

State of Hawaii
DEPARTMENT OF LAND AND NATURAL RESOURCES
Engineering Division
Honolulu, Hawaii 96813

July 27, 2012

Board of Land and Natural Resources
State of Hawaii
Honolulu, Hawaii

**AUTHORIZE THE APPROVAL AND ISSUANCE OF
A DLNR DAM SAFETY CONSTRUCTION/ALTERATION PERMIT NO. 60
DAM OUTLET REPLACEMENT FOR PAUWELA RESERVOIR (MA-0096)
HAIKU, MAUI, HAWAII**

The Engineering Division hereby submits an application for your approval and authorization for the Chairperson and Department to stipulate conditions and issue a Dam Safety Construction/Alteration Permit for the subject permit application, "PAUWELA RESERVOIR OUTLET VALVE REPLACEMENT", pursuant to Hawaii Revised Statutes Chapter 179D.

APPLICANT:

Mr. Mark Vaught
Superintendent, Administration & Maintenance Operations
East Maui Irrigation Company
497 Baldwin Avenue
Paia, Maui, Hawaii 96779

LANDOWNER:

Mr. Nelson Chun
Senior Vice President & Chief Legal Officer
Alexander & Baldwin, Inc.
822 Bishop Street
Honolulu, HI 96813
TMK: (2) 2-7-003:030, (2) 2-7-003:056, (2) 2-7-008:038, (2) 2-7-008:039

SUMMARY OF REQUEST:

Application for a Dam Safety Construction/Alteration Permit for the replacement and relocation of the outlet valve to the upstream side of the embankment for Pauwela Reservoir, Haiku, Maui, Hawaii (See Exhibit 1)

LOCATION: Napili, Maui, Hawaii

TMK: (2) 2-7-003:030 – A&B – Hawaii Inc
TMK: (2) 2-7-003:056 – A&B – Hawaii Inc
TMK: (2) 2-7-008:038 – A&B Properties, Inc
TMK: (2) 2-7-008:039 – A&B - Hawaii Inc (See Exhibit 2)

BACKGROUND:

The dam at the Pauwela Reservoir was constructed in 1904 as a water storage and distribution system for the sugar plantations on Maui. There are no known construction drawings of the dam and it appears to be a typical earthen embankment of the early plantation era. The dam was noted to have excessive seepage in the 1980s and a toe drain was constructed to control and monitor the seepage.

The embankment at the Pauwela Reservoir is 47 feet high, has a length of 270 feet, and serves as a paved county road (Kauhikoa Road). The surface area of the reservoir at the dam crest is approximately 6.8 acres. The dam impounds 98 ac-ft of water at the crest. There is an uncontrolled concrete box culvert spillway at the left abutment which passes flows under Kauhikoa Road. The outlet consists of a trash rack protecting a drop box inlet in the bottom of the basin. Water is routed through the embankment via a 14 inch diameter pipe and flow is currently controlled with a downstream gate valve. The dam has a size classification of "intermediate" and hazard potential classification of "high". (See Exhibit 3)

A September 2010 Phase I Dam Inspection Report Review by GEI Consultants, Inc. determined that the dam's overall condition was "CONDITIONALLY FAIR". The potential dam safety deficiencies and recommended actions noted were to evaluate the condition of the low level outlets, consider upstream control, establish a monitoring program, update the hydrologic analysis, and update the stability analysis. The work covered under this permit is to install an upstream control valve.

An application for the outlet modification of the Pauwela Reservoir was filed on November 7, 2011 by the operator, East Maui Irrigation (EMI), on behalf of Alexander and Baldwin, Inc., the dam owner.

PROJECT DESCRIPTION:

East Maui Irrigation is proposing to install an upstream control valve at the reservoir. This will prevent the outlet pipe from being pressurized at all times and is considered to be a dam safety improvement. The manually operated valve will be installed at the end of an inclined stem which will extend up the upstream slope of the embankment. A trash rack will be installed over the valve inlet to prevent debris from clogging the outlet pipe. These improvements should have little effect on the embankment at the facility as very little earth on the upstream face of the dam will be disturbed during the construction sequence. (See Exhibit 4)

CHAPTER 343 – ENVIRONMENTAL ASSESSMENT:

The project is entirely on privately owned lands and does not trigger the requirement for an environmental assessment. (See Exhibit 5)

REMARKS:

The applicant (EMI) and the owner (Alexander & Baldwin) have completed a basis of design, plans and specifications for the proposed outlet modification. East Maui Irrigation has requested for the approval of the submitted dam safety construction/alteration permit. The staff of the Engineering Division's Dam Safety Unit has reviewed the documents and concluded that they are sufficient for their intended purposes. Staff recommends approval of this permit application along with the Dam Safety Permit General Conditions. (See Exhibit 6)

RECOMMENDATION:

That the Board:

1. Authorize the approval and issuance of the DLNR Dam Safety Construction/Alteration Permit Number 60 for the Dam Outlet Replacement at Pauwela Reservoir (MA-0096), Haiku, Maui, Hawaii; and
2. Direct the Chairperson to issue a dam safety permit for the dam outlet replacement at Pauwela Reservoir (DLNR Dam Safety Construction/Alteration Permit No. 60) subject to such other terms and conditions as may be prescribed by the Chairperson to best serve the interests of the State.
3. Authorize the Department to oversee the permitted work and take appropriate action including but not limited to selecting and procuring testing or professional services to verify and inspect the construction work, approve revisions and changes to the project or permit conditions, and issue fines and /or revoke the permit, if necessary.

