DEPARTMENT OF WATER SUPPLY • COUNTY OF HAWAI`I

345 KEKŪANAŌ`A STREET, SUITE 20 • HILO, HAWAI`I 96720

TELEPHONE (808) 961-8050 • FAX (808) 961-8657

March 5, 2015

WAIKOLOA RESERVOIR NO. 1 EARTHQUAKE REPAIR PROJECT
Information Sheet

Overview

The purpose of this Project is to repair damages to the Waikoloa Reservoir No. 1 which were sustained during the October 2006 Kīholo Bay Earthquake. After the Earthquake, an inspection of the Reservoir and its neighboring Reservoir – Waikoloa Reservoir No. 2 - found cracks in the internal slope, as well as seepage along the external embankment slope of both Reservoirs, requiring complete drainage of Reservoir No. 2 until the repairs were completed in 2011. While the repairs were being done, Waikoloa Reservoir No. 1 remained in service to maximize water storage for area residents. The Waikoloa Reservoir No. 1 Repair Project will involve installing a new liner on the floor and internal slope as well as stabilizing the external slope of the reservoir. Monetary funds for the Repair Project will be provided by the DWS. The DWS is presently seeking Federal Emergency Management Agency (FEMA) financial assistance for the Project construction.

Facility Information

Constructed in 1970, the Waikoloa Reservoir No. 1 is one of 3 large open reservoirs. The storage capacity of this Reservoir is 50 million gallons. Water from the Waikoloa and Kohākōhau Streams is diverted into this Reservoir for storage, and then conveyed to the Waimea Treatment Plant facility for treatment. The treated water is stored in the Waimea Clearwater Reservoir for distribution to area customers.

Figure 1: Waikoloa Reservoir No. 1 is the kidney shaped reservoir in the middle of the picture. Reservoir No. 2 is at the bottom and No. 3 is at the top. At the very top is the much smaller pentagon-shape 8.5-MG reservoir.

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Figure 2: Waikoloa Reservoir No. 1 was partially drained after the 2006 Kīholo Bay Earthquake. It is presently empty and will remain empty until repairs are completed.

Summary of Repairs

The cracks and joints in the concrete panels lining the internal slope, the floor and side slopes will be repaired. A lining material will then be placed over the panels. The sample drawing on the next page (Figure 4) details how the reservoir will be lined. Using sophisticated seismic modeling computer software, the exterior slope improvements include a subdrainage system and a stability berm at the bottom of the slope. A sample drawing for this work is also shown on the next page (Figure 5).

Project Status

The Project is currently in its Design Phase. Design documents (construction plan drawings and specifications), an environmental assessment and a biological assessment have been prepared and are being reviewed by affected government organizations for final approval before the Bidding and Construction Phases are allowed to begin. The respective Design and Construction Schedules are shown in Figures 6 and 7.

Contact:

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Figure 3: Due to an accumulation of sediment, the reservoir had to be scraped and washed.

