 2000:105-107). A year later they founded the Olaa [Kea'au] Sugar Company (#49) on lands owned by the Shipman family.

The following is an excerpt from Sugar Waters by Dorrance (2000:105-107):

The rocky, acidic Puna District south of Hilo had a much smaller number of plantations. In the 1890s the land was peppered with small homesteads, some devoted to coffee growing. After Hawai'i was annexed to the United States [1898], Benjamin Dillingham saw a sugar-growing opportunity in Puna. Along with investors that included Lorrin Thurston and James Castle, he incorporated Olaa Sugar Company to exploit the land. At the time Dillingham was building the Hilo Railroad Company and considered the new plantation a source of revenue for the railroad. By 1905 Olaa Sugar Company had a modern mill, and 7, 676 acres under cultivation serviced by the only gauge plantation railway in Hawai'i. Production increased when Olaa Sugar Company began milling Puna Sugar Company's harvest in and around Kapoho. But Olaa Sugar Company waxed and waned during the first 20 years of its life, paying dividends only twice in all that time. The land was rocky,

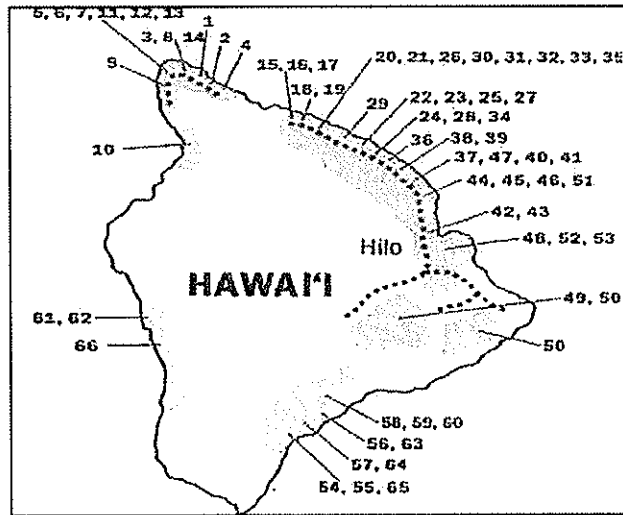


Figure 9. Sugar ventures after 1876: (Dorrance 2000:82)

sticky, acidic, and difficult to clear and cultivate. Not every acre received adequate rainfall, growth was stunted, and irrigation water was lacking. An infestation of leaf hoppers in 1916-1917 ruined 10,000 tons of sugar from the 1918 crop. In later years mechanical harvesting was limited because field equipment rusted and eroded too rapidly under the difficult conditions.

In the 1930s, cultivated acreage stabilized at slightly over 15,000 acres. The fields extended up to 23 miles from the mill. Harvests were delivered via the Glenwood branch of Hawaiian Consolidated Railway, which ran from Olaa toward Kilauea Volcano, and stopped seven miles short of it at the village of Glenwood. Harvests from the Pahoia region were delivered by the Kapoho branch of tracks that extended 17 miles southwest of the mill. Flumes and the plantation's railroad took care of about half of each harvest, while the Hawaiian Consolidated Railway hauled the rest, and also transported product to the Hilo docks.

In 1935 the plantation housed 5,648 workers and dependents in 1,086 company-supplied houses distributed among over 15 camps or villages. In addition, some 230 homesteaders lived and grew cane on family plots. Maximum production of the combined Olaa and Puna/Kapoho enterprises was 52,011 tons of sugar in 1937.

The tsunami of 1946 struck a serious blow when it caused the Hilo railroad to shut down. Then the 1955 volcanic eruption covered thousands of acres in the Kapoho

Division and isolated it. Despite all, the plantation company, renamed Puna Sugar Company in 1960 at the urging of landowner Herbert Shipman (1892-1976), struggled on.

By 1982, the Oloa mill generated over 40 million kilowatt hours of electric power that was sold to Hawai'i Electric Light Company. The end of sugar operations came when its owners, Amfac, Inc. closed the Puna Sugar Company in the same year. But the mill's generating capability was perpetuated and increased. Oil was burned in the furnaces instead of the former mixture of bagasse and oil, and fulfilled a dire need for electrical energy.

Shops in nearby Kea'au (Oloa) served the mill camps and homesteaders who supplied harvests to the Oloa mill. When it shut down in 1982, many small businesses were devastated. Highway 11 leading to Kilauea Volcano bypassed the town and further accentuated the demise of its prosperity.

Beginning in the 1930's and continuing through the 1960's the Hawaiian sugar industry noted a decline in business, due in large part to competing overseas markets (Kent 1983:107-108). More changes were soon to take place on the landscapes of Hawaii. Mechanization associated with the industry occurred between the 1950s to 1970s which resulted in the decline of plantation camp lifestyles (Vorfeld 2002:1 in Orr 2004). Due to increasing unfavorable sugar markets and high costs, by the 1990s the majority of the sugar plantations closed their operations.

## Previous Archaeological Research

Limited archaeological research has been conducted within the Land of Kea'au. The earliest work was undertaken in 1906 and 1907 by Stokes (1991) who surveyed and mapped the *heiau* of Hawai'i Island. As indicated in *Figure 10*, he identified nine named and one unnamed *heiau* within the district of Puna, though none were situated within the Land of Kea'au. James (1995) confirmed the absence of *heiau* within Kea'au.

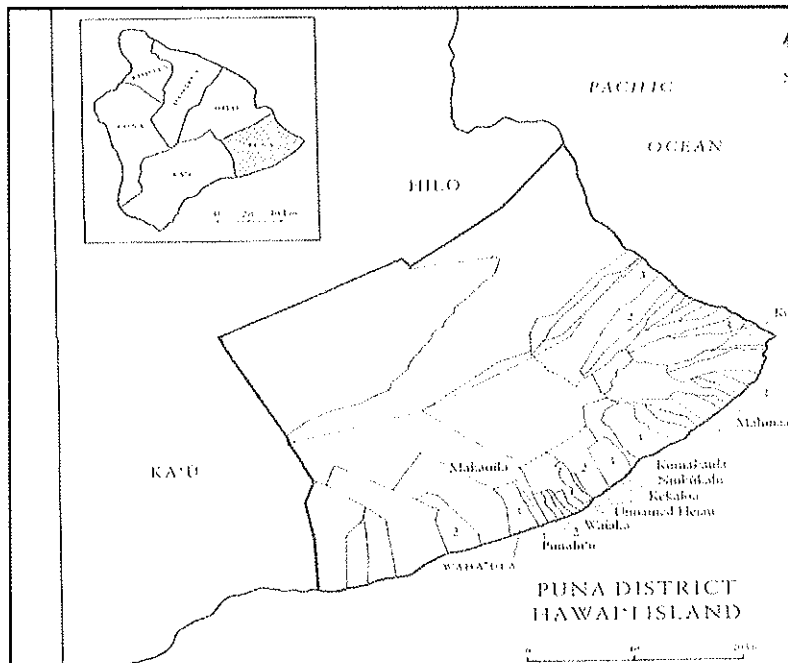


Figure 10. Map of Puna District Heiau (Stokes 1991:137)

In 1945, Emory, along with employees of Herbert Shipman explored a number of lava tubes and *kipuka* located on Shipman lands (Emory 1945). Two of the longest tubes were called Oleole-ana and Keakiu and two special cave areas were designated the Poi Pounder Cave and the Fish Hook Cave (due to the presence of those artifacts within the interiors. The Oleole-ana tube extended all the way to the ocean and had been utilized as a refuge cave. The Keakiu tube contained human remains.

Ewart and Luscomb (1974) undertook a reconnaissance survey of the proposed Kapoho-Keaukaha Highway that extended through a number of ahupua'a from Kea'au to Waiakahiula. A total of 118 sites were identified during this survey though only 30 sites were found in the Kea'au portion. These sites were comprised of coastal habitation complexes, livestock control walls and enclosures and a lava tube that contained human remains.

Hammatt (1978) conducted a reconnaissance survey of the proposed Kings Landings subdivision in Kea'au and Rosendahl (1982) undertook a reconnaissance study of portions of the Shipman Industrial Park. No sites were identified in either of these studies.

Hunt (1993) conducted an archaeological assessment of 600 acres Shipman Lands with Kea'au. This study was conducted by helicopter followed by extensive ground surface reconnaissance. This study identified a total of 50 sites which were interpreted as being associated with sugarcane clearing activity.

Hurst and Schilz (1994) undertook a survey of the Kea'au-Puna Road, Kea'au Town Section, and identified former sugarcane fields and plantation buildings, some of which were still in use. Masterson and Hammatt (1998) conducted an inventory survey of a c. 2.4-acre parcel in Kea'au town adjacent to the police station. No archaeological sites were encountered though a modern camp attributed to Filipino workers was documented.

McGerty and Spear (2000) conducted an archaeological inventory survey of the proposed 300-acre Kamehameha Schools Bishop Estates, East Hawaii Campus, located in inland Kea'au at the c. 600 ft elevation. The parcel had been disturbed by modern sugarcane cultivation and the only archaeological remains identified during the survey consisted of seven stone mounds interpreted as historic clearing piles. In 2004, Haun et al. (2004) conducted an assessment of the Kea'au-Pahoa Road, in conjunction with a shoulder conversion project. No sites were identified during this study.

Haun et al. (2004) conducted an archaeological assessment of a 2.2 mile long corridor on the seaward side of the Keaau-Pahoa road, opposite of the present project area corridor. This survey area originated 120.0 m northwest of the entrance to the Hawaii Island Humane Society facility and extended southeast to where it terminated 26.0 m southeast of the Shower Drive/Pohaku Drive Intersection. No archaeological sites or features were identified.

Haun and Henry (2008) conducted an archaeological inventory survey of a c. 10.6-acre parcel located south of Kea'au road. The survey identified a site comprised of seven historic buildings constructed and utilized by the Puna Sugar Company in the mid-1900's as a as a maintenance facility for the trucks and vehicles associated with the sugar cane industry. The facility was abandoned in 1982 when Puna Sugar Company was closed by its owners, Amfac, Inc.

McEldowney (1979) used site inventory and historic documentary evidence to develop a land use and settlement pattern model for the Hilo area that is applicable to the present project. The model consists of five elevationally-defined zones: Coastal Settlement, Upland Agricultural, Lower Forest, Rainforest, and Sub-Alpine or Montane. The Coastal Settlement Zone extended approximately 0.5 miles inland from the shoreline between sea level and 50 ft elevation. The zone was the most densely populated with both permanent and temporary habitations, high status chiefly residences, and *heiau*. Settlements were concentrated at Hilo Bay and sheltered bays and coves.

The Upland Agricultural Zone was situated between approximately 50 ft and 1,500 ft elevation. Settlement in the zone consisted of scattered residences among economically beneficial trees and agricul-



tural plots of dryland taro and bananas. Lava tubes were utilized for shelter. A pattern of shifting cultivation is believed to have converted the original forest cover to parkland of grass and scattered groves of trees. Wetland cultivation of taro occurred along streams.

The Lower Forest Zone ranged from 1,500 ft to 2,500 ft elevation. Timber and other forest resources such as medicinal plants, *olona*, and birds were gathered from the zone. Site types consisted of temporary habitations, trails, shrines, and minor agricultural features in forest clearings and along streams. Sites in the Rainforest Zone (2,500-5,000 ft elevation) and Subalpine or Montane Zone (5,000-9,000 ft) were limited to trails and associated temporary habitations. These zones were used for intra-island travel and gathering of valued resources including hardwoods, birds, and stone for tool making.

## **PROJECT EXPECTATIONS**

The project area is situated in McEldowney's (1979) Upland Agricultural Zone where expected site types include agricultural plots, trails to the interior, and scattered dwellings. The study area is situated in an area that has been significantly impacted by historic agricultural activity and historic/modern road construction activity. Due to this disturbance, and the inland location of the project area it is unlikely that pre-contact habitation sites would be present. Walls designed to control cattle and trails or roads for horse and wagon traffic may potentially be present. It is possible that the remnants of the commercial sugarcane production infrastructure would be present within the project area.

## FINDINGS

The inventory survey identified one site, an historic concrete bridge that spans Waipahoe Stream (SIHP 50-10-44-26874). The site is located inland of an existing modern concrete bridge and is situated c. 650 m northwest of the intersection of the Keaau-Pahoa Road and Shower Drive (see *Figure 1*). The bridge is comprised of a rectangular-shaped concrete slab that measures 22.3 m (73.1 ft) m long (northeast by southwest) and 6.7 m (22 ft) wide (*Figures 11 and 12*).

The bridge is supported along the northwest and southeast ends by vertical mortared stone retaining walls that are built into the sides of the Stream (*Figure 13*). These walls range in height from 2.1 (6.9 ft) to 2.2 (7.2 ft) m above the stream bed.

The span of the bridge is supported by a series of five formed concrete piers set into the stream bed. These piers are oriented parallel with the stream bed at a slight angle to the bridge surface (*Figure 14*). The marks from the form boards used to construct both the piers and bridge are also visible in *Figure 14*. The five piers are pointed on the upstream, southwestern side and are squared off on the downstream side, apparently constructed to facilitate water diversion around the piers. The piers are wider at the base than at the top. The northwest and southeastern-most piers are thicker than the central three, measuring 1.95 m (6.4 ft) wide at the base, tapering to 1.29 m (4.25 ft) wide at the top. The three central piers are 0.7 m (1.9 ft) wide at the base, tapering to 0.45 m (16.5" thick) wide at the top. These piers average 2.43 m (8 ft) in height from the underside of the bridge to the stream bed.

A metal United States Geodetic Survey (USGS) bench mark is imbedded in the top of the southeastern-most pier on the upstream side of the bridge. The bench mark reads, "207 feet above sea level" and "87YY". It also has a barely legible date of either 1952 or 1953.

The sides of the bridge surface are bordered by raised concrete curbs that are .3 m (1 ft) wide and 0.25 m (10" in height). Guard rails comprised of a framework of 2 ½" galvanized pipes joined together by threaded fittings are imbedded into the top of the raised curbs (*Figure 15*). An asphalt roadbed extends to the northwest and southeast from the bridge, representing the original Keaau-Pahoa Road.

Site 26874 is interpreted as an historic transportation feature constructed to allow vehicular traffic to pass over the Waipahoe Stream drainage. According to the client, the bridge was likely constructed in the 1930s. The bench mark noted on the surface of one of the piers confirms that it was built at least by the early 1950s. Site 26874 is unaltered and in good condition and is assessed as significant for its information content.

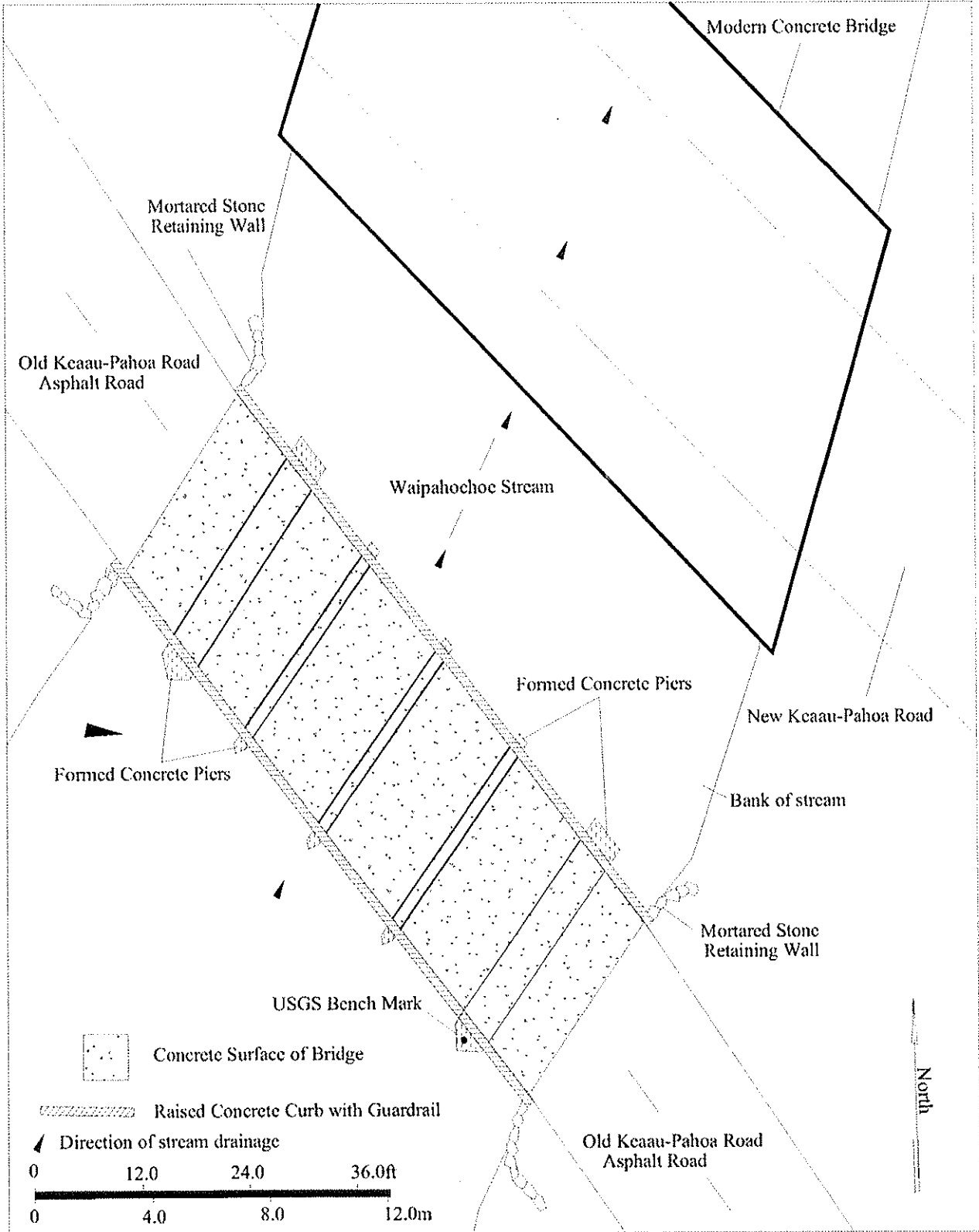


Figure 11. Plan Map of Site 26874



Figure 12. Site 26874 Bridge, view to northeast



Figure 13. Stone Retaining Wall, view to northwest



Figure 14. Formed Concrete Piers, view to east



Figure 15. Surface of Bridge showing Guardrails, view to southeast

# CONCLUSION

## Discussion

As expected, no pre-contact archaeological remains were identified within the project area due to its inland location away from the coastal habitation areas. The absence of sites is also likely due to the extensive ground altering disturbance associated with the cultivation of sugar cane that occurred in the area and road construction activities. The Site 26874 bridge identified in the survey area functioned as a component of the primary transportation route between the towns of Keaau and Pahoa. Information provided by the client suggests that the structure may have been built as early as the 1930s.