Respectfully submitted,



CARTY S. CHANG
Chief Engineer

APPROVED FOR SUBMITTAL:



WILLIAM J. AILA, JR.
Chairperson

- Exhibit(s):
- 1 Owner Permit Application
 - 2 Location Map / TMK Map
 - 3 Site Images
 - 4 Partial Construction Drawing set
 - 5 Environmental Assessment Exemption Justification (Chapter 343 HRS)
 - 6 Dam Safety Permit General Conditions

State of Hawaii
BOARD OF LAND AND NATURAL RESOURCES
Department of Land and Natural Resources
Engineering Division

APPLICATION FOR APPROVAL OF PLANS AND SPECIFICATIONS FOR CONSTRUCTION,
ENLARGEMENT, REPAIR, ALTERATION, OR REMOVAL OF A DAM

Date of Application: 10/19/2011

Applicant:
Contact Name: Mark Vaught Firm / Company: East Maui Irrigation Co., Ltd.

Mailing Address P.O. Box 791628, Paia, HI 96779

Telephone: 808-579-9516 Fax: 808-579-9517 Email: mvaught@hcsugar.com

The Applicant hereby applies to the Board of Land and Natural Resources for the approval of the attached plans and specification for the Addition of upstream controls for Pauwela Reservoir (construction, etc.) in accordance with Chapter 179D HRS (as amended by Act 262, SLH 2006), and subject to the provisions, conditions, and limitations of the current Hawaii Administrative Rules and various DLNR dam safety guidelines.

Accompanying this application are: (please check)

- 1. Filing fee (\$25.00) (Waived for government agencies) _____
- 2. Three (3) copies of the Detailed Cost Estimate _____
- 3. Three (3) copies of the Final Design Report _____
- 4. Three (3) copies of the Plans _____
- 5. Three (3) copies of the Specifications _____
- 6. Proposed Construction Schedule _____
- 7. Supporting documents: _____

NAME OF STRUCTURE: Pauwela Reservoir

DAM OR RESERVOIR LOCATION: Haiku, Hawaii

Island: Maui Tax Map Key: (2)2-7-003:30,56; (2)2-7-008:38,39

Attach USGS topographic map (scale 1" = 2000') and property tax map (showing location access to site, proposed work)

State Land Use District: X Agriculture Urban Rural Conservation

BRIEF DESCRIPTION OF WORK TO BE PERFORMED

Install upstream control valve.

Exhibit 1

TECHNICAL INFORMATION:

1. Drainage Area 1.19 sq. miles or 762 acres
2. Classification of Dam High Hazard
3. Type of Structure Earthen Dam
4. Elevation-Area-Capacity Data:

| | Elevation | Surface Area (acres) | Total Storage Volume (acre-feet) |
|--------------------|---------------------------------|-------------------------|-------------------------------------|
| Natural Streambed | <u>414'+/-</u> | <u>0</u> | <u>0</u> |
| Primary Spillway | <u>435.5'+/-</u> | <u>6.8+/-</u> | <u>100+/-</u> |
| Secondary Spillway | <u>NA</u> | <u>NA</u> | <u>NA</u> |
| Top of Dam | <u>460'+/-</u> | <u>7.6+/-</u> | <u>142+/-</u> |
| Design Water Level | <u>Varies with rainfall</u> | | |
| Invert of Drain | <u>423.5'(assumed)upstream,</u> | | <u>414'downstream</u> |
5. Spillway Details (Type, Dimensions, Material)
Primary: Upstream - earthen, downstream - concrete lined riprap.
Secondary: _____
6. Purpose of Structure Irrigation water storage.
(water supply, irrigation, recreation, real estate development, etc.)
7. Attach rainfall and stream flow records, and flood-flow records and estimates (as accurately as may be readily obtained)

ADDITIONAL INFORMATION

1. Primary Owner Contact (if different from applicant) Same as applicant
Owner Company or Entity: _____
Mailing Address _____
Telephone: _____ Fax: _____ Email: _____
2. Registered Hawaii Professional Engineer who prepared the plan _____
Mailing Address _____
Registration No. _____
Telephone: _____ Fax: _____ Email: _____
3. Registered Professional Engineer to be responsible for inspection during construction _____
4. Contractor (If known) _____
Mailing Address _____
Telephone: _____ Fax: _____ Email: _____
5. List all other permits applications submitted to other governmental agencies:
N/A
6. Anticipated effect of proposed structure on natural environment: N/A

Exhibit 1

- 7. List all other parties that have ownership or other interest on the parcels where the dam and reservoir are located and identify their interest in the property. The Owners herein listed below concur with the work proposed within this application by the applicant and by his/her signing hereto, the owner of the land extends to the Board of Land and Natural Resources, and its designated representatives, a right-of-entry onto the project site to conduct any investigations or inspections required in compliance with the provisions of Chapter 13-190, Hawaii Administrative Rules. (Submit additional copies of this sheet should there be more owners)

Signature on Original

(Signature of Owner)

Applicant-address/Operator

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

Signature on Original

(Signature of Owner) **CHARLES W. LOOMIS**
ASST SECRETARY

(Address / Interest in Dam or Reservoir)

ALEXANDER & BALDWIN, INC. / Owner
P.O. Box 3440
Honolulu, Hawaii 96801

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

(Address / Interest in Dam or Reservoir)

(Signature of Owner)

(Address / Interest in Dam or Reservoir)

I Mark Vaught, the applicant, hereby certify that the information herein is true and factual to the best of my knowledge. Signing below indicates that the applicant understands that, if the permit requested is granted by the Board of Land and Natural Resources, the proposed work is to be initiated and completed within two (2) years of the approval date, unless specifically permitted in the approved permit terms and conditions.