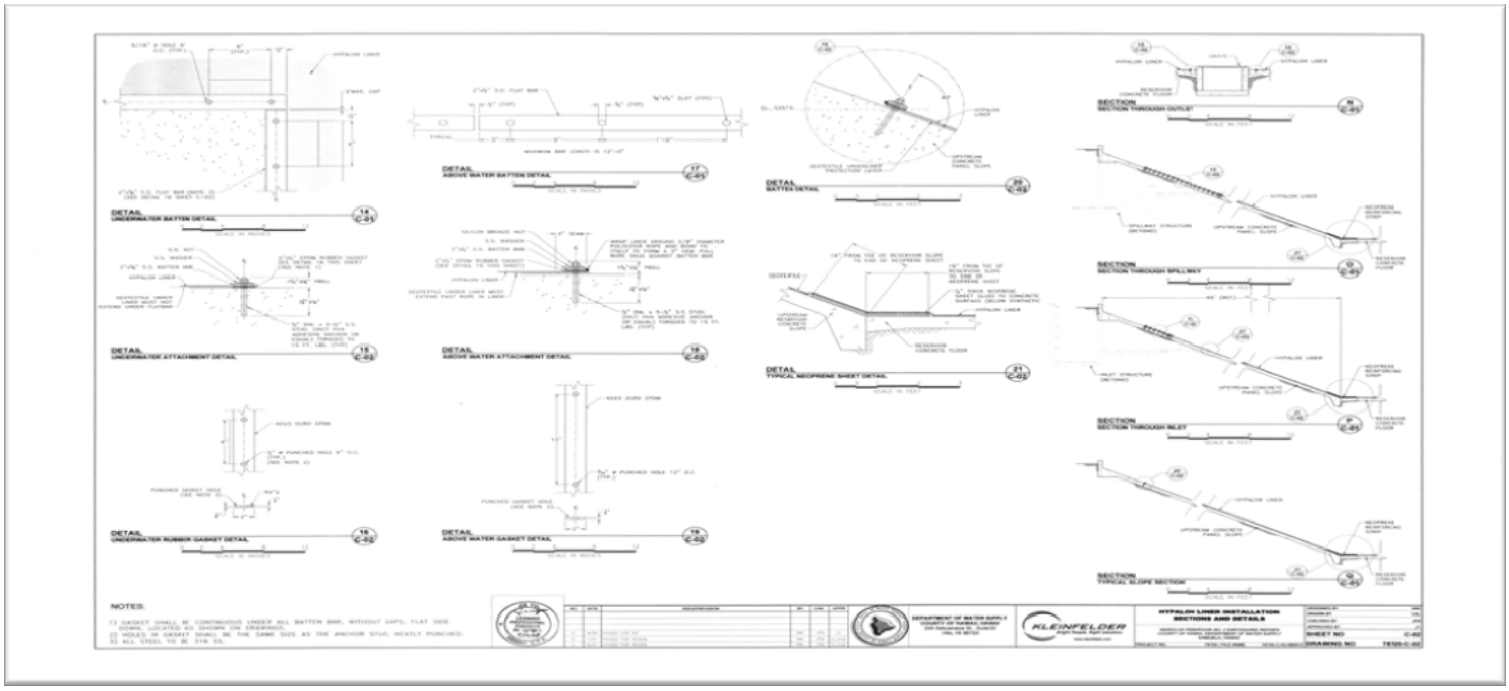

Figure 4: The Reservoir Liner

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