

ATTACHMENT VI

Final Potential Retrofit List and RRI Forms

Final List of Retrofit BMPs for HNL

Rank	Description	Project ID	Total Pounds of TP Removed	Cost Effectiveness	Runoff Reduction	Public Education	Quick Implementation	Specific Problem	Low Maintenance Burden	No Permitting Issues	Few Site Constraints	Total
1	Bioretention on Lagoon Drive	A2-2	30	21	15	20	0	0	1	0	0	87
2	Paiea Street Bioretention	E-7	30	15	15	20	0	0	1	1	1	83
3	Ewa Concourse Green Roof	B10-3	21	30	15	10	0	0	1	1	1	79
4	Overseas Terminal Green Roof	D5-1	21	30	15	10	0	0	1	1	0	78
5	Interisland Terminal Green Roof	B13-2	15	30	15	10	0	0	1	1	1	73
6	New Elliot Street Parking Lot Bioretention	B15-1	30	15	15	10	1	0	1	0	1	73
7	Central Concourse Green Roof	B9-1	15	30	15	10	0	0	1	1	0	72
8	New Mauka Concourse Green Roof	D1-1	15	30	15	10	0	0	1	1	0	72
9	Rain Garden in Vacant Lot on Kalewa Street	D16-2	21	21	15	10	0	0	1	0	1	69
10	Dry Detention Basin on Kalewa Street	A1-1	21	21	15	10	0	0	0	0	0	67
11	Bioretention at Outfall 4105 near ARFF 2	A10-1	15	15	15	20	0	0	0	0	1	66
12	Dry Detention Basin South of Runway 26R	A2-1	30	21	15	0	0	0	0	0	0	66
13	New Hawaiian Air Hangar Green Roof	B11-1	6	30	15	10	1	0	1	1	1	65
14	Parking Lot R Bioretention	D10-6	21	15	15	10	0	0	1	1	1	64
15	Cell Phone Waiting Lot Permeable Pavers	D10-7	6	21	15	20	0	0	0	1	1	64
16	Nakolo Place Parking Lot Bioretention	A4-1	6	15	15	20	0	0	1	1	1	59
17	Lagoon Drive Parking Lot Bioretention and Permeable Pavers	A9-3	15	6	15	20	0	0	1	1	1	59
18	Detention Basin from Unnamed Canal at the End of Runway 4L	B6-1	21	21	15	0	0	1	1	0	0	59
19	Parking Lot G Bioretention	D10-4	15	15	15	10	0	0	1	1	1	58
20	Access "A" Canal Stabilization	D10-1	30	6	7.5	0	0	1	1	0	0	45.5
21	Kaloaloa Canal Stabilization	D14-1	30	6	7.5	0	0	1	1	0	0	45.5
22	Planter for Bldg 223 Roof Runoff	A3-1	6	6	15	10	0	0	1	1	1	40
23	Planter for Bldg 206 Roof Runoff	A4-2	6	6	15	10	0	0	1	1	1	40
24	VIP Trans Oil Water Separator	D16-3	6	21	0	10	0	1	0	0	0	38

Retrofit Site ID: A1-1
Description: Rental Car Maintenance Area
Ranking Number: 10 of 24
Overall Score: 67

Potential Retrofit

Name: Dry Detention Basin

Location: South of Kalewa Street near storm drain 4640

Size: 20,000 square feet with 6 foot depth

Details: Flow splitter from storm drain 4640 will divert water to the detention basin to allow for evaporation. Area may be filled with vegetation to assist in removing contaminants and decreasing evaporation time periods.

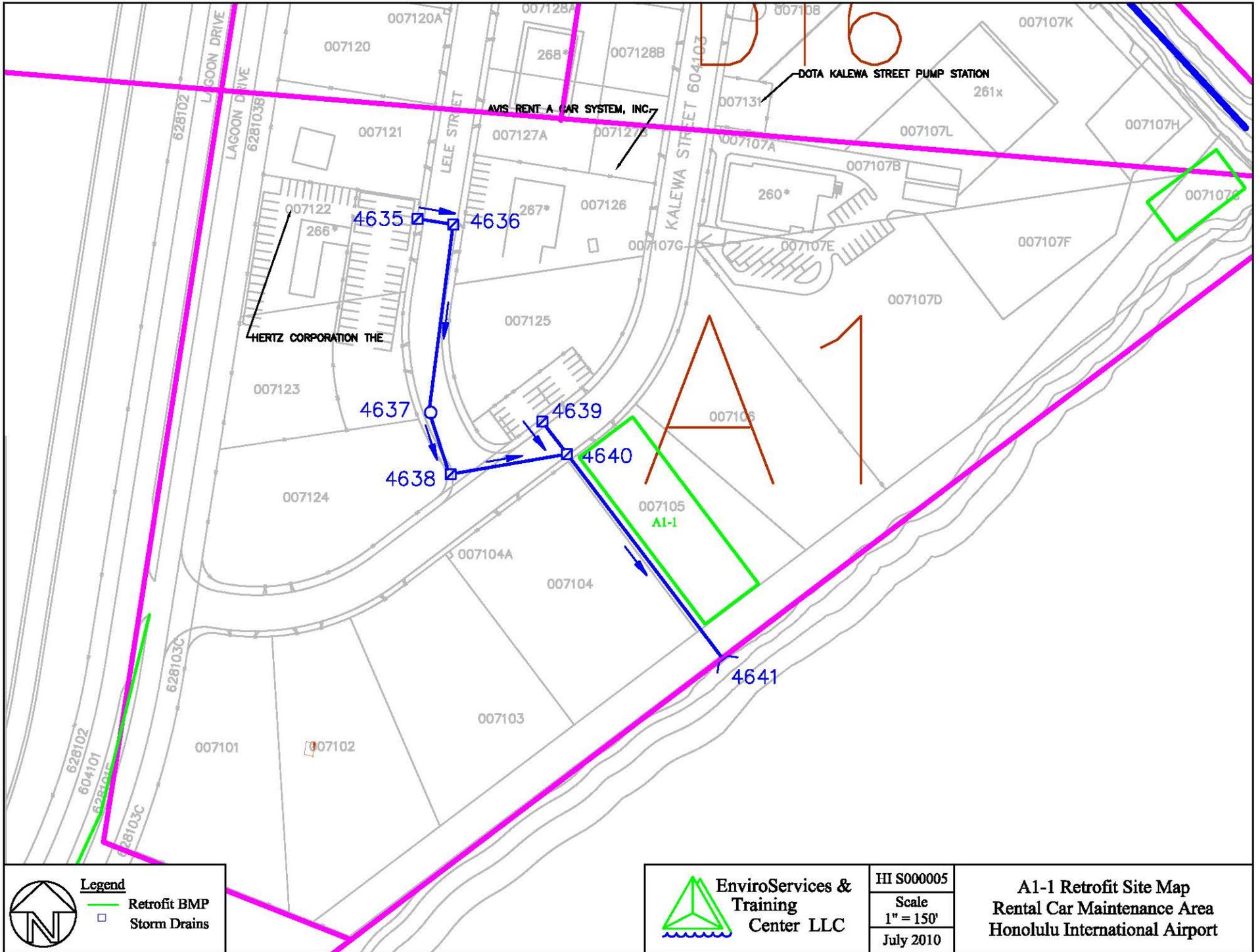
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form

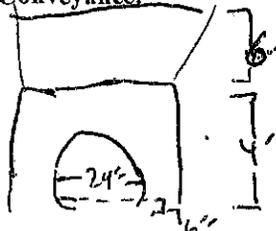


815305 = 10 acres

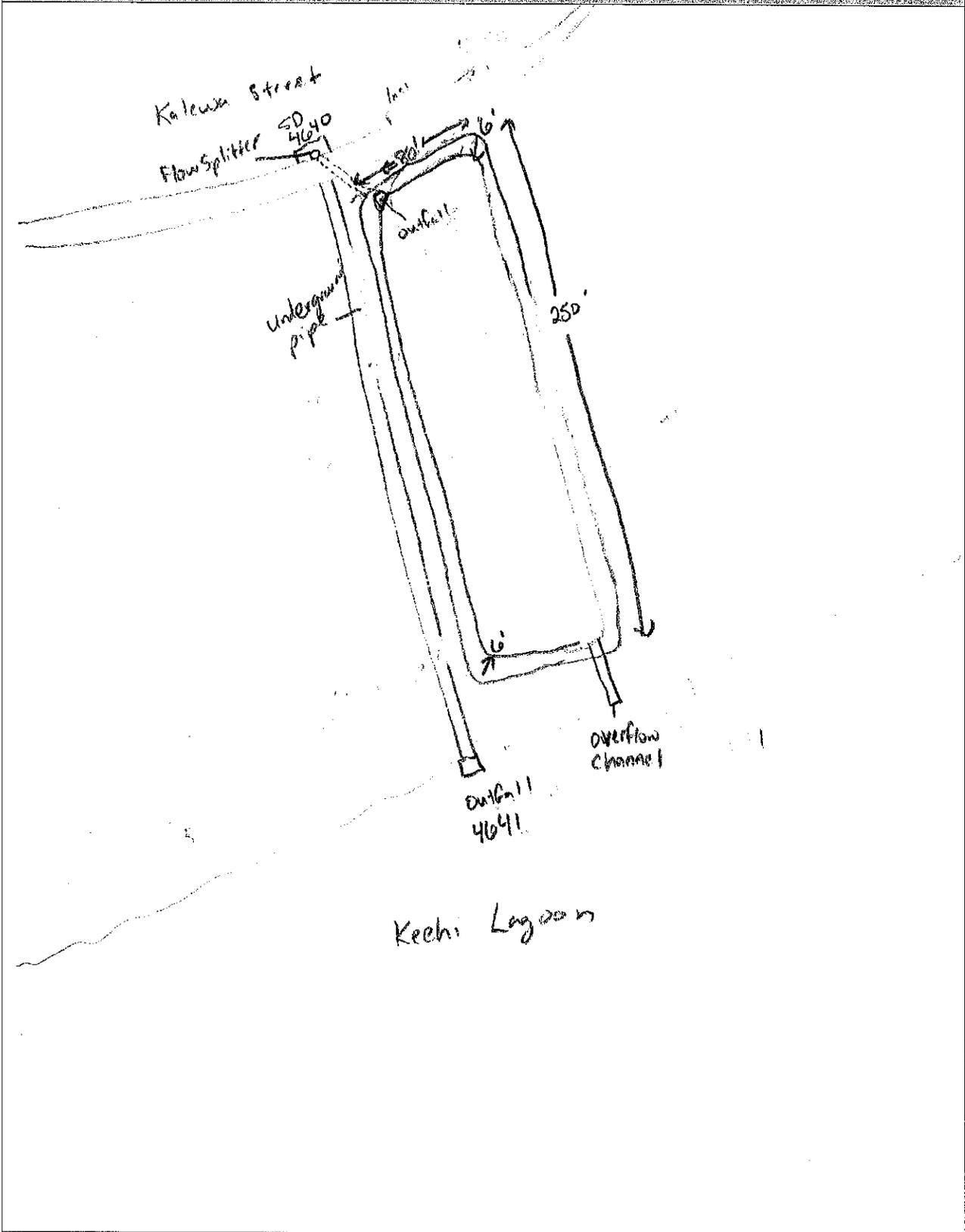
Retrofit Reconnaissance Investigation (RRI)

DATE: 7/19/10		INVESTIGATOR: CW/KD	
WATERSHED: Keehi		BASIN: A1	SITE ID: A1-1
SITE DESCRIPTION			
Name: Rental Car Maintenance			
Address: Kalewa St			
Land Use: Industrial Commercial	<input checked="" type="checkbox"/> DOTA Street	<input checked="" type="checkbox"/> Tenant Property	<input type="checkbox"/> Unknown
Proposed Retrofit Location: Off of MA 4640			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input checked="" type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 18.72 acres		Drainage Area Land Use:	
Imperviousness ≈ 70-80 40-60 80%		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 100% ↑ 4 acres		<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes: 476602.82 ≈ 10.92		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: MS4			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Vacant Unpaved Lots, Paved Parking Areas, some structures			
Existing Head Available and Points Where Measured: 5' from SD 4640 bottom to outfall bottom.			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_T = \left(\frac{P}{12}\right)(A)(RV)$ $\sim RV = 0.8$ $V_T = \left(\frac{1.2}{12}\right)(1677)(0.8) = 1.44 \text{ AF}$ $V_T = 62,789 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3}(d)(SA)$ Assuming $d = 6'$, $SA = 20,000 \text{ SF}$ $V_{AV} = \frac{2}{3}(6)(20,000) = 80,000 \text{ CF}$																																							
Proposed Treatment Options: <input checked="" type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="display: flex; align-items: flex-start;"> <div style="flex: 1;">  </div> <div style="flex: 2; padding-left: 20px;"> <p>MH4640 = 24.5' ^{water} gutter</p> <p>Approx Surface Area = 15,000 SF</p> <p>Max Depth ~ must be verified (utilities / basin table)</p> <p>~ 6'</p> <p>Conveyance from SD in MS4</p> </div> </div>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: <i>No large trees/birds</i>	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input checked="" type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input checked="" type="checkbox"/>	Sewer	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Water	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;">Potential Permitting Factors:</th> <th style="width: 15%;">Probable</th> <th style="width: 15%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>	Potential Permitting Factors:	Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dewatering	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
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Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Other factors:																																								
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input checked="" type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																								

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em; margin: 0;">Salt water may not allow plants to survive</p> <p style="margin: 5px 0 0 20px;">- May not have enough head to have gravity head retrofit</p> <p style="margin: 5px 0 0 20px;">- Consider leaving as dry pond</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input checked="" type="checkbox"/> Confirm drainage area	<input checked="" type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input checked="" type="checkbox"/> Confirm volume computations	<input checked="" type="checkbox"/> Confirm storm drain invert elevations		
<input checked="" type="checkbox"/> Complete concept sketch	<input checked="" type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em; margin: 0;">Consider proximity to runway</p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A2-1
Description: Dry Detention Basin South of Runway 26R
Ranking Number: 12 of 24
Overall Score: 66

Potential Retrofit

Name: Dry Detention Basin

Location: South of Runway 26R

Size: 60,000 square feet with 6 foot depth

Details: Flow splitter from storm drain 5833 will divert water to the detention basin to allow for evaporation. Area may be filled with vegetation to assist in removing contaminants and decreasing evaporation time periods.

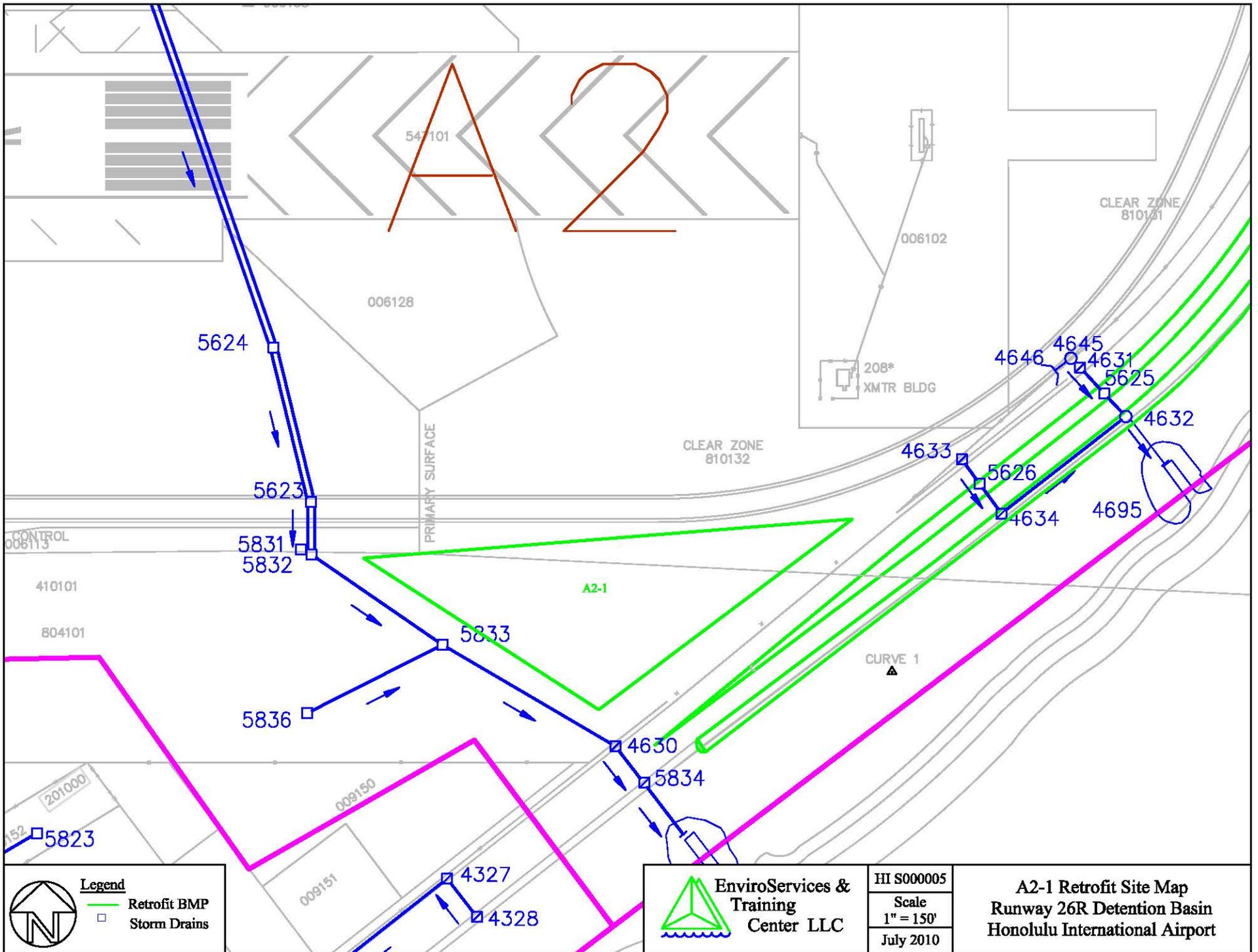
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005
Scale
1" = 150'
July 2010

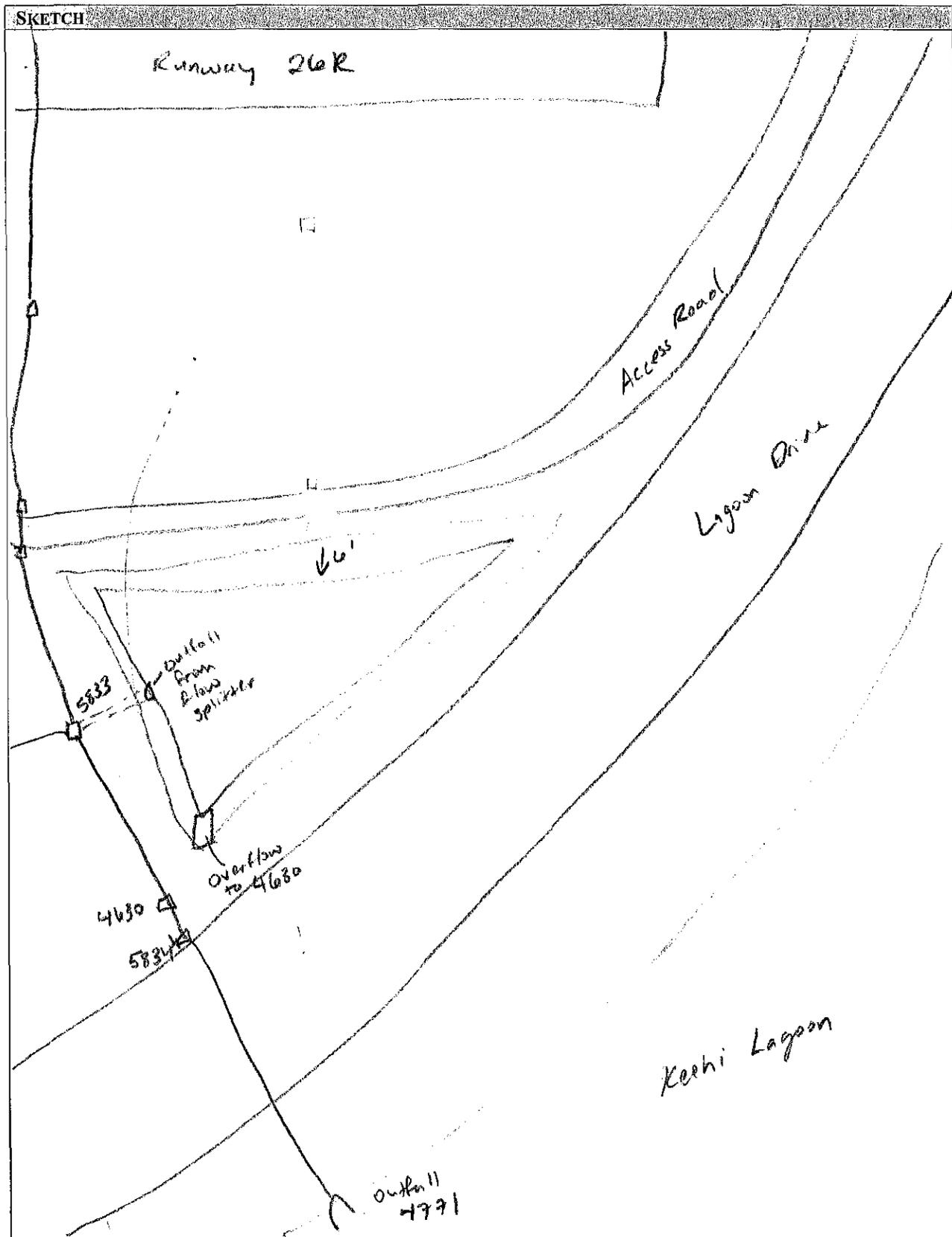
**A2-1 Retrofit Site Map
Runway 26R Detention Basin
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: <i>July 19, 2010</i>	INVESTIGATOR: <i>K. Davis C. Wassman</i>		
WATERSHED: <i>Keokuk</i>	BASIN: <i>A2</i>	SITE ID: <i>A2-1</i>	
SITE DESCRIPTION			
Name: <i>Outfall 4771</i>			
Address: <i>South of Runway 26R</i>			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input checked="" type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ <i>102.64 acres</i>	Drainage Area Land Use:		
Imperviousness ≈ <i>50</i> %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ <i>51.32</i>	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Possible
If Yes, Describe: <i>MS4 drains</i>			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: <i>Runoff from runways enters storm drains on either side of runways 26R and 22L. Remaining areas are gravel and weeds.</i>			
Existing Head Available and Points Where Measured: <i>5' at 5833</i>			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $W_{AV} = \left(\frac{1.2}{1.2}\right) (102.64) (0.5) = 43560$ $= 223,549.90 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (6) (60,000)$ $= 240,000 \text{ CF}$																																							
Proposed Treatment Options: <input checked="" type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-family: cursive;">Triangle shape dry detention basin with flow splitter off SD 5833. SA = 60,000 SF, Depth = 6' Overflow into SD 4630</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: <i>Proximity to Runway</i>	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																								



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em;">May require flow pump to divert water from current SID system</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input checked="" type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input checked="" type="checkbox"/> Other: <i>FAA Restrictions?</i>			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S)			

Retrofit Site ID: A2-2
Description: Bioretention on Lagoon Drive
Ranking Number: 1 of 24
Overall Score: 87

Potential Retrofit

Name: Bioretention on Lagoon Drive

Location: Lagoon Drive between Kalewa Street and Outfall 4771

Size: 41,000 square feet with a depth of 18 inches.

Details: Plant bioretention areas in the median and northside of Lagoon Drive.

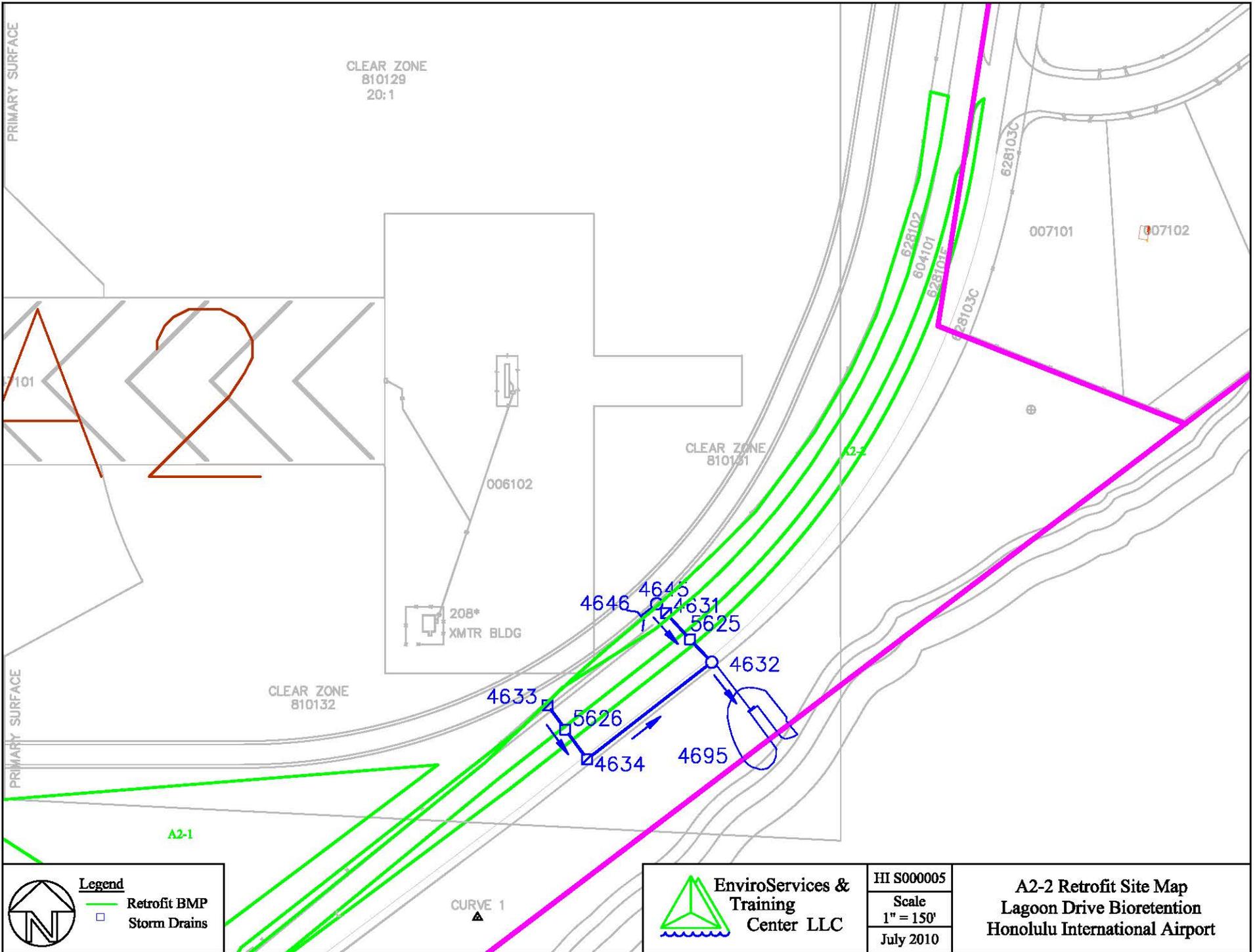
Aerial Picture

*From Bing Maps



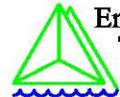
Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005

Scale
1" = 150'
July 2010

**A2-2 Retrofit Site Map
Lagoon Drive Bioretention
Honolulu International Airport**

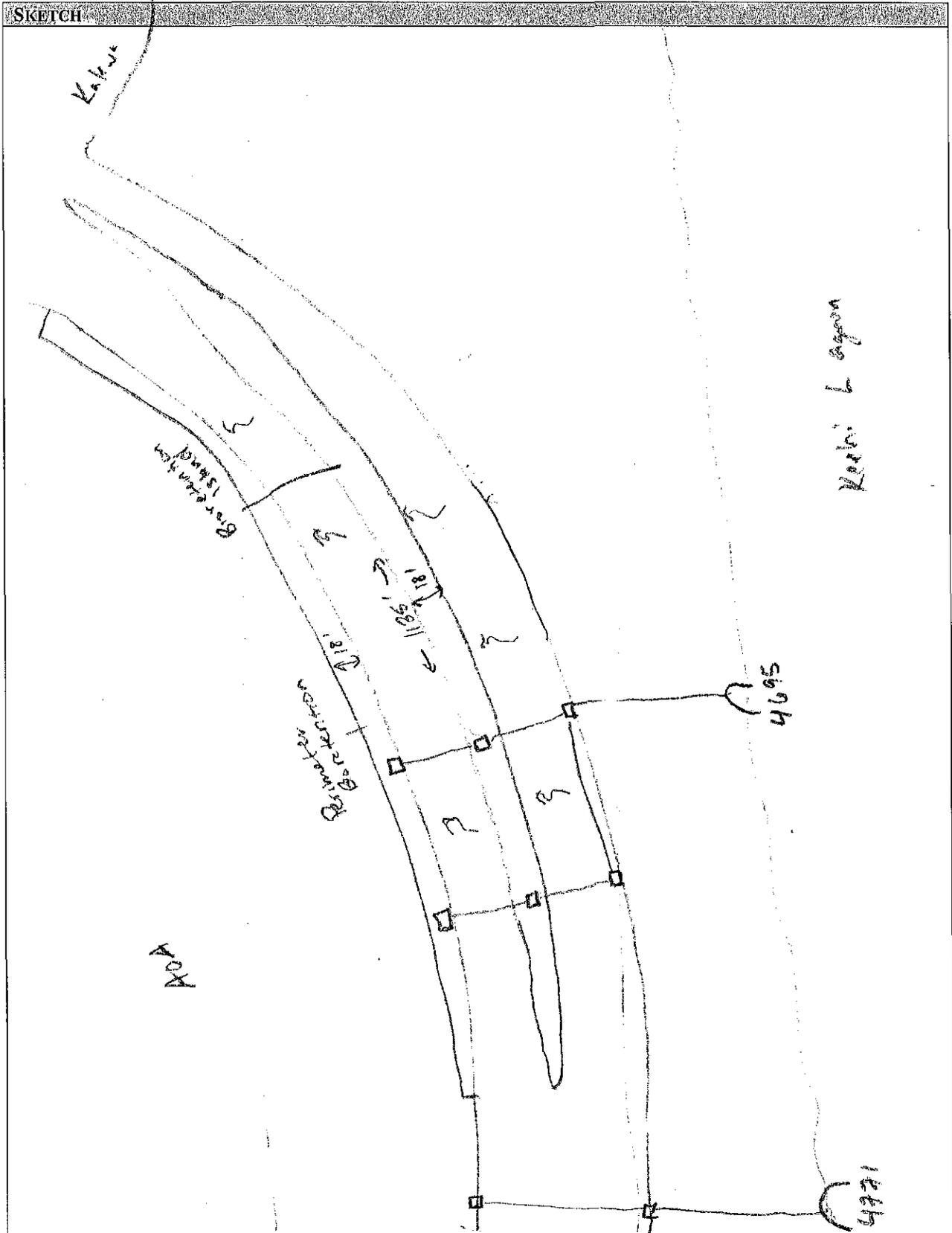
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Keehi	BASIN: A2	SITE ID: A2-2	
SITE DESCRIPTION			
Name: Lagoon Drive in Basin A2			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input checked="" type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 102.64 acres		Drainage Area Land Use:	
Imperviousness ≈ 50 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 51.32		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes: Assuming 2/3 SW goes to SD and transmittion only covers 1/2 of that 17 acres (drainage area)		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: Existing landscaping in median. MS4 drains.			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Landscaped median and grassy area south of Lagoon Dr.			
Existing Head Available and Points Where Measured: Not measured			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_T = \frac{1.2}{12} (117) (0.5) (43560)$ $= 37,026 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (41,000) (1.6)$ $= 43,733 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-family: cursive;">Bioretention in median and south side of road between Kalkwa Street and Outfall 4771. SA ≈ 41,000 SF, D ≈ 18 inches, Conveyance = sheet flow</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input checked="" type="checkbox"/> Other: <u>Road Use</u>																																							
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	Potential Permitting Factors: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%;">Probable</th> <th style="width: 15%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>		Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other factors:		
Yes	Possible																																							
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Area over 1 acre	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																						
Other factors:																																								
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																								

Retrofit Reconnaissance Investigation (RRI)



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-family: cursive;">Consider tidal influence and use plants that can withstand salt water.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL REASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A3-1
Description: Building 223
Ranking Number: 22 of 24
Overall Score: 40

Potential Retrofit

Name: Planter for Bldg 223 Roof Runoff

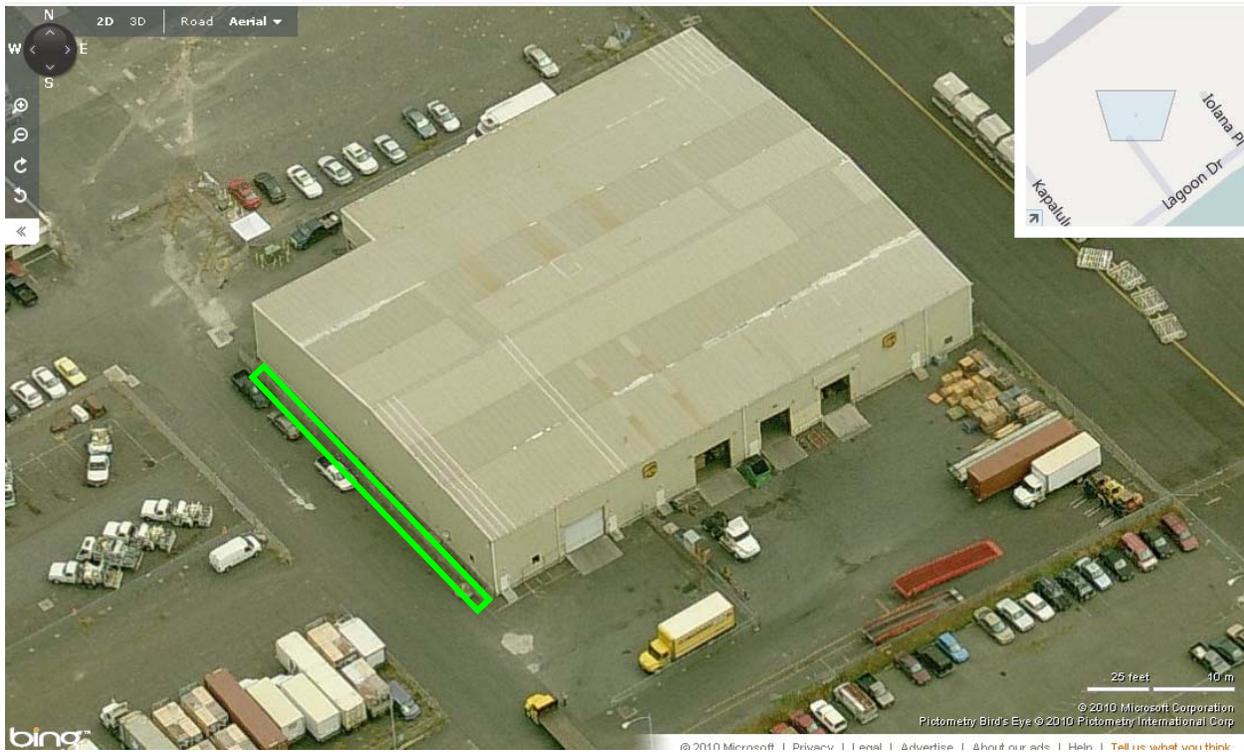
Location: 119 Kaulele Place

Size: 800 square feet with a depth of 3 feet.