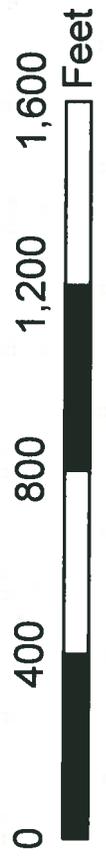
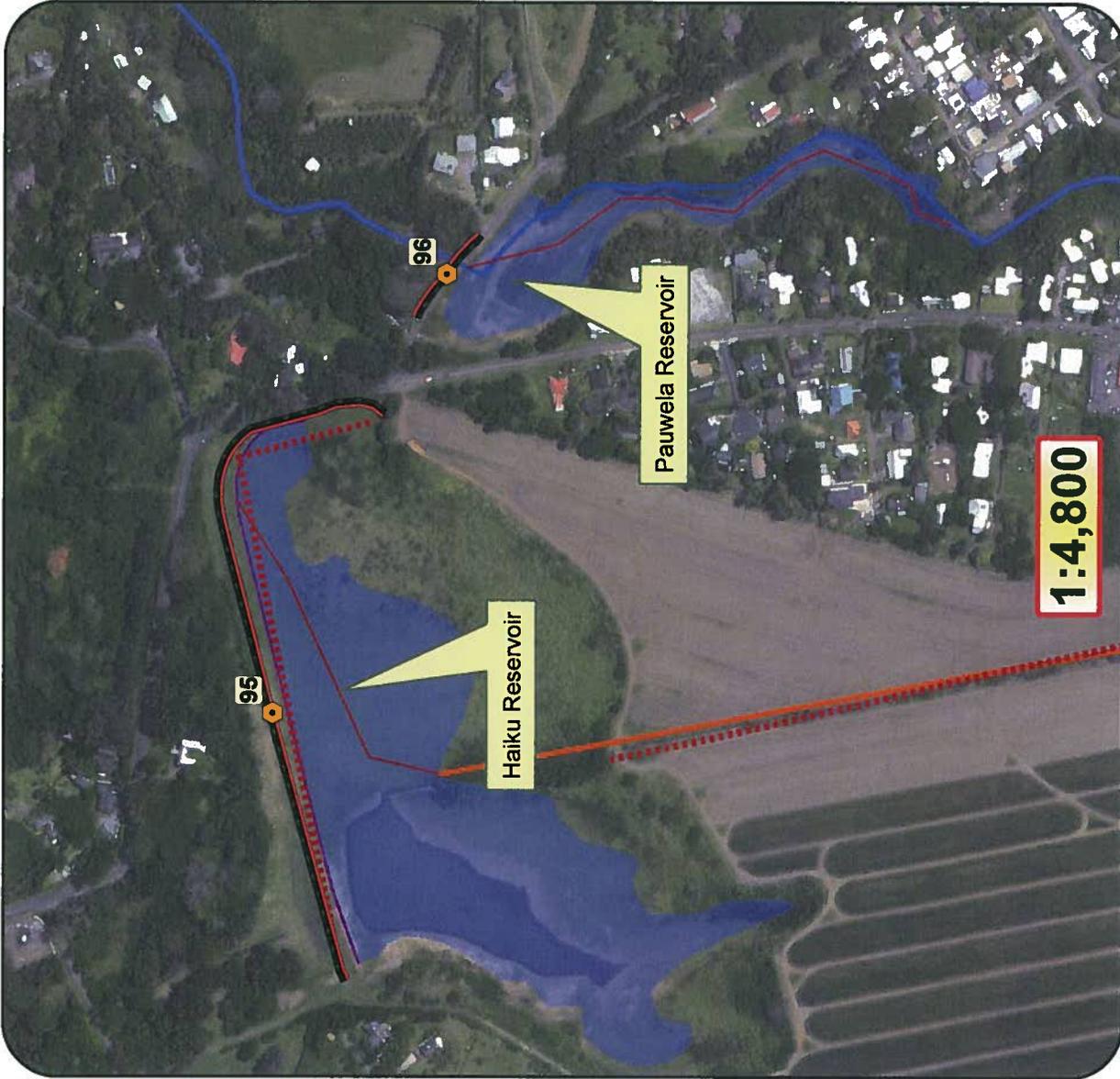
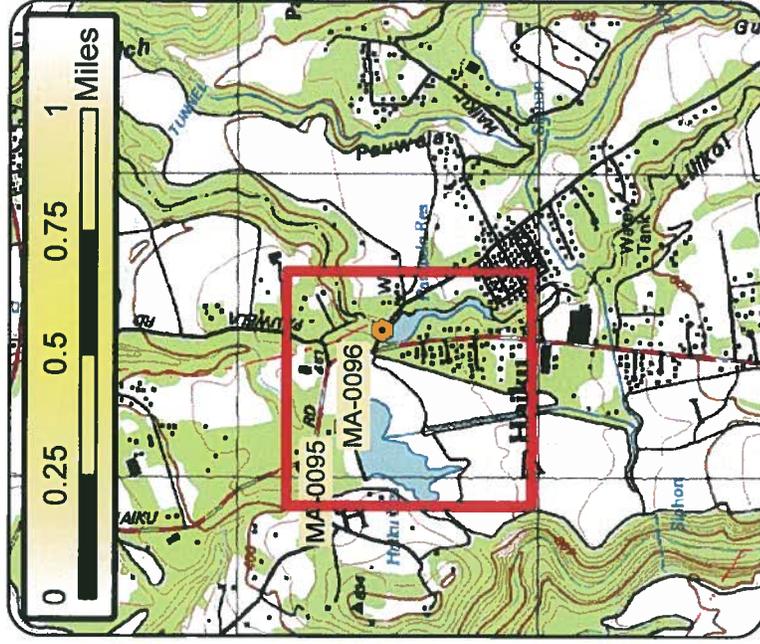
Signature on Original