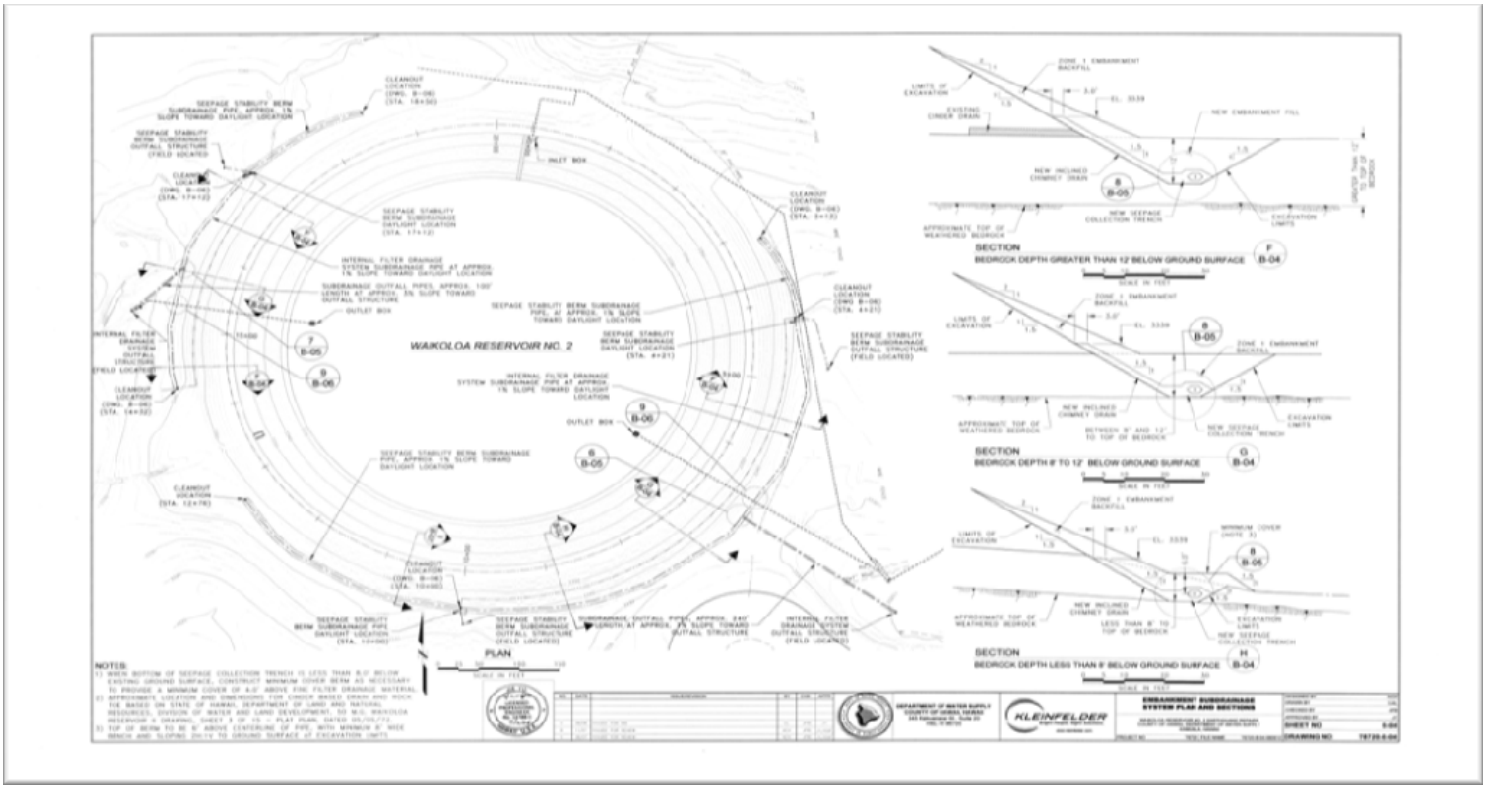
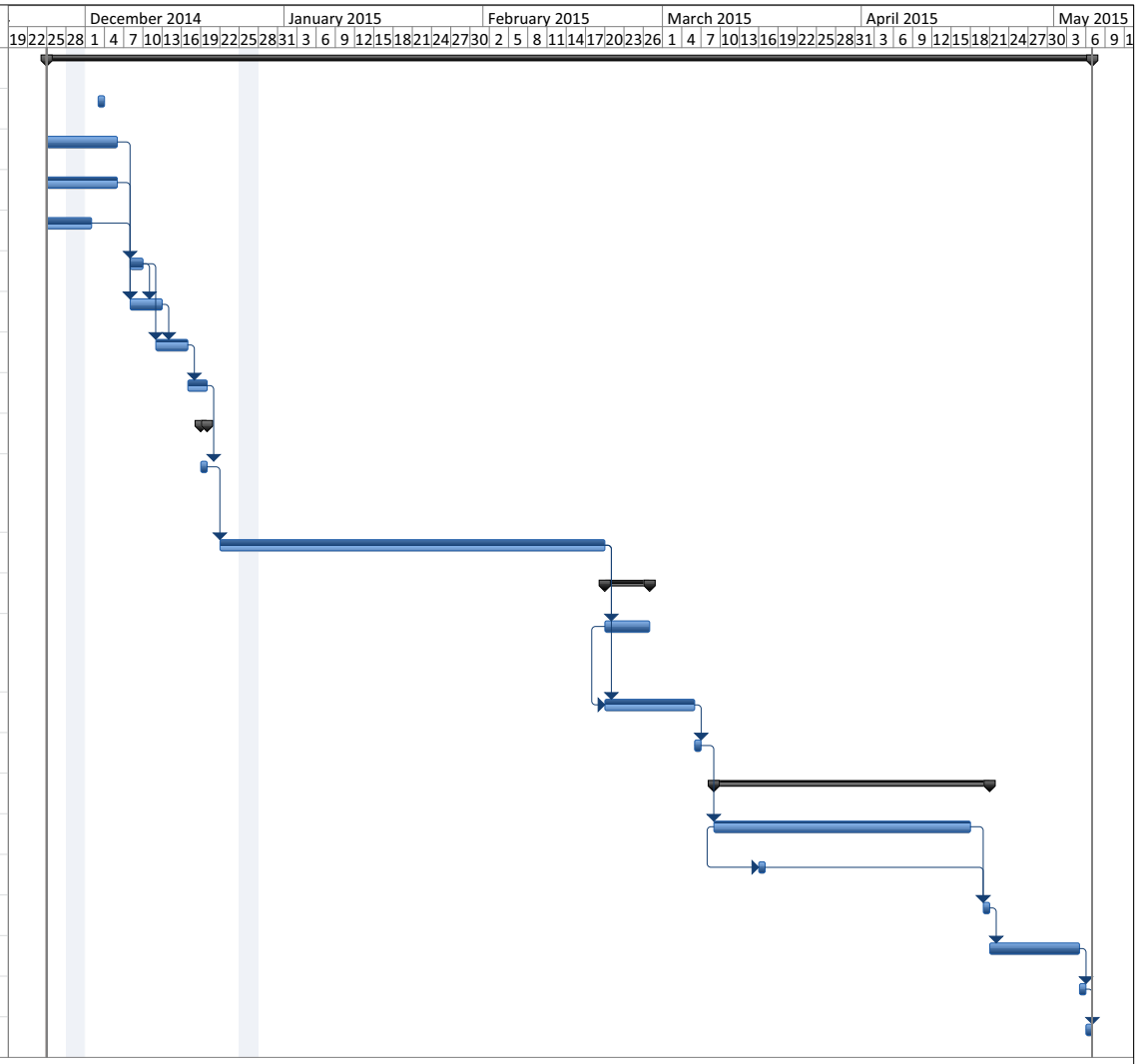