Details: Redirect half of the building's roof downspouts to a planter.

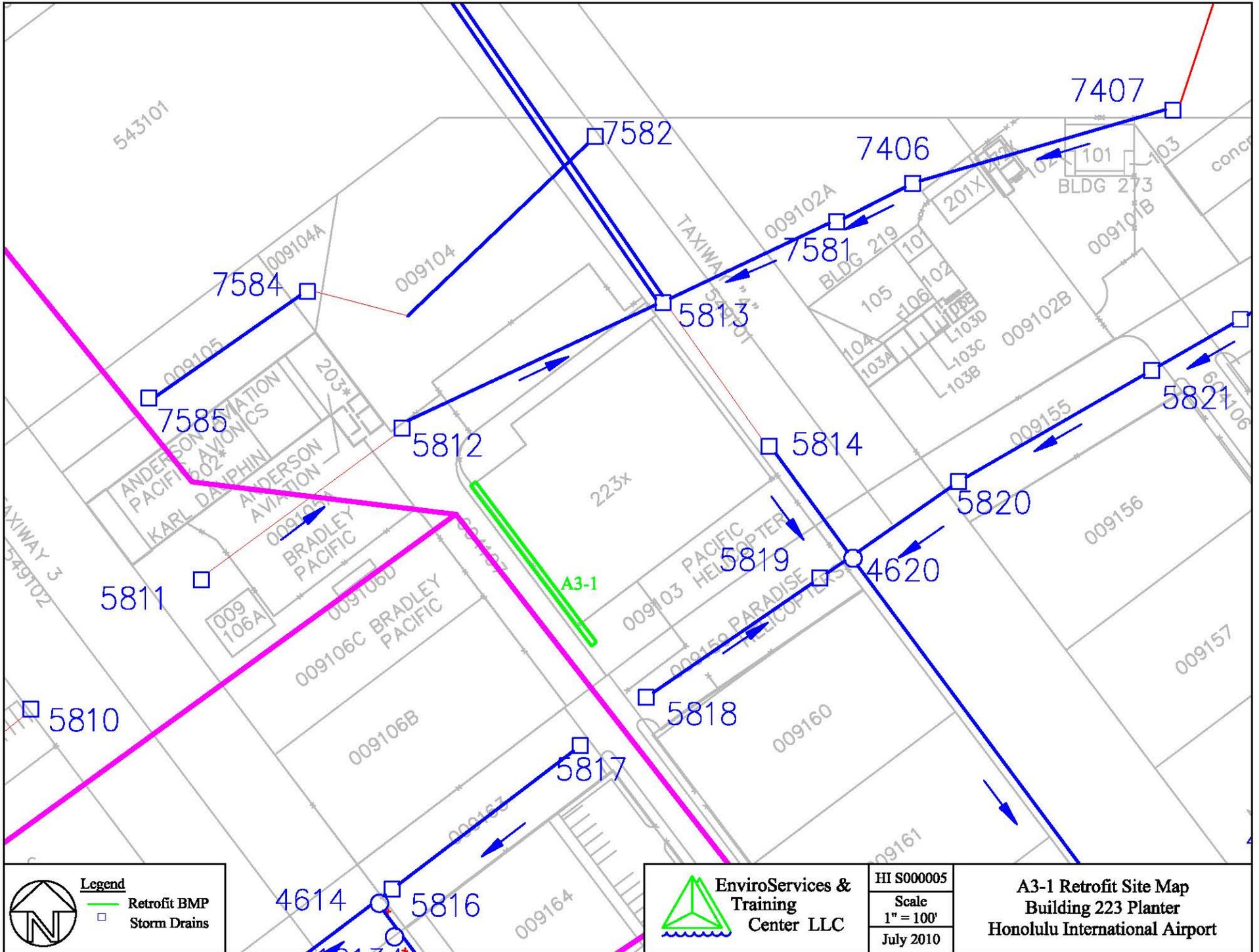
Aerial Picture

*From Bing Maps



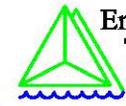
Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



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HI S000005
Scale
1" = 100'
July 2010

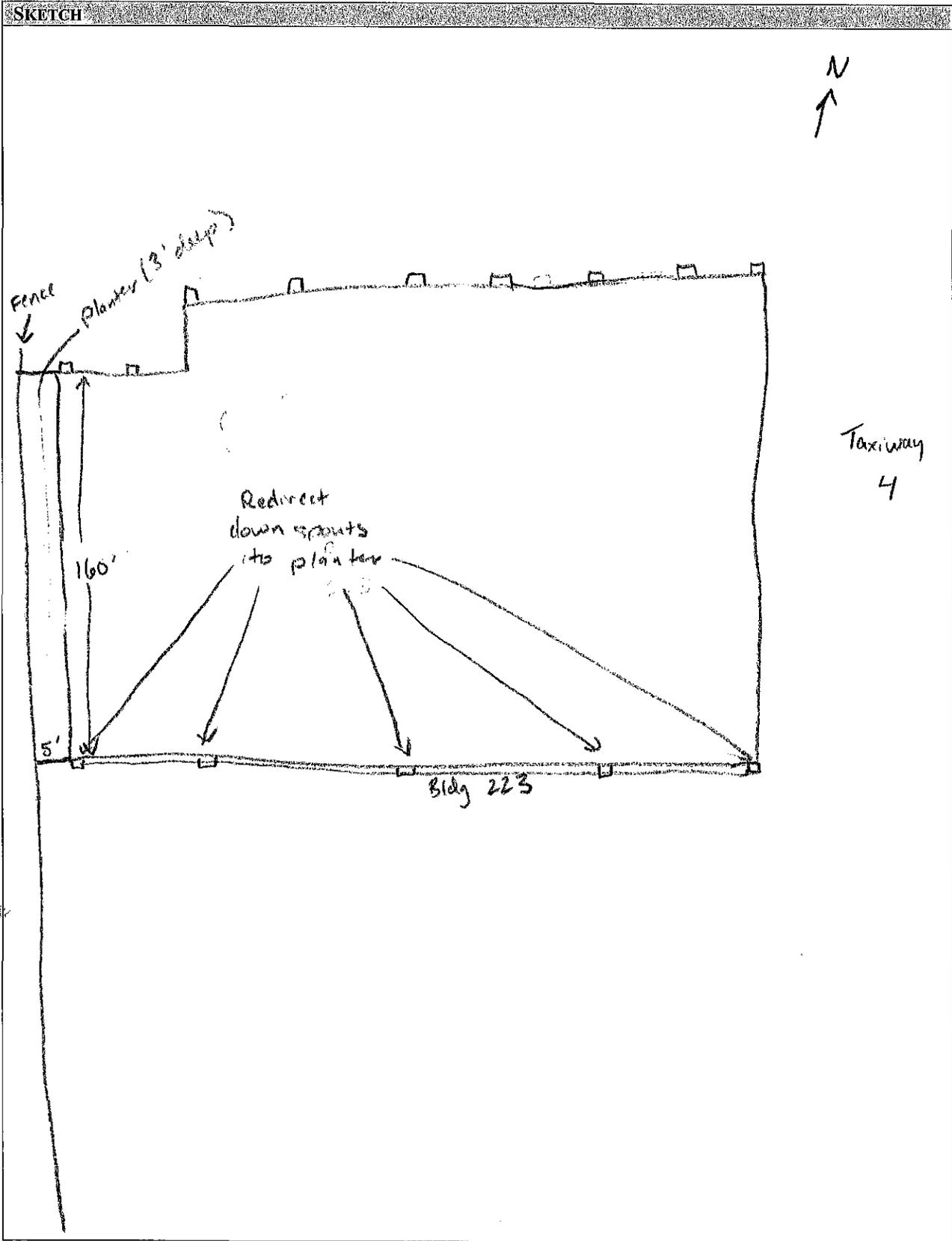
**A3-1 Retrofit Site Map
Building 223 Planter
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010	INVESTIGATOR: K. Davis, C. Wassman		
WATERSHED: Keen:	BASIN: A3	SITE ID: A3-1	
SITE DESCRIPTION			
Name: Bldg 223			
Address: 119 Kaula Pl Honolulu HI 96819			
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 34085 SF		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 34085 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Building built 1982 = 34085 SF per DPP			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \left(\frac{1.2}{12}\right) (0.78) (0.95) (435600)$ $= 3238 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (3) (5 \times 160)$ $= 1600 \text{ CF}$ <p><i>* Half of the area needed - only to direct half of downspouts.</i></p>																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="text-align: center;"><i>SA = 800 SF, Depth = 3', Conveyance = Half of current downspouts.</i></p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Yes	Possible																																							
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Know the
Photo

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A4-1
Description: Nakolo Place Parking Lot
Ranking Number: 16 of 24
Overall Score: 59

Potential Retrofit

Name: Nakolo Place Parking Lot Bioretention

Location: The end of Nakolo Place

Size: 413 square feet with a depth of 18 inches.

Details: Three bioretention islands between parking rows.

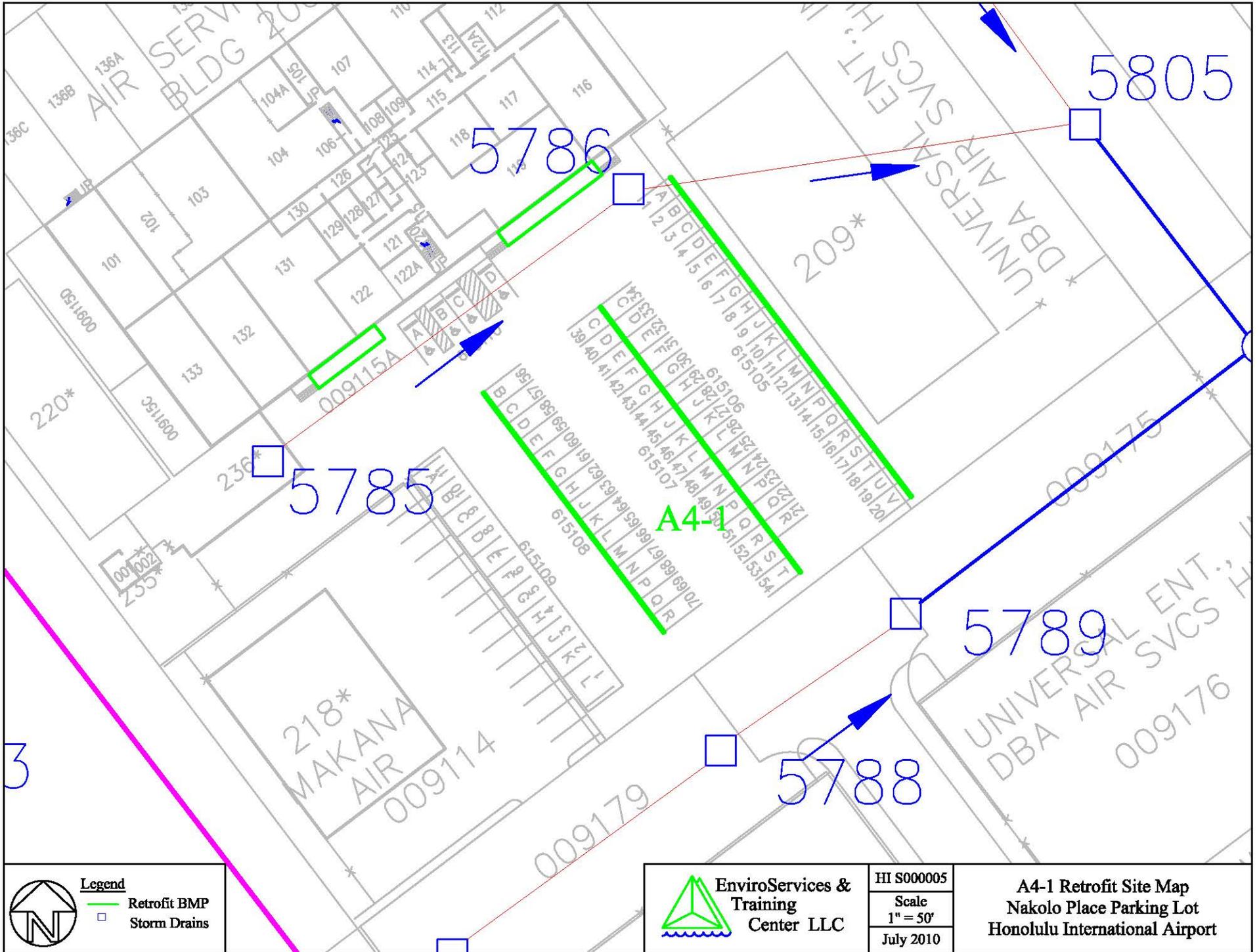
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- ▬ Retrofit BMP
- Storm Drains



EnviroServices & Training Center LLC

HI S000005

Scale
1" = 50'
July 2010

**A4-1 Retrofit Site Map
Nakolo Place Parking Lot
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010		INVESTIGATOR: K. Davis, C. Wassman	
WATERSHED: Manunwai		BASIN: A4	SITE ID: A4-1
SITE DESCRIPTION			
Name: Bldg 206 Parking Lot			
Address: Nakolo Place			
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 32300 SF		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 32800 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: 2 storm drains to MS4			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Sheet flow to either drains north of parking lot or to two drains south of parking lot			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \left(\frac{1.2}{12}\right) (0.74) (0.95) \cdot 43560$ $= 3068.5 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (1.6) [(120' \times 1') + (133' \times 1') + (160' \times 1')]$ $= 440.5 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em; margin-left: 40px;">SA = 413 SF, Depth = 18 inches, Conveyance = Sheet Flow</p> <p style="margin-left: 40px;">3 Bioretention islands between parking rows.</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: <i>Air Service Hawaii Parking Lot</i>	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p>May require regrading of parking lot to bio retention islands.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A4-2
Description: Building 206 Rooftop
Ranking Number: 23 of 24
Overall Score: 40

Potential Retrofit

Name: Planter for Building 206 Rooftop

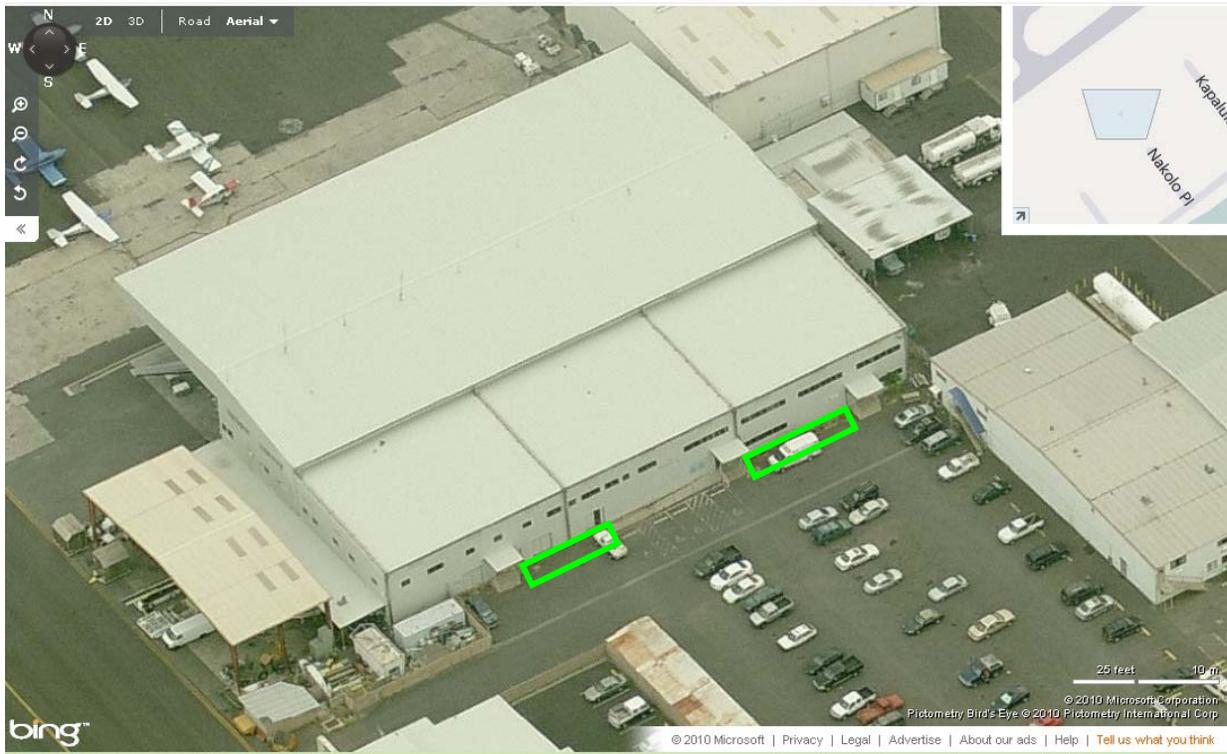
Location: 90 Nakolo Place

Size: 546.96 square feet with a depth of 3 feet.

Details: Redirect lower southern portion of the building's downspouts to planters.

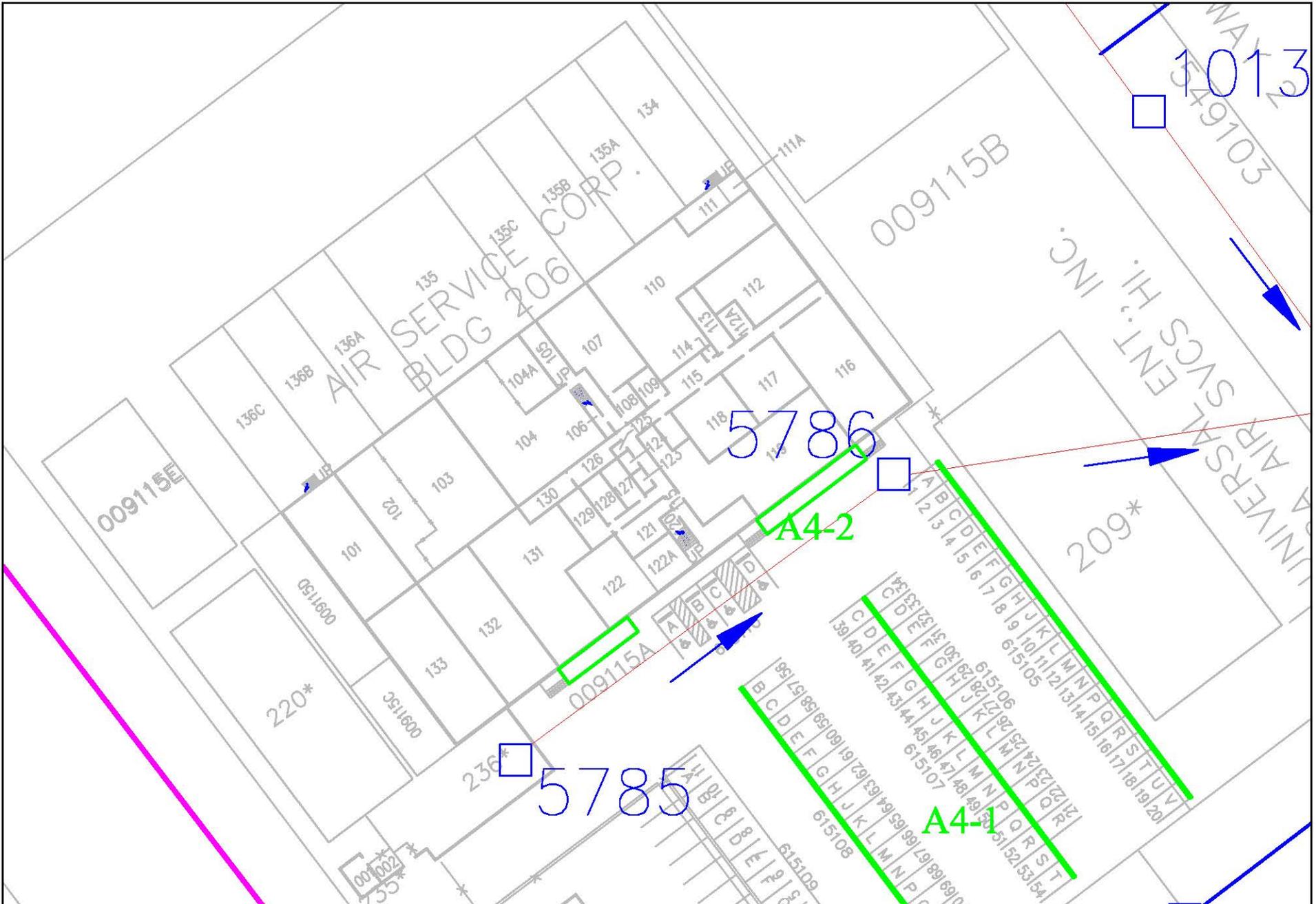
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

-  Retrofit BMP
-  Storm Drains

 **EnviroServices & Training Center LLC**

HI S000005
 Scale
 1" = 50'
 July 2010

A4-2 Retrofit Site Map
Building 206 Rooftop
Honolulu International Airport

Retrofit Reconnaissance Investigation (RRI)

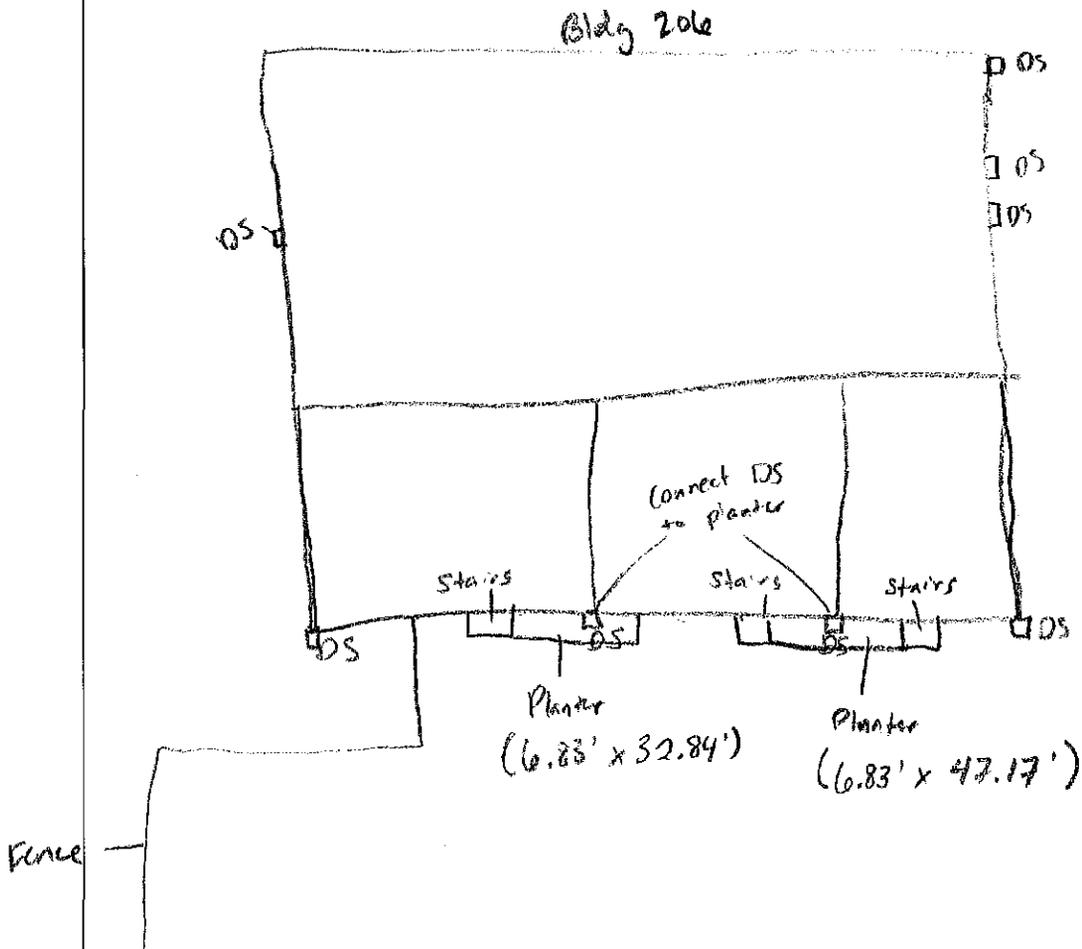
DATE: 19 July 2010		INVESTIGATOR: K. Davis C. Wassman	
WATERSHED: Manuwaia		BASIN: A4	SITE ID: A4-2
SITE DESCRIPTION			
Name: Building 206 Roof top			
Address: 90 Nakolo Place			
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 41,328 SF		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 41,328 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Bldg built in 1971 with 41,328 SF area * Bldg too old for green roof			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \left(\frac{1.2}{12}\right) (0.95) (0.95) \cdot 43560$ $= 3926.16 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{Av} = \frac{2}{3} (3') (322.31 + 224.65)$ $= 1093.92$ <p style="text-align: center;">* $\frac{1}{3}$ of Roof Area</p>																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em;">SA = 546.96 SF, Depth = 3', Conveyance = $\frac{1}{3}$ of bldg down spouts</p> <p style="font-size: 1.2em;">2 Planters on south side of bldg</p>																																								
SITE CONSTRAINTS																																								
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Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em; margin: 0;"><i>Ensure sufficient space for handicap ramp.</i></p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A9-3
Description: Lagoon Drive Parking Lot
Ranking Number: 17 of 24
Overall Score: 59

Potential Retrofit

Name: Lagoon Drive Parking Lot Bioretention and Permeable Pavers

Location: End of Lagoon Drive

Size: 13205.36 square feet with a depth of 2.5 feet for the permeable pavers and 9285.23 square feet with a depth of 18 inches for the bioretention.

Details: Install bioretention island between parking rows and redirect storm water to the island as well as the northern border of the parking lot. The driving area of the parking lot will be fitted with permeable pavers.

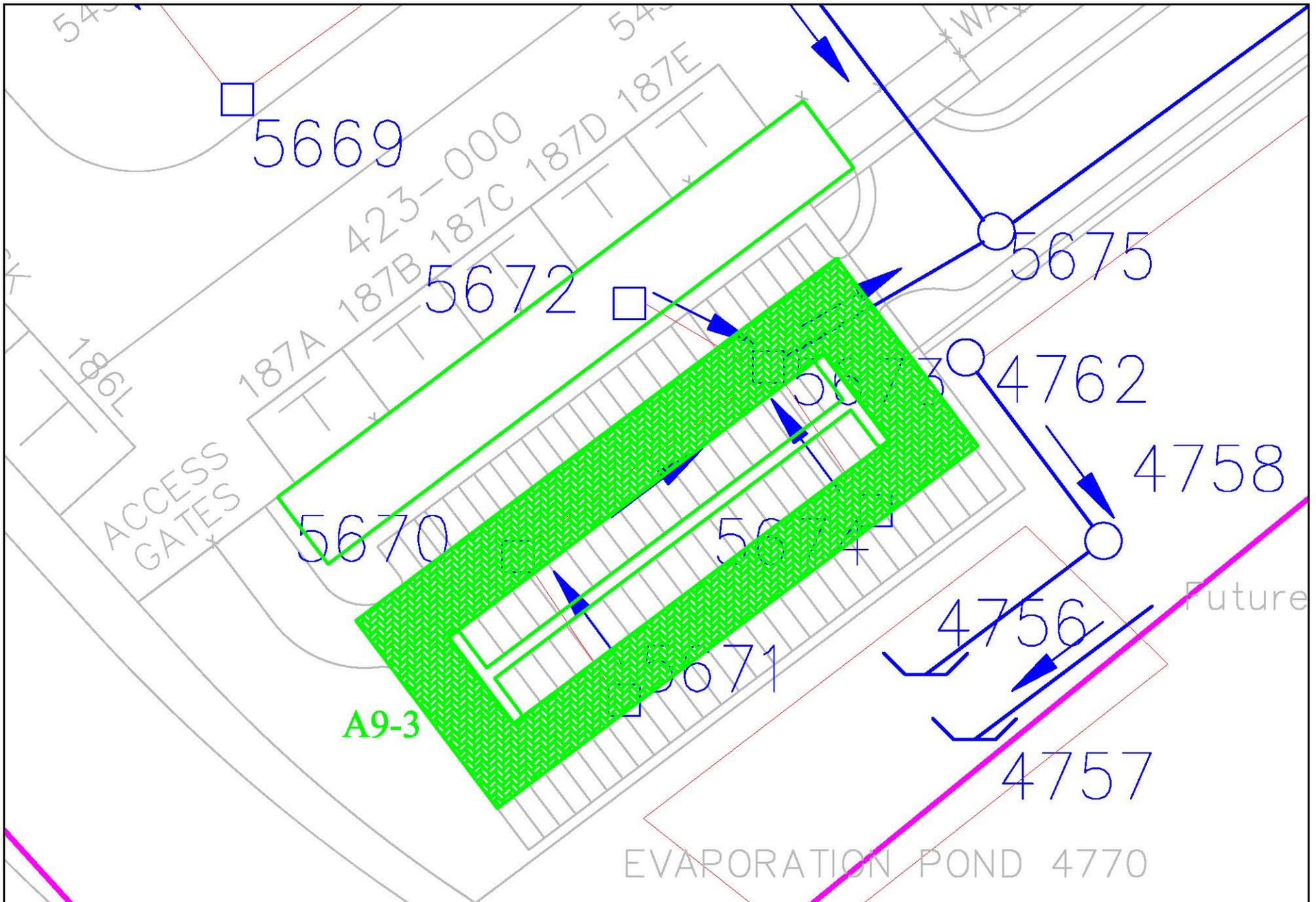
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

-  Retrofit BMP
-  Storm Drains

 **EnviroServices & Training Center LLC**

HI S000005
 Scale
 1" = 50'
 July 2010

A9-3 Retrofit Site Map
Lagoon Drive Parking Lot
Honolulu International Airport

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010		INVESTIGATOR: K. Davis, C. Wassman	
WATERSHED: Manuawai		BASIN: A9	SITE ID: A9-3
SITE DESCRIPTION			
Name: Lagoon Drive Parking Lot			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 0.7		Drainage Area Land Use:	
Imperviousness ≈ 100 %			
Impervious Area ≈ 0.7			
Notes:		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Public
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: MS4 storm drains			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Graded toward 4 storm drains in the center			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \left(\frac{1.2}{12}\right) (0.7) (0.95)$ $= 2896.74 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (0.5) (13205.26) +$ $\frac{2}{3} (1.6) (9285.23)$ $= 31,913 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input checked="" type="checkbox"/> Other: <i>Pavers</i>																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: Permeable Pavers SA = 13205.36 SF, Depth 2.5' Bioretention SA = 8019.48 + 1265.75 = 9285.23 SF, Depth 18" * May need to regrade to direct sheet flow to island + perimeter bioretention.																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Area over 1 acre	<input type="checkbox"/>	<input type="checkbox"/>																																						
Other factors:		<input type="checkbox"/>																																						
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																								

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input checked="" type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: A10-1
Description: Outfall 4105
Ranking Number: 11 of 24
Overall Score: 66

Potential Retrofit

Name: Bioretention at Outfall 4105

Location: Near ARFF 2

Size: 6562 square feet with a depth of 18 inches.

Details: Install a flow splitter in the channel draining Outfall 4105 and divert water a rain garden located to the north on the corner of Lagoon Drive and the Access Road to ARFF 2. Install signs and benches for public education.