(Signature of Applicant & Title)

s Manager

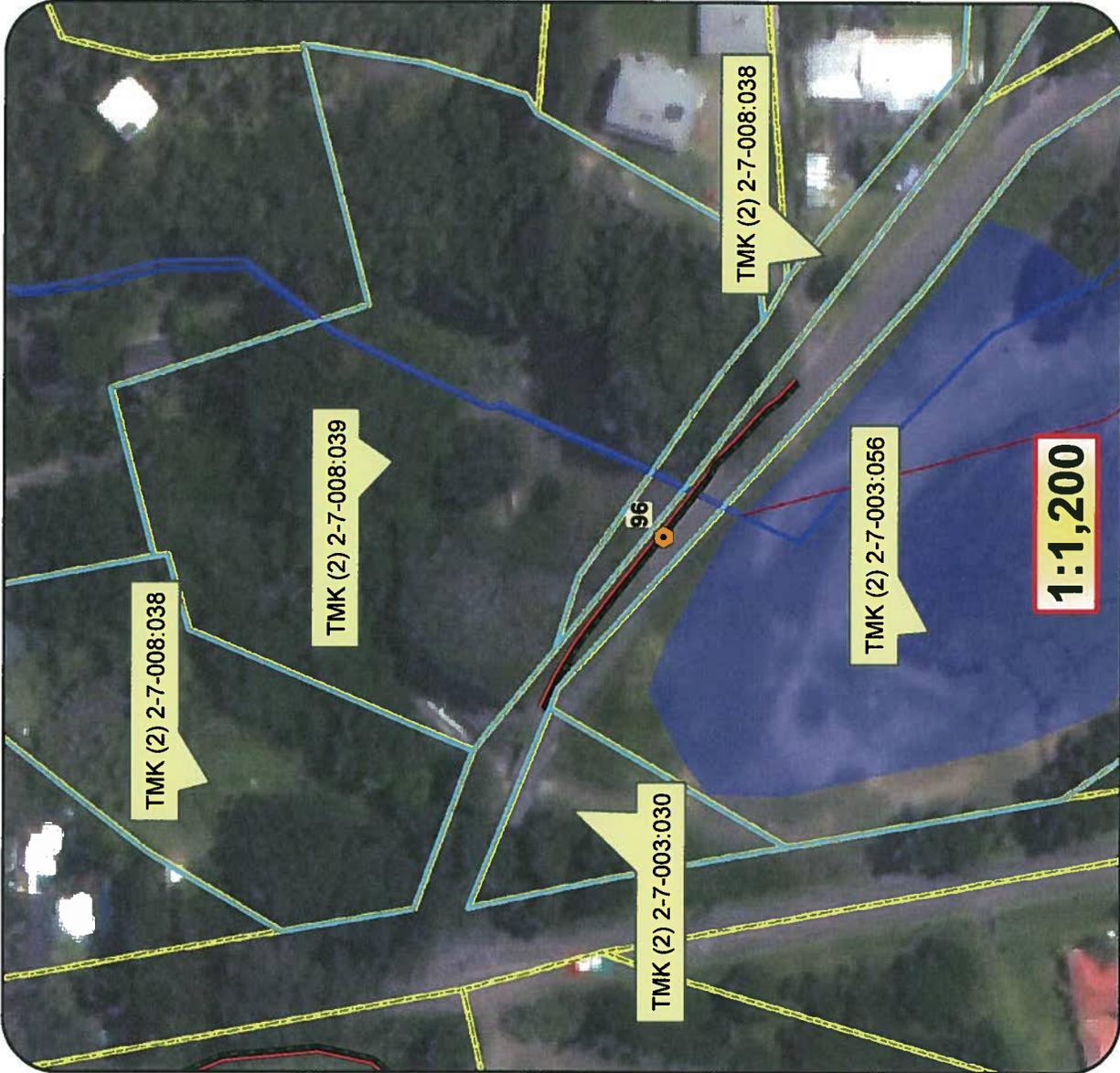
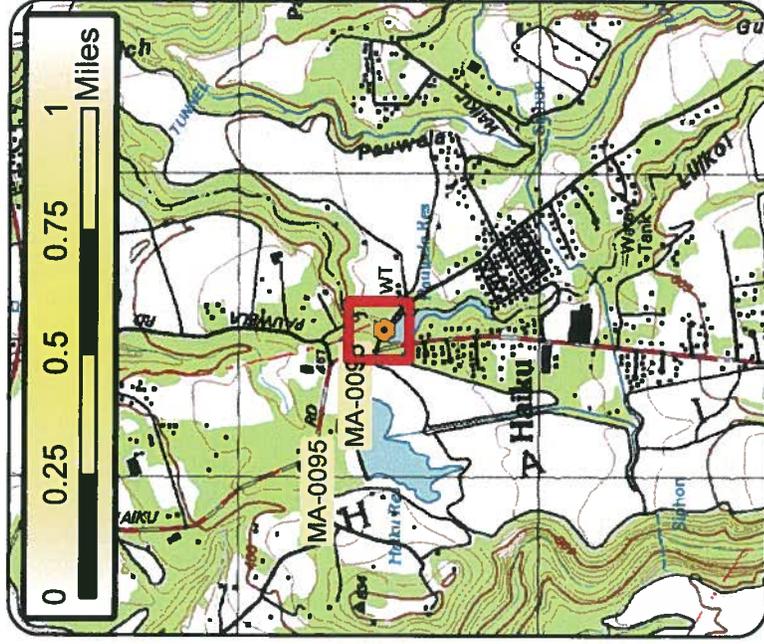
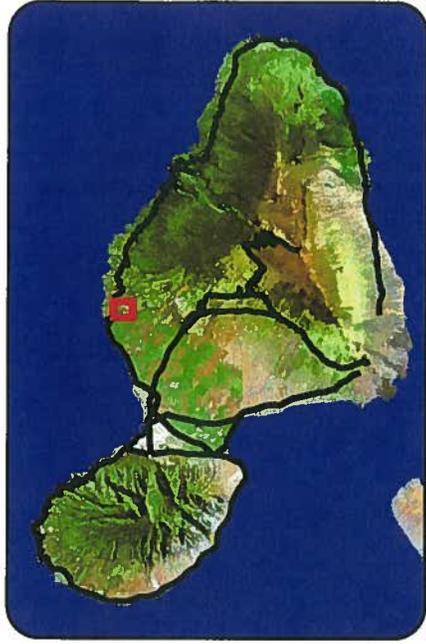
Date: 10/26/11