Figure 5: Exterior Slope Improvements

Figure 6

ID	Task Name	Duration	Start	Finish
1	**Waikoloa Reservoir #1 Repairs**	**111 days**	**Tue 11/25/14**	**Wed 5/6/15**
2	Finalize Archeological Report	1 day	Wed 12/3/14	Wed 12/3/14
3	Edits to Specifications Package	7 days	Tue 11/25/14	Fri 12/5/14
4	Edits to Drawing Package	7 days	Tue 11/25/14	Fri 12/5/14
5	Edits to Spillway Report	3 days	Tue 11/25/14	Mon 12/1/14
6	Update Engineer's Opinion of Probable Cost (EOPC)	2 days	Mon 12/8/14	Tue 12/9/14
7	Design Report Edits	5 days	Mon 12/8/14	Fri 12/12/14
8	Complete Response to Comment Form	3 days	Fri 12/12/14	Tue 12/16/14
9	Document Reproduction	3 days	Wed 12/17/14	Fri 12/19/14
10	**Submittal of 100% Documents**	**1 day**	**Fri 12/19/14**	**Fri 12/19/14**
11	3 copies each of final design drawings, specifications, design report, and detailed cost estimate	1 day	Fri 12/19/14	Fri 12/19/14
12	Review and Approval of 100% Documents (By Others)	40 days	Mon 12/22/14	Thu 2/19/15
13	**Document Reproduction**	**5 days**	**Fri 2/20/15**	**Thu 2/26/15**
14	40 sets each of the final approved design drawings and specifications	5 days	Fri 2/20/15	Thu 2/26/15
15	Preparation of Bidding Documents	10 days	Fri 2/20/15	Thu 3/5/15
16	Release for Bid	1 day	Fri 3/6/15	Fri 3/6/15
17	**Bidding**	**31 days**	**Mon 3/9/15**	**Mon 4/20/15**
18	Contractor Bidding	30 days	Mon 3/9/15	Fri 4/17/15
19	Pre-Bid Meeting	1 day	Mon 3/16/15	Mon 3/16/15
20	Bids Due	1 day	Mon 4/20/15	Mon 4/20/15
21	Contractor Selection and Award	10 days	Tue 4/21/15	Mon 5/4/15
22	Pre-Construction Meeting	1 day	Tue 5/5/15	Tue 5/5/15
23	Notice to Proceed	1 day	Wed 5/6/15	Wed 5/6/15



