Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix A

Email from Raymond Young (DPP) to Grace Pacific, dated December 20, 2013, regarding 2013 Annual Report (1 page)



Makakilo Quarry November 2013 Annual Report Young, Raymond

'Robert Creps (rcreps@gracepacificcorp.com)' 12/20/2013 03:27 PM

"Arakawa, Bonnie K. N.", "'bsaruwat@dbedt.hawaii.gov"" Show Details

1 Attachment



Bob,

Thank you for submitting the 2013 Annual Report and supporting materials. We are reviewing the materials and had a question/concern and hoped you can clarify. In the attached aerial photo, I've generally marked off two areas, Area 1 and Area 2. Both these areas appear to have earth work that is outside of the approved quarry excavation and berming areas and also do not appear to be firebreak roads. Please clarify what the earthwork is for. In a previous correspondence about earth work outside of the approved area, you indicated that that work was in error and have stopped the apparent grading. But, as of the latest aerial photo, earth work appears to have continued and expanded into two new areas including a new dirt road around the eroded area of Puu Makakilo (Area 1).

We also have received concerns from residences that blasting vibration have recently affected at least two residences above the quarry and want to know how your firm is responding to those incidences. Perhaps additional sensors in strategic locations may better monitor blasting vibration intensities

I will be out of the office until Jan 10. Replies to this email can be directed to Bonnie Arakawa if you should need further information.

Raymond Young
Department of Planning and Program
650 S. King St., 7rh Flr.
Honolulu, Hawaii 96813
Ph. (808) 768-8049
Fax (808 768-6743



Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix B

Letter from Grace Pacific to Raymond Young (DPP), dated January 13, 2014, responding to December 20, 2013 email (1 page)

January 13, 2014

Mr. Raymond Young Department of Planning and Permitting 650 South King Street, 7th Floor Honolulu, Hawaii 96813

Dear Ray,

I am responding to your email of December 20th regarding earthwork and blasting vibration at the Makakilo Quarry.

In the aerial photo attached to your email you identified Areas 1 and 2 and questioned if the activity in these areas is outside of the approved excavation and berming areas. Area 1 (your email) is in the former golf course driving range. The area you have delineated is within Landscape Area 1B as shown on the attached exhibit to the 2013 Beneficial Reuse Plan. In regards to the previous grading in the vicinity of the driving range, outside of the approved area, this area has been hydroseeded subsequent to the photo date, and will be maintained in accordance with our Renaturalization Plan. The activity in Area 2 (your email) outside of the approved limits of Landscape Area 1A (attached) reflects the activity associated with the placement of topsoil at the water features at the former holes 9 and 10 of the golf development.

We did receive several phone calls from Pueonani Street residents about blast vibrations in early December. In an effort to further reduce vibrations, we have begun to "double-deck" the blasts, effectively making two smaller blasts, by detonating the upper half of the blast a few milliseconds ahead of the lower half. We also continue to work with Aimone-Martin Associates, who review the blast data and report their findings to us monthly. To date, ground vibrations have fallen well within safe levels for the protection of all structures. I am enclosing a copy of the Aimone-Martin report for December 2013 for your information.

I hope this addresses your questions. My cell number is 216-6787 and is the best way to reach me.

Sincerely,

Robert M. Creps Senior Vice President

Name aug

Grace Pacific LLC

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix C

Letter from George Atta (DPP), dated May 5, 2014, regarding 2013 Annual Compliance Report (2 pages)

DEPARTMENT OF PLANNING AND PERMITTING

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813 PHONE: (808) 768-8000 • FAX: (808) 768-6041 DEPT, WEB SITE; <u>www.honoluludpp.org</u> • CITY WEB SITE; <u>www.honolulu.gov</u>

KIRK CALDWELL MAYOR





GEORGE I, ATTA, FAICP DIRECTOR

ARTHUR D. CHALLACOMBE DEPUTY DIRECTOR

2007/SUP-6 2007/CUP-91

May 5, 2014

Mr. Robert M. Creps Senior Vice-President Grace Pacific LLC P.O. Box 78 Honolulu, Hawaii 96810

Dear Mr. Creps:

Thank you for submitting your Fifth Annual Report (Report) dated November 14, 2013, for Special Use Permit (SUP) No. 2007/SUP-6 (Land Use Commission Docket No. SP73-147 Grace Pacific Corporation) and Conditional Use Permit (CUP) No. 2007/CUP-91. These land use approvals involve Tax Map Keys 9-1-016: 004, 9-2-002: portion of 006, and 9-2-003: 074 and 082.

We provide the following comments:

SUP Condition No. 2 - Renaturalization Plan. Condition No. 2 requires approval of a renaturalization plan one year after the Land Use Commission's (LUC) Decision and Order. As of this date, a renaturalization plan has not been approved by the Department of Planning and Permitting (DPP). We understand that renaturalization of the buffer area is a major undertaking and therefore have previously suggested directing renaturalization efforts to select areas that are in most need of ground cover to reduce to a minimum, the potential for fugitive dust generation. Your original plan to disperse seed and let natural rainfall help propagate seedlings did not return expected results and you are now experimenting with test plots with direct irrigation. Condition No. 2 calls for the submission of landscaping details including plant types, sizing and spacing, irrigation facilities, and distribution systems. Please submit the required renaturalization plan as soon as possible and no later than June 1, 2014, for review and approval. We will consider a landscape phasing plan where areas that require the most need receive priority renaturalization attention.

SUP Condition No. 4 - Lower Quarry Landscape Plan, Exhibits 3 - 7, dated November 5, 2013. The subject Landscape Plan, Exhibits 3 through 7, dated November 5, 2013, is **APPROVED**. As required under Condition No. 4, landscaping is to be implemented within one year of its approval and the Parcel is to be returned to landscape open space by November 6, 2014, six years after the SUP was approved by the LUC. However, we understand that implementation of the landscape plan may be delayed until remediation of contaminated portions of Parcel 4 have been completed. Since your report indicates that there

Mr. Robert M. Creps May 5, 2014 Page 2

may be portions that are not contaminated, it follows that remediation in non-contaminated areas may not be necessary and landscaping of these areas should begin as soon as possible in order to show a "good faith" effort in returning Parcel 4 to landscape open space by November 6, 2014. Please keep the DPP informed as to the status of implementing the required landscaping for the areas not subject to remediation, but that were used for quarry operations.

SUP Condition No. 10 and CUP Condition No. 3 – Beneficial Re-use Plan. We have reviewed the Beneficial Re-use Plan (Re-use Plan). The Ewa Development Plan's (DP) policy for the quarry area and Puu Makakilo is for preservation and agriculture, therefore, the Re-use Plan should include at least one scenario that addresses the current land use policy, including funding requirements for future costs associated with its implementation. Also consider alternative scenarios permitted under the current land use policy and zoning designations. Please note that Condition No. 10 of the LUC's Decision and Order for the SUP requires the retention of a "professional qualified in re-use planning". The Re-use Plan should embody creativity and vision for the future beneficial re-use of the quarry and surrounding lands, consistent with the area's land use policies.

<u>CUP Condition No. 5 – Berm Stabilization</u>. Condition No. 5 of the CUP requires landscaping of any berms within 30 days of completion of construction. We note that a berm has been constructed above the north end of the pit. It appears to have been constructed several months ago and no additional construction activity has been observed. Please provide a status report on the berm's landscaping implementation by June 1, 2014.

Therefore, please submit a revised Re-use Plan, prepared by a professional qualified in re-use planning, as required under Condition No. 10, by November 6, 2014, the deadline for your next annual review. We encourage you and your consultants to meet with our staff to further discuss the objectives and future vision for the site and surrounding lands.

If you have any questions, please contact Raymond Young of our staff at 768-8049.

Very truly yours,

George I. Atta, FAICP

George 8. atta

Director

GIA:kh

cc: D. Yasui/A&B Properties, Inc. State Land Use Commission

1139250

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix D

Letter from Grace Pacific to George Atta (DPP), dated May 6, 2014, regarding status updates of recent discussions (3 pages)

May 6, 2014

Mr. George I. Atta, FAICP
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention:

Ms. Kathy Sokugawa

Ms. Bonnie Arakawa

Mr. Ray Young

Dear Mr. Atta,

Special Use Permit (SUP)

Docket No. SP73-147/Grace Pacific Corporation

Ewa District, Oahu, Hawaii

This letter is intended to provide a status update of matters discussed between the Department of Planning and Permitting (DPP) and Grace Pacific (GP) at meetings held on March 14, 2014 and April 1, 2014, as well as via various correspondence and communications between DPP and GP regarding the Makakilo Quarry.

The following is a status update on the items discussed.

HECO Substation (SUP Condition 4)

Per our meeting of March 14, 2014, DPP agreed to allow HECO to refile the building permit application under two conditions: 1) that the substation would only serve the mauka quarry and 2) that there not be an expansion of the substation. This information was communicated to HECO and at this time, the HECO substation plan set is being routed through DPP for review.

Outdoor Lighting Plan (CUP Condition 4.c)

It is GP's understanding that GP has met the requirements of Condition 4.c. Lighting that was previously directed towards the H-1 Freeway has been removed. The remaining lighting is directed towards the quarry pit and is under timer control as required by the lighting plan. A monthly inspection and testing of the timers is performed by American Electric. Copies of the American Electric monthly reports are available from GP upon request. Please advise if DPP has any further concerns with the Lighting Plan.

Pre-Existing Trailers, Building Permit (SUP Condition 11, CUP Condition 7)

Since our meeting with DPP on April 1, 2014, the Individual Wastewater System has been constructed and received approval on April 7, 2014 for use by the DOH Waste Water Branch. The building permit plan set is currently being routed for final review by DPP. GP received one comment during final review; to provide DPP with the appropriate Hawaii Modular building numbers for the pre-existing trailers in question. This item is currently being addressed by GP. If there are no other comments, the permits are expected to be issued by May 9, 2014.

Guard Shack (SUP Condition 11, CUP Condition 7)

The guard shack was removed on April 17, 2014. At the April 1st meeting, GP proposed the use of a modular (mobile) security trailer, which would not need a building permit. GP has looked into placing the trailer within the access easement, but has determined it could not be safely located there as the access easement is too narrow. As an alternative, GP is therefore contemplating a right of entry from UHWO to locate the security trailer on their adjacent property. Inasmuch as DPP has questioned whether such a use would be considered an off-site use and require an amendment to the use permits, GP would appreciate DPP's advice regarding possible alternatives to address this matter, as GP continues to believe that a security presence is beneficial to all neighboring landowners and users, which includes eight other private and public entities.

Return of Lower Site to Landscaped Open Space (SUP Condition 4)

Grace will meet with the SLUC staff to discuss the impact of the VRP on meeting the requirements of Condition 4.

Landscaping Plan Upper Quarry and Buffer Area (SUP Condition 2)

The Renaturalization Plan for the upper quarry was submitted on November 5, 2009 as required. Per this Plan, landscaping test plots for the upper quarry were undertaken and are still ongoing. GP provided aerial images of these test plots in the November 2013 annual report for review by DPP and the SLUC. GP is available to discuss any comments DPP may have regarding the Plan, in order to attain DPP's approval.

Landscaping Plan Lower Site (SUP Condition 4)

The Lower Site landscaping plan was revised to meet the recommendations of the DPP's July 19, 2013 letter, and submitted along with the 2013 Annual Compliance Report. GP believes it has complied with DPP's requirements for the preparation and submission of the plan. Please advise if DPP has any further concerns with the Landscape Plan for the lower site.

Northern Berm Landscaping (CUP Condition 5)

Construction of the Northern Berm has not yet commenced, with the material being accumulated in anticipation of construction. In the interim period we will stabilize the pile with hydro mulch. Drainage around the pile has been engineered to ensure it does not impact natural drainage

features. Proper landscaping will be implemented once this construction is complete and in the timeframe required.

Water Wells

Water Use Permit (WUP No. 958) for Well Nos. 2103-06 (Upper) and 2104-01 (Lower) was approved on August 15, 2013 for the use of 0.256 million gallons per day for the combined wells. The Upper quarry well was placed into service in September 2013. The Lower Site well discontinued pumping in October 2013. The Lower Site well pump will be removed in June of this year, and the well shaft converted to an observation well.

2013 Annual Compliance Report (SUP Condition 9)

GP received an email from DPP dated December 20, 2013 with several questions. GP responded, and asks if, other than the above items, there are any further comments or questions.

2013 Beneficial Reuse Plan (SUP Condition 10, CUP Condition 3)

As requested above, GP would be happy to meet and discuss the Plan submitted in November 2013.

We appreciate the patience that DPP has afforded us regarding these matters. We will put forth the effort to give you updates as things progress. We are also available to meet to discuss these matters in more detail.

If you have any questions please feel free to contact me at 693-7105.

Sincerely,

Makakilo Quarry Manager

Grace Pacific LLC

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix E

Letter from Grace Pacific to George Atta (DPP), dated May 16, 2014, clarifying May 6th letter to DPP (1 page)

May 15, 2014

Mr. George I. Atta, FAICP
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention:

Ms. Kathy Sokugawa

Ms. Bonnie Arakawa Mr. Ray Young

Dear Mr. Atta:

Special Use Permit (SUP)

Docket No. SP73-147/Grace Pacific Corporation

Ewa District, Oahu, Hawaii

This letter is intended to update and supersede the second paragraph of our letter to you dated May 6, 2014, regarding the above subject matter, as it relates to the "HECO Substation (SUP Condition 4)".

Per our meeting of April 1, 2014, the Department of Planning and Permitting (DPP) agreed to allow Hawaiian Electric Company (HECO) to refile the substation building permit with the condition that the substation will only serve the Mauka Upper Quarry. In addition, Grace Pacific explained to DPP that there will be a minor expansion at the substation. This minor expansion will provide the necessary area for a mobile sub unit and allow continued service to the Makakilo Upper Quarry during construction and as needed for emergency replacements. Per DPP's instruction, HECO has added notes to the HECO substation plans explaining in detail this minor expansion. DPP found the minor expansion of the HECO substation to be acceptable. At this time the HECO substation plan set is being routed to DPP for review and approval.

Thank you for the opportunity to provide this clarification.

If you have any questions, please contact me at 216-2435 or Mr. Ben Rasa at 497-6209.

Sincerely,

Makakilo Quarry Manager

Grace Pacific LLC

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix F

Letter from Grace Pacific to George Atta (DPP), dated May 30, 2014, responding to May 5th letter from DPP (2 pages)

May 30, 2014

Mr. George I. Atta, FAICP
Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

Attention:

Ms. Kathy Sokugawa

Ms. Bonnie Arakawa Mr. Ray Young

Dear Mr. Atta:

I am responding to your letter of May 5, 2014 regarding Grace Pacific's Fifth Annual Report for the Makakilo Quarry (SUP No. 2007/SUP-6 and CUP No. 2007/CUP-91).

SUP Condition No. 2 - Renaturalization Plan. I am transmitting herein a revised Renaturalization Plan dated May 30, 2014 for your review and approval. Please note that it includes, as requested, detail about plant types, sizing and spacing, irrigation facilities, and distribution systems. It also indicates a phased implementation plan, prioritizing areas that require priority renaturalization efforts. Grace's earlier submission, the September 18, 2009 Landscape Re-Naturalization Concept prepared by Belt Collins, should be read in conjunction with this Plan.

Generally speaking, the landscape plan involves phasing the landscaping of the quarry from top to bottom, following the excavation activities. As for the buffer area, we are prioritizing the areas that require the most renaturalization attention, starting with the water features at the former golf holes 8 and 9.

In addition, Grace is in discussions with the Fire Department about best practices to minimize potential brush fires and to provide access roads to the area. We are including as an exhibit a proposed fire break road previously discussed with the Fire Department. As current discussions on Fire Protection and Control Plan are completed and agreed upon we will update the Renaturalization Plan.

Please note that we are also working with the Federal government on the clean-up of WWII unexploded ordinance on approximately 15 acres on the southern corner of the buffer area. Renaturalization efforts on these acres are being postponed until the unexploded ordinance is taken care of.

After your review, we would suggest a meeting to go over the more detailed aspects of the revised plan.

<u>SUP Condition No. 4 – Lower Quarry Landscape Plan</u>. Grace acknowledges the DPP's acceptance of the Plan, and Grace will begin landscaping activities as soon as possible to return Parcel 4 to landscape open space by November 6, 2014.

<u>SUP Condition No. 10 and CUP Condition No 3 - Beneficial Re-use Plan</u>. Grace will set up a meeting with consultant Chester Koga of R.M. Towill and Ray Young of your office upon Mr. Young's return June 2nd to go over the recommendations in your letter.

<u>CUP Condition No. 5 – Berm Stabilization</u>. A status report on the berm landscaping was requested in your June 5th letter. Grace is still in the process of accumulating material for the construction of the berm, which has not yet commenced. In the interim period Grace will stabilize the pile with hydro mulch. Drainage around the pile has been engineered to ensure it does not impact natural drainage features. Proper landscaping will be implemented once this construction is complete and in the timeframe required.

If you have any questions, please feel free to contact me at 216-2435.

Sincerely,

Boyd Nobriga

Makakilo Quarry Manager

Grace Pacific LLC

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix G
Correspondence from State of Hawaii Clean Air Branch dated October 17, 2014; Complaint dated April 15, 2014
(2 pages)

"Peltier, Crystal E" <crystal.peltier@doh.hawaii.gov> <MDEntremont@gracepacific.com> From:

To:

Date: 10/17/2014 10:59 AM Subject: FW: 0045 complaints

Here are the complaint reports on 0045 for 2013- 2014.

Crystal Peltier Clean Air Branch Department of Health (808) 586-4200



CLEAN AIR BRANCH COMPLAINT REPORT									
Firm:	Grace Pacific Telephone: 216-2435								
Site Address:	91-920 Farrii	91-920 Farrington Hwy., Kapolei, Hi							
TMK:		Person Contact		Boyd Nob	riga	Title:	Quarry mgr		
Date of Inspection:	4/15/14	Time:	ln:	10:00am	Out:	10:30am	Inspected By: RH		
Findings:				1					

I phoned and spoke to Mr. Nobriga regarding the fugitive dust during the blasting for the quarry rocks. He explained that they have a water cannon, which shoots water prior to and during the blasting, to control the dust as much as possible. There is still dust due to the nature of the action and how deep a blast to obtain the material. They have not been blasting due to the windy weather but had an opportunity. He will make sure they saturate the area before placing all the explosives.

Actions Taken:												
Phoned and left a	message	with										
Administrative R	AR §11-6	60.1:	33(a)		Follow-up Needed:		eded:	Yes	Х	No		
Written Notice Issued:			None	X	Co	Complaint Letter			Informal NOV			
					Field Citation			Formal NOV				
Complaint No.:	OA-14-0	inn I	Comp Type:		aint 1p Inspector Signature:							
							Date:	4	30	14		
Requested By:						T	el. Bus.:		_			
Address:	Makakilo	kakilo				Res.:			.21			
Complaint Received By: LK				l	Date:	4/14	/14	Time:	: 10):45a	am	
Additional Inform												

Blasting of GP quarry causing plumes of red dust traveling offsite and towards homes.

CAB02 1 of 1

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix H

Makakilo Quarry Hotline Phone Log October 1, 2013 through September 30, 2014 (2 pages)

GRACE PACIFIC MAKAKILO QUARRY

COMMUNITY HOTLINE LOG (Redacted)

OCTOBER 01, 2013 TO SEPTEMBER 30, 2014

Date of Call	Time of Call	Last Name	First Name	Message / Description of Call	Caller's Contact Info	Investigation / Responsible Party	Investigation / Action Plan	Follow-Up with Caller	Date of Follow-Up
Sun. Oct. 27, 2013	12:29 PM			Security is using the road behind her house. It is kicking up dust and she wants the traffic to stop on that access road. Her address is: Pueonanai St. She phoned re: the same issue on 11-03-12.		Boyd Nobriga, Quarry Mgr / Bob Creps, Sr. VP	complaint on 11-03-12 was handled by re-routing quarry traffic and placing	10/28/13 Boyd Nobriga phoned resident and resolved the matter with her.	Same
Mon. Dec. 02, 2013	12:12 PM			Pueonani Street resident called re: the blast. His house shook around 11:54AM. He wanted to confirm we blasted at that time. He did not mention any damage.		Boyd Nobriga, Quarry Mgr	going to blast so he is aware	•	Same
Thurs. June 05, 2014 *NON HOTLINE CALL*	2:00 PM			Nemo Street resident called the quarry office re: the blast earlier that day.		Margaret D'Entremont, Admin Asst	voice mail. June 06, 2014:Boyd tt:	Boyd will e- mail him prior to the following day's blast.	6/6/2014

				GRACE	PACIFIC MAKAKILO	QUARRY				
	COMMUNITY HOTLINE LOG (Redacted)									
	OCTOBER 01, 2013 TO SEPTEMBER 30, 2014									
Mon. June 16, 2014 *NON HOTLINE CALL*	3PM @ Main Office			Kahiwelo Street resident phoned main office re: diesel smell coming from Quarry at 7-9pm nightly. Msg forwarded to Boyd.		Margaret D'Entremont, Admin Asst	6/17/14 - Boyd phoned & Im on resident's VM. Bob C. asked Sid to find out who was in quarry around that time of night. 06/18/14 8:30AM - resident phoned back. Resident confirmed he smells what he thinks are diesel fumes @ 7-9pm nightly. 06/23/14 @ 8AM – Boyd tt: David who confirmed he smells the fumes during the day too. Boyd asked him to log date and times. We will follow up with resident every week or two. We are still researching the cause.	Same	6/17/2014	
Tues. July 29, 2014	1:42 PM			Resident lives in Kapolei Knolls next to the lower quarry. He registered a dust complaint.		Chris Hermosura, Quarry Superintendent	water truck dampen the area. Resident did not call back.	07/29/14 Chris H. handled complaint. Made extra water truck runs in the area.	7/29/2014	

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix I

Index of attached DVD:

2014 Annual Report

2014 Annual Report Appendices A - L

Aerial Photos and Topographic Map, dated September 12,

2014

Copies of Photos and Topographic Map follow this cover sheet (4 pages)

SCALE 1" = 400'





MAKAKILO QUARRY OVERALL AERIAL IMAGE

UPDATED OCTOBER 27, 2014

DATE OF AERIAL SEPTEMBER 12, 2014

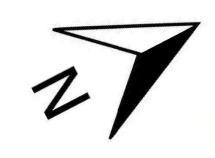


GRACE PACIFIC MAKAKILO
QUARRY
QUARRY EXPANSION PROJECT
MAKAKILO, HI



20141027 REV. 00 SHEET 1 OF 1 TPL JOB# 1000







MAKAKILO QUARRY UPPER AERIAL IMAGE

UPDATED OCTOBER 27, 2014

DATE OF AERIAL SEPTEMBER 12, 2014



GRACE PACIFIC MAKAKILO QUARRY QUARRY EXPANSION PROJECT MAKAKILO, HI



20141027 REV. 00 SHEET 1 OF 1 TPL JOB# 1000







GRACE PACIFIC MAKAKILO QUARRY

QUARRY EXPANSION PROJECT

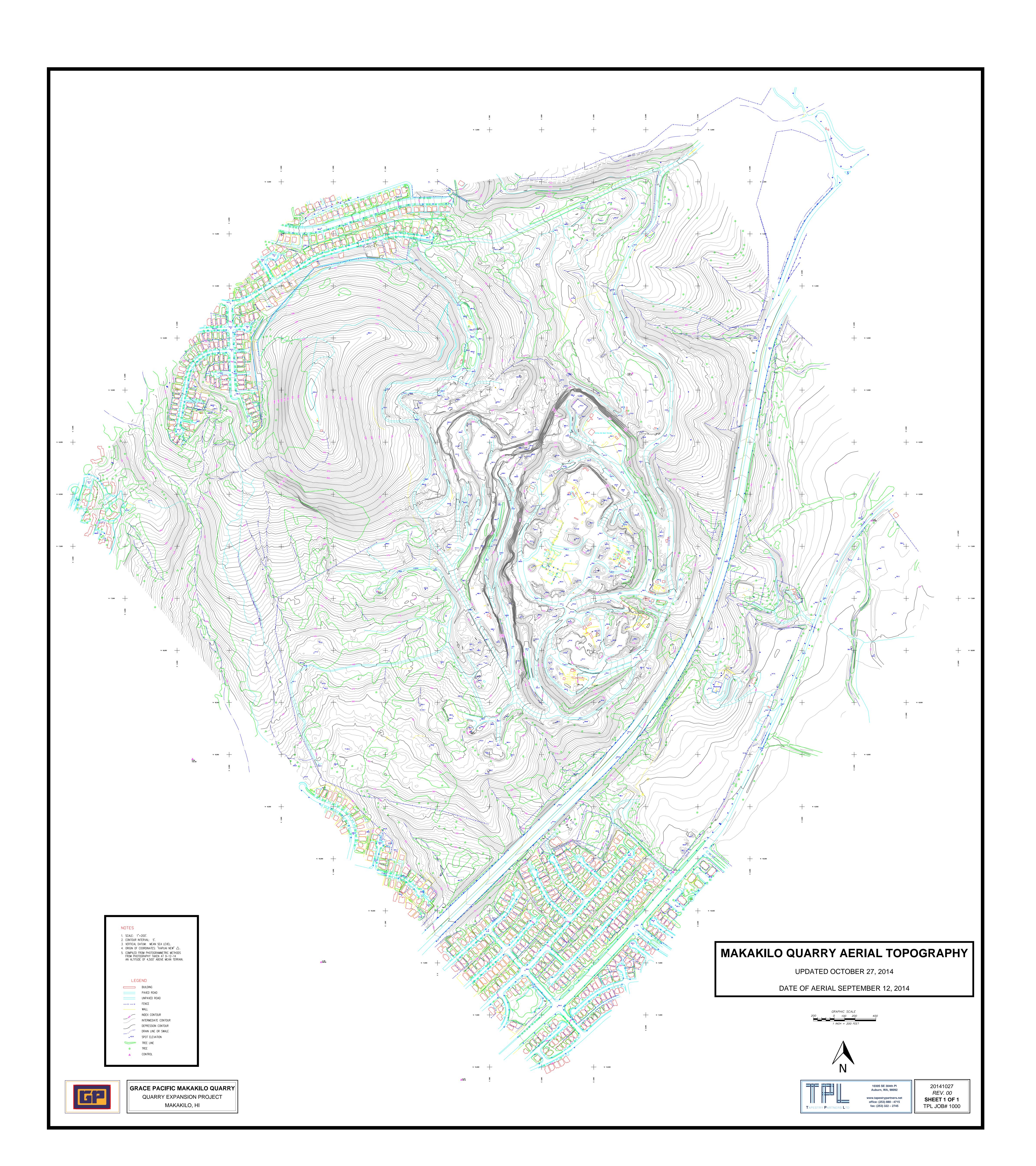
MAKAKILO, HI

MAKAKILO QUARRY LOWER AERIAL IMAGE

UPDATED OCTOBER 27, 2014 DATE OF AERIAL SEPTEMBER 12, 2014



20141027 REV. 00 SHEET 1 OF 1 TPL JOB# 1000



Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix J

Revised Makakilo Renaturalization Plan, dated May 30, 2014 (14 pages)

DEPARTMENT OF PLANNING AND PERMITTING CITY AND COUNTY OF HONOLULU HONOLULU, HAWAII

MAKAKILO QUARRY LANDSCAPE RENATURALIZATION PHASE 1

OAHU, HAWAII



PREPARED BY:

BELT COLLINS HAWAII LLC

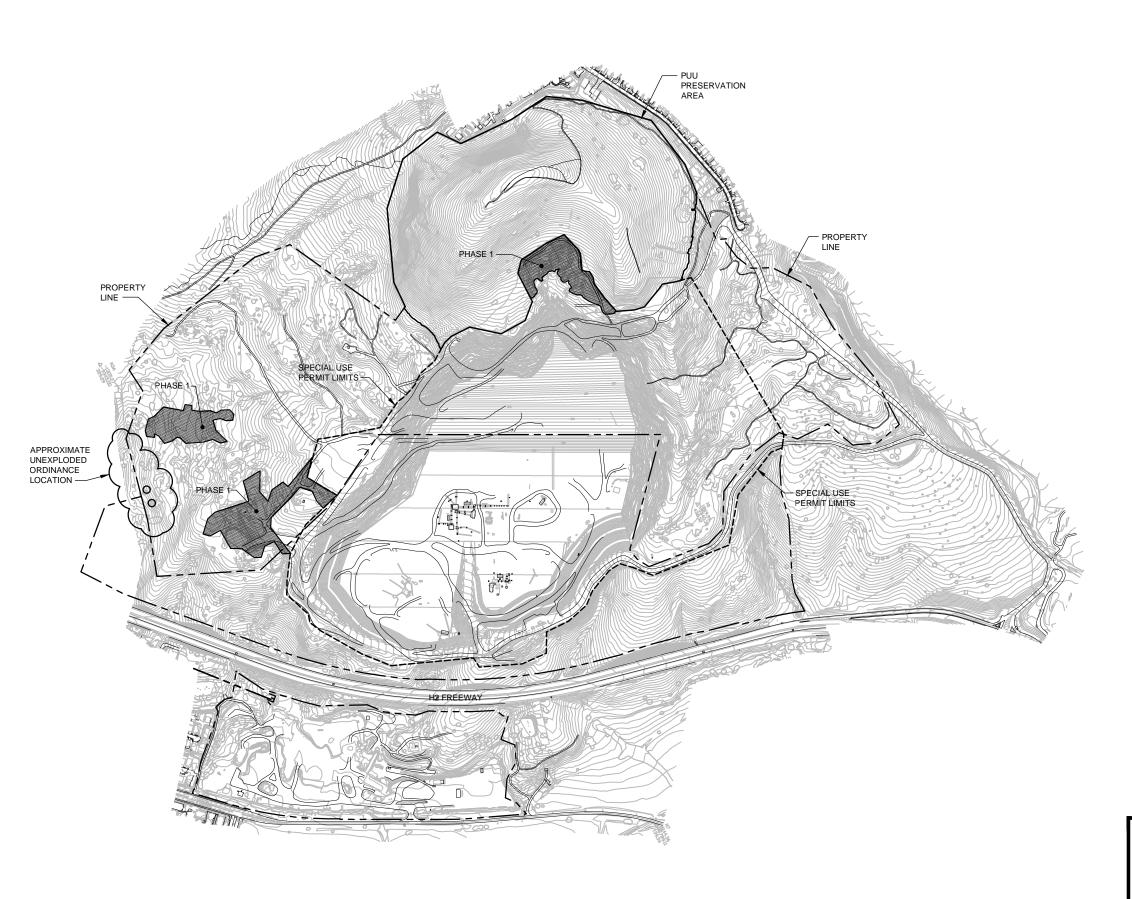
APPROVED BY:

Director, Department of Planning and Permitting

Date

	INDEX OF DRAWINGS						
FILE NO.	SHT NO.	DWG NO.	DESCRIPTION				
	1	T-1	TITLE SHEET, VICINITY MAP, INDEX OF DRAWINGS				
	2	L-1.00	OVERALL PLAN				
	3	L-1.01	FIRE BREAK PLAN				
	4	L-1.02	EXISTING BARE AREAS				
	5	L-2.01	PLANTING PLAN				
	6	L-2.02	PLANTING PLAN - HOLE 8 AND DISTURBED AREA				
	7	L-2.03	PLANTING PLAN - HOLE 9 AND DISTURBED AREA				
	8	L-2.04	TYPICAL PLANTING LAYOUT				
	9	L-3.01	IRRIGATION PLAN				
	10	L-3.02	IRRIGATION PLAN - HOLE 8 AND DISTURBED AREA				
	11	L-3.03	IRRIGATION PLAN - HOLE 9 AND DISTURBED AREA				
	12	L-3.04	TYPICAL IRRIGATION LAYOUT				
	13	L-4.01	PLANT MATERIAL LIST, DETAILS AND NOTES				
	14	L-5.01	IRRIGATION EQUIPMENT LIST, DETAILS AND NOTES				

JOB NO. SHEET OF ___ FILE NO. . DRAWING NO. T-



OVERALL SITE PLAN

SCALE: 1"=400'

NORTH

 LAND AREA

 OVERALL PROPERTY
 486 ACRES

 PUU PRESERVATION
 82.7 ACRES

 ACTIVE QUARRY
 181 ACRES

 BUFFER
 305 ACRES

 PHASE 1
 5.2 ACRES

 PHASE 1 (HOLE 8)
 4 ACRES

 PHASE 1 (HOLE 9)
 7.6 ACRES

REVISION DATE DESCRIPTION MADE BY APPROVED

DEPARTMENT OF PLANNING & PERMITTING

CITY & COUNTY OF HONOLULU



MAKAKILO QUARRY
LANDSCAPE RENATURALIZATION

OVERALL SITE PLAN

FILE NO.

wing no. ____L-1.00

THIS WORK WAS PREPARED BY ME
DR LINDER MY SUPERVISION AND
CONSTRUCTION OF THIS PROJECT
WILL BE UNDER MY GENERATION.