## Significance Assessments

Pursuant to DLNR (2003) Chapter 275-6 (d), the initial significance assessments provided herein are not final until concurrence from the DLNR has been obtained. Sites identified and relocated during the survey are assessed for significance based on the criteria outlined in the Rules Governing Procedures for Historic Preservation Review (DLNR 1998:Chap. 275). According to these rules, a site must possess integrity of location, design, setting, materials, workmanship, feeling, and association and shall meet one or more of the following criteria:

1. Criterion "a". Be associated with events that have made an important contribution to the broad patterns of our history;
2. Criterion "b". Be associated with the lives of persons important in our past;
3. Criterion "c". Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value;
4. Criterion "d". Have yielded, or is likely to yield, information important for research on prehistory or history; and
5. Criterion "e". Have an important traditional cultural value to the native Hawaiian people or to another ethnic group of the state due to associations with traditional cultural practices once carried out, or still carried out, at the property or due to associations with traditional beliefs, events or oral accounts--these associations being important to the group's history and cultural identity.

Based on the above criteria, Site 26874 is assessed as solely significant under Criterion "d". The site has yielded information important for understanding the historic land use in the project area.

## Recommended Treatments

The mapping, written descriptions and photography at Site 26874 adequately document it and no further work or preservation is recommended.

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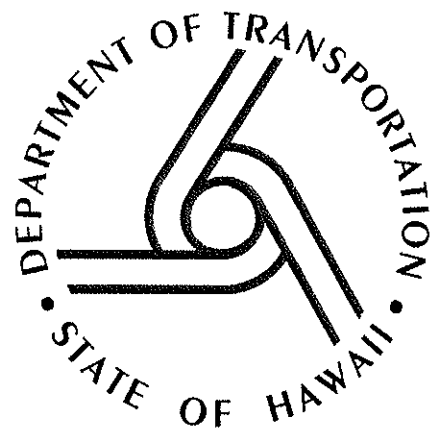
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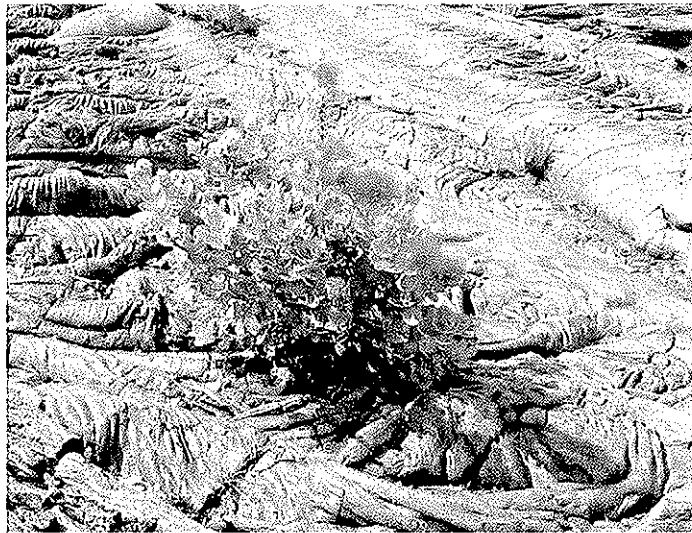
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2001 Geological Map of the Island of Hawaii. U.S. Department of the Interior. U.S Geological Survey



**APPENDIX E**

**Cultural Impact Study/Assessment**  
**Keaau By-Pass Road to Shower Drive Shoulder Lane Conversion Project**  
**Kea`au Ahupua`a,**  
**District of Puna, Hawai`i Island, Hawai`i**



Prepared for  
**Haun & Associates**  
**Wilson Okamoto Corp**

The complete Cultural Impact Study/Assessment has been filed with the State of Hawaii Department of Land and Natural Resources Historic Preservation Division and the State of Hawaii Office of Environmental Quality Control. A copy is also on file with Department of Transportation Highways Division.

By Maria E. Ka`imipono Orr  
July 5, 2004

## CULTURAL IMPACT STUDY/ASSESSMENT

This cultural impact study is based on two guiding documents, Act 50 and OEQC Guidelines [see Appendices A & C], as well as the *Criteria for Historic Preservation* cited below.

**Act 50 [State of Hawai'i 2000].** H.B. NO. 2895 H.D.1 was passed by the 20<sup>th</sup> Legislature and approved by the Governor on April 26, 2000 as *Act 50*. The following excerpts illustrate the intent and mandates of this Act:

The legislature also finds that native Hawaiian culture plays a vital role in preserving and advancing the unique quality of life and the "aloha spirit" in Hawai'i. Articles IX and XII of the state constitution, other state laws, and the courts of the State impose on government agencies a duty to promote and protect cultural beliefs, practices, and resources of native Hawaiians as well as other ethnic groups.

Moreover, the past failure to require native Hawaiian cultural impact assessments has resulted in the loss and destruction of many important cultural resources and has interfered with the exercise of native Hawaiian culture. The legislature further finds that due consideration of the effects of human activities on native Hawaiian culture and the exercise thereof is necessary to ensure the continued existence, development, and exercise of native Hawaiian culture.

The purpose of this Act is to: (1) Require that environmental impact statements include the disclosure of the effects of a proposed action on the cultural practices of the community and State; and (2) Amend the definition of "significant effect" to include adverse effects on cultural practices.

SECTION 2. Section 343-2, Hawai'i Revised Statutes, is amended by amending the definitions of "environmental impact statement" or "statement" and "significant effect", to read as follows:

"Environmental impact statement" or "statement" means an informational document prepared in compliance with the rules adopted under section 343-6 and which discloses the environmental effects of a proposed action, effects of a proposed action on the economic [and] welfare, social welfare, and cultural practices of the community and State, effects of the economic activities arising out of the proposed action, measures proposed to minimize adverse effects, and alternatives to the action and their environmental effects....

### **State Historic Preservation Division Draft Rules (1989)**

**Criteria for Historic Preservation.** The "significance" of a site is determined by a set of criteria. The following is the State of Hawai'i criteria for historic preservation:

- Criterion A: Be associated with events that have made an important contribution to the broad patterns of our history.
- Criterion B: Be associated with the lives of persons important in our past.
- Criterion C: Embody the distinctive characteristics of a type, period, or method of construction; represent the work of a master; or possess high artistic value.
- Criterion D: Have yielded, or be likely to yield, information important for research on prehistory or history.
- Criterion E: Have an important historical cultural value to an ethnic group of the state.

## SUMMARY OF FINDINGS.

The following summaries are based on the information presented in the previous sections: the traditional and historical literature review in Part III and the ethnographic data and analyses in Part IV. References are not cited here unless it is new information and not already cited in the text above. These summaries condense the information above, but also serve to focus on a few significant individuals and events in Puna history in relation to the *ahupua`a* of Kea`au (and indirectly, the project area), as well as give a broad overview of land, water and marine resources and uses in the general area, as they reflect cultural properties and practices and access to them.

William H. Shipman (known to everyone as Willie) purchased the *ahupua`a* of Kea`au at a public auction in 1882. A village area just *mauka* of the coast was called Kea`au. The uplands, according to Mary Shipman and other Hawaiians familiar with Kea`au *Ahupua`a*, used to be generally referred to as `Ōla`a, the forests where bird feathers were collected for the *ali`inui* and more importantly a sacred place and domain of the *kahuna*. When the lands in the vicinity of Kea`au Town were leased to Olaa and Puna Sugar Companies in the 1890s, they were given permission to clear the forests, but leave any breadfruit, coconut, or mango trees. Mary Shipman, matriarch of the W.H. Shipman company had expressed that nothing commercial should be called `Ōla`a as it was very sacred. But it wasn't until the 1950s that her youngest son Herbert Shipman had the name of `Ōla`a township, post office, etc. officially changed to Kea`au (Town, Post Office, etc.).

### Summary of Significant People and Events.

According to traditional and historical archival material, the Puna District, and specifically the lands of Kea`au *Ahupua`a* have gone through a number of significant changes over time and witnessed the comings and goings of many significant people and events. Some of these people contributed substantially not only to the history of Puna, but of Hawai`i Island and the rest of the Hawaiian Islands as well. There were several people and events noted in the oral histories and later recorded by explorers, missionaries, native Hawaiian scholars and ethno-historians, from the time of Pele to Pa`ao to Kamehameha I who waged war and conquered the various district chiefs and island kingdoms and brought them under one realm, with the exception of Kaua`i. Some of these significant people lived in the Puna and/or neighboring districts, were responsible for land modifications, shifts in polity and commerce, and the gene pool of Hawai`i's *ali`i*, monarchs and people. Some of these people and events are noted below.

### Mythical Entities.

The most significant mythical entity to impact the Puna District, the lands of Kea`au, as well as greater Hawai`i Island, was the volcano or fire goddess Pele, who left evidence of her visits in the form of *pu`u* which dot the landscape, but especially the residuals of her monumental lava flows. In her wake she annihilated villages, shelters, trails, temples, shrines, water sources, fishponds, pools, holua slides, and countless other structures and features, forever changing the lives of those affected by the destruction. Even those outside of the direct flows of lava were affected as resources on the land and in the marine environment were forever obliterated. Through time here in the Puna lands, the people have had to alter their lifestyle, look for other resources and start all over again due to lava flows. Often, though time has passed, archaeologists with the help of oral histories are able to reconstruct the life of the ancient ones through the clues left by their abandoned shelters, house sites, sacred places and remains of the food they ate. This however, cannot be done in the places visited by Pele; the few stories left will have to suffice. However, the flows of Pele created more land mass, and more possible lava tube shelters should they be needed again someday.

Two other legendary entities in the Puna lands and specifically Kea`au, were Hōpoe and Hi`iaka. Hi`iaka was the younger sister of Pele, and Hōpoe was a special friend of Hi`iaka who taught Hi`iaka the ancient dances and how to make *lei*. Pele and her family resided in Puna (her latest home is Kīlauea, Puna). During one period Pele went to sleep and asked her sister Hi`iaka to watch over her and wake her at a pre-set time. During her long sleep, Pele's dream body found Lohi`au and fell in love with him. When she woke, Pele sent Hi`iaka to Kauai to fetch Lohi`au for her. As she left, Hi`iaka asked Pele to take particular care of her friend Hōpoe from Kea`au. But when Hi`iaka failed to return in a timely manner, Pele sent her destructive forces to Kea`au. Hi`iaka sensed the tragedy and said (Westervelt 1916):

Puna is shaking in the wind,  
Shaking is the hala grove of Keaau,  
Tumbling are Haena and Hopoe,  
Moving is the land--moving is the sea.

Hōpoe and Hi`iaka's beloved `ohia and hala forests of Kea`au were destroyed by Pele and Hōpoe was turned into a "dancing rock" at Hā`ena, Kea`au. According to residents of Kea`au the top of the dancing rock was knocked away by the 1946 tidal wave, however, Westervelt's (1916) story of Hōpoe said it was destroyed by an earthquake.

### Ali`i nui.

One of the first legendary people or families who impacted the history of Hawai`i was the Nanaula family who came from the southern islands around the 6<sup>th</sup> century along with other families from Tahiti or Samoa and brought their Polynesian traditions. They peopled all the islands for thirteen or fourteen generations. During the 10<sup>th</sup> century the Paumakua family arrived from Tahiti. They too are the ancestors of many of the families of the islands. During the 11<sup>th</sup> century the Nanamaoa family from the Society Islands established families on the islands of Hawai`i, Maui and O`ahu. During this period the descendants of Paumakua: Haho (who started the *Aha-ali`i*), Palena, Hua, Hanala`anui, Hanala`aiki (twins and progenitors of Maui and Hawai`i Island *ali`i nui*), and Mauiloa, were well established on Maui and Hawai`i Island. The Nanamaoa families were shortly followed by Pa`ao and Pili who came (some say Society Islands, other say Samoa) during the reign of La`au-ali`i and Kapawa, grandson of Nanamaoa, and changed the religious and social structures of the island chiefdoms, bringing with them the Kū cult and the concept of human sacrifice and supplanting the Kāne and `Io belief systems. Around the beginning of the 12<sup>th</sup> century great voyages took place to and from the southern islands, but stopped abruptly around the end of that century, during the time of Wakalana around AD 1175, right after the arrival of white foreigners, possibly from Japan.

Most of the islands were ruled by the southern families with the exception of Molokai (Kamauaua family) and parts of O`ahu (Maweke family) who were descendants of the ancient Nanaula line. One of the first legendary *ali`i nui* was the priest Pa`ao who is said to have arrived on Hawai`i Island between AD 1100-1200. Pa`ao built the *heiau* of `Aha`ula (Waha`ula) when he landed to honor his gods. In the oral histories, he is credited with constructing at least three *heiau*, specially *luakini* or temples of human sacrifice, thereby radically changing the religious system and political structure of the people of Hawai`i. Pa`ao not only brought about a significant change in religious practices (i.e., the Ku cult, human sacrifices), he brought high chief Pili to rule in place of chief's he believed had lost their *mana* or power due to too many intermarriages with commoners and/or ineffective rule. His new system introduced the concept of hierarchical or *ali`i* rule to the islands and a new order of *kahuna* or priests. Waha`ula was said to have been reconstructed (ca. 1500

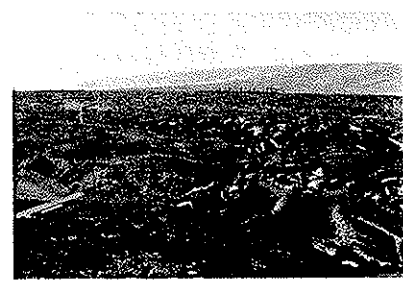


Photo 9. Waha`ula (Glidden 1997)

AD) by *ali`inui`Imaikalani* of Ka`ū; and again by Kalani`opu`u (ca. 1770 AD) and Kamehameha I (ca. early 1800s) (James 1995:71-71). Waha`ula was permanently destroyed by lava flows on August 12, 1997 (VW 2004).

Cape Kumakahi (past Pāhoa and Kapoho) was named after a “migratory hero” Kumakahi, who is said to have incurred the wrath of Pele; she sent a lava flow that created the cape. It is considered the most eastern point of Hawai`i (James 1995:64-65). There are countless places in Puna that were connected with past *ali`inui* and ancient villages that are now destroyed by lava flows (Kalapana/Kaimū, Kamoamoā, Lae`apuki, Pu`uloa, Queen’s Bath, Ka`ili`ili, Poupou and Kauka) (James 1995:66-73).

The area between Kumukahi and Pāpa`i is an old volcanic mound where Kūkui Heiau was constructed, measuring more than thirty by fifty feet. It was traditionally connected to astronomical observations and said to have been built by `Umi-a-Liloa in the sixteenth century or a generation later by Paka`a (James 1995:65), an advisor (steward) of Keawe-nui-a-Umi. Later, Kalākaua felt the *heiau* significant and brought some of the stones from it for the foundation of `Iolani Palace (James 1995:65).

Many battles took place across this landscape as relative fought relative for supreme rule. A couple relatively recent names that stand out are Kalani`opu`u and his nephew Kamehameha I who not only successfully conquered the local island polities, he went on to conquer those on the neighbor islands as well, situating himself in a position that only Kualii was said to have done, to have all the island polities under one rule. Kamehameha’s advantage was foreign weapons and foreign advisors who knew how to use the weapons skillfully and strategically, as well as powerful *kahuna* or priests who were also knowledgeable in their own right. Although the common translation for “kahuna” is priest, they are actually masters who studied all their lives in their particular craft and arts. Some were astronomers, others water managers, and some were architects in the building of temples or fishponds. . Two of these *kahuna nui* were Pu`ou and his son Hewahewa. Pu`ou and Hewahewa were masters of many arts, and were considered *kahuna nui*, the highest rank of a *kahuna*. In 1848 the *ili* lands Halauloa, Kea`au were awarded to Hewahewa who later deeded it to Catholic Bishop Maigret.

After Kamehameha died in 1819, his son Liholiho, chose to capitulate to his mother, Queen Ke`ōpūolani and his *Kuhina Nui* (co-ruler in this case) Queen Ka`ahumanu, and break the *`ai kapu*. This signaled the end of the old way, the religion of Pa`ao. Hewahewa, who had been given the role of guardian and priest for Liholiho, resigned his position and helped the missionaries. He eventually left Hawai`i Island and moved to Waimea, Oahu where he was buried.

The entire *ahupua`a* of Kea`au was awarded to William Charles Lunalilo, son of Charles Kanaina and Kekauluohi (who was the daughter of Hoapili & Kalakua; widow of Liholiho-Kamehameha II; sister of Queen Kamamalu and Kinau; granddaughter of Ke`eaumoku & Namahana; and niece of Ka`ahumanu). His will dictated that the proceeds of his lands were to go into constructing and maintaining a home for elderly Hawaiians, today known as Lunalilo Home in Hawaii Kai, O`ahu.