Exhibit 1



Pauwela Reservoir (MA-0096)

Exhibit 2



Pauwela Reservoir (MA-0096)

Exhibit 2



Exhibit 3

Pauwela Reservoir (MA-0096)

Upstream Slope on Left - Empty Basin



N 20.919065° W 156.323109°

03

18-05-2011 10:54 AM

Pauwela Reservoir (MA-0096)

Outlet Intake Trashrack



N 20.918810° W 156.322714°

22

18-05-2011 11:03 AM

Exhibit 3

Pauwala Reservoir (MA-0096)

Embankment Upstream Slope



N 20.918443° W 156.322934°

32

18-05-2011 11:14 AM

Pauwala Reservoir (MA-0096)

Outlet Works Operator - Downstream Control

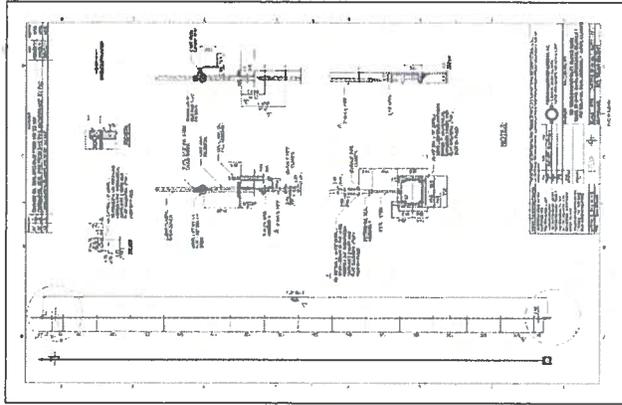


N 20.919313° W 156.322337°

45

18-05-2011 11:46 AM

Exhibit 3



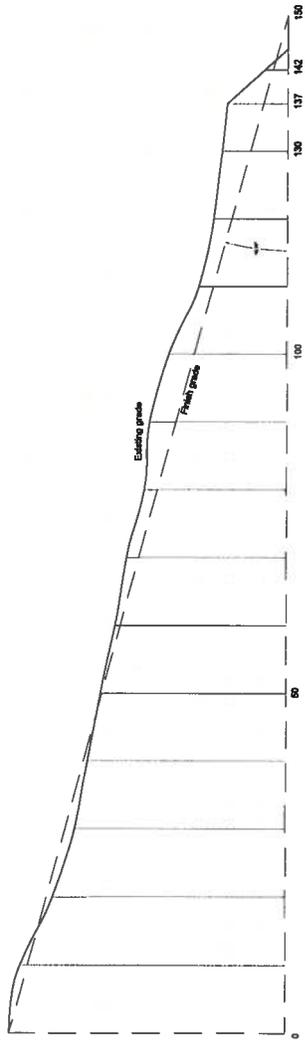
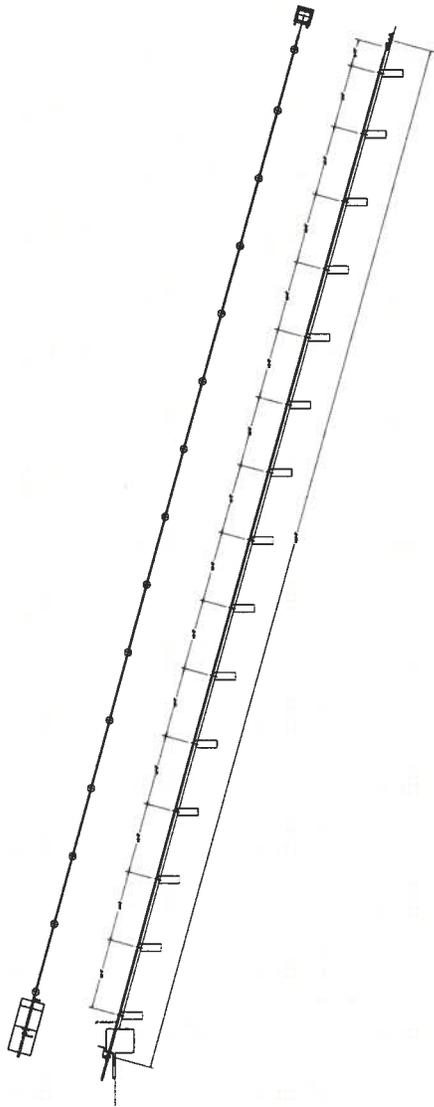
NO SCALE