APRIL 30, 2016

EXPIRATION DATE OF THE LICENSE

DESIGNED BY:
REVIEWED BY:
APPROVED:
CONF. DEPARTMENT OF PLANNING AND PERMITTING

CHIP. DEPARTMENT OF PLANNING AND PERMITTING

SHEET OF FILE

OF FILE

OF FILE

THIS WORK WAS PREPARED BY ME
APPROVED:

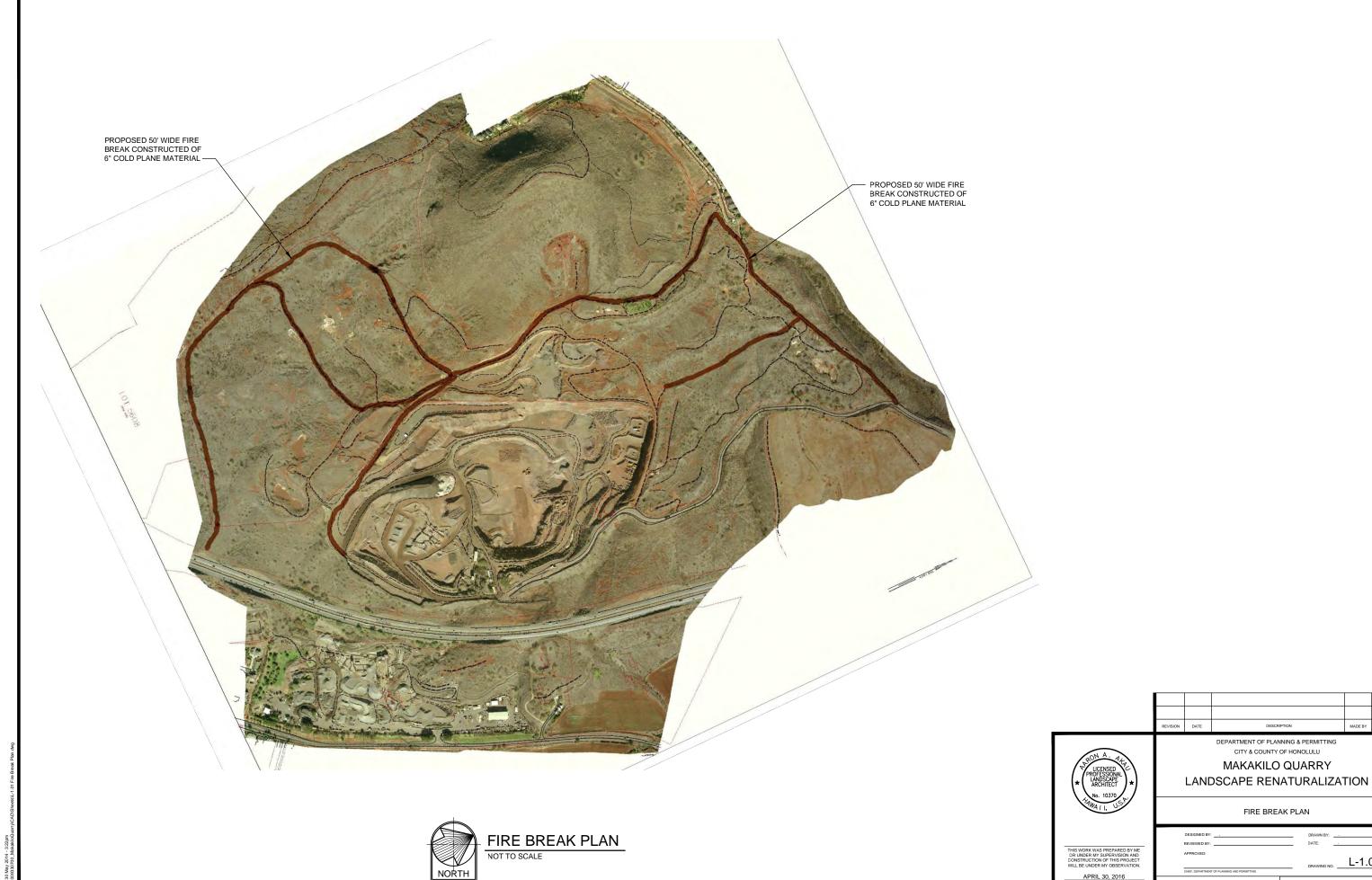
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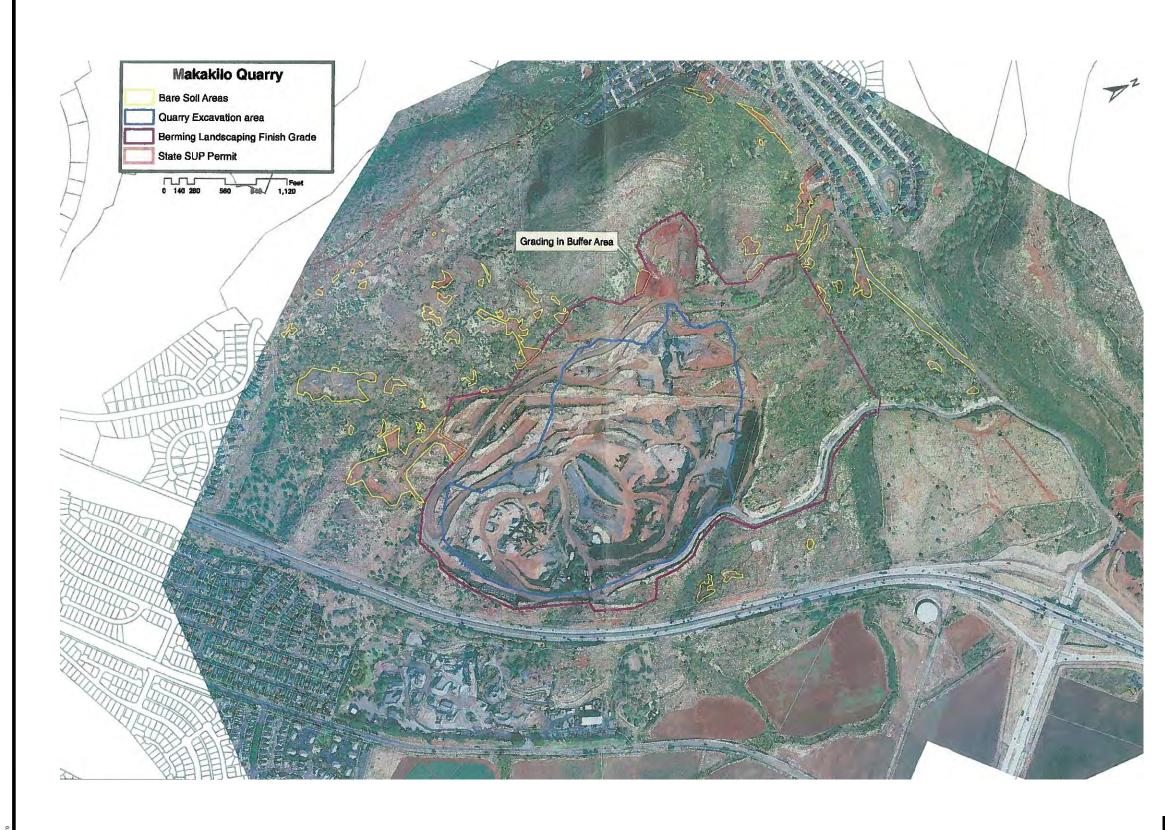
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SCALE IN FEET



FILE NO.





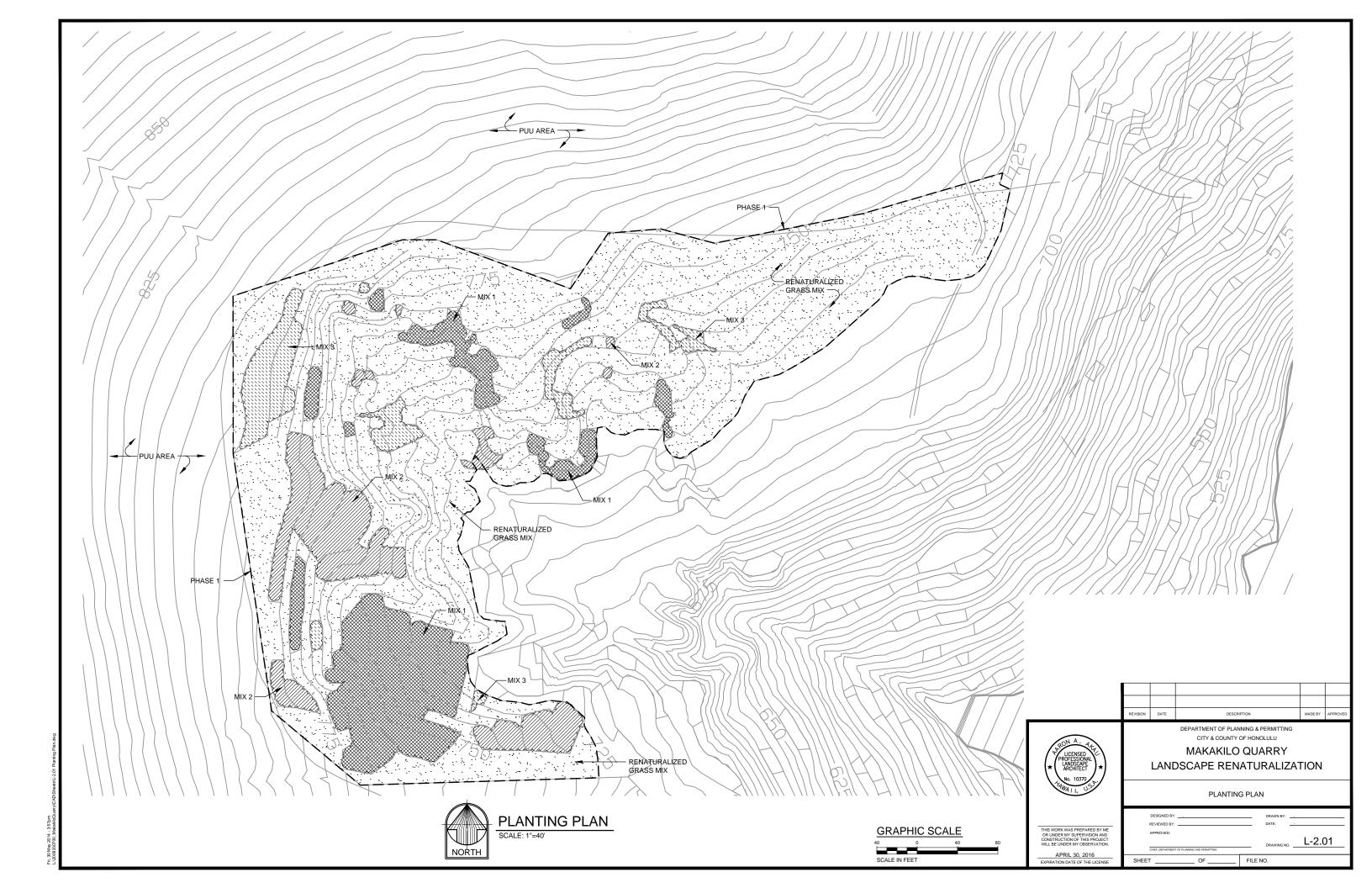
DEPARTMENT OF PLANNING & PERMITTING
CITY & COUNTY OF HONOLULU

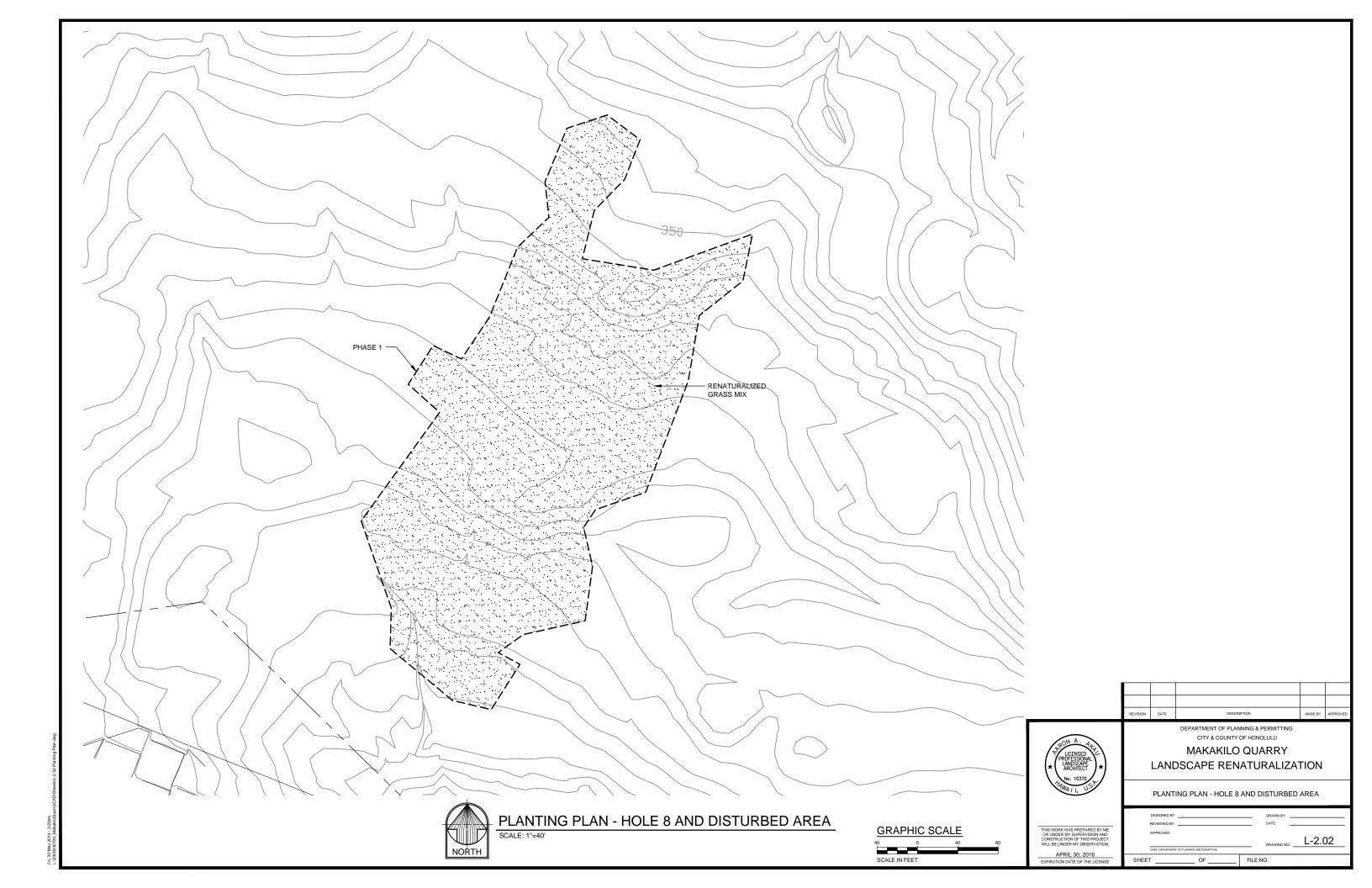
MAKAKILO QUARRY LANDSCAPE RENATURALIZATION

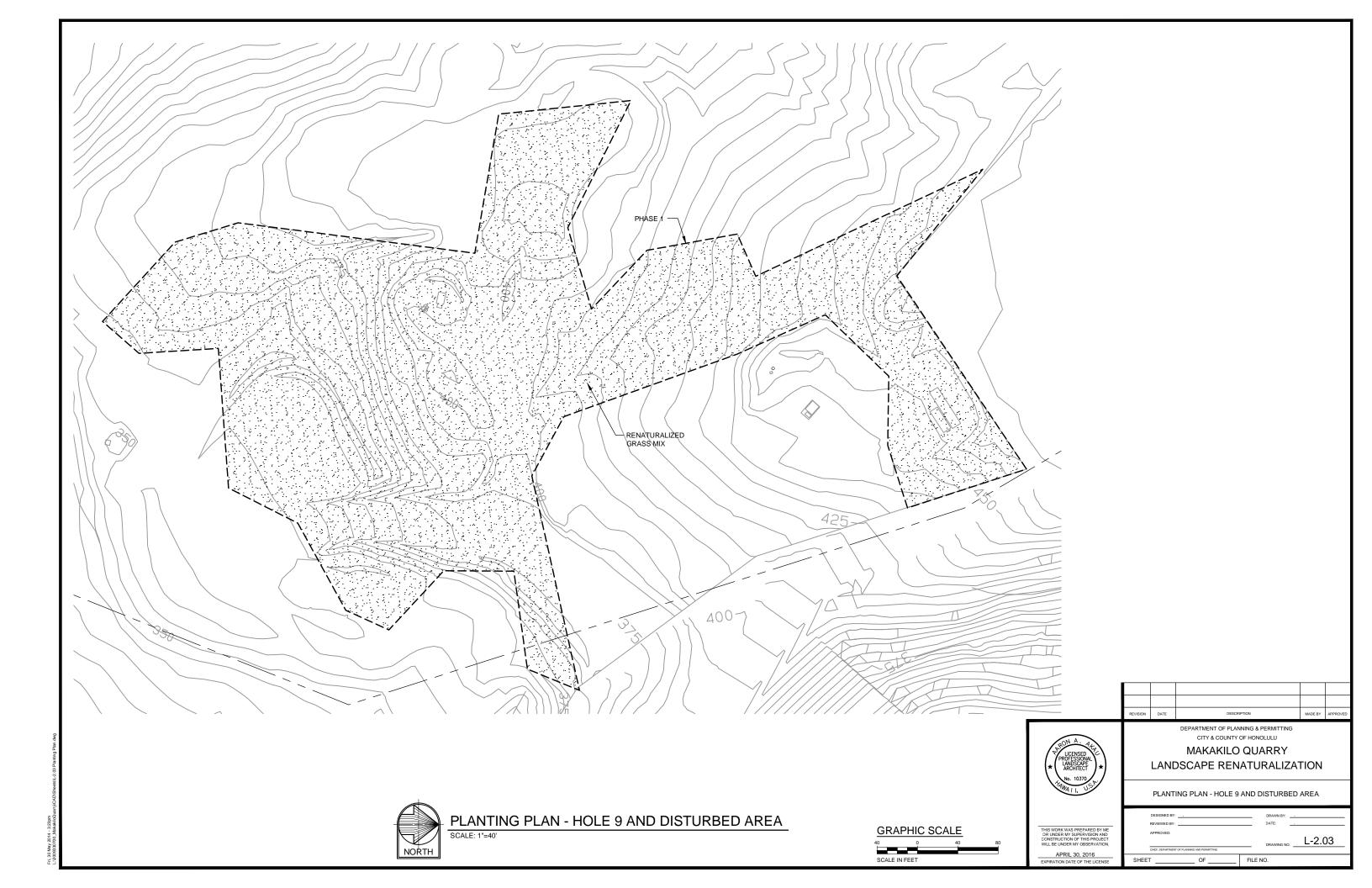
EXISTING BARE AREAS

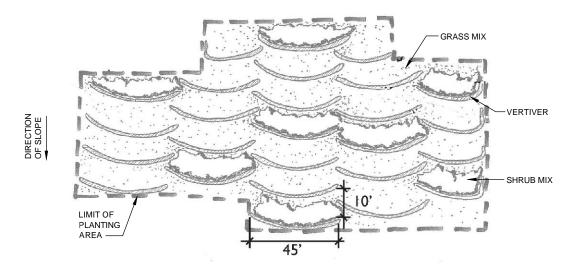
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CHIEF, DEPARTMENT OF PLANNING AND PERMITTING	

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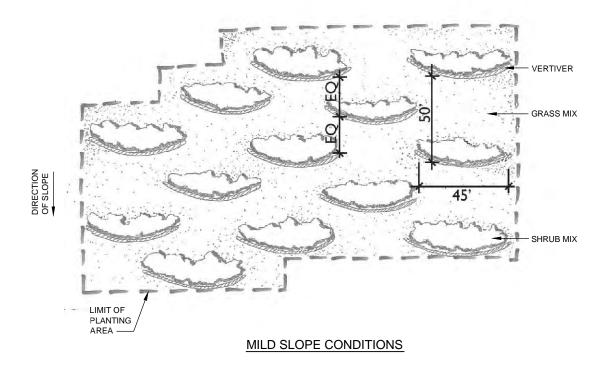






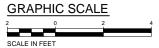


STEEP SLOPE CONDITIONS



TYPICAL PLANTING LAYOUT
SCALE: 1/2"=1'-0"

NOTE: REFER TO THE MAKAKILO QUARRY LANDSCAPE RE-NATURALIZATION REPORT DATED SEPTEMBER 18, 2009 FOR RE-NATURALIZATION PLANTING.



VE UCENSED VE PROFESSIONAL LANGSCAPE ARCHIVE A
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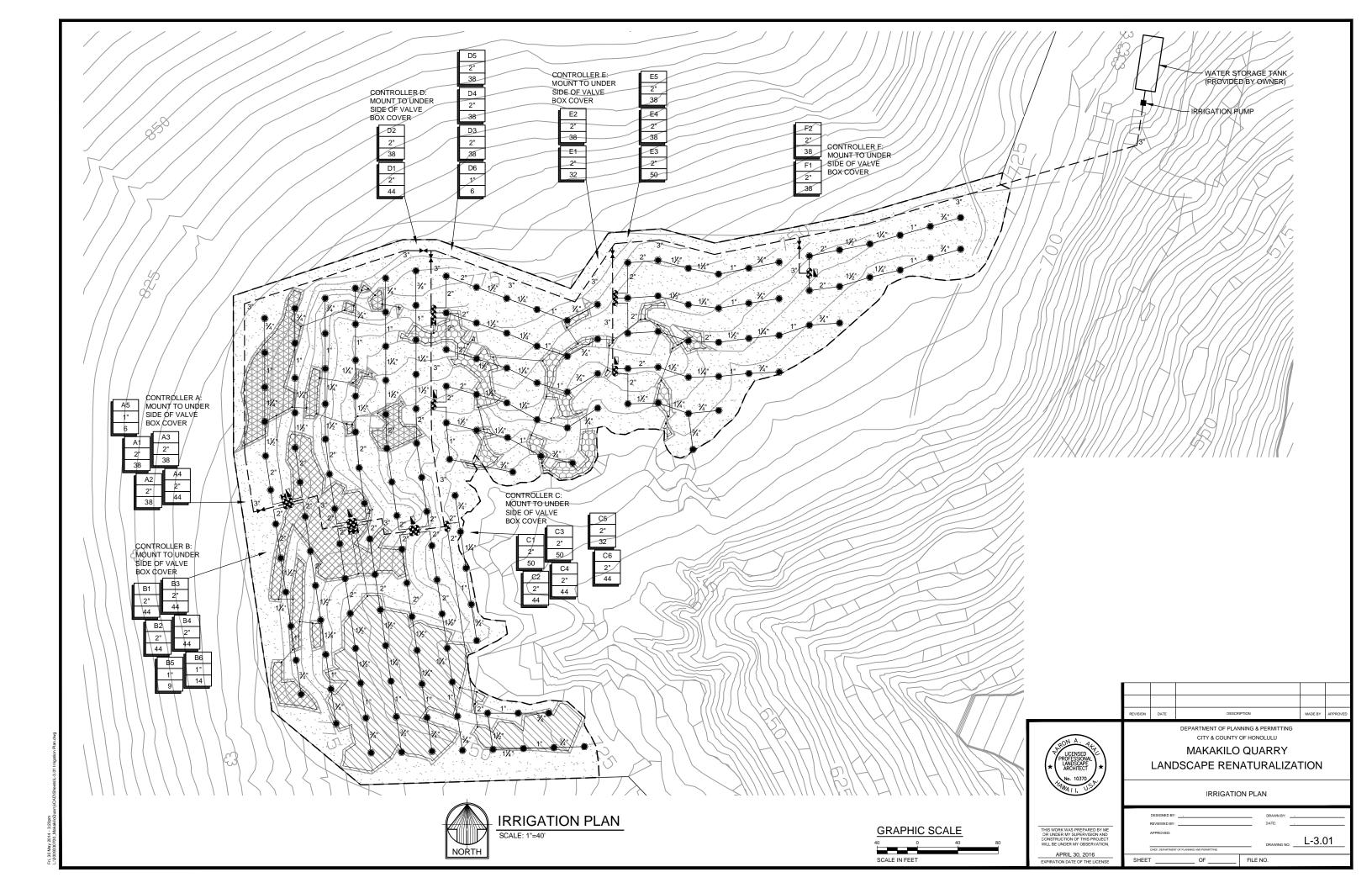
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CITY & COUNTY OF HONOLULU

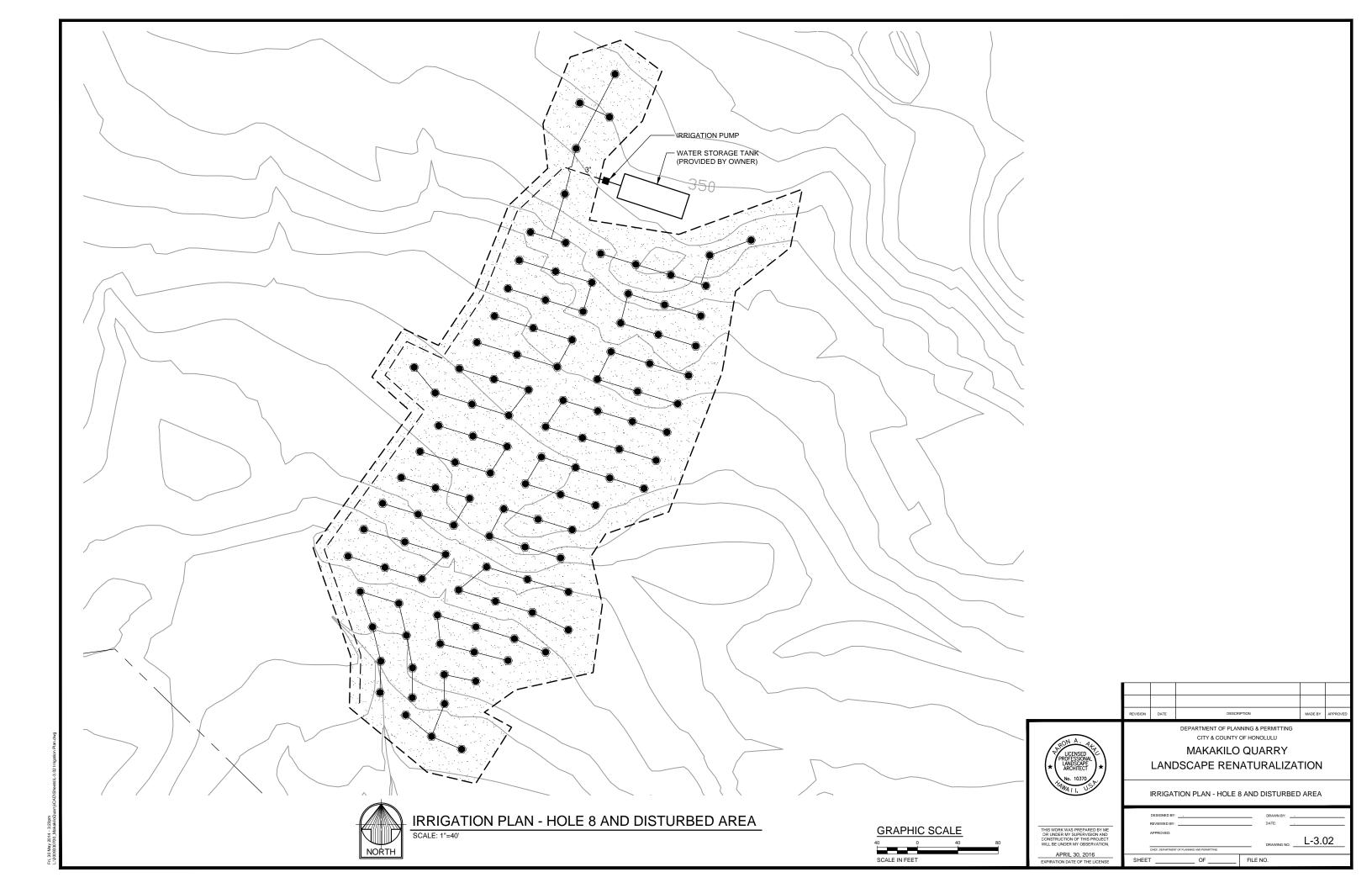
MAKAKILO QUARRY LANDSCAPE RENATURALIZATION