## Historic People

During the Mahele period (ca. AD 1846-1856) lesser chiefs and *konohiki* were claiming or being assigned lands. As stated above the *ahupua`a* of Kea`au was awarded to William Charles Lunalilo when he was only fifteen; his father Charles Kanaina became his *konohiki* or land guardian. Lunalilo was elected king of the Hawaiian Kingdom in 1873, however his reign only lasted a year. He was plagued by poor health and died of tuberculosis on February 3, 1874 on O`ahu. As per the instruction of his will, Kea`au was sold at a public auction in 1882 and bought by partners William H. Shipman (Willie--son of missionaries Rev William Cornelius Shipman and Jane Stobie Shipman), retired German sea captain Johannes Emil Elderts, and another son of missionaries, Samuel Damon. The following year Willie bought out his two

partners and Kea`au became the property of Willie and Mary Shipman. Willie stuck with ranching with which he was most familiar, and the family built their homes near the coastal part of Kea`au.

### **Significant Events.**

The most significant ancient events in Kea`au and Puna would have been the construction of *heiau* and villages in ancient times; to lava flows both ancient and historic which destroyed many cultural sites and villages; to scenes of battles, also both ancient and early historic. The construction of the Volcano Road/Highway was significant in that it not only went right through Kea`au, but it connected Hilo to the high uplands of Puna--Kīlauea Volcano on the flanks of Mauna Loa. It also allowed for other communities to be established along the way. The place called Pāpa`i (crab) is the old Hawaiian name for King's Landing the place where Kamehameha I was hit on the head with a paddle by a Hawaiian fisherman (James 1995:65). It was from this experience that Kamehameha came up with what is today called the *Splintered Paddle* law.

### **Summary of Land, Water and Marine Resources and Use**

Various land use patterns are physically evident as well as recounted in the literature, legends, maps and legal documents, but are not always physically evident on the landscape. The physical evidence is usually in the form of stone ruins that are fortunate to have been preserved relatively intact. Clues regarding function and use can sometimes be extrapolated from the stories, songs, chants and ethno-historical observations that were also fortunately recorded, as well as from the cultural remains identified during surface and sub-surface studies (artifacts, midden, charcoal for dating). Several of these stone cultural remains were recorded during studies of Kea`au coastal lands and also mentioned by a couple of Maly's consultants (i.e., *heiau*, caves, platforms, mounds, walls, enclosures, and burials). These are all evidence of both permanent and/or temporary use of the land and its diverse natural resources.

### **Ancient Land, Water and Marine Resources and Use**

While the traditional literature is somewhat silent of the subject of Kea`au and vicinity, the cultural resources found on the landscape speak volumes. The permanent and temporary shelters, the midden clues at those sites, and in the caves, the extended use of the lava tube systems, the habitation and agricultural complexes, and especially the burials and the *heiau* tell a story of ancient use of the land. People lived and died here. People worked and worshipped here. People cultivated the diverse natural resources (endemic/indigenous plants; bountiful marine resources; bountiful aquaculture), as well as cultivated their own Polynesian-introduced cultigens; their staples and their medicine and ritual plants.

The traditional literature has a sparse amount of information about Kea`au; the goings and comings of various *ali`i nui*, their families and their adventures and the *maka`āinana*, the people who cared for the land. Archaeological studies have revealed that fishing villages or settlements were along the coastal lands of the Puna District. In the early 1800s several ancient villages and cultural sites were noted by the first missionaries in that district and later surveyors. Some of the earliest records noted that taro, sweet potato, and sugar cane were grown in large scale "plantations" in these villages. It was estimated that several thousand people once lived in this district. Kea`au also had an inland ancient village as well as coastal. There were at least a couple of *heiau* (structure of worship), alluding to organized and complex social and religious systems, above the ordinary scope of the personal and occupational *ko`a* (shrines) and shrines associated with Kea`au, as well as legendary people noted above. According to the *mo`ōlelo* the coastal area was especially known for its fragrant *hala* groves and its upland forests of `ohia and ferns. However many of these ancient villages and sites were destroyed by various lava flows, earthquakes, and tidal waves; or extensively modified by ranching, sugar, coffee, and other industry activities.



There was only one recorded fishponds in the Kea`au, along with a few other smaller ponds. The fishpond had mullet, *moi*, *o`opu* and *opae*. The fishpond was fed partly by underground springs. The only flowing stream in the Puna district went through Kea`au and was noted by missionary Ellis in 1823. However, by the time the Shipmans acquired the property in 1882 the stream was not noted as flowing. It may have been an intermittent stream or the source of the stream may have been altered by lava flows or earthquakes. Fishing off the coastal lands of Kea`au was very good according to people who grew up in the area.

### **Historic Land, Water & Marine Resources and Use (Post 1823).**

In the late 1890s Willie Shipman leased large tracts of the Kea`au uplands to the Olaa Sugar Company and the Puna Sugar Company. The project area went from upland forests to partly sugar cane fields and partly ranching grazing lands.

Drinking water in coastal Kea`au came from a couple of springs and wells however the stream was no longer flowing. Brackish water filled the fishpond that Shipman gave the local people permission to fish in, in exchange for them constructing a stone wall around the fishpond. Coastal Kea`au has a long history of prolific marine resources (fish, turtles, crabs, *opihī* and seaweed). The area has been protected by its purposeful isolation by generations of the Shipman family and employees.

There are a couple of streams that flow under the Keaau By-Pass Road, closer to the Shower Drive end of the project area. According to one of the landowners and a couple of Maly's consultants, nearby Waipāhoehoe is "land of flood waters."

### **Summary of Survey Findings (Cultural Sites & Practices)**

It is evident that at one time the lands of Kea`au, were part of an ancient Hawaiian life system. However, whatever was once on the landscape between Keaau By-Pass Road and Shower are no longer evident, as this area was heavily modified during the sugar plantation era of the late 1800s/early 1900s, as well as during the construction of the current road.

### **Summary of Consultants Concerns**

While it hasn't been made clear to the landowners as to the extent of construction activity for the proposed Keaau By-Pass to Shower Drive Shoulder Lane Conversion, several landowners are concerned that the front portions of their property may be affected by the proposed activity. One landowner, `Aha Pūnana Leo is a traditional cultural immersion school where cultural practices are taught on that property every day.

**Cultural Resources.** This category entails sites or places associated with significant events and/or people important to the native Hawaiian patterns of prehistory; embody distinctive characteristics; or are likely to yield information important for research on the prehistory of Hawai`i. It also includes sites that yield resources important for native Hawaiian Cultural Practices, past and present; and items that are part of a cultural context. *Wahi Pana* or sacred places are important cultural resources to native Hawaiians regardless that the original sites that may have been there no longer exist. Often it is not the lack of interest but the lack of knowledge of whereabouts or more likely, lack of access that prevent native Hawaiians from visiting these sites. Other than the *ohia* trees along the highway adjacent to the project area, there are no cultural resources located on project lands.

**Cultural Practices.** This category includes items that are essential to the gathering practices that have cultural value to either native Hawaiians or other ethnic groups. This category also includes the teaching of cultural practices (*halau* -- *hula* schools, places where traditional crafts are taught, and conceivably where the Hawaiian language is taught.)

**Historic Resources.** This category entails sites associated with significant events and/or people important to the broad patterns of history [post Western contact], which includes other ethnic groups; embodies distinctive characteristics of an historic era or master; or are likely to yield information important for research on the history of Hawai'i. There are no structural remains of the historic sugar, coffee or ranching industries in the project area. However, people who worked in former camps located in the vicinity now live in homes located along portions of the proposed project area.

## CULTURAL IMPACT ASSESSMENT

- ❖ **Cultural Resources (Land) Impact.** The lands within the project area were heavily impacted by the historic activities of the 19<sup>th</sup> and 20<sup>th</sup> centuries. Any cultural sites and/or resources would have been destroyed or buried by ranching, sugar and coffee plantation activities; therefore there will be no adverse impact to any cultural resources on Keaau By-Pass to Shower Drive lands.
- ❖ **Cultural Practices/Access (Land) Impact.** Since there are no resources on Keaau By-Pass to Shower Drive lands, there will be no adverse effects to cultural practices on Pulelehua lands.
- ❖ **Cultural Practices: Indirect Adverse Impact.** There is one condition that has the potential to create an adverse effect or impact on cultural practices in the project area. There are cultural practices being taught at `Aha Pūnana Leo, one of the affected landowners, and they are concerned that their property may be adversely impacted by the Keaau By-Pass to Shower Drive Shoulder Lane Conversion project.
- ❖ **General Concerns.** While many of the concerns of the consultants do not involve traditional cultural resources or practices, they are never-the-less concerned that their properties may be adversely affected by the proposed project warrant some consideration. They all should be notified as soon as possible and given an explanation of the project and the extent that it may or may not affect their properties.

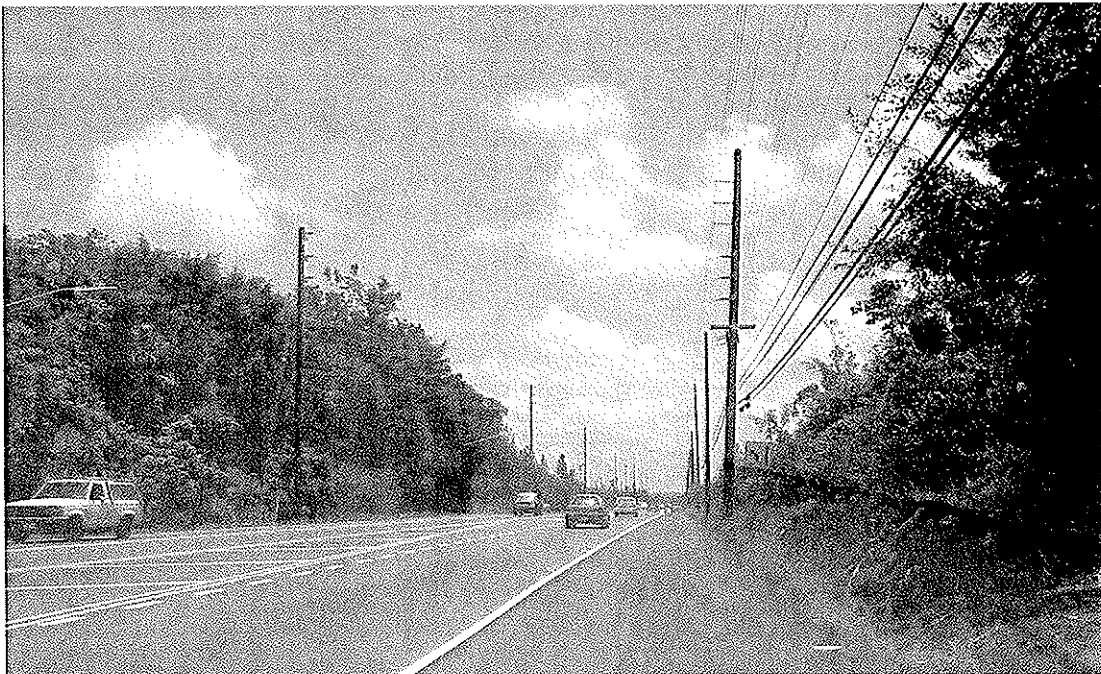


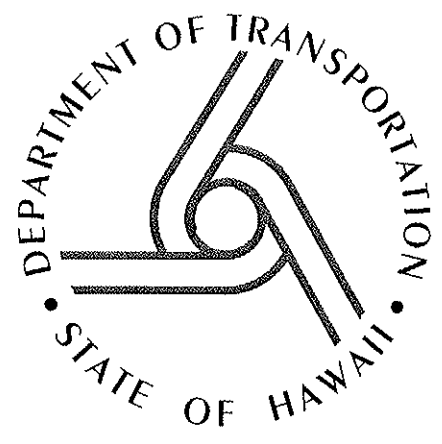
Photo 10. View of Keaau By-Pass Road



Photo 11 Manicured lawn of land owner along Keaau By-Pass Road to Shower Drive.



Photo 12. Another View of Keaau By-Pass Road to Shower Drive.



**APPENDIX F**



DEPARTMENT OF THE ARMY  
U.S. ARMY CORPS OF ENGINEERS, HONOLULU DISTRICT  
FORT SHAFTER, HAWAII 96858-5440

REPLY TO  
ATTENTION OF: CEPOH-ECT

November 10, 2009

Civil Works Technical Branch

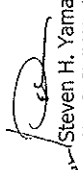
Mr. John L. Sakaguchi, Project Manager  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

Thank you for the opportunity to review and comment on the Draft Environmental Assessment (DEA) for the Keau-Pahoa Road Bypass Project, Puna, Hawaii (Federal Aid Project No. STP-130-028). I concur with the flood hazard designation provided on page 2-6 of the DEA.

Should you require additional information, please contact Ms. Jessie Dobinchick of my staff at (808) 438-8876.

Sincerely,

  
Steven H. Yamamoto, P.E.  
Chief, Civil Works Technical Branch



1907 South Beretania Street  
Aiea, Hawaii 96826  
Wilson Okamoto Corporation  
Honolulu, Hawaii 96826  
Phone: 808 946 2251  
Fax: 808 946 2251  
www.wilsonokamoto.com

6615-01  
January 19, 2010

Mr. Steven H. Yamamoto, P.E.  
Chief, Civil Works Technical Branch  
Department of the Army  
U.S. Army Corps of Engineers, Honolulu District  
Fort Shafter, Hawaii 96858-5440

Attention: CEPOH-ECT

Subject: Draft Environmental/Assessment/Anticipated Finding of No Significant Impact, Keau-Pahoa Road Shoulder Lane Conversion, Keau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keau, Puna District, Island of Hawaii Response to Comment

Dear Mr. Yamamoto:

Thank you for your November 10, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keau-Pahoa Road Shoulder Lane Conversion, Keau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the U.S. Army Corps of Engineers, Honolulu District concurs with the flood hazard designation provided on page 2-6 of the Draft EA.

We appreciate your participation in the Draft EA review process.

Sincerely,  


John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

6615-01  
JLS/ry  
PL  
FILE  
cc: DOT/em

RECEIVED  
NOV 12 2009  
WILSON OKAMOTO CORPORATION



United States Department of the Interior

U.S. GEOLOGICAL SURVEY  
Pacific Islands Water Sciences Center  
677 Ala Moana Blvd., Suite 415  
Honolulu, HI 96813  
Phone: (808) 587-2400/Fax: (808) 587-2401

November 18, 2009

RECEIVED  
NOV 19 2009

WILSON OKAMOTO CORPORATION

Mr. John L. Sakaguchi, AICP  
Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact (FONSI), Keau-Paho Road Shoulder Lane Conversion, Keau Bypass to Shower Drive Federal Aid Project No. STP-130 (028), Keau, Puna District, Island of Hawaii, Review and Comment

Thank you for forwarding the subject FONSI for review and comment by the staff of the U.S. Geological Survey Pacific Islands Water Science Center. We regret however, that due to prior commitments and lack of available staff, we are unable to review the report.

We appreciate the opportunity to participate in the review process.

Sincerely,  
*Stephen S. Anthony*  
Stephen S. Anthony  
Acting Center Director



1807 South Beretania Street  
Honolulu, Hawaii 96826 USA  
Phone: 808 846 2277  
Fax: 808 846 2253  
www.usgs.gov

6615-01  
January 19, 2010

Mr. Stephen S. Anthony, Acting Center Director  
Pacific Islands Water Science Center  
U.S. Department of the Interior  
Geological Survey  
677 Ala Moana Boulevard, Room 415  
Honolulu, Hawaii 96813-5412

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keau-Paho Road Shoulder Lane Conversion, Keau Bypass to Shower Drive Federal Aid Project No. STP-130 (028), Keau, Puna District, Island of Hawaii Response to Comment

Dear Mr. Anthony:

Thank you for your November 18, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keau-Paho Road Shoulder Lane Conversion, Keau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the U.S. Geological Survey was not able to review the Draft EA.

We appreciate your participation in the Draft EA review process.

Sincerely,  
*John L. Sakaguchi*

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

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11/23/09  
BC  
File



**DEPARTMENT OF BUSINESS,  
ECONOMIC DEVELOPMENT & TOURISM**

STRATEGIC INDUSTRIES DIVISION  
245 South Beretania Street, 5th Floor, Honolulu, Hawaii 96813  
Mailing Address: P.O. Box 2359, Honolulu, Hawaii 96804

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6615-01  
January 19, 2010

Mr. Theodore Peck, Administrator  
Strategic Industries Division  
State of Hawaii  
Department of Business, Economic Development, & Tourism  
235 S. Beretania Street, 5th Floor  
Honolulu, Hawaii 96813

November 30, 2009

Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826  
Attn: Mr. John L. Sakaguchi, Senior Planner

RECEIVED  
DEC 09 2009  
WILSON OKAMOTO CORPORATION

Dear Mr. Sakaguchi:

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive, Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Review and Comment

In response to your November 6, 2009, notice, thank you for the opportunity to provide comments on Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive, Island of Hawaii. We have no comments on this project relating to energy efficiency and renewable energy. In regard to resource efficiency, we recommend using recycled concrete aggregate as fill material and recycled asphalt pavement for surfacing.

For additional information or clarification, please contact Carilyn O. Shon at telephone number 808-587-3810.

Sincerely,

Theodore A. Peck  
Administrator

c: OEQC  
J. Strickler, SID  
E. Raman, SID

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive, Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Peck:

Thank you for the November 30, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive, Federal Aid Project No. STP-130 (028) project.