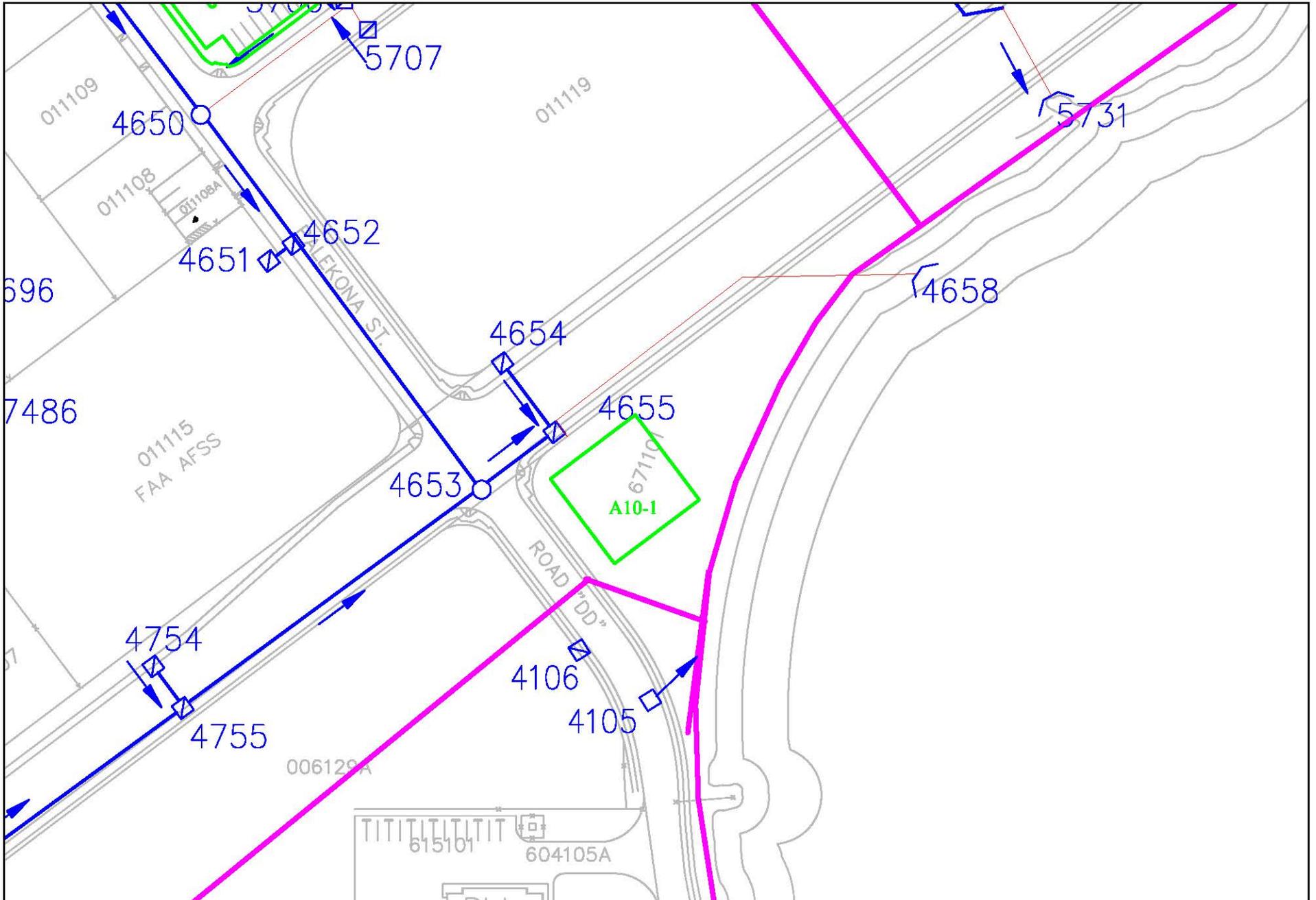
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains

4036



**EnviroServices &
Training
Center LLC**

HI S000005

Scale
1" = 100'
July 2010

**A10-1 Retrofit Site Map
Outfall 4105
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

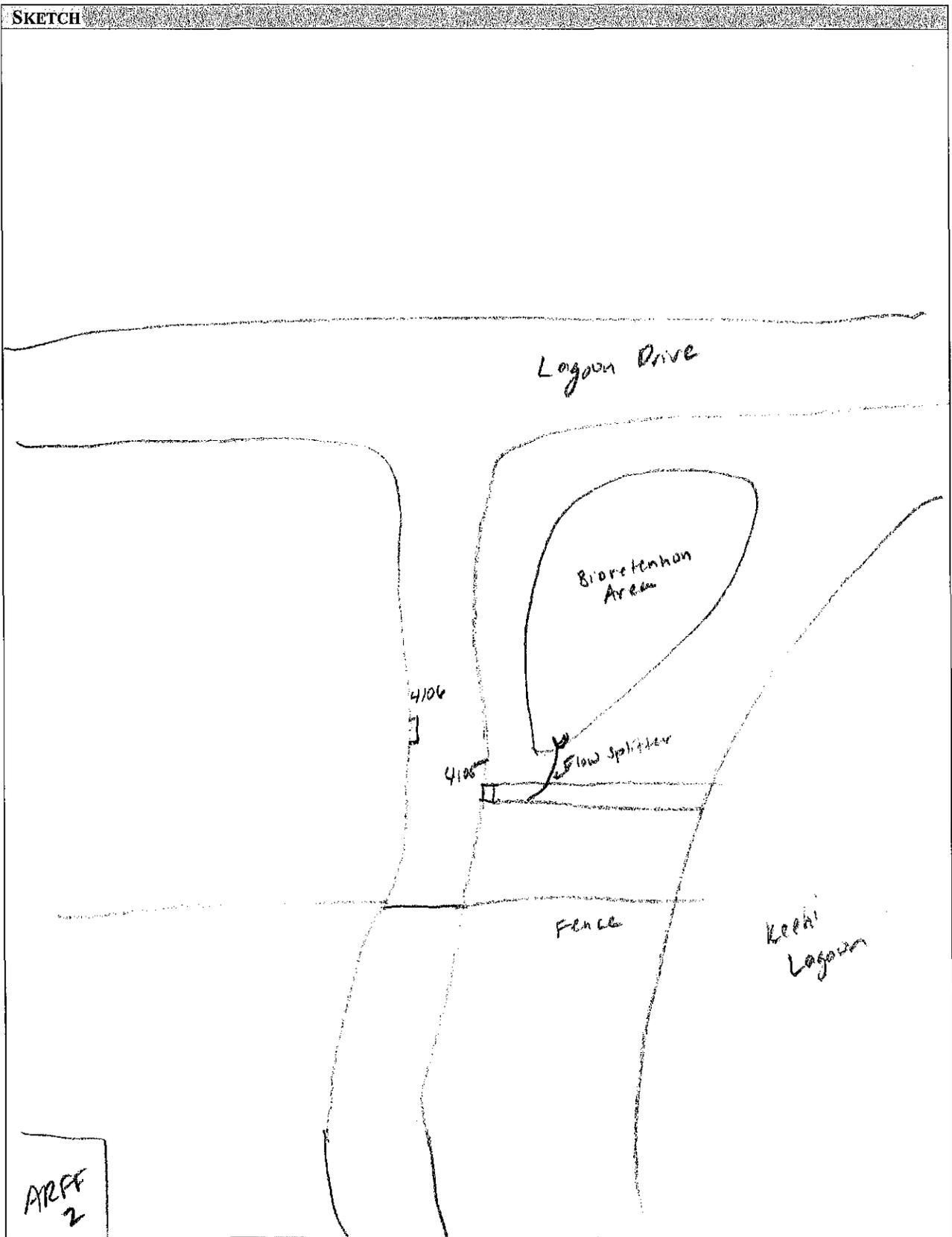
DATE: 19 July 2010	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manawai	BASIN: A10	SITE ID: A10-1	
SITE DESCRIPTION			
Name: Outfall 4105			
Address: ARFF 2 Access Road			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input checked="" type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 123153 SF	Drainage Area Land Use:		
Imperviousness ≈ 50 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 61576.5 SF	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes: ARFF 2 Area Only	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Fire Station	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: Small MS4 Channel			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Sheet flow through curb cut 4105 over stone channel to Keeki Lagoon			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																							
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																							
Retrofit Volume Computations – Target Storage: $V_t = \left(\frac{1.2}{12}\right) (2.82) (0.5) 43560$ $= 6157.65 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (1.6) 6562$ $= 7000 \text{ CF}$																																						
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																							
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: SA = 6562 , Depth = 18 inches Conveyance = gravity through a channel to bioretention * Good chance for public education along with Lagoon Drive Parking lot and development of area into park.																																							
SITE CONSTRAINTS																																							
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																						
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	Potential Permitting Factors: Probable Not Probable <table style="width: 100%; border-collapse: collapse;"> <tbody> <tr> <td style="width: 70%;">Impacts to Wetlands</td> <td style="width: 15%; text-align: center;"><input type="checkbox"/></td> <td style="width: 15%; text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>			Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
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Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																					
Other factors:																																							
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																							

Retrofit Reconnaissance Investigation (RRI)

SKETCH



ARFF
2

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES		
<p>Construct in association with A9-3 and Lagoon Drive Park to enhance public education.</p> <p>Consider plants tolerant to salt water due to close proximity</p>		
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT		
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts	
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts	
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography	
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping	
<input type="checkbox"/> Confirm volume computations	<input checked="" type="checkbox"/> Confirm storm drain invert elevations	
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types	
<input type="checkbox"/> Other:		
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS		
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO
IF YES, TYPE(S):	<input type="checkbox"/> MAYBE	<input type="checkbox"/> MAYBE

Retrofit Site ID: B10-3
Description: Ewa Concourse Rooftop
Ranking Number: 3 of 24
Overall Score: 79

Potential Retrofit

Name: Ewa Concourse Rooftop

Location: Ewa Concourse

Size: 7 acres with a depth of 6 inches.

Details: Green Roof

Aerial Picture

*From Modernization Plan



Attached

- RRI Form

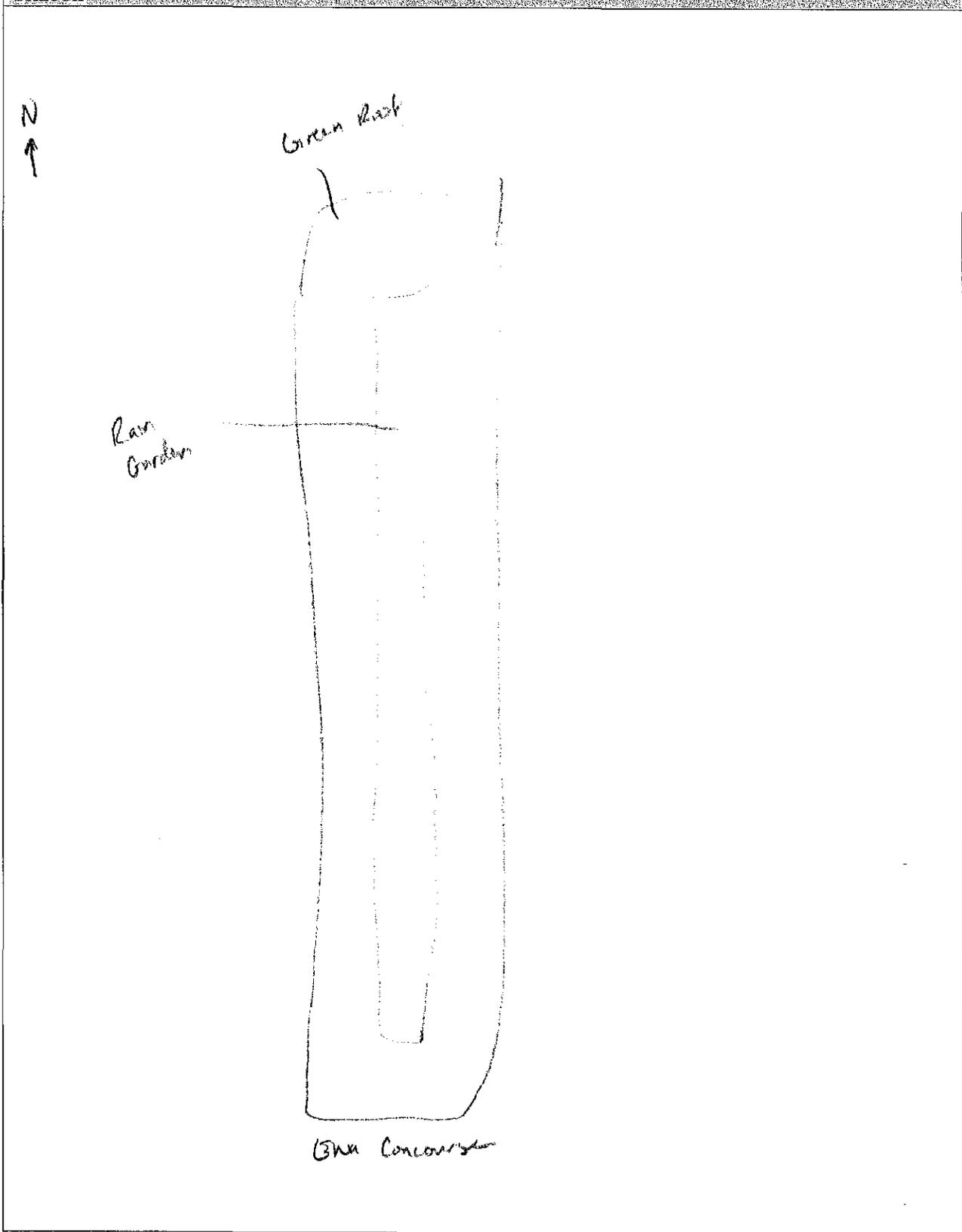
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 2010	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manuwaia	BASIN: B10	SITE ID: B10-3	
SITE DESCRIPTION			
Name: Ewa Concourse Rooftop			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 7 ac	Drainage Area Land Use:		
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 7 ac	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Down spouts to storm drains			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT			
Purpose of Retrofit:			
<input checked="" type="checkbox"/> Water Quality	<input type="checkbox"/> Recharge	<input type="checkbox"/> Channel Protection	<input type="checkbox"/> Flood Control
<input type="checkbox"/> Demonstration / Education	<input type="checkbox"/> Repair	<input type="checkbox"/> Other:	
Retrofit Volume Computations – Target Storage:		Retrofit Volume Computations – Available Storage:	
$V_T = \frac{1.2}{12} (0.95)(7) (48560)$ $= 28,967 \text{ CF}$		$V_{AV} = \frac{2}{3} (0.5)(7)$ $V_{AV} = 101,640 \text{ CF}$	
Proposed Treatment Options:			
<input type="checkbox"/> Extended Detention	<input type="checkbox"/> Dry Pond	<input type="checkbox"/> Created Wetland	<input checked="" type="checkbox"/> Bioretention
<input type="checkbox"/> Filtering Practice	<input type="checkbox"/> Infiltration	<input type="checkbox"/> Swale	<input type="checkbox"/> Other:
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance:			
<p>Green Roof SA = 7 acres, depth 6 inches</p> <p>Disconnect downspouts to rain garden in center of Concourse.</p>			
SITE CONSTRAINTS			
Adjacent Land Use:		Access:	
<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	<input type="checkbox"/> No Constraints	
<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	Constrained due to:	
<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	<input type="checkbox"/> Slope	<input type="checkbox"/> Space
<input type="checkbox"/> Residential	<input type="checkbox"/> Other:	<input type="checkbox"/> Utilities	<input type="checkbox"/> Tree Impacts
Possible Conflicts Due to Adjacent Land Use?		<input checked="" type="checkbox"/> Structures	<input type="checkbox"/> Tenant Activities
<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	<input checked="" type="checkbox"/> Airport Operations	<input type="checkbox"/> Other:
If Yes, Describe:			
Conflicts with Existing Utilities:		Potential Permitting Factors:	
<input type="checkbox"/> None			
<input checked="" type="checkbox"/> Unknown			
Yes	Possible		
<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Wetlands	<input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<input type="checkbox"/>	<input type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<input type="checkbox"/>	<input type="checkbox"/>	Dewatering	<input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<input type="checkbox"/>	<input type="checkbox"/>	Area over 1 acre	<input type="checkbox"/> Probable <input checked="" type="checkbox"/> Not Probable
<input type="checkbox"/>	<input type="checkbox"/>	Other factors:	
Soils:			
Soil auger test holes:		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Evidence of poor infiltration (clays, fines):		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Evidence of shallow bedrock:		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
Evidence of high water table (gleying, saturation):		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No

SKETCH



* Based on Modernization Plan Renderings

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-family: cursive;">Cisterns is an alternative option if green roof is not feasible due to birds or structural concerns</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input checked="" type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: B11-1
Description: New Hawaiian Air Hangar
Ranking Number: 13 of 24
Overall Score: 65

Potential Retrofit

Name: New Hawaiian Air Hangar

Location: Elliot Street

Size: 30782 square feet with a depth of 6 inches.

Details: Green Roof

Aerial Picture

*From Modernization Plan Rendering



Attached

- RRI Form

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010	INVESTIGATOR: K. Davis C. Weissman		
WATERSHED: Manuawai	BASIN: B11	SITE ID: B11-1	
SITE DESCRIPTION			
Name: New Hawaiian Air Hangar			
Address: Off Elliot Street			
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ UNK		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ UNK		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes: Assume similar to current hangar 30,782 SF		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Paved area - small MS4 drains to Manuawai Canal			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.95) 30782$ $= 2924.29 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (0.5) (30782)$ $V_{AV} = 10260.66 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em; margin-left: 40px;">Green roof SA = 30782 SF, depth = 6 inches</p>																																								
SITE CONSTRAINTS																																								
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<input type="checkbox"/>	<input type="checkbox"/>	Water																																						
<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines																																						
<input type="checkbox"/>	<input type="checkbox"/>	Electric																																						
<input type="checkbox"/>	<input type="checkbox"/>	Other:																																						
	Probable	Not Probable																																						
Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																						
Other factors:																																								
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																								

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input checked="" type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Reconnaissance Investigation (RRI)

SKETCH

* Building designs not yet developed

Retrofit Site ID: B13-2
Description: Interisland Terminal
Ranking Number: 5 of 24
Overall Score: 73

Potential Retrofit

Name: Interisland Terminal

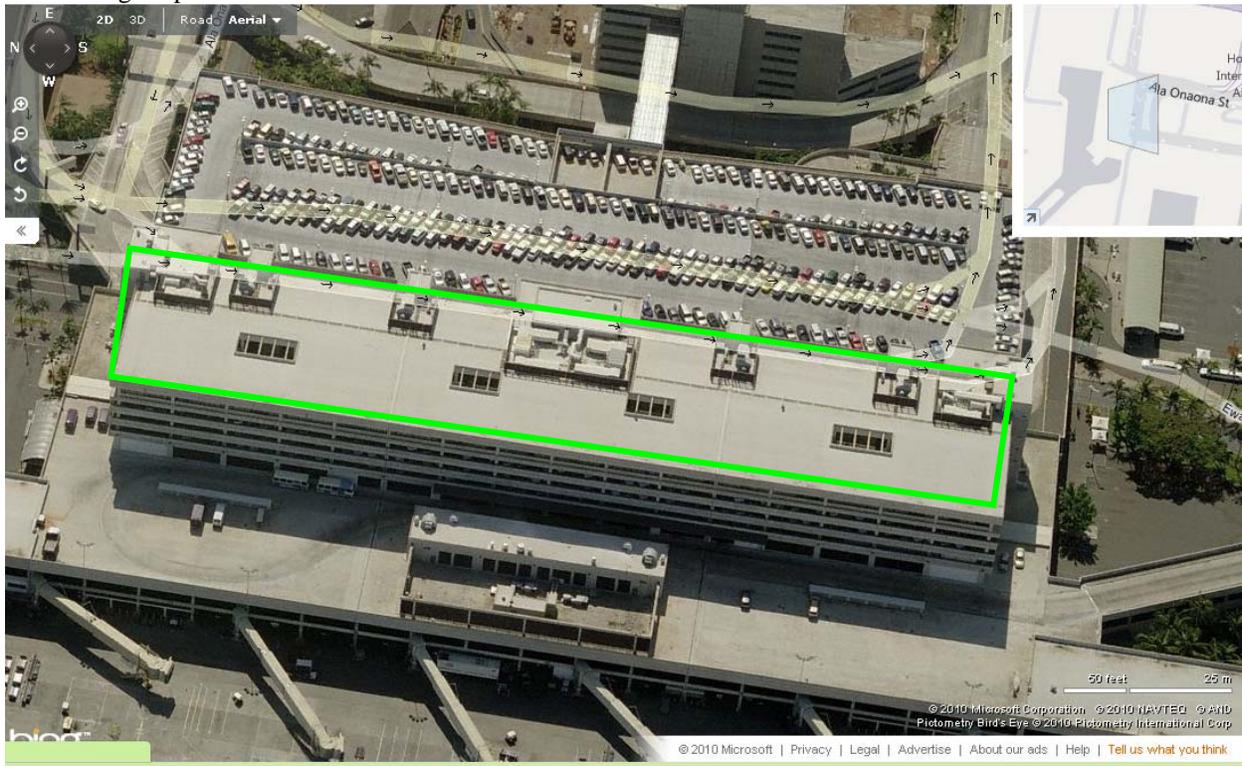
Location: Rodgers Boulevard

Size: 62584 square feet with a depth of 2.5 feet.

Details: Green Roof

Aerial Picture

*From Bing Maps



Attached

- RRI Form

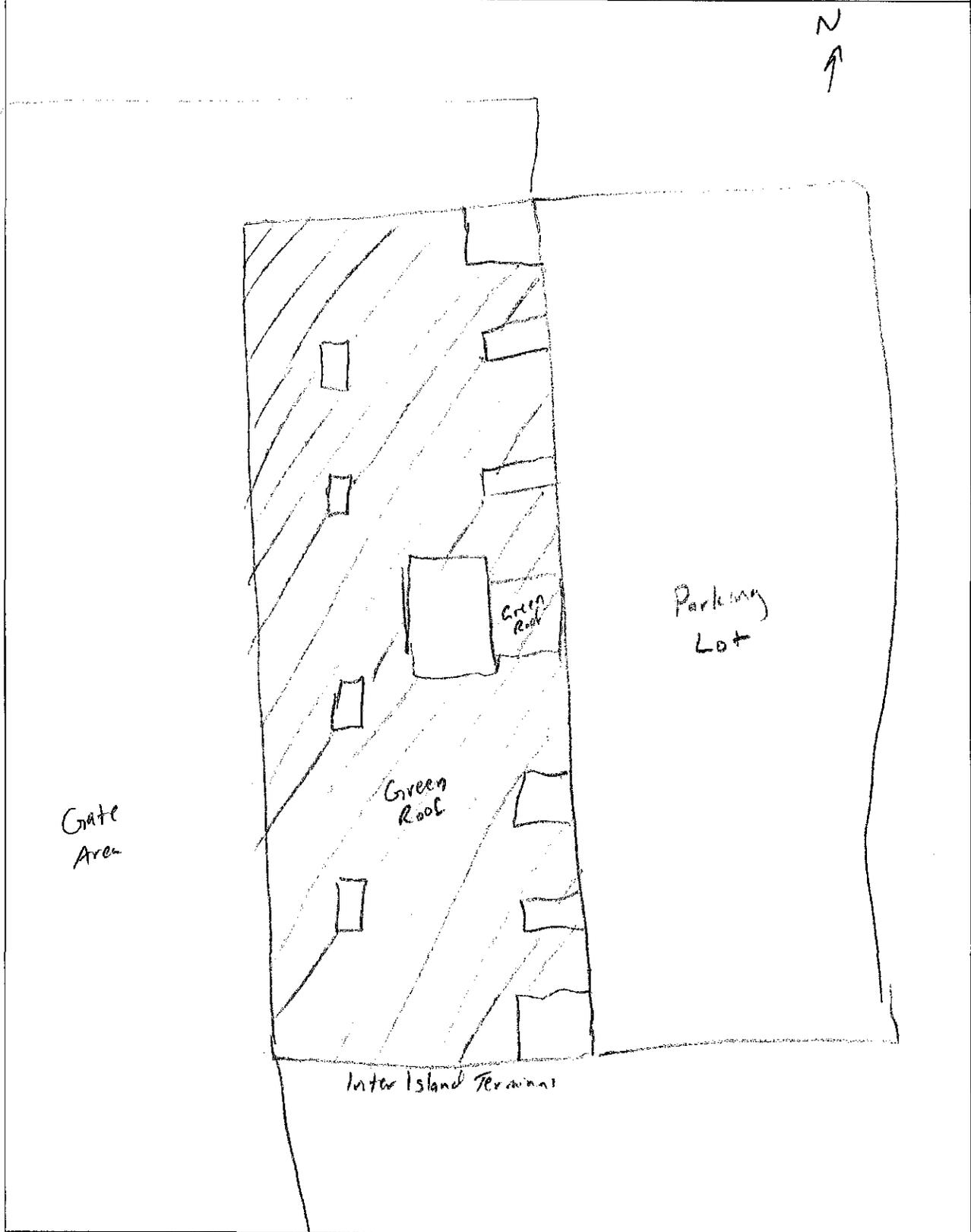
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 2010	INVESTIGATOR: K. Davis, C. Wassman		
WATERSHED: Manuwaia	BASIN: B13	SITE ID: B13-2	
SITE DESCRIPTION			
Name: Inter Island Terminal			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area \approx 590' x 130' = 76700 SF		Drainage Area Land Use:	
Imperviousness \approx 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area \approx 76700 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes		<input type="checkbox"/> No	<input type="checkbox"/> Possible
If Yes, Describe: Downspouts			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Roof is flat and storm water flows to downspouts and eventually to storm drains.			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.95) (76700)$ $= 7286.5 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_A = \frac{2}{3} (2.5') (62584)$ $= 104,306.66 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: $SA = 76700 - \overset{\text{Utilities}}{[78 \times 44 + (32 \times 22) \times 4 + (5.2 \times 48) \times 2 + (21 \times 38) \times 2 + (20 \times 32) \times 2]} = 62584 \text{ SF}$ $D = 2.5'$																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input checked="" type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input checked="" type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
Conflicts with Existing Utilities: <input checked="" type="checkbox"/> None <input type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	Potential Permitting Factors: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%;">Probable</th> <th style="width: 15%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>		Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
Yes	Possible																																							
<input type="checkbox"/>	<input type="checkbox"/>	Sewer																																						
<input type="checkbox"/>	<input type="checkbox"/>	Water																																						
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Other factors:																																								
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																								

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em;">Consider whether structure can support the weight of a green roof. Cisterns may be an alternative.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input checked="" type="checkbox"/> Other: Determine structural support			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: B15-1
Description: New Elliot Street Parking
Ranking Number: 6 of 24
Overall Score: 73

Potential Retrofit

Name: New Elliot Street Parking

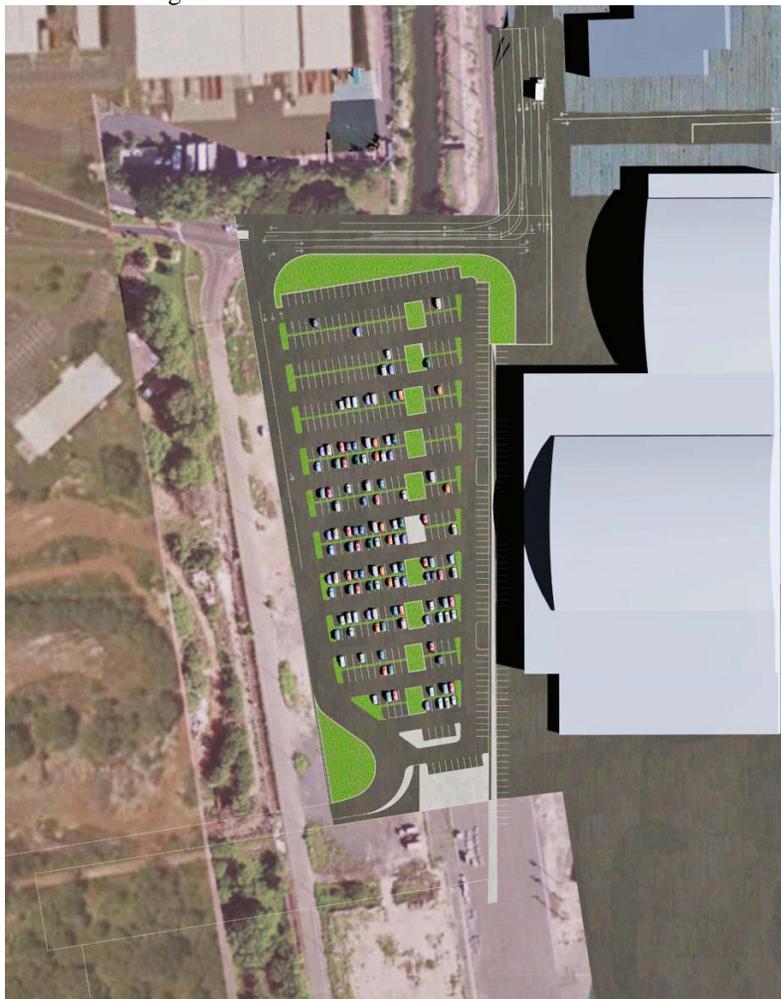
Location: Elliot Street

Size: 18,000 square feet with a depth of 18 inches.

Details: 10 bioretention islands between parking areas.

Aerial Picture

*From Modernization Plan Rendering



Attached

- RRI Form

Retrofit Reconnaissance Investigation (RRI)

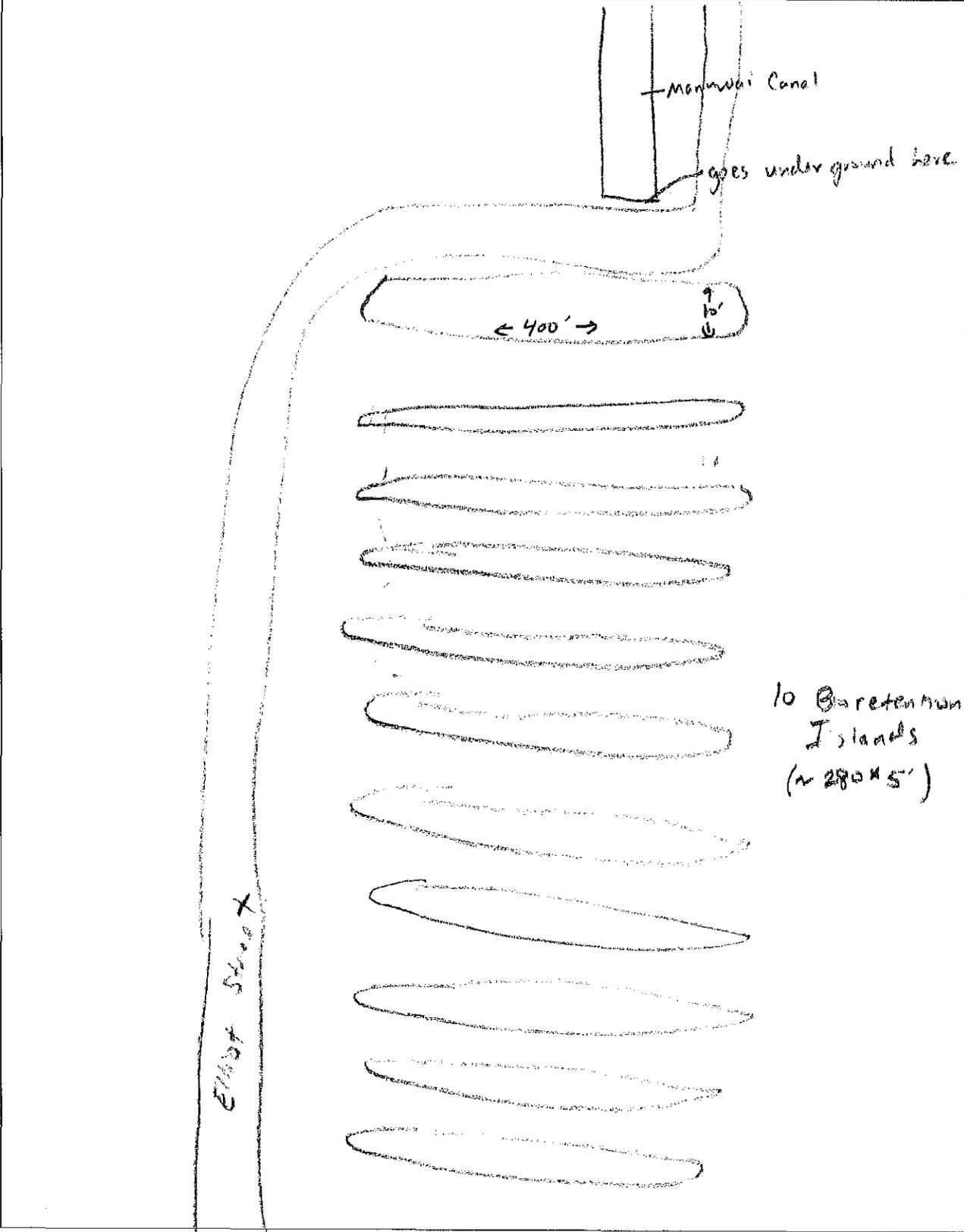
DATE: 19 Jul 2010	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manuawai	BASIN: B15	SITE ID: B15-1	
SITE DESCRIPTION			
Name: New Elliot Street Parking			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area $\approx 860 \times 400 = 344,000$		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area $\approx 344,000$		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes: Estimated based on current modernization plans		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: Small MS4 storm drains			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Currently parking lot is not developed. Storm water sheet flows to nearest MS4 storm drain.			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.95) (344000)$ $= 32680 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_A = \frac{2}{3} (1.6') (18000)$ $= 19200 \text{ CF}$ <p><i>* Concept only treats half of SW</i></p>																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p>Bioretention islands between parking rows and perimeter bioretention to north. Approximately 10 bioretention islands.</p> $SA = (280 \times 5) \times 10 + (400 \times 10) = 18,000 \text{ SF}$ <p>D = 18 inches Conveyance = sheet + flow</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: <i>Proximity to Hickam</i>	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Yes	Possible																																							
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Other factors:																																								
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Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input checked="" type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input checked="" type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input checked="" type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input checked="" type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input checked="" type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: B6-1
Description: Canal South of Runway 4L
Ranking Number: 18 of 24
Overall Score: 59

Potential Retrofit

Name: Canal South of Runway 4L

Location: In the AOA between Runway 4L and Hickam Air Force Base

Size: 30,000 square feet with a depth of 5 feet.

Details: Stabilize the current canal by reducing slope angle to 2:1. Expand storage at the canal bend by adding a 21,500 square foot pool. Add vegetation to entire area.

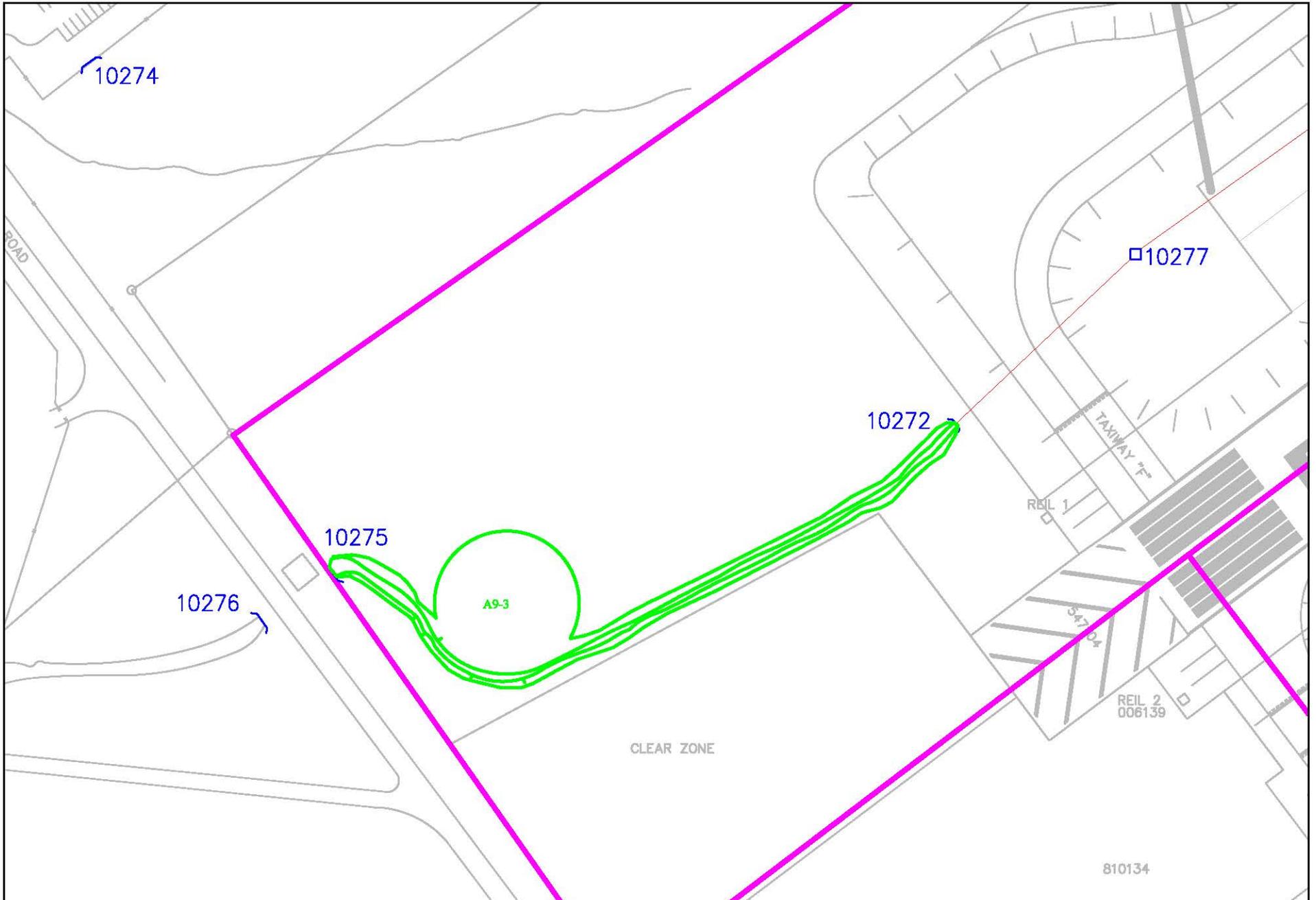
Aerial Picture

*From Bing Maps



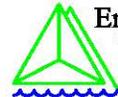
Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005

Scale
1" = 150'
July 2010

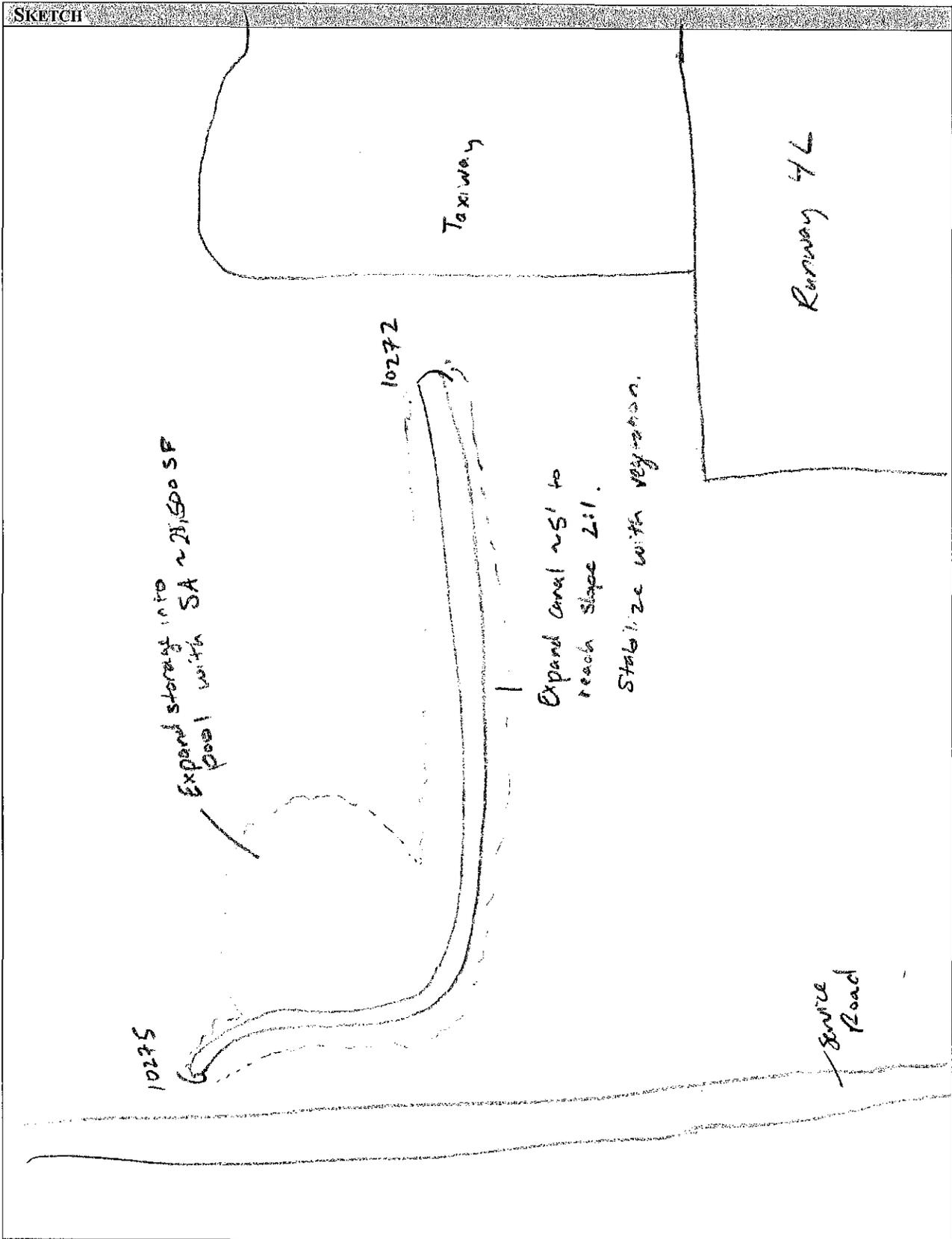
**B6-1 Retrofit Site Map
Canal South of Runway 4L
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manuwai	BASIN: B6	SITE ID: B6-1	
SITE DESCRIPTION			
Name: Unnamed Canal at the end of Runway 4L			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input checked="" type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 45.90	Drainage Area Land Use:		
Imperviousness ≈ 50 %	<input type="checkbox"/> Industrial	<input checked="" type="checkbox"/> Federal / Military	
Impervious Area ≈ 22.95	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice:	<input checked="" type="checkbox"/> Yes	<input type="checkbox"/> No	<input type="checkbox"/> Possible
If Yes, Describe: Canal to Hickam which discharges to Manuwai			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Canal acts more as a detention basin due to height of outfalls. (~5' above water level) Canal depth gets deeper toward western end (~10'). Evidence of erosion noted. Current SA = 5975.54 SF			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input checked="" type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.5) (45.90) (43560)$ $= 99970.2 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = 2/3 (5) (39000)$ $= 100000 \text{ CF}$ <p><i>* Based on after area after regrading</i></p>																																							
Proposed Treatment Options: <input checked="" type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input checked="" type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em; margin-left: 20px;">Change canal walls to a slope no greater than 2:1 Expand storage at canal bend. Stabilize area with vetiver grass or similar.</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input checked="" type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input checked="" type="checkbox"/> Confirm volume computations	<input checked="" type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: B9-1
Description: Central Concourse
Ranking Number: 7 of 24
Overall Score: 72

Potential Retrofit

Name: Central Concourse

Location: Central Concourse

Size: 61,050 square feet with a depth of 2.5 feet.

