

ATTACHMENT A

4. Additional Tax Map Keys

Zone	Section	Plat	Parcel(s)
1	6	001	015
1	6	003	002, 065, 074

5.a. Receiving State Water(s) Information – Are there additional discharge points into receiving State waters?

Storm water enters various culverts and then discharges on the makai side of Keaau-Pahoa Road and sheet flows off-site along the project right-of-way (makai of Keaau-Pahoa Road) between “Being Project” and “End Project” points (see Att. B, Figure 2)

Receiving Waters Coordinate ranges

RW#	Latitude	Longitude	RW Class	RW Name
1	19°35'20"N	155°00'50"W	2	Keaau Stream
2	19°35'21"N	155°00'49"W	2	Keaau Stream
3	19°35'14"N	155°00'45"W	2	Keaau Stream
4	19°35'15"N	155°00'45"W	2	Keaau Stream
5(Begin Sheetflow)	19°38'21"N	154°58'52"W	AA	Pacific Ocean
6 (Begin/End Sheetflow)	19°38'08"N	154°58'42"W	AA	Pacific Ocean
7(End Sheetflow)	19°37'40"N	154°57'52"W	AA	Pacific Ocean
8(Begin Sheetflow)	19°37'22"N	154°57'28"W	AA	Pacific Ocean
9(End Sheetflow)	19°37'24"N	154°56'52"W	AA	Pacific Ocean

The new 3-48" culvert will convey water from the mauka to makai side of Keaau-Pahoa Road and discharge into Keaau Stream (also referred to as Waipahoehoe Stream or “unnamed intermittent stream located near Waipahoehoe Bridge”). See Attachment B, C-12 for coordinates. Keaau Stream is an intermittent stream that does not reach the Pacific Ocean or any other State waters.

5.c.iii Receiving Separate Drainage System

The Director of the Department of Transportation approves runoff from Keaau-Pahoa Road to discharge into the Highways Division drainage system. A copy of the project's NOI will be sent to the Hawaii District, Highways Division.

6. Quantity of Storm Water Discharge

Use Rational Method $Q=CIA$

Rainfall Intensity

I=9in/hr

(2 Yr, 24-hour design storm, Technical Paper No. 43, Rainfall Frequency Atlas of the Hawaiian Islands)

Coefficient "C"

Unpaved: C=0.2

(High infiltration, rolling-flat terrain, good-high vegetal cover, agricultural type)

Paved: C=0.9

Drainage Area No. 1 – Total Area = 5.3 Acres

A_{unpaved} = 2.5 acres

A_{paved} = 2.8 acres

C_{Weighted} = (2.5*0.2 + 2.8*0.9)/5.3 = 0.57

Q=0.57*9*5.3 = 27.19 cfs

Runoff sheet flows off-site outside of the right-of-way, towards Pacific Ocean

Drainage Area No. 2 – Total Area = 12.0 Acres

A_{unpaved} = 5.0 acres

A_{paved} = 7.0 acres

C_{Weighted} = (5.0*0.2 + 7.0*0.9)/12.0 = 0.61

Q=0.61*9*12.0 = 61.88 cfs

Runoff sheet flows off-site outside of the right-of-way, towards Pacific Ocean

Drainage Area No. 3 – Total Area = 9.0 Acres

A_{unpaved} = 3.7 acres

A_{paved} = 5.3 acres

C_{Weighted} = (3.7*0.2 + 5.3*0.9)/9.0 = 0.61

Q=0.61*9*9 = 49.41 cfs

Runoff sheet flows off-site outside of the right-of-way, towards Keaau Stream

Drainage Area No. 4 – Total Area = 4.5 Acres

A_{unpaved} = 1.6 acres

A_{paved} = 2.9 acres

C_{Weighted} = (1.6*0.2 + 2.9*0.9)/4.5 = 0.65

Q=0.65*9*4.5 = 26.33 cfs

Runoff sheet flows off-site outside of the right-of-way, towards Keaau Stream

Total Storm Water Discharge = 164.81 cfs

7.b. Non-Storm Water Handling Method

No excessive dust control or irrigation will be done (dust screen/silt fences will be used). See Attachment B, Shts C-60 to C-87 and C-88 & C-89 for dust screen/silt fence location and details. Saw-cutting slurry will be vacuumed, collected, and emptied into a concrete

waste bin. Concrete wash out water will be captured in an impermeably lined retention basin. See Attachment B, Sht C-88 and C-89 for detail of basin, location to be determined 30 days prior to start of construction. Construction equipment washdown water handling method and location will be determined 30 days prior to start of construction. Concrete curing water will evaporate.

8.b. Location Map

For Legal Boundary and discharge points see Attachment B, Sht. C-11 & C-12. For topographic map see Attachment B, Shts. C-60 to C-87. For state receiving waters map see Attachment B, Figure 2.

11.a. Construction Site Characterization

The construction activities will commence with clearing and grubbing and then mass grading and installation of the southbound shoulder lane. At this time the South-bound portion of the bridge will be extended. Next, the relocation of utility poles and overhead electrical lines will occur. The mass grading and installation of the new North-bound lane and extension of the North-bound portion of the bridge will occur after utility pole work. Next is the installation utilities such as extension of existing culverts and the relocation of the waterline. Following the utilities will be the fine paving and grading of the road. Finally will be the installation of the traffic signals at the Shower Drive intersection. Preliminary estimate of the start of site disturbance is April 2011. The contractor shall submit the actual timetable at least 30 days prior to the start of construction.

11.b. History of Land Use

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.