The Final EA will note the Strategic Industries Division has no comments on this project relating to energy efficiency and renewable energy. The Final EA will include your recommendation to use recycled concrete aggregate as fill material and recycled asphalt pavement for surfacing.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

LINDA LINSLE  
GOVERNOR

MAJOR GENERAL ROBERT G. F. LEE  
DIRECTOR OF CIVIL DEFENSE

EDWARD T. TEIXEIRA  
VICE DIRECTOR OF CIVIL DEFENSE



STATE OF HAWAII  
DEPARTMENT OF DEFENSE  
OFFICE OF THE DIRECTOR OF CIVIL DEFENSE  
1907 SOUTH BERETANIA STREET  
HONOLULU, HAWAII 96816-4495

November 24, 2009

Mr. John L. Sakaguchi  
Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

Draft Environmental Assessment/Anticipated Finding of No Significant Impact,  
Keeau-Pahoia Road Shoulder Lane Conversion

Thank you for the opportunity to comment on this Draft Environmental Assessment. After review of the document you have sent for this project, we have no early consultation comments to make.

If you have any questions please call Ms. Havinne Okamura, Hazard Mitigation Planner, at (808) 733-4300, extension 556.

Sincerely,

*Edward T. Teixeira*  
EDWARD T. TEIXEIRA  
Vice Director of Civil Defense

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NOV 27 2009

WILSON OKAMOTO CORPORATION

6615-01  
11/24/09  
FILE JS



1907 South Beretania Street  
Aiea, HI 96816-4495  
Honolulu, Hawaii 96826 USA  
PHONE: 808 946 2177  
FAX: 808 946 2251  
www.wilsonokamoto.com

6615-01  
January 19, 2010

Mr. Edward T. Teixeira, Vice Director of Civil Defense  
Office of the Director of Civil Defense  
State of Hawaii  
Department of Defense  
State of Hawaii  
3949 Diamond Head Road  
Honolulu, Hawaii 96816-4495

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keeau-Pahoia Road Shoulder Lane Conversion, Keeau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keeau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Teixeira:

Thank you for your November 24, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keeau-Pahoia Road Shoulder Lane Conversion, Keeau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the State of Hawaii Office of the Director of Civil Defense had no comments.

We appreciate your participation in the Draft EA review process.

Sincerely,

*John L. Sakaguchi*

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT





STATE OF HAWAII  
DEPARTMENT OF HEALTH  
P.O. Box 3378  
HONOLULU, HAWAII 96861-3378

December 22, 2009

John L. Sakaguchi  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

**SUBJECT:** Draft Environmental Assessment for Keaan-Pahoia Road Shoulder Lane  
Conversion  
Keaan, Puna District, Island of Hawaii, Hawaii

Thank you for allowing us to review and comment on the subject application. The application was routed to the various branches of the Environmental Health Administration. We have the following Clean Water Branch and General comments.

Clean Water Branch

The Department of Health (DOH), Clean Water Branch (CWB), has reviewed the subject document and offers these comments on your project. Please note that our review is based solely on the information provided in the subject document and its compliance with Hawaii Administrative Rules (HAR), Chapters 11-54 and 11-55. You may be responsible for fulfilling additional requirements related to our program. We recommend that you also read our standard comments on our website at <http://www.hawaii.gov/health/environmental/plan/anduse/cwb-standardcomment.pdf>.

1. Any project and its potential impacts to State waters must meet the following criteria:

- a. Antidegradation policy (HAR, Section 11-54-1.1), which requires that the existing uses and the level of water quality necessary to protect the existing uses of the receiving State water be maintained and protected.
- b. Designated uses (HAR, Section 11-54-3), as determined by the classification of the receiving State waters.
- c. Water quality criteria (HAR, Sections 11-54-4 through 11-54-8).

Mr. Sakaguchi  
December 22, 2009  
Page 2

2. The Army Corps of Engineers should be contacted at (808) 438-9258 to see if this project requires a Department of the Army (DA) permit. Permits may be required for work performed in, over, and under navigable waters of the United States. Projects requiring a DA permit also require a Section 401 Water Quality Certification (WQC) from our office.

3. You are required to obtain a National Pollutant Discharge Elimination System (NPDES) permit for discharges of wastewater, including storm water runoff, into State surface waters (HAR, Chapter 11-55). For the following types of discharges into Class A or Class 2 State waters, you may apply for NPDES general permit coverage by submitting the applicable Notice of Intent (NOI) form:

- a. Storm water associated with construction activities, including excavation, grading, clearing, demolition, uprooting of vegetation, equipment staging, and storage areas that result in the disturbance of equal to or greater than one (1) acre of total land area. The total land area includes a contiguous area where multiple separate and distinct construction activities may be taking place at different times on different schedules under a larger common plan of development or sale. An NPDES permit is required before the start of the construction activities.
- b. Discharges of hydrotesting water.
- c. Discharges of construction activity dewatering.

You must submit a separate NOI form for each type of discharge at least 30 calendar days prior to the start of the discharge activity, except when applying for coverage for discharges of storm water associated with construction activity. For this type of discharge, the NOI must be submitted 30 calendar days before the start of construction activities. The NOI forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/geni-index.html>.

4. For types of wastewater discharges not covered by an NPDES general permit or discharges to Class AA or Class 1 State waters, you may need an NPDES individual permit. An application for an NPDES individual permit must be submitted at least 180 calendar days before the commencement of the discharge. The NPDES application forms may be picked up at our office or downloaded from our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/forms/indiv-index.html>.

5. Please note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the Water Quality Standards. Noncompliance with water quality requirements contained in HAR, Chapter 11-54, and/or permitting requirements, specified in HAR, Chapter 11-55, may be subject to penalties of \$25,000 per day per violation.

6615-01  
11/16/09  
BLJS  
In reply, please refer to:  
EPO-09-158  
FILE

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JAN 05 2010  
WILSON OKAMOTO CORPORATION

Mr. Sakaguchi  
December 22, 2009  
Page 3

If you have any questions, please visit our website at <http://www.hawaii.gov/health/environmental/water/cleanwater/index.html>, or contact the Engineering Section, CWB, at 586-4309.

General

We strongly recommend that you review all of the Standard Comments on our website: [www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html](http://www.hawaii.gov/health/environmental/env-planning/landuse/landuse.html). Any comments specifically applicable to this project should be adhered to.

The same website also features a Healthy Community Design Smart Growth Checklist (Checklist) created by Built Environment Working Group (BEWG) of the Hawaii State Department of Health. The BEWG recommends that State and county planning departments, developers, planners, engineers and other interested parties apply the healthy built environment principles in the Checklist whenever they plan or review new developments or redevelopment projects. We also ask you to share this list with others to increase community awareness on healthy community design.

If there are any questions about these comments please contact Jacai Liu with the Environmental Planning Office at 586-4346.

Sincerely,



GENEVIEVE SALMONSON, Acting Manager  
Environmental Planning Office

c: EPO  
CWB  
EH-Hawaii



6615-01  
January 19, 2010

1307 South Beretani Street  
Aiea, HI 96706  
Honolulu, Hawaii 96826 USA  
Phone: 808 946 2377  
Fax: 808 946 2353  
[www.hawaii.gov/health/environmental](http://www.hawaii.gov/health/environmental)

Ms. Genevieve Salmonson, Acting Manager  
Environmental Planning Office  
State of Hawaii  
Department of Health  
919 Ala Moana Boulevard, Rm. 300  
Honolulu, Hawaii 96814

Subject: Draft Environmental Assessment/ Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Ms. Salmonson:

Thank you for your December 22, 2009 comment letter (EPO-09-158) on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

Clean Water Branch

1. The Draft EA Section 6.0, List of Permits, included National Pollution Discharge Elimination System Storm Water Associated with Construction Activities as a required permit.
2. The Final EA will state, on October 23, 2009, subsequent to submittal of the Draft EA to the Office of Environmental Quality Control, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction.
  - a. See 1 above.
  - b. The Draft EA Section 1.4.2 discussed the hydrotest procedure and permit.
3. See 1 above.



6615-01  
 Letter to Ms. Genevieve Salmonson  
 Page 2  
 January 19, 2010

- The Draft EA Section 2.2, Surface Water Resources, stated the waters of shoreline of east coast of Hawaii are classified as Marine A.A. The Final EA will state a National Pollution Discharge Elimination System Individual permit will be required.
- The Final EA will note that all discharges related to the project construction or operation activities, whether or not NPDES permit coverage and/or Section 401 WQC are required, must comply with the Water Quality Standards.

We appreciate your participation in the Draft EA review process.

Sincerely,

*John L. Sakaguchi*

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

LIZMA LINGLE  
 GOVERNOR OF HAWAII



STATE OF HAWAII  
 DEPARTMENT OF LAND AND NATURAL RESOURCES  
 LAND DIVISION

POST OFFICE BOX 621  
 HONOLULU, HAWAII 96809

December 7, 2009

Wilson Okamoto Corporation  
 1907 South Beretania Street Suite 400  
 Honolulu, Hawaii 96826

Attention: Mr. John L. Sakaguchi, AICP

Ladies and Gentlemen:

Subject: Draft Environmental Assessment for Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive

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 Division of Aquatic Resources, Commission on Water Resource Management, the Department of Land and Natural Resources has no other comments to offer on the subject matter. Historic Preservation will be submitting comments through a separate letter. Should you have any questions, please feel free to call our office at 587-0433. Thank you.

Sincerely,

*Morris M. Atta*  
 Morris M. Atta  
 Administrator

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DEC 08 2009

WILSON OKAMOTO CORPORATION

6615-01  
 12/19/09  
*JLS*  
*BL*  
 LIZMA LINGLE  
 GOVERNOR OF HAWAII  
 BOARD OF LAND AND NATURAL RESOURCES  
 COMMISSION ON WATER RESOURCE MANAGEMENT

LAURA E. THIELER  
GOVERNOR OF HAWAII  
COMMISSION ON WATER RESOURCES MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

November 12, 2009

LINDA LINGLE  
GOVERNOR OF HAWAII



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

November 12, 2009

LAURA E. THIELER  
GOVERNOR OF HAWAII  
COMMISSION ON WATER RESOURCES MANAGEMENT

AQUATIC RESOURCES: 37203

DIRECTOR	
COMM. FISH	
AO RESERV	
AO REC	
PLANNER	
STAFF SVCS	
ACQUIR	
STATISTICS	
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EDUCATION	
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DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

MEMORANDUM

TO: DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division -



FROM: Morris M. Atta *M. Atta*

SUBJECT: Draft Environmental Assessment for Keau-Paho Road, Shoulder Lane Conversion, Keau Bypass to Shower Drive

LOCATION: Island of Hawaii

APPLICANT: Wilson Okamoto Corporation on behalf of Department of Transportation, Highways Division

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 5, 2009.

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: 11/13/09

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DIV OF AQUATIC RESOURCES  
HIL O. HAWAII

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LAND DIVISION  
NOV 17 A 10 17  
DEPT. OF LAND & NATURAL RESOURCES  
STATE OF HAWAII

MEMORANDUM

TO: DLNR Agencies:

- Div. of Aquatic Resources
- Div. of Boating & Ocean Recreation
- Engineering Division
- Div. of Forestry & Wildlife
- Div. of State Parks
- Commission on Water Resource Management
- Office of Conservation & Coastal Lands
- Land Division -

FROM: Morris M. Atta *M. Atta*

SUBJECT: Draft Environmental Assessment for Keau-Paho Road, Shoulder Lane Conversion, Keau Bypass to Shower Drive

LOCATION: Island of Hawaii

APPLICANT: Wilson Okamoto Corporation on behalf of Department of Transportation, Highways Division

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 5, 2009.

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: 11/13/09



6615-01  
January 19, 2010

1507 South Berensina Street  
Aiea, HI 96701, Suite 400  
Honolulu, Hawaii 96826 USA  
Phone: 808 846 2277  
Fax: 808 846 2253  
www.wilsondamasio.com

Mr Morris M. Atta, Administrator  
Land Division  
State of Hawaii  
Department of Land and Natural Resources  
1151 Punchbowl Street, Room 130  
Honolulu, Hawaii 96813

**Subject:** Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment, Division of Aquatic Resources

Dear Mr. Atta:

Thank you for your December 7, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the Division of Aquatic Resources had no objections to the project.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT



6615-01  
January 19, 2010

1507 South Berensina Street  
Aiea, HI 96701, Suite 400  
Honolulu, Hawaii 96826 USA  
Phone: 808 846 2277  
Fax: 808 846 2253  
www.wilsondamasio.com

Mr. Morris M. Atta, Administrator  
Land Division  
State of Hawaii  
Department of Land and Natural Resources  
1151 Punchbowl Street, Room 130  
Honolulu, Hawaii 96813

**Subject:** Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment, Commission on Water Resource Management

Dear Mr. Atta:

Thank you for the November 13, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the Commission on Water Resources had no comments to the project. To confirm the December 10, 2009 telephone conversation with Robert Chong, DLNR, the Final EA will include, on October 23, 2009, subsequent to submittal of the Draft EA to the Office of Environmental Quality Control, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction. Thus, a stream channel alternation permit will not be required from the Commission on Water Resource Management.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

LAURA R. TIDDELL  
COMMISSIONER OF LAND AND NATURAL RESOURCES  
CONSUMER OF WATER RESOURCES MANAGEMENT



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

November 12, 2009

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LAND DIVISION  
2009 DEC -9 A 9 11 11  
DEPT. OF LAND &  
NATURAL RESOURCES  
STATE OF HAWAII

MEMORANDUM

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

FROM: Morris M. Atta  
SUBJECT: Draft Environmental Assessment for Keau-Paho Road, Shoulder Lane Conversion, Keau Bypass to Shower Drive  
LOCATION: Island of Hawaii  
APPLICANT: Wilson Okamoto Corporation on behalf of Department of Transportation, Highways Division

Transmitted for your review and comment on the above referenced document. We would appreciate your comments on this document. Please submit any comments by December 5, 2009.

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.

( ) We have no objections.  
( ) We have no comments.  
(x) Comments are attached.  
Signed: *[Signature]*  
Date: 12/1/09

Attachments

LAURA LANCE  
COMMISSIONER OF LAND



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
LAND DIVISION

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

December 9, 2009

RECEIVED  
DEC 11 2009  
WATER RESOURCES MANAGEMENT

Wilson Okamoto Corporation  
1907 South Beretania Street Suite 400  
Honolulu, Hawaii 96826  
Attention: Mr. John L. Sakaguchi, AICP  
Ladies and Gentlemen:  
Subject: Draft Environmental Assessment for Keau-Paho Road Should Land Conversion, Keau Bypass to Shower Drive

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 Engineering Division for their review and comment.

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,  
*Chalene E. Under*  
Morris M. Atta  
Administrator

*[Handwritten initials/signature]*  
12/10/09  
PL  
file

DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

LM/Morris/Atta  
REF.: DEAKeaaupahoaroad  
Hawaii-463

DEPARTMENT OF LAND AND NATURAL RESOURCES  
ENGINEERING DIVISION

Draft Environmental Assessment for Keaaupahoaroad Road,  
Shoulder Lane Conversion, Keaaupahoaroad Bypass to Shower Drive  
Keaaupahoaroad, Puna, Hawaii

COMMENTS

- We confirm that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X. The Flood Insurance Program does not have any regulations for developments within Zone X.
- Please take note that the project site, according to the Flood Insurance Rate Map (FIRM), is located in Zone X.
- Please note that the correct Flood Zone Designation for the project site according to the Flood Insurance Rate Map (FIRM) is \_\_\_\_\_.
- Please note that the project 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 T'yan-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 Sumitomo at (808) 768-8097 or Mr. Mario Shi Li at (808) 768-8098 of the City and County of Honolulu, Department of Planning and Permitting.
- Mr. Frank DeMarco at (808) 961-8042 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 water demands and infrastructure required to meet project needs. Please note that projects within State lands requiring water services from the Honolulu Board of Water Supply system will be required to pay a resource development charge, in addition to Water Facilities Charges for transmission and daily storage.
- 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 Ms. Suzie S. Agraan of the Planning Branch at 387-0258.

Signed:  CARY S. CHANG ACTING CHIEF ENGINEER

Date: 12/10/09

ADDITIONAL COMMENTS

For the proposed shoulder lane conversion and related improvements, we offer the following suggestions:

1. If utilities (sewer, gas, water, etc.) are to be suspended along the bridge structure, they should be located and constructed to minimize flood damage, leakage and prevent snagging of debris.
2. The proposed lane conversion should not impede the storm water carrying capacity of the body of water it crosses.
3. A scour analysis should be conducted to ensure that the design of the structure will minimize erosion of the foundation. If the channel opening at the structure is widened, evaluate downstream reaches to provide for adequate capacity and erosion.



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Aiea, HI 96810  
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6615-01  
January 19, 2010

Mr. Morris M. Atta, Administrator  
Land Division  
State of Hawaii  
Department of Land and Natural Resources  
1151 Punchbowl Street, Room 130  
Honolulu, Hawaii 96813

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment, Engineering Division

Dear Mr. Atta:

Thank you for the December 9, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the Department of Land and Natural Resources Engineering Division confirms that the project site is in Zone X of the Flood Insurance Rate Map.

- As stated in the Draft EA, a 12-inch water line will be relocated from the east (makai) to the west (mauka) side of Waipahoehoe Bridge. The Final EA will note the water line will not extend below the bridge deck. No other utility lines are sited on the bridge.
- As stated in the Draft EA, the bridge will be widened by 15 feet on both sides by extending the four walls of the bridge structure. As stated in the Draft EA, the bridge crosses an unnamed intermittent stream.
- The Final EA will state the four walls of the bridge are set on a rock surface. As such, a scour analysis will not be required.

We appreciate your participation in the Draft EA review process.