Details: Green Roof

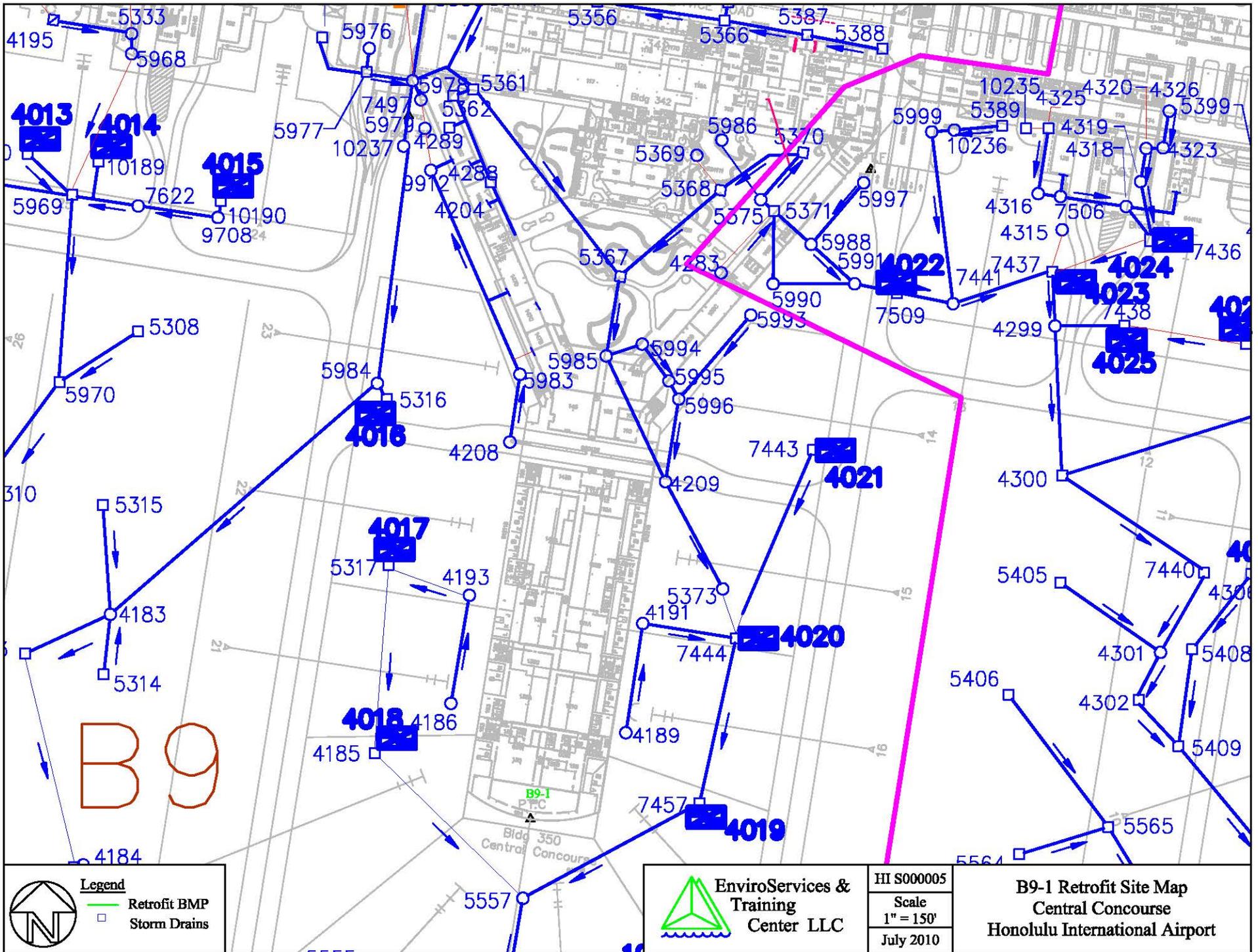
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005

Scale
1" = 150'
July 2010

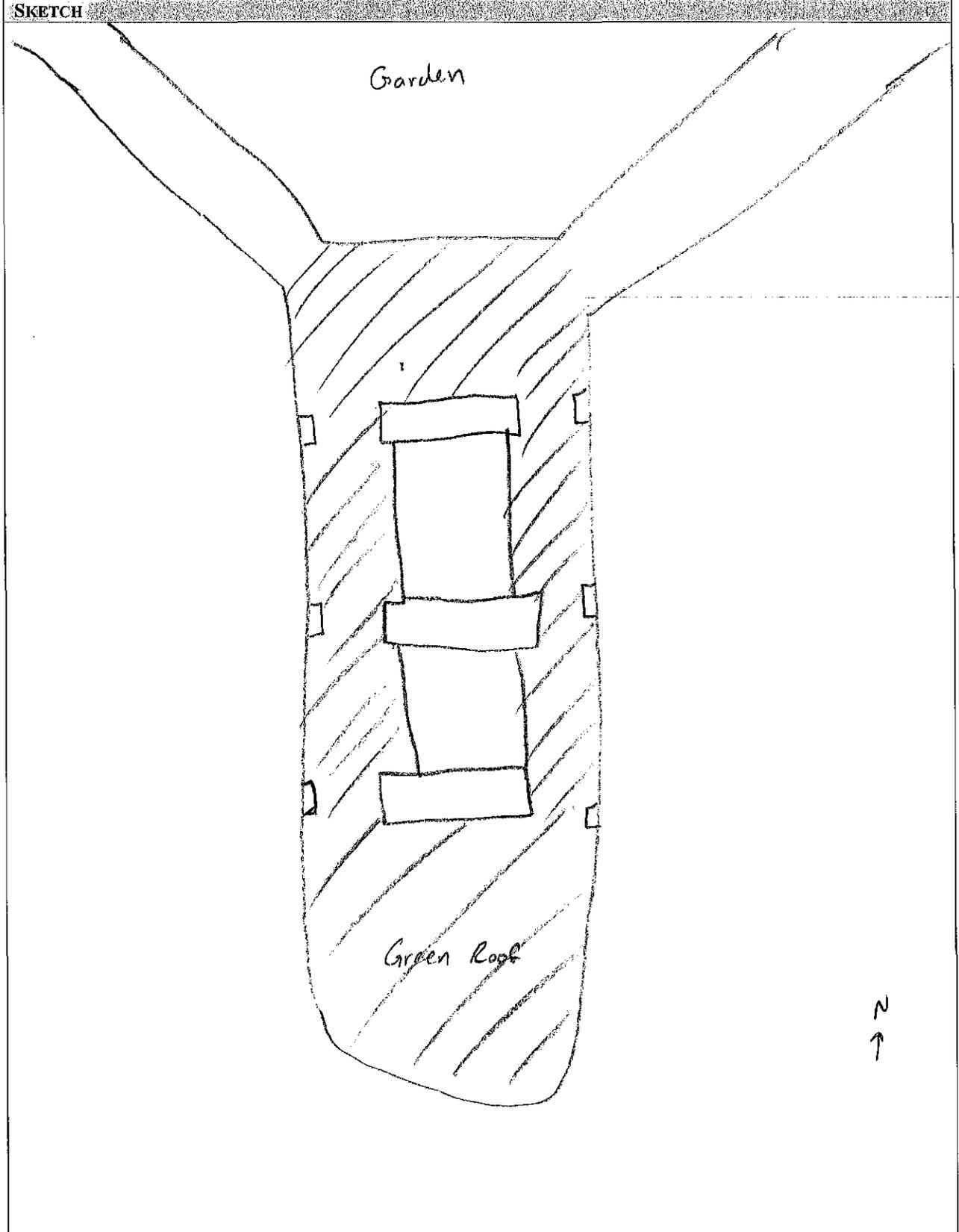
**B9-1 Retrofit Site Map
Central Concourse
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manuawai	BASIN: B9	SITE ID: B9-1	
SITE DESCRIPTION			
Name: Central Concourse			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area $\approx 540 \times 155 = 83700$ SF		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 83700 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Downspouts to MS4			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																										
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																										
Retrofit Volume Computations – Target Storage: $V_T = \frac{1.2}{12} (0.95) (83700)$ $= 7951.5 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{1}{3} (2.5) (61050)$ $= 1101750 \text{ CF}$																																									
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																										
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: $SA = 83700 - (10 \times 20) \times 6 - (65 \times 330) = 61050$ $D = 2.5$																																										
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Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-family: cursive;">Consider whether bldg can support green roof weight. Disconnect down spouts and direct toward garden area.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D1-1
Description: New Mauka Concourse
Ranking Number: 8 of 24
Overall Score: 72

Potential Retrofit

Name: New Mauka Concourse

Location: Near current Commuter Terminal

Size: 150,000 square feet with a depth of 2.5 feet.

Details: Green Roof

Aerial Picture

*From Modernization Plan Rendering



Attached

- RRI Form

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010	INVESTIGATOR: K. Davis C. Wausman		
WATERSHED: Manuwai	BASIN: D1	SITE ID: D1-1	
SITE DESCRIPTION			
Name: New Manka Concourse			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area $\approx 500 \times 300 = 150,000$		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area $\approx 150,000$		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Not built yet, a part of the modernization plan.			
Existing Head Available and Points Where Measured:			
N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																										
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																										
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Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																										
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="text-align: center; font-family: cursive; font-size: 1.2em; margin-top: 10px;"> Green roof on new main concourse </div>																																										
SITE CONSTRAINTS																																										
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Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																										

SKETCH



Munitz Hwy

Taxiway 5

New Manka Terminal

Green Roof

Inter Island Terminal

Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p>- Follow-up on inclusion in modernization plan</p> <p>- Way to get on roof and maintain green roof</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input checked="" type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input checked="" type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input checked="" type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input checked="" type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D10-1
Description: Access “A” Canal
Ranking Number: 20 of 24
Overall Score: 45.5

Potential Retrofit

Name: Access “A” Canal
Location: Near the AOA Access “A”
Size: 6245 square feet with a depth of 10 feet.
Details: Green Roof

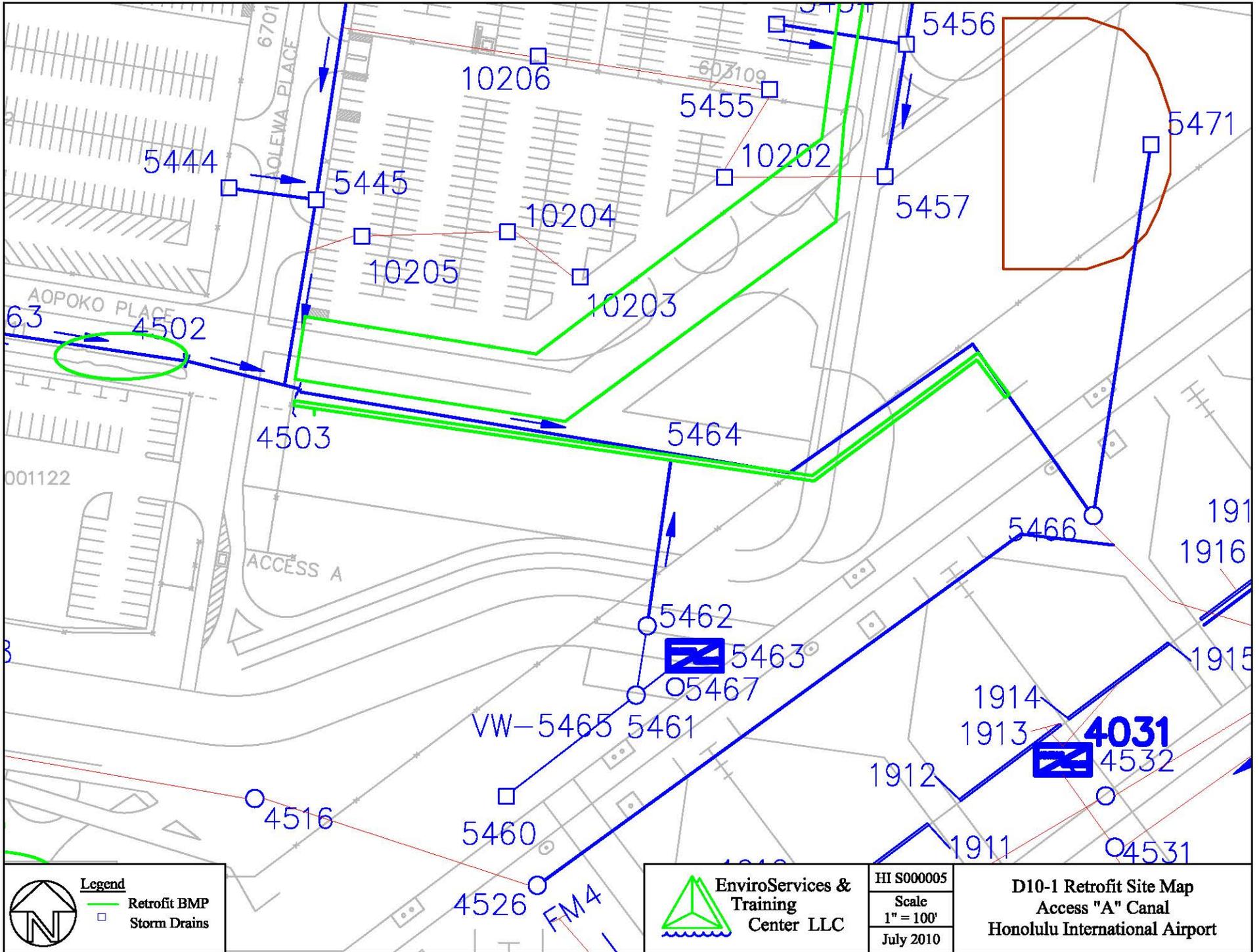
Aerial Picture

*From Modernization Plan Rendering



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



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Center LLC**

HI S000005

Scale
1" = 100'
July 2010

**D10-1 Retrofit Site Map
Access "A" Canal
Honolulu International Airport**

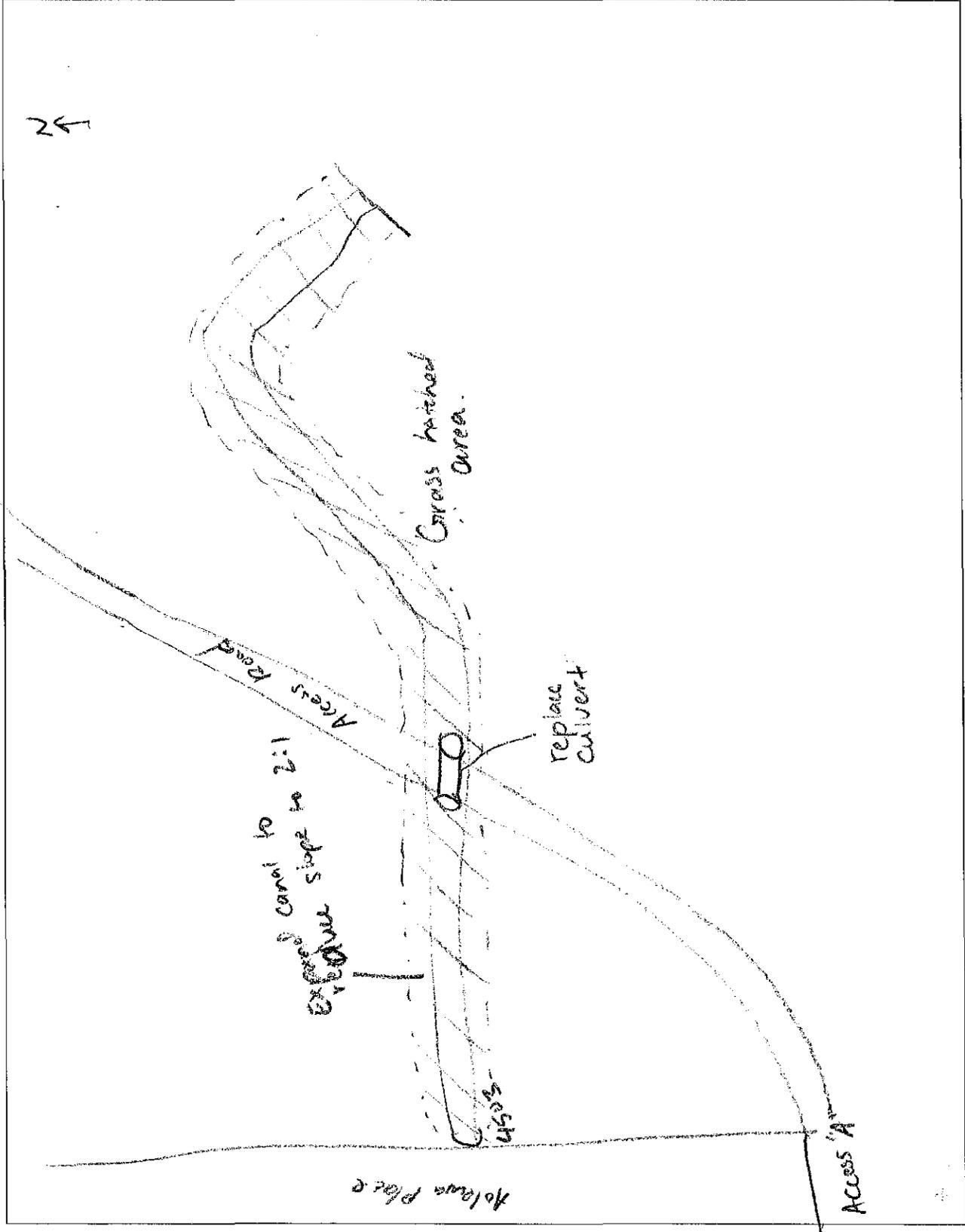
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Weissman		
WATERSHED: Keehi	BASIN: D10	SITE ID: D10-1	
SITE DESCRIPTION			
Name: Access "A" Canal			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input checked="" type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 41 ac	Drainage Area Land Use:		
Imperviousness ≈ 90 %	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 36.9 ac	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: MS4 storm drains to canal Flows through DWS prior to reaching Keehi Lagoon.			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Channel shows signs of erosion. Particularly near bridge area.			
Existing Head Available and Points Where Measured: ~ 10' at bridge			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																										
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input checked="" type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input checked="" type="checkbox"/> Repair <input type="checkbox"/> Other:																																										
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.86) (41 \text{ ac})$ $V_t = 153,592 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (10) (6245)$ $1141,636 \text{ CF}$																																									
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input checked="" type="checkbox"/> Swale <input type="checkbox"/> Other:																																										
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-family: cursive;">Redesign canal from 4503 to 5466 as a grassed swale. Reduce slope to 2:1, stabilize bridge using concrete culvert grass entire area. Current SA = 2500 SF, New SA = 6245 SF</p>																																										
SITE CONSTRAINTS																																										
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																									
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Potential Permitting Factors:</th> <th style="width: 20%;">Probable</th> <th style="width: 20%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>			Potential Permitting Factors:	Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Area over 1 acre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other factors:		
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SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em;">Consider developing a treatment pool by access road culvert. Would only need to place culvert higher than water level.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D10-4
Description: Parking Lot G Bioretention
Ranking Number: 19 of 24
Overall Score: 58

Potential Retrofit

Name: Parking Lot G

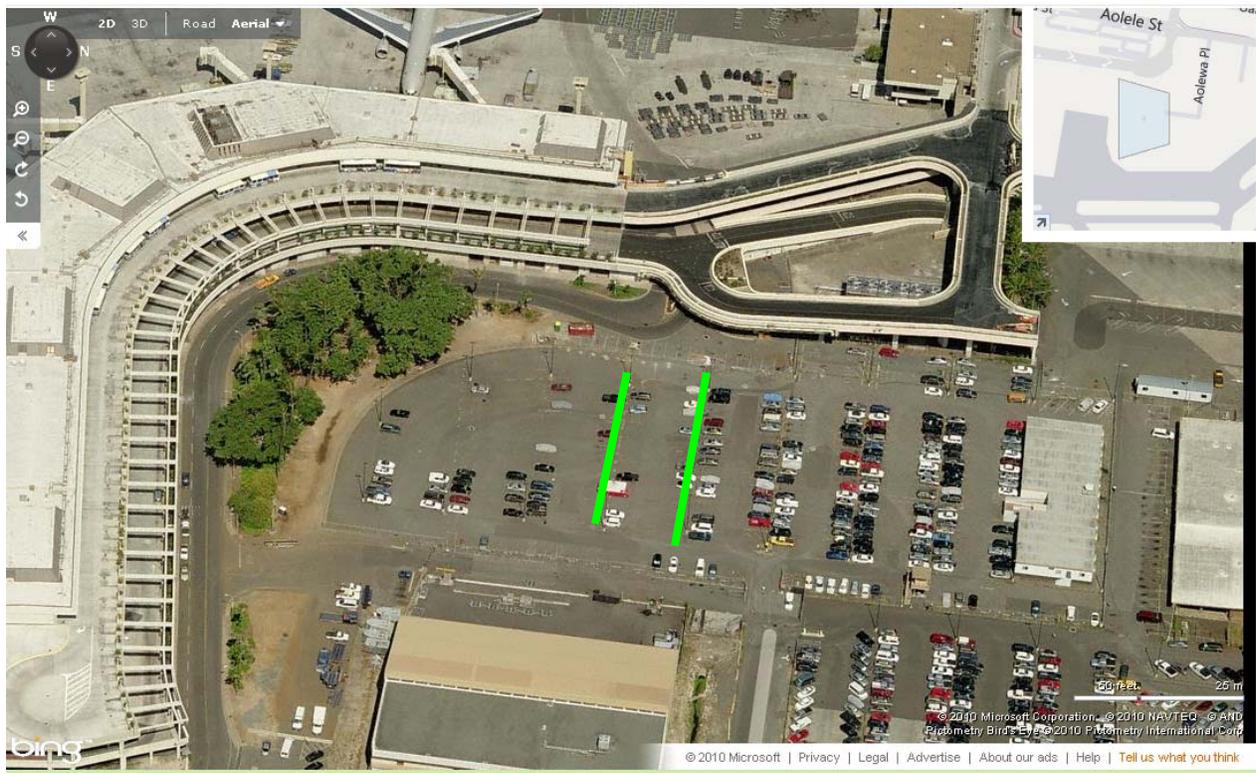
Location: Near the Diamondhead Concourse

Size: 47785 square feet with a depth of 18 inches.

Details: Bioretention islands in the two center rows based on parking lot grade.

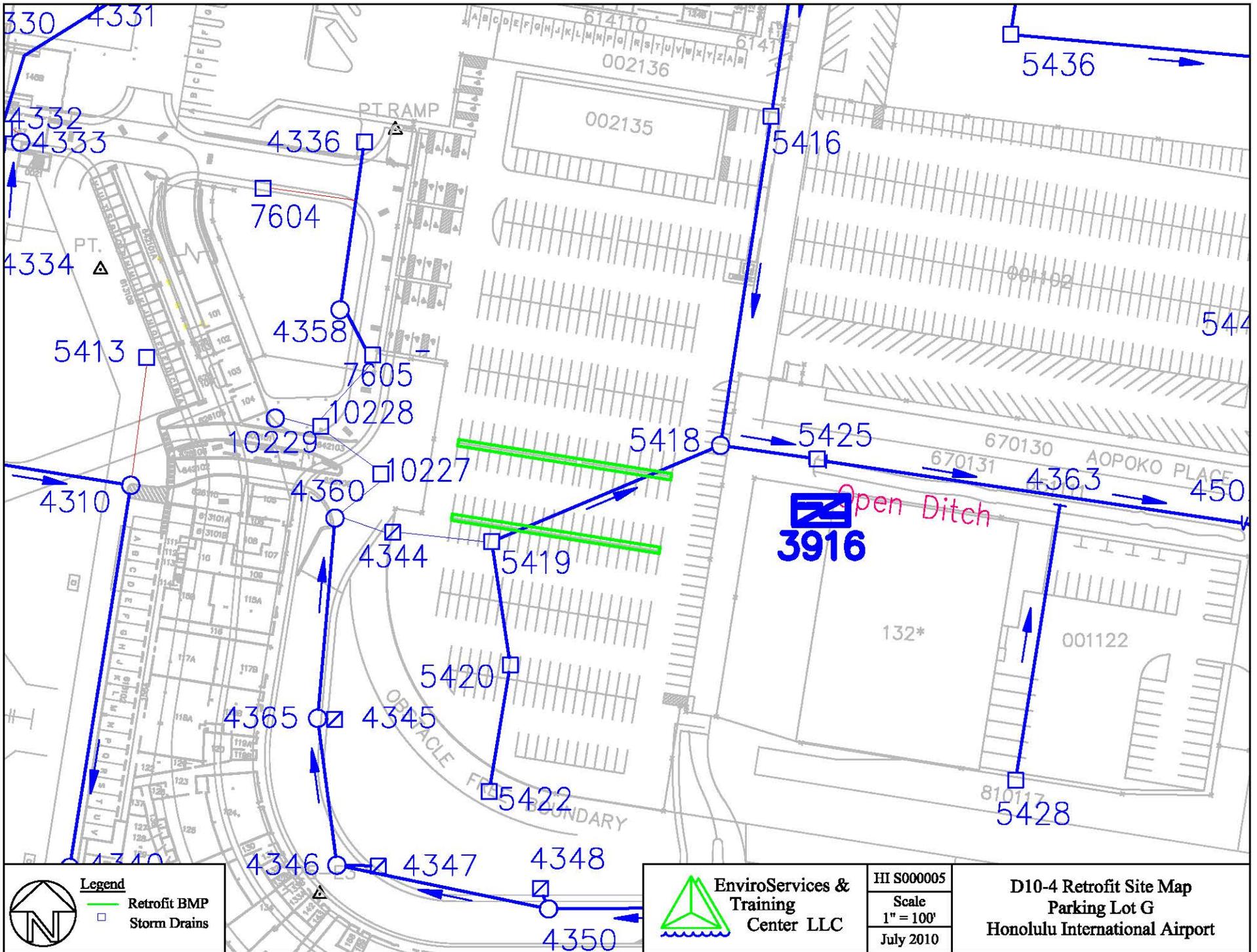
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



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Training
Center LLC**

HI S000005

Scale
1" = 100'
July 2010

**D10-4 Retrofit Site Map
Parking Lot G
Honolulu International Airport**

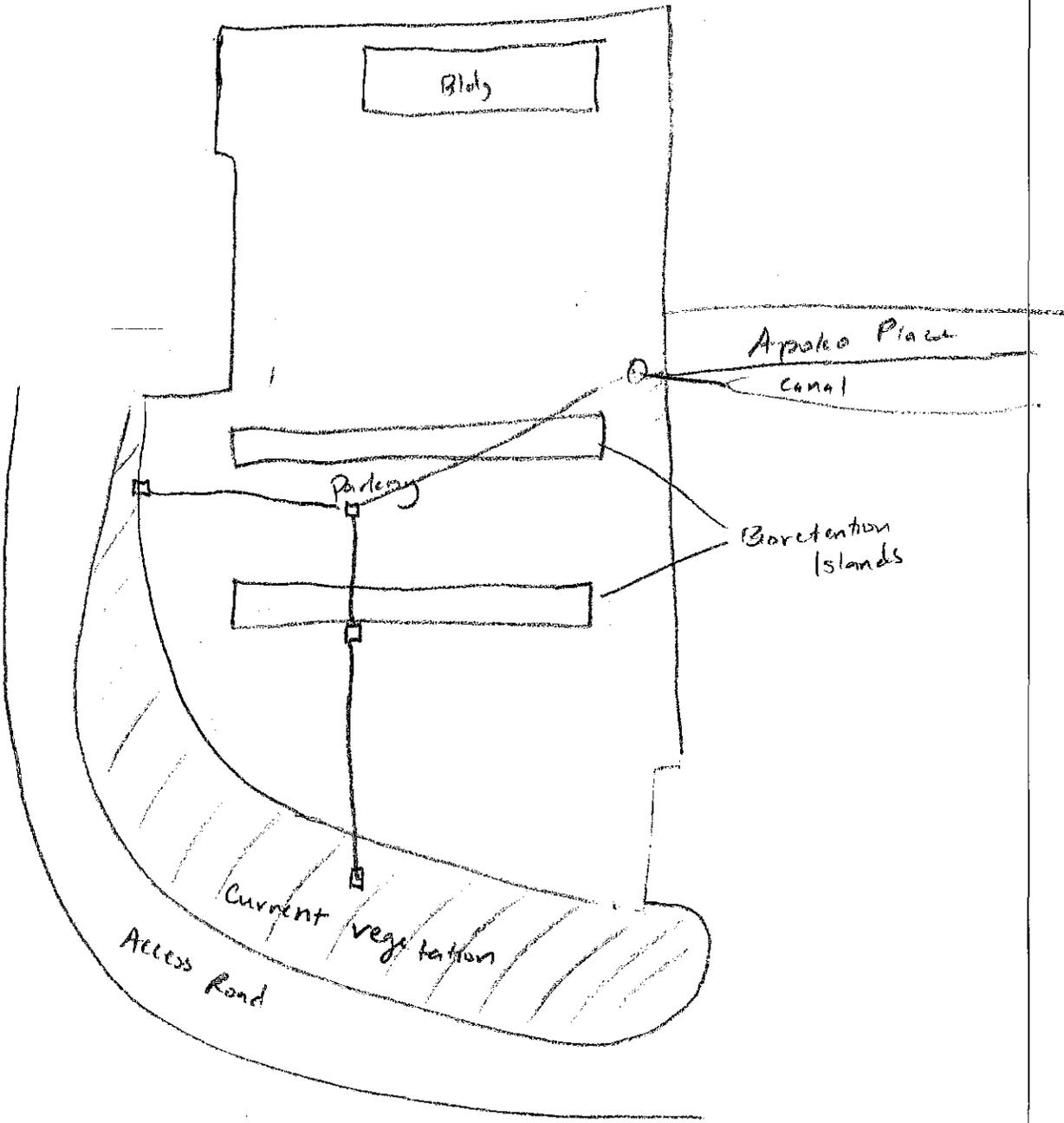
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis, C. Wassman	
WATERSHED: Keeki	BASIN: D10	SITE ID: D10-4
SITE DESCRIPTION		
Name: Parking Lot G		
Address: Diamondhead Concourse		
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant <input type="checkbox"/> Unknown
Proposed Retrofit Location:		
Storage <input type="checkbox"/> Above Roadway Culvert <input type="checkbox"/> Below Outfall <input type="checkbox"/> In Conveyance System <input type="checkbox"/> Large Parking Lot <input type="checkbox"/> Other:		On-Site <input type="checkbox"/> Hotspot Operation <input checked="" type="checkbox"/> Small Parking Lot <input type="checkbox"/> Individual Streets <input type="checkbox"/> Individual Rooftops <input type="checkbox"/> Small Impervious Area <input type="checkbox"/> Landscapes / Hardscape <input type="checkbox"/> Underground <input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT		
Drainage Area ≈ 2.64	Drainage Area Land Use:	
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 2.64	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
	<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Parking lot
EXISTING STORM WATER MANAGEMENT		
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible		
If Yes, Describe: MS4 storm drains		
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Small MS4 drains to Access "A" canal.		
Existing Head Available and Points Where Measured:		

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_T = \frac{LZ}{12} (0.9) (2.64) (43560)$ $= 10925 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (1.6) (1713)$ $= 1828 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: Bioretention on southern perimeter. SA = 1713, D = 18 in Conveyance = sheet flow																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Other factors:																																								
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																								

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D10-6
Description: Parking Lot R
Ranking Number: 14 of 24
Overall Score: 64

Potential Retrofit

Name: Parking Lot R

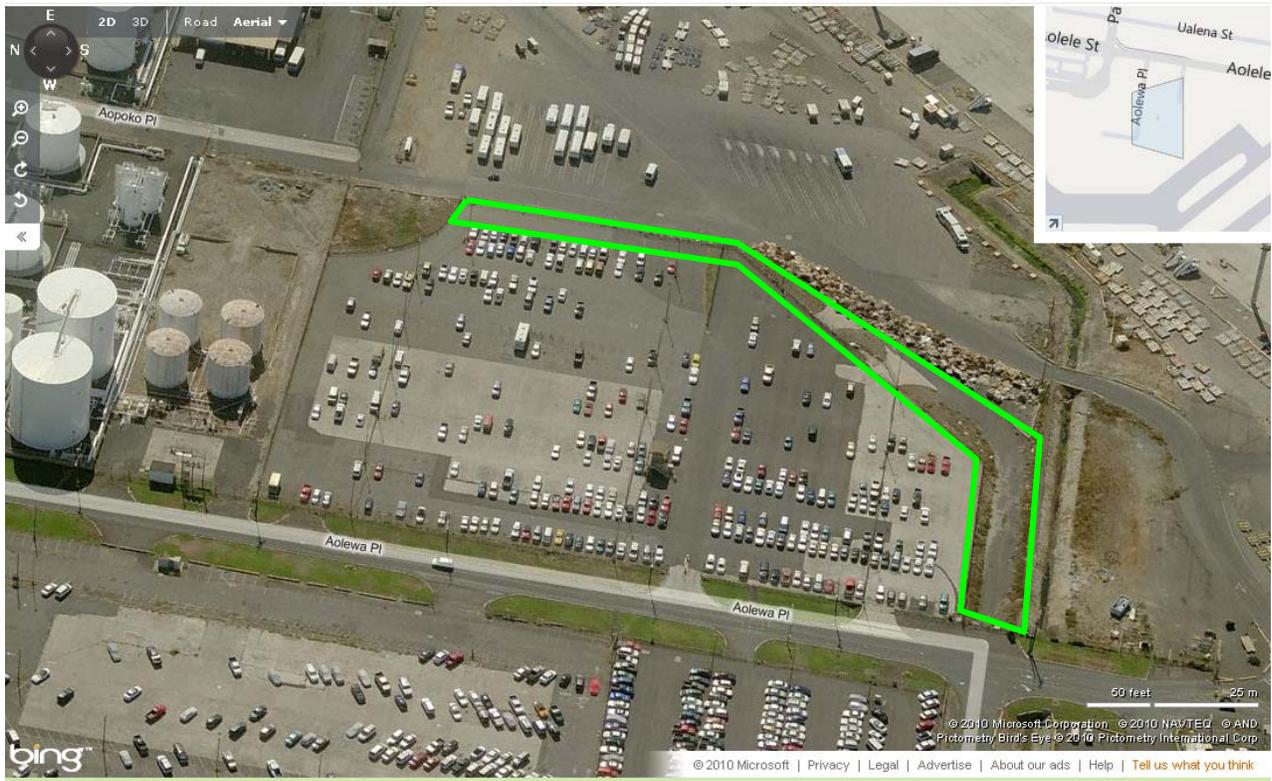
Location: Off Aolewa Place

Size: 31317.42 square feet with a depth of 18 inches.