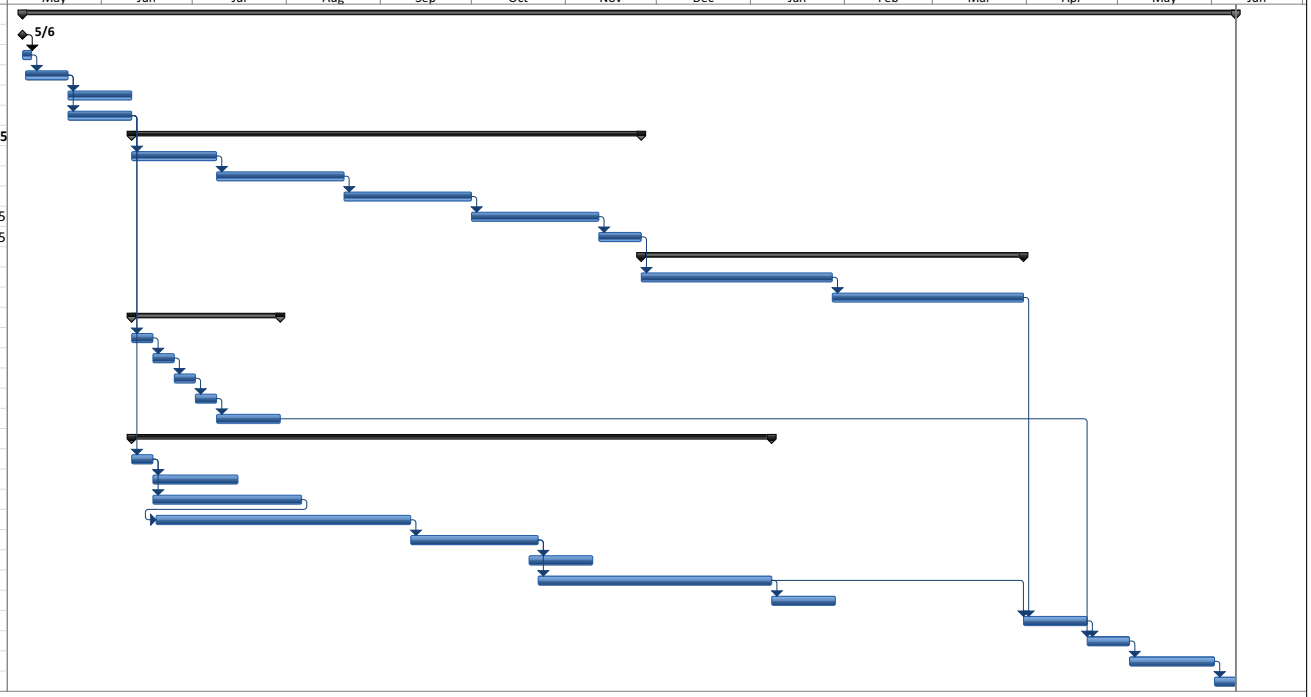
Project: Design Schedule 112514_
Date: Tue 11/25/14

Task	Project Summary	Inactive Milestone	Manual Summary Rollup	Deadline	
Split	External Tasks	Inactive Summary	Manual Summary	Progress	
Milestone	External Milestone	Manual Task	Start-only		
Summary	Inactive Task	Duration-only	Finish-only		