Sincerely,

*John L. Sakaguchi*  
John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

LAND DIVISION  
DEPARTMENT OF LAND AND NATURAL RESOURCES



STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES

POST OFFICE BOX 621  
HONOLULU, HAWAII 96809

March 22, 2010

LOG: 2010.0630  
DOC: 1003RS19

TO: John Sakaguchi  
Wilson, Okamoto, Corporation  
1907 South Beretania Street, Unit 400  
Honolulu, HI 96826

SUBJECT: Section 106 (NHPA) Consultation / Abandoned Waipahoehoe Stream Bridge  
Permit # (None)  
Building Owner: Department of Transportation, State of Hawaii  
Location: Keaau-Paho Highway  
Tax Map Key: ROW adjacent to (3) 1-6-004-049

This letter is in response to email communications between archaeologist Alan Haun, planner John Sakaguchi, historian Ross Stephenson, and archaeologist Theresa Donham re an abandoned highway bridge along the Keaau-Paho Highway on the Big Island.

The State of Hawaii Department of Transportation has proposed widening the highway. This would require demolition of the abandoned bridge. The area of potential effect would be within the highway corridor. No excavations are planned outside of previously disturbed areas.

Nancy McMahon, in a letter dated June 15, 2009, stated that lava tubes had been found to cross the highway in the area, and requested that Wilson, Okamoto hire a qualified archaeologist to examine the area and include their report in the draft environmental assessment. The resulting *Archaeological Inventory Survey Portions of TMK: (3) 1-6-004-011, :047-.053, :055.056; and (3) 1-6-004-266-.269, :283-.286, Land of Keaau, Puna District, Island of Hawaii* discovered the abandoned bridge over Waipahoehoe Stream. The latter site was assessed under Criteria D. The abandoned bridge's date of construction was approximated as the 1930s. After mapping, written description and photographic documentation the recommendation of Dr. Haun was that "no further work or preservation is recommended".

This office concurs with Dr. Haun that such mitigation is satisfactory and that the abandoned bridge may be removed.

If you have any questions, please contact Ross W. Stephenson at (808) 692-8028 or ross.w.stephenson@hawaii.edu.

Mahalo for the opportunity to comment.

*Nancy McMahon*  
Nancy McMahon, Deputy Historic Preservation Officer, DLNR, State of Hawaii

In the event that historic resources, including human skeletal remains, lava tubes, and lava blisters/bubbles are identified during construction activities, all work should cease in the immediate vicinity of the find, the find should be protected from additional disturbance, and the State Historic Preservation Division should be contacted immediately at (808) 692-8015.

6615-01  
LAWRENCE W. STEPHENSON  
DIRECTOR  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
3/24/10  
STATE OF HAWAII  
DEPARTMENT OF LAND AND NATURAL RESOURCES  
HONOLULU, HAWAII 96809

BS  
cc: A Haun em  
DOT





1807 South Beretania Street  
 Arletian Plaza, 4th Floor  
 Honolulu, HI 96818 USA  
 Phone: 808-946-2277  
 Fax: 808-946-2253  
 www.wilsonokamoto.com

6615-01

April 12, 2010

Ms. Nancy McMahon, Deputy Historic Preservation Officer  
 State of Hawaii  
 Department of Land and Natural Resources  
 Historic Preservation Division  
 601 Kamokila Boulevard  
 Kapolei, Hawaii 96707

Attention: Dr. Ross W. Stephenson

Subject: Draft Environmental Assessment/ Anticipated Finding of No  
 Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion,  
 Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
 Keaau, Puna District, Island of Hawaii  
 Response to Comment - Section 106 (National Historic Preservation  
 Act) Consultation

Dear Ms. McMahon:

Thank you for your March 22, 2010 comment letter (LOG: 2010.0650, DOC  
 1003RS19) Section 106 (National Historic Preservation Act) Consultation on the Draft  
 Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-  
 Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid  
 Project No. STP-130 (028) project. Our responses follow:

The Final EA will note, the State Historic Preservation Division has reviewed the  
 Archaeological Inventory Survey Report dated July 2008. The findings of the Report  
 were that the abandoned bridge adjacent to the existing Waipahoehoe Bridge was  
 constructed in the 1930s. The abandoned bridge was assessed under Criteria D. After  
 mapping, written description and photographic documentation, the Report  
 recommended that "no further work or preservation is recommended".

The Final EA will state, the State Historic Preservation Division concurs with the  
 recommendation of the Report and the mitigation of mapping, written description and  
 photographic documentation in the Report is satisfactory and the abandoned bridge  
 may be removed.



6615-01

Letter to Ms. Nancy McMahon, Deputy Historic Preservation Officer

Page 2

April 13, 2010

The Final EA will also include, in the event that historic resources, including human  
 skeletal remains, lava tubes, and lava blisters/bubbles are identified during  
 construction activities, all work should cease in the immediate vicinity of the find, the  
 find should be protected from additional disturbance, and the State Historic  
 Preservation Division should be contacted immediately at (808) 692-8015.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT



County of Hawaii

DEPARTMENT OF ENVIRONMENTAL MANAGEMENT

25 Aupuni Street • Hilo, Hawaii 1 96720  
(808) 961-8083 • Fax (808) 961-8086  
[http://co.hawaii.hi.us/directory/dir\\_emvms.htm](http://co.hawaii.hi.us/directory/dir_emvms.htm)

18, 2009

Sakaguchi, AICP  
Senior Planner  
Wilson Okamoto Corporation  
Beretania St., Suite 400  
HI 96826

Re: EA Pre-Assessment  
'au-Pāhoā Road, Shoulder Lane Conversion, Kea'au Bypass to Shower Drive  
eral Aid Project No. STP-130 (028)  
'au, Puna District, Island of Hawaii

akaguchi,

for further comments on this project.

for allowing us to review and comment on this project.

Typson

X

William P. Kenoi  
Mayor



County of Hawaii

POLICE DEPARTMENT  
349 Kapihalei Street • Hilo, Hawaii 96720-3998  
(808) 935-3311 • Fax (808) 961-5865

November 20, 2009

Mr. John Sakaguchi, AICP  
Senior Planner  
Wilson Okamoto Corporation  
1907 South Beretania Street, Suite 400  
Honolulu, HI 96826

Dear Mr. Sakaguchi:

**Subject:** Draft Environmental Assessment/Anticipated Finding of No  
Significant Impact, Keaau-Pāhoā Road Shoulder Lane  
Conversion, Keaau Bypass to Shower Drive Federal Aid Project  
No. STP-130 (028); Keaau, Puna District, Island of Hawaii

Staff, upon reviewing the provided documents and visiting the proposed site,  
does not anticipate any significant impact to traffic and/or other public safety  
concerns.

We support efforts to improve the traffic flow along Highway 130. Thank you for  
allowing us the opportunity to comment.

If you have any questions, please call Captain Steven Guillerimo of our Puna  
District at 966-5835.

Sincerely,

DEREK D. PACHÉCO  
ASSISTANT POLICE CHIEF  
AREA I OPERATIONS BUREAU

SG:lll

6615-01 JS  
11/23/09  
Lono A. Tyson  
Director  
Ivan M. Torigoe  
Deputy Director  
BL  
FILE

RECEIVED

NOV 19 2009

WILSON OKAMOTO CORPORATION

at  
) (028)

at  
No.

6615-01  
11/17/09  
Harry S. Kubojiri  
Police Chief  
Paul K. Ferreira  
Deputy Police Chief

RECEIVED

NOV 25 2009

WILSON OKAMOTO CORPORATION

JS



167 South Beretania Street  
Aiea, Hawaii 96806 USA  
Phone 808 946 2177  
Fax 808 946 2252  
www.wilsonokamoto.com

6615-01  
January 19, 2010

Assistant Chief Derek D. Pacheco, Assistant Police Chief  
Area I Operations Bureau  
County of Hawaii  
Police Department  
349 Kapiolani Street  
Hilo, Hawaii 96720

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Assistant Chief Pacheco:

Thank you for your November 20, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note the County of Hawaii Police Department has reviewed the document and visited the project site and does not anticipate any significant impact to traffic and/or other public safety concerns. Also, the Police Department supports efforts to improve traffic flow along Highway 130, Keaau-Paho Road.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

William P. Kenci  
Mayor



County of Hawai'i

PLANNING DEPARTMENT  
Aupuni Center • 101 Puuahi Street, Suite 3 • Hilo, Hawaii 96720  
Phone (808) 961-8288 • Fax (808) 961-8742

December 10, 2009

Mr. John L. Sakaguchi, AICP, Senior Planner  
Wilson Okamoto Corporation  
1907 S. Beretania St., Suite 400  
Honolulu, Hawaii 96826

Dear Mr. Sakaguchi:

Subject: Draft Environmental Assessment (DEA) – Anticipated Finding of No Significant Impact (FONSI)  
Applicant: State of Hawaii, Department of Transportation, Highways Division  
Project: Kea'au-Pāho Road Shoulder Lane Conversion from Kea'au Bypass Road to Shower Drive – Federal Aid Project No. STP-130(028)  
Location: Kea'au, Puna, Island of Hawai'i

We are in receipt of your letter dated May 6, 2009, transmitting the Draft Environmental Assessment (DEA) for the subject project. We appreciate the opportunity to review the DEA and offer the following comments for consideration.

Section 2.8 Traffic

2.8.1. Existing Environment

The Level of Service (LOS) discussion is limited to the Shower Drive/Pohaku Drive intersection and should be expanded to include the LOS for the entire project area, which is particularly relevant to the justification for the additional permanent northbound lane and the limited PM peak period southbound lane.

The most recent traffic counts cited are more than 4½ years old. Given the significant population increases in the area served by the Kea'au-Pāho Road between 2000 and 2009, the LOS calculations may be seriously misrepresentative of current conditions.

2.8.2 Impacts and Mitigation Measures

It is stated that "the Shoulder Lane Conversion project will be designed to be compatible

6615-01  
Bl Leithhead Todd  
Director 11/10/09  
Margaret K. Masunaga  
Deputy  
J. File

*with the HDOT project (Project No. STP 0130 (27)) to increase roadway capacity between Keaau and Pāhoā by constructing a roadway with 4 or 6 travel lanes to service the Puna region.* This section fails to explain how the Shoulder Lane Conversion project can be designed to be compatible with the Kea au-Pāhoā Road Improvement project when the latter project has yet to be defined to the extent that design elements, particularly intersection treatments, are yet to be determined.

Statements on page 2-19 concluding that the installation of a traffic signal at the Kea au-Pāhoā Road-Shower Drive intersection will improve left turn movements and not create adverse impacts to traffic along Kea au-Pāhoā Road should be substantiated or qualified through a more thorough comparison between a signalized intersection and a modern roundabout at this location.

In order to more accurately reflect the existing conditions in the area of Puna serviced by the Kea au-Pāhoā Road, the last sentence on page 2-19 should be amended to add "or smaller" after "1-acre parcels". This paragraph should also be amended to recognize the need for a great many Puna residents in the Kea au-Pāhoā Road service area to travel to Kea au and Hilo to access K-12 as well as higher educational resources.

#### Section 2.13 Socio-economic Considerations

##### 2.13.2 Impacts and Mitigation Measures

The "Right-of-Way Taking by Parcel" table on page 2-28 shows the % of Total Parcel for TMK 1-5-036:119 being 18.05%, however, the last sentence in the preceding paragraph indicates that "almost 25 percent" of the total parcel area will be taken.

The last paragraph of this section on page 2-29 states that the combined populations of Kea au and Hawaiian Paradise Park is "a relatively small portion of the County's total population." This conclusion seems to be based solely on the out-of-date 2000 census data and fails to take into account the significant population increases in Puna as a whole and Hawaiian Paradise Park in particular over the past nine years with respect to the rest of the island. The relevance of this conclusion with respect to the socio-economic considerations is also unclear since the impacts of the project area are relevant to the entire lower Puna area, which is where most of the population growth in Puna has occurred.

#### Section 2.14 Public Facilities

##### 2.14.1 Schools and Medical Facilities

The Existing Conditions portion of this section should include mention of the Hilo Urgent Care Center that opened in Kea au in 2008.

##### 2.14.2 County Refuse Convenience Center

The last paragraph on page 2-31 should include a discussion on the possibility of linking

the driveways for the County Solid Waste Convenience (transfer station) Center, the Humane Society and the surrounding W.H. Shipman Ltd. Parcel (TMK 1-6-003-002) so as to create a four-way modern roundabout intersection with the existing Opukahaia St & Kea au-Pāhoā Road intersection.

#### Section 3. Relationship to Plans, Policies and Controls

This section should include reference to Resolution No. 573-08 by the Hawai'i County Council requesting cooperation between the County of Hawai'i, Department of Public Works and the State Department of Transportation in recommending interim traffic pattern options to alleviate the PM southbound congestion at the south end of the Kea au Bypass. This is consistent with Priority #2 in the Puna CDP Existing Roadways Working Group Report as cited on page 3-5 of the DEA, which is not discussed in this DEA as a possible alternative that might allow for a more comprehensive and integrated environmental study and design for improving the Kea au-Pāhoā Road from the Kea au Bypass to Pāhoā.

The following sections of the Puna CDP should also be noted and included in discussion or the proposed project.

##### Objective 4.4.2:

"a. Make intersection improvements along highways that allow for safer access from intersecting streets as a priority over traffic speed on the highway, giving preference to the use of roundabouts;

b. Consider roundabouts as a means to control private driveway access to major highways with higher traffic volumes, such as Highway 130; and

d. Incorporate traffic-calming features into highway design in preference to signage and signalization, where possible."

##### Action 4.4.3:

"a. Reduce speed limit on Highway 130 to 45 mph between the Kea au bypass and 'Āinaloa Boulevard.

#### Section 4. Alternatives to the Proposed Action

The Planning Department believes that this DEA should include a Transportation Systems Management (TSM) alternative to the proposed action. This alternative should include, but not be limited to, further discussion on the possibility of interim expansion to provide a third peak-hour reversible lane, intersection improvements that improve both safety and capacity, improvements to accommodate transit, etc. The discussion on a TSM Alternative could also elaborate on the advantages and disadvantages of determining the impacts and design of any improvements to the Kea au-Pāhoā Road as one project rather than two.

Mr. John L. Sakaguchi, AICP  
Wilson Okamoto Corp.  
Page 4  
December 10, 2009

Mr. John L. Sakaguchi, AICP  
Wilson Okamoto Corp.  
Page 5  
December 10, 2009

#### Section 4.3 Roundabout at Shower Drive

The discussion in this section should be expanded to more comprehensively articulate the advantages with respect to safety, maintenance, carbon footprint and long-term costs, both public and private, of a modern roundabout as compared to a signalized intersection.

This section concludes that the additional 100 to 120 feet of right-of-way necessary to construct a 4-lane roundabout at the Shower Drive/Pohaku Drive and Kea'au-Pāhoā Road intersection and the unfamiliarity of motorists with roundabouts "*make use of a roundabout an infeasible alternative.*" This discussion should also consider the how the feasibility of a roundabout might be enhanced with the acquisition of the vacant parcel (TMK 1-5-035:122) on the SE corner of Shower Drive and Kea'au-Pāhoā Road and a makai portion of the large parcel (TMK 1-6-064:269) on the SW corner of Pohaku Drive and Kea'au-Pāhoā Road. With some relatively minor realignment of Shower Drive and Pohaku Drive, this could allow for an opportunity to offset a modern roundabout south of the existing intersection without significantly impacting existing improvements on adjacent lots. Also, the discussion does not explain how the "*unfamiliarity of motorists with roundabouts*" makes their use an infeasible alternative.

This section further states that HDOT has **generally** limited the use of roundabouts to single lane roundabouts and concludes that their use would not be compatible with the construction of a 4 or 6 lane roadway. (Emphasis added) This discussion should be expanded to document the extent of HDOT use of roundabouts and the extensive use of 4 or more lane roundabouts on the mainland as well as other countries.

Thank you for the opportunity to comment on this DEA. Should you have questions, please feel welcome to contact Larry Brown of my staff at 961-8135.

Sincerely,



BJ LEITHEAD TODD  
Planning Director

cc: Ms. Katherine Puana Kealoaha, Director  
State of Hawaii

Office of Environmental Quality Control  
235 Beretania Street, Suite 702  
Honolulu, Hawai'i 96813

Mr. Brennon T. Morioka, Director  
State Department of Transportation  
869 Punchbowl Street, Room 509  
Honolulu, Hawai'i 96813

Board of Directors  
Hawaiian Paradise Park Owners Association  
HC3, Box 11000  
Kea'au, Hawai'i 96749

Ms. Barbara Bell, Chair  
Puna CDP Action Committee

Mr. William P. Kenoi, Mayor

Mr. Warren Lee, Director  
Department of Public Works



1807 South Beretania Street  
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 Phone: 808-946-2277  
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6615-01  
 April 13, 2010

Ms. Bobby Jean Leithhead Todd, Planning Director  
 County of Hawaii  
 Planning Department  
 101 Pauahi Street, Suite 3  
 Hilo, Hawaii 96720

Subject: Draft Environmental Assessment/ Anticipated Finding of No  
 Significant Impact, Keaau-Paho Road Shoulder Lane Conversion,  
 Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
 Keaau, Puna District, Island of Hawaii  
 Response to Comment

Dear Ms. Leithhead Todd:

Thank you for the December 10, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

**Section 2.8 Traffic**

As stated in the Draft EA, the project limits extend along Keaau-Paho Road from Keaau Bypass to Shower Drive. Additional analysis beyond the project limits is not included. Also, the Draft EA stated a traffic warrant study was conducted at the Keaau-Paho Road Shower Drive/Pohaku Drive intersection to determine the need for a traffic signal. As stated, in the Draft EA, since two of the warrants were satisfied, a traffic signal is to be installed at the intersection. The Final EA will include, since an updated study would, most likely, result in similar findings, another study is not necessary.