Details: Perimeter bioretention on the south and east edges of the parking lot.

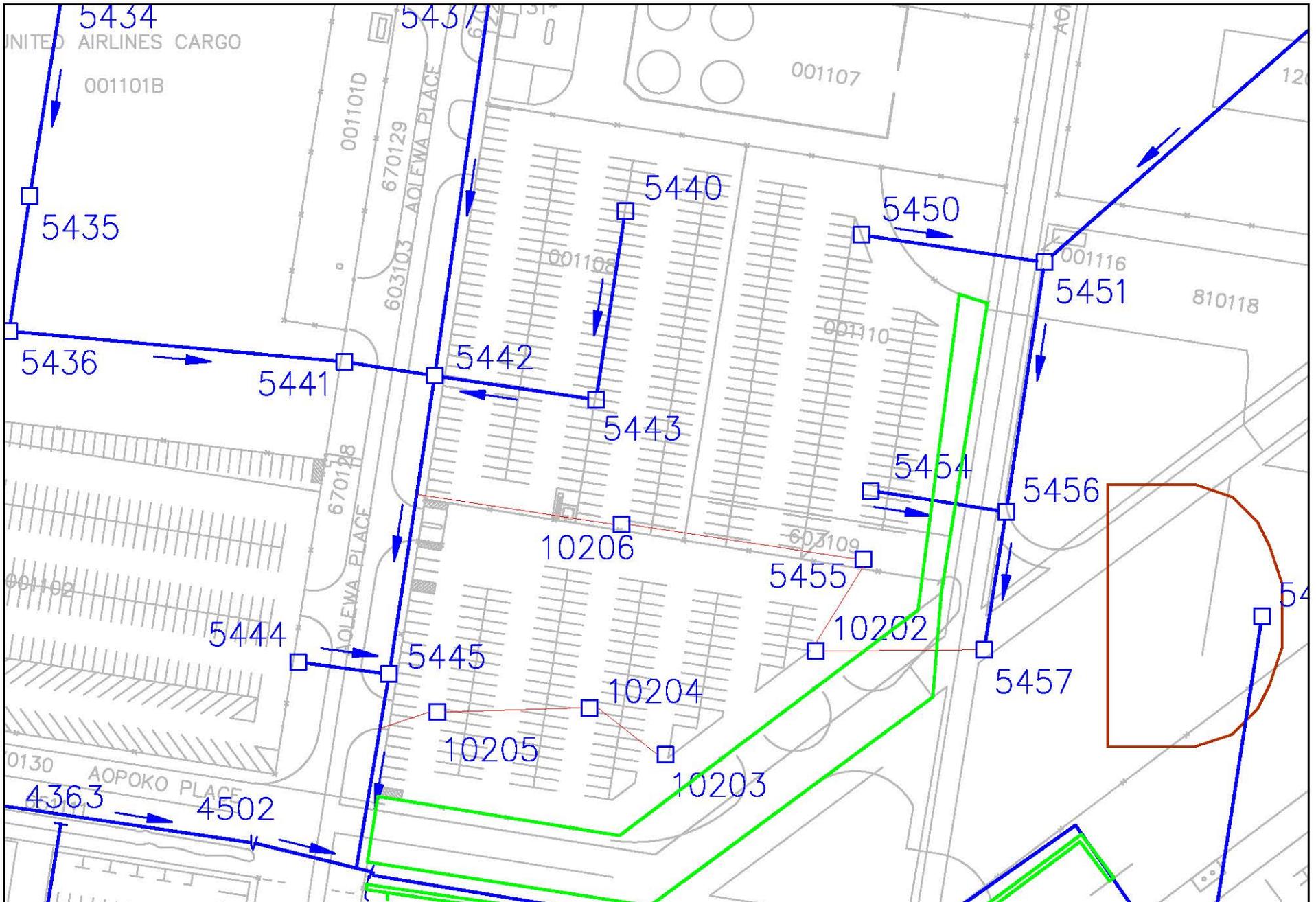
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

-  Retrofit BMP
-  Storm Drains

 **EnviroServices &
Training
Center LLC**

HI S000005
Scale
1" = 100'
July 2010

**D10-6 Retrofit Site Map
Parking Lot R
Honolulu International Airport**

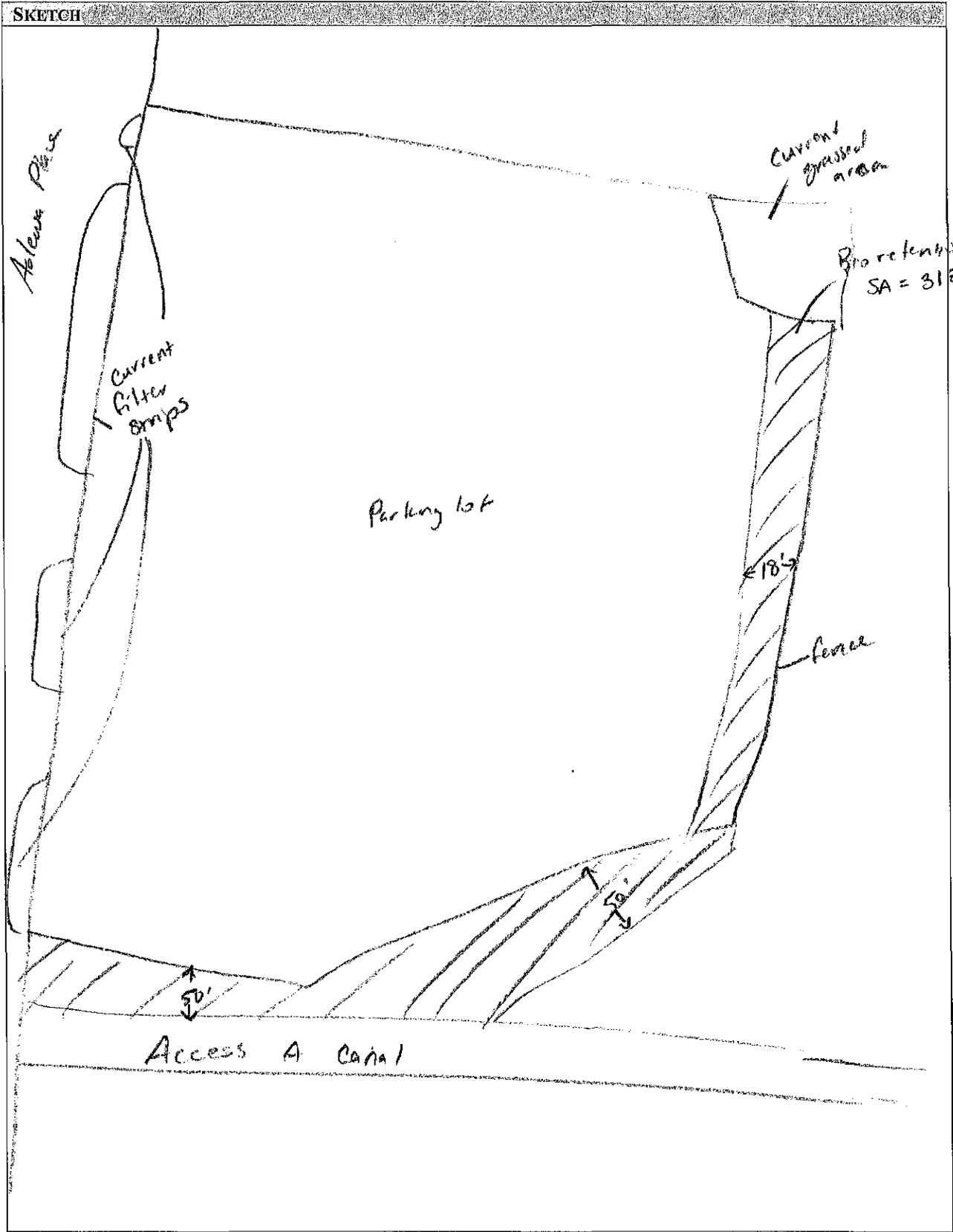
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 2010		INVESTIGATOR: K. Davis C. Wassman	
WATERSHED: Keehi		BASIN: D10	SITE ID: D10-6
SITE DESCRIPTION			
Name: Lot R			
Address: Off Aolewa Place			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 4.23 ac		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 4.23		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Parking
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: MS4 storm drains and Bitter Strip areas along Aolewa Place.			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Storm drains flow to Access "A" canal.			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations -- Target Storage: $V_t = \frac{1.2}{12} (0.9) (4.23) (43560)$ $= 16,583.29 \text{ CF}$	Retrofit Volume Computations -- Available Storage: $V_{AV} = \frac{2}{3} (1.6) (3137.42)$ $= 33,405.25 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: $SA = 3137.42 \text{ SF}$, Depth: 18 inches Conveyance = sheet flows																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	Potential Permitting Factors: <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%;">Probable</th> <th style="width: 15%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>		Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
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Retrofit Reconnaissance Investigation (RRI)



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
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<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D10-7
Description: Cell Phone Waiting Lot
Ranking Number: 15 of 24
Overall Score: 64

Potential Retrofit

Name: Cell Phone Waiting Lot

Location: Off Aolele Street

Size: 0.29 acres with a depth of 2.5 feet.

Details: Permeable pavers throughout area.

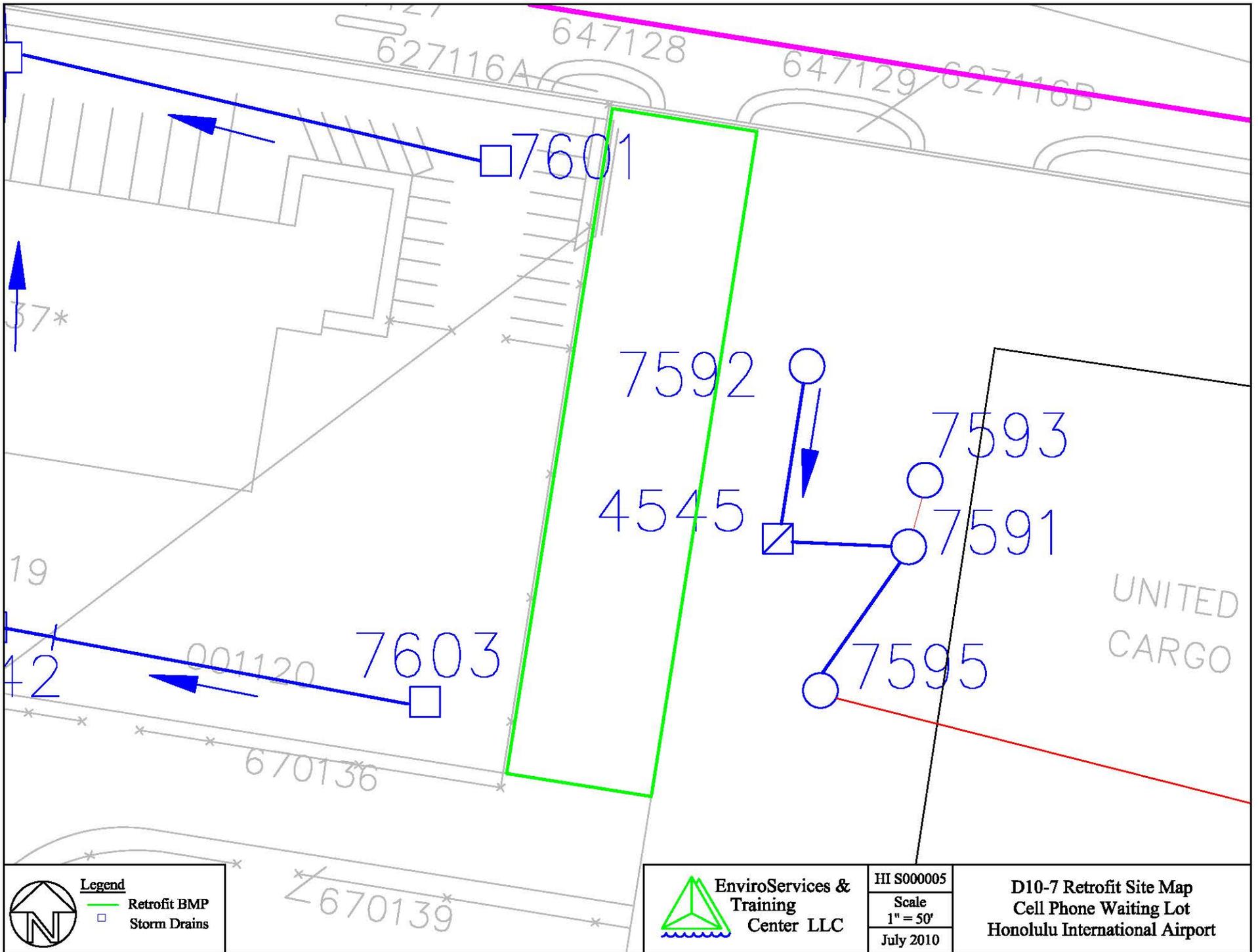
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005

Scale
1" = 50'
July 2010

**D10-7 Retrofit Site Map
Cell Phone Waiting Lot
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Watson		
WATERSHED: Kechi	BASIN: D10	SITE ID: D10-7	
SITE DESCRIPTION			
Name: Cell Phone Waiting Lot			
Address: Aolele Street			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input checked="" type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 0.29	Drainage Area Land Use:		
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 0.29	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Parking	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Sheet flow to storm drains			
Existing Head Available and Points Where Measured:			
N/A			

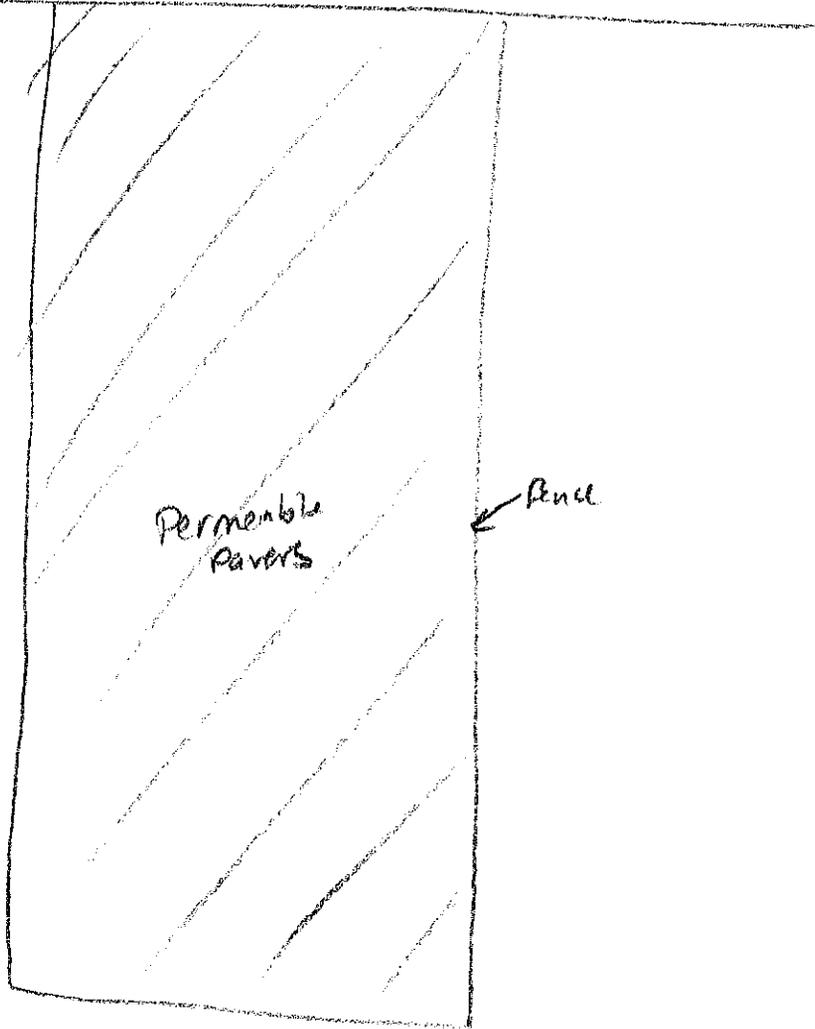
Retrofit Reconnaissance Investigation (RRI)

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Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.95) (0.29) 43560$ $= 1200.08 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (2.5) (0.29)$ $= 21054 \text{ CF}$																																									
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input checked="" type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																										
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em; margin-top: 10px;">Permeable pavers throughout area. Sign in area describing SW retrofits.</p>																																										
SITE CONSTRAINTS																																										
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Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No																																										

Retrofit Reconnaissance Investigation (RRI)

SKETCH

Aolele Street



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES	
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT	
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types
<input type="checkbox"/> Other:	
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS	
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES <input type="checkbox"/> NO <input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES <input checked="" type="checkbox"/> NO <input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES <input type="checkbox"/> NO <input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):	

Retrofit Site ID: D14-1
Description: Kaloaloha Canal
Ranking Number: 21 of 24
Overall Score: 45.5

Potential Retrofit

Name: Kaloaloha Canal
Location: Along Aolele Street
Size: Stabilize 865 feet from storm drain 4573
Details: Regrade area to a 2:1 slope and stabilize with vegetation.

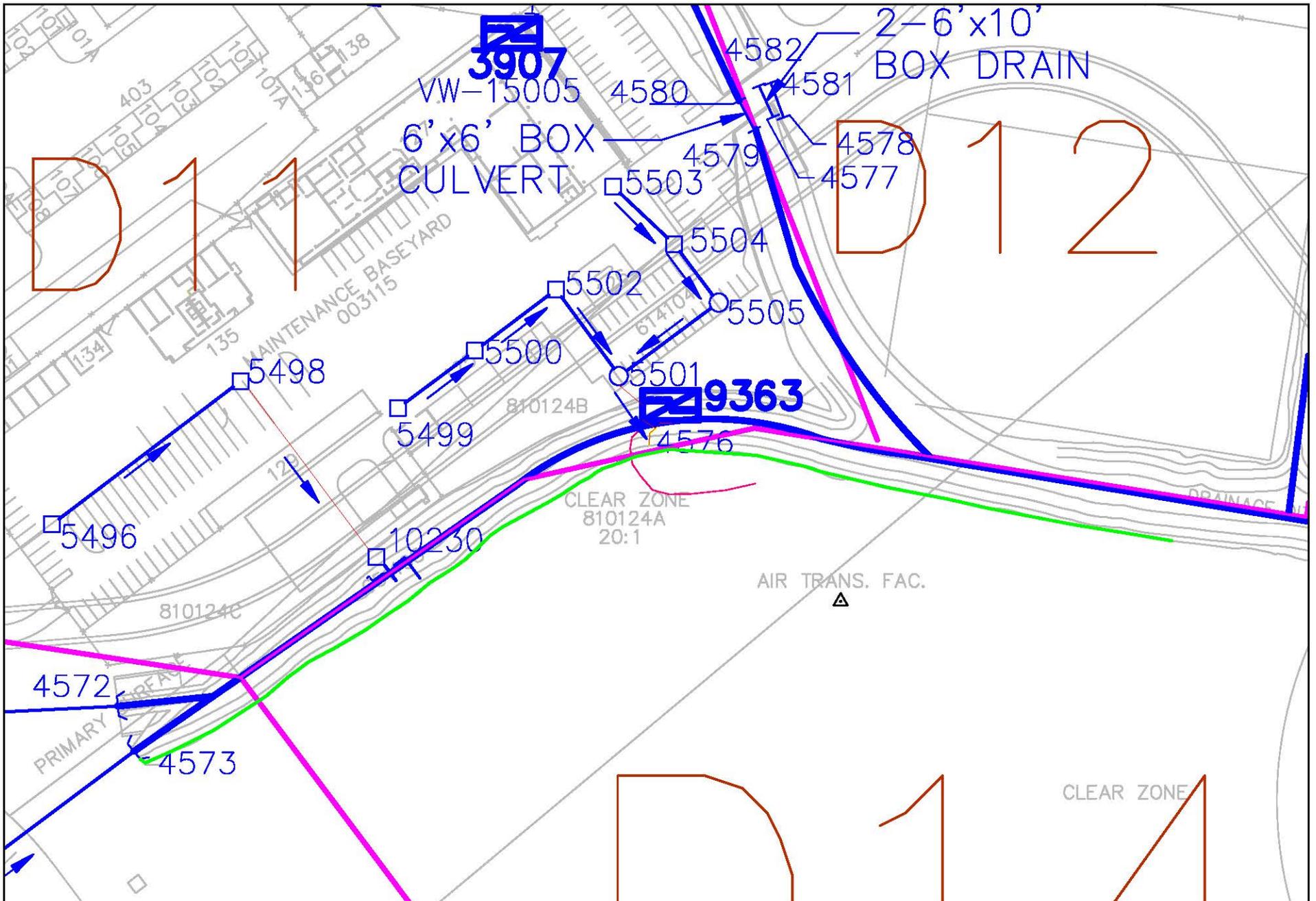
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

-  Retrofit BMP
-  Storm Drains

 **EnviroServices & Training Center LLC**

HI S000005
 Scale
 1" = 100'
 July 2010

D14-1 Retrofit Site Map
Kaloaloo Canal
Honolulu International Airport

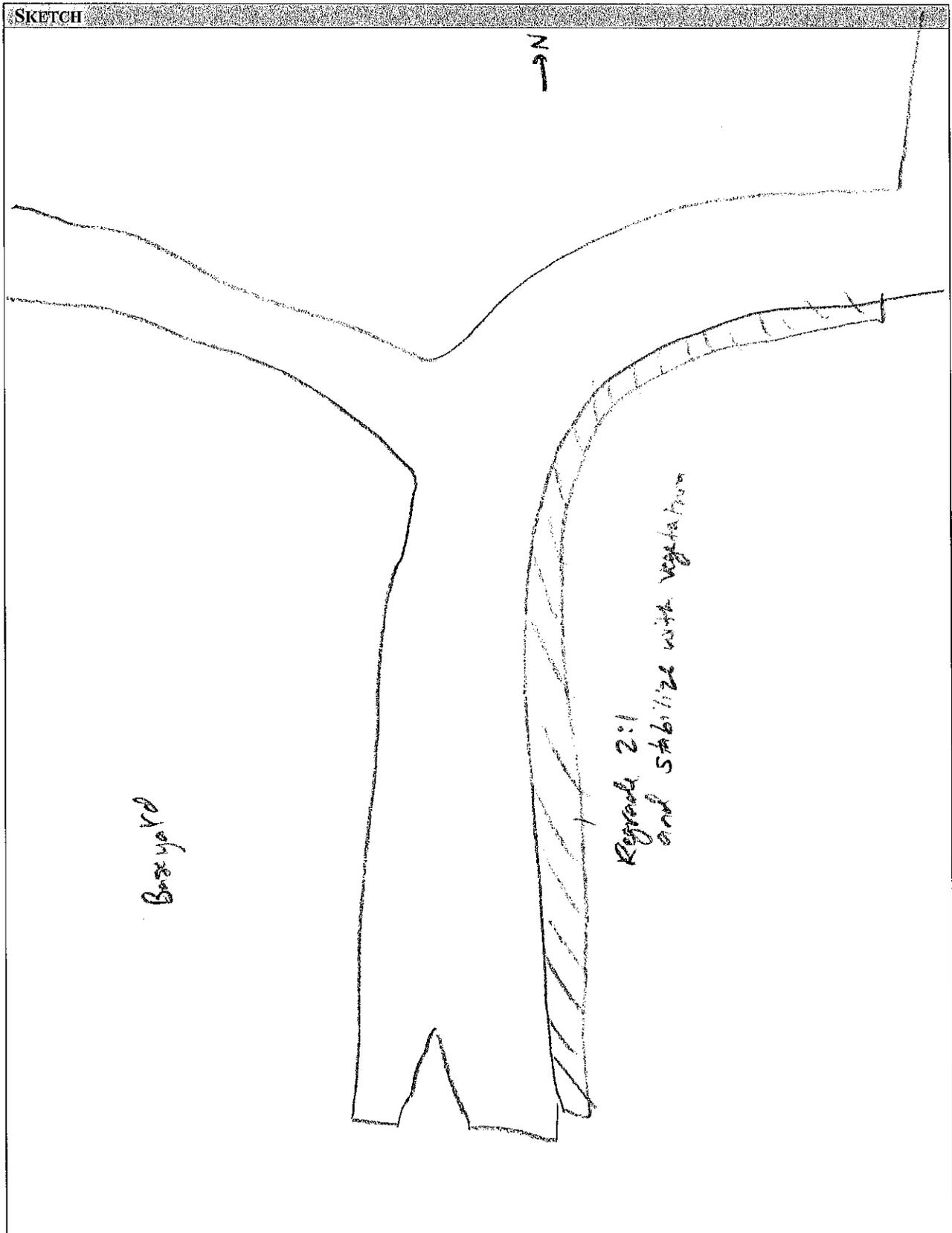
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 July 2010		INVESTIGATOR: K. Davis, C. Wassman	
WATERSHED: Keahi		BASIN: D14	SITE ID: D14-1
SITE DESCRIPTION			
Name: Kalaloa Canal			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input checked="" type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 375.07 ac		Drainage Area Land Use:	
Imperviousness ≈ 90 %		<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 337.56 ac		<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes: Assuming D1 = D14 + E + D17		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: Several OWS in small MS4 drains			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Majority of canal is channelized; however, the portion in Basin D14 is not and shows evidence of erosion.			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																														
Purpose of Retrofit: <input type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input checked="" type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																														
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.86) 375.07 (43560)$ $= 1405072 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{Av} = \frac{2}{3} (10)$																																													
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																														
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-size: 1.2em; margin: 0;">Length 845' from 4573 will be regraded to 2:1 and stabilized with plants</p>																																														
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Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: FAA flight area clearance	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																													
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Impacts to Stream / Canal	<input checked="" type="checkbox"/>	<input type="checkbox"/>																																												
Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																												
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Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>																																												
Other factors:																																														
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input type="checkbox"/> No Evidence of high water table (gleying, saturation): <input type="checkbox"/> Yes <input type="checkbox"/> No																																														

Retrofit Reconnaissance Investigation (RRI)



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input checked="" type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D16-2
Description: Vacant Lot by Pump Station
Ranking Number: 9 of 24
Overall Score: 69

Potential Retrofit

Name: Vacant Lot by Pump Station

Location: Kalewa Street

Size: 6,000 square feet with a depth of 18 inches.

Details: Rain garden at the corner of the property.

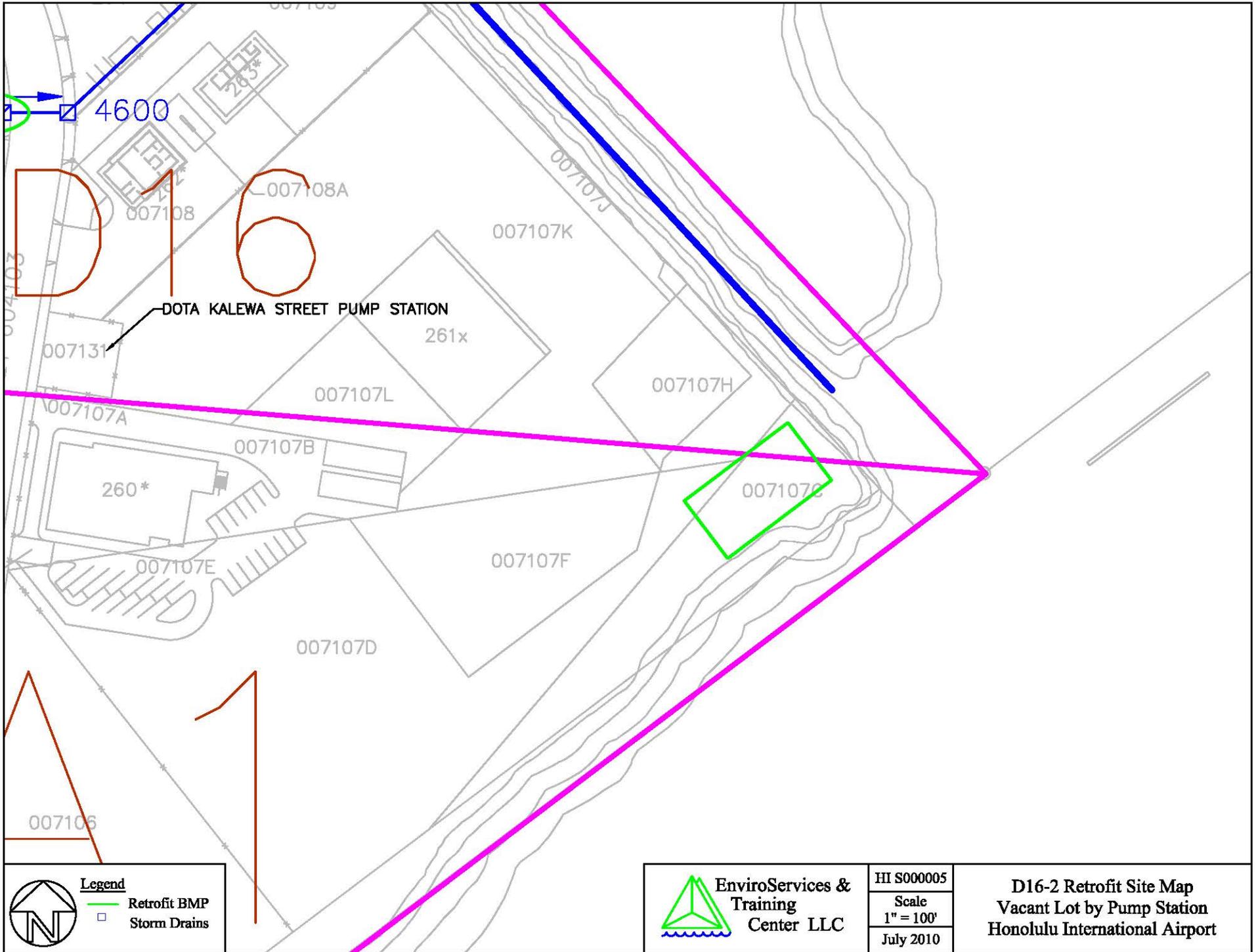
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains

**EnviroServices &
Training
Center LLC**

HI S000005
Scale 1" = 100'
July 2010

**D16-2 Retrofit Site Map
Vacant Lot by Pump Station
Honolulu International Airport**

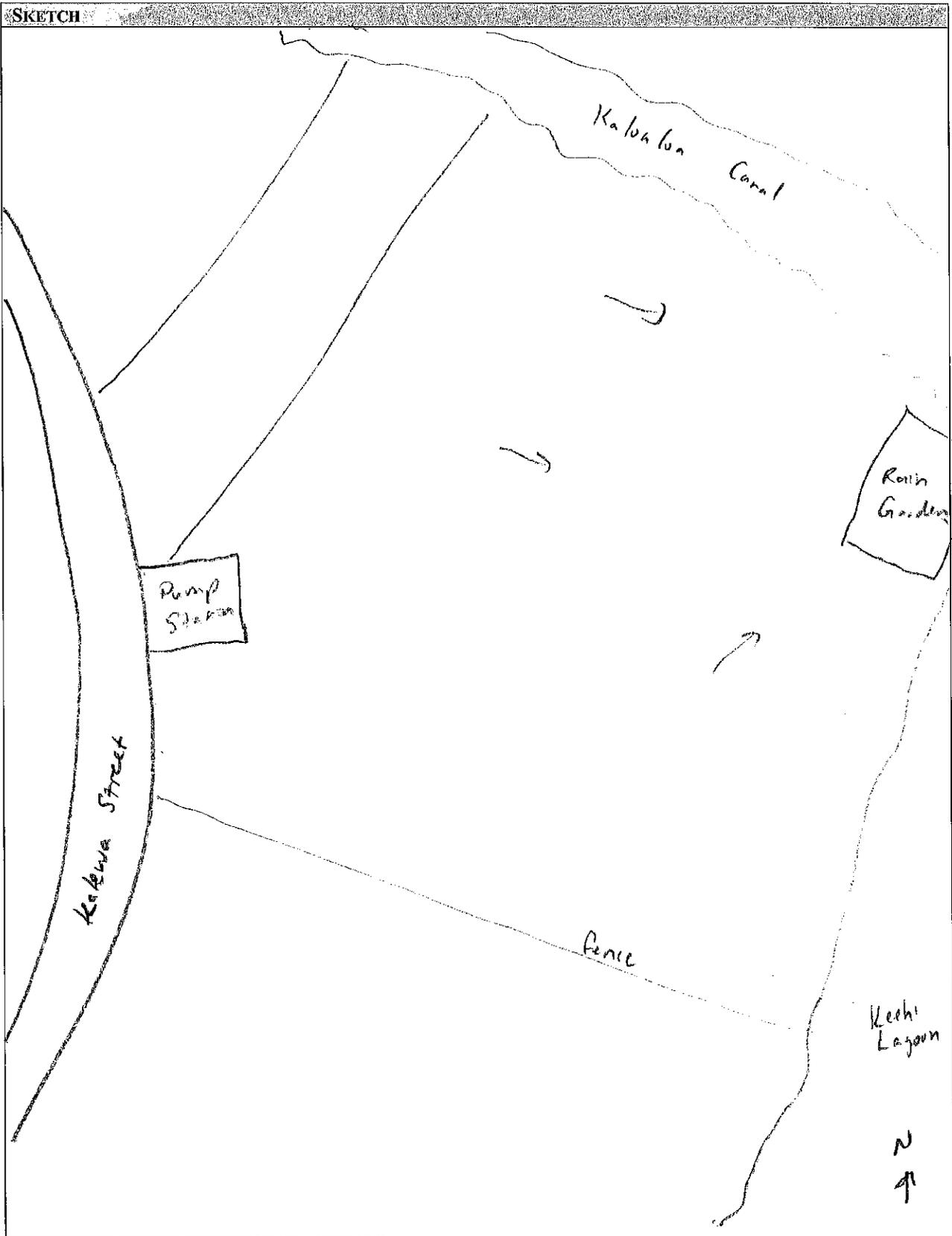
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Keeki	BASIN: D16	SITE ID: D16-2	
SITE DESCRIPTION			
Name: Vacant Lot by Pump Station			
Address: Kalewa Street			
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input checked="" type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 31 8824.92 SF		Drainage Area Land Use:	
Imperviousness ≈ 95 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 302883.64 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input checked="" type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: Car + Bus Parking
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Area slopes toward corner where Kalewa Canal and Keeki Lagoon intersect.			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.91) (7.32) (43560)$ $= 28853.66 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (1.6) (6,000)$ $= 6400 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <p style="font-family: cursive;">Rain Garden at corner of the lot to assist in Altering the runoff. SA = 6,000 SF, depth = 18 inches Conveyance = sheet flow</p>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: <p style="font-family: cursive;">May be too close to Keehn' Lagoon</p>	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <i>Not likely</i> <table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 15%;">Yes</th> <th style="width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>	Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<table style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 60%;">Potential Permitting Factors:</th> <th style="width: 20%;">Probable</th> <th style="width: 20%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>	Potential Permitting Factors:	Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Impacts to Shoreline	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
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Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <i>Tidal influence</i>																																								

Retrofit Reconnaissance Investigation (RRI)



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D16-3
Description: VIP Transportation
Ranking Number: 24 of 24
Overall Score: 38

Potential Retrofit

Name: VIP Transportation

Location: 443 Kalewa Street

Details: Install CMU wall on northern portion of the property with a trench drain that directs storm water to an OWS, which discharge the filtered water to the sanitary sewer of Kaloaloa Canal.