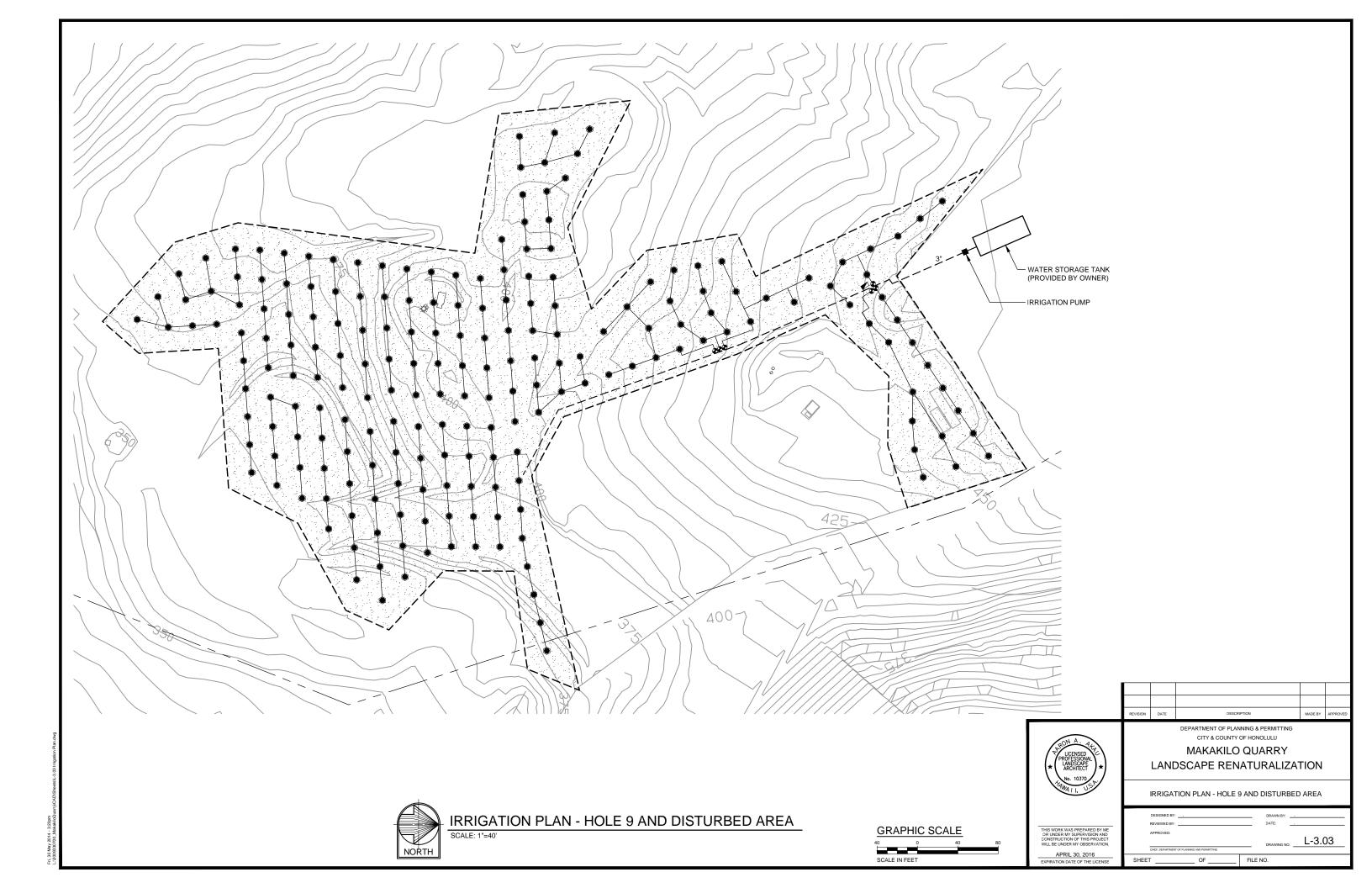
TYPICAL PLANTING LAYOUT

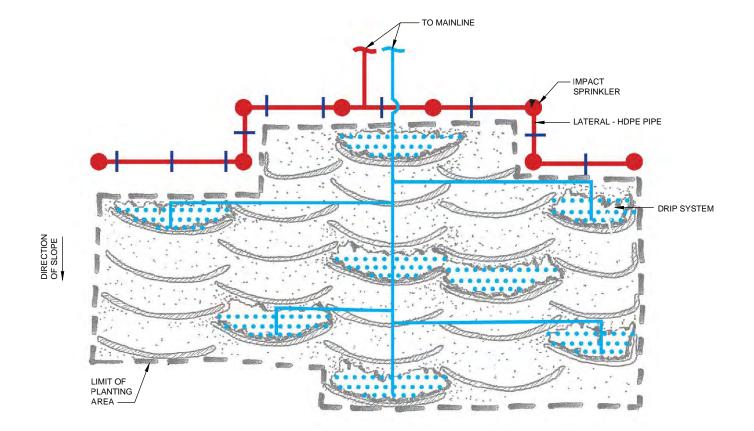
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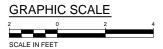






NOTE: REFER TO THE MAKAKILO QUARRY LANDSCAPE RE-NATURALIZATION REPORT DATED SEPTEMBER 18, 2009 FOR IRRIGATION.

TYPICAL IRRIGATION LAYOUT
SCALE: 1/2"=1'-0"





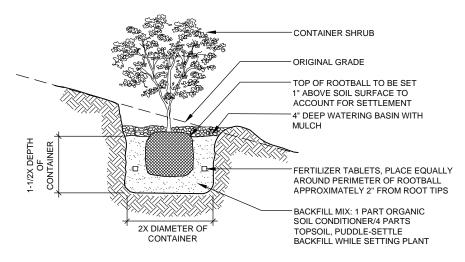
DEPARTMENT OF PLANNING & PERMITTING

CITY & COUNTY OF HONOLULU

MAKAKILO QUARRY LANDSCAPE RENATURALIZATION

TYPICAL IRRIGATION LAYOUT

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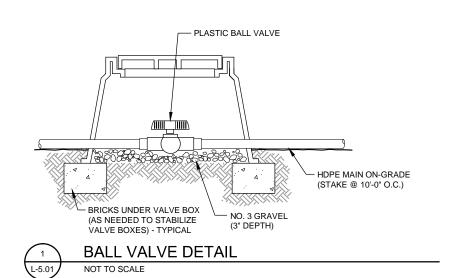
OTAL TY		BOTANICAL NAME	COMMON NAME	OUTPLANTING SIZE (HARDENED TO SUN AND DROUGHT)	AVERAGE OUTPLANTING SPACING	REMARKS
RUBS			_			I
(1						
1,600	EΑ	DODONEA VISCOSA	A'ALI'I	6" POT	3'	
1,600	EΑ	VITEX ROTUNDIFOLIA	POHINAHINA	6" POT	3'	
(2						
390	ΕA	MYOPORUM SANDWICENSE	NAIO	6" POT	5'	
1,060	ΕA	GOSSYPIUM TOMENTOSUM	MA'O	6" POT	3'	
(3		F	Taus			
640	\vdash	SIDA FALLAX	ILIMA	6" POT	3'	
640	EA	WALTHERIA AMERICANA	UHALOA	6" POT	3'	
ASS MIX						
AGG IVIIA		CENCHRUS CILIARIS 'LAREDO'	LAREDO BUFFEL GRASS	UN-HULLED SEEDS		
167,220	SF		ANNUAL RYE GRASS	SEEDS		· ·
,		CYNODON DACTYLON	COMMON BERMUDA GRASS	HULLED SEEDS		
	İ					
ASS MIX -	HOL	LE 8 AND DISTURBED AREA				
		CENCHRUS CILIARIS 'LAREDO'	LAREDO BUFFEL GRASS	UN-HULLED SEEDS		
174,290	SF	LOLIUM MULTIFLORUM	ANNUAL RYE GRASS	SEEDS		
		CYNODON DACTYLON	COMMON BERMUDA GRASS	HULLED SEEDS		
ASS MIX -	HOL	LE 9 AND DISTURBED AREA				
		CENCHRUS CILIARIS 'LAREDO'	LAREDO BUFFEL GRASS	UN-HULLED SEEDS		
329,590	SF		ANNUAL RYE GRASS	SEEDS		
		CYNODON DACTYLON	COMMON BERMUDA GRASS	HULLED SEEDS		

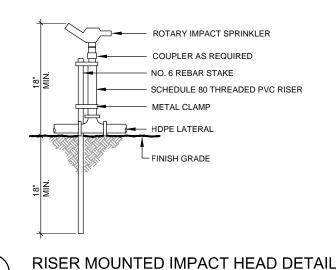
PLANTING NOTES:

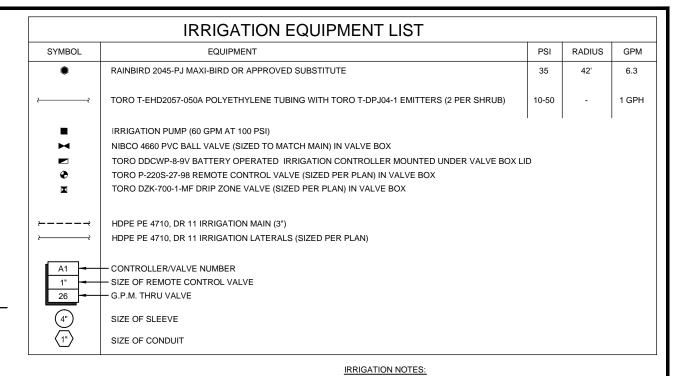
- 1. BACKFILL MIX SHALL CONSIST OF FOUR (4) PARTS OF AMENDED IMPORTED PLANTING SOIL TO ONE (1) PART ORGANIC SOIL CONDITIONER (SEE SPECIFICATIONS). ADD ONE (1) POUND OF 10-30-10 FERTILIZER TO ONE (1) CUBIC YARD OF BACKFILL MIX. MIX THOROUGHLY ON PROJECT SITE PRIOR TO ANY PLANTING OPERATIONS.
- 2. USE SLOW RELEASE FERTILIZER TABLETS 20-10-5, 21 GRAM SIZE.
- 3. GRASS MIX SHALL BE PLANTED UNDER ALL SHRUBS.
- 4. QUANTITIES ARE SHOWN FOR THE CONVENIENCE OF THE CONTRACTOR ONLY. THE CONTRACTOR SHALL PERFORM ITS OWN QUANTITY ESTIMATES FOR THE PURPOSES OF BIDDING AND CONSTRUCTION. THE CONTRACTOR SHALL PROVIDE PLANTS AND OTHER MATERIALS IN THE QUANTITIES NECESSARY TO COMPLETE THE INSTALLATION AS SHOWN ON THE DRAWINGS.

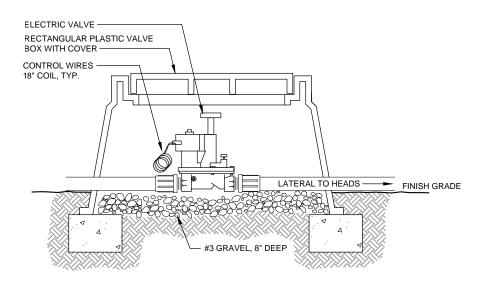
	REVISION	DATE	DESCR	IPTION	MADE BY	APPI	
QON A. A-T	DEPARTMENT OF PLANNING & PERMITTING CITY & COUNTY OF HONOLULU MAKAKILO QUARRY LANDSCAPE RENATURALIZATION PLANT MATERIAL LIST, DETAILS AND NOTES						
THIS WORK WAS PREPARED BY ME OR UNDER MY SUPERVISION AND CONSTRUCTION OF THIS PROJECT WILL BE UNDER MY OBSERVATION. APRIL 30, 2016 EXPIRATION DATE OF THE LICENSE		REVIEWED BY: APPROVED: CHIEF, DEPARTMEN	TOF PLANING MID PREMETTING OF		L-4.())	

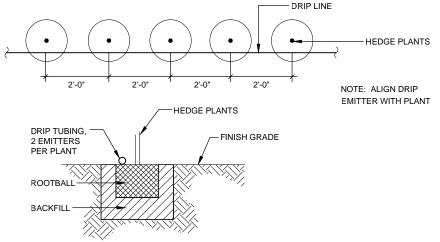
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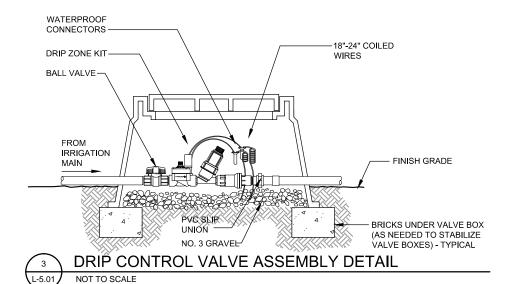














TEMPORARY IRRIGATION SYSTEMS SHOWN ON THE DRAWINGS ARE

UNANTICIPATED FIELD CONDITIONS. UNLESS OTHERWISE NOTED,

THE IRRIGATION SYSTEM DESIGN IS BASED ON A MINIMUM STATIC WATER PRESSURE OF 55 PSI AT THE POINT OF CONNECTION.

NOTIFY PROJECT ENGINEER IF PRESSURE IS LESS THAN 55 PSI OR

CONTRACTOR IS RESPONSIBLE FOR THE COORDINATION OF THE INSTALLATION OF ALL SLEEVES, CONDUITS, MAINS AND LATERALS

THESE ITEMS ARE LAID PRIOR TO THE PLACEMENT OF

FOR EACH BATTERY OPERATED CONTROLLER.

UNDER PAVEMENT AND THROUGH WALLS AND SHALL ASSURE THAT

PAVEMENT/WALL. ALL IRRIGATION WIRES SHALL BE BUNDLED AND INSTALLED UNDER THE IRRIGATION MAIN FOR IN-GRADE INSTALLATION. INSTALL IRRIGATION WIRES IN CONDUITS WHERE WIRES ARE NOT FOLLOWING THE IRRIGATION MAIN AND ALL

ABOVE-GRADE INSTALLATIONS. VERIFY UTILITY LOCATIONS BEFORE

THE CONTRACTOR SHALL COORDINATE THE WATERING SCHEDULE

THE CONTRACTOR, TOGETHER WITH THE OWNER'S MAINTENANCE REPRESENTATIVE SHALL PROGRAM THE IRRIGATION CONTROLLER TO ACCOMMODATE THE LANDSCAPE AND SITE REQUIREMENTS. AND SHALL INSTRUCT THE REPRESENTATIVE ON THE OPERATION OF THE

TRENCHING. CONTRACTOR WILL BE RESPONSIBLE FOR ANY

DIAGRAMMATIC AND ARE SUBJECT TO ADJUSTMENTS DUE TO

LOCATE ALL SPRINKLER HEADS, VALVES, AND PIPES WITHIN

PLANTING AREAS

GREATER THAN 100 PSI.

DAMAGE TO UTILITIES.

COMPLETE SYSTEM.

DEPARTMENT OF PLANNING & PERMITTING CITY & COUNTY OF HONOLULU

MAKAKILO QUARRY LANDSCAPE RENATURALIZATION

IRRIGATION DETAILS

	DESIGNED BY:		DRAWN BY:	
	REVIEWED BY:		DATE:	
	APPROVED:			
			DRAWING NO.	L-5.01
	CHIEF, DEPARTMENT	OF PLANNING AND PERMITTING	_	
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DRIPLINE DETAIL

ANNUAL COMPLIANCE REPORT

Makakilo Quarry, Ewa, Oahu, Hawaii

2014

Appendix K

Index and photos of Renaturalization Plan test plots (5 pages)





Photos 1 and 2, foreground, (above and below) Drip irrigation at former golf Water Feature No 9





Photo 3, right side, (above), West Road Berm, Hydromulched, without irrigation Photo 4, foreground, (below), West Corner, Hydromulched, without irrigation





Photos 5 and 6, foreground, (above and below), Mauka Slope, Hydromulched, without irrigation





Photos 7 and 8 (above and below) Mauka/Kunia Corner of former Driving Range. Hydromulched, with temporary irrigation



Beneficial Re-Use Plan for the Makakilo Quarry

Makakilo Quarry
Tax Map Keys (1) 9-2-03: 074 and 082 (Portions)
Makakilo, District of 'Ewa, O'ahu, Hawai'i

Prepared for:

STATE LAND USE COMMISSION

Prepared in compliance with Section 205-6, Hawai'i Revised Statutes, Sections 15-15-95 and 15-15-96, Hawai'i Administrative Rules and, Condition 10, Special Use Permit, Docket Number SP73-147. November 7, 2008.

and

DEPARTMENT OF PLANNING AND PERMITTING CITY AND COUNTY OF HONOLULU

Prepared in compliance with Sections 25.5.520 and 21-2.90, Revised Ordinances of Honolulu, Condition 3, Conditional Use Permit (Major), File Number 72/CUP-15. July 17, 2009.

Prepared by:

R. M. TOWILL CORPORATION

2024 North King Street, Suite 200 Honolulu, Hawai'i 96819

October 27, 2014

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EXHIBITS

- 1. Special Use Permit, Docket Number SP73-146
- 2. Conditional Use Permit, File Number 2007/CUP-91
- 3. Permits and Approvals for the Operation of Makakilo Quarry
- 4. Closure Grading Plan
- 5. Renaturalization Plan Submittal
- 6. Engineering Report
- 7. DPP Exhibit 24 Comments
- 8. DPP Exhibit 28 Cross-Section
- 9. View of 'Ewa
- 10. Prior Re-Use Plans
- 11. Summary of Resource Extraction to Date
- 12. Comparison of Resource Extraction Projections to Actual Data
- 13. Makakilo Quarry Excavation and Renaturalization Areas
- 14. Closure Grading Plan (Cross-Sections)

ACRONYMS AND ABBREVIATIONS

CCH City and County of Honolulu

CUP Conditional Use Permit

DP Development Plan

DPP Department of Planning and Permitting (City and County of Honolulu)

D&O Decision and Order

HAR Hawai'i Administrative Rules
 HRS Hawai'i Revised Statutes
 LUC Land Use Commission
 MGD Million Gallons Per Day

MW Megawatt PV Photovoltaic

ROH Revised Ordinances of Honolulu

SUP Special Use Permit

TMK Tax Map Key

UIC Underground Injection Control Line

Beneficial Re-Use Plan for the Makakilo Quarry

1.0 Purpose of the Beneficial Re-Use Plan

The Makakilo Quarry has been in operation since 1973 and is presently operated by Grace Pacific LLC. It is located in the 'Ewa District on the island of O'ahu. See **Figure 1, Location Map** and **Figure 2, Existing Quarry**. The Makakilo Quarry (Quarry) site is identified by tax map keys (TMKs) (1) 9-2-003: 074 and 082 (portions.) See **Figure 3, Parcel Map**.

The purpose of this Beneficial Re-Use Plan (Plan) is to comply with Condition 10 of the Special Use Permit (SUP), docket number SP73-147, and with Condition 3 of the Conditional Use Permit (CUP), file number 2007/CUP-91. This Plan presents Grace Pacific LLC's initial long-term re-use objectives, strategy, and operational plans for the 98.4-acre Quarry floor ("pit.") This Plan will be followed by 4 updates in the years, 2017, 2022, 2027 and 2032. It is anticipated that as the date for the Quarry closure draws nearer, the plans for the re-use of the site will become more definitive. It is expected that the surrounding communities of Kapolei, Makakilo, and Hoʻopili will continue to change over time and that the area's long term land use plan, the 'Ewa Development Plan (DP), will be updated before the year 2032 to reflect a more up-to-date vision for the future of the area. It is the intention of Grace Pacific LLC to reuse the "pit" in a way that is consistent with the values of the surrounding communities.

The extension of Quarrying activities was conditionally permitted by the State of Hawai'i, Land Use Commission (LUC), on November 7, 2008, SP73-147. See **Exhibit 1, Docket Number SP73-147**. The operation of the Makakilo Quarry is permitted until 2032, and includes expanded resource extraction and aggregate processing activities, and buffer areas. In addition to SP73-147, the Quarry is permitted under City and County of Honolulu (CCH), CUP, file number 2007/CUP-91. It also provides a set of requirements for the closure of the Makakilo Quarry. The eventual cessation of resource extraction activities at the Makakilo Quarry requires the preparation of a beneficial re-use plan, as stipulated by the CCH, Department of Planning and Permitting (DPP). See **Exhibit 2, File Number 2007/CUP-91**.

This Plan is prepared in accordance with the Decision and Order (D&O) Condition 10 as stipulated by SUP, docket number SP73-147, which states:

The Applicant shall provide a beneficial re-use plan for lands disturbed by its Quarry operations. The plan shall include planning and preparation of design and implementation scenarios for the beneficial re-use of the "pit" area consistent with established land use policies for the site and surrounding area. The re-use planning document and accompanying scenarios and drawings shall be submitted to the Department of Planning and Permitting, for review and approval within the fifth (5th) year after the date of the Land Use Commission's Decision and Order approving this expansion. An updated re-use plan shall be submitted to the DPP for review and approval every five (5) years thereafter. The beneficial re-use planning and design

document shall be an ongoing document prepared by a professional qualified in re-use planning and contain objectives, implementation and funding strategies for reclamation of the pit area for the purpose of achieving the area's long term land use policies. The Applicant will update the plan, as may be required by the Director of the Planning and Permitting, to respond appropriately to any changes in the surrounding area's land use policies.

The beneficial re-use plan shall include at least one public access across Tax Map Key: 9-2-03: 81 and the extension of Makakilo Drive, across the project in which safe pedestrian/bicycling passage can be established. Access requirements, such as but not limited to, subdivision, nature of improvements, routing, hours accessible, shall be established as part of the final beneficial re-use plan. Suggested routing of the public access is shown on Exhibit A.

In addition to SUP SP/73-147, this Plan is prepared in accordance with the 2007/CUP-91 which requires the fulfillment of the following D&O Condition 3 for the subject property:

Condition 3. On the fifth anniversary date of this Decision and Order, and an update every fifth year thereafter, as may be required by the Planning Director, the applicant shall submit a Beneficial Re-Use Plan which shall show how the property is to be left in a form suitable for reuse for purposes permissible in the district, relating such reuses to existing or proposed uses of surrounding properties. Among items to be included in the plan are feasible circulation patterns in and around the site, the treatment of exposed soil or subsoil, including measures to be taken to replace topsoil or establish vegetation in excavated areas in order to make the property suitable for the proposed reuse, treatment of slopes to prevent erosion and delineation of floodways and floodplains (if any) to be maintained in open usage. Submittal of the Beneficial Re-Use Plan under Condition 10 of the Land Use Commission Decision and Order, dated November 7, 2008, may satisfy the requirements of this condition (providing the Re-Use Plan complies with Land Use Ordinance Section 5.520, Specific Use Development Standards, for Resource Extraction).

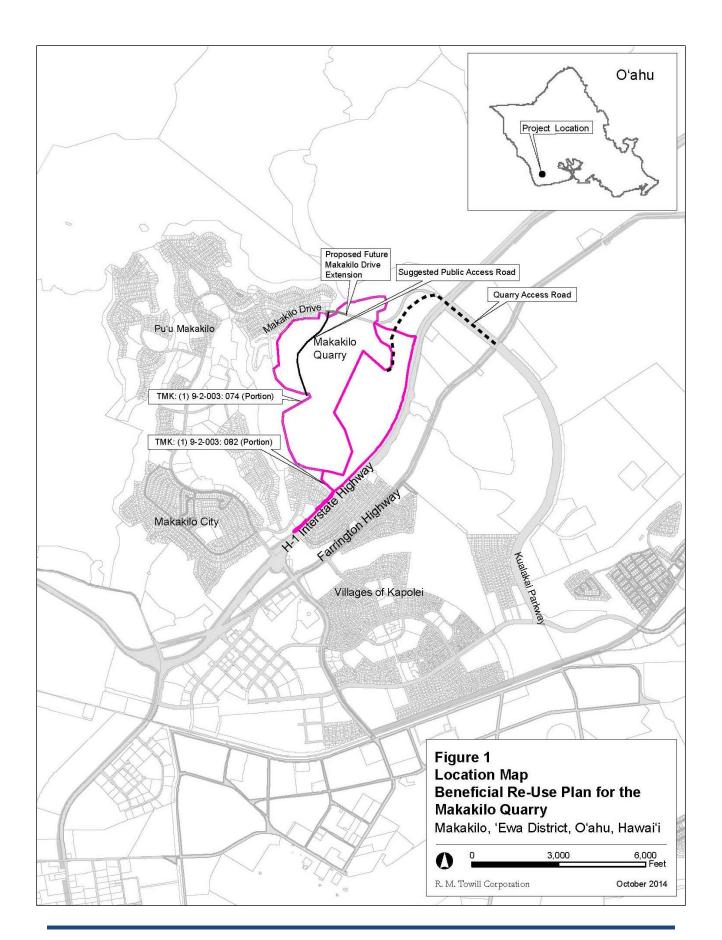
This Plan outlines alternatives that are permissible in the district in which it is situated. Circulation patterns in and around the Quarry are addressed by including the construction of a new access road that would connect to the future Makakilo Drive extension. All exposed soil in excavated areas will be revegetated irrespective of the chosen re-use scenario that is determined. Further, the 303.6 acre buffer site immediately surrounding the active Quarry will remain in its natural state. **See Figures 8-12**. A grading plan has also been prepared for the site which includes a vegetated area.

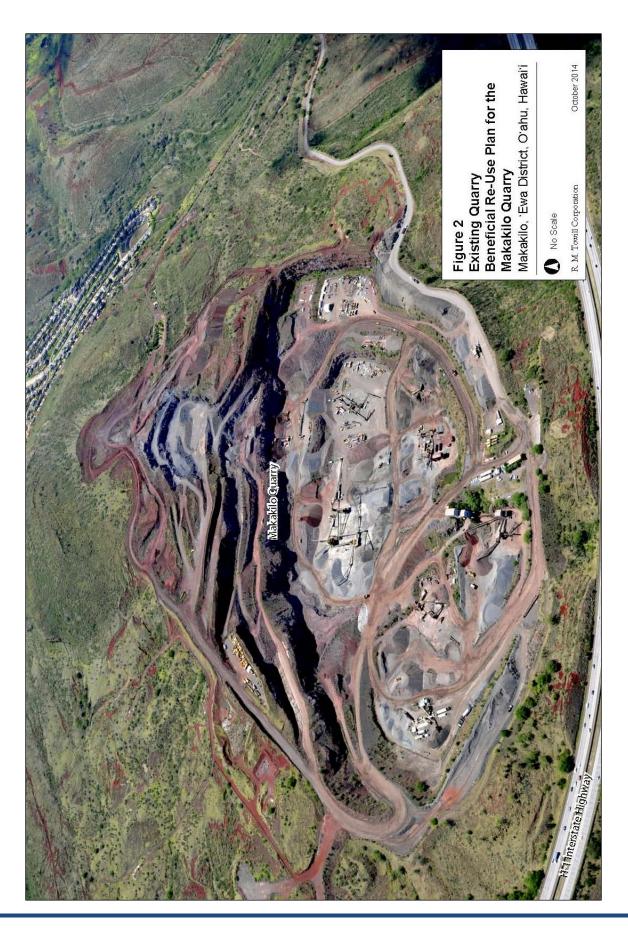
The 2007/CUP-91 for the Quarry operations was granted to the James Campbell Estate and its licensee Grace Pacific Corporation, now Grace Pacific LLC, subject to conditions. The total permitted 488.4 acres were incorporated into two TMKs: (1) 9-2-003: 074 and 082 (portions). See Exhibit 3, Permits and Approvals for Operation of Makakilo Quarry for a listing of land use entitlements associated with the project site.

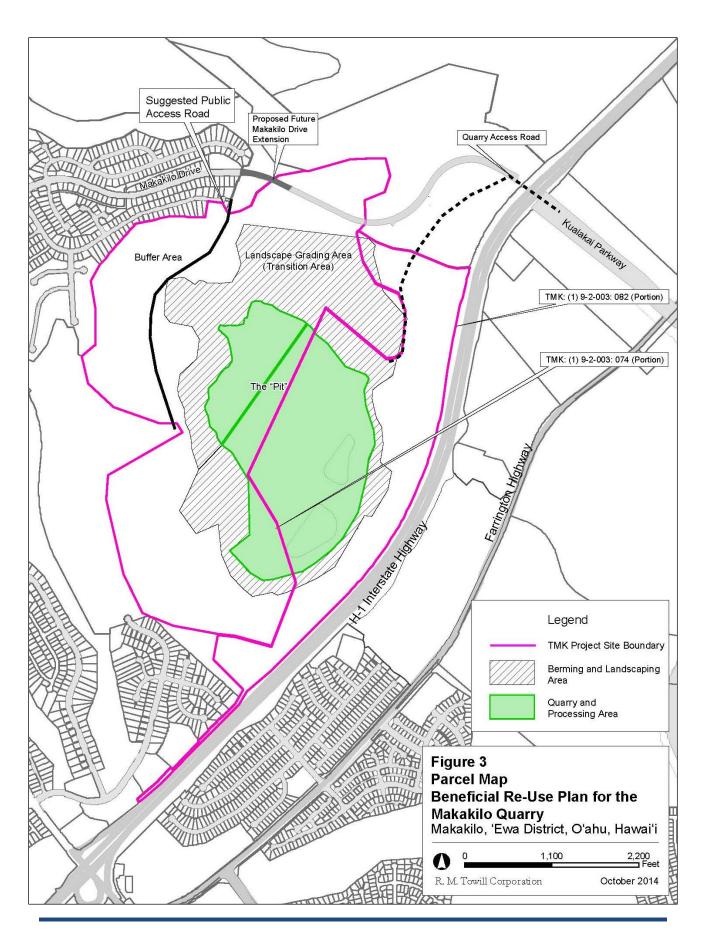
The remaining quarrying activities will continue to adhere to the requirements of the Land Use Ordinance (LUO), Section 21-5.520. Compliance for the exploitation phase of the Makakilo

Quarry has been met by adhering to SUP conditions 1-16, and CUP conditions 1-9. This Plan is submitted in compliance with the SUP and CUP which requires a plan delineating the re-use phase.