The Draft EA stated, one of the purposes of the Shoulder Lane Conversion project is to design the improvement to be compatible with the HDOT project (Project No. STP 0130 (27)) which involves improving highway safety, increasing roadway capacity, and modernizing the existing facility along Keaau-Paho Road between the Keaau Bypass and Pahoia-Kapoho Road. The Draft EA also stated the Keaau-Paho Road Shoulder Lane Conversion project will meet the design guidelines of the American Association of State Highway and Transportation Officials (AASHTO) and the



6615-01  
 Letter to Ms. Bobby Jean Leithhead Todd, Planning Director  
 Page 2  
 April 13, 2010

Federal Highway Administration (FHWA). These design guidelines have been adopted by the Hawaii Department of Transportation (HDOT) for transportation and highway planning and design purposes. The Final EA will note adherence to these guidelines will ensure that the Shoulder Lane Conversion will be compatible with the future roadway.

The Draft EA stated the traffic signal would facilitate turning movements including left turns onto and from Keaau-Paho Road to the two side streets. The traffic signal would facilitate these turning movements during peak periods when Keaau-Paho Road is heavily used. As stated in the Draft EA, use of a roundabout would not be compatible with the DOT project to construct 4 or 6 travel lanes along Keaau-Paho Road.

The Final EA will add the information related to the parcel size. The Final EA will also include the need for the residents along Keaau-Paho Road to travel to Keaau and Hilo to access schools and other higher educational resources.

**Section 2.13 Socioeconomic Considerations**

The Final EA will restate information regarding the parcel taking, as necessary.

The Draft EA information related to population and demographic characteristics from the 2000 Census was used as a consistent source of information by small area and the County. The Final EA will note the information as to the total population may be low as the area has experienced growth since 2000.

**Section 2.14 Public Facilities**

The Final EA will include the information regarding the Hilo Urgent Care Center.

The possible changes to the access to the County Refuse Convenience Center were reviewed by the County of Hawaii Department of Environmental Management as part of the Draft EA pre-assessment consultation. (See Draft EA Appendix A.) As discussed in that response, should expansion of the transfer station and potential road easement for W.H. Shipman property be proposed by the Department of Environmental Management, a traffic study and signal warrant study should be conducted at that time. A consolidation of all three driveways with the transfer station driveway and the addition of a traffic signal should also be included at that time. These two changes will not be part of the Shoulder Lane Conversion project. This will be restated in the Final EA.



6615-01

Letter to Ms. Bobby Jean Leithhead Todd, Planning Director

Page 3

April 13, 2010

### Section 3 Relationship to Plans, Policies and Controls

The Final EA will include the provided information on the Puna Community Development Plan, as appropriate.

### Section 4 Alternatives

Use of Transportation Systems Management (TSM) in lieu of the shoulder lane conversion can be considered. However, as stated in the Draft EA, one of purposes of the Shoulder Lane Conversion project is to improve traffic conditions for both northbound and southbound traffic. The Shoulder Lane Conversion project would provide 3 permanent 12-foot lanes (2 permanent northbound and one permanent southbound) and one temporary 10-foot southbound afternoon shoulder lane, which would negate the need for a TSM plan. Use of TSM with the current roadway section would be temporary solution without gaining the advantages of the Shoulder Lane Conversion.

### Section 4.3 Roundabout at Shower Drive

The Final EA will include, when operating within their capacity, roundabouts typically operate with lower vehicle delays than other intersection forms. When there are queues on one or more approaches, traffic within the queues usually continues to move. The movements for circulating and exiting a double lane roundabout could add to the delays which might occur at an intersection.

The Final EA will include injury crash rates for vehicle occupants are generally lower for roundabouts, although the proportion of single vehicle crashes is typically higher. Also, bicyclists and pedestrians are involved in a relatively higher proportion of injury accidents than they are at other intersections due to unprotected crossings lengths, and increase conflicts between vehicles and pedestrians.

The Final EA will include the advantages of a roundabout include reduction in potential conflicts at the intersection and related reduction in crashes. The Final EA will also state double lane roundabouts often cannot achieve the same level of crash reduction due to the circulating and exiting movements needed at all times. Further, pedestrians crossing double lane roundabouts are exposed for a longer time and can be obscured from, or not see, approaching vehicles in adjacent lanes if vehicles in the nearest lane yield to them.



6615-01

Letter to Ms. Bobby Jean Leithhead Todd, Planning Director

Page 4

April 13, 2010

The Draft EA included there will be an unfamiliarity of motorists with roundabouts as there are no existing roundabouts on State highways in the Puna area, the island of Hawaii, or other places on the State highway system. Also, single or double lane roundabouts are lacking on major roadways under County of Hawaii jurisdiction.

The Final EA will note that the roundabout inscribed diameter, 200 feet, is the minimum needed for two travel lanes for entry and circulating speed of 20 to 25 miles per hour. Additional land would also be needed to accommodate a shoulder and setbacks. Thus, the land area needed would be greater than the 200-foot diameter and could be up to 240 to 260 feet, when accounting for shoulders and setbacks.

A roundabout with a 200-foot inscribed circle diameter would place the roundabout travel lane about 65 feet from the residence at the southwest corner to the Keaau-Pahoa Road/Shower Drive/Pohaku Drive intersection and about 50 feet from the residence at the northwest corner of the intersection. A 260-foot diameter inscribed circle would place the roadway about 45 feet from southwest corner residence and 30 feet from the northwest corner residence.

The existing right-of-way of Keaau-Pahoa Road at the Shower Drive intersection is 80 feet. Thus, to construct a roundabout at the intersection, the right-of-way would require a minimum of an additional 100 to 120 feet of land area, or 50 to 60 feet on each side of the existing right-of-way. The roundabout land area would be an addition to the proposed right-of-way needed for the Shoulder Lane travel lanes.

The Final EA will discuss the County's proposal to acquire portions of parcels TMK: 1-5-036:122 and 1-6-064:269 and realign the intersection approaches to Shower Drive and Pohaku Drive. The County's acquisition proposal would need additional planning and design to relocate the intersection, especially as both side street approaches would also have to be realigned to provide a 90 degree entry to the roundabout.

The Final EA will note that AASHTO, FHWA, HDOT guidelines do not provide information on the use of a roundabout with a one lane approach and a two lane exit or a two lane approach and one lane exit such as would occur at the Keaau-Pahoa Road/Shower Drive intersection. Lastly, the HDOT Policy Guideline (DEP-HY 08:010, December 19, 2008) states the HDOT policy is to generally limit consideration to modern single-lane roundabouts only.



6615-01  
 Letter to Ms. Bobby Jean Leithead Todd, Planning Director  
 Page 5  
 April 13, 2010

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT



DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAII  
 345 KEKUNAŌA STREET, SUITE 20 • HILO, HAWAII 96720  
 TELEPHONE (808) 961-8050 • FAX (808) 961-8657

December 10, 2009

Mr. John L. Sakaguchi  
 Wilson Okamoto Corporation  
 1907 South Beretania Street, Suite 400  
 Honolulu, HI 96826

**DRAFT ENVIRONMENTAL ASSESSMENT  
 KEA'AU-PAHOA ROAD SHOULDER LANE CONVERSION, KEA'AU BYPASS TO SHOWER  
 DRIVE  
 TAX MAP KEY 1-5 AND 1-6**

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

1. The proposed project will involve the relocation of approximately 11,210 feet of 12-inch waterline. The Department will require that construction plans be submitted for review and approval before any relocation work can begin.
2. There are several existing service laterals that extend from the existing 12-inch waterline to the right-of-way boundary that will also need to be relocated. The location, size, and type of lateral must be identified on the construction plans.
3. The existing 12-inch waterline within the project area must remain in service during the installation of the replacement 12-inch waterline. The relocation of all existing service laterals, fire hydrants, valves, valve boxes, cleanouts, and other water system appurtenances must be completed to the satisfaction of the Department of Water Supply before the existing 12-inch waterline can be removed. All new relocated facilities must be properly pressure tested, chlorinated, and flushed in accordance with the State of Hawaii's Water System Standards.
4. The Department of Water Supply shall not be responsible to bear any costs associated with the relocation work.

If you have any questions, please contact Mr. Finn McCall of our Water Resources and Planning Branch at (808) 961-8070, extension 255.

Sincerely yours,

Milligan D. Pavao, P.E.  
 Manager

FM-dfg

... *Water, Our Most Precious Resource* ... *Ka Wai A Kāne* ...  
 The Department of Water Supply is an Equal Opportunity provider and employer.

6615-01  
 12/14/09  
 PL  
 [Handwritten initials and dates]





1501 South Beretania Street  
Aurora Plaza, Suite 400  
Honolulu, Hawaii 96825, USA  
Phone 808 946 2217  
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www.wilsonokamoto.com

6615-01  
January 19, 2010

Mr. Milton D. Pavao, PE, Manager  
County of Hawaii  
Department of Water Supply  
345 Kekuanaoa Street, Suite 20  
Hilo, Hawaii 96720

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment


Dear Mr. Pavao:

Thank you for the December 10, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

1. The Final EA will note the construction plans will be submitted to the Department of Water Supply (DWS) for review and approval before relocation of the waterline can begin.
2. The Final EA will state the existing service laterals from the existing 12-inch waterline will also need to be relocated and the location, size, and type of lateral will need to be shown on the construction plans.
3. The Draft EA stated the existing 12-inch waterline must remain in service until the replacement waterline has been installed and tested. The Draft EA Sections 1.4.2 and 2.15.1 set forth the general procedure for testing the replacement waterline.
4. The Draft EA, Section 1.4, stated relocation of the existing 12-inch waterline will be done under a Utility Agreement between the State Department of Transportation and the DWS.

We appreciate your participation in the Draft EA review process.

Sincerely,

  
John L. Sakaguchi, AICP, Senior Planner

JL/S/ry

cc: E. Barroga, DOT



HOUSE OF REPRESENTATIVES

STATE OF HAWAII  
STATE CAPITOL  
HONOLULU, HAWAII 96813

December 2, 2009

Wilson Okamoto Corporation  
1907 S. Beretania St. #400  
Honolulu, HI 96826  
Attention: Mr. John L. Sakaguchi, Senior Planner

Re: Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact, Kea au-Paho Road Shoulder Lane Conversion, Kea au Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Kea au, Puna District, Island of Hawaii  
Review and Comment

Dear Mr. Sakaguchi,

Mahalo for the opportunity to review and comment on the above project.

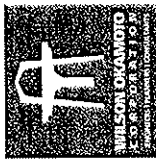
I do not have any comments to offer at this time.

Aloha,



Faye P. Hanohano  
House of Representatives  
District 4 – Puna, Pahoia, Kalapana, Hawaiian Acres

6615-01  
12/1/09 JS  
BL



1907 South Beretania Street  
 4th Floor, Suite 400  
 Honolulu, Hawaii 96826 USA  
 Phone 808 546 2177  
 Fax 808 546 2153  
 www.wilsonokamoto.com

6615-01  
 January 19, 2010

Representative Faye P. Hanohano, House of Representatives  
 District 4 - Puna, Pahoa, Kalapana, Hawaiian Acres  
 Hawaii State Capitol, Room 303  
 415 Beretania Street  
 Honolulu, Hawaii 96813

**Subject:** Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keanu-Pahoa Road Shoulder Lane Conversion, Keanu Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
 Keanu, Puna District, Island of Hawaii  
 Response to Comment

**Dear Representative Hanohano:**

Thank you for your December 2, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keanu-Pahoa Road Shoulder Lane Conversion, Keanu Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note you had no comments to offer at this time.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

# Hawaiian Paradise Park

Administrative Services

DEC 07 2009

John L. Sakaguchi, AICP  
 Senior Planner  
 Wilson Okamoto Corporation  
 1907 South Beretania Street, Suite 400  
 Honolulu, HI 96826

Re: Comments on Draft Environmental Assessment Keanu-Pahoa Road, Shoulder Lane Conversion, Keanu Bypass to Shower Drive, District of Puna, Island of Hawaii

Dear Mr. Sakaguchi:

We initiated a telephone request and received a copy of the DEA on November 16, 2009, and as such have not had the necessary time to study and make more in-depth comments and still meet the appointed deadline. As such, we will limit our comments to the impacts we perceive this project will have on Hawaiian Paradise Park (HPP) and its extensive community, and not to the entire project as presented.

As you are most likely aware, HPP is the second largest private subdivision in the United States, covering approximately 10,000 acres, with 8,800 lot owners, 137 road miles in the park, and five miles of road frontage along Highway 130.

We are contiguous to the terminus of this project and would like your planners as well as Hawaii DOT to recognize us as such. Hence, our first concern is that we ask to be recognized as a valued stakeholder in the development of Highway 130, in all its phases, buildouts, and improvements. We therefore wish to be notified of all related activity of both this proposed project and its other phases to come.

While our roads are private, we are not a gated community, as such, both our residents and the public have access to our community. This brings up our second concern as it relates to this project: we anticipate that during the road construction period, the public will traverse our roads in an attempt to avoid the backup that will mostly likely occur as travel lanes on Highway 130 are shifted to one side and traffic delays ensue. The two-year build-out time will most definitely impact our residents, especially those who live along the paved roads such as 28th Avenue and 22nd Avenue. We already see many non-residents use these two roads as short cuts during peak traffic times to avoid backups that occur on Highway 130. We can only imagine how much more impact will occur during the construction phase of this project.

Lastly, we remain concerned with reference to the hydrological portion of your DEA, which is absent from the report, and yet your proposal shows nine four-foot culverts placed along the highway. We think a simple matrix showing how you arrived at this conclusion should have been included along with reference to quantity of water during floods (of 50 or 100 years), intermittent streams, rainfall, and sheeting impacts from vehicles driving on the highway.

Sincerely,

Ka'ahu Kimimaka, Stockdale  
 General Manager

**Hawaiian Paradise Park Owners Association**

HC 3 Box 11000 • Keanu, Hawaii 96749-9204  
 Phone (808) 966-4500 • Fax (808) 982-5198  
<http://www.hawaiianparadisepark.org>  
[hppoa@interpac.net](mailto:hppoa@interpac.net)

6615-01  
 12/14/09  
 JS



1671 South Berekona Street  
 Arroyo Viejo, Suite 400  
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 FAX: 808 846 2753  
 www.wilson-davanzo.com

6615-01  
 January 19, 2010

Ms. Kaniu Kimimaka-Stocksdale, General Manager  
 Hawaiian Paradise Park Homeowners Association  
 HC-3 Box 11000  
 Keaau, Hawaii 96749-9204

**Subject:** Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
 Keaau, Puna District, Island of Hawaii  
 Response to Comment

Dear Ms. Kimimaka-Stocksdale:

Thank you for the December 2, 2009 comment letter on the Draft Environmental Assessment (EA)/Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

The Final EA will state Hawaiian Paradise Park is located at the makai terminus of the project limits of the Shoulder Lane Conversion project. As stated in the Draft EA, the project limits for the Shoulder Lane Conversion project extends from Keaau Bypass on the northern end to the Shower Drive/Pohaku Drive intersection at the southern end. The Final EA will include that the Hawaiian Paradise Park Homeowners Association wishes to be notified of other projects along Highway 130.

The Draft EA included information regarding traffic controls during construction. The Shoulder Lane Conversion will require shifting the travel lines to allow two 10-foot wide travel lanes, one in each direction, to be open to traffic at all times. During the morning peak travel period, an additional 10-foot wide northbound travel lane will be open to traffic.

The Final EA will also state the traffic control plan during construction is intended to allow the same travel lanes as currently used for northbound morning peak travel.



6615-01  
 Letter to Ms. Kaniu Kimimaka-Stocksdale  
 Page 2  
 January 19, 2010

The Draft EA Section 2.2, Surface Water Resources, 2.3 Groundwater Resources, and 2.4 Flood Hazard, discussed conditions related to water resources within the project limits. Further the Draft EA stated there are nine existing culverts within the project limits and the culverts will be extended about 15 feet on the makai side to provide for the 12-foot permanent northbound travel lane and shoulder. As stated in the Draft EA, extension of the existing culverts will not change the drainage patterns within the project limits.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

cc: E. Barroga, DOT

**Friends of Puna's Future**  
P.O. Box 1959, Pahoehoe, HI 96778 808-965-1555

Date: December 8, 2008

To: John L. Sakaguchi, Wilson Okamoto Corp.

**Subject: Comments on Draft E.A. Keaau-Pahoehoe Should Lane Conversion (KPSLC)**

We are a non profit community organization (501c4) with extensive involvement in planning of improvements on Hwy. 130 in the Puna District of Hawaii County.

We have only recently become aware of the E.A. in preparation by your firm. While we have been in close contact with the Keaau-Pahoehoe Advisory Group the issue of a separately planned effort to consider a should lane conversion is new to us. It is our opinion that insufficient effort has been made on the part of your firm to inform and solicit community input for your E.A. and as such your E.A. will be incomplete.

We ask that your E.A. process be extended to include public meeting(s) with adjacent and affected homeowners associations and all others affected by the proposal.

Our organization, and others, appear to have been prevented from obtaining a clear understanding of the proposal(s) and from delivering informed input.

We are also writing in support of the statements put forward to you by the Hawaiian Paradise Park (HPP) office in a letter dated December 2, 2008. HPP is a major stake holder in the proposal(s) and they, and we, are due more time in consideration of the draft E.A.

Please provide two (2) hard copies of your draft E.A. to our address above. We would also appreciate a written recap of your firm's efforts to inform the public of the Keaau-Pahoehoe Road Should Lane Conversion (KPSLC) intentions.

Lastly we would appreciate clarification of why and by what manner the (KPSLC) is being studied and E.A. prepared independently of the general study of improvements undertaken at this time by SSFM for HDOT.

Sincerely,

Rob Tucker, president

cc: HPOA

(6615-01)  
12/10/08  
BC

RECEIVED  
DEC 08 2008

**Friends of Puna's Future**  
P.O. Box 1959, Pahoehoe, HI 96778 808-965-1555

Date: December 21, 2008

To: John L. Sakaguchi, Wilson Okamoto Corp.