HC&S
 HAWAIIAN COMMERCIAL & SINKER CO.
 A Division of A. B. S. Inc.
 Honolulu, Hawaii, Hawaii 96794

**PAUWELA RESERVOIR OUTLET VALVE
 REPLACEMENT
 - ASSEMBLY -**

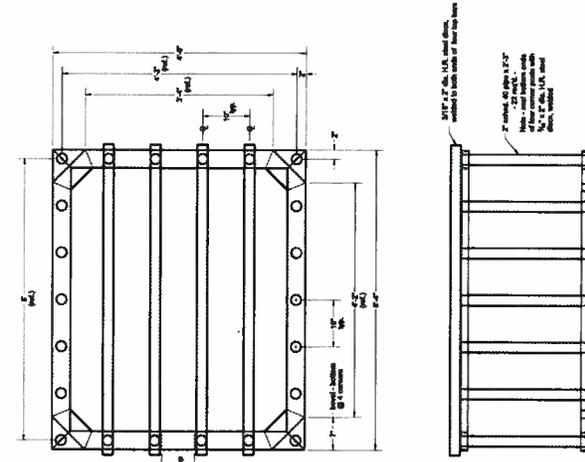
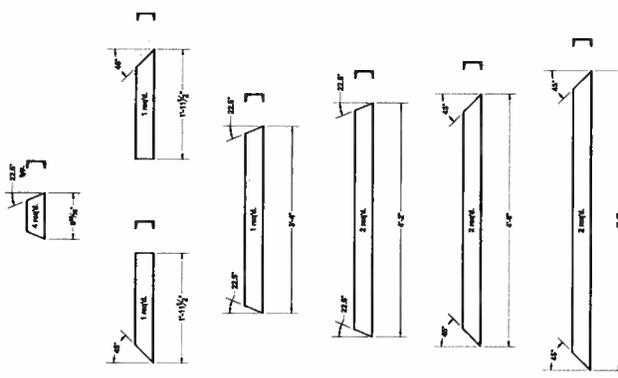
D. J. YOUNG
 T. C. WALKER
 2

THIS DRAWING WAS PREPARED BY ME
 OR UNDER MY CLOSE PERSONAL
 SUPERVISION AND I AM A LICENSED
 PROFESSIONAL ENGINEER IN THE
 STATE OF HAWAII. I AM NOT PROVIDING
 ANY GUARANTEE OR WARRANTY OF ANY
 KIND FOR THE DESIGN OR CONSTRUCTION
 OF THE PROJECT OR FOR THE RESULTS
 THEREOF.



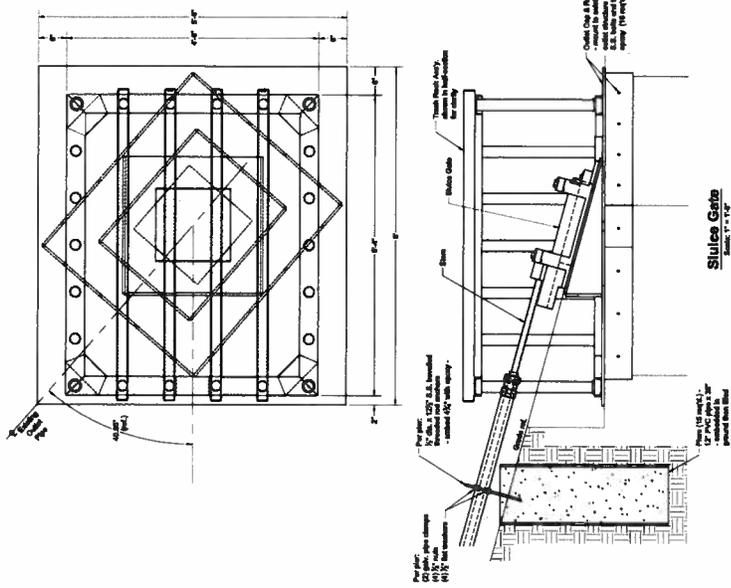
SCALE: 1/8" = 1'-0"