Two implementation scenarios for the site are presented in this Plan for which 5 concept alternatives are included. The first scenario presents four re-use alternatives, i.e. renaturalization, active or passive recreation, agriculture, and energy production, within the existing land use policies for the Quarry and surrounding area. The second scenario delineates a re-use alternative, i.e. residential, commercial, and light industrial mixed use, which takes into account the possibility of future changes in state and county land use designations for the Quarry and greater area.







2.0 Compliance with Regulations and Approved Land Use Plans

In addition to the SUP SP/73-147 and 2007/CUP-91 permits, this Plan is completed in compliance with state and county regulations and approved land use plans.

2.1 Hawai'i Revised Statutes (HRS), Chapter 205, Land Use Commission

The two parcels comprising the Makakilo Quarry site encompasses approximately 488.4 acres within the State Agricultural Land Use District. The total Quarry area includes a buffer that is approximately 303.6 acres, and a working area of the Quarry which is approximately 184.4 acres. HRS, Section 205-6, and the supporting Hawai'i Administrative Rules (HAR), Sections 15-15-95 and 15-15-96, provide guidelines for approval of an "unusual and reasonable" use such as resource extraction within the State Agricultural District. In accordance with the November 2008 LUC Conclusions of Law for the State SUP (72/SUP-1 by the CCH Planning Commission), Item 2, resource extraction at the Quarry site is a permitted use that "generally meets the guidelines for determining an 'unusual and reasonable' use within the State Land Use Agricultural District."

2.2 Revised Ordinances of Honolulu (ROH), Chapter 21, Land Use Ordinance (LUO), Section 21.5.520, Resource Extraction

ROH, Chapter 21, provides the framework for granting a CUP for resource extraction land uses on O'ahu in accordance with Article 5, *Specific Land Use Development Standards*, Section 21.5.520, *Resource Extraction*. This section states:

- (a) Blasting operations shall be restricted to Mondays through Fridays between 8 a.m. and 5 p.m.
- (b) The plan to be submitted with the application for a conditional use permit shall include a plan for development of the property which shall consist of two phases: the exploitation phase and the reuse phase.
 - (1) The plan for the exploitation phase shall show the proposed development as planned in relation to surrounding property within 300 feet, and shall include topographic surveys and other materials indicating existing conditions (including drainage) and the conditions (including topography, drainage and soils) which shall exist at the end of the exploitation phase. Contour intervals for topography shall be five feet in areas where slope is greater than 10 percent, two feet in areas where slope is 10 percent or less.
 - (2) The plan for the reuse phase shall indicate how the property is to be left in a form suitable for reuse for purposes permissible in the district, relating such reuses to uses existing or proposed for surrounding properties. Among items to be included in the plan are feasible circulation patterns in and around the site, the treatment of exposed soil or subsoil (including measures to be taken to replace topsoil or establish vegetation in excavated areas) in order to make the property suitable for the proposed reuse, treatment of slopes to prevent erosion and delineation of floodways and floodplains (if any) to be maintained in open usage. In the plan for reuse, intermittent lakes and marshes shall not be

allowed, except in areas included in flood hazard districts and if situated more than 1,000 feet from the nearest residential, apartment, apartment mixed use or resort zoning district boundary.

(*Added by Ord.* 99-12)

2.3 General Plan, City and County of Honolulu

Among the land use planning and policy documents prepared by DPP, the CCH *General Plan* (*General Plan*) sets comprehensive guidelines governing development on O'ahu. As stated in the introduction to the *General Plan* (revised 2002):

The General Plan for the City and County of Honolulu is a comprehensive statement of objectives and policies which sets forth the long-range aspirations of Oahu's residents and the strategies of actions to achieve them. It is the focal point of a comprehensive planning process that addresses physical, social, economic and environmental concerns affecting the City and County of Honolulu. This planning process serves as the coordinative means by which the City and County government provides for the future growth of the metropolitan area of Honolulu.

The general development standards for quarries are provided in Section III, *Natural Environment*. The *General Plan* defines quarries as mountains that must be restored to a natural looking state at the time of Quarry closure. The *General Plan* states:

- Objective A, To protect and preserve the natural environment.
 - Policy 2, Seek the restoration of environmentally damaged areas and natural resources.
 - Policy 6, Design surface drainage and flood-control systems in a manner which will help preserve their natural settings.
- Objective B, To preserve and enhance the natural monuments and scenic views of Oahu for the benefit of both residents and visitors.
 - Policy 1, Protect the Island's well-known resources: its mountains and craters; forests and watershed areas; marshes, rivers, and streams; shoreline, fishponds, and bays; and reefs and offshore islands.
 - Policy 2, Protect Oahu's scenic views, especially those seen from highly developed and heavily traveled areas.

Zoning for the Makakilo Quarry is shown in **Figure 6**, **Zoning Map**.

2.4 Ewa Development Plan (2013), City and County of Honolulu

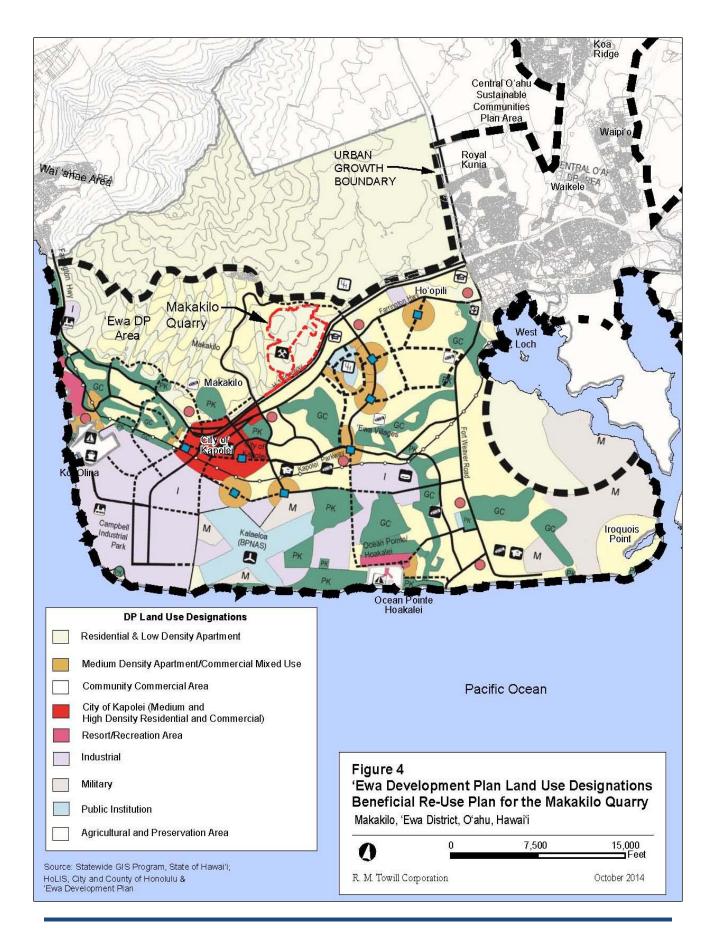
The Quarry site is located within the 'Ewa DP area adopted in 2013.

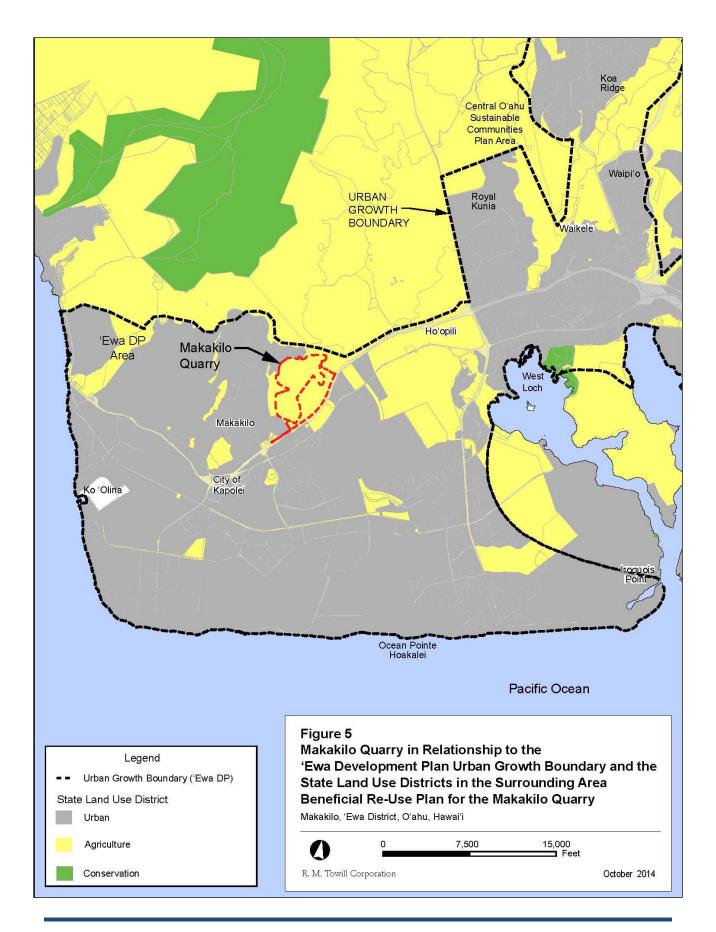
The stated objectives of the 'Ewa DP includes:

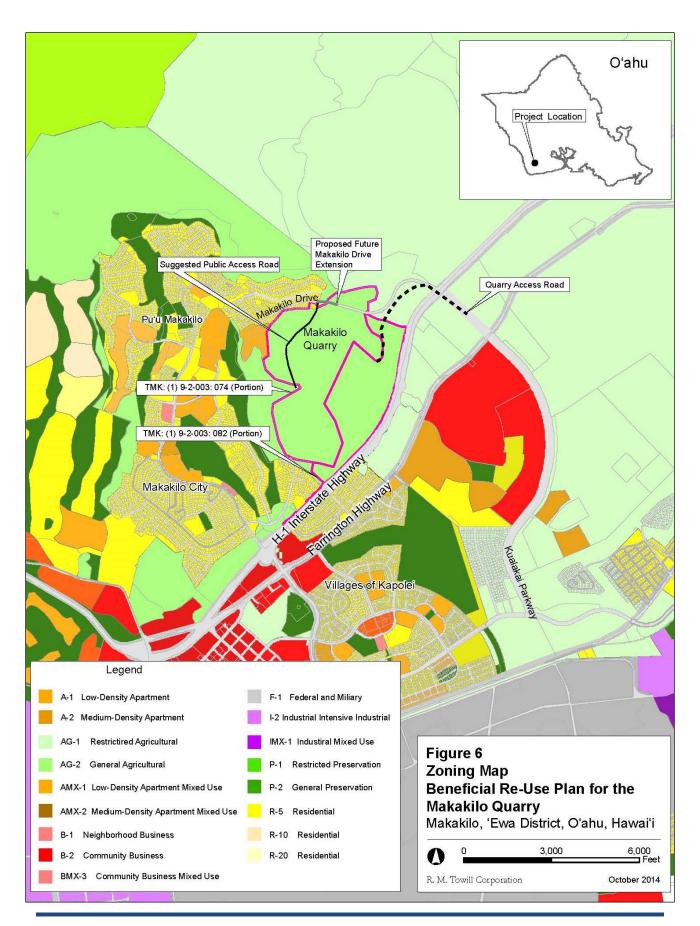
"The [2013 'Ewa Development] Plan protects prime agricultural lands; supports development of the Secondary Urban center at Kapolei; establishes a regional open space network; protects natural, historical and cultural resources; promotes master planned communities; and requires provisions of adequate infrastructure to meet current and anticipated needs."

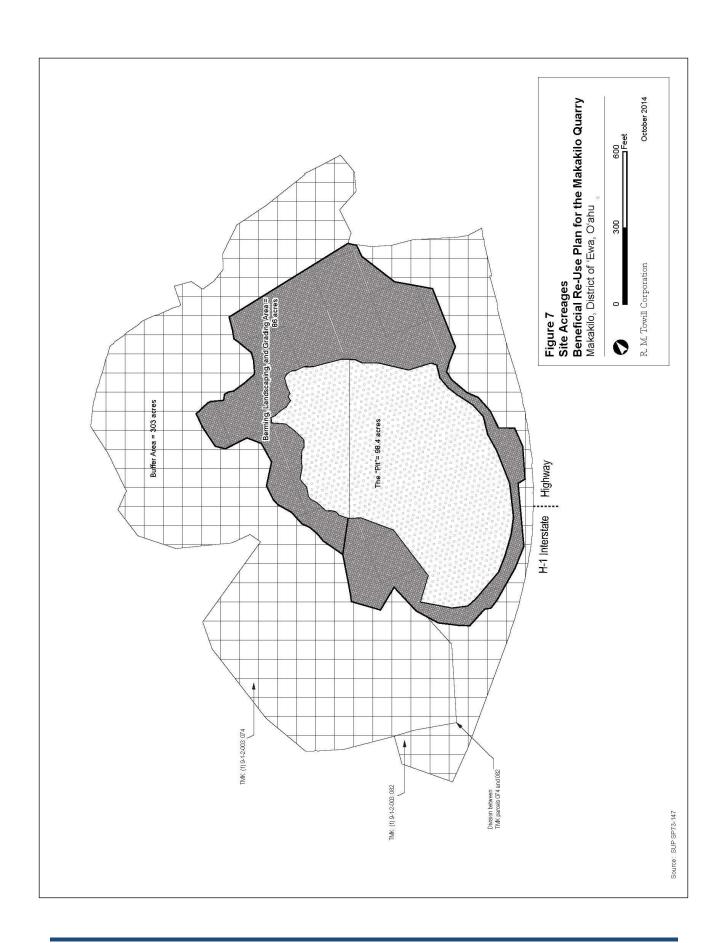
The 'Ewa DP designates the Makakilo Quarry for agricultural and preservation uses. In addition, the 'Ewa DP located the Quarry within the Urban Growth Boundary. See Figure 4, 'Ewa Development Plan Land Use Designations and Figure 5, Makakilo Quarry in Relationship to the 'Ewa Development Plan Urban Growth Boundary and the State Land Use Districts in the Surrounding Area. Further, Pu'u Makakilo, which encompasses the Quarry area, is included in the 2013 'Ewa DP in the contexts of open space. As stated in the 'Ewa DP:

• Open Space. A network of Open Space and Greenways will link the Secondary Urban Center and associated employment centers, new master planned residential developments and revitalized established communities, an 'Ewa shoreline park, and a major regional park at Kalaeloa (Sec. 2.2.3). Pu'u Makakilo is part of the Open Space and Greenways Network as a "mountain and agricultural area" intended for preservation and enhancement as a visual landmark and part of a significant vista from Kapolei (Sec. 2.2.3, Table 2.2).









2.5 Compliance Objectives

In consideration of the site's opportunities and constraints, and the conditions of the SUP and CUP, alternatives were developed as described below. The Estate of James Campbell, owner of the Quarry site from 1973 through 2009, did not refine their vision for the end use of the site because they were primarily concerned about maintaining the visual appearance of Pu'u Makakilo. In presenting the proposed Quarry expansion to the Makakilo/Kapolei/Honokai Hale Neighborhood Board in July and November of 2006, Grace Pacific LLC, representatives noted that the Mayor's Commission on Landfill Siting had ruled out Makakilo because it sits within the underground injection control (UIC) zone. The residents were strongly opposed using the site as a landfill.

2.5.1 Closure Grading Plan

The *Closure Grading Plan*, attached to this Plan as **Exhibit 4, Closure Grading Plan**, illustrates the final topography 2032. Resource extraction and land-forming that will occur between 2014 and 2032 are directed at achieving this end-state. **Exhibits 11** and **12** measure the progress through 2013 towards achieving the *Closure Grading Plan*. The *Closure Grading Plan* was included with the 2009 Annual Compliance Report as Appendix J. The objective of the *Closure Grading Plan* is to conform the land to match the general contours of Pu'u Makakilo. When observed from the H-1 Interstate Highway or Farrington Highway, one would observe a continuous slope from the H-1 to the top of Pu'u Makakilo.

2.5.2 Renaturalization Plan

The *Renaturalization Plan* is complementary to the *Closure Grading Plan* and is included within this Plan as **Exhibit 5**, **Renaturalization Plan**. The *Renaturalization Plan* describes actions to be taken to revegetate areas exposed as a result of quarrying activities. The objective of the *Renaturalization Plan* is to introduce plant material that reflect the current character of Pu'u Makakilo. Plant material is to be drought-tolerant and native to Hawai'i. The plan has not been approved by DPP and the extent and method of naturalizing the buffer zone is awaiting resolution. The *Renaturalization Plan* was included with the 2009 Annual Compliance Report as Appendix C and was resubmitted on May 30th, 2014.

2.5.3 Grading and Drainage

The May 2008 *Engineering Report* prepared by Belt Collins is attached to this Plan as **Exhibit 6**, **Engineering Report**. The *Engineering Report* addresses grading, drainage and revegetation of the land disturbed by quarrying. This is included as Exhibit 21 of the Planning Commission's record, as provided by DPP.

The letter from Belt Collins to DPP dated July 7, 2008 recaps the changes that were made to the April 2007 SUP/CUP application in May and June of 2008 as well as the schedule of excavation and naturalization. The *Closure Grading Plan* with cross sections and profiles, dated June 5, 2008, is attached to this Plan as **Exhibit 5, DPP Exhibit 28 Comments**.

Further, included within **Exhibit 8, DPP Exhibit 28 Comments** is a plan view depiction of the naturalization phasing. **Exhibit 9, View of 'Ewa** includes a plan view depiction of the excavation phasing, and **Exhibit 10, Prior Re-Use Plans** includes the designation of areas and



3.0 Factors to Consider for Beneficial Re-Use of the Makakilo Quarry

- The "pit" area which is the focus of this Beneficial Re-Use Plan, comprises approximately 98.4 acres.
- Storm Water Runoff Detention Basins.
 Two storm water detention basins are proposed to handle site runoff.
- Physical Site Characteristics for Certain Types of Uses.

 The site is suited for photovoltaic (PV) facilities or recreational uses. The "pit" is exposed to high solar insolation.
- Buffer Areas.

 Buffer areas will have been renaturalized consistent with the surrounding terrain.
- Location.
 The Quarry is located next to existing transportation facilities, and includes the H-1 Interstate Highway, Farrington Highway, and Kalaeloa Harbor.
- Topography.

 The current site is comprised of highly sloped lands as a result of quarrying activities. However, there remains a relatively flat area designated as the "pit" that may be usable.
- Limited Water Allocation of 0.250 mgd.
 Water on-site has thus far only been used for non-potable purposes.
 The availability of potable water to serve future potential uses will need to be addressed.
- Site ventilation is limited by gradient and relationship to the buffer area.
- Vehicular access is limited.
 The property does not currently facilitate other site uses. The existing 50-foot wide road has one entry point from an unnamed private road. If the site is to be redeveloped in a way that would increase vehicular traffic, the access roadway will need to be improved.
- Electrical Services.

 The project site currently has a small, dedicated electrical sub-station on the makai side of the H-1 Interstate Highway for the Quarry operations only.
- Wastewater Service.
 The project site does not have wastewater infrastructure.
- The Project Site is Located within the UIC zone.

4.0 Re-Use Plan Alternatives

Alternative concept land use plans were developed for the re-use of the "pit," recognizing the beneficial re-use opportunities, constraints, and conditions of the SUP and CUP permits granting authorization for the use of the Quarry. The following is a summary of the alternatives including estimated costs associated with development. Each of the five alternatives involves the implementation of public access to the site from the proposed Makakilo Drive Extension project. The access, however, will not be open for public use until 2032.

4.1 Scenario One: Re-Use Based on Existing Land Use

This re-use scenario is based on the current State and CCH land use entitlements which are for agriculture. The recently adopted 'Ewa Development Plan (2013) reaffirms the land use designation for agricultural uses. The 'Ewa DP however notes that the site is within the "Urban Growth" boundary. See Figure 5, 'Ewa Development Plan Urban Growth Boundary and the State Land Use Districts in the Surrounding Area. Zoning for the site as described in Chapter 21, ROH is Agriculture 2 (AG-2.)

The LUO describes permitted uses with lands zoning AG-2 as follows:

"Aquaculture" means the production of aquatic plant and animal life for food and fiber within ponds and other bodies of water.

"Crop production" means agricultural and horticultural uses, including production of grains, field crops, and indoor and outdoor nursery crops, vegetables, fruits, tree nuts, flower fields and seed production, ornamental crops, tree and sod farms, associated crop preparation services and harvesting activities.

"Forestry"

"Open land" means land which may be improved, but which contains no structures, and which is set aside, designated or reserved for public or private recreational use or enjoyment, including but not limited to picnic grounds, beaches, beach accesses, greenways and areas for hiking, fishing, hunting, and other scenic interests.

"Open space" means any portion of a zoning lot essentially free of structures that serves the purpose of visual relief and buffering from building and structural mass. These areas may be privately or publicly owned, and may or may not be accessible to the general public. Open space includes but is not limited to parks, playgrounds, playfields, plazas, outdoor dining areas, botanical gardens, fountains, reflecting pools and other bodies of water, walkways and nonbuildable easements. Simple structures which contribute to the enjoyment of the area may be permitted, including stages for performances, street furniture, sculpture, umbrellas, and other similar features. In determining whether an area is open space, the following shall apply:

- (1) It shall be unobstructed from its lowest level to the sky, except for umbrellas, and unsupported roof eaves and roof overhangs.
- (2) It shall be at finish grade unless otherwise specified in this chapter.
- (3) It shall not be used for parking, loading, maneuvering of vehicles, or storage of equipment or refuse.

(4) A required yard may be considered open space.

Open Space, Public. "Public open space" means open space that is accessible to the public at all times, not including required yards, except where permitted. It adjoins a public street, public way, pedestrian easement or public open space such as a park, playground or shoreline area, for at least 20 percent of its perimeter at an elevation not more than three feet above the adjoining sidewalk. A minimum of 50 percent of its total area is landscaped (see Figure 21-10.5).

"Game Preserves"

"Livestock grazing" means the raising or feeding of livestock by grazing or pasturing. Not included are feedlots or the raising and keeping of swine.

"Minor livestock production" means commercial small animal operations as a principal land use, such as rabbit farms, apiaries or aviaries.

"Livestock Veterinary Services"

The basis for this re-use scenario is to promote uses allowed in the AG-2 zone. Five alternatives for potential re-use for the 488.4-acre site are outlined below:

4.1.1 Alternative One: Renaturalization

This alternative follows the landowner's submittal in 2009, to provide for the introduction of drought tolerant, native vegetation on the cut areas and benches. See **Figure 8**, **Renaturalization Beneficial Re-Use Plan**. Plant materials selected are described in the planting plan in the Renaturalization Plan.

The estimated cost of renaturalization: \$3 million dollars.

(Construction of a roadway, parking lot and landscaping).

4.1.2 Alternative Two: Active and Passive Recreation

This alternative can facilitate the creation an open space passive recreation oasis utilizing the benches and the "pit" area with little or minimal "land forming" which would involve grading. Impervious surfaces will be kept to a minimum. For a conceptual example of how the land area could be allocated, see **Figure 9**, **Active and Passive Recreation Beneficial Re-Use Plan**.

In addition, this alternative can facilitate the creation of an active recreational area that could be used by organizations with compatible objectives. The space will utilize the benches and the "pit" area "subdivided" into activity venues.

The estimated cost of passive or active recreation use: \$9.8 million dollars. (Construction of a roadway, intersection, improvements and fill. Does not include power.)

4.1.3 Alternative Three: Agriculture

The objective of this alternative is to use the site for agricultural purposes. There is a possibility for the "pit" to be subdivided into areas for establishing cultivar, grow-out areas, open and covered plant nurseries, storage areas, research plots, and post-harvest production areas. Future water availability for the site will require additional research. See **Figure 10**, **Agricultural Beneficial Re-Use Plan.**

The estimated cost of agriculture use: \$11 million dollars. (Construction of a roadway, sewer pump station, sewer force main, gravity line, fill, and other site improvements.)

4.1.4 Alternative Four: Energy Facility – Photovoltaic Farm (PV)

The objective of this alternative is to offer the approximately 98.4-acre "pit" area (and possibly portions of the benches) for lease to an energy entrepreneur for energy production, such as a PV utility grade production facility. The site has the potential of generating 12+ megawatts (MW) of power (estimate based on the 10 acre La Ola Solar Farm on the island of Lāna'i, which produces 1.5 MW). The site has the advantage of a south to southwest solar orientation. Visual impacts and integration into the Hawaiian Electric Company's (HECO) grid is yet to be determined. See **Figure 11, Energy Facility – PV Farm Beneficial Re-Use Plan.**

The estimated cost of an energy facility use: \$3 million dollars (excluding PV improvements.) (Construction of a roadway and other site improvements. Does not include power.)

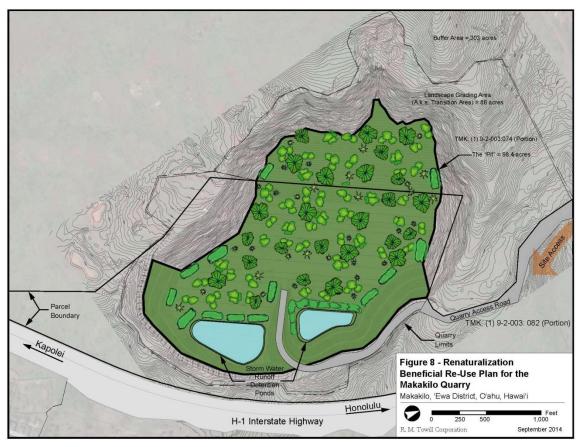
4.2 Scenario Two: Re-Use Based on Change in Land Use Entitlements

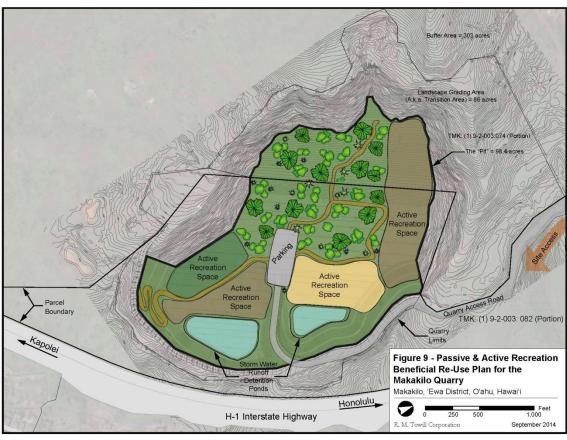
This alternative reuse scenario is based on a hypothetical future change in State and County land use entitlements from agriculture to an "urban" use, allowing for development such as residential, commercial, or industrial use. Grace Pacific LLC currently does not have definitive plans for an "urban" beneficial re-use development. For the purposes of this analysis, it is assumed that the DP amendment will include a change in land use from *agricultural* to an *urban use such as: residential, commercial, or industrial*. The DP amendment process requires community input and adoption by the City Council.

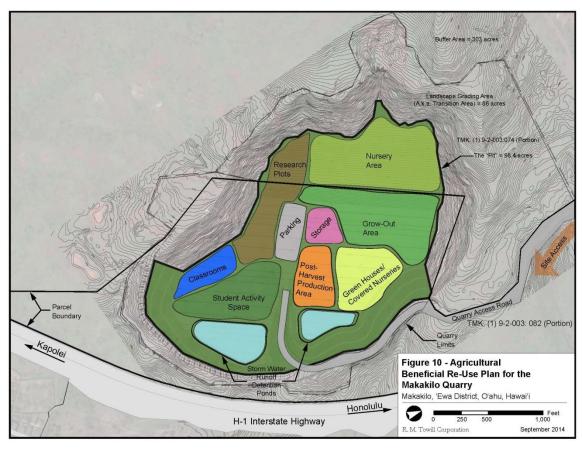
Following the redesignation of the state land use and the DP amendment, a zoning change would also be required. The specific zoning to be sought remains undetermined because a viable use for the Quarry's beneficial re-use has not been determined.

4.2.1 Alternative Five: Potential Urban Use

Several factors point to the long term potential for some form of urban use at the property. The property is situated in close proximity to existing and planned urban development, including the existing residential neighborhoods of Makakilo, the master planned community of Ho'opili and the UH West O'ahu. UH West O'ahu currently has plans for commercial development, campus expansion, agricultural use and solar farms on lands near the current campus and on lands mauka of the H-1 Interstate Highway, near the property. Ho'opili has plans for a large new residential community, including ancillary commercial uses. The potential for synergies with these planned uses will be examined. The planned Makakilo Drive Extension will provide connectivity for the region and enhance access to the property. While infrastructure improvements would be required to serve the property, it would build upon existing improvements. As noted previously, the site is situated within the Ewa DP's urban growth boundary, a recognition of the site's suitability for and proximity to existing and planned urban development. These and other factors point to the potential for some form of urban type use at the property. Grace Pacific LLC will monitor development plans within the region and continue to assess potential re-use alternatives as the quarry term nears. Any proposed urban use will be thoroughly vetted with community stakeholders.