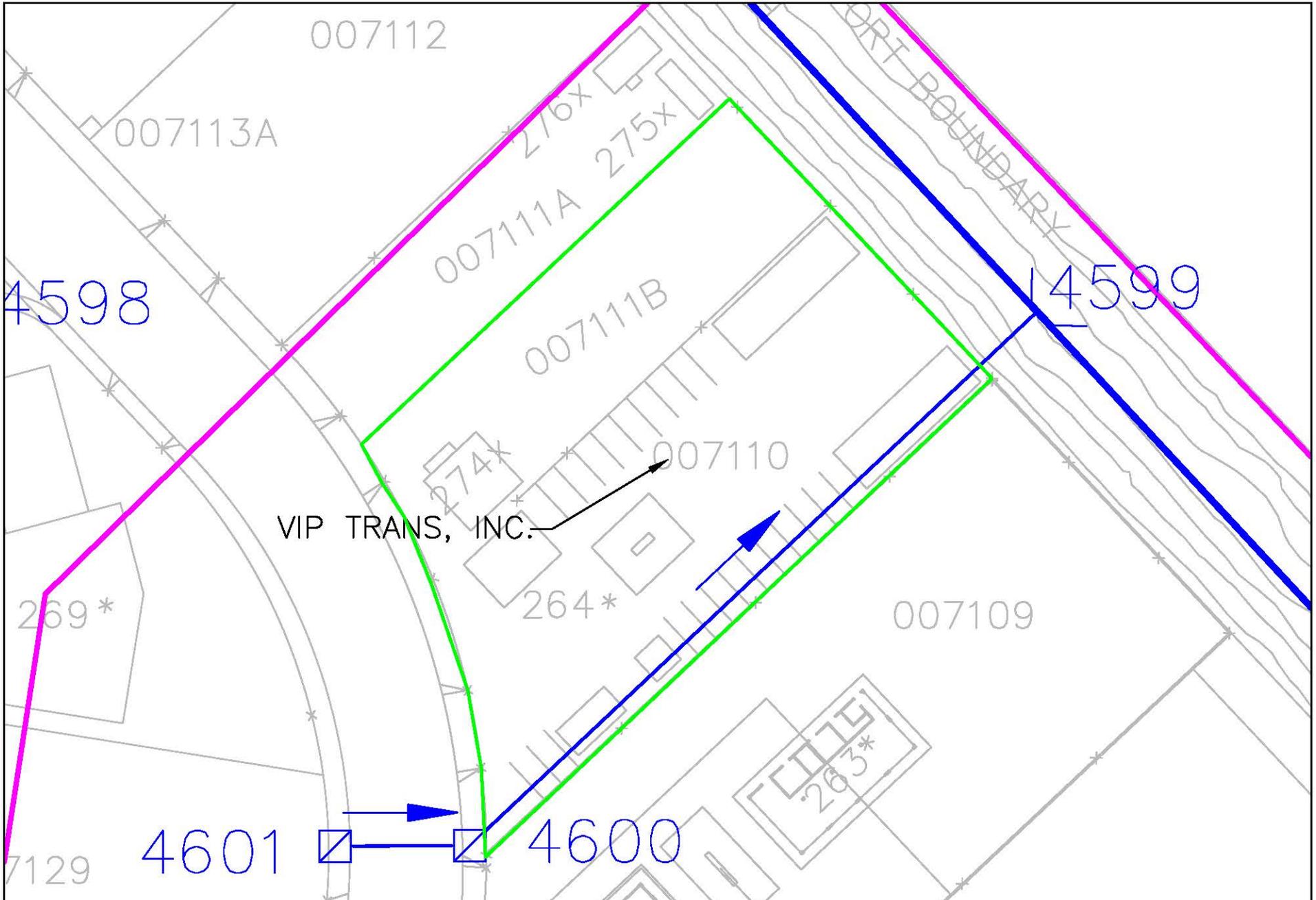
Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

-  Retrofit BMP
-  Storm Drains

 **EnviroServices & Training Center LLC**

HI S000005
 Scale
 1" = 50'
 July 2010

**D16-3 Retrofit Site Map
 VIP Transportation
 Honolulu International Airport**

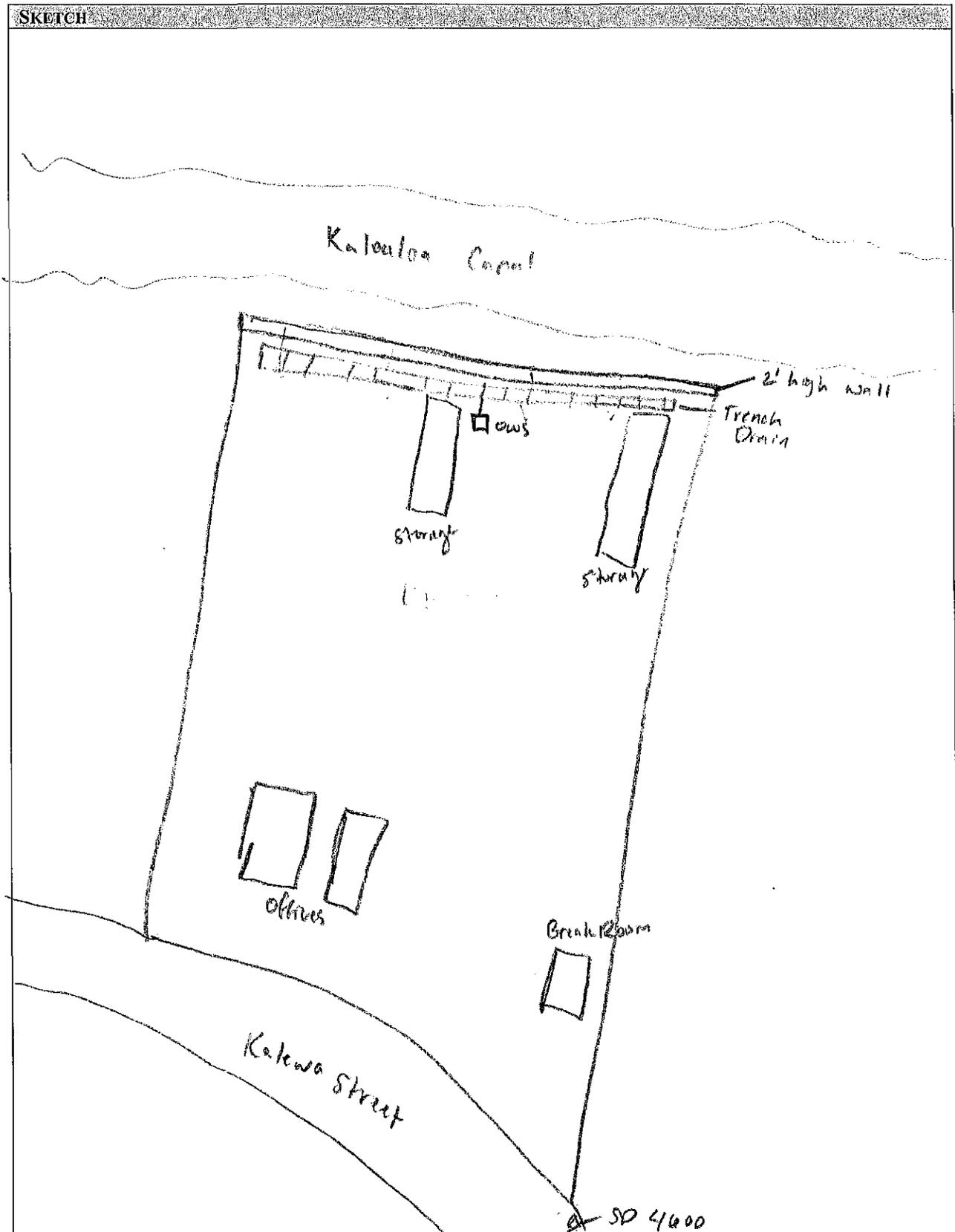
Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Wassman	
WATERSHED: Keeki	BASIN: D16	SITE ID: D16-3
SITE DESCRIPTION		
Name: VIP Trans		
Address: 443 Kalena Street Honolulu HI 96819		
Land Use:	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant <input type="checkbox"/> Unknown
Proposed Retrofit Location:		
Storage		On-Site
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation <input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets <input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area <input type="checkbox"/> Landscapes / Hardscape
		<input checked="" type="checkbox"/> Underground <input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT		
Drainage Area ≈ 41140 SF	Drainage Area Land Use:	
Imperviousness ≈ 100 %	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 41140	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM-WATER MANAGEMENT		
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible		
If Yes, Describe: Boom placed on north boundary of property near Kalua loa Canal.		
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Storm water sheet flows north to Kalua loa Canal. Tenant conducts vehicle maintenance operations outdoors.		
Existing Head Available and Points Where Measured:		

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{1.2}{12} (0.95) (41140)$	Retrofit Volume Computations – Available Storage: <i>Yes MA</i>																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input checked="" type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <i>Install CMA wall on northern portion of property with a trench drain that directs storm water to an OWS and the filtered water would discharge to Kalaalua Canal.</i>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input checked="" type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Retrofit Reconnaissance Investigation (RRI)



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em;">Maybe limited space due to current structures which the wall and trench drain can be built around.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D5-1
Description: Overseas Terminal
Ranking Number: 4 of 24
Overall Score: 78

Potential Retrofit

Name: Overseas Terminal

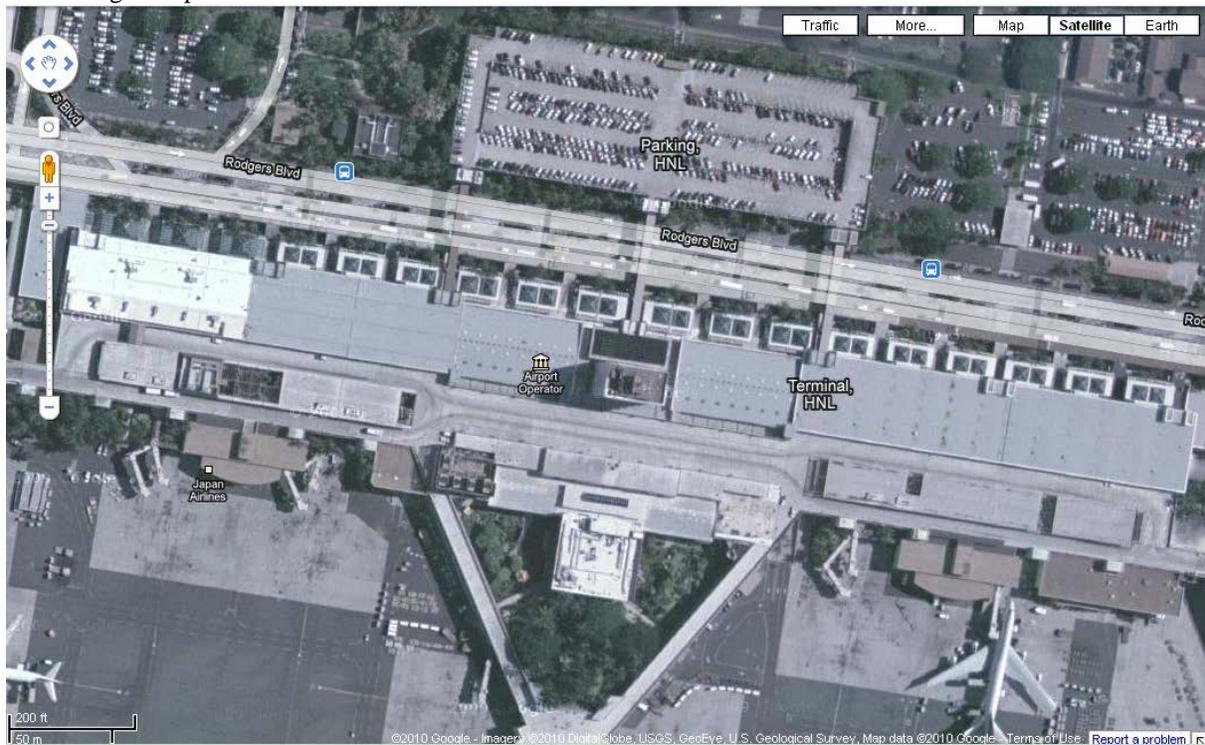
Location: Rodgers Boulevard

Size: 199458 square feet with a depth of 6 inches.

Details: Green Roof

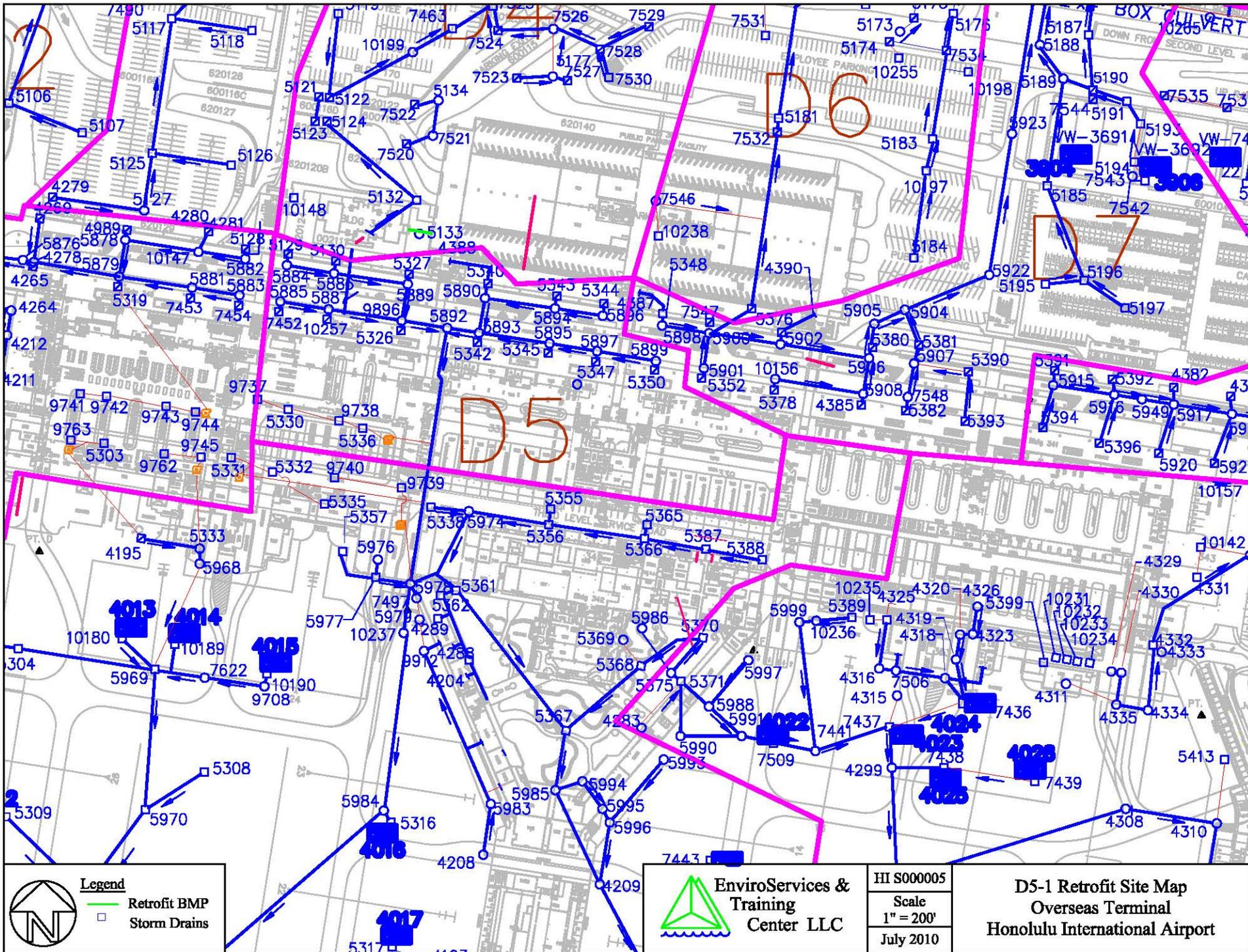
Aerial Picture

*From Google Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend

- Retrofit BMP
- Storm Drains



**EnviroServices &
Training
Center LLC**

HI S000005
Scale
1" = 200'
July 2010

**D5-1 Retrofit Site Map
Overseas Terminal
Honolulu International Airport**

Retrofit Reconnaissance Investigation (RRI)

DATE: 19 Jul 10	INVESTIGATOR: K. Davis C. Wassman		
WATERSHED: Manuwa'	BASIN: D5	SITE ID: D5-1	
SITE DESCRIPTION			
Name: Overseas Terminal			
Address: Rodgers Blvd			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input checked="" type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 225,000 SF		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 225,000 SF		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: Down spouts			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: Downspouts to MS4			
Existing Head Available and Points Where Measured:			

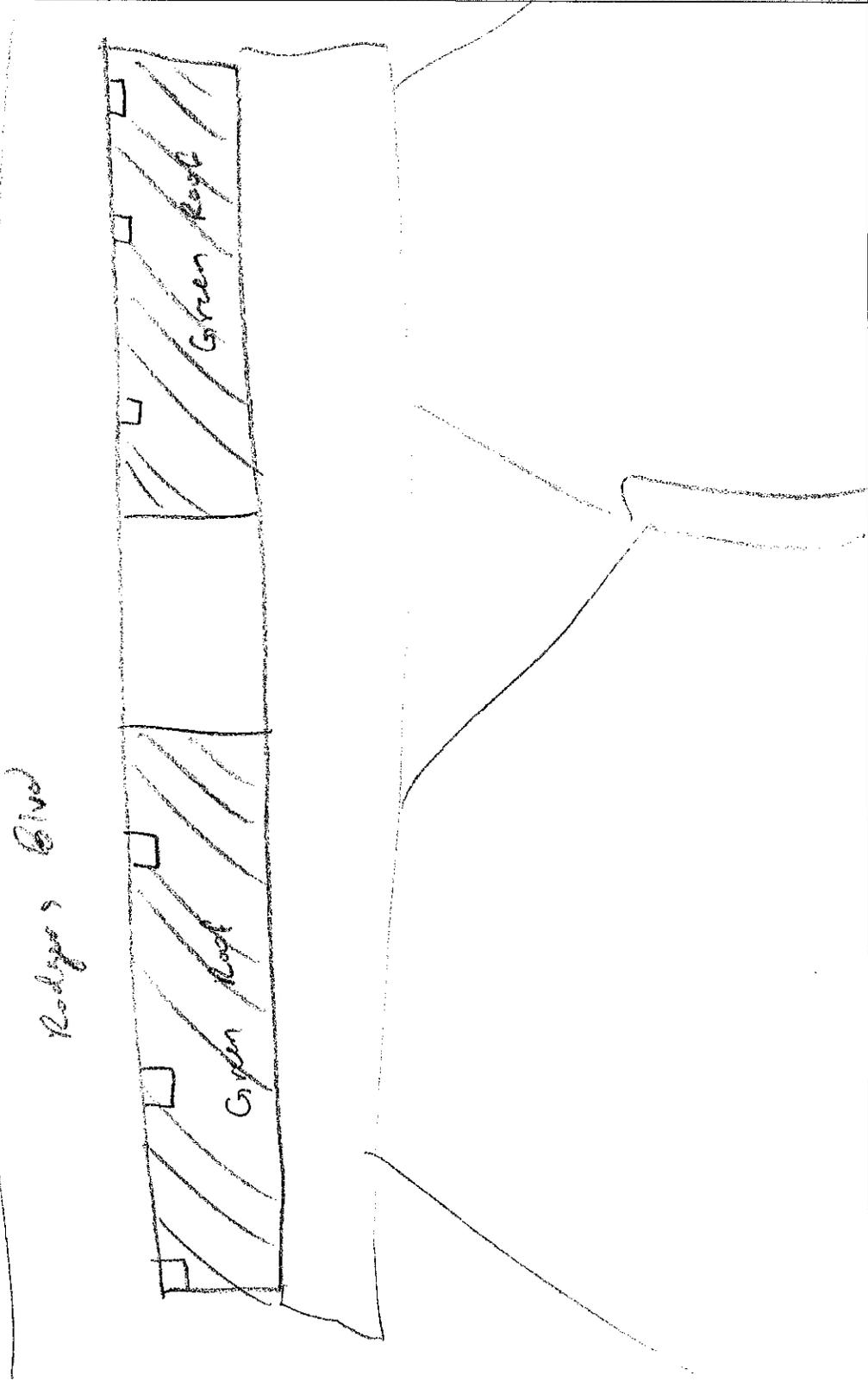
Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input checked="" type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_r = \frac{1.2}{12} (0.95) (225000)$ $= 21375 \text{ CF}$	Retrofit Volume Computations – Available Storage: $V_{AV} = \frac{2}{3} (0.5) (199458)$ $= 66486 \text{ CF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input checked="" type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: $SA = 125 \times 1800 - (21 \times 42) \times 6 - (162 \times 125) = 199,458 \text{ SF}$ Depth = 6 inches Green Roof over terminal area.																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input checked="" type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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SKETCH



Consider re-directing downspouts to planters.



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em; font-family: cursive;">Consider whether building structure can withstand weight of green roof.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input checked="" type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: E-7
Description: Paiea Street
Ranking Number: 2 of 24
Overall Score: 83

Potential Retrofit

Name: Paiea Street

Location: Paiea Street

Size: 47372.42 square feet with a depth of 18 inches.

Details: Filter strip along roadside.

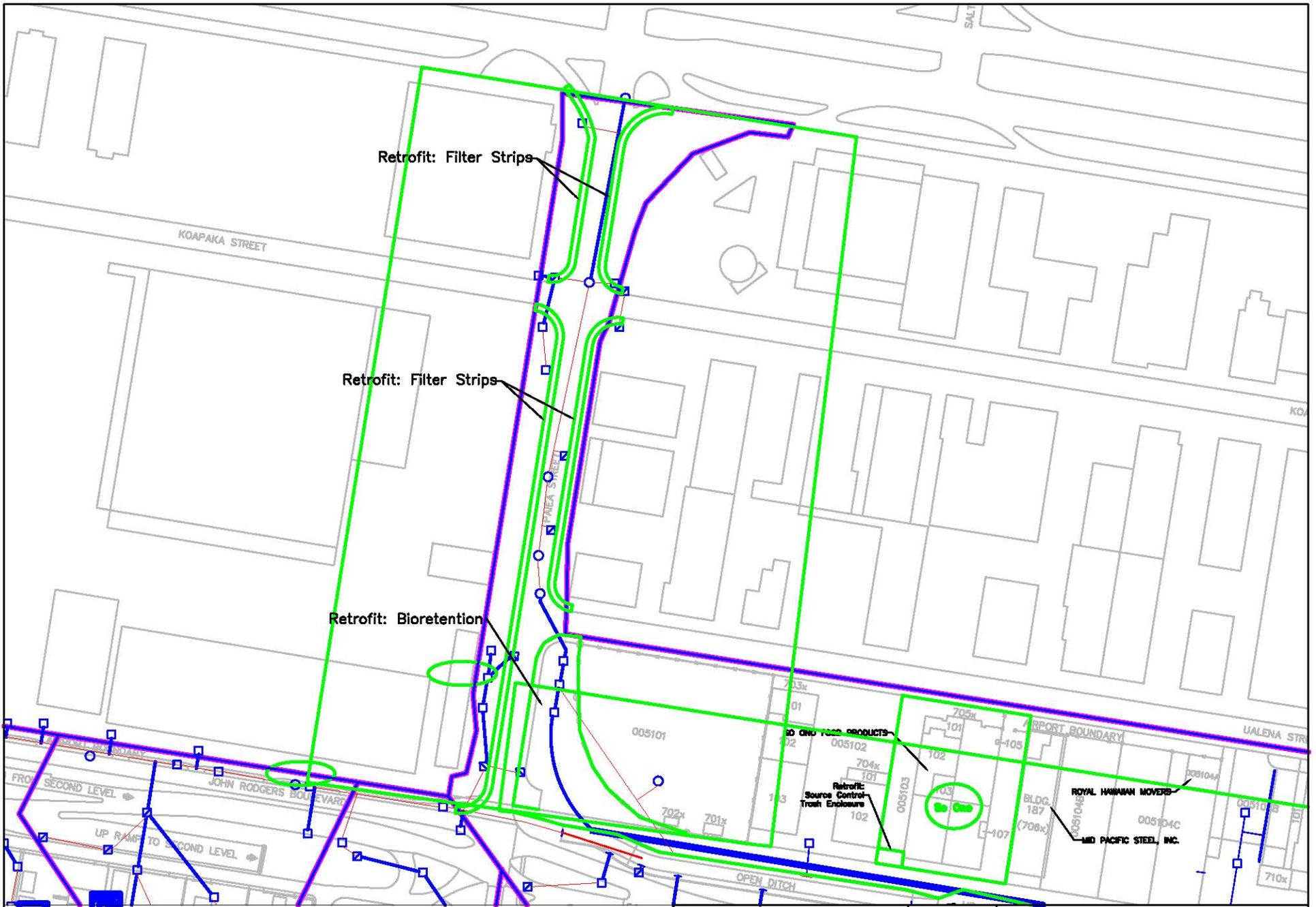
Aerial Picture

*From Google Maps



Attached

- Autocad Drainage Map
- RRI Form



Legend
 — Retrofit BMP
 □ Storm Drains

EnviroServices & Training Center LLC

HI S000005
 Scale
 1" = 200'
 July 2010

**E-7 Retrofit Site Map
 Paiea Street
 Honolulu International Airport**

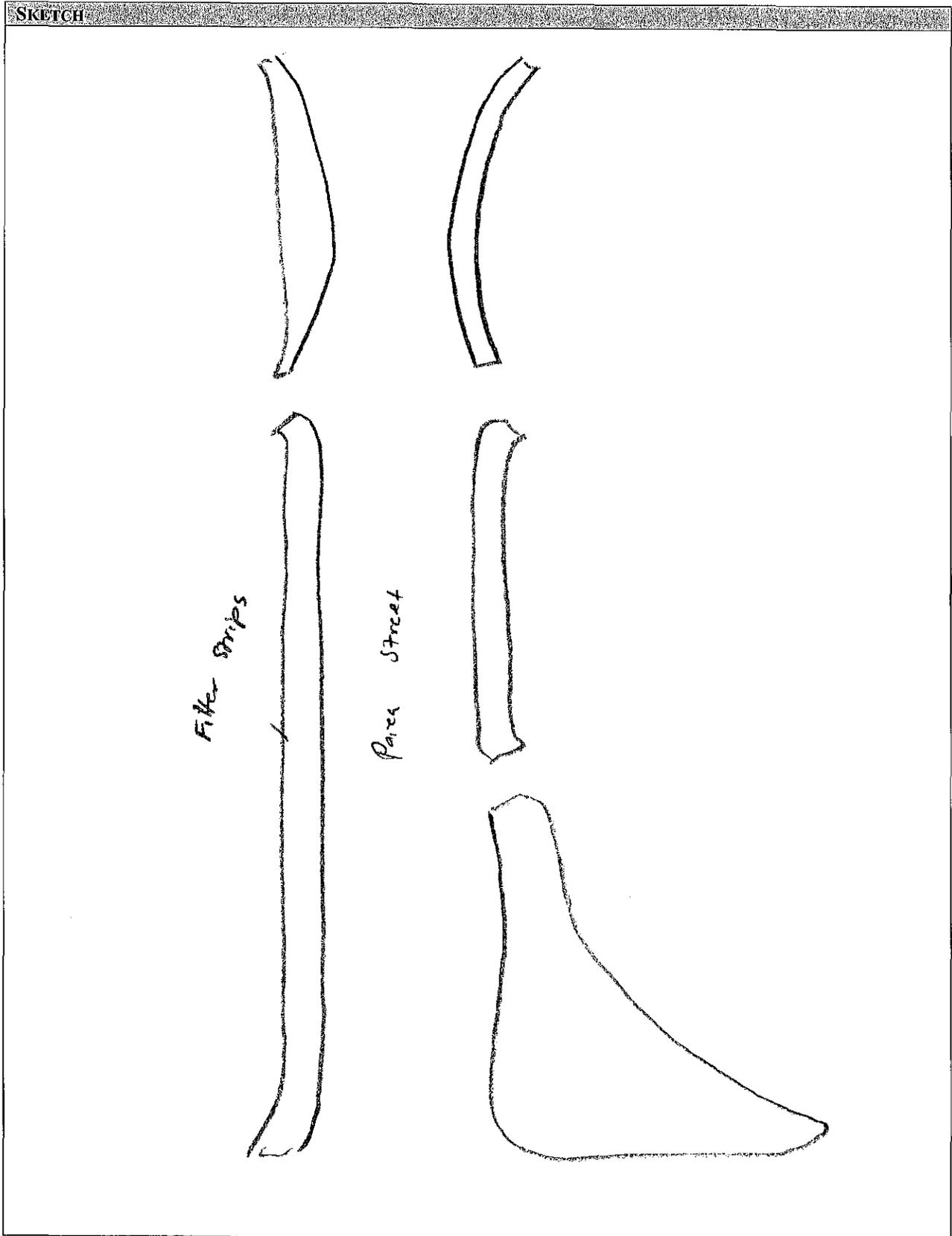
Retrofit Reconnaissance Investigation (RRI)

DATE:	INVESTIGATOR: CW/KD		
WATERSHED:	BASIN: E	SITE ID: E-7	
SITE DESCRIPTION			
Name: Paiea Street Filter Strip, Bioretention			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
PROPOSED RETROFIT LOCATION:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input checked="" type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 17.72ac (approximate)	Drainage Area Land Use:		
Imperviousness ≈ 90 %	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 15.9	<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: MS4			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: MS4 from neighboring areas, freeway			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage: $V_t = \frac{12}{12} (0.86) (17.7)$ $= 66,307.03 \text{ SF}$	Retrofit Volume Computations – Available Storage: $V_{av} = \frac{2}{3} (1.5) (47372.42)$ $= 47372.42 \text{ SF}$																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input type="checkbox"/> Other:																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: Filter strips 5' $SA = 8331.27 + 3315.22 + 3450.78 + 4949.10 + 27326.05$ $= 47372.42 \text{ SF}$ Depth = 18 inches Conveyance - curb cuts																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe: filter strips may encroach on tenants	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em; font-family: cursive;">Filter strips along paiea st. Bioretention area near aolele st intersection</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em; font-family: cursive;">may not have enough space to handle all storm water</p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input checked="" type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