**Subject: Comments on Draft E.A. Keaau-Pahoehoe Should Lane Conversion (KPSLC)**

We have received notice of the extension of comment period for the project under draft E.A. and offer these comments:

**1. Time allowed.** From our learning of the D.E.A. to the end of extended comment period we have still not had as much time as we would like to consider the D.E.A. As such our comments here are limited and we may have further comment at a later date.

**2. Project Purpose (page 1-2):**

a. Paragraph 3: We question the expressed purpose of "a need to improve traffic conditions..." as being vague and want to understand the degree, or lack thereof, that this project is intelligently integrated into the overall improvements intended for Hwy. 130 from the Keaau Bypass to Pahoehoe Village. This appears to be a separate project and there appears to be substantial risk that the cost and disruption may aggravate the situation, both financially and practically, more than improve it. Please provide clarification.

**3. Traffic Environment (2-17; paragraph 3)**

This paragraph mentions installation of a traffic signal but fails to mention installation of a roundabout. It is our understanding that HDOT policy requires consideration of roundabouts. We will address your roundabout positions separately below. Please provide clarification.

**4. 4.2 Alternative route to Hwy. 130 (4-1; paragraph 1)**

Within your analysis of Traffic Environment (2-15) no mention is made of the larger project, intentions and the manner in which the Shoulder Lane Conversion will affect it either positively or negatively. When you state "The Shoulder Land Conversion project is an integral part of the HDOT plan to widen Keaau-Pahoehoe Road to four travel lanes" you do not explain how it is integral. Will the expenditure and disruption be assimilated 100% into the larger project or will some part of the Should Lane Conversion need to be torn out and reworked soon after completion? Please provide clarification.

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12/25/08  
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WILSON OKAMOTO CORPORATION

**5. Roundabout at Shower Drive (4-2; paragraph 4)**

a. Your phrase "additional land needed" fails to quantify the additional land needed and is deficient in addressing this issue. Using your larger estimate of a 200' diameter circle (paragraph 3) We have calculated that the additional and area required for a roundabout at Shower Drive would be 1/4 acre. Not a substantial amount of land considering that your D.E.A. proposes acquisition of 4.476 acres. Add .25 acres to 4.476 acres and the total would be 4.726 acres - an increase of 5.5%. There is an appearance that your office failed to make this calculation and if so is neglecting the input from the Puna Community Plan (3-4).

b. Your phrase "unfamiliarity of motorists with roundabouts" appears to have no basis. It is not addressed in your Traffic Environment section (2-17). Your office appears to be making an assumption here without benefit of research. I was recently in the Palm Springs area of California on Interstate 10. I-10 is a huge interstate with extremely heavy traffic intended for use by any and all travelers local and distant. An intersection there recently acquired a roundabout which is now in use and shows no sign that unfamiliarity is a problem with a well designed roundabout. So I find your statement to be prejudicial and not appropriate to an expensive professional E.A. Please provide clarification.

c. The Puna Community Development Plan (3-5, paragraph 2 Priority #1 Safety) identifies a traffic signal as a "last resort". You seem to have this backward and are favoring a traffic signal as a first resort. We expect that your office should be able to provide a cost/benefit analysis of roundabouts vs. traffic signals which would include costs, cost burdens and safety. We have seen compelling evidence of the safety aspects of roundabouts. Please clarify your intentions to provide a cost benefit analysis and safety consideration.

We will point out that we, the residents who live and die on this road, expect due consideration of the Puna Community Development Plan's focus on Priority #1 Safety. Prejudicial assumptions which ignore safety may create liabilities for the State of Hawaii. Those liabilities may extend to your firm.

**In closing:** We appreciate that this is a Draft E.A. and the opportunity to amend and make corrections exists. Please take this opportunity to address the shortcomings we address here. Upon further consideration we may have other thoughts to bring forward. We do appreciate that you were very timely in providing two copies of your D.E.A. to our request.

Friends of Puna's Future is a non profit community organization whose members included the Boards of Directors of all subdivisions directly affected by the Draft E.A. for the Keaau Pahoa Road Shoulder Lane Conversion project.

Sincerely,



Rob Tucker, president  
2 of 2



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6615-01  
April 13, 2010

Mr. Rob Tucker, President  
Friends of Puna's Future  
P.O. Box 1959  
Pahoa, Hawaii 96778

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoa Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Tucker:

Thank you for your December 21, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoa Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

1. Time allowed. We appreciate your comments within the time extension period.
2. Project Purpose. The Draft EA stated there are several purposes for the Shoulder Lane Conversion project, one of which was to improve traffic operations. As stated in the Draft EA, one of the purposes of the Shoulder Lane Conversion project is to design the improvements to be compatible with the HDOT project (Project No. STP 0130 (27)) which involves improving highway safety, increasing roadway capacity, and modernizing the existing facility along Keaau-Pahoa Road between the Keaau Bypass and Pahoa-Kapoho Road. The Draft EA also stated the Keaau-Pahoa Road Shoulder Lane Conversion project will meet the design guidelines of the American Association of State Highway and Transportation Officials (AASHTO) and the Federal Highway Administration (FHWA). These design guidelines have been adopted by the Hawaii Department of Transportation (HDOT) for transportation and highway planning and design purposes. The Final EA will note adherence to these guidelines will ensure that the Shoulder Lane Conversion will be compatible with the future roadway.
3. Traffic Environment. Section 4.3 discusses use of a roundabout at the Shower Drive/Pohaku Driver Intersection.



4. Alternative Route to Highway 130. See above response 2.
5. Roundabout at Shower Drive
  - a. The Final EA will note that the roundabout inscribed diameter, 200 feet, is the minimum needed for two travel lanes for entry and circulating speed of 20 to 25 miles per hour. Additional land would also be needed to accommodate a shoulder and setbacks. Thus, the land area needed would be greater than the 200-foot diameter and could be up to 240 to 260 feet, when accounting for shoulders and setbacks.

A roundabout with a 200-foot inscribed circle diameter would place the roundabout travel lane about 65 feet from the residence at the southwest corner to the Keaau-Pahoa Road/Shower Drive intersection and about 50 feet from the residence at the northwest corner of the intersection. A 260-foot diameter inscribed circle would place the roadway about 45 feet from southwest corner residence and 30 feet from the northwest corner residence.

The existing right-of-way of Keaau-Pahoa Road at the Shower Drive intersection is 80 feet. Thus, to construct a roundabout at the intersection, the right-of-way would require a minimum of an additional 100 to 120 feet of land area, or 50 to 60 feet on each side of the existing right-of-way. The roundabout land area would be an addition to the proposed right-of-way needed for the Shoulder Lane Conversion travel lanes.
  - b. The Draft EA stated there will be an unfamiliarity of motorists with roundabouts as there are no existing roundabouts on State highways in the Puna area, the island of Hawaii, or other places on the State highway system. Also, roundabouts are not found on major roadways under County of Hawaii jurisdiction.
  - c. The Final EA will include most modern roundabouts have resulted in an overall reduction in the number and severity of crashes, especially as the design of roundabouts reduces entry and circulating speeds to about 20 miles per hour. However, some of this reduction decreases when multiple lane roundabouts are used.

The Final EA will include a comparison of costs which shows traffic signals have costs associated with power requirements and maintenance associated with controllers and detection systems. The roundabouts have costs associated with signing and pavement marking maintenance and with landscaping maintenance.

The Final EA will include that safety at the Keaau-Pahoa Road/Shower Drive intersection was a consideration in use of a traffic signal at the intersection.

The Final EA will note that AASHTO, FHWA, HDOT guidelines do not provide information on the use of a roundabout with a one lane approach and a two lane exit or a two lane approach and one lane exit such as would occur at the Keaau-Pahoa Road/Shower Drive intersection. Lastly, the HDOT Policy Guideline (DEP-HY 08.010, December 19, 2008) states the HDOT policy is to generally limit consideration to modern single-lane roundabouts only.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT



November 17, 2009

JS

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NOV 25 2009

WILSON OKAMOTO CORPORATION

Dr. Brennon Morioka  
Director  
Department of Transportation,  
State of Hawaii  
869 Punchbowl Street  
Honolulu, HI 96813

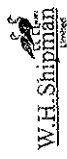
Re: Keaau-Paho Road Shoulder Conversion

Dear Dr. Morioka,

We have reviewed the Draft EA for Federal-Aid Project No. STP-0130(28) and have the following comments:

- Section 1.3.3 Other Project Site Data
  - The report states that "Land uses are vacant and undeveloped for most of the project limits. The only developed land uses on the makai side of the road occur at the beginning and end of the project limits."
    - This statement could lead one to believe that there is no activity on the TMK's bordering the highway on the makai side. However, much of the land there is actively farmed. Further there are access points on route 130 that are used by the farmers for ingress and egress to those farm lands. Cutting off those access points is not acceptable to the farmers using this area nor for their landlord.
  - The report goes on to state: "At the beginning of the project limits, the Hawaii Island Humane Society..."
    - It is not clear exactly where the project does start. As a matter of record, the West end of TMK 1-6-003:002 adjacent to the Humane Society contains an active agriculture processing facility. This facility is serviced by a left turn pocket lane on r. 130 and, of course, has access to the highway. Drawing # 1.5.1 does not show this existing left turn pocket. Most traffic in and out of the facility comes from (and goes to) Volcano Highway. The loss of the left turn lane would greatly reduce the utility of the location virtually removing access to traffic coming from Volcano Highway.
  - The report further states: "Other lands along the mauka side within the project limits are currently undeveloped up to Waipahoehoe Bridge." In fact lots on the mauka side of the road are actively farmed. In particular,

16-523 Keaau-Paho Road Keaau, HI 96749  
tel.: 808.966.9325 • fax: 808.966.8522  
www.wshipman.com



the bridge serves a periodic stream that runs through excellent farmland informally called the "Mauka Kipuka." It is serviced by an access point on Rt. 130 west of the bridge. Other entry ways along the route service additional farmland activities. Cutting off current access to these lots would make them inaccessible for any activities, which is not acceptable.

- 1.4 Project Description
  - Widening of the pavement may increase the potential for speeding. The plan should include features to mitigate safety concerns, such as cross-over accidents since there is no median.
  - When the southbound shoulder lane is in use, there will be no area for stalled motorist to safely pull over. The plan should include emergency pull-out areas.
  - The plan should include adequate sight-distances at road connections as well as adequate lane space for turning, acceleration and deceleration, especially along the southbound lanes when the shoulder lane is in use and only a 2-foot shoulder is proposed.
  - The relocated water line should be upsized, as needed based on the latest water demands for the area.
  - Provisions for future utility crossings to serve the parcels on either side of the roadway should be allowed across the right-of-way.
  - Relocated overhead utilities, poles and guys anchors will be kept within the roadway right-of-way.
  - The plan should include permanent best management practices for treatment of roadway runoff and erosion.
  - Noise mitigation should be considered due to the widening and added capacity along existing dwellings.
- 1.4.1 Right-of-Way Acquisition
  - The report states: the taking involves... a portion of one parcel owned by the County of Hawaii used for the County refuse convenience center."
    - The County of Hawaii does not own the parcel in question. This parcel is owned by W. H. Shipman, Limited and is leased to the County of Hawaii.
  - Table 1.1
    - TMK 1-6-003:054 (County of Hawaii)
      - Parcel is owned by W. H. Shipman, Limited. (As noted in the County of Hawaii Environmental Management response).
  - Access to Keaau-Paho Road and right-of-way should be provided at all existing roadway and driveway connections.

16-523 Keaau-Paho Road Keaau, HI 96749  
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- o Access should be provided to lots that abut against the Keaau-Pahoa Roadway right-of-way that would otherwise not have roadway access.
- Figure 1.5.1
  - o This figure does not show the currently existing left turn pocket lane (Southbound) for TMK 1-6-003-002. Loss of this pocket land and entry way would cause significant economic hardship through loss of utility to the West Entrance to the TMK, currently an active agricultural processing site.
  - Figure (1.5.2 - 8)
    - o Difficult to determine which figure to reference as the figures show TMK's that are listed either as 1-6-001:xxx or 1-6-005:xxx
      - In any case there are active access points for agricultural use on TMK's 1-6-004-011 and 1-6-004-048. Loss of these access points would for practical purposes land lock the farms and other property uses within those TMK's and service by their current entrances on Rt. 130.
    - 5. Determination
      - o 2) "The Keaau-Pahoa Road Shoulder Lane Conversion will use lands that are currently vacant and undeveloped."
        - As stated above this is an inaccurate statement. Cutting off access to lands mauka and makai of Rt. 130 would land lock those properties making them unusable. Lands mauka and makai of the highway in these sections are in fact in active use.
      - o 4) Substantially affect the economic or social welfare of the community or state.
        - This section does not address the negative affect on those farmers whose lively hood would be destroyed should access to the properties be cut off as a result of loss of access points rendering them landlocked as the report appears to suggest will occur. The State of Hawaii, Hawaii County and Puna CDP all encourage active use of lands for agriculture. Cutting access to such lands violates the principals enumerated by all of the above.



- 7. 2 Agencies and Organizations to be Consulted on the Draft EA
  - o We note that W. H. Shipman, Limited is listed in this group and look forward to our meeting.
- ARCHAEOLOGICAL ASSESSMENT SURVEY
  - o Figure 2. Project Area Map –
    - This map shows in simple form several of the access points noted in the above comments.

Thank you for your attention to this. We look forward to your positive response.

Sincerely,

Bill Walter  
President

C: Mr. John L. Sakaguchi, Wilson Okamoto  
Mr. Greg Hiyakumoto, R. M. Towill





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6615-01  
 April 13, 2010

Mr. Bill Walter, President  
 W.H. Shipman, Limited  
 P.O. Box 950  
 Keaau, Hawaii 96749

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keaau, Puna District, Island of Hawaii  
 Response to Comment

Dear Mr. Walter:

Thank you for your November 17, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoia Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. The responses to your comments follow:

**Section 1.3.3**

The Final EA will be revised to state, west, or outside of the makai right-of-way, active farming occurs. The existing access permitted to these farms from Keaau-Pahoia Road will remain with no changes.

Figure 1.5-0 and Figure 1.5-1 in the Draft EA show the northern end of project limits. On the makai, or east side, the project begins about 650 feet north of the Humane Society entrance. On the mauka, or west side, the project begins about 1,250 feet north of the Humane Society entrance. Figure 1.5-1 in the Final EA will be revised to show TMK: 1-6-003:002, instead of TMK: 1-6-003:074. The left turn storage lane into TMK: 1-6-003:002 will remain with no changes.

The Final EA will be revised to state, east, or outside of the mauka right-of-way, active farming occurs. The existing access permitted to these farms from Keaau-Pahoia Road north of the bridge will remain with no changes.

**Section 1.4 Project Description**

The design plans do not show a center median.

The design plans do not include emergency pull outs.



6615-01  
 Letter to Mr. Bill Walter, President  
 Page 2  
 April 13, 2010

The design drawings show adequate sight distance and turning radius to driveways adjacent to the shoulder lane. Acceleration and deceleration lanes for the temporary shoulder lane are not typically provided.

The access permitted points along the project limits will remain with no changes.

The existing water lines will be relocated as stated in the Draft EA and as discussed with the County of Hawaii Department of Water Supply.

Future utility connections will be the responsibility of the party seeking the connection. Since such connections are not known, future utility connections will not be included in the design plans.

The Final EA will note the relocated overhead utility lines and poles will be sited within the right-of-way, as currently exist.

The Final EA will note, on October 23, 2009, the US Army Corps of Engineers determined that the unnamed intermittent stream located near Waipahoehoe Bridge is not a water of the U.S. under Department of Army jurisdiction. The DOT guidelines show that permanent best management practices (BMPs) are not required when there is no discharge to waters not under the Department of Army jurisdiction.

The Draft EA included the Shoulder Lane Conversion project would not generate additional traffic, as such there should be no significant adverse noise effects from project.

**Section 1.4.1 Right-of-Way Acquisition**

The Final EA will be revised to state the County refuse convenience center is owned by W.H. Shipman and leased to the County of Hawaii.

Table 1.1 will be revised in the Final EA to show private ownership of TMK: 1-6-003:054, the County refuse convenience center.

The Final EA will state the will be no changes to the existing access permitted points

See above previous statement.



6615-01  
Letter to Mr. Bill Walter, President  
Page 3  
April 13, 2010

- Figure 1.5-1 in the Final EA will be revised to show TMK: 1-6-003:002, instead of TMK: 1-6-003:074. The existing left turn storage lane will remain with no changes.
- Figure 1.5-0 to 1.5-8A will be revised to show the TMKs on the mauka side. The existing access permitted points will remain with no changes.
- 5) Determination
- 2) The Final EA will retain this determination with no changes. The Final EA will state the will be no changes to the existing access permitted points
- 4) The Final EA will retain this determination with no changes. The Final EA will state the will be no changes to the existing access permitted points

We appreciate your participation in the Draft EA review process.

Sincerely,  
*John L. Sakaguchi*

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT

Nov 16, 09  
6615-01 11/16/09 PL FILE

Dear Sir: cc: DOT  
I'm happy about the improvement on the Pahoa highway & the signal at Shouir & Pahoa. However, there is another very dangerous place that needs a signal. That is at Ainaloa Blvd. & Pahoa Highway. It's very dangerous with lots of accidents (including me). It would be cheaper to install at the same time as the Shouir signal. Maybe there could be some rights for a change, instead of in an illegal manner as usual.

Another signal is sincerely,  
meets on Pahoa Highway at the town of Malama  
A signal is also needed at the intersection of Pahoa Highway  
Lorena A. Padilla  
HC-1, BOX 5314  
Keaau, HI 96749  
808/966-4877  
OVER

*all three of signals needed  
are not at cross intersections,  
but the volume of traffic  
makes it dangerous for  
people driving forward  
onto the Paho Highway. They  
all have high accident  
rates.*

*Maybe stimulus money or  
woud pay for these  
signals. They are not  
prohibited projects.  
They would save lives.*



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Fax 508-546-2173  
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6615-01  
January 19, 2010

Ms. Cornelia Radich  
HC-1, Box 5314  
Keaau, Hawaii 96749

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keaau, Puna District, Island of Hawaii  
Response to Comment

Dear Ms. Radich:

Thank you for your November 16, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Paho Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project.