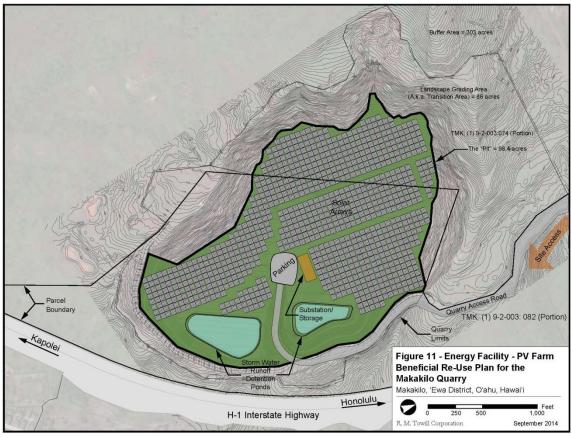


EXHIBIT 1—SPECIAL USE PERMIT, DOCKET NUMBER SP73-146





'08 NOV 19 P1:01

BEFORE THE LAND USE COMMISSION OF THE STATE OF HAWAI'I OF THE STATE OF HAWAI'I

DOCKET NO CDES 145

)	DOCKET NO. 5173-147
)	
)	FINDINGS OF FACT, CONCLUSIONS
)	OF LAW, AND DECISION AND ORDER
)	APPROVING WITH MODIFICATIONS
)	THE RECOMMENDATION OF THE
)	CITY AND COUNTY OF HONOLULU
)	PLANNING COMMISSION TO (1)
)	EXTEND THE LIFE OF THE
)	MAKAKILO QUARRY RESOURCE
)	EXTRACTION AND AGGREGATE
)	PROCESSING OPERATIONS TO 2032;
)	AND (2) EXPAND THE RESOURCE
)	EXTRACTION AND BUFFER AREAS OF
)	THE QUARRY
)	
)	

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER
APPROVING WITH MODIFICATIONS THE RECOMMENDATION OF THE CITY
AND COUNTY OF HONOLULU PLANNING COMMISSION TO (1) EXTEND THE
LIFE OF THE MAKAKILO QUARRY RESOURCE EXTRACTION AND AGGREGATE
PROCESSING OPERATIONS TO 2032; AND (2) EXPAND THE RESOURCE
EXTRACTION AND BUFFER AREAS OF THE QUARRY

This is to certify that this is a true and correct copy of the document on file in the office of the State Land Use Commission, Honolulu, Hawaii.

Executive Officer

should be a conclusion of law is to be taken as such notwithstanding its denomination as a finding of fact.

DECISION AND ORDER

Having duly considered the complete record in this matter, the oral arguments presented by the parties in this proceeding, the LUC, through an amended motion having been duly made at a meeting conducted on October 2, 2008, in Honolulu, Hawai'i, and the amended motion having received the affirmative votes required by section 15-15-13, HAR, and there being good cause for the amended motion, hereby APPROVES with modifications the recommendation of the Planning Commission to (1) extend the life of the Makakilo Quarry resource extraction and aggregate processing operations to 2032; and (2) expand the resource extraction and buffer areas of the quarry on the Property for a total special use permit area in this docket of approximately 541.5 acres of land within the State Land Use Agricultural District at Pu'u Makakilo, 'Ewa, O'ahu, Hawai'i, identified as TMKs: 9-1-16: 4 and 9-2-03: por. 74 and por. 82,10 and approximately shown on Exhibit B and described in Table 1, attached hereto and incorporated by reference herein, subject to the following conditions to replace all other conditions imposed by the LUC on March 23, 1973, in this docket that are applicable to the rock quarrying operations:

1. Within six (6) months of the Land Use Commission's Decision and

¹⁰ The approximately 541.5 acres of land also includes that portion of the tunnel located beneath the H-1 Freeway, which is not assigned a TMK parcel.

Docket No. SP73-147/Grace Pacific Corporation (Formerly Pacific Concrete & Rock Co., Ltd.)

Page 23
Findings Of Fact, Conclusions Of Law, And Decision And Order Approving With Modifications The Recommendation Of The City
And County Of Honolulu Planning Commission To (1) Extend The Life Of The Makakilo Quarry Resource Extraction And
Aggregate Processing Operations To 2032; And (2) Expand The Resource Extraction And Buffer Areas Of The Quarry

Order approving the Special Use Permit, the Applicant shall submit:

- a. A new site plan with metes and bounds map and description delineating the approximately 541-acre Property, including the boundaries of the quarry excavation and berming areas, the processing site and conveyor tunnel, and the buffer area to the Director of Planning and Permitting for review and approval. The site plan shall also be submitted to the Land Use Commission.
- b. A fire protection and control plan to Honolulu Fire Department for review and approval. A copy of the approved plan shall be submitted to the Director of Planning and Permitting within 30 days of approval.
- 2. Within one (1) year of the Land Use Commission's Decision and Order approving the Special Use Permit, the Applicant shall submit to the Director of Planning and Permitting for review and approval a renaturalization plan in coordination with the proposed Closure Grading Plan for the quarry site and buffer area mauka of the H-1 Freeway showing landscaping details including plant types, sizing and spacing, irrigation facilities and distribution systems.
- 3. All resource extraction, related aggregate processing and concrete and asphalt production activities, including recycling activities shall cease by December 31, 2032. Final beneficial re-use plans as approved by the Department of Planning and Permitting shall be implemented immediately upon the cessation of said resource extraction and related quarrying activities.
- 4. The Applicant shall close the processing site on Parcel 4 by relocating all uses on the site into the quarry pit or Campbell Industrial Park by

December 31, 2012, and Parcel 4 shall be returned to landscaped open space use within six (6) years of the date of the Land Use Commission's Decision and Order. A landscape plan shall be submitted to the Director of Planning and Permitting for review and approval on the second anniversary date of the Land Use Commission's Decision and Order and the approved landscape plan shall be implemented within one (1) year of its approval. Landscaping shall be maintained in a natural state for the life of the Special Use Permit.

- 5. Beginning January 1, 2012, quarry operations shall be limited to the following days/hours:
 - a. Quarry excavation, crushing, stockpiling, equipment maintenance, and recycling facility 6:00 a.m. to 6:00 p.m., Monday to Saturday.
 - b. Hot-mix asphalt plant 6:00 a.m. to 6:00 p.m., Monday to Friday.
 - c. Unloading of cold-planed asphaltic concrete during re-paving jobs 6:00 p.m. to 10:00 p.m., Sunday to Friday.
- 6. Except for quarry, recycling activities in the quarry, and renaturalization activities, the remainder of Tax Map Key: 9-2-03: 74 shall remain in open space buffer for the life of the quarry and related activities. Minor accessory uses or structures may be permitted on Parcel 74 with the express written consent of the Director of Planning and Permitting. Any other uses shall be processed pursuant to Section 205-6, Hawai'i Revised Statutes.

- 7. As may be required by the State Department of Health, the Applicant shall place in service additional dust control measures to control dust generation at the project such that no visible fugitive dust shall cross the combined property boundaries of Tax Map Key: 9-2-03: 74 and 82.
- 8. The Applicant shall, as a result of modifications to the final grading and beneficial re-use plans, submit an update of the drainage plan, prepared by a qualified civil engineer, as may be required by the Director of Planning and Permitting for review and approval.
- 9. On each anniversary date of the Land Use Commission's Decision and Order, the Applicant or its successor shall file with the Department of Planning and Permitting and the Land Use Commission a report and supporting documentation demonstrating the status of compliance with each of the conditions of the Special Use Permit approval. Included in the supporting documentation shall be an updated rectified aerial imagery of the quarry, buffer area and processing site and dust control management plan. The following items shall also be a part of the supporting documentation:
 - a. Observations of fugitive dust.
 - b. A report on replanting activities, including the areas replanted, and the type of vegetation planted.
 - c. A report of any citizen's complaints relating to the operation along with the actions taken to ameliorate those complaints.

The Director may present its analysis and recommendations on the annual report to the Planning Commission and the State Department of Health for further action pursuant to the Rules of the Planning Commission.

10. The Applicant shall provide a beneficial re-use plan for lands disturbed by its quarry operations. The plan shall include planning and preparation of design and implementation scenarios for the beneficial re-use of the pit area consistent with established land use policies for the site and surrounding area. The re-use planning document and accompanying scenarios and drawings shall be submitted to the Department of Planning and Permitting, for review and approval within the fifth (5th) year after the date of the Land Use Commission's Decision and Order approving this expansion. An updated re-use plan shall be submitted to the DPP for review and approval every five (5) years thereafter. The beneficial re-use planning and design document shall be an ongoing document prepared by a professional qualified in re-use planning and contain objectives, implementation and funding strategies for reclamation of the pit area for the purpose of achieving the area's long term land use policies. The Applicant will update the plan, as may be required by the Director of Planning and Permitting, to respond appropriately to any changes in the surrounding area's land use policies.

The beneficial re-use plan shall include at least one public access across

Tax Map Key: 9-2-03: 74, connecting Tax Map Key: 9-2-03: 81 and the extension of

Makakilo Drive, across the project in which safe pedestrian/bicycling passage can be established. Access requirements, such as but not limited to, subdivision, nature of improvements, routing, hours accessible, shall be established as part of the final beneficial re-use plan. Suggested routing of the public access is shown on Exhibit A.

- 11. Approval of this Special Use Permit does not constitute compliance with other land use ordinances or governmental agencies' requirements. They are subject to separate review and approval. The Applicant shall be responsible for insuring that the final plans for the project approved under this permit comply with all applicable provisions of the Land Use Ordinance and other governmental agencies' provisions and requirements.
- 12. The Applicant and/or landowner shall notify the Director of Planning and Permitting and the Land Use Commission of any changes in uses on the Property; termination of any uses on the Property; and/or transfer in ownership of the Property or any uses on the Property. The Planning Commission shall then, in consultation with the Director of Planning and Permitting, determine the appropriate disposition of this Special Use Permit and facilities.
- 13. In the event of noncompliance with any of the conditions set forth herein, the Director of Planning and Permitting may terminate all uses approved under this Special Use Permit or the Director may declare this Special Use Permit null and void or seek available civil procedures to enforce compliance.

- 14. The Applicant shall, for the life of the Special Use Permit, establish and disclose to the community, a telephone number dedicated to receiving and recording complaints relating to quarry and recycling operations. A continuous volume of complaints shall warrant reconsideration of the Special Use Permit by the Planning Commission.
- 15. The uses in the quarry excavation area shall be limited to rock excavation, crushing, stockpiling, a new hot-mix asphalt plant, recycling of concrete rubble, glass, and asphaltic concrete pavement, equipment maintenance, employee support, parking, administration, and a water well and pump. No other uses shall be permitted without the approval of the Land Use Commission.
- 16. The Applicant shall establish the quarry expansion in substantial compliance with the representations made to the Land Use Commission in obtaining the Land Use Commission Special Use Permit. Failure to do so may result in the revocation of the permit.

IT IS FURTHER ORDERED that the conditions imposed by the LUC on March 23, 1973, in this docket that are applicable to the sanitary landfill operations shall remain in full force and effect.

ADOPTION OF ORDER

The undersigned Commissioner	rs, being familiar with the record and
proceedings, hereby adopt and approv	e the foregoing ORDER this $6th$ day of
A 1	ER and its ADOPTION shall take effect upon the
date this ORDER is certified and filed b	by this Commission.
Done at Honolulu Ha	wai'i, this 6th day of Nowner
2008, per motion on 1/20.6 , 2008.	
	LAND USE COMMISSION
APPROVED AS TO FORM	STATE OF HAWAI'I
Deputy Attorney General	DUANE KANUHA Chairperson and Commissioner
	ABSENT RANSOM PILTZ
	Vice-Chairperson and Commissioner
	VLADIMIR PAUL DEVENS
	Vice-Chairperson and Commissioner
	ABSENT
	KYLE CHOCK
	Commissioner

ABSEN'	Г

THOMAS CONTRADES

Commissioner

LISA M. JUDGE

Commissioner

NORMAND LEZY

Commissione

NICHOLÁS W. TEVES, JR.

Commissioner

REUBEN S.F. WONG

Commissioner

Filed and effective on: November 7, 200 8

Certified by:

ORLANDO DAVIDSON

Executive Officer

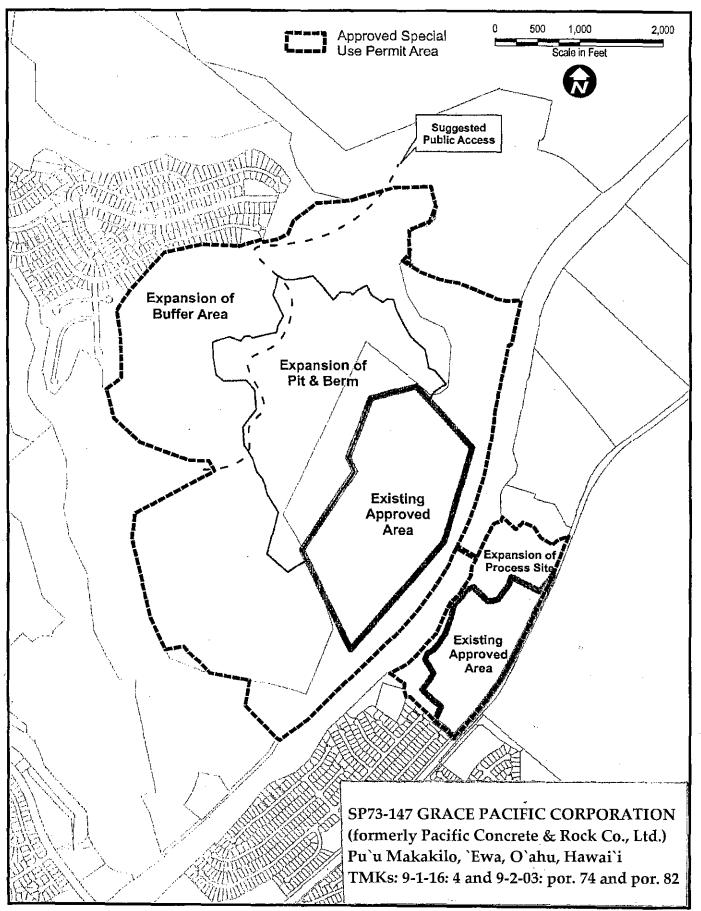




EXHIBIT B

Table 1

Acreage of Existing Quarry and Proposed Expansion Areas

	· · · · · · · · · · · · · · · · · · ·			
Description of Area	Existing Acreage	Proposed	Total	TMKs
	_	Additional Acreage		Affected _
Quarry Excavation &	78.4	105.8 (including	184.2	9-2-03: por.
Berming (including		20.6 acres of		74 & por. 82
landscaping and grading)		quarry expansion		
		& 44 acres of		
		landscaping and		
	(grading in Parcel		
		74 and 41.2 acres		
		in Parcel 82)		
Processing Site &	54.6 (comprising 53.6	0.00	54.6	9-1-16: 4
Conveyor Tunnel	Parcel 4, 0.6 flag-			
	strip connecting to			
	Parcel 10, 0.3 road			
	remnant, and 0.1			
	tunnel)			
Buffer Area Surrounding	188.0	114.7	302.7	9-2-03: por.
Quarry (Passive Open				74 & por. 82
Space)				
Offsite Stilling Basin (to	1.4	(1.4)	0.00	9-1-16: por.
be abandoned)				108
Access Road	0.00	0.00	0.00	9-2-02: por.
				6
Total	322.4	219.1	541.5	

BEFORE THE LAND USE COMMISSION

OF THE STATE OF HAWAI'I

In The Matter Of The Application Of)	DOCKET NO. SP73-147
)	
GRACE PACIFIC CORPORATION)	CERTIFICATE OF SERVICE
(Formerly Pacific Concrete & Rock Co.,)	
Ltd.))	
)	
To Extend The Life Of The Makakilo)	
Quarry Resource Extraction And)	
Aggregate Processing Operations To)	
2032 And To Expand The Resource)	
Extraction And Buffer Areas Of The)	
Quarry On Approximately 541.5 Acres)	
Of Land Within The State Land Use)	
Agricultural District At Pu'u Makakilo,)	
`Ewa, O`ahu, Hawai`i, Tax Map Keys:)	
9-1-16: 4 And 9-2-03: Por. 74 And Por. 82)	
)	

CERTIFICATE OF SERVICE

I hereby certify that a certified copy of the FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER APPROVING WITH MODIFICATIONS THE RECOMMENDATION OF THE CITY AND COUNTY OF HONOLULU PLANNING COMMISSION TO (1) EXTEND THE LIFE OF THE MAKAKILO QUARRY RESOURCE EXTRACTION AND AGGREGATE PROCESSING OPERATIONS TO 2032; AND (2) EXPAND THE RESOURCE EXTRACTION AND BUFFER AREAS OF THE QUARRY was served upon the following by either hand delivery or depositing the same in the U. S. Postal Service by regular or certified mail as noted:

DEL. ABBEY MAYER, Director

Office of Planning P. O. Box 2359

Honolulu, Hawai'i 96804-2359

BRYAN C. YEE, Esq.
Deputy Attorney General
425 Queen Street
Honolulu, Hawai'i 96813
Attorney for State Office of Planning

ROBERT M. CREPS
Senior Vice President Administration
Grace Pacific Corporation
P. O. Box 78
Honolulu, Hawaii 96810

DOUGLAS ING, Esq.
Watanabe Ing Kawashima & Komeiji LLP
999 Bishop Street, 23rd Floor
Honolulu, Hawaii 96813
Attorney for Petitioner

HENRY ENG, Director
Department of Planning and Permitting
City and County of Honolulu
650 South King Street
Honolulu, Hawaii 96813

CARRIE OKINAGA, ESQ.
Corporation Counsel
City & County of Honolulu
530 South King Street
Honolulu, Hawaii 96813
Attorney for City and County of Honolulu

DATED: Honolulu, Hawai'i, 100, 7208

ORLANDO DAVIDSON

Executive Officer

EXHIBIT 2—CONDITIONAL USE PERMIT, FILE NUMBER 2007/CUP-91

DEPARTMENT OF PLANNING AND PERMITTI

CITY AND COUNTY OF HONOLULU

650 SOUTH KING STREET, 7TH FLOOR • HONOLULU, HAWAII 96813
PHONE: (808) 768-8000 • FAX: (808) 768-6041
DEPT. WEB SITE: <u>www.honoluludpp.org</u> • CITY WEB SITE: <u>www.honolulu.gov</u>

MUFI HANNEMANN MAYOR



DAVID K. TANOUE

ROBERT M. SUMITOMO

2007/CUP-91(RY)

July 17, 2009

Mr. Lee Sichter Belt Collins Hawaii, Ltd. 2153 North King Street, Suite 200 Honolulu, Hawaii 96819

Dear Mr. Sichter:

Subject: Conditional Use Permit No. 2007/CUP-91

Grace Pacific Corporation

92-1130 Pueonani Street - Makakilo

Tax Map Keys 9-2-3: Portion of 74 and 82; 9-2-2: Portion of 6

The Director of Planning and Permitting has <u>APPROVED</u> the above Conditional Use Permit application, subject to conditions. A copy of the Director's Findings, Conclusions, and Decision and Order, including the conditions of approval, are attached.

Any party (to the case) wishing to appeal the Director's action must submit a written petition to the Zoning Board of Appeals (ZBA) within 30 calendar days from the date of mailing or personal service of the Director's written decision (Zoning Board of Appeals' Rules Relating to Administrative Procedure, Rule 22-2, Mandatory Appeal filing deadline). Essentially, the Zoning Board of Appeals' rules require that a petitioner show that the Director based his action on an erroneous finding of a material fact, and/or that the Director acted in an arbitrary or capricious manner, or manifestly abused his discretion. Generally, the ZBA can only consider the evidence previously presented to the Director of Planning and Permitting. The filing fee for appeals to the ZBA is \$200 (payable to the City and County of Honolulu).

Failure to comply with ZBA Rule 22-2, Procedures for Appeals, may result in the dismissal of the appeal. Copies of the ZBA rules are available at the Department of Planning and Permitting. Appeals should be addressed to:

Zoning Board of Appeals c/o Department of Planning and Permitting 650 South King Street, 7th Floor Honolulu, Hawaii 96813 Mr. Lee Sichter Belt Collins Hawaii, Ltd. July 17, 2009 Page 2

If you have any questions, please contact Raymond Young at 768-8049.

Very truly yours,

David K. Tanoue, Director Department of Planning and Permitting

DKT:Ih Doc.706013

Attachment

DEPARTMENT OF PLANNING AND PERMITTING OF THE CITY AND COUNTY OF HONOLULU

STATE OF HAWAII

IN THE MATTER OF THE APPLICATION)
OF))
GRACE PACIFIC CORPORATION	FILE NO. 2007/CUP-91
FOR A	
CONDITIONAL USE PERMIT - MAJOR	

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER

I. APPLICATION

A. Basic Information

APPLICANT:

Grace Pacific Corporation

LANDOWNER:

Puu Makakilo, Inc.

James Campbell Company LLC
D R Horton – Schuler Homes LLC

LOCATION:

92-1130 Pueonani Street, and two lots situated between Parcel 74 and the H-1

Freeway, Ewa, Oahu, Hawaii

(Exhibit 1)

TAX MAP KEY:

9-2-3: (Portion of) 74 and (Portion of) 82

Access: 9-2-2: (Portion of) 6

LAND AREA:

488.4 Acres

ZONING DISTRICT:

AG-2 General Agricultural District

(Exhibit 2)

EXISTING USE:

Quarry, manufacturing and processing,

recycling facility, support facilities, and

open space (Exhibit 3)

- precluding the use of surrounding properties for the principal uses permitted in the underlying zoning district; and
- 4. The use at its proposed location will provide a service or facility that will contribute to the general welfare of the community-at-large or surrounding neighborhood.

V. DECISION AND ORDER

Pursuant to the Findings of Fact and Conclusions of Law, the Director of the Department of Planning and Permitting (DPP) hereby <u>APPROVES</u> the application for a Conditional Use Permit to allow resource extraction, recycling of concrete and cold-planed asphalt, HMA plant, and other uses and structures as shown on Exhibit 5, subject to the following conditions:

- 1. Blasting shall be restricted to the hours of 8:00 a.m. to 12 noon, Mondays through Fridays.
- 2. Within one year of this Decision and Order, the applicant shall submit to the Director of the DPP for review and approval, final grading plans with contour intervals of five feet in areas where the slope is greater than ten percent; two feet in areas where the slope is ten percent or less.
- 3. On the fifth anniversary date of this Decision and Order, and an update every fifth year thereafter, as may be required by the Director, the applicant shall submit a beneficial reuse plan which shall show how the property is to be left in a form suitable for reuse for purposes permissible in the district, relating such reuses to existing or proposed uses of surrounding properties. Among items to be included in the plan are feasible circulation patterns in and around the site, the treatment of exposed soil or subsoil, including measures to be taken to replace topsoil or establish vegetation in excavated areas in order to make the property suitable for the proposed reuse, treatment of slopes to prevent erosion and delineation of floodways and floodplains (if any) to be maintained in open usage. Submittal of the beneficial reuse plan under Condition 12 of the Land Use Commission Decision and Order, dated November 7, 2008, may satisfy the requirements of this condition (providing the reuse plan complies with Land Use Ordinance Section 5.520, Specific Use Development Standards, for Resource Extraction).
- 4. Prior to the issuance of a building permit for any structures within and/or the relocation of any structures to the Project Site, the applicant shall submit to the Director for review and approval:
 - a. A site plan showing compliance with all development standards of the Land Use Ordinance, including but not limited to, parking and loading, structure heights and setbacks, and building coverage.

- b. A water source and distribution plan approved by the Board of Water Supply. The plan shall include the disposition of the existing water source in the processing site.
- c. An outdoor lighting plan showing all existing and proposed outdoor lighting fixtures. All exterior lighting shall be fully shielded to prevent glare and light spillage on surrounding lots and public rights-of-way. Lighting for unloading of cold-planed asphalt shall be directed away from adjoining residential uses and be turned off upon completion of unloading operations.
- 5. The applicant shall stabilize exposed soils during the construction of any berms to minimize runoff impacts to the area's natural drainage features. Landscaping of any berms shall commence within 30 days of completion of berm construction.
- 6. Operation of the resource extraction facility and accessory uses shall be in general conformance with the approved project, as described herein and shown on plans on file with the DPP. Any modification to the project and/or plans shall be subject to the prior review and approval by the Director. Major modifications shall require a new Conditional Use Permit.
- 7. This application has only been reviewed and approved pursuant to the provisions of Section 21-5.520 (Resource Extraction), and its approval shall not constitute compliance with the requirements of other governmental agencies. These are subject to separate review and approval. The applicant shall be responsible for insuring that the final plans for the project approved under this permit comply with all applicable government agencies' provisions and requirements, including compliance with all other provisions of the Land Use Ordinance.
- 8. The applicant and/or landowner shall submit written notification to the Director of DPP of any change in use, including the addition of any accessory uses and/or structure, termination of any use on the property; and/or transfer in ownership of the property or of any use on the property. In the case of any addition and/or change in use, the Director shall determine if the proposed change requires a minor or major modification of the Conditional Use Permit. In the event of a change in ownership, the Director shall notify the new owner (by copy of this report) that the site and/or facility is permitted and/or governed by the Conditional Use Permit, and that compliance with all conditions of approval is required.
- 9. The Director may modify the conditions of this permit by imposing additional conditions, modifying existing conditions, or deleting conditions deemed satisfied upon a finding that circumstances related to the approved project have significantly changed so as to warrant a modification to the conditions of approval. In the event of the noncompliance with any of the conditions set forth herein, the Director may terminate all uses approved under this permit or halt

their operation until all conditions are met or may declare this Conditional Use Permit null and void or seek civil enforcement.

Dated at Honolulu, Hawaii this 17th day of July 2009.

DEPARTMENT OF PLANNING AND PERMITTING CITY AND COUNTY OF HONOLULU STATE OF HAWAII

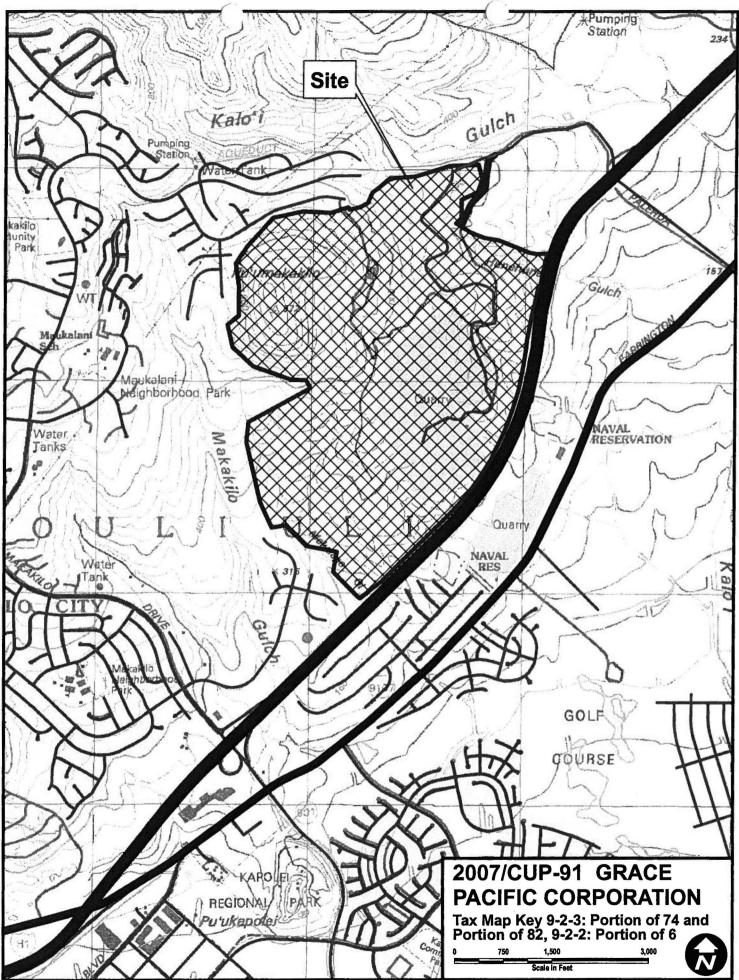
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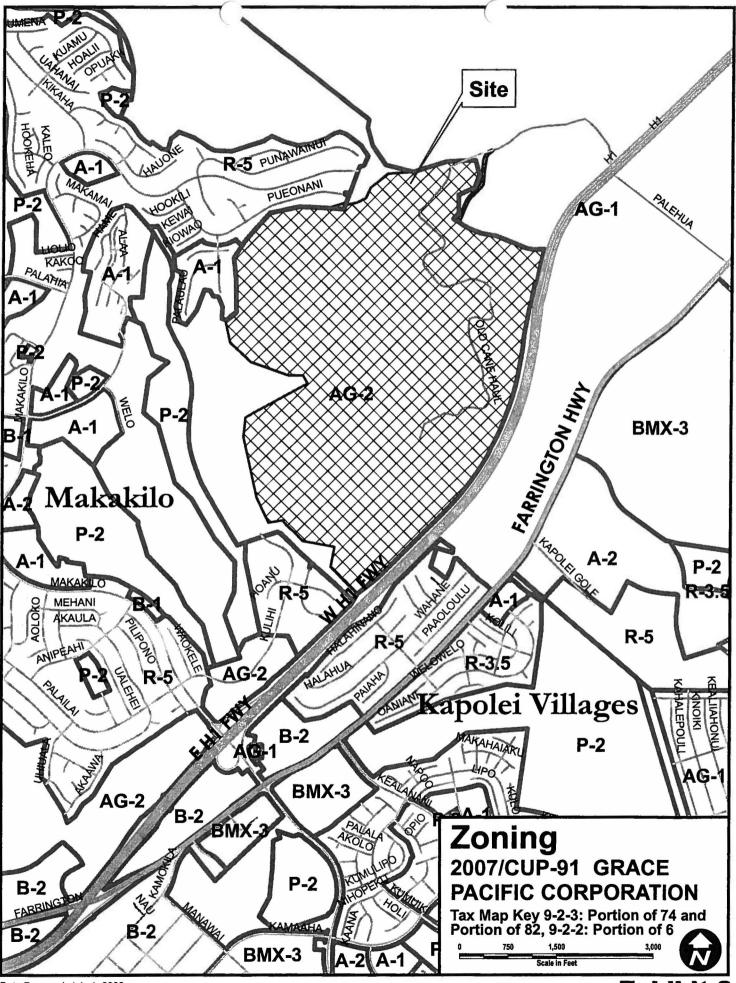
David K. Tanoue, Director

DKT:lh Doc. 695938

Attachments

EXHIBITS







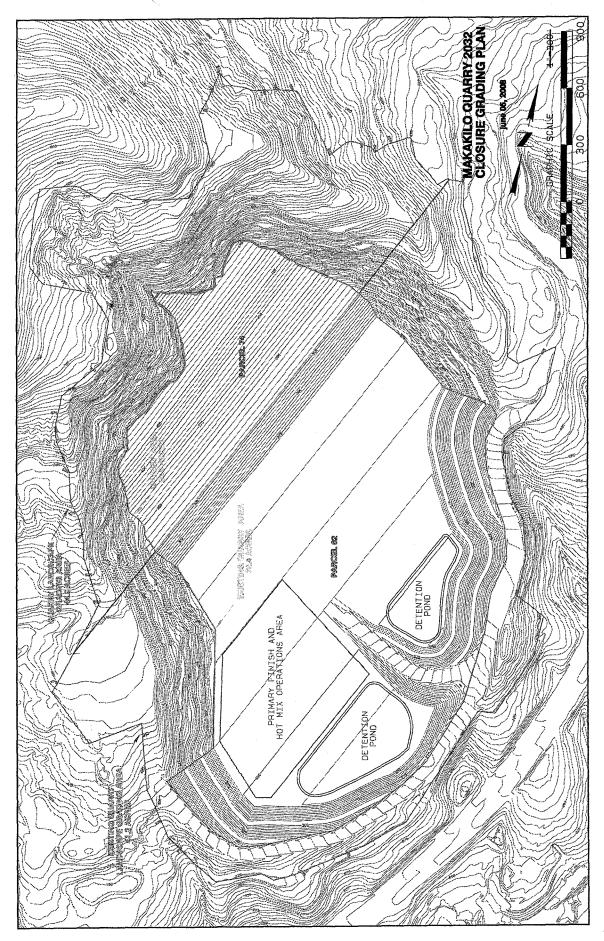


EXHIBIT 4

F oforma Site Plan Lot for the Makakilo Quarry, November 04, 2008

The site plan list below describes the building and structures that will be contained in the various areas of operation in the Makakilo Quarry. As stated in the permit submittal due to the conditions placed on the use and the extensive planning necessary for final fabrication of the processing equipment, a final mutually agreeable site plan between the City and Grace Pacific will be provided one year from the approval of the C.U.P.. The dimensions, areas, heights and ground elevations below are an approximations to quantify the necessary operational areas for the C.U.P.. See Figure 6 for location of designated areas.