ATTACHMENT VII

Hotspot RRI Forms

Retrofit Site ID: D10-3
Description: Gate 6 Triturator

Potential Retrofit

Details: Containment walls

Picture



Attached

- RRI Form

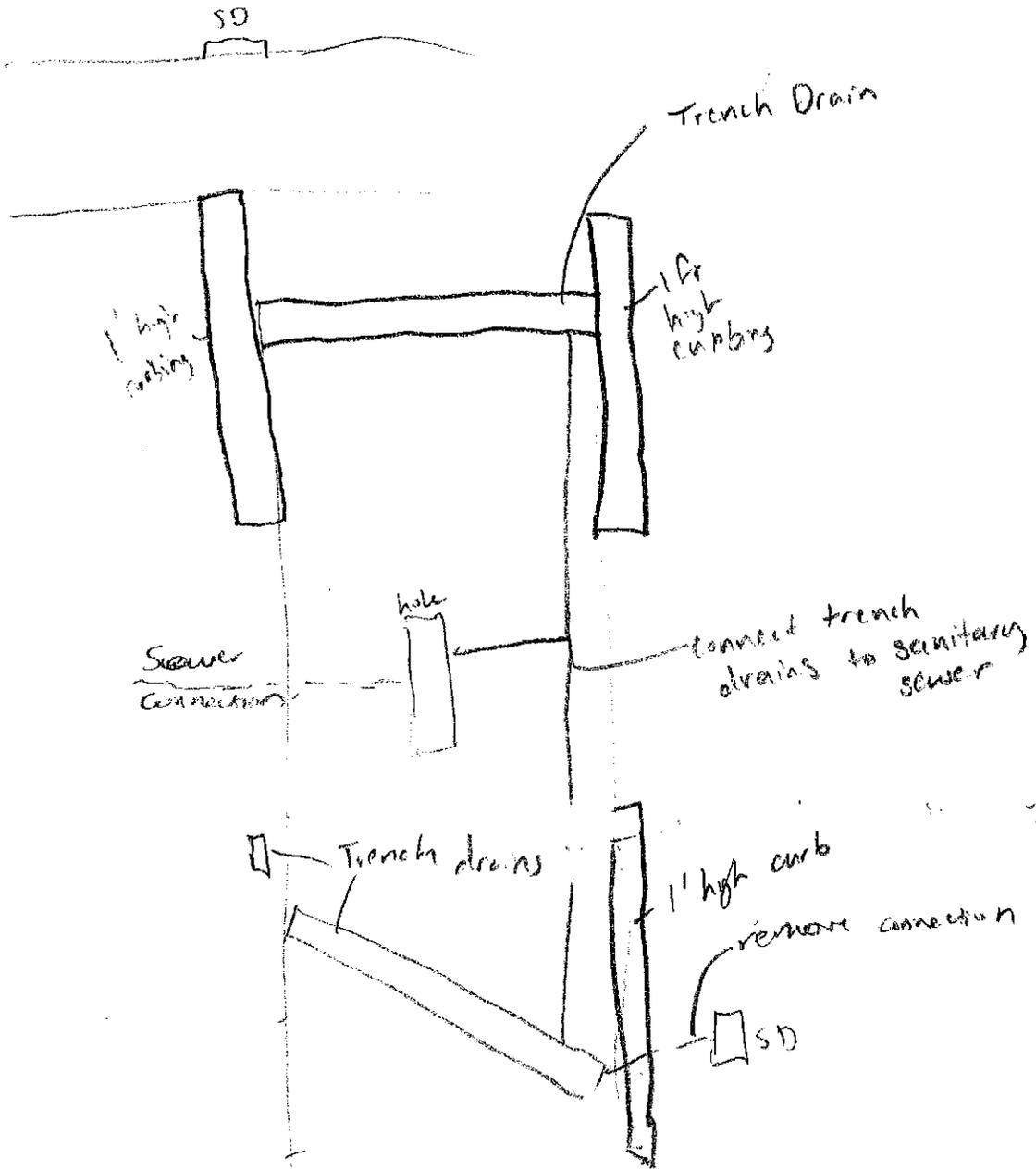
Retrofit Reconnaissance Investigation (RRI)

DATE: <i>July 19, 2010</i>	INVESTIGATOR: <i>KD / CW</i>		
WATERSHED: <i>Kechi</i>	BASIN: <i>D10</i>	SITE ID: <i>D10-3</i>	
SITE DESCRIPTION			
Name: <i>Gate 6 Triturator</i>			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈		Drainage Area Land Use:	
Imperviousness ≈	%	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: <i>Absorbent boom blocking french drains</i>			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: <i>slope from triturator on either side to MS4 drains</i>			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="font-family: cursive; font-size: 1.2em; padding: 5px;"> Install 1' high curbing around perimeter. Drive through portion should have trench drain on either side connected to sanitary sewer. </div>																																										
SITE CONSTRAINTS																																										
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Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																										

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input checked="" type="checkbox"/> Obtain utility mapping		
<input checked="" type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input checked="" type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S)			

Retrofit Site ID: B10-1
Description: Gate 34 Triturator

Potential Retrofit

Details: Containment walls

Picture



Attached

- RRI Form

Retrofit Reconnaissance Investigation (RRI)

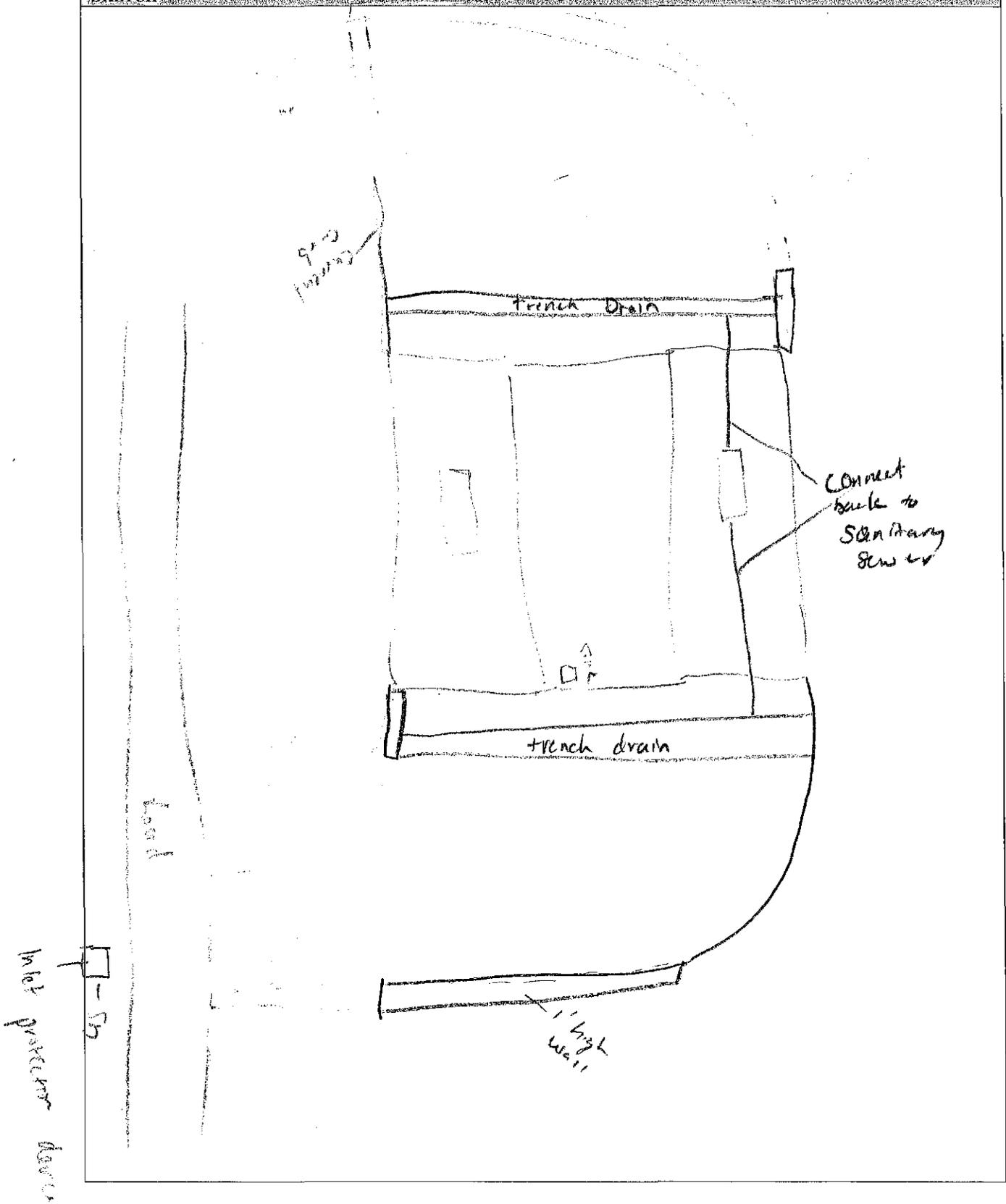
DATE: <u>July 19, 2010</u>		INVESTIGATOR: <u>K.D. / CW</u>	
WATERSHED: <u>Manunui</u>		BASIN: <u>B10</u>	SITE ID: <u>B10-1</u>
SITE DESCRIPTION			
Name: <u>Crate 34 Triturator</u>			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈		Drainage Area Land Use:	
Imperviousness ≈	%	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈		<input type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input checked="" type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice:		<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No
If Yes, Describe:		<input type="checkbox"/> Possible	
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
<u>Triturator slopes down to MS4 storm drain</u>			
Existing Head Available and Points Where Measured:			
<u>N/A</u>			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																										
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																										
Retrofit Volume Computations – Target Storage:		Retrofit Volume Computations – Available Storage:																																								
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input checked="" type="checkbox"/> Other: <i>containment</i>																																										
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="font-family: cursive; font-size: 1.2em; margin-top: 10px;"> Containment concrete berms around trieractor perimeter </div>																																										
SITE CONSTRAINTS																																										
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input checked="" type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other:		Access: <input type="checkbox"/> No Constraints Constrained due to: <input checked="" type="checkbox"/> Slope <input checked="" type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input checked="" type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																								
Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:																																										
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 15%; text-align: left;">Yes</th> <th style="width: 15%; text-align: left;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>		Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	Potential Permitting Factors: <table style="width: 100%; border-collapse: collapse; margin-top: 5px;"> <thead> <tr> <th style="width: 70%;"></th> <th style="width: 15%; text-align: center;">Probable</th> <th style="width: 15%; text-align: center;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>			Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other factors:		
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Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p>May need to consider trench drain for water fall-off during washing. Connect back to sanitary sewer.</p> <p>Consider extending roofed area to prevent storm water from overloading sanitary sewer.</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Retrofit Site ID: D11-2
Description: Maintenance Baseyard

Potential Retrofit

Details: Evaporation area for sweeper wash out.

Aerial Picture

*From Bing Maps



Attached

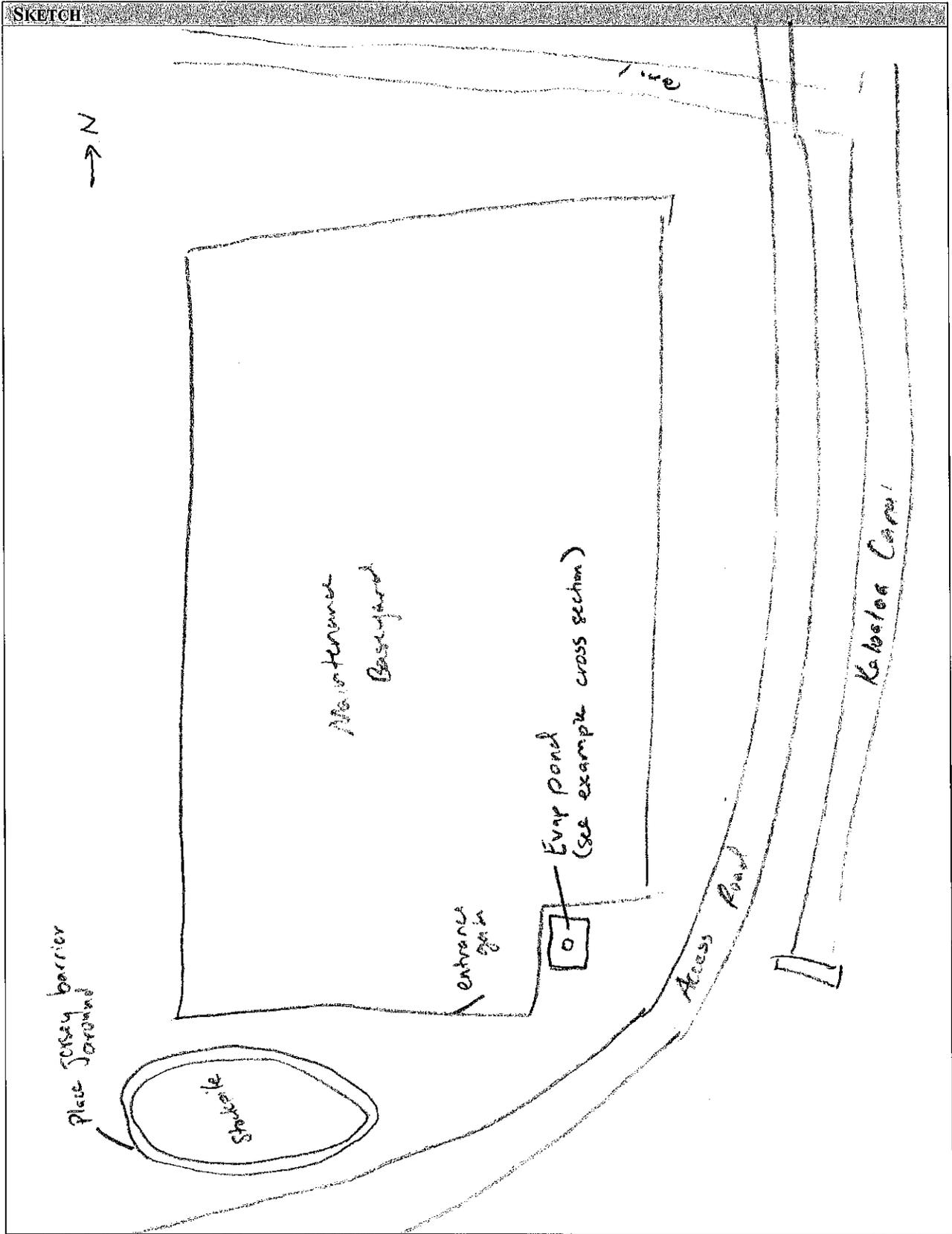
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

DATE: <i>July 19, 2010</i>	INVESTIGATOR: <i>KD / CW</i>		
WATERSHED: <i>Kechi</i>	BASIN: <i>D11</i>	SITE ID: <i>D11-2</i>	
SITE DESCRIPTION			
Name: <i>Maintenance Bayyard</i>			
Address:			
Land Use:	<input checked="" type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ <i>11.05 ac</i>	Drainage Area Land Use:		
Imperviousness ≈ <i>100</i> %	<input checked="" type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ <i>11.05 ac</i>	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input checked="" type="checkbox"/> Other: <i>DOTA</i>	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: <i>Safe Drains by Fuel Area's CWS in Maint. Shop</i>			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance: <i>Drains to Kahoe Iou Canal</i>			
Existing Head Available and Points Where Measured:			

Retrofit Reconnaissance Investigation (RRI)

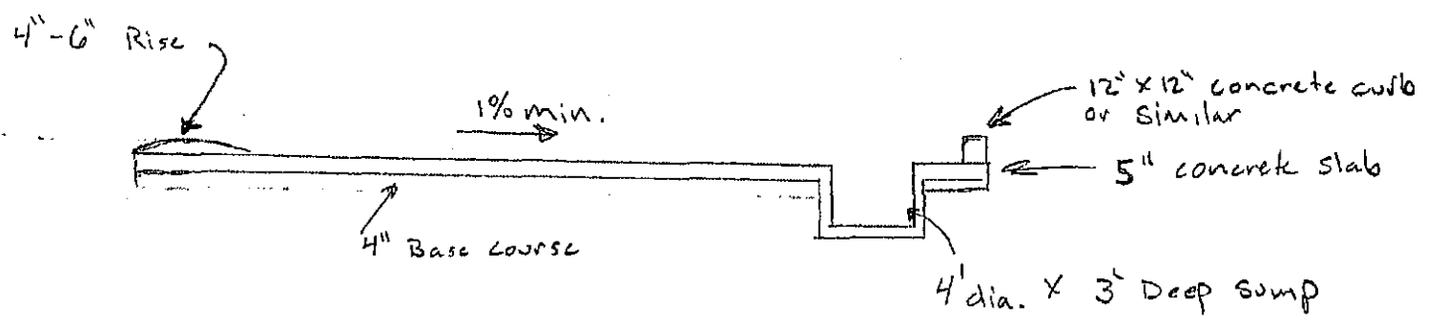
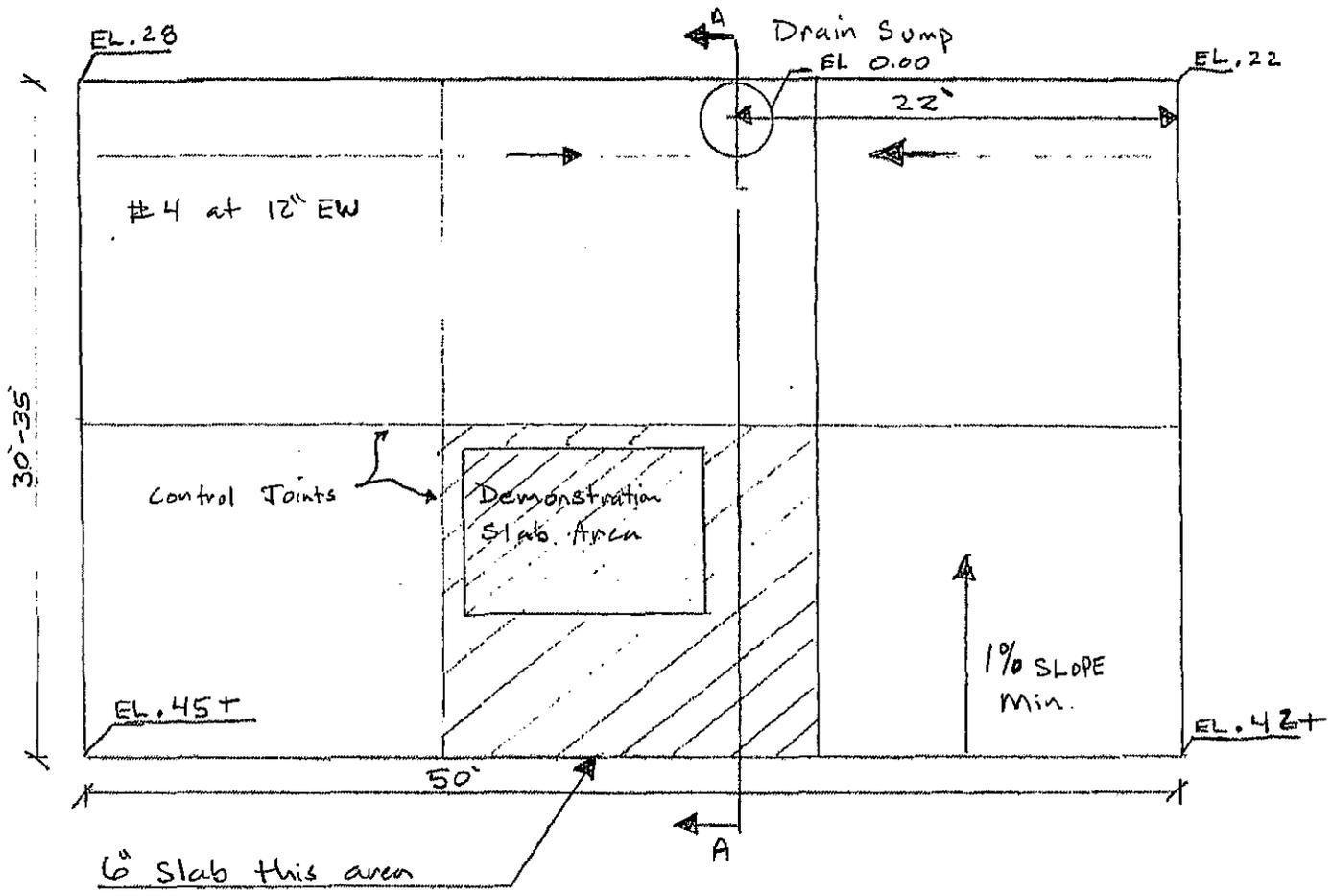
PROPOSED RETROFIT																																								
Purpose of Retrofit: <input type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input checked="" type="checkbox"/> Other: <i>Contain Sweeper rubbish</i>																																								
Retrofit Volume Computations – Target Storage: 	Retrofit Volume Computations – Available Storage: 																																							
Proposed Treatment Options: <input type="checkbox"/> Extended Detention <input type="checkbox"/> Dry Pond <input type="checkbox"/> Created Wetland <input type="checkbox"/> Bioretention <input type="checkbox"/> Filtering Practice <input type="checkbox"/> Infiltration <input type="checkbox"/> Swale <input checked="" type="checkbox"/> Other: <i>Evap Pond</i>																																								
Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <i>Evaporation area to wash out sweeper. Once dry move solids to disposal bins.</i>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input checked="" type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:	Access: <input type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input checked="" type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
<p style="font-size: 1.2em; margin: 0;">Worst Part * Concrete berms</p>			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

Example Evap Pond for Sweeper Rubbish



SECTION AA

Retrofit Site ID: E-2
Description: Building 180 Autobody Shops

Potential Retrofit

Details: Place a filter along CMU wall holes

Picture



Attached

- Autocad Drainage Map
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

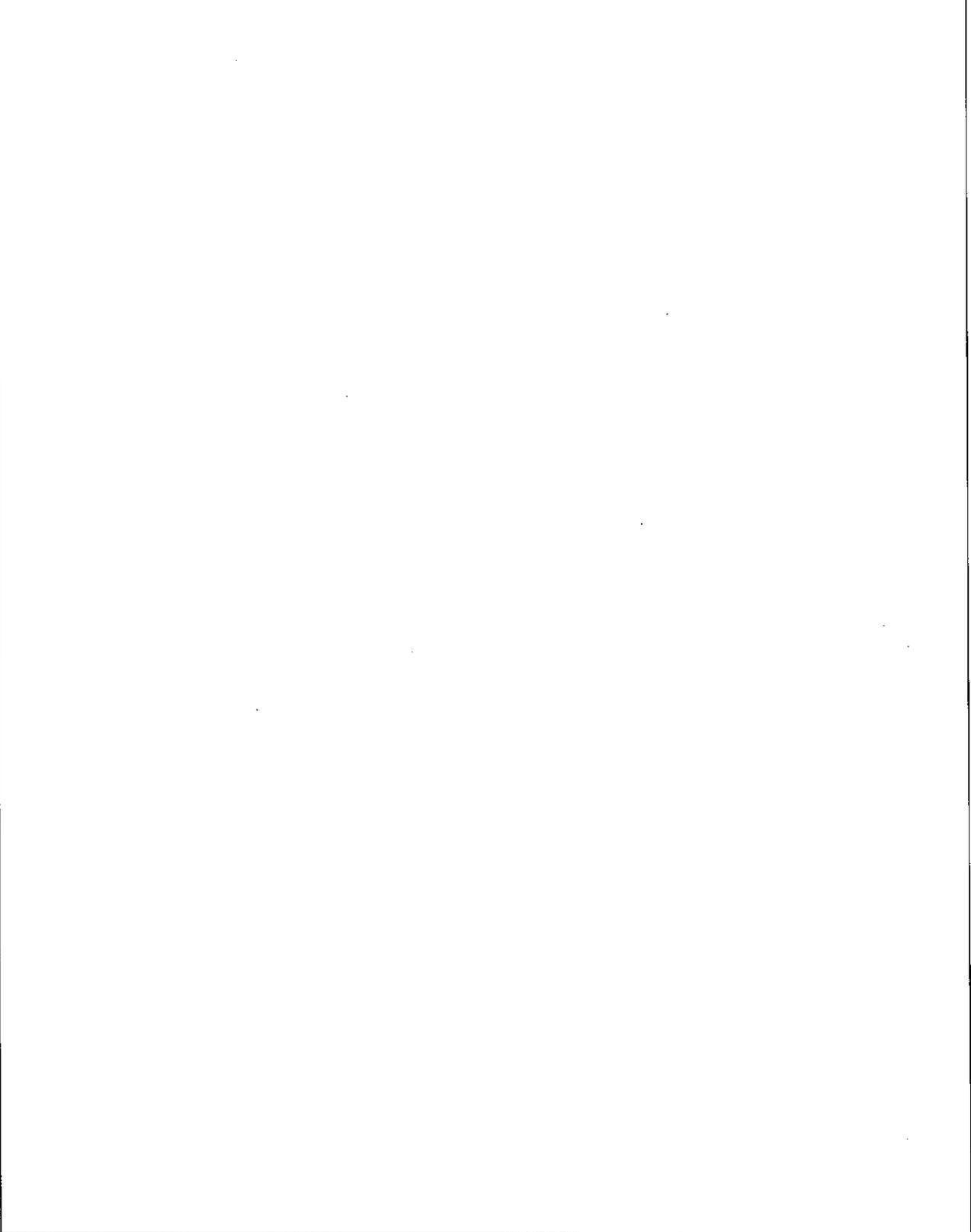
DATE: 7/28/10	INVESTIGATOR: CW/KD		
WATERSHED:	BASIN: E	SITE ID: E-2	
SITE DESCRIPTION			
Name: Source Control Bldg 180 auto body shops			
Address: Bldg 180			
Land Use: Auto Body	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
PROPOSED RETROFIT LOCATION:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input checked="" type="checkbox"/> Other: source control		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 0.605 ac		Drainage Area Land Use:	
Imperviousness ≈ 100 %		<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military
Impervious Area ≈ 100		<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park
Notes:		<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped
		<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe: grassed swale			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
water collected in pkg lot passes through drain holes in CMU wall, water flows to grassed swale			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																											
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																											
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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="font-family: cursive; padding: 10px;"> Prevent contaminants from spray painting/sanding activities from entering grassed swale. Use wattles or filters to collect contaminants before CMU wall. Adjust work practices to ensure leaking equipment is not present. Install concrete pad for sanding activities and sweep it following use. Wash equipment/cars in approved areas only. </div>																											
SITE CONSTRAINTS																											
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other:		Access: SD required! <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																									
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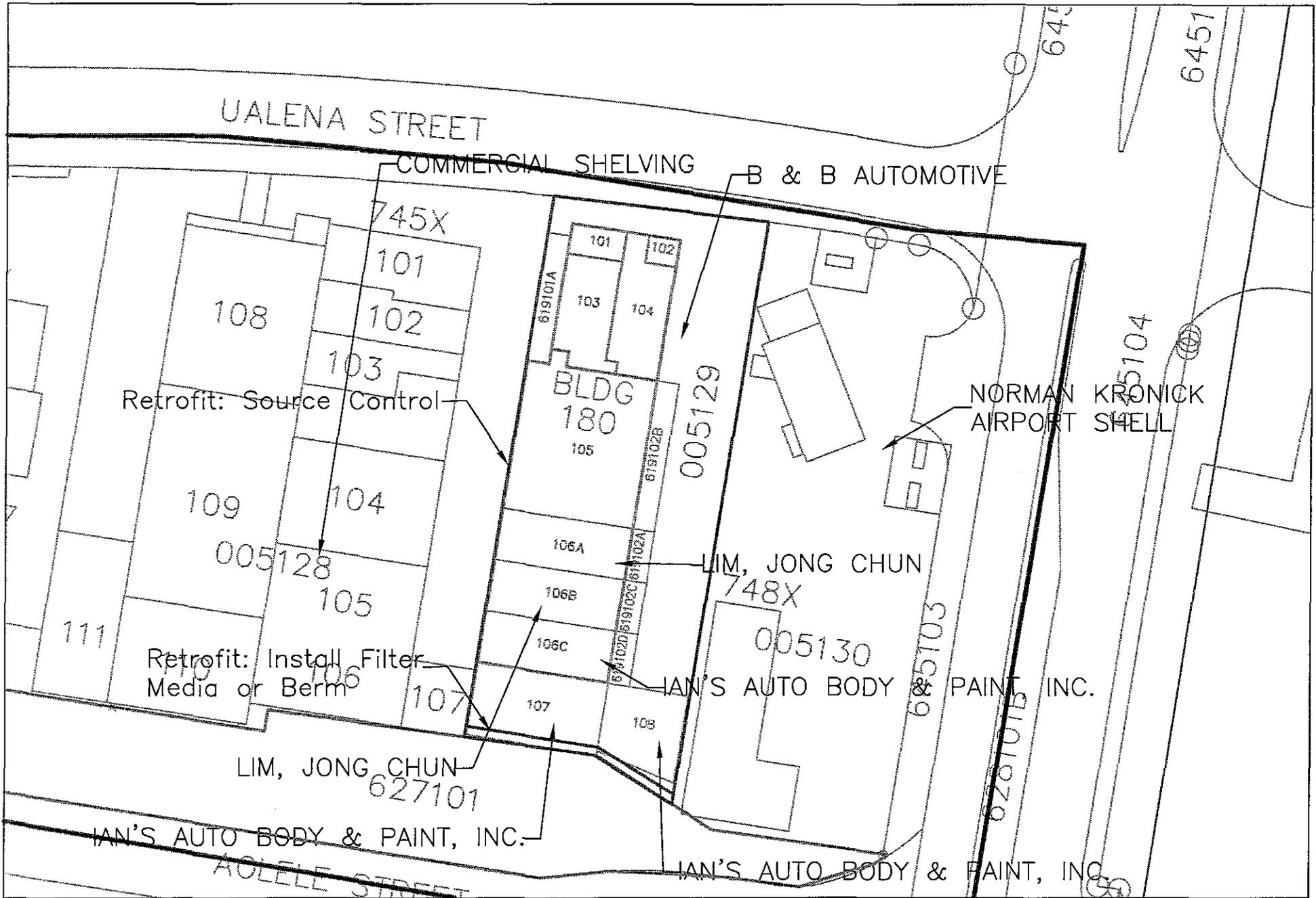
Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em;">Tenant would^{may} be responsible for retrofits Facility may be impacted by rail construction.</p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S)			



Retrofit Site ID: E-3
Description: 2875 Ualena Street

Potential Retrofit

Details: Storm drain insert. Consider an oil water separator to address washing activities.

Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

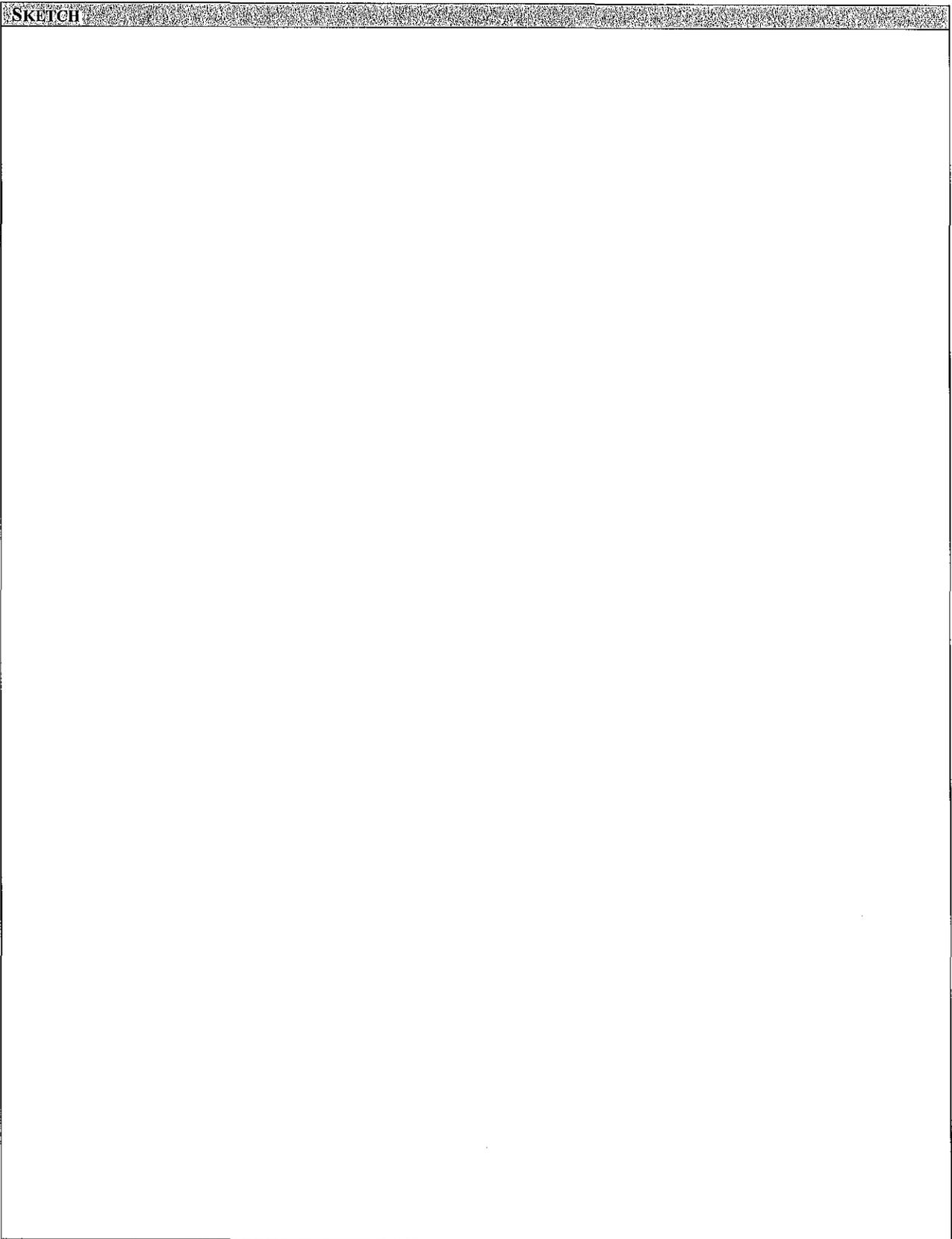
DATE: 7/28/10	INVESTIGATOR: CW/KD		
WATERSHED:	BASIN: E	SITE ID: E-3	
SITE DESCRIPTION			
Name: 2875 Valena St			
Address:			
Land Use: Commercial	<input type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input checked="" type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 0.522 ac	Drainage Area Land Use:		
Imperviousness ≈ 0.522 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 0.522 ac	<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Sheet flow to SD on north side along Valena St and out of roof drains to grassed area to the south			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="font-family: cursive; padding-left: 40px;"> Source Control Drain pans under cars, proper storage of petroleum products, maintenance and washing in designated area 'SD retrofit (OWS?) </div>																																								
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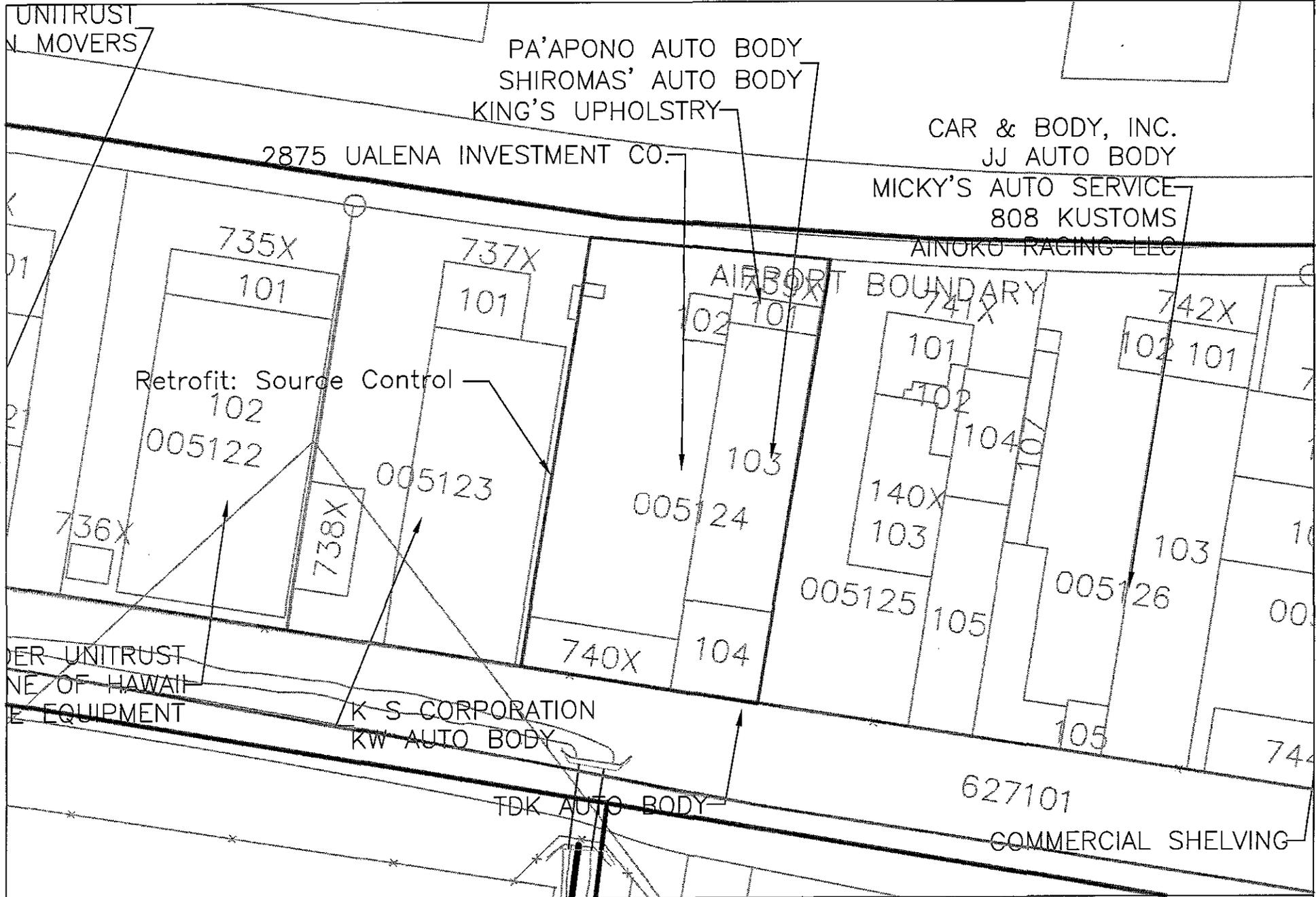
Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-family: cursive;">Tenant may be responsible for retrofits</p> <p style="font-family: cursive;">Facility may be impacted by rail construction.</p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			