The Final EA will note your support of the improvements to Keaau-Paho Road and the traffic signal at the Shower Drive/Pohaku Drive intersection. As stated in the Draft EA, the Keaau-Paho Road Shoulder Lane Conversion project limits extend from Keaau Bypass to Shower Drive. Construction of improvements beyond these project limits, such as traffic signals at other intersections, is not included in the scope of this project. However, since, as noted in the Draft EA, the Department of Transportation (HDOT) has a project to increase roadway capacity between Keaau and Paho, your comments regarding traffic signals at other intersections will be provided to the HDOT.

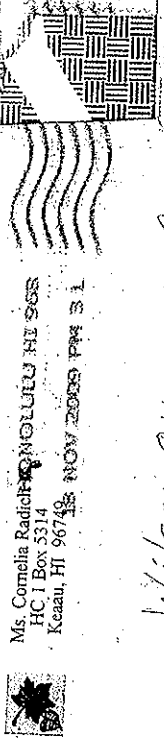
We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

JLS/ry

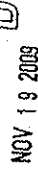
cc: E. Barroga, DOT



Ms. Cornelia Radich  
HC-1, Box 5314  
Keaau, HI 96749

NOV 2009 PM 31

*Wilson Okamoto Corp.  
1907 Beretania 50-510-400  
Honolulu, HI 96814*



NOV 19 2009

*John Sakaguchi*  
WILSON OKAMOTO CORPORATION  
1907 BERETANIA AVE  
HONOLULU, HI 96814

December 3, 2009

Wilson Okamoto Corp.  
1907 Bereania St., Suite 400  
Honolulu, HI 96826  
Attention: John Sakaguchi

Dear Mr. Sakaguchi:

SUBJECT: Keau-Paho Road Widening Affecting TMK (3) 1-5-036-021

I am writing to express my concern about the impact of the proposed highway widening on my property. My home abuts Highway 130 at the makai corner of Shower Drive and the highway.

The State Department of Transportation informed me by letter, dated September 15, 2008, that an area twenty feet wide along the highway will be taken for the road widening. My home is presently 80 feet from my property boundary adjacent to the highway. After the taking it will be 60 feet from the highway. I presently have a chain-link fence along this boundary. There have been at least four incidents that I know of within the last ten years, when cars have crashed through the fence and entered my property. The deepest incursion was about ten feet in. (Police conducted an extensive search on my property for a missing baby, which the delirious driver claimed to have on-board, and trampling my anthurium patch in the process.) The extent and frequency of these incursions would have been much greater except that there is a dip on the road-side and then a rise in my property, along a major part of the boundary, which acts as a barrier against the vehicles from penetrating further onto my property. The peak of the rise is within the twenty feet to be taken. This natural barrier once gone will allow vehicles a clear downward path to my house. A barrier of some kind must be built to prevent vehicles entering my property from the highway.

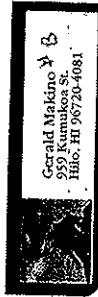
The elevation of my home is below that of the current road bed. Flooding regularly occurs on my property, just mauka of my home, during heavy rains, due in large part from runoff from the highway. Flooding on my property will increase due to the widening of the road and elimination of the dip and rise in the property as mentioned above. I also have a cesspool in the area which may overflow and create a health hazard should flooding become more regular. A barrier to prevent runoff must be built to reduce flooding onto my property from the highway.

I am concerned, too, that the traffic noise level in my house will increase significantly unless appropriate measures are taken.

I understand that it is within the state's rights to take part of my property for this public purpose, however, not to jeopardize my safe use of the remainder of my property. Thank you for your consideration. Please contact me at 969-7912 should there be any questions.

Sincerely,

*Kazuo Makino*  
Kazuo Makino  
Gerald Makino  
HCR-1 Box 4198  
Keauau, Hawaii 96749



Mr. Kazuo Makino  
Mr. Gerald Makino  
HCR-1 Box 4198  
Keauau, Hawaii 96749

Subject:

Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keauau-Paho Road Shoulder Lane Conversion, Keauau Bypass to Shower Drive Federal Aid Project No. STP-130 (028)  
Keauau, Puna District, Island of Hawaii  
Response to Comment

Dear Mr. Makino:

Thank you for the December 3, 2009 comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keauau-Paho Road Shoulder Lane Conversion, Keauau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

The Final EA and design plans will show a metal guardrail will be installed on the makai side of Keauau-Paho Road between the new shoulder lane along the entire length of the parcels adjacent to the roadway. The guardrail will align approximately with the existing fence. A new fence will be installed at the new right-of-way. There are several purposes of the guardrail, including keeping vehicles in travel lanes and shoulders and preventing vehicles from leaving the travel lanes and damaging properties adjacent to roadway.

The design plans also show an earthen berm or a swale will be constructed along the roadway fronting the new property boundary line to direct storm water runoff towards Shower Drive.

Noise along the highway should remain near current levels as the existing AM shoulder lane will be widened by 2 feet wide to accommodate the permanent northbound travel lane.

We appreciate your participation in the Draft EA review process.

Sincerely,

*John L. Sakaguchi*

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT

6615-01  
January 28, 2010  
6615-01  
12/10/09  
JL

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DEC 04 2009

WILSON OKAMOTO CORPORATION

Thank you.

James Weatherford, PhD  
PO Box 2017  
Keeau, Hawaii 96749  
808-982-5549

John Sakaguchi

From: Brian A. Lock  
Sent: Tuesday, December 08, 2009 1:38 PM  
To: John Sakaguchi  
Subject: FW: CORRECTION TO COMMENTS

From: Emilio.Barroga@hawaii.gov [mailto:Emilio.Barroga@hawaii.gov]  
Sent: Tuesday, December 08, 2009 1:36 PM  
To: Brian A. Lock  
Subject: Fw: CORRECTION TO COMMENTS

Brian,  
For your information.

— Forwarded by Emilio Barroga/HWYHIDOT on 12/08/2009 01:35 PM —  
James Weatherford <gardengreen@hawaiiintel.net>  
To: emilio.barroga@hawaii.gov  
cc  
Subject: CORRECTION TO COMMENTS  
12/08/2009 01:26 PM

Emilio,

I discovered a typographical error in the comments I sent yesterday.

Could you please forward this to the consultant at Okamoto?

The correction is here with the word 'not' added in bold font:

"Again, the research does not bear out the implication that roundabouts require more total space."

12/10/2009

12/10/2009

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12/10/09

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John Sakaguchi

From: Brian A. Lock  
Sent: Monday, December 07, 2009 2:08 PM  
To: John Sakaguchi  
Subject: FW: comments on the Environmental Assessment for the Keasa-Paha Road Shoulder Lane Conversion (Federal Aid Project No. STP-0130028).

From: James Weatherford [mailto:jweatherford@hawaii.gov]  
Sent: Monday, December 07, 2009 2:04 PM  
Cc: emil@hawaii.gov  
Subject: comments on the Environmental Assessment for the Keasa-Paha Road Shoulder Lane Conversion (Federal Aid Project No. STP-0130028).

This is to make comment on the Environmental Assessment for the Keasa-Paha Road Shoulder Lane Conversion project (Federal Aid Project No. STP-0130028), and to register protest in the strongest terms at the information regarding a roundabout as an alternative for the intersection at the Keasa-Paha Road Shoulder Drive/Pohaku Drive intersection.

The excuses -- i.e. no "reasoning" -- used to dismiss a roundabout are ill-informed, illogical, and deceitful.

Below are examples that demonstrate the fallacious nature of the statements in the EA. These examples are but a few and are far from exhaustive -- there are many more.

Advantages of a Roundabout

It is said that the "main advantage of a roundabout is that traffic of the through road (Keasa-Paha Road) does not need to come to a complete stop to exit onto a side street (Shower Drive and Pohaku Drive).

This statement is indefensible, being contradicted by an extensive amount of research. Below are examples of proven advantages of roundabouts, notably safety, traffic flow, and requirement for less taking of land.

"The Advantage of a Roundabout

Roundabouts perform favorably, when compared with conventional controlled intersections (i.e., stop signs or signals), in terms of improved safety, shorter delays, increased capacity, and improved aesthetics. Early results generally indicate that roundabouts have resulted in an overall reduction in the number and severity of accidents, despite the initial concern that lack of familiarity with this type of intersection would lead to driver confusion."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"Constructing either a signalized intersection or a roundabout in place of the stop sign control would reduce peak-period traffic delays, but a roundabout would provide greater traffic flow benefits.

Compared with a traffic signal, a roundabout would reduce average vehicle delay during the various peak hours by an estimated 13-63 percent and reduce the incidence of vehicle queuing by 10-41 percent. Another important advantage of a roundabout is that fewer traffic lanes would be needed, thereby eliminating the costly errors required to mitigate the effect of road widening on adjacent properties."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"...studies of crash experience finds that roundabouts are safer than standard methods of intersection control."

"There is documented evidence to support the claim that roundabouts are a safe intersection control.

The safety benefits of roundabouts may be a result of simplifying the driving task. At a standard intersection, the driver is required to react to vehicles to the right, left, and ahead, and to pedestrians on all parts of the intersection."

"Based on the published literature, properly designed roundabouts provide a safe environment for bicyclist and pedestrians."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"Roundabouts can be installed to replace standard signalized or unsignalized intersections. They offer the important advantage of eliminating head-on and right angle crashes that can occur at ordinary intersections, and when they are installed to replace problem intersections, several studies from the U.S., Europe, and Australia confirm that

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roundabouts tend to decrease overall crashes in general and injury crashes in particular."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"What are the advantages of roundabouts?"

Less Traffic Conflict:

Figure 3 compares the conflict points between a conventional intersection and a modern roundabout. The lower number of conflict points translates to less potential for accidents.

Greater safety:

Primarily achieved by slower speed and elimination of left turns. Design elements of the roundabout cause drivers to reduce their speeds.

Efficient traffic flow:

Up to 50% increase in traffic capacity

Reduced Pollution and fuel usage:

Less stops, shorter queues and no left turn storage.

Money saved:

No signal equipment to install or maintain, plus savings in electricity use.

Community benefits:

Traffic calming and enhanced aesthetics by landscaping."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"Feasibility" of a Roundabout

It is said that "unfamiliarity of motorists with roundabouts" makes it infeasible to apply this intersection design for this project.

This type of excuse would mean that a roundabout -- or any other new innovation not yet familiar -- would never be used. Furthermore, repeated experience has shown that this concern is not valid.

"The number of roundabouts constructed in the U.S. is relatively small. Those that are currently in operation have been reported to be performing favorably, when compared with conventional controlled intersections (i.e., stop signs or signals), in terms of improved safety, shorter delays, increased capacity, and improved aesthetics. Early studies generally indicate that roundabouts have resulted in an overall reduction in the number and severity of accidents, despite the initial concern that lack of familiarity with this type of intersection would lead to driver confusion."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

"... Results of a National survey contained in the NCHRP Synthesis 264.

Uncertainty about functionality/effectiveness (safety and operation), and drivers lack of familiarity prevailed.

Several jurisdictions who were pioneers in recommending and building roundabouts confronted these doubts by developing guidelines and building them (Maryland, and several cities in Florida)

Doubts were proven to be unfounded and were dispelled by experience."

<http://www.fhwa.dot.gov/roundabouts/roundabouts.cfm#advantages>

It is also stated that the "additional land area needed" for a roundabout are a constraint.

There is additional land area needed for the full length of the project and that does not make the project "infeasible."

Again, the research does bear out the implication that roundabouts require more total space:

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Roundabouts do not necessarily require more space than traditional intersections. Geometric design details vary from site to site and must take into account traffic volumes, land use, topography, and other factors. Because they can process traffic more efficiently than traffic signals and stop signs, roundabouts typically require fewer traffic lights to accommodate the same amount of traffic. In some cases, roundabouts can require more space than stop signs or traffic signals at the actual intersection to accommodate the central island and circulating lanes, but approaches to roundabouts typically require fewer traffic lanes and less right-of-way than those at traditional intersections.

<http://www.tlha.org/research/guides/roundabouts.html>

#### Summary

The statements made in the Environmental Assessment regarding roundabouts should be changed to reflect reality rather than, as is now the case, excuses to do what the DOT wants while cheerily ignoring facts and the wishes of the community. Otherwise, the EA will not have credibility in the community or the court.



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6615-01

April 13, 2010

Mr. James Weatherford, PhD  
P.O. Box 2017  
Keaau, Hawaii 96749

Subject: Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoa Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) Keaau, Puna District, Island of Hawaii Response to Comment

Dear Dr. Weatherford:

Thank you for your December 7, 2009 e-mail comment letter on the Draft Environmental Assessment/Anticipated Finding of No Significant Impact, Keaau-Pahoa Road Shoulder Lane Conversion, Keaau Bypass to Shower Drive Federal Aid Project No. STP-130 (028) project. Our responses follow:

#### Advantages of Roundabout

The Final EA will clarify that the vehicles entering the roundabout must yield to already circulating vehicles at all times. The Final EA will also add most modern roundabouts have resulted in an overall reduction in the number and severity of crashes, especially as the design of roundabouts reduces entering and circulating speeds to about 20 miles per hour.

The Final EA include roundabouts treat all movements at an intersection equally with each approach required to yield to circulating traffic, regardless to whether the approach is a local street or major arterial. This may result in more delay to the major movements than otherwise might be desired. This delay is exacerbated when a high volume major street intersects a low volume minor street.

The Final EA will include, when operating within their capacity, roundabouts typically operate with lower vehicle delays than other intersection forms. When there are queues on one or more approaches, traffic within the queues usually continues to move. The movements for circulating and exiting a double lane roundabout could add to the delays which might occur at an intersection.

The Final EA will include injury crash rates for vehicle occupants are generally lower for roundabouts, although the proportion of single vehicle crashes is typically higher.

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 Letter to Mr. James Weatherford, PhD  
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 April 13, 2010

Also, bicyclists and pedestrians are involved in a relatively higher proportion of injury accidents than they are at other intersections due to unprotected crossings lengths, and increase conflicts between vehicles and pedestrians.

The Draft EA included a roundabout at the Keaau-Paho Road/ Shower Drive intersection as an alternative to installation of traffic signal.

The Final EA will include the advantages of a roundabout include reduction in potential conflicts at the intersection and related reduction in crashes. The Final EA will also state double lane roundabouts often cannot achieve the same level of crash reduction due to the circulating and exiting movements needed at all times. Further, pedestrians crossing double lane roundabouts are exposed for a longer time and can be obscured from, or not see, approaching vehicles in adjacent lanes if vehicles in the nearest lane yield to them.

The Draft EA included there will be an unfamiliarity of motorists with roundabouts as there are no existing roundabouts on State highways in the Puna area, the island of Hawaii, or other places on the State highway system. Also, single and double lane roundabouts are lacking on major roadways under County of Hawaii jurisdiction.

The Final EA will note that the roundabout inscribed diameter, 200 feet, is the minimum needed for two travel lanes for entry and circulating speed of 20 to 25 miles per hour. Additional land would also be needed to accommodate a shoulder and setbacks. Thus, the land area needed would be greater than the 200-foot diameter and could be up to 240 to 260 feet, when accounting for shoulders and setbacks.

A roundabout with a 200-foot inscribed circle diameter would place the roundabout travel lane about 65 feet from the residence at the southwest corner to the Keaau-Paho Road/Shower Drive/Pohaku Drive intersection and about 50 feet from the residence at the northwest corner of the intersection. A 260-foot diameter inscribed circle would place the roadway about 45 feet from southwest corner residence and 30 feet from the northwest corner residence.



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 Letter to Mr. James Weatherford, PhD  
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 April 13, 2010

The existing right-of-way of Keaau-Paho Road at the Shower Drive intersection is 80 feet. Thus, to construct a roundabout at the intersection, the right-of-way would require a minimum of an additional 100 to 120 feet of land area, or 50 to 60 feet on each side of the existing right-of-way. The roundabout land area would be an addition to the proposed right-of-way needed for the Shoulder Lane travel lanes.

The Final EA will note that AASHTO, FHWA, HDOT guidelines do not provide information on the use of a roundabout with a one lane approach and a two lane exit or a two lane approach and one lane exit such as would occur at the Keaau-Paho Road/Shower Drive intersection. Lastly, the HDOT Policy Guideline (DEP-HY 08.010, December 19, 2008) states the HDOT policy is to generally limit consideration to modern single-lane roundabouts only.

We appreciate your participation in the Draft EA review process.

Sincerely,

John L. Sakaguchi, AICP, Senior Planner

cc: E. Barroga, DOT



6615-01

12/1/09

FILE



Emilio Barrozo  
#1 Dept of Transportation  
869 Panch Bowl St.  
Princeton, NJ 08542

303

Re: Puna/30 Expansion - YES!  
But Shower/Parkku stop lights is not  
the worst - Orchardland + '80,  
And Ainaloa + '80 also need them!  
I hope shoulder lane is not just  
commute time - We need all the  
lanes we can get - full time lane.  
Roundabout is dumb idea.  
Kevin Lewis/Hib

6615-01

11/13/09

BL

FILE

cc: DOT/em

Re: Puna/30 Expansion - Yes!  
But Shower/Parkku stop lights  
not only are - We need at Orchardland  
W/130 Ainaloa/180. We don't want  
commuter lane - We need full  
time lanes. Roundabout is  
junk idea. Fix it Right - Not  
Short Sighted local way then need  
fix again. John/Paloo



John Sakaguchi  
Wilson Okamoto Corp  
1917 Berkelee St. 409  
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303