I	AREA#	1 "Items	to be	included in	the Scale	and	Access Road area"
---	-------	----------	-------	-------------	-----------	-----	-------------------

				L
Width Ft.	Length Ft.	Square Ft.	Height Ft.	Ground El.
12	30	360	15	355
12	60	720	5	355
12	60	720	5	355
8	16	128	15	355
		1,000		
		270,000		
		6.3		
	12 12	12 30 12 60 12 60	12 30 360 12 60 720 12 60 720 8 16 128 1,000 270,000	12 60 720 5 12 60 720 5 8 16 128 15 1,000 270,000

AREA # 2 "Items to be included in the Office and Maintenance area"

Office area					
Group and Individual Items	Width Ft.	Length Ft.	Square Ft.	Height Ft.	Ground El.
SALES OFFICE	. 36	60_	2,160	20	275
FIELD OFFICES	36	60	2,160	20	275
TESTING LAB AND OFFICES	24	60	1,440	20	275
DECKS WALKWAYS			15,000		
EMPLOYEE PARKING			25,000		·
QUARRY MAINTEANCE SHOP	70	200	14,000	35	275
QUARRY MAINTEANCE AREA			28,000		
ROADS			48,000		
OPEN SPACE			94,000		
TOTAL ACRES AREA # 2			5.3		

AREA # 3 "Items to be included in the Existing Recycle Plant area and the New Plant(s) area"

Recycle Plant					
Group and Individual Items	Width Ft.	Length Ft.	Square Ft.	Height Ft.	Ground El.
JAW CRUSHER	12	52	624	20	275
SCREEN AND SECONDARY CRUSHER PLANT	12	50	600	18	275
SECONDARY SCREEN	10	25	250	15	275
GENERATOR SET TRAILER	8	40	320	18	275
SWITCH HOUSE	8	30	240	18	275
FUEL TANK WITH ENCLOSURE	10	30	300	9	275

			-		
HYDROLIC HAMMER VER		8	4	34 2	25 2
CONVEYORS					27
CONVEYORS (PORTABLE)					27
			_		
Finish Plant	100 100		<u>. </u>	. 	
Group and Individual Items	Width F				
SCREEN HOUSE			0 1,20		5 27
CRUSHER HOUSE			0 60		
GENERATOR SET TRAILER		8 4	0 32	0 1	8 27
CONVEYORS					27
CONVEYORS (PORTABLE)			•		27
			`		
Wash Plant					
Group and Individual Items	Width Ft				
ENCLOSURE	1:	5 5	750	0 25	
CONVEYORS				•	27
CONVEYORS (PORTABLE)					27
Hot Mix Plant					
Group and Individual Items	Width Ft.	Length F	. Square Ft	. Height Ft	. Ground El.
STRUCT. BURNER, DRYER, AND BAG HOUSE	20				
SCALE WITH FOUR SILOS IN LINE	20				
FEED BINS	12		_		
OPERATORS HOUSE AND SWITCH GEAR	10				
GENERATOR SET TRAILER	10				
FUEL STORAGE TANK WITH ENCLOSURE	10				
HOUSE AND SHOP	10				
				1	
Topsoli Plant (Re-naturalization)				1	
Group and Individual Items	Width Ft.	Length Ft	Square Ft.	Height Ft.	Ground El.
SCREEN HOUSE	24		_		
ENCLOSURE STORAGE FOR PRODUCTION	10				
CONVEYORS		 	1	 	275
CONVETORO	+		 	 	
Quarrying Supply Storage Area	 			1	
Group and Individual Items	Width Ft.	Length Ft.	Square Ft.	Height Ft.	Ground El.
4 STORAGE CONTAINERS	10	.24	960	8	
SECURE CONTAINENT AREA	10	- 27	160,000		275
SECONE CONTAINENT AREA		 	100,000		213
QUARRY EQUIPMENT PARKING			25,000		
TRUCK STAGING AREA		 	50,000		
ROADS	·		560,000		
STOCK PILES			386,000		
OPEN SPACE	+		900,000	<u> </u>	
TOPEN GFACE			300,000	 	
TOTAL ACRES AREA # 3	 		48.1		
LIVIAL AVOES AREA #3	 		70.1	 	
	 			<u> </u>	
ADEA # 4 filtarra ta ba finalista dia	- 4l 31-a	A -41			
AREA # 4 "Items to be included in	THE NEV	v ACTIVE	wuarry a	area"	
1					
Primary Plant(s) (Portable)					
Froup and Individual Items		Length Ft.	Square Ft.	Height Ft.	Ground El.
PRIMARY CRUSHER	12	52	624		325 - 650
PRIMARY CRUSHER	12	52	624	20	325 - 650
GENERATOR SET TRAILER	10	50	500	18	325 - 650
GENERATOR SET TRAILER	10	50	500		325 - 650
FUEL TANK TRAILER	8	30	240		325 - 650
FUEL TANK TRAILER	8	30	240		325 - 650
CONTAINER FOR PARTS AND TOOLS	10	24	240		325 - 650
CONVEYORS (PORTABLE)		= 1			325 - 650
OPEN SPACE	 		1,125,000		
	 				
TOTAL ACRES AREA # 4	1		25.9		
IVIAL AUNES ANEA ##	<u> </u>	لم	40.3		

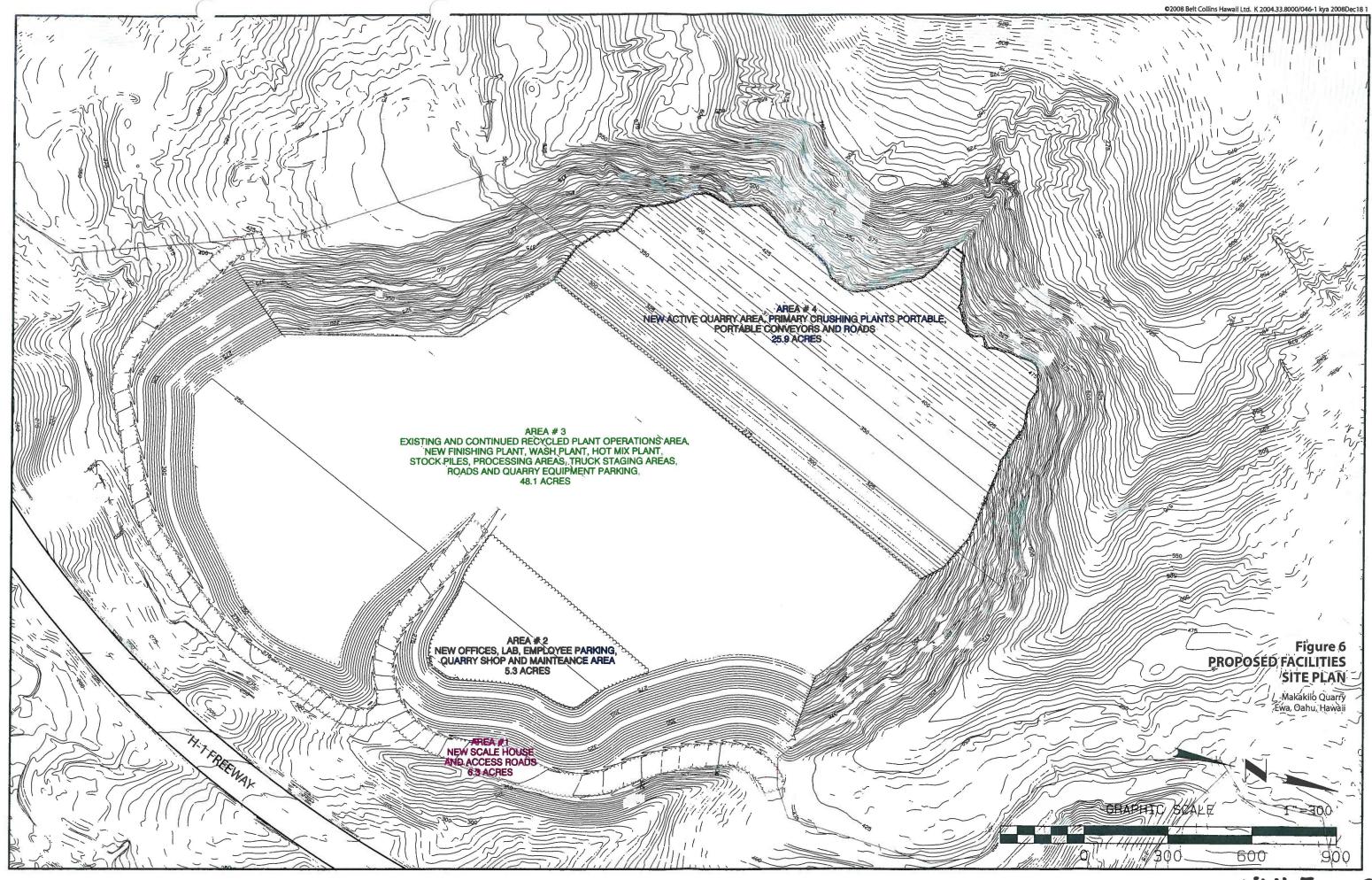


Exhibit 5 page 3

ATTACHMENT 1



NOV 19 P1:01 80°

DEPT OF SLANGER AND SERMETES.

BEFORE THE LAND USE COMMISSION CITY & COUNTY OF HONGLU OF THE STATE OF HAWAI'I

In The Matter Of The Application Of)	DOCKET NO. SP73-147
)	
GRACE PACIFIC CORPORATION)	FINDINGS OF FACT, CONCLUSIONS
(Formerly Pacific Concrete & Rock Co.,)	OF LAW, AND DECISION AND ORDER
Ltd.))	APPROVING WITH MODIFICATIONS
)	THE RECOMMENDATION OF THE
To Extend The Life Of The Makakilo)	CITY AND COUNTY OF HONOLULU
Quarry Resource Extraction And)	PLANNING COMMISSION TO (1)
Aggregate Processing Operations To)	EXTEND THE LIFE OF THE
2032 And To Expand The Resource)	MAKAKILO QUARRY RESOURCE
Extraction And Buffer Areas Of The)	EXTRACTION AND AGGREGATE
Quarry On Approximately 541.5 Acres)	PROCESSING OPERATIONS TO 2032;
Of Land Within The State Land Use)	AND (2) EXPAND THE RESOURCE
Agricultural District At Pu`u Makakilo,)	EXTRACTION AND BUFFER AREAS OF
`Ewa, O`ahu, Hawai`i, Tax Map Keys:)	THE QUARRY
9-1-16: 4 And 9-2-03: Por. 74 And Por. 82)	
)	

FINDINGS OF FACT, CONCLUSIONS OF LAW, AND DECISION AND ORDER APPROVING WITH MODIFICATIONS THE RECOMMENDATION OF THE CITY AND COUNTY OF HONOLULU PLANNING COMMISSION TO (1) EXTEND THE LIFE OF THE MAKAKILO OUARRY RESOURCE EXTRACTION AND AGGREGATE PROCESSING OPERATIONS TO 2032; AND (2) EXPAND THE RESOURCE EXTRACTION AND BUFFER AREAS OF THE OUARRY

> This is to certify that this is a true and correct copy of the document on file in the office of the State Land Use Commission, Honolulu, Hawaii.

> > **Executive Officer**

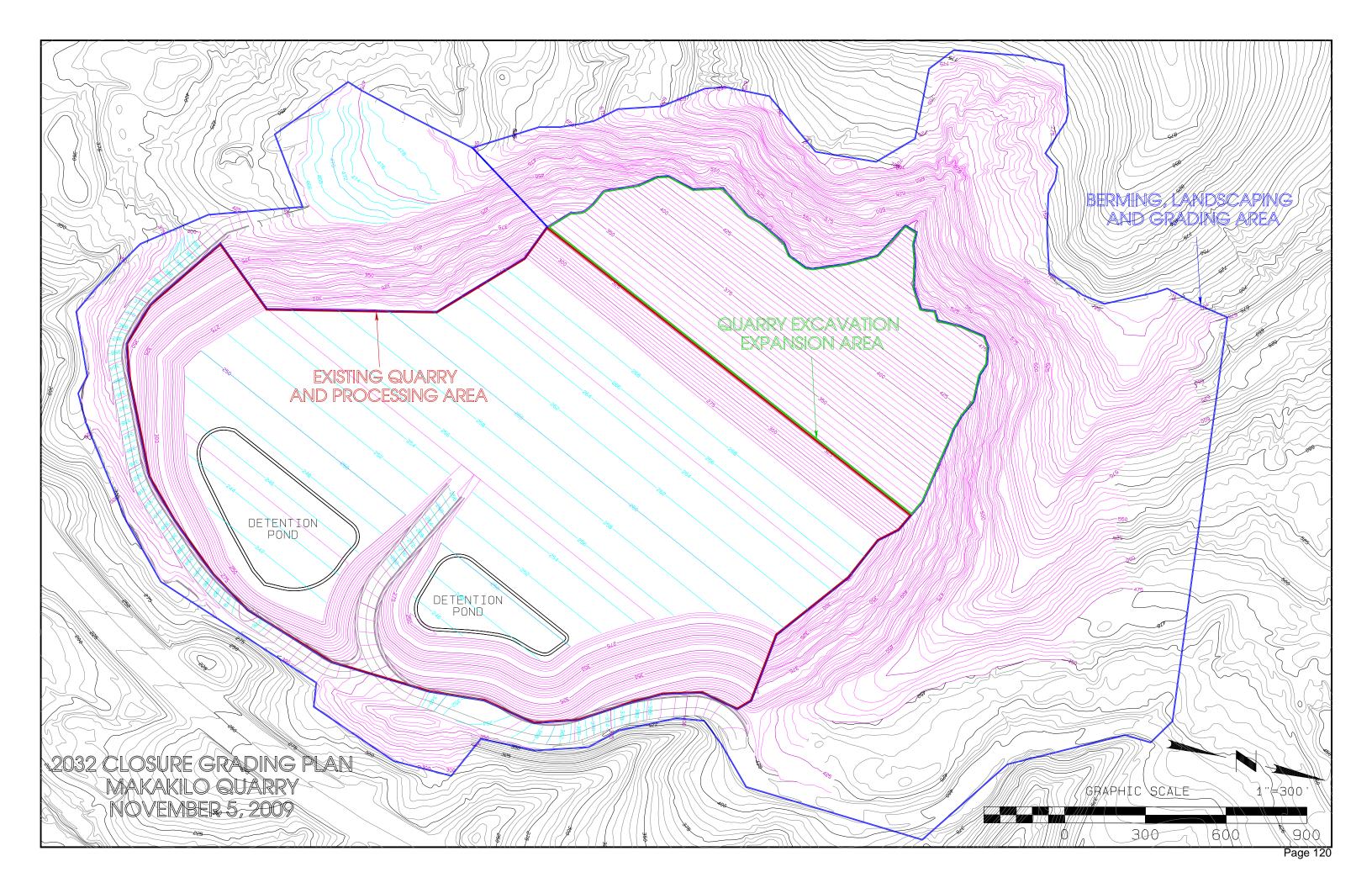
EXHIBIT 3— PERMITS AND APPROVALS FOR THE OPERATION OF MAKAKILO QUARRY

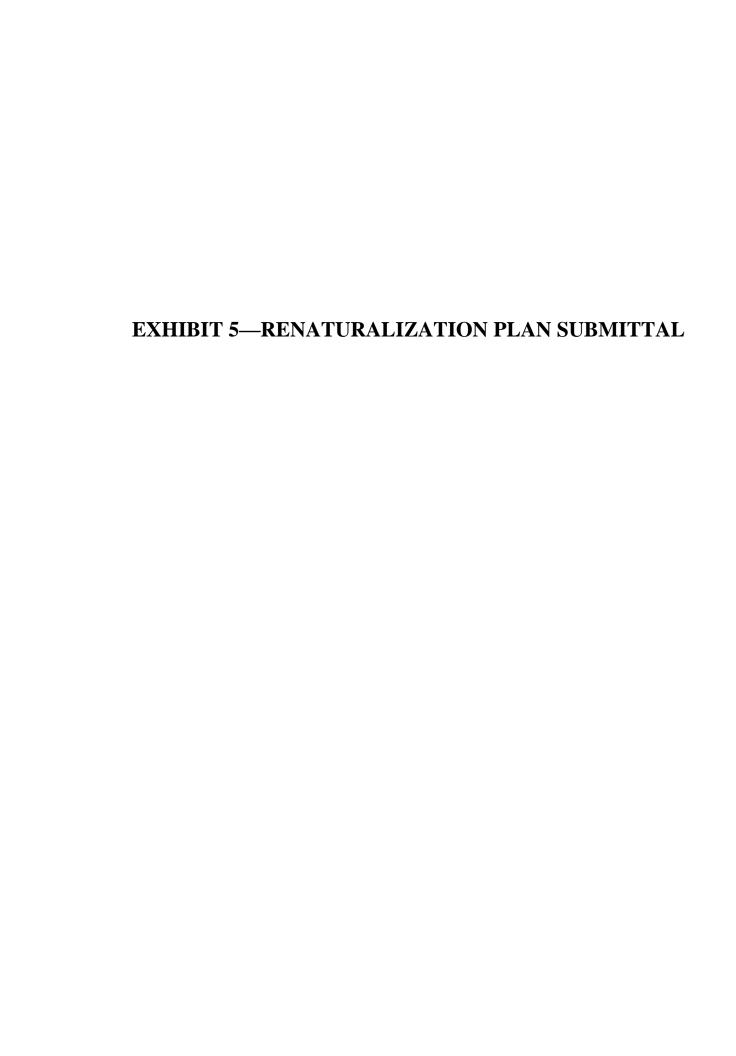
Permits and Approvals for Operation of Makakilo Quarry

Since the original 1973 regulatory approvals for resource extraction at the Makakilo Quarry, there have been five approvals from the State of Hawai'i LUC (SUPs for land use in the State Agricultural District) and DPP (CUPs (Major) and (Minor), and Zoning Variances). Approved permits are included in the following table.

Date of Approval	Type of Permit	Document/File Identification Number	Granting Authority	Approved Land Use
02/28/1973	SUP	72/CUP-15	Planning Commission	Rock quarrying operations on the southeastern slopes of Pu'u Makakilo to produce basalt for concrete production and fill rock.
03/23/1973	SUP	SP73-147	LUC	Rock quarrying operations on the southeastern slopes of Pu'u Makakilo to produce basalt for concrete production and fill rock.
04/17/1973	CUP	72/CUP-15	City Council Resolution No. 95	Establishment of quarry and related facilities; 72 acres mauka H-1; 35 acres Makai of H-1 Interstate Freeway.
10/19/1998	Compliance with Condition No. 2	72/CUP-15	DPP	Acceptance of engineering report and grading plans prepared by Parametrix, July 1998.
11/13/2002	Zoning Variance	2002/VAR-51	DPP	Establishment of an asphalt and concrete recycling facility in the quarry pit.
04/23/2004	CUP Minor Modification	72/CUP-15	DPP	Specific revisions to grading and revegetation plans.
04/27/2007	CUP (Minor)	2007/CUP-47	DPP	Joint development of lots 82 and 74 to allow quarry expansion of excavation and buffer areas.
11/07/2008	SUP	SP73-147	LUC	Extend the life of Makakilo Quarry extraction and processing to 2032, and expand the extraction and buffer areas of the quarry.
07/17/2009	CUP	2007/CUP-91	DPP	Expand the excavation and buffer areas of the Makakilo Quarry and extend its use and operations to 2032.
12/27/2011	Zoning Variance	2011/VAR-28	DPP	Allow various structures and equipment for existing quarry to exceed height limit and increase nonconformity.







GRACE PACIFIC CORPORATION

Renaturalization Plan Submittal

Makakilo Quarry, Hawaii

Prepared By:

Grace Pacific Corporation

Belt Collins Hawaii Ltd.

(Aaron A. Akau Director of Landscape Architecture)

11/5/2009



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	rigation Matrix			
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D: 4 D				
_	Placement of soilsteep Slope Conditions			
	Aild Slope Conditions			
Figure 4. Irrigation System				

1.0 Introduction

S.U.P. Decision and Order # 2 (docket # SP73/147 November 7, 2008)

Within one (1) year of the Land Use Commission's Decision and Order approving the Special Use Permit, the Applicant shall submit to the Director of Planning and Permitting for review and approval a renaturalization plan in coordination with the proposed Closure Grading Plan for the quarry site and buffer area mauka of the H-1 Freeway showing landscaping details including plant types, sizing and spacing, irrigation facilities, and distribution systems.

The following sections are for submittal and review in response to the S.U.P Decision and Order # 2 above. (See Appendix A for a copy the Proposed Closure Grading Plan for the Quarry Site).

1.0.1 PURPOSE

This report outlines the necessary steps for the renaturalization of Makakilo quarry along the outer rim, with the end goal of visually integrating the quarry with the surrounding hillside by the time the quarry ceases operation. Obtaining this goal will be by the process of establishing designated planting areas at one end of the quarry and as these plots become established and self sufficient, additional plots will be constructed adjacent to these until the entire site is complete. In order to plant in the designated areas, multiple steps will be needed to construct an environment conducive to plant growth and health. These steps will include the importation of topsoil, installation of irrigation, installation of erosion control devises, and the planting of native shrubs.

1.1 Soils

A soil analysis will be performed for all potential soil sources before it is acquired. This will insure that the soil will be free from any contaminants that it will inhibit plant growth, and that the amount of any amendments needed to be added will be economically feasible.

1.1.1 ANALYSIS

All potential imported soil shall be tested for nutrient deficiencies prior to being brought on-site. Soil samples shall be submitted to either C. Brewer Analytical Laboratory or the University of Hawaii, College of Tropical Agriculture and Human Resources, for testing. After testing, soil shall be brought on-site and amended per the soil analysis' recommendations. See Appendix D for a guide to soil testing in Hawaii.

1.1.2 PLACEMENT

After the imported soil has been amended, it shall be placed at the designated planting areas (The maximum number of planting areas in operation at one time will be determined by the available water supply). The soil will be evenly spread across the site to a depth of 8"-12" after settlement (Figure 1).

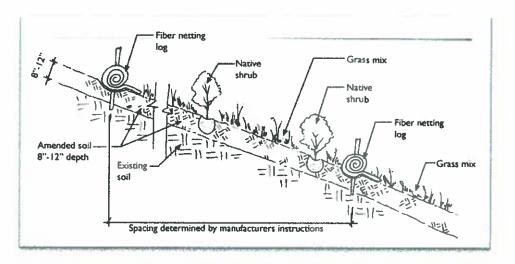


Figure 1: Placement of soils

1.2 Erosion Control.

Erosion control will be implemented in planting areas to reduce soil movement. It will be implemented by the placement of fiber netting logs and the application of hydromulch.

1.2.1 FIBER NETTING LOGS

Fiber netting logs will reduce loss of soil caused by water runoff, but will allow water to pass through (See Appendix E for further details of Fiber netting products). The logs will be laid out perpendicular to the slope and the spacing will be determined in the field to effectively deal with varying slopes in the terrain and the manufacture instructions. Examples of a steep grade

condition (Figure 2) and a mild slope condition (Figure 3) have been given for reference.

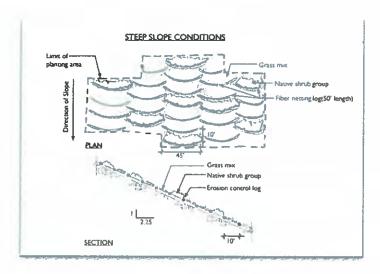


Figure 2: Steep Slope Conditions

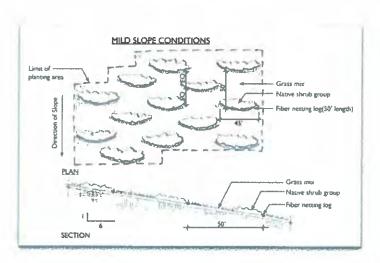


Figure 3: Mild Slope Conditions

1.2.2 HYDROMULCH

The hydromulch is a slurry mixture combination of straw, cotton fibers, seeds, fertilizer and soil tackifiers which is sprayed onto the newly laid topsoil. This application promotes the rapid growth and establishment of grasses for renaturalization (See Appendix F for further details of hydromulch products).

1.3 IRRIGATION

Temporary irrigation will be supplied for the start of each planting area until the vegetation has established itself to the point that it is self sufficient and no longer requires supplemental water for survival. Two types of systems will be needed for each planting area. Spray rotors will be used to irrigate the grass mix, and a drip system will be used to water the native shrub groups (see Figure 4 for graphic example). As the plants grow and become established the amount of water will be cut back to start the process of "weening off". Eventually the plants will be established enough that they will no longer need irrigation, and at this point both irrigation systems for that plant area can be removed for re-use at the next planting area.

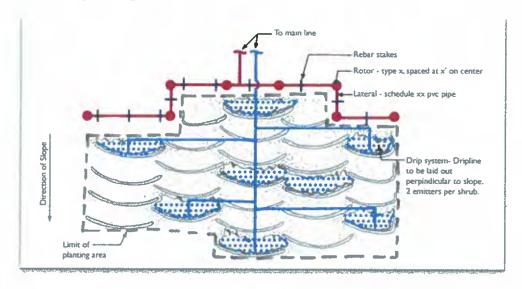


Figure 4: Irrigation System

1.3.1 IRRIGATION MATRIX

Table 1 below provides the plant palette for Makakilo Quarry used in the renaturalization plan along with essential irrigation details.

Table 1: Irrigation Matrix

Type	Manufacturer	Model	Description	Operating Pressure (PSI)	Flow Range	Coverage Radius	Remarks
Rotor	Toro	TG-101-NPT	Gun style sprinkler	40-95	42-248 GPM	91'-178'	Cannot use effluen water supply
Rotor	Rain Bird	2045-PJ Maxi- Bird	Riser mounted im- pact head	25-60	1.5-8.4 GPM	22'-45'	
Drip							
Dripline	Toro	T-EHD2057-050A	3/4" polethylene hose	59 max			
Emitter	Toro	T-DPJ04-1	Pressure compensat- ing emitter	10-50	I GPH		Two emitters per shrub
Checkvalve							
Controller	Toro	DDCWP	8-station battery operated controller				
Gate Valve							
Back Flow Preventer							
Quick Cou- pler		0					
Valve Box							+

1.4 PLANTING

The planting of drought resistant native shrubs, in addition to the hydromulch grasses, will occur on approximately 11.5 acres of enclosed planting areas where slope is suitable as shown in Appendix B. By utilizing these shrubs water demands will be reduced in addition to creating visual integration with the surrounding area.

1.4.1 PLANT MATRIX

Table 2 below provides the plant palette for Makakilo Quarry used in the renaturalization plan along with essential planting details for determining layout and patterns.

Table 2: Plant Matrix

	112444 174111	TE FOR MAKAKILO T	QUARK!	T			T	
Value	Common Name	Botanical Name	Seed Source	*Propagation Techniques	Outplanting Size (hardened to sun and drought)	Average Outplant- ing Specing	Estimated Outplanting Quantity per Acre	Remarks
I	'A'ali'i	Dodonaea viscosa	*Wild populations on Pu'u Makakilo.	Pgs. 352-353	Mature 6" por	5*	1,750	Requires well drained soil.
24.	Naio	Myoporum sandwi- cense	*Wild populations in Kalaeloa and Campbell Industrial Park	Pgs. 254-255	Mature 6" pot	10,	450	Requires well drained soil.
1	Ма'о	Gossypium tomen- tosum	*Wild populations in Honokai Hale.	Pgs, 237-238	Mature 6" pot	5'	1,750	Requires well drained soil.
1	fliahi (coastal variety)	Santalum ellipticum	*Wild populations on Pu'u Makakilo.	Pgs, 347-349	Mature 6" pot	15"	175	Plant next to a host plant. Requires well drained soil.
2	Pohinahina	Vitex rotundifolia		Pgs. 390-391	Mature 6" pot	5"	1.750	
1	llima (shrub form)	Sida fallax	*Wild populations in Makakilo.	Pgs, 248-249	Mature 6" pot	5	1,750	Requires well drained soil.
}	Uhalou	Waltheria americana	*Wild populations on Pu'u Makakilo.		Mature 6" pot	5"	1,750	
1	Laredo Buffel grass	Cenchrus ciliaris 'Laredo'	Koolau Seed & Supply Co., Inc.		Un-hulled Seeds		10 lbs. de-hulled seeds	Hydro-seed with bunded fiber matrix (Airtrol Geobinder),
1	Annual ryegrass	Lolium multitlorum	Koolau Seed & Supply Co., Inc.		Seeds		25 lbs. seeds	fertilizer (450#/mere 10-30-10 +2% iron zine) and mulch
1	Common bermuda	Cynodon daetylon	Koolau Seed & Supply Co., Inc.		Hulled Seeds		25 lbs. de-hulled seeds	in one mix. Listablish mature grass coverage before planting potted materials.
			*Seed source informa- tion from Shad Kone	*See book: "Growing Hav Plants" by Lill				

Photos of recommended native shrubs and also grasses for hydromulch mixture can be found in Appendix C.