EnviroServices &
Training
Center LLC

Sketch of Retrofit E 3

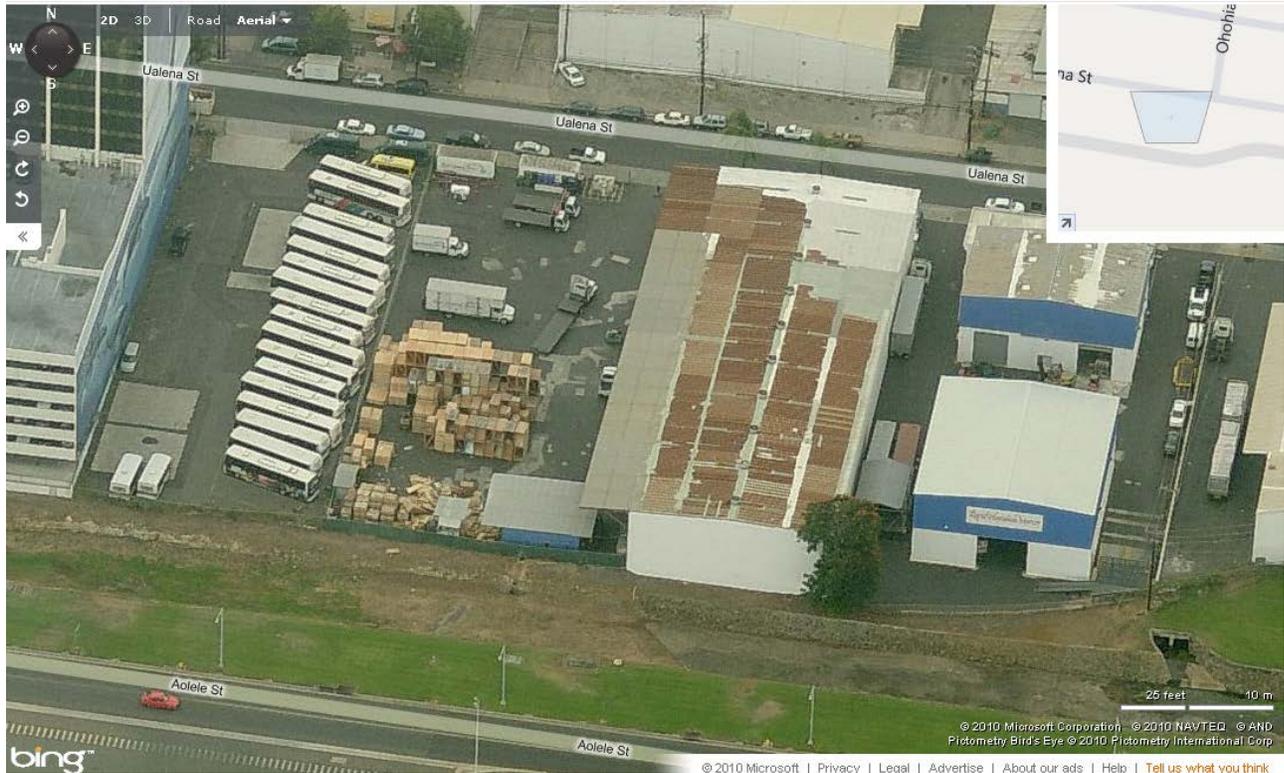
Retrofit Site ID: E-4
Description: Royal Hawaiian Movers

Potential Retrofit

Details: Storm drain insert and berm around pallet storage area.

Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

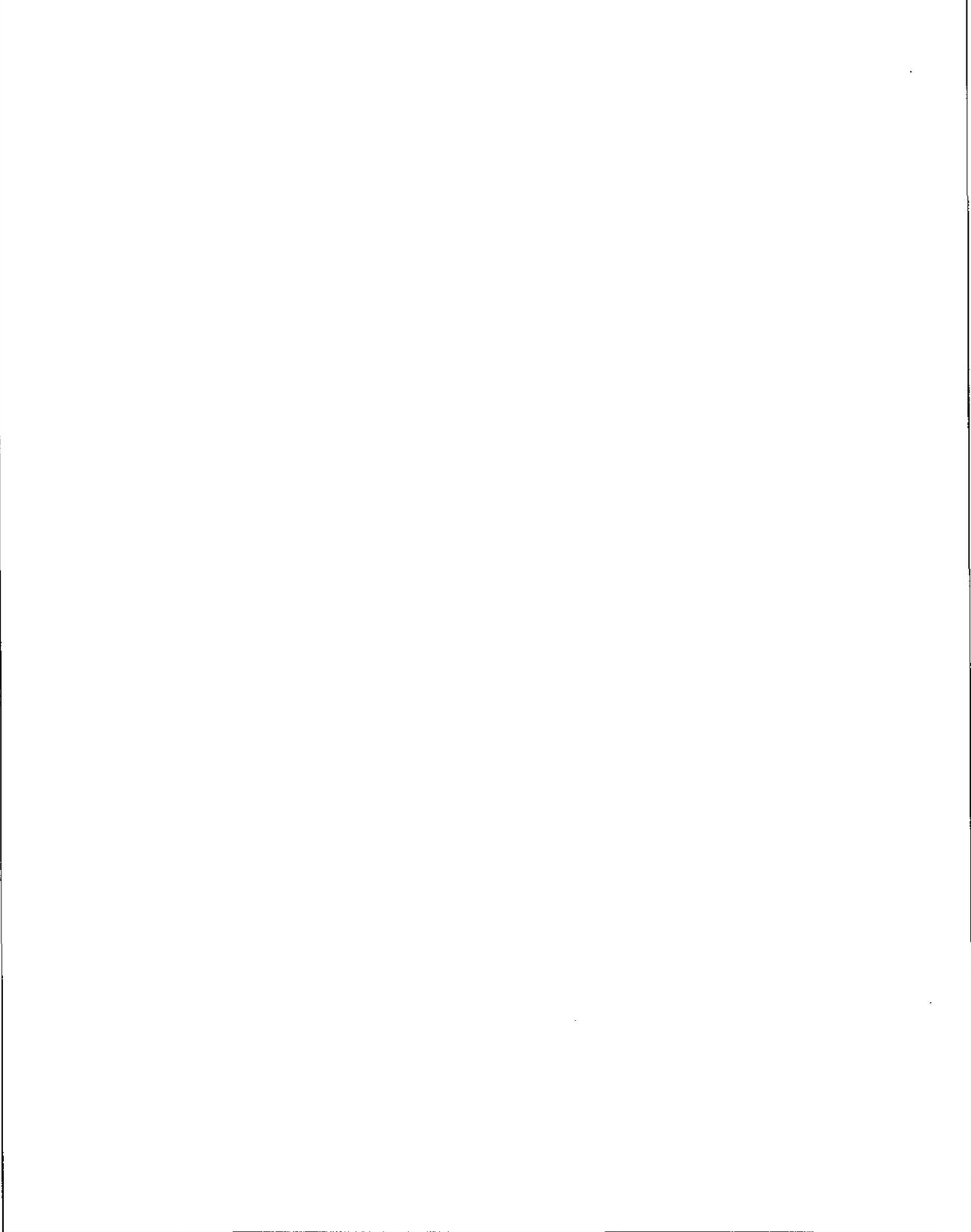
DATE: 7/29/10	INVESTIGATOR: CW/KD		
WATERSHED:	BASIN: E	SITE ID: E-4	
SITE DESCRIPTION			
Name: Royal Hawaiian Movers			
Address: 3071 Ualena St			
Land Use: Commercial	<input type="checkbox"/> DOTA	<input type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 1.94 ac	Drainage Area Land Use:		
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 1.94 ac	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
sheet flow to sd on Ualena and to grass area makai. drain inlets lead to grass open ditch			
Existing Head Available and Points Where Measured: NA			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <i>Source Control</i> <div style="font-family: cursive; font-size: 1.2em; padding-left: 20px;"> Drain pans under parked cars. proper maintenance of fork lifts, vehicle repair/wash in proper areas. Prevent runoff from ^{encountering} waste pallets, install in let protection. </div>																																								
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Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
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<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em; margin: 0;"><i>tenant may be responsible for retrofits</i></p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

FOREST CORPORATION
ROYAL HAWAIIAN MOVERS

SERVEND OF HAWAII, INC.

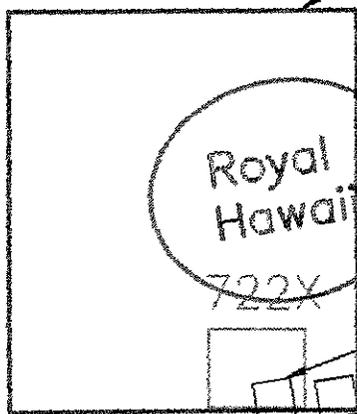
S. LTD.
INC.

Source
Cisterns



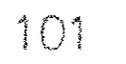
005110

AIRPORT BOUNDARY
FILTERS, INC.



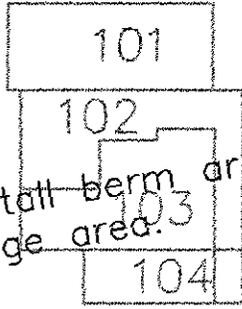
005111

721X



102

723X

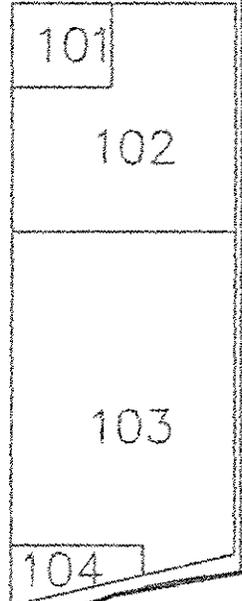


Retrofit: Install berm around
pallet storage area.

005112



725X



005113

MOKUAIAI ASSOCIATES
ROYAL HAWAIIAN MOVERS



Sketch of Retrofit E-4

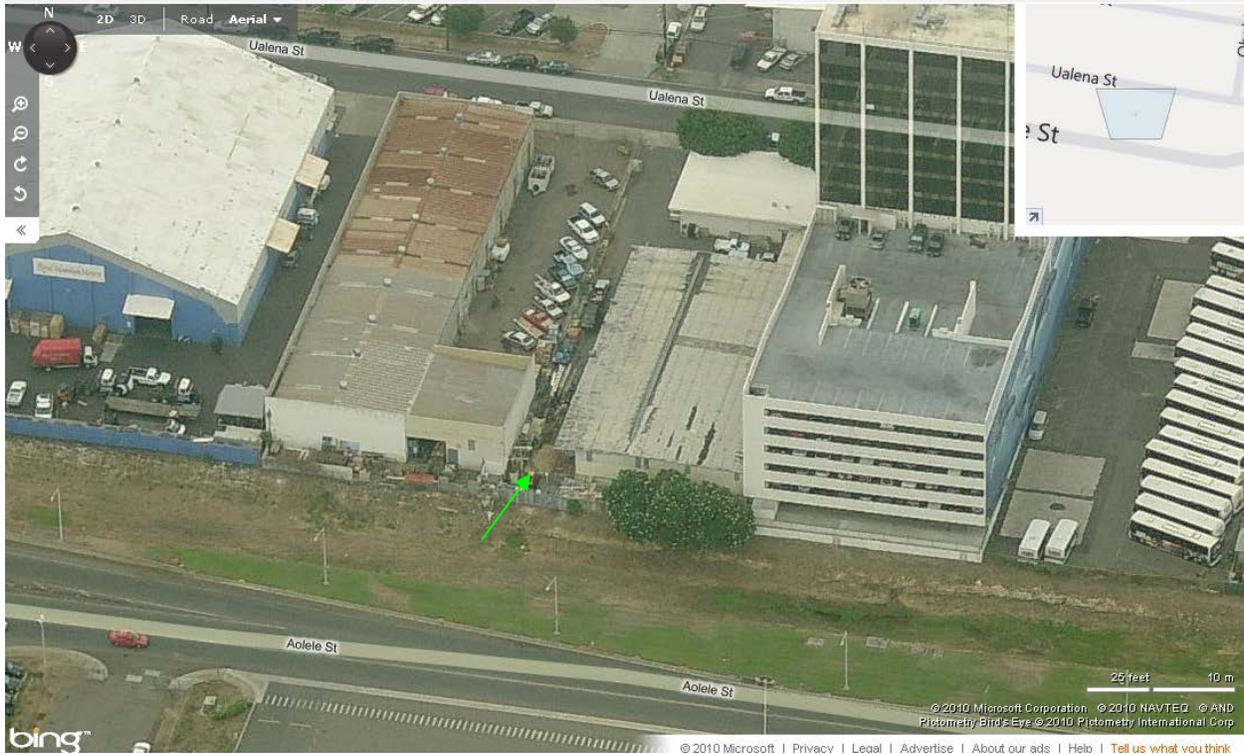
Retrofit Site ID: E-5
Description: Punaluu Builders

Potential Retrofit

Details: Storm drain insert.

Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

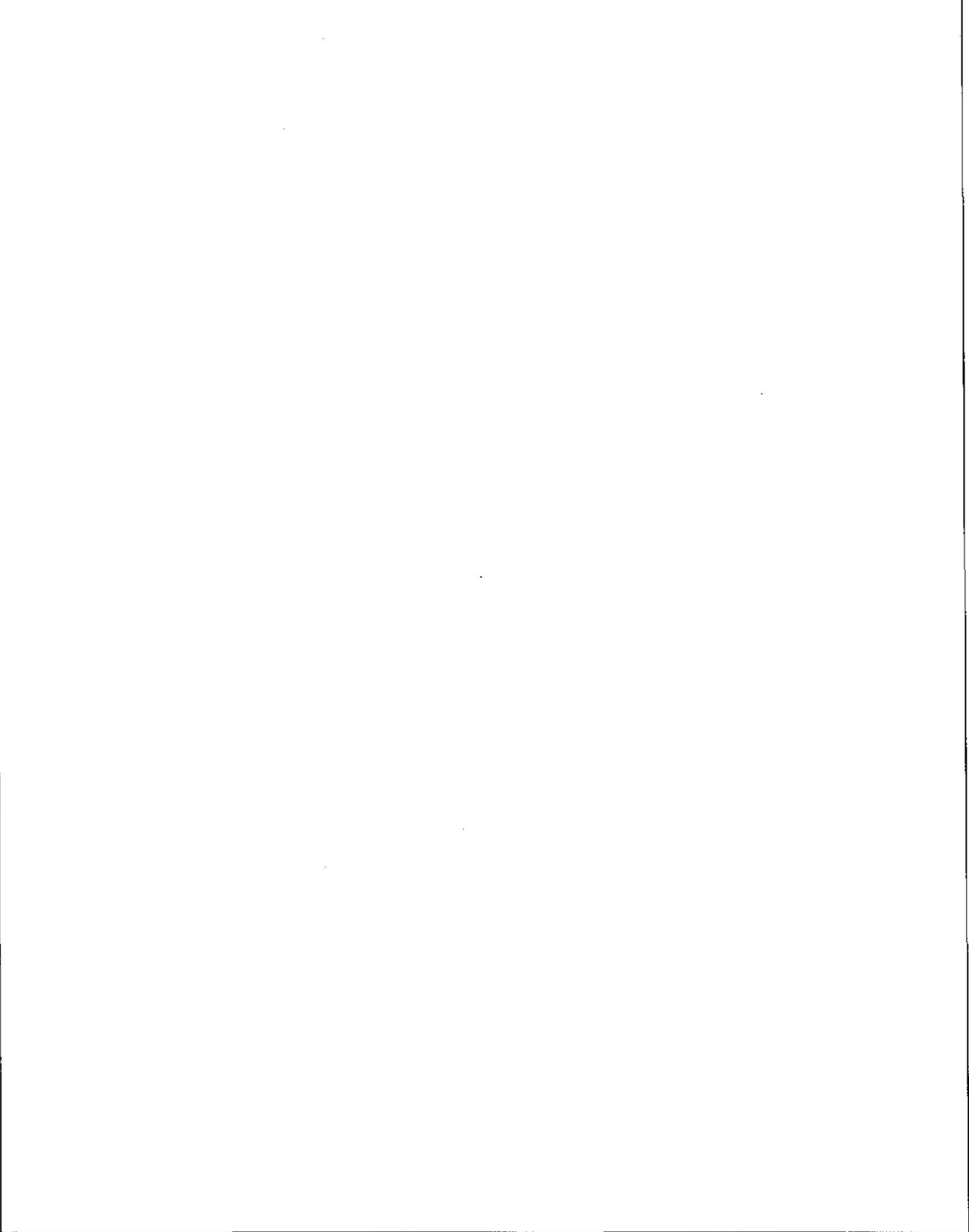
DATE: 7/29/10	INVESTIGATOR: CW/KD		
WATERSHED:	BASIN: E	SITE ID: E-5	
SITE DESCRIPTION			
Name: Punaluu Builders			
Address: 3059 Halena St			
Land Use: Commercial	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input checked="" type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 1.20	Drainage Area Land Use:		
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 1.20 ac	<input type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
sheet flow to Halena Sds. & grassed area makai, roof drains exit to grassed area makai sd on property leads to open ditch,			
Existing Head Available and Points Where Measured: N/A			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																										
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																										
Retrofit Volume Computations – Target Storage: 		Retrofit Volume Computations – Available Storage: 																																								
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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <i>Source Control</i> <i>move any debris machinery affected by runoff away from makai fence. filter roof drains or collect stormwater in cisterns. perform maintenance / washing activities in appropriate areas. install sd filter</i>																																										
SITE CONSTRAINTS																																										
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No If Yes, Describe:		Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																								
Conflicts with Existing Utilities: <input type="checkbox"/> None <input checked="" type="checkbox"/> Unknown <table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; width: 15%;">Yes</th> <th style="text-align: left; width: 15%;">Possible</th> <th style="width: 70%;"></th> </tr> </thead> <tbody> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Sewer</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Water</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Jet Fuel Lines</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Electric</td> </tr> <tr> <td><input type="checkbox"/></td> <td><input type="checkbox"/></td> <td>Other:</td> </tr> </tbody> </table>		Yes	Possible		<input type="checkbox"/>	<input type="checkbox"/>	Sewer	<input type="checkbox"/>	<input type="checkbox"/>	Water	<input type="checkbox"/>	<input type="checkbox"/>	Jet Fuel Lines	<input type="checkbox"/>	<input type="checkbox"/>	Electric	<input type="checkbox"/>	<input type="checkbox"/>	Other:	<table style="width: 100%; border: none;"> <thead> <tr> <th style="text-align: left; width: 60%;">Potential Permitting Factors:</th> <th style="text-align: center; width: 15%;">Probable</th> <th style="text-align: center; width: 25%;">Not Probable</th> </tr> </thead> <tbody> <tr> <td>Impacts to Wetlands</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Stream / Canal</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Impacts to Shoreline</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Dewatering</td> <td style="text-align: center;"><input type="checkbox"/></td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> </tr> <tr> <td>Area over 1 acre</td> <td style="text-align: center;"><input checked="" type="checkbox"/></td> <td style="text-align: center;"><input type="checkbox"/></td> </tr> <tr> <td>Other factors:</td> <td></td> <td></td> </tr> </tbody> </table>		Potential Permitting Factors:	Probable	Not Probable	Impacts to Wetlands	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Stream / Canal	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Impacts to Shoreline	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Dewatering	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Area over 1 acre	<input checked="" type="checkbox"/>	<input type="checkbox"/>	Other factors:		
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Other factors:																																										
Soils: Soil auger test holes: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of poor infiltration (clays, fines): <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of shallow bedrock: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No Evidence of high water table (gleying, saturation): <input checked="" type="checkbox"/> Yes <input type="checkbox"/> No																																										

Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
<input type="checkbox"/> Confirm drainage area impervious cover	<input type="checkbox"/> Obtain utility mapping		
<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em; margin: 0;"><i>tenant may be responsible for retrofits</i></p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

HAWAII INDUSTRIAL SERVICES, LTD.

FOREST C ROYAL HAWAII

712x005106A

BLDG 183

BLDG 189

101

102

101A

101B

101C

101D

101E

HAWAII INDUSTRIAL SERVICES, LTD.
PUNALUU BUILDERS, INC.

005108

Retrofit: Source Control
Install Cisterns or Rain Barrels

721X Control &
101

103C

103A

103B

005107

BOUNDARY

005109

BOUNDARY

005110

PUNALUU BUILDERS, INC.

PUNALUU BUILDERS, INC.

Punaluu Builders

BLDG 192

Retrofit: Install Inlet Filter

PUNALUU BUILDERS, INC.

005106B

104

102

103

101

102

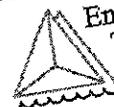
104

103

PUNALUU BUILDERS, INC.

OPEN DITCH

MOVERS



EnviroServices & Training Center LLC

Sketch of Retrofit E-5

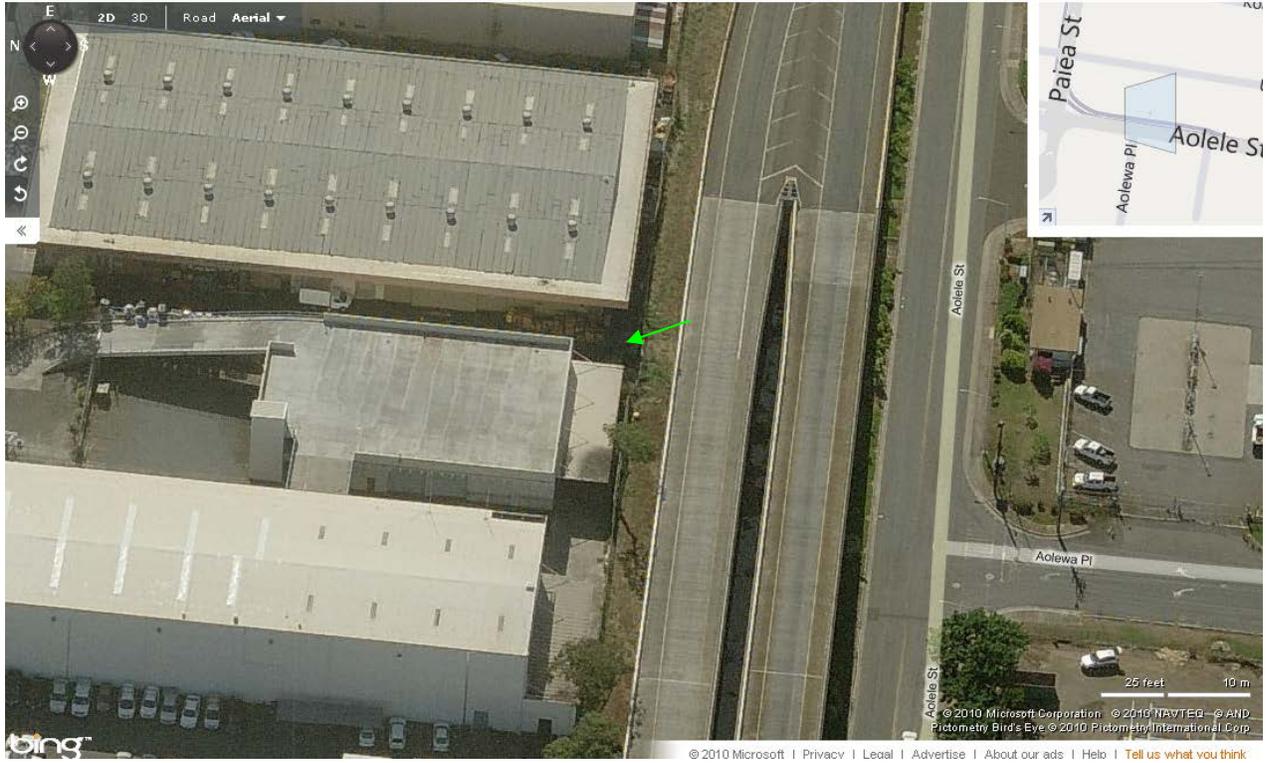
Retrofit Site ID: E-6
Description: So Ono Foods

Potential Retrofit

Details: Trash enclosure.

Aerial Picture

*From Bing Maps



Attached

- Autocad Drainage Map
- RRI Form

Retrofit Reconnaissance Investigation (RRI)

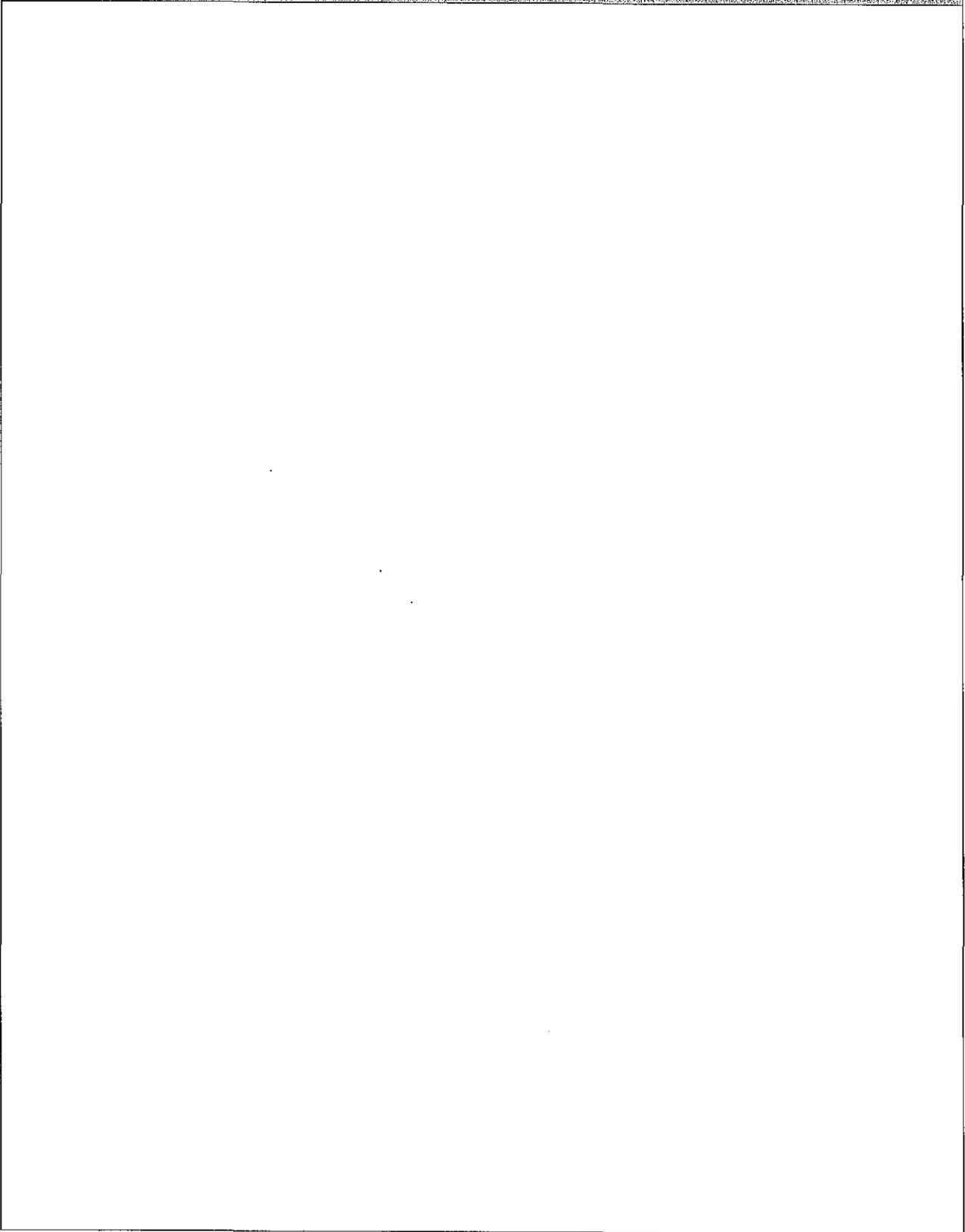
DATE: 7/29/10	INVESTIGATOR: OW/KD		
WATERSHED:	BASIN: E	SITE ID: E-6	
SITE DESCRIPTION			
Name: So Ono Food Products			
Address: 3259 Walena St			
Land Use: Commercial	<input type="checkbox"/> DOTA	<input checked="" type="checkbox"/> Tenant	<input type="checkbox"/> Unknown
Proposed Retrofit Location:			
Storage		On-Site	
<input type="checkbox"/> Above Roadway Culvert	<input type="checkbox"/> Below Outfall	<input checked="" type="checkbox"/> Hotspot Operation	<input type="checkbox"/> Small Parking Lot
<input type="checkbox"/> In Conveyance System	<input type="checkbox"/> Large Parking Lot	<input type="checkbox"/> Individual Streets	<input type="checkbox"/> Individual Rooftops
<input type="checkbox"/> Other:		<input type="checkbox"/> Small Impervious Area	<input type="checkbox"/> Landscapes / Hardscape
		<input type="checkbox"/> Underground	<input type="checkbox"/> Other:
DRAINAGE AREA TO PROPOSED RETROFIT			
Drainage Area ≈ 1.20 ac	Drainage Area Land Use:		
Imperviousness ≈ 100 %	<input type="checkbox"/> Industrial	<input type="checkbox"/> Federal / Military	
Impervious Area ≈ 1.20 ac	<input checked="" type="checkbox"/> Commercial	<input type="checkbox"/> Park	
Notes:	<input type="checkbox"/> Airport Common Use	<input type="checkbox"/> Undeveloped	
	<input type="checkbox"/> Vacant	<input type="checkbox"/> Other:	
EXISTING STORM WATER MANAGEMENT			
Existing Storm Water Practice: <input type="checkbox"/> Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> Possible			
If Yes, Describe:			
Describe Existing Site Conditions, Including Existing Site Drainage and Conveyance:			
Food Waste from trash bins enters storm drain grass/dirt area then drainage canal, sheet flow to sd and grassed area, roof drains lead to parking lot			
Existing Head Available and Points Where Measured: NA.			

Retrofit Reconnaissance Investigation (RRI)

PROPOSED RETROFIT																																								
Purpose of Retrofit: <input checked="" type="checkbox"/> Water Quality <input type="checkbox"/> Recharge <input type="checkbox"/> Channel Protection <input type="checkbox"/> Flood Control <input type="checkbox"/> Demonstration / Education <input type="checkbox"/> Repair <input type="checkbox"/> Other:																																								
Retrofit Volume Computations – Target Storage:	Retrofit Volume Computations – Available Storage:																																							
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Describe Elements of Proposed Retrofit, Including Surface Area, Maximum Depth of Treatment, and Conveyance: <div style="font-family: cursive; font-size: 1.2em; margin-top: 10px;"> Install trash enclosure/seal trash cans to prevent food waste runoff. </div>																																								
SITE CONSTRAINTS																																								
Adjacent Land Use: <input type="checkbox"/> Industrial <input type="checkbox"/> Federal / Military <input checked="" type="checkbox"/> Commercial <input type="checkbox"/> Park <input type="checkbox"/> Airport Common Use <input type="checkbox"/> Undeveloped <input type="checkbox"/> Residential <input type="checkbox"/> Other: Possible Conflicts Due to Adjacent Land Use? <input type="checkbox"/> Yes <input type="checkbox"/> No If Yes, Describe:	Access: <input checked="" type="checkbox"/> No Constraints Constrained due to: <input type="checkbox"/> Slope <input type="checkbox"/> Space <input type="checkbox"/> Utilities <input type="checkbox"/> Tree Impacts <input type="checkbox"/> Structures <input type="checkbox"/> Tenant Activities <input type="checkbox"/> Airport Operations <input type="checkbox"/> Other:																																							
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Retrofit Reconnaissance Investigation (RRI)

SKETCH



Retrofit Reconnaissance Investigation (RRI)

DESIGN OR DELIVERY NOTES			
FOLLOW-UP NEEDED TO COMPLETE FIELD CONCEPT			
<input type="checkbox"/> Confirm land usage	<input checked="" type="checkbox"/> Obtain existing storm water practice as-builts		
<input type="checkbox"/> Determine inclusion in modernization plan	<input checked="" type="checkbox"/> Obtain site as-builts		
<input type="checkbox"/> Confirm drainage area	<input type="checkbox"/> Obtain detailed topography		
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<input type="checkbox"/> Confirm volume computations	<input type="checkbox"/> Confirm storm drain invert elevations		
<input type="checkbox"/> Complete concept sketch	<input type="checkbox"/> Confirm soil types		
<input type="checkbox"/> Other:			
INITIAL FEASIBILITY AND CONSTRUCTION CONSIDERATIONS			
<p style="font-size: 1.2em; font-family: cursive;">tenant may be responsible for retrofit</p>			
SITE CANDIDATE FOR FURTHER INVESTIGATION:	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IS SITE CANDIDATE FOR EARLY ACTION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF NO, SITE CANDIDATE FOR OTHER RESTORATION PROJECT(S):	<input checked="" type="checkbox"/> YES	<input type="checkbox"/> NO	<input type="checkbox"/> MAYBE
IF YES, TYPE(S):			

703x
101
SO ONO
102
103

FOOD PRODUCTS
005102

704x
101

Retrofit:
Source Control
Trash Enclosure
102

705x
101
102
103

SO ONO

BLDG.
187
(706x)

706x
101
102
103

ROYAL HAWAIIAN
005104B

MID PACIFIC S

105

107

005103

UP RAMP TO SECOND LEVEL

UP RAMP TO THIRD LEVEL

PEN DITCH

Sketch of Retrofit E-6

EnviroServices &
Training
Center LLC



110