Figure 7

Waikoloa Reservoir No. 1 Earthquake Repairs

ID	Task Name	Duration	Start	Finish
1	**Waikoloa Reservoir No. 1 Earthquake Repairs**	**286 days**	**Wed 5/6/15**	**Wed 6/8/16**
2	Notice to Proceed	0 days	Wed 5/6/15	Wed 5/6/15
3	Mobilize	3 days	Wed 5/6/15	Fri 5/8/15
4	Install Temporary Erosion Control Measures	10 days	Thu 5/7/15	Wed 5/20/15
5	Clean Existing Reservoir Liner	15 days	Thu 5/21/15	Wed 6/10/15
6	Install Dewatering Measures	15 days	Thu 5/21/15	Wed 6/10/15
7	**Existing Liner Repairs**	**120 days**	**Thu 6/11/15**	**Wed 11/25/15**
8	Grout Voids Beneath Existing Concrete Liner	20 days	Thu 6/11/15	Wed 7/8/15
9	Repair Existing Concrete Liner Cracks	30 days	Thu 7/9/15	Wed 8/19/15
10	Repair Existing Concrete Liner Construction Joints	30 days	Thu 8/20/15	Wed 9/30/15
11	Repair Existing Concrete Liner Expansion Joints	30 days	Thu 10/1/15	Wed 11/11/15
12	Repair Spalling of Existing Liner	10 days	Thu 11/12/15	Wed 11/25/15
13	**Install New Reservoir Liner**	**90 days**	**Thu 11/26/15**	**Wed 3/30/16**
14	Install Geotextile Underlayment and Anchoring System	45 days	Thu 11/26/15	Wed 1/27/16
15	Install Hypalon Liner Including Anchoring System	45 days	Thu 1/28/16	Wed 3/30/16
16	**Spillway Modification**	**35 days**	**Thu 6/11/15**	**Wed 7/29/15**
17	Saw and Demolish Existing Liner	5 days	Thu 6/11/15	Wed 6/17/15
18	Clearing and Grubbing	5 days	Thu 6/18/15	Wed 6/24/15
19	Excavate New Spillway	5 days	Thu 6/25/15	Wed 7/1/15
20	Place Precast Spillway	5 days	Thu 7/2/15	Wed 7/8/15
21	Place New Concrete and Riprap	15 days	Thu 7/9/15	Wed 7/29/15
22	**Install Seepage Stability Berm and Drainage System**	**151 days**	**Thu 6/11/15**	**Thu 1/7/16**
23	Clearing and Grubbing	5 days	Thu 6/11/15	Wed 6/17/15
24	Degrade Downstream Embankment	20 days	Thu 6/18/15	Wed 7/15/15
25	Excavate Pipe Trench	35 days	Thu 6/18/15	Wed 8/5/15
26	Place Zone 2 Material (Below Pipe)	60 days	Fri 6/19/15	Thu 9/10/15
27	Place Zone 3 Material and Pipe	30 days	Fri 9/11/15	Thu 10/22/15
28	Construct Outfall Structure	15 days	Tue 10/20/15	Mon 11/9/15
29	Place Zone 2 Material and Zone 1 Backfill	55 days	Fri 10/23/15	Thu 1/7/16
30	Install and Test Geotechnical Instrumentation	15 days	Fri 1/8/16	Thu 1/28/16
31	Remove Dewatering Measures	15 days	Thu 3/31/16	Wed 4/20/16
32	Install Perimeter Fencing	10 days	Thu 4/21/16	Wed 5/4/16
33	Site Restoration	20 days	Thu 5/5/16	Wed 6/1/16
34	Demobilization	5 days	Thu 6/2/16	Wed 6/8/16



Project: 119160 Construction Sch
Date: Tue 11/25/14

Task	Summary	External Milestone	Inactive Summary	Manual Summary Rollup	Finish-only
Split	Project Summary	Inactive Task	Manual Task	Manual Summary	Deadline
Milestone	External Tasks	Inactive Milestone	Duration-only	Start-only	Progress