Exhibit 4



| NO. | DESCRIPTION | QTY. | UNIT |
|-----|---------------------------------|------|------|
| 1 | TRASH RACK ASSEMBLY | 1 | EA. |
| 2 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 3 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 4 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 5 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 6 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 7 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 8 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 9 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |
| 10 | 2" x 2" x 1/4" U.S. STEEL PLATE | 4 | EA. |

Trash Rack Ass'y.
Scale: 1" = 1'-0"



Sluice Gate
Scale: 1" = 1'-0"

Exhibit 4

HC&S
HAWMAN COMMERCIAL & SEAL CO.
A Division of H. B. Howard, Inc.
Pasadena, Wash., D.C. 20131-1979

PAUWELA RESERVOIR OUTLET VALVE REPLACEMENT - DETAILS -

D.A. YOUNG
T.C. WALKER
4

THE WORK HAS BEEN PROVIDED BY THE ARCHITECT FOR THE PURPOSE OF THE CONTRACTOR'S USE IN THE PREPARATION OF THE BIDDING DOCUMENTS. THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING ALL NECESSARY PERMITS AND FOR OBTAINING ALL NECESSARY INFORMATION FROM THE ARCHITECT AND THE OWNER. THE ARCHITECT'S LIABILITY IS LIMITED TO THE DESIGN OF THE WORK SHOWN HEREON. THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR THE CONSTRUCTION OF THE WORK OR FOR THE RESULTS THEREOF.

CHAPTER 343 ANALYSIS

Project Name: Upstream Control for Pauwela Reservoir (MA-0096)
Reviewer: John Dawley Date of Review: 10-November-2011

 EA Done with Finding of no Significant Impact (FONSI)
 EIS Done with Finding of no Significant Impact (FONSI)

If FONSI has been issued no further analysis is required. Date of FONSI: _____

TRIGGERS (HRS §343-5(a))

Is there an "action" that triggers the need for an EA?

Action

An "action" is a program or project:

 Initiated by an agency

 X Initiated by an "applicant"

Any person who, pursuant to statute, ordinance, or rule, officially requests "approval" for a proposed action (discretionary consent required from an agency prior to actual implementation of an action, distinguished from a ministerial consent)

 HRS 179D Statute
 Ordinance
 Rule

Triggers

- | Yes | No | |
|-----------|------------|--|
| <u> </u> | <u> X</u> | Use of state or county lands or funds |
| <u> </u> | <u> X</u> | Use of conservation district lands |
| <u> </u> | <u> X</u> | Use within shoreline setback area |
| <u> </u> | <u> X</u> | Use of historic site designated on the National or Hawaii registers |
| <u> </u> | <u> X</u> | Use of land in the Waikiki Special District |
| <u> </u> | <u> X</u> | Amendment to county general plan which would result in designations other than agriculture, conservation, or preservation unless initiated by a county |
| <u> </u> | <u> X</u> | Reclassification of conservation lands by the Land Use Commission |
| <u> </u> | <u> X</u> | Construction or modification of helicopter facilities that may affect conservation district lands, a shoreline setback area, or a historic site |
| <u> </u> | <u> X</u> | Wastewater facilities, waste-to-energy facility, landfill, oil refinery, or power-generating facility |

Triggers summary:

Is there a trigger? Yes No X

If Yes, Go to Exemptions to determine if the program or project is exempt
If it is not exempt an Environmental Assessment is required

If No, Environmental Assessment is NOT required. Go to Summary.

Exhibit 5

CHAPTER 343 ANALYSIS

- (b) Multi-unit structures designed for *not more than four dwelling units* if not in conjunction with the building of two or more such structures;
- (c) Stores, offices, and restaurants designed for total occupant load of *twenty persons or less* per structure, if not in conjunction with the building of two or more such structures; and
- (d) Water, sewage, electrical, gas, telephone, and other essential public utility services extensions *to serve such structures* or facilities; accessory or appurtenant structures including garages, carports, patios, swimming pools, and fences; and acquisition of utility easements

- _____ *Minor alterations* in the conditions of land, water, or vegetation
- _____ Basic data collection, research, experimental management, and resource evaluation activities that *do not result in a serious or major disturbance* to an environmental resource
- _____ Construction or placement of *minor structures accessory* to existing facilities
- _____ *Interior alterations* involving things such as partitions, plumbing, and electrical conveyances
- _____ Demolition of structures, *except* those structures located on any *historic site* as designated on the National or Hawaii registers
- _____ Zoning variances *except shoreline* set-back variances
- _____ Continuing administrative activities including, but not limited to purchase of supplies and personnel related actions; and
- _____ Acquisition of land and existing structures, including single or multi-unit dwelling units, for the provision of *affordable housing*, involving *no material change of use* beyond that previously existing, and for which the *legislature has appropriated* or otherwise authorized *funding*

Explain (how the exemption indicated above applies):

Exhibit 5

CHAPTER 343 ANALYSIS

Exemptions summary:

Does the Project qualify for an exemption? Yes ___ No ___

If Yes, Exemption noted above, No Environmental Assessment Required

If No, Project requires Environmental Assessment

CUMULATIVE IMPACT

Exemptions are inapplicable when the cumulative impact of planned successive actions in the same place, over time, is significant, or when an action that is normally insignificant in its impact on the environment may be significant in a particularly sensitive environment.