1.4.2 LAYOUT

The placement of the native shrubs groups will be random across the planting area to give more of the desired naturalistic look (see Figure 2 & Figure 3 for examples of two different slope conditions). Two methods will need to be tried to find the best overall success of the grass mix and native shrub combination.

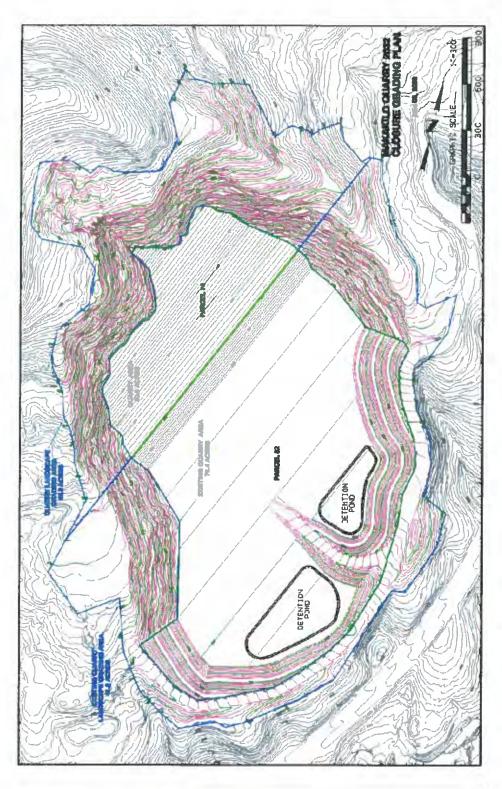
Method "A": will consist of applying the hydromulch mix across the entire planting area, with no planting of native shrubs at this time.

After the grass mix has been well established and growth is healthy, native shrubs will then be planted in groupings.

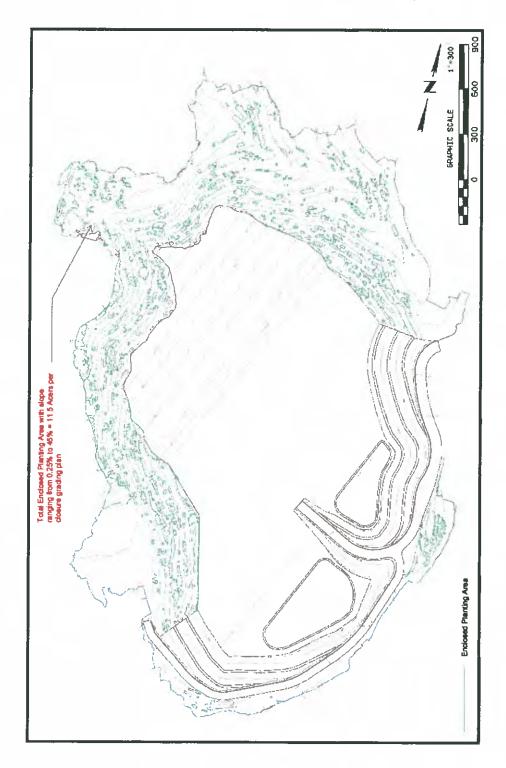
Method "B": native shrub groupings will be installed first, then immediately afterward the hydromulch mix will be sprayed across the entire planting area.

For both methods the size of the native plant groupings will be an area approximately 10'x45'.

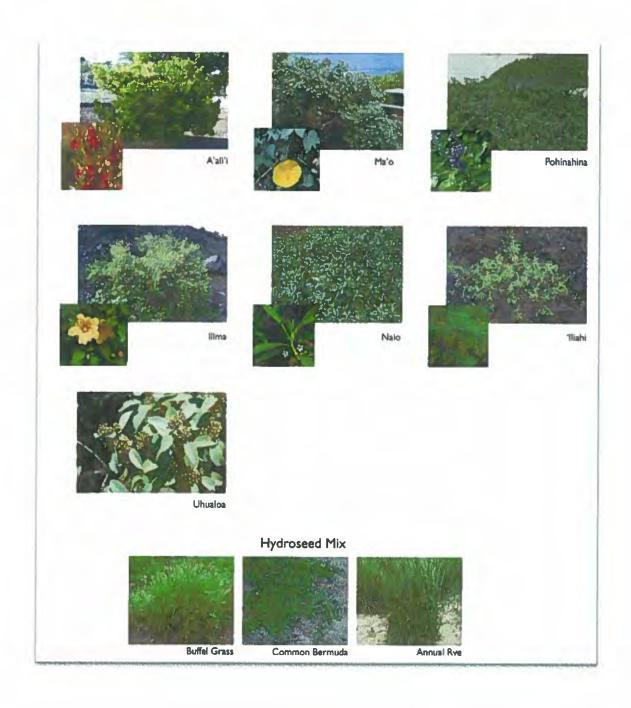
APPENDIX A: PROPOSED CLOSURE GRADING PLAN FOR THE QUARRY SITE



APPENDIX B: CLOSURE PLAN PLANTING AREAS



APPENDIX C: PLANT IMAGES



APPENDIX D: SOIL ANALYSIS

(Hue, Uchida, & Ho, 2009)

Rx for Soils and Crops

Page 1 of 6

Refere to the for feet and Cores.

Rx for Soils and Crops

Date Last Edited: 09/13/2001

A Guide To Soil Testing For Hawaii's Residents

N. V. Hue, R. Uchida, and M. C. Ho

Department of Tropical Plant and Soil Sciences and Agricultural Diagnostic Service Center

College of Tropical Agriculture and Human Resources University of Hawaii at Manoa

Why have a soil tested?

Having a soil tested is an integral part of good farming/gardening because it will let you know if your soil needs any fertilizer, what kind and how much so that your crop can grow better. In this factsheet, we will show you how to obtain a good soil test. Because laboratory analyses are performed on a small sample of soil from an entire field or garden, the analytical results are useless if the sample submitted does not represent the soil you intend to grow your plants in. A properly collected sample makes test results valid, and will produce correct recommendations that enhance yields, make efficient use of resources, and/or preserve quality of the emitrograment.

How to take a representative soil sample

When sampling home gardens, one composite sample consisting of 5-10 subsamples per 100 sq. ft. collected over the planting area should be taken. For larger areas like pastures or tree orchards, first make a detailed map of your area, then divide your map into smaller uniform soil-test areas of a few (1-5) acres each. Label each area clearly on the map by using a combination of letters/humbers that make sense and thus are easy to remember. Each test area should be uniform with regard to soil type or condition. Fields with different slope, soil color, drainage, apparent texture (for example, heavy, light, or A'a) or cropping history should be sampled separately. A soil-test sample for each area should be a composite of 10-15 subsamples.

Soil subsamples consist of 1-inch thick sices of the soil taken to a



http://www2.cta.hr.hswaii.edu/tpss/research extension/rxsoil/soilsample.htm

specified depth, normally 4 inches for no-till fields or established pasture, tawn and turf and 8 inches for conventionally tilled fields. For tree crops (forests, nuts, tree fruits), where possible, collect a surface sample to a depth of 8 inches and a sub-soil sample from 8-24 inches deep. Each sample to be tested should be a thorough mix of the cores taken randomly, say, in a zigzag pattern as shown in Figure 1.



Figure 1. Sampling soil using a zigzag pattern.

Such a sampling technique minimizes the variability that may be present in your field or garden, and allows you to obtain a reasonably representative soil

sample.

A specially designed soil probe is often used for collecting soil subsamples (called cores). However, if you do not own a probe, then use a steel or plastic garden spade or shovel to collect soil cores as follows. Dig a hole to the sampling depth, then cut a 1-inch thick slice from the top to bottom of the hole. Take a 1" wide by 1" thich segment of the slice, and place it in a clean mixing bucket, preferably made of plastic.

Plan to collect soil samples two to three months before planting so you will get your test results in ptenty of time to plan your fining and fertilization. Depending on workload, the turnaround time at the tab can be up to two-three weeks. Soil in fields or gardens should be tested at least once every two years.



Submitting samples and providing relevant information

After collecting the soil samples, take them to the county extension office in your area or send them directly to the Agricultural Diagnostic Service Center (ADSC) in the College of Tropical Agricultura and Human Resources, University of Hawaii (University of Hawaii, Agricultural Diagnostic Service Center, 1910 East-West Road, Rin 134, Honolulu, HI 96822). To get the most accurate recommendations from your soil test, be sure to fill out a soil information sheet, which is available from your county extension office or the ADSC. A blank soil information sheet is shown in Floure 2.

Figure 2. Soil information sheet used by the ADSC, Univ. of Hawaii.

http://www2.cts.hr.hawmi.edu/tpes/research_extension/rxsoil/soilsample.htm

Agricultural Diagnostic Service Center College of Tropical Agriculture & Human Resources 1910 East-West Rd., Honolutu, HI 96822 Phone; 956-6706/7980 Fax: 956-2592 Department of Agronomy and Soil Science University of Hawaii at Manoa 1910 East-West Rd., Honotutu, Hi 96822 Phone: 956-7530 Fax: 956-6539

email: agras@hawaii.edu

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	1 E		

Name:	Ad	idress:							City:
State	Zip:	P	none					Fæ	×C
Client ID:	Sam	Sample Type: Sample L		le Loc	ocation				
Agent:	Ad	dress;							City:
State:	Zip:	P	none					Fa	C
Job Control No	San	nple ID:		*Ser	tel :	No.			*Date (m/d/y):
Soil or Mix:	St	e of are	22: 80	, fL:				Acı	98:
Soil Depth (inches):	Мар	unit:	Seri	9 5		Ar iig	paren ht, or	t di Aa	ensity; heavy,
Elevation:	Annua (inches	l raintail s):	D	rainag) 0		Slop (%):	e	Irrigation:
Lime used:	Yr.of	applica	tion:	Rate	2.				Type of Lime:
Fertilizer used:	Analy	sis:		Rate			Method:		
Manure type:	Rate:			Compost:				Rate of compost:	
Has rock phosp been applied?	hate	Plant (growi	own: Plant		ant to	to be grown		
Can you till in tertilizer 4-6 inches if necessary?		В	Bottom land:			Rolling:			
Describe the on	obiem A			end opies t	n-	Ot	hectiv	PR 1	for this sample

http://www2.ctahr.hawan.edu/tpss/research_extension/rxsoil/soilsample.htm

observations;	NRCS	Diagnosis only
	ASCS	

Complete information will provide you with the best possible recommendation. Fertilizer and time requirements vary with soils and crops; therefore, the soil's apparent density, namely heavy (most Hawaii's soils), light (volcanic ash-derived soils on the Big Island) or A'a land (irregular pieces of lava), crop to be grown and crop previously grown are among the most important items of information needed to make correct recommendations.

How are soil samples tested?

The ADSC provides all residents of Hawaii with a reasonably priced soil and plant tissue testing service. Routine analyses of soils include acidity/alkalinity (pH), extractable phosphorus (P), potassium (K), calcium (Ca), and magnesium (Mg). Soil organic carbon (organic matter), total nitrogen, extractable aluminum (AI), boron (B), and other micronutrients (e.g., zinc, manganese, copper) are measured on request. Detailed descriptions of the analytical procedures are given in the Soil Fertility Manual, 1996, published by the College of Tropical Agriculture and Human Resources, University of Hawaii.

Soil test results and fertilizer recommendations

Within two to three weeks after you submit your samples to the ADSC, you should receive the test results for your soil along with fertilizer recommendations for your garden or field. The results should include at teast pH, and levels of P, K, Ca and Mg in ppm (or mg per kg). A brief interpretation of these levels is also provided as either, very low, low, sufficient, high, very high, or extremely high. An example of the form for the analytical results and interpret-ations is shown in the upper half of Figure 3.

Figure 3. ANALYTICAL RESULTS AND FERTILIZER RECOMMENDATIONS PROVIDED BY THE ADSC

Analytical Results / Interpretations

umaibiersmou

http://www2.ctahr.hawaii.odu/tpss/research_extension/xxsoil/soilsample.htm

Phosphorus (ppm) MT or OL:	Phosphorus (% P):
Potassium (ppm K)	Potassium (% K):
Calcium (ppm Ca)	Calcium (% Ca):
Magnesium (ppm Mg)	Magnesium (% Mg)
Salinity (EC, mmhos/cm)	Suitur (% S)
Zinc (ppm Zn)	Iron (ppm Fe)
Manganese (ppm Mn)	Manganese (ppm Mn)
Copper (ppm Cu)	Zinc (ppm Zn)
Boron (ppm B)	Copper (ppm Cu)
Total N (%)	Boron (ppm B)
Org. C (%)	Molybdenum (ppm Mo)
NH4-N (ppm)	Aluminum (ppm Al)
NO3-N (ppm)	Nitrate (ppm NO3-N)

Fertilizer Recommendation

Total nutrient requirement (lbs/A)	Nitrogen(N):	Phosphorus (P):	Potassium (K):
Fertilizer/Material	Fertilizer A	Est. Cost	
Options	lbs/1000sq.ft./Crop	ibs/1000sq. ft./mo.	\$/1000sq. n.
Lime		:	
Fertilizer selection			
Micronutrient			
Other Fertilizers			
Comments:			

http://www2.ctahr.hawaii.edu/tpss/research_extension/rxsoil/soilsample.htm

Note: The Interpretations are based on the Fact Sheet No. 3 "Adequate Nutrient Levels in Soils and Plants in Hawaii".

Did the recommendation help? To help improve future recommendations, please answer the following questions, photocopy this form and return it to above address (ADSC).

1. Did you need to modify the

recommendations? If so, how?

Did your plants improve? Please give unit area yield before and after the recommendation was applied.

Although these results and interpretations are essential to making fertilizer recommendations, they may not be very helpful to you. That's why we also provide fertilizer recommendations for your garden or field as shown in the lower half of Figure 3. These include amounts of time (in either lbs/1000 sq. ft. or tons/acre), and its estimated cost, fertilizer type (for example, 21-0-0, 21-0-32, 10-30-10), and its amount and cost.

At the bottom of the form, we ask you to give us some feedback in terms of how your crop performed as a result of our fertilizer recommendations. Such information would allow us to fine-tune our recommendations so that we can better serve you in the future.

We hope that with this information you can make your garden or field more productive as well as help protect the quality of our environment.



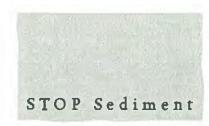
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Home | Academics | Facelly and Staff | Links | Hours | Research and Princeton | Statests | Contact the

http://www2.ctahr.hawaii.edu/tpss/research_extension/rxsoil/soilsample.htm

APPENDIX E: FIBER NETTING LOG

(Green, SedimentSTOP, 2008)



in its tracks with



SEDIMENT CONTROL SOLUTION

the Versatile

North American Green's SedimentSTOP® Biodegradable Piltration System is a temporary sediment filtration device that provides highly effective sediment control for a wide range of applications.



SedimentSTOP consists of a 70% straw / 30% coconut fiber matrix reinforced with a 100% biodegradable netting that is rolled from edge to edge to create a seamless temporary, water-permeable three-dimensional sediment filtrations tructure.

A Best Management Practice that reduces soil loss caused by stormwater runoff, Sediment STOP traps soil particles while allowing water to pass through, protecting waterways, sidewalks and roads from sediment accumulation.

SedimentSTOP assists engineers, specifiers and contractors in complying with many NPDES Phase II rules and other environmental regulations.

SedimentSTOP saves soil, time, and money in applications that include:

Forest Fire Rehabilitation

Bioengineering Projects

Active Jobsites — Commercial/New Home Construction

Ski Slopes

Highway Construction

Industrial Sites

Pipeline Revegetation

Steep Slopes

Wet Areas

Edging/Perimeter Control



VERSATILE

the SedimentSTOP

ADVANTAGE

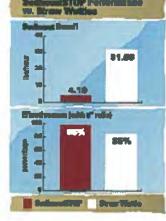
SedimentSTOP dramatically reduces surface sheet erosion, and offers significantly greater filtration capabilities and sediment retention than wattles, straw bales or silt fences. And unlike wattles, which use a single netting on the outside to encapsulate the fiber fill, SedimentSTOP utilizes multiple layers of netting to eliminate the possibility of failure if the outer netting is ever damaged.



Sediments TOP is more porous than a wattle, allowing it to perform as a buffer strip that slows water and filters sediment. In the event that water does flow over the top, Sediments TOP has an attached Splash Apron, which and uses rill formation and potential down slope erosion.



Wattles create a dam-like structure that causes water to back up and flow over the top, resulting in potentially severe erosion on the down slope side of the wettle.



SedimentSTDP was put to the test against straw wortles in research recently conducted at Utah State University's Water Research Facility.

Three 20-ft. long plots of sandy loam soil were set at a 2-1 gradient. SedimentSTOP rolls with a 9-inch diameter were placed at the mid-point and 2-ft. from the bottom of one plot, straw wattles of the same diameter were similarly placed on a second plot, and one plot was left unprotected as the control. Sediment most was set un collected and measured as sech plot was exposed to 4 inches of raintell over a one-hour pariod.

The sediment control effectiveness of SedimentSTOP vensus the wartles was algorificant. While 31.66 lbs. of sediment was collected from the plot with strew wattles, only 4.16 lbs. of sediment was collected from the plot protected by SedimentSTOP. Compared to the bare soil control plot, the straw wattles were only 95% effective, while the SedimentSTOP was independently proven to be 96% effective at reducing sediment nuchfil



EFFECTIVE

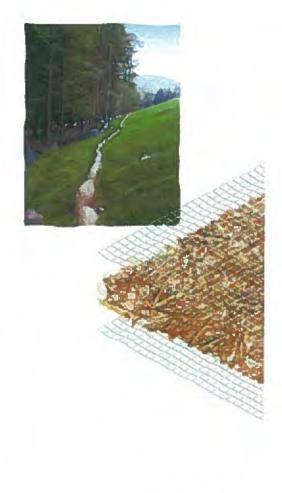
SEDIMENT CONTROL

Biofriendly

SedimentSTOP is an environmentally friendly, 100% biodegradable product. It can be incorporated with a variety of planting techniques such as: live planting, live staking and seed incorporation. The leno woven net enables its jute strands to move independently of each other, allowing the net openings to expand as necessary. This flexibility, combined with the 100% biodegradability, minimizes the risk of accidental wildlife entrapment.

Because it leaves absolutely no synthetic residues on site, SedimentSTOP is ideal for use in bioengineering projects, wetland mitigation, riparian area protection, shaded areas, stream bank restorations and environmentally-sensitive areas where synthetic-netted products may pose a threat to wildlife. By eliminating the need to return to the jobsite to remove the sediment control structure, SedimentSTOPsaves you time, money and potential headaches.





NATURAL

EASY TO INSTALL

SedimentSTOP'is

SedimentSTOP is easy to install, and features a two to three year functional lifespan. The structurally sound netreinforced layers prevent failures - even if the outer netting wrap is damaged during or after installation.

SedimentSTOP is easily field fabricated for greater flexibility to specific site requirements. It is extremely flexible and readily conforms to the ground surface, minimizing undercutting. Longer, 50-foot finished roll length reduces the number of overlaps, and its leno woven natural jute net allows easier contouring to the soil. The short, lightweight packaged rolls are easily transported over difficult terrain and to remote areas.

Finished roll diameter can also be increased, if necessary, by simply adding other organic materials such as grass clippings, pine needles, straw, or leaves.



This illustration provides general guidelines to assist in the design, installation and assising of SedimentSTDP. These guidelines may require madification due to varieties in soil type, rainfull intensity or duration, and amount of runoff affecting the application site. As alope gradient increases the specing between the SedimentSTDP atructures should decrease. For example, on a slepe with a gradient of 8.6-4.1 6.4%, the SedimentSTDP structures should be instalted 25 feet sport However, on a slope with a gradient of 2:1 - 1:1 the spacing should be reduced to 10 feet.

HERE'S HOW IT IS DONE

Stop 7

Dig a 3" deep x 8" wide another trench along the contour of the slope or across the pusie.

Step 2

Position the SedimentSTOP* packaged rell perpendicular to the transh so the double-rested postion covers the erefror trench and extends downslope one foot beyond the archor trench. [This forms the Splash Aproxim.] Unroll to cover the trends.

Stop 3

Secure SedimentSTQP material into the anchor trends with a row of staples, and then secure the downslope solge of the Splash Apren with another new of stoples 1Z apart.

Step 4

Hall the remaining SedmentSTDP material from the upslope edge into the anchor trench. (If a thicker roll is needed, simply add argenic meterials across the product width prior to relling!

Step 5

Once the product has been rolled up, secure it to the and surface using wooden states 3' on center.

MCRE. The complete furthfields instructions are provid an early package of Softward 100°.

PACIOLCED BOLLS

With & R t Q43ml Larget - 50.00 ft (15.24 m) Weight 65.00 hs (29.50 kg) ± 10%

Matrix 70% Straw Fiber

1.225 lbs/yd* @ \$85 kg/m/| 20% Coconst Fiber

0.525 (bu/yd*@ 285 kg/m*) Bottom Netting - lene woven jute net Splush Apron Top Net - 2.00 ft lang waven jutg net

FINISHED INSTALLED STRUCTURE

Diameter - Approximately 9.00 in (0.23 m) Langth - 50 linear feet (16.2 m) Downhill Splash Apren Length -1.00 ft (20 cm)

EASY

If you are thinking about using wattles, you need to STOP and consider

the advantages of using

SedimentSTOP.

SedimentSTOP Benefits Comparison Chart SedimentSTOP | Strew Wattle | Sift Fence When you compare Completely Binday radeble YES the benefits of using Radoons Rill Formation YF3 SedimentSTOP Contomiza No Dineseter YES against other Allows Water Filtration YES sediment filtration Shellow Angher Treesh YES YES methods, you'll see No Special Equipment Headed YES YES. that there really is no Little to se Bick of Wildlife Entragment YES YES Seamber Joints comparison. YES YES No Removal Required YES Used on Slopes >2:1 YES YES Abeltiple Layers of Motting YES

SedimentSTOP is economical, delivers exceptional performance, and is easily installed. Contact North American Green today for even more reasons to stop using wattles and start using SedimentSTOP.

1-800-772-2040 www.SedimentSTOP.com











Costonizable Langths

Escopanical Bundles for Shipping



YES

YES

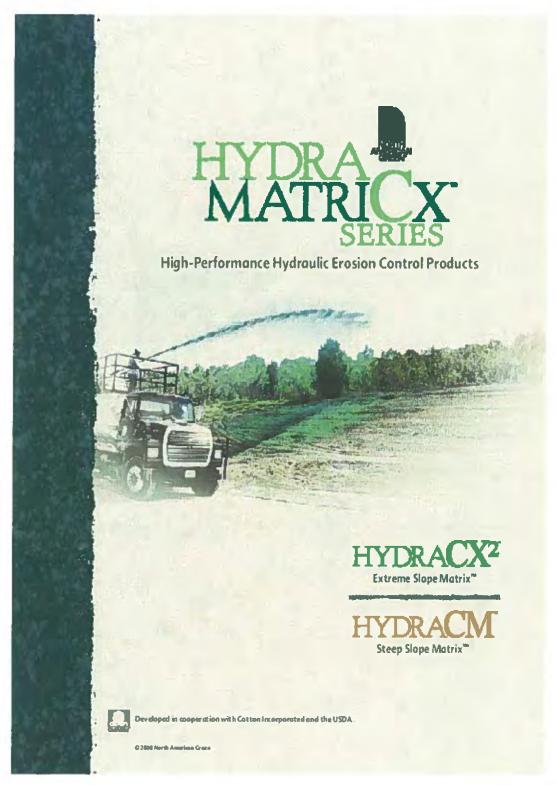
C2001 Naith American line on

234

YES.

APPENDIX F: HYDROMULCH

(Green, Hydra MatriCx SEries, 2008)



HydraMatriCx™ Series

High-Performance Hydraulic Erosion Control Products



HydraMatriCxna Series high-performance hydraulic erosion control products are made with a proprietary blend of straw, reclaimed cotton plant material, tacklifiers, and polymers.

This exciting line of products from North American Green was developed in cooperation with Cotton Incorporated and the U.S. Department of Agriculture.

Consider the benefits of HydraMatriCx Series products:

- · Cost-effective application
- · Low water-to-mulch ratio
- One-step application of seed, fertilizer, and mulch
- · No synthetic fibers
- · Pleasing, deep-green color

In many slope-protection applications, HydraMatriCx products can replace temporary erosion control blankets.



HydraCX² Extreme Stope Matrix⁸ is a high-performance hydraulic mulch designed especially for steep to severe slopes, 2:1 to 1:1.



HydraCM[®] Steep Slope Matrix[®] is a high-performance hydradic mulch designed especially for medium-length, moderate to steep slopes, 4:1 to 3:1.



HydraCX2: Proven Performance

The potosity, absorbency, and proprietary blend of tackifiers and polymers of HydraCX2 deliver exceptional erosion control and fast vegetation establishment.

San Diego State University Slope Testing

Cover Factor (2,4, and 6 inch as /hour event, 20-minute-duration events)	ASTM D 6459*	0.002*
Percent Effectiveness	ASTM D6459*	99,8%
Vegetation Establishment	ECTC Test Method #4	500%

"Maddied ASTM D 6459 (Samdout Tort Method for Descriptions of Enterior Control Methot (ECB) Professions: in Protesting Hillshopes from Reinfeld-Induced Erminn) translated by the Sail Erosica Research Laboratory (SEML) at San Diego Sean University in Documber 2007. For bade utilized by SEML, measure 2 on z 8 on Tages application tets was 3,500 posseds per uses.

To push HydraCX? to its performance extremes, one of the test bods received an extended rain event:

Slope	Rainfall	Duration	Extended Intensity	Extended Duration
3H:TV	2, 4, and 6 inches per hour	20 minutes	6 inches per hour	60 minutes

This extended rain event totaled 10 inches of rain over a two-hour time period (an average of S inches of rain per hour). The data from this event showed that HydraCX2 can reduce sediment loss by as much as 99,7% compared to a non-protected plot.

TRI/Environmental Slope Testing

ASTM D64591				
Cover Factor	Rainfall	Duration	Percent Effectiveness	
0.004	2, 4, and 6 inches per hour	20 minutes	99.6%	

Thering prevent to ASTM D 669 (friending Test Method for Demainmin of Ensies Control Blades (ECB) Performance in Processing Hillsaper from Rainfall-Indiand Errolins) was conducted by TRI/Environmental, Inc. The unit used two plots on a RE19 days guiding with an application onto at 4,000 portrols per some The plots rand water if fore with by 48 first long. Rainfalls are sected as a function of rainfall intendpy Wind queeds was animated below I miles per home Rainfall height was a minimum of 15 first. Each of the plots received an average related of 22 inches per home, 475 inches per home, and 6.5 inches per home for James for James duration of 15 first. Each of the plots received an average related of 22 inches per home, 475 inches per home, and 6.5 inches for James for James duration.

HydraMatriCx Series products achieve maximum performance once the matrix has dried.



Cost-Effective Application

- · One-step application
- · Low water-to-mulch ratio
- · Ready to agitate instantly
- . Uses convenient, sprsy-on technology
- · Easy to clean up

Low Water-to-Mulch Ratio

HydraCK? and HydraCM require a maximum of only 100 gallons of water per 50 pounds of mulch. Water-to-mulch ratio is important when you consider the costs of water and the time, labor, and fuel consumption for trips to and from the water source.

One-Step Application

HydraMatriCx products can be applied in one step together with seed and fertilizer. Contractors will appreciate the convenience and the quick, easy tank loading and one-step application of HydraMatriCx products.

No Synthetic Fibers

HydraCX² and HydraCM contain no synthetic fibers.

In multiple training studies conducted according to EPA-821-R-02-123 Methods for Messuring Acuto Toxicity of Effluents, the Ceriodaphnia dubis, Daphnia magna, and Piraephales promelas tests of HydrsCX² detected no significant toxicity in any of the tests, and control performance criteria were met.

In addition, HydraCX² contains beneficial nitrogen, phosphorous, and potassium, nutrients that are important for plant growth.



Grows Grass Fast

HydraCK¹ enhances seed germination and vegetation establishment. Its natural absorbancy holds moisture and promotes seed-to-soil contact and germination, quickly promoting vegetation.

HydroCX² has been tested according to ASTM 7322, Determination of Rolled Ecosion Control Products (RECP) Ability to Encourage Seed Germination and Plant Growth Under Bench-Scale Conditions. The results concluded that the average plant height was improved by 35 percent in comparison to the control plot. In addition, vegetation establishment was increased by 500 percent.