13.a.ii. Facility Site Maps

- (1) See Attachment B, Shts. C-60 to C-87
- (2) See Attachment B, Shts. C-60 to C-87. BMPs for the demolition of the existing abandoned bridge and utility poles and lines shall be submitted with the Site-Specific BMPs at least 30 days prior to the start of construction activities.
- (3) Construction baseyards and/or staging areas shall be located on-site within project right-of-way. The exact area(s) shall be determined at least 30 days prior to start of construction. In the case that construction baseyards and/or staging areas are outside the project right-of-way and contributes (1) or more acres to the project site, the contractor shall submit NPDES permit application along with the additional filing fee and publication of a public notice. After construction is complete, ingress/egress areas are to be removed and paved and/or grassed according to Roadway/Grading plans.
- (4) See Attachment B, Shts. C-32 to C-59
- (5) See Attachment B, Figure 2
- (6) According to the Flood Insurance Rate Map (Panel 1551661125C), the project site is located in Zone X, areas to be determined to be outside of the 500-year flood plain. See Attachment B, Figure 4
- (7) Areas used for storage shall be located on-site within project right-of-way. The exact area(s) shall be determined at least 30 days prior to start of construction. In the case that construction baseyards and/or staging areas are outside the project right-of-way and contributes (1) or more acres to the project site, the contractor shall submit NPDES permit application along with the additional filing fee and publication of a public notice.
- (8) To be submitted 30 days prior to start of construction
- (9) To be submitted 30 days prior to start of construction
- (10) To be submitted 30 days prior to start of construction

13.b.i Construction Activity

- (1) 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. 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 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 shoulder lane and addition of a 2-foot wide paved shoulder; construction of one new multiple reinforced concrete pipe culvert beneath the road within the right-of-way to alleviate overtopping of the road during heavy rainfall events; widening of Waipahoe Bridge from 40 feet to 70 feet wide;
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and installation of a new traffic signal at the intersection of Keaau-Pahoa Road, Shower Drive /Pohaku Drive. The existing abandoned bridge over the intermittent Keaau Stream will be demolished also.

The construction sequence will be as follows:

1. Clearing and Grubbing on Mauka Side (South-bound)
 2. Demolition of old existing bridge.
 3. Extend South-bound portion of bridge, install South-bound portion of new 3-48" culverts, and demo/extend existing culverts according to plans
 4. Mass grading for South-bound Shoulder Lane
 5. Fine grading and paving of South-bound Shoulder Lane
 6. Clearing and Grubbing on Makai side (North-bound)
 7. Relocation of utility poles and overhead electrical lines
 8. Installation of utilities, demolition/extension of existing culverts, complete installation of new 3-48" culverts, relocation of waterline
 9. Extend North-bound portion of bridge
 10. Mass grading for new North-bound Lane
 11. Fine grading and paving for New North-bound lane
 12. Traffic signal at Shower Drive intersection
- (2) Not a multi phase construction project
- (3) Construction materials include excavated soil and basalt rock, HMA pavement, aggregate subbase, untreated permeable base course, glassphalt base course, concrete. The types of construction equipment generally include: dozers, cranes, tractors, motor graders, excavators, backhoe loaders, asphalt pavers, vibratory compactors and rollers, pipe layers, forklifts, hoptoes, concrete trucks, dump trucks, and pick-up trucks.

13.b.ii. Quality of Discharge

Imported fill material consisting of non-expansive select granular materials, such as crushed basalt will be used.

Subsurface conditions at the bridge widening site generally consisted of hard basalt rock formation with clinker layers and occasional voids and/or cavities at various depths. Subsurface conditions along the shoulder lane conversion alignment generally consisted of a surface layer of very stiff sandy silts and/or medium dense silty sands overlying hard basalt rock formation. No groundwater was encountered.

13.b.iii. Potential Pollutant(s)

- (1) Construction debris and removed vegetation – Construction debris and removed vegetation will be removed offsite for disposal immediately at a DOH Solid and Hazardous Waste Branch (SHWB), Solid Waste Section (SWS) permitted facility.
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If not, contractor shall contact the SHWB-SWS at (808) 586-4226 for additional permits that may be required.

- (2) Discharges associated with the operation and maintenance of the equipment, such as oil, fuel and hydraulic fluid leakage – Construction vehicles and equipment will be checked and maintained regularly to minimize the potential for any leakage. Care shall be taken to ensure that no petroleum deleterious substances are allowed to fall, leach, or otherwise enter any surface or groundwater.
- (3) Soil erosion from the disturbed areas and stockpile areas – Erosion and sediment control measures shall be in place, according to the erosion control plan, and functional before the earth moving operations begin. These measures shall be properly constructed and maintained throughout the construction period.
- (4) Location(s) of oil, fuel or any hazardous material storage site(s) and containment structure(s) – Hazardous materials found on-site shall be disposed of appropriately by contractor.
- (5) N/A

13.b.iv. Controls for Land Disturbances

The Controls for Land Disturbances is acknowledged

13.b.v. Erosion and Sediment Control Requirements

This project will be exempt from a County grading permit and erosion control plan under Chapter 10, Erosion and Sediment Control, Section 10-3 (b) (10). DPW Contact: Kelly Gomes, kgomes@co.hawaii.hi.us , Ph. (808) 961-8927.

13.b.vi. Construction Schedule

The following is a preliminary estimate. The contractor shall submit the actual timetable at least 30 days prior to the start of construction.

- (1) The date when the general contractor will begin the site disturbance – April 2, 2012
The date when the general contractor will end the site disturbance – October 31, 2013
- (2) The date when erosion control measures will be implemented – April 2, 2012
The date when erosion control measures will be removed – October 31, 2013
- (3) The date when major construction activities begin – April 9, 2012
The date when major construction activities end – October 24, 2013

14. Post-Construction Pollutant Control Measures

- New pavement for shoulder lane conversion.
 - All cut/fill slopes are to be hydro-mulched.
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-Hand-laid rip-rap to be installed at all culvert outlets areas.