Additional Notes

SUMMARY

Is Environmental Assessment required?

Yes _____

No X

Exhibit 5

DAM SAFETY PERMIT GENERAL CONDITIONS

APPROVAL OF PLANS AND SPECIFICATIONS FOR DAM AND RESERVOIR CONSTRUCTION, ENLARGEMENT, REPAIR, ALTERATION OR REMOVAL

The following General Conditions shall be adhered to for all Dam Safety permits unless otherwise authorized in writing.

1. Actual construction, enlargement, repair, alteration or removal shall be completed within 5 years of issuance of the permit application approval unless an extension authorized in writing by the Board is issued.
2. Prior to the start of work the owner or applicant shall provide a construction engineer to ensure compliance with the approved plans and specifications and who shall have ultimate responsibility for the supervision of all inspection tasks. The construction engineer may assign some inspection tasks to a duly authorized agent under the construction engineer's supervision. The engineer shall be licensed in the State of Hawaii.
3. The construction engineer shall maintain a record of construction that at a minimum, shall include, daily activity, and progress reports, all test results pertaining to construction; photographs sufficient to provide a record of foundation conditions and various stages of the construction through completion, all geologic information obtained; and construction problems and remedies.
4. A construction quality assurance plan shall be prepared and submitted to the Department for approval prior to the start of construction, which details the minimum requirements of the construction engineer's observation of construction.
5. A construction schedule, which includes the notice to proceed date and estimated project duration and a construction emergency action plan shall be submitted prior to the preconstruction meeting.
6. A preconstruction meeting shall be held subsequent to submitting the quality assurance plan, construction schedule and construction emergency action plan, but not later than 14 days prior to the start of construction. All parties actively involved in the construction should be requested to attend, such as the dam owner, the design engineer, the construction engineer, the contractor and the Department.
7. The Department shall be notified 5 calendar days prior to the commencement of construction.
8. Any changes from the approved plans and specifications shall be approved by the design engineer and a change order, including details and supporting calculations, must be provided to the Department. Major changes must be submitted in writing with supporting documentation and approved in writing by the Department. No work shall be initiated until the approval by the Department or Board is received. Minor changes may be transmitted verbally and approved by the Department verbally provided that documentation of the change is provided to the Department within 10 days of the approval.

Exhibit 6

9. For new dam construction and for dams and reservoirs that have lowered the water level or have been drained to facilitate construction, the construction engineer shall file and obtain approval of a filling plan with the Department. The applicant/owner shall not proceed with the filling of the reservoir until it receives permission from the Department. The construction engineer shall provide documentation of monitoring during the filling operation.
10. Prior to the filling of the reservoir, the construction engineer shall submit one copy each of the approved Operations Manual and the approved Emergency Action Plan for the facility upon completion of the project as applicable.
11. The construction engineer shall give the Department at least ten days advanced notice of initial materials placement of the dam's foundation, in the cutoff trench, outlet backfill, outlet foundation, and any appurtenance requested by the Department in the approval of the plan for construction observation, to allow for observation by the Department.
12. Notice of substantial completion shall be issued by the construction engineer to the Department stating that the permitted improvements are functionally complete such that filling of the reservoir can be initiated with an approved filling plan.
13. The construction engineer shall give the Department fifteen (15) calendar days advance written notice prior to the project's final construction inspection. The construction engineer shall coordinate with the Department to conduct this inspection in the presence of the Department's dam safety personnel.
14. The construction engineer shall provide notice at least ten (10) days prior to initiating filling the reservoir, unless agreed at the final inspection.
15. If conditions are revealed which will not permit the construction, enlargement, repair, alteration, or removal of a safe dam or reservoir, the application for approval for construction, enlargement, repair, alteration, or removal shall be revoked.
16. A topographic survey of completed work including all monuments, inverts, crest alignment, spillways, and significant appurtenant features, when required by the Department shall be completed.
17. The applicant/owner shall utilize appropriate erosion control best management practice measures during construction to minimize turbidity (such as scheduling of work during period of low stream flow) and prevent debris and construction materials, including concrete, petroleum products, and other pollutants from enter the waters of the State. Construction related water and debris should be properly disposed of in a legal and environmentally safe manner and in accordance with the Department of Health and other Federal regulations.
18. The applicant/owner shall submit a copy of the dam safety application and the plans and specifications of the proposed improvements to the County Engineer of the County for which the dam resides for compliance with County codes.
19. Within fifteen (15) calendar days of completing the project, the applicant/owner or its representative shall provide the Department with a confirmation letter of compliance, signed and stamped by the construction engineer, indicating that the construction

was completed in accordance to approved plans and specifications including any field changes. The construction engineer shall submit the remaining construction completion documents which may include, but not be limited to, as-constructed drawing, final construction report, topographic survey, record of the location of permanent monuments, log of recorded water levels and other readings from the refilling operation, long-term instrumentation monitoring plan, and affidavit showing the actual cost of construction including engineering costs, within 60 calendar days of the submittal of the final construction inspection.

20. Construction completion documents and the construction engineer's certification shall be provided to the Department within 60 days of the final construction inspection. The Department will review the submitted items and furnish acceptance or denial within 60 days of receipt of satisfactorily completed construction completion documents and close out the dam safety permit.
21. This permit does not relieve the applicant/owner of their obligations to comply with all applicable Federal, State, and County regulations.