Compost Analysis of HydraCX² Extreme Slope Matrix

			Be / 100 ou ft.	lbs. /OL yel	lbs_/ton
lbs./gel		0.83	DICE SALTIMENTS	A STATE OF	
lbs/cu.ft.		6.24	624	168.5	
Total Solids (TS)	THE U	86.62	- Washing	W.	
Moisture		13.38			100
Total Nitrogen (TKN)	1.59	1.38	8.61	2.32	27.50
Available Nitrogen	0.54 0.04 0.02 1.55 0.52 0.20	0.47 0.03 0.02 1.34 0.45 0.17	2.93 0.19 0.13 8.36 2.81 1.06	0.79 0.05 0.03 2.26 0.76 0.29 0.67	9.40 0.60 0.40 26.80 9.00 3.40
Ammonio Nitrogen					
Available Ammenia					
Organic Nitrogan					
Available Organic N					
Phosphorous (P)					
Phosphate (P205)					
Potassium(K)	2.49	2.16	13.40	3.64	4320
Potech (IC20)	2.99	2.59	16.16	4.34	\$1.00
Calclum (Ca)	0.50	0.43	2.68	0.72	1.40
Carbon: Nitragen Ratio	1030 (PL)	29:1		Barrier W	

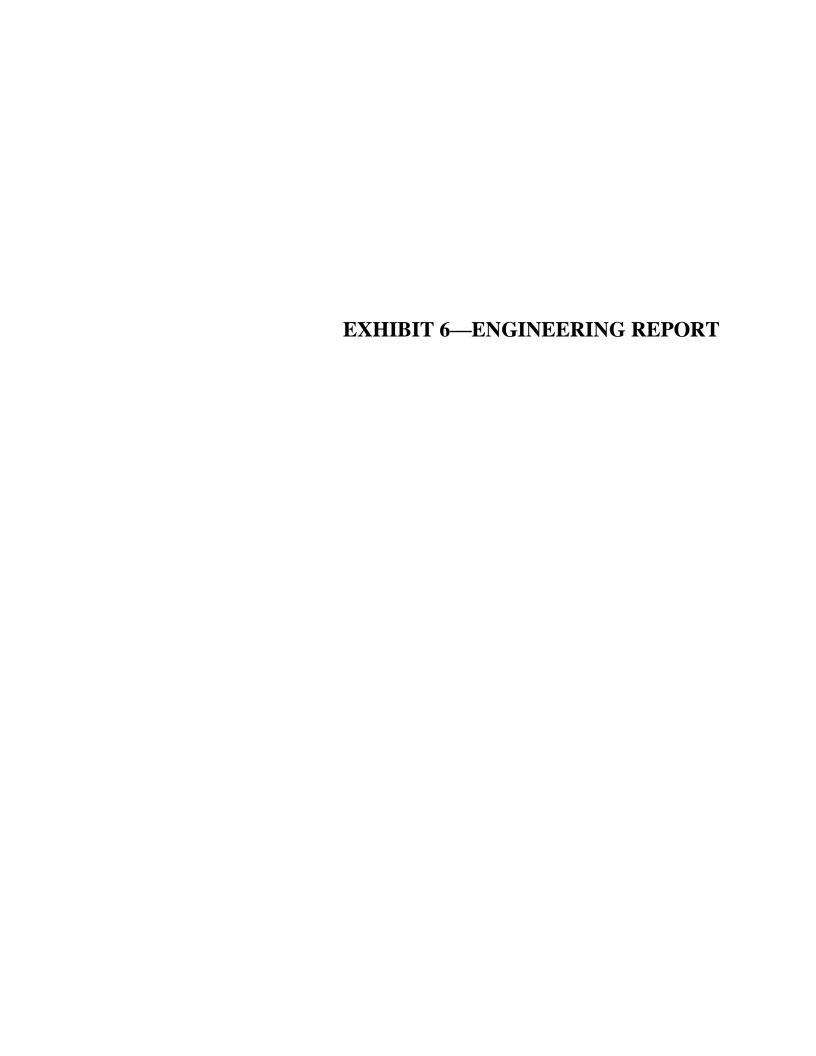
Unlike some wood-based malches that may have carbon-to-nitrogen (C:N) ratios of more than 300:1, HydraCX? has a carbon-to-nkrogen ratio that is typically less than 40:1. HydraCX? requires less nitrogen from the soll for decomposition, leaving more of that nutrient synilable for plant growth.

HydroCX²Content

65% x 3% Mechanically processed stree
25% x 3% Mechanically processed cotton
filters and hyproducts 1016 a 194 Proprietory hydrocolloidal tackillers and activators

HydraCM Content

75% s 3% Me districtly processed stress 15% a 3% Me dearlically processed anten-fibers and byproducts



MAKAKILO QUARRY (Tax Map Key 9-2-3: 82) CONDITIONAL USE PERMIT NO. 72/CUP-15 ENGINEERING REPORT AMENDMENT

Prepared for:

GRACE PACIFIC CORPORATION

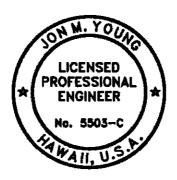
P.O. Box 78 Honolulu, Hawaii 96810

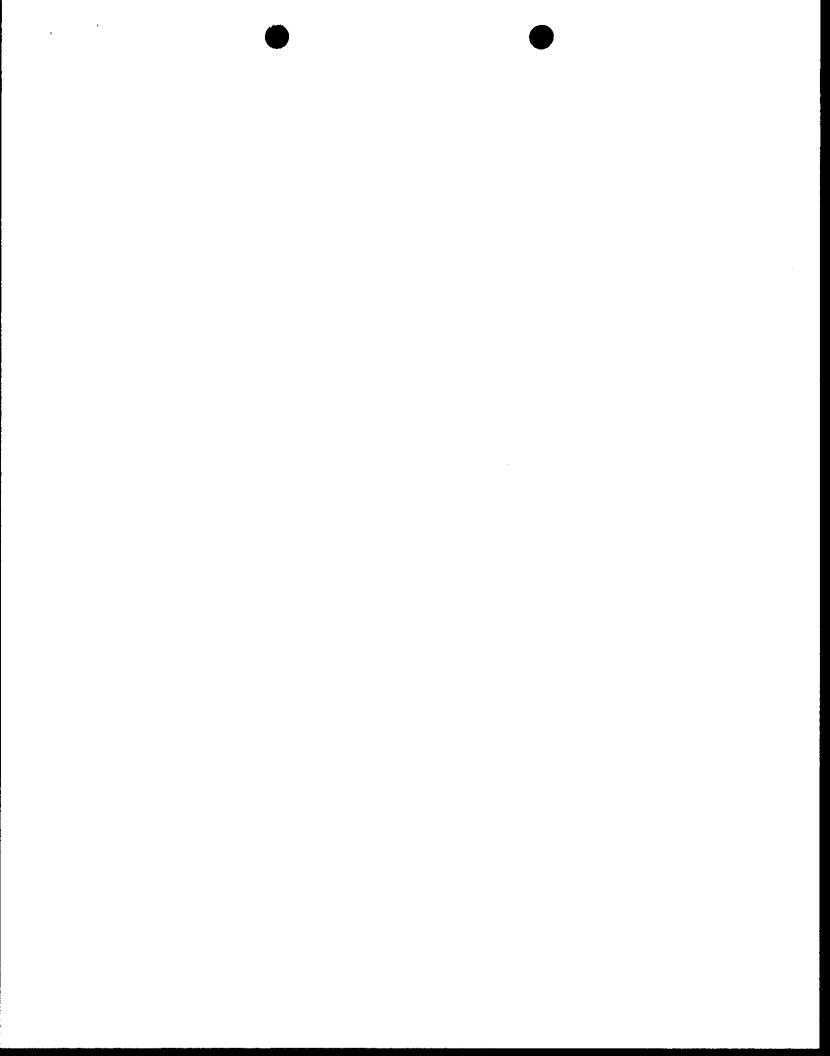
Prepared by:

BELT COLLINS HAWAII, LTD.

2153 North King Street, Suite 200 Honolulu, Hawaii 96819

April 2007 and Amended May 2008





ENGINEERING REPORT AMENDMENT

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1. INTRODUCTION

1.1 PURPOSE

This Makakilo Quarry Engineering Report, dated April 2007 and amended May 2008 (the "April 2007 Report"), is prepared to assist Grace Pacific Corporation in its application for a modification to use permits 72/CUP-15 and 73/SUP-147, to allow the relocation and continuation of quarrying activities at Pu'u Makakilo (the "Application").

The original Makakilo Quarry Engineering Report was approved by the City and County of Honolulu Department of Planning and Permitting on October 19, 1998 (the "1998 Report"). The 1998 Report was prepared to satisfy Condition no. 2 of City Council resolution 95. An amendment was made to the 1998 Report in March of 2004 (the "2004 Report"). The 2004 Report dealt largely with the retention of run-off within the property, visual mitigation and landscaping.

While this report is written to be a free-standing document, a review of the 1998 Report and the 2004 Report is of value in understanding the current operations. These reports are included as Exhibit J of the Application.

1.2 SITE DESCRIPTION

The James Campbell Company owns the land under the Makakilo Quarry (Tax Map Key 9-2-3:82), and licenses it to Grace Pacific Corporation for quarry operations. The license agreement expires in the year 2017. Subject to the approval of the Application, Grace Pacific has negotiated with Campbell for an extension of the license to 2032.

The quarry is situated on the slopes of Pu'u Makakilo. The west bound lanes of the H-1 Freeway front the southeast side of the property. The area makai of the H-1 Freeway is used as a processing site for quarry, but its operations are not included in this report.

Pu'u Makakilo Inc., a subsidiary of Grace Pacific Corporation, owns the property surrounding the existing quarry. The land is characterized as dry-range land with poor, scrubtype vegetation on greater than 10 percent slopes.

2. GRADING PLAN

2.1 Grading

The attached grading plan (Figure 4, Appendix B) shows the proposed final grades prior to reclamation of the quarry in the year 2032. The plan maximizes the excavation of the known basalt reserve while minimizing visual and environmental impacts to the surrounding community.

The southeast boundary of the quarry, which consists of undisturbed ridges and gullies, parallels the H-1 freeway. This area serves as a buffer and will remain undisturbed,

providing a noise and visual barrier from the freeway. The quarry sides and mauka face will utilize slopes averaging flatter than 1.5 (horizontal) to 1 (vertical) and undulating faces to minimize the appearance of a man-made landform. The existing quarry floor will gently slope from the back and sides to the front at approximately a 2% grade. The floor of the proposed mauka quarry area will be steeper, at 15% to 25%, matching the gradients of the existing Pu'u formation.

Restoration grading recommendations prepared by a geotechnical engineer are attached as Appendix A. Several key methods are recommended to provide an adequate foundation for access roads, residential and light loaded commercial development. Excess stockpile material, 1 inch minus, may be used for landscape restoration provided the material contains or is amended with proper portions of organics, sand and silts.

The proposed relocation of the quarry extends up the Pu'u from existing lower elevations between 500 feet to 550 feet to an upper elevation of 700 feet. An access road running across the 350 foot elevation of Parcel 82 will be constructed to allow vehicle access from the southwest portion of the 312 acre parcel (TMK 9-2-3-74) to the northeast portion of the parcel.

As part of this proposal, two drainage basins will be constructed within the lower active pit for runoff retention. There is only minimal additional run-on arising from this proposal, representing runoff from the southwestern portion of the berm that is to be constructed on the northeast boundary. Today, approximately one-half of the runoff in the vicinity of the proposed berm finds its way into the Kaloi Gulch watershed.

Two new landforms will be created from the 475 foot to 700 foot elevations in conjunction with the relocation of quarrying activities. On the southwest boundary, the ridgeline of the Puu will be cut and graded by up to 50 feet to reduce the visual impact of the quarrying, as seen from the H-1 freeway on the approach to Kapolei. For the same reason, Grace Pacific will construct a ridge-like berm extending from the northeastern ridge of the Puu. This berm will range in height from 15 feet to 100 feet above the existing ground. The berm will be constructed with flatter than 2:1 horizontal to vertical slopes. In addition, the bowl of the Puu, in the 700 foot to 800 foot elevation, will be restored to its pre-golf, gullied appearance.

The quarry sides and mauka face will consist of slopes of averaging greater than a 1.5 to 1 horizontal to vertical proportion to reach the desired depths of approximately 200 feet below the existing ground surface. Quarrying to such slopes arguably leaves good material in the ground, but success in achieving visual mitigation in the land forming and revegetation processes is deemed a greater benefit. Over-excavation on the quarry floor will be necessary in some areas to follow rock deposits. Such over-excavation will be filled and compacted to achieve the desired final grades. See Figures 4, 5a and 5b of Appendix B for a detailed look at the slopes along the sides and mauka face of the proposed quarry area.

2.2 ALTERNATIVE FLOOR RECLAMATION

If post-closure development plans deem it desirable, the quarry can be indirectly reclaimed to increase infiltration. After the quarry has been shaped to match the grading plan, the pit floor can be regraded to produce a rough, irregular surface. This method will increase water infiltration and slow erosion by keying the replaced soil into the substrate. This can be achieved by either blasting or ripping the pit floor. Since this quarry is hard rock quarry, blasting is the appropriate method to fracture the pit floor so that water can drain slowly and roots can penetrate. A good technique is to blast an extra 10 feet during the last production round and leave some of the fractured material in place.

2.3 BENCH RECLAMATION

Under the May 2008 Revised Grading Plan several areas of the existing quarry will be left with traditional 25 foot wide benches and 50 foot high faces. In these cases, the benches will be sloped toward the high wall to help trap moisture and soil. Topsoil will be placed on the benches and planted. Other methods may be used to break up the linear features including performing post-production blasting to form staggered benches. Strategic blasting can create chutes, spurs, and rough vertical cliff faces can be created. The desired effect depends on the rock type, structural geology, and blasting agent from a choice of blast patterns, delays, and stemming depths. The appropriate methods will be chosen only when final quarry grades are achieved and rock faces can be evaluated. Appendix E presents the current revegetation plan for screening and restoration of the quarry.

3. DRAINAGE PLAN

3.1 Drainage Plan

3.1.1 METHOD

The intent of the Makakilo Quarry drainage plan is to reduce the amount of stormwater run-on and minimize the impacts of run-off on the quarry as well as downstream. Elements of the drainage plan are detailed in Appendix C.

The method used in this report to calculate required storage uses the total rainfall depth from the design storm. This number is multiplied by the drainage area to yield the total required storage. See Appendices C-1 through C-4 for rainfall storage calculations.

The depth of recorded rainfall for a 100-year storm with a 24-hour duration was extracted from the State Hawaii Department of Land and Natural Resources, Division of Water Land Development, "Rainfall Frequency Study for Oahu, Report R-73", 1984. The applicable page from this reference is included in Appendix B, as figure 1.

3.1.2 EXISTING DRAINAGE

The existing upper quarry covers 94 acres of the Makakilo Pu'u. The slopes of Pu'u Makakilo generate approximately 148 acres of rainfall into the existing quarry area. Figure 2 of Appendix B shows the extent of the existing drainage area.

Twoe existing drainage basins located near the bottom elevation of the quarry create the necessary storage capacity for a design 100-year 24-hour storm. They are DB#1 and DB#2. The required storage was calculated to be 151.9 ac-ft. See Appendix C-1 for required storage calculations. The volume capacity of the three drain basins is 175 ac-ft.

3.1.3 QUARRY DRAINAGE WITH RELOCATION OF QUARRY

The relocated quarry extends mauka within the northeast and southwest trending ridges of Pu'u Makakilo. See Figure 4 of Appendix B for the proposed relocation of quarrying activities. The total proposed area plus the offsite area contribution totals 170.0 acres. This includes the rainfall from the southwestern face of the new berm. See Figure 3 of Appendix B for the developed drainage arising from the proposed relocation of the quarry. On-site storage capacity of 174.3 ac-ft is needed for the increased runoff surface. Free board at this rainfall capacity will be 2 feet. See Appendix C-2 for calculations.

The limit of grading runs along the outer ridge of the Pu'u on the southwest side of the quarry. Runoff generated outside the limit of grade will fall away naturally from the quarry. On the northeast, a new berm will be constructed. As a result, no measures are necessary to divert offsite runoff from the northeast and southwest limits of the relocated quarry. Subsequently, run-on generated from the northwestern edge of the relocated quarry will be handled by the three drainage basins.

The flow off of the northeastern berm face is 18.33 cfs and will continue to flow along the existing flow patterns.

3.1.4 CONCLUSION

The intent of the Makakilo quarry drainage plan is to reduce the amount of storm water entering the site and fully retain all the storm water runoff within the upper quarry.

The two existing basins (DB#1 and DB#2) with capacity of 175 ac-ft sufficiently store the 174.3 ac-ft (100-yr storm) of required by the expansion. A 100-yr storm at 174.3 ac-ft of rainfall will reach hydrological water levels of 253 ft. The surrounding berm height at the 96" culvert is at elevation 255 ft. This results in 2' of freeboard. The existing slopes along the southwestern edge of the quarry will convey runoff away along its natural existing flow pattern preventing offsite runoff from entering the site.

The berm on the northeastern edge of the proposed quarry will serve as an offsite runoff diversion. The southwestern face of the berm will produce approximately 18.33 cfs of runoff and will follow existing flow patterns. The existing area (under the site of the proposed berm) generates approximately 18.33 cfs, therefore there is no net increase in runoff generated by the construction of the berm. The direction of flow of this 18.33 cfs of runoff will continue along the same direction as the existing flows.

Overall, no additional flows will be added to outside drainage patterns. Runoff will be contained within the quarry limits. The quarry relocation project will have no adverse impact on adjacent properties or existing downstream drainage systems.

3.2. EROSION CONTROL PLAN

Minimizing or eliminating water-quality problems by mechanical or operational means is generally described as a best management practice (BMP). BMPs can be classified as either short- or long-term with considerable overlap existing between the two. Also, erosion controls at a site will likely change over time as the configuration of the site changes. The best strategy for stormwater control is to divert stormwater around the quarry and into an existing drainage. However, in the absence of such diversion, once stormwater has entered a quarry, a very effective control technique during ongoing operations is to develop numerous sumps or low areas to disperse stormwater. These low areas collect sediments and allow stormwater to infiltrate into the ground.

The runoff created within the Makakilo quarry expansion will be retained, therefore no soil loss is expected within the quarry expansion.

Proper erosion control measures will be implemented during the construction of the new berm. The northeastern face of the berm measures to be approximately 5.7 acres. Flow generated during a 10-year storm for this area would be 18.33 cfs.

Silt fences will be installed along the toe of the berm slope down stream of drainage pattern flow. Geotextile fabrics will be installed along the berm slopes, in order to stabilize the bare slopes while the grassing is being established. Other methods include mulching, straw bales, silt fences, jute matting, and plastic coverings. Mulching, matting, and plastic covering are good methods to reduce rain drop erosion especially on slopes; while straw bales and silt fences are designed to prevent fully or rill erosion of long overland areas such as swales.

The quarry is exempted from complying with the City and County of Honolulu, Soil Erosion Standards and Guidelines, November 1975. (Chapter 23. Grading, Soil Erosion and Sediment Control). However, Grace Pacific. will use the guidelines, as appropriate, in its erosion control activities at the site.

3.3. WATER QUALITY

No discharge is expected from the quarry. The site has been designed to fully contain runoff for a 100-year storm event.

The newly constructed berm will produce runoff that will flow towards Kaloi Gulch but the quantity of flow will not be in excess of what was already conveyed in the same area. Industrial activity will not take place within the berm area.

4. 2007 REVEGETATION PLAN

4.1 PURPOSE OF THE PLAN

The purpose of the Plan is to address the visual mitigation and revegetation of the areas affected by the proposed relocated quarry while operating (2007-2032), and the post-closure revegetation efforts beginning in 2032.

The Plan assumes the final landforms described in the Grading Plan section of this report. See Figures 4, 5a, 5b, and 6 of Appendix B.

The tools of the Plan are landforms and re-naturalization (or "revegetation"). The key elements of the Plan are:

- 1) the use of the existing ridges and man-made berms as effective visual screens of quarry activities and quarry faces;
- 2) for quarried faces not able to be screened, minimizing the man-made appearance of the final contours is preferable from a visual standpoint; and
- 3) the re-naturalization of man-made berms and quarried faces with drought tolerant vegetation, mixed and placed to blend with that existing on the Puu, is the most water-efficient and effective approach to long term landscape management.

The Proposed Use affords an opportunity an opportunity to improve upon several aspects of the 2004 Revegetation Plan. The existing excavation area is completely screened from view from the Kapolei Regional Park towards Ko Olina by a ridge on the southwest boundary. This aspect will be retained. A ridge and berm along the H-1 freeway at the 275 foot elevation screens the close-in views from Farrington Highway in the vicinity of Kapolei Knolls around to Palehua Road. This aspect will also be retained.

The intermediate and distant views from the Villages of Kapolei and Kalaeloa (formerly BPNAS) presently are that of a 2,400 foot wide active quarry face with a visible height of 250 feet (from elevation at 275 feet to 525 feet). The proposed excavation activity will quarry upslope through this quarry face and leave a bowl-shaped landform 700 feet further mauka, complementing the existing bowl of the Puu. The exposed face of the bowl (prior to revegetation) will be 200 feet in height (from elevation at 500 feet to 700 feet). The top of the Pu'u is at an elevation of 980 feet. What is presently the quarry face will become the quarry floor (from elevation at 275 feet to 500 feet), which as a landform, will be readily revegetated.

The intermediate and distant views from Ewa and Waipahu, while not viewing the existing active face head-on, will benefit from the move mauka and the bowl-shaped final landform.

The weak ridge on the northeast boundary of the proposed excavation area will expose the southwest quarry face on the approach to Kapolei on the H-1 Freeway from Kunia Road to the vicinity of the proposed North South Road Interchange. To mitigate this visual impact, Grace Pacific is proposing to lower the southwest ridgeline by approximately 50 feet

in elevation and to build a berm on the northeast ridgeline of approximately 75 feet in height. The net effect of these actions will be to leave no more than 100 feet of the southwest face unscreened. Further, it is planned to grade the unscreened face with slopes averaging flatter than 1.5 to 1 (horizontal to vertical slope) to facilitate the revegetation effort.

4.2 GOALS AND OBJECTIVES

Minimize or eliminate the visual recognition of the quarry from off-site locations. Through the re-establishment of plant material and careful excavation of exposed rock areas, it is the intent of this Plan to either screen or "visually blend" wherever possible exposed areas of the site. "Visual blending" is based on the use of appropriate plant material and grow-in procedures.

Screen the quarry machinery and equipment from public view. Placing the quarry machinery and equipment on the Quarry floor effectively screens it from the public view. The quarry floor will be at a 245-foot elevation, which will be at least 70 feet below the quarry rim.

Minimize the long-term use of irrigation water. Although all plant materials require water for establishment and to survive, this plan recommends a minimum of water consumption through the use of drought-tolerant species and growth in procedures that are designed to acclimate plants to dry conditions.

Minimize long-term maintenance in the re-naturalized areas. On the same basis in which irrigation water use is being minimized, recommendations are geared towards the long term, low maintenance requirements of the quarry environment. Plant materials will be selected based on ability to survive with minimal maintenance for the two-year establishment period. These plants ultimately will naturalize into the existing vegetation and survive without regular maintenance. See Exhibits 3 of Appendix E for the Recommended Plant Palette. See Exhibits 4 and 5 of Appendix E for the Revegetation Matrix and Revegetation Phasing Plan arising from the Proposed Use.

Avoid an "engineered appearance" to the completed project. In regards to the arrangement and appearance of the plant materials and rock walls, it is the intent of this plan to convey the importance of using irregular forms wherever possible. No straight row plantings will occur anywhere within the site or at the site boundary, including the benches. Clusters of plant materials and benches of varying shapes, orientation and dimension will be used to create a more natural appearance.

Quickly establish a re-naturalized appearance. Plant materials that are currently surviving on the site without irrigation provide a guide to those plants that will survive in the hot, windy and dry climate of the site and should be considered for use. Plant materials with a fast growth rate and hardy nature will be used so that screening and slope stabilization can occur as quickly and effectively as possible. Plant materials that have strong colors and textures and would not visually blend in with the

naturally occurring grasses and lightly textured and colored trees found in neighboring areas will not be used. See Exhibit 3 of Appendix E for recommended Plant Palette.

Activities will not disturb protected areas of the site. All areas, which are not intended for quarry development, will be left undisturbed. These areas will serve as the benchmark and guide for the appearance of the quarry re-naturalized areas when that work is done. See Exhibit 1 of Appendix E for photos of undisturbed lands on the surrounding Puu Makakilo slopes.

Minimize costs associated with the re-naturalization efforts. The plan strives to minimize short and long-term costs associated with the re-naturalization. Seed or seedlings of many of the plant materials recommended can be propagated directly on-site and most are considered easy to grow. Many of the plant materials used will reseed themselves and spread on their own eliminating the potential need for periodic follow-up plantings. Typically smaller container size trees will be planted because they more readily adapt to site conditions and because they are available at a relatively low cost. The irrigation system contemplated for use will require an initial cost and some on-going costs for maintenance but will lower the potential long-term costs of replanting during extremely dry periods. Test plots will be used on-site to test varying seed mixes and maintenance practices to improve the chances of success and to fine tune a cost effective planting and low maintenance approach.

4.3 SITE OPPORTUNITIES AND CONSTRAINTS

Site opportunities and constraints are summarized below:

Natural ridgelines screen views. The ridge on the Makakilo side of the quarry completely screens distant, intermediate and close-up views of the quarry from the Makakilo residential neighborhood (Exhibits 2-1 and 2-2 of Appendix E) to the Kapolei Regional Park; The ridge on the Waipahu side of the quarry screens intermediate and close-up views of the quarry face, as seen from the intersection of Farrington Hwy and the old Palehua Road (Exhibit 2-3 of Appendix E). The western quarry face is visible from the distant view at the H-1/Kunia intersection (Exhibit 2-4 of Appendix E). The lowering of the elevation of the southwest ridge and construction of a berm on the northeast ridge will mitigate the effects of the proposed excavation area on this distant view. See Exhibit 2-0 of Appendix E for a map of screening zones and photograph vantage points.

Berm above H-1 freeway screens views into Upper Quarry. The existing H-1 freeway cut faces and the intervening gullies of Puu Makakilo serve to screen close-up views of the quarry from the H-1 and Farrington Hwy (Exhibit 2-5 of Appendix E). The quarry face is visible from intermediate views such as Kapolei Golf Course (Exhibit 2-6 of Appendix E) and the Villages of Kapolei (Exhibit 2-7 of Appendix E) and from distant views, such as the Ewa Golf Course (Exhibit 2-8 of Appendix E). See Exhibit 2-0 of Appendix E for a map of screening zones and photograph vantage points.

<u>Puu Makakilo screens views from Upper Makakilo.</u> Puu Makakilo completely screens views of the quarry from the residents of upper Makakilo (Exhibit 2-9 of Appendix E).

The variation of colors of the quarry face rock and surrounding natural vegetation. Distant views of the quarry are indistinct due to moving cloud shadows and the mottled appearance of the quarry rock and cinder. Much of the existing quarry face rock and surrounding vegetation has an uneven gray-brown to blue color from a distance. This unevenness helps to break up the line of the quarry faces and benches.

<u>Color/Texture.</u> During the dry season, the surrounding area vegetation is brown to yellow in color. During the rainy season, the plants are grayish-green with occasion splashes of yellow. Textures vary among the vegetation found on site, but generally smaller, finer textured plants appear to predominate visually rather than broadleafed ones. Brightly colored plants, such as Bougainvillea, should be avoided, as they attract attention, rather than diffuse it.

Types of plants. The plants existing on site have volunteered naturally. These plants include a wide variety of shrubs, groundcovers, and grasses. None of the established plants on site receive any permanent irrigation. Therefore, only the hardiest and drought tolerant plants tend to survive. All proposed plants should be extremely drought-tolerant, and require minimal water after establishment. See Plant Palette, Exhibit 3 of Appendix E.

<u>Volunteer/Natives.</u> Many volunteered or native plants are very drought tolerant and hardy. Many are considered "weeds" in ornamental landscapes, but on this site they cover the ground and minimize erosion. However, there are a few noxious weeds and toxic plants that should be eliminated. An example of this is the Tree Tobacco (Nicotiana glauca), which is poisonous to man and to livestock.

Source of irrigation water. Grace Pacific Corporation has a well at its Processing Site with an allocation of 168,000 GPD. Water from this well is pumped to the Upper Quarry and stored in tanks near the primary crusher. Portable water tanks may be located on the upper benches and supplied by water wagons.

The Revegetation Matrix and Revegetation Phasing Plan (Exhibits 4 and 5 of Appendix E) assume the availability of approximately .200 mgd of water for all quarry purposes (Processing Site well plus Board of Water Farrington Hwy meters). Of this amount, the Revegetation Plan targets .050 mgd or less for revegetation purposes. This limitation on supply serves as a constraint on the speed by which quarried land and land graded for visual mitigation purposes may be revegetated.

<u>Climate.</u> Rainfall is historically less than 20 inches per year, and usually occurs between the months of December and February. Prevailing trade winds are from the northeast and can be quite strong. Temperatures are very high, with summer

average highs in the mid to high 90's and winter average highs in the lower 80's. The average annual humidity ranges from 65% in the summer to 75% in the winter.

Agricultural soils analysis. Soil tests on quarry benches and the slopes surrounding the quarry suggest that existing site soils are high in sodium and magnesium, and low in calcium, phosphorous, iron and zinc. With proper amendments re-naturalization can occur readily given the soils present on-site. Toxic concentrations of boron and magnesium have been found in certain areas of the site. These areas will require the addition of Gypsum to bind the toxic materials in the soil.

4.4 LANDSCAPE DEVELOPMENT PLAN

Quarry Floor. The quarry floor will encompass an area of approximately 107 acres. This area makes up the lower ground plane or base of the quarry. It is understood that this base area of the quarry may be developed in the future, however until the specific development plan has been determined, the area will be planted with grasses and ground covers to control dust and erosion. The floor of the quarry with elevations below 300 feet will be hidden from view and will have no visual impact from off-site locations.

Upon removal of Grace Pacific's plant and equipment in 2032, the first priority will be to establish a natural appearing grass/ground cover mix. The species already growing on site provide a good indication of species that will tolerate the harsh site conditions occurring in Makakilo. A carefully selected combination of grass/ground cover species that are fast growing, drought tolerant and will reseed or otherwise spread is recommended. Species will be combined to ensure that plants will establish within all of varying microclimates present on-site. The quarry floor soil materials may also need to be amended to provide nutrients and drainage. The ultimate planting plan for the quarry floor will depend upon the final land use determined by the James Campbell Company and Grace Pacific. For this reason no large landscape materials will be introduced within the quarry floor area.

Irrigation will be required to establish grasses and ground covers in the quarry floor area. Rotary impact heads will be used to establish the plantings for a period of approximately two years. Irrigation lines will be buried in shallow 4" trenches to protect then from UV and other damage and lengthen the usable life of the system. The irrigation system will be turned on periodically in times of drought to minimize potential fire hazards.

Mauka Quarry Faces. The most visible aspect of the quarry at its completion will be the faces above the 400 foot elevation up to the mauka perimeter. To mitigate the appearance of these faces, an undulating landform and a slope averaging flatter than 1.5 to 1 but allowing for significant variation will be created to render a more natural appearance than straight benches and slopes..

Because of the high exposed elevations that will be exposed, it not the intent of the revegetation plan to screen the entire face with trees but rather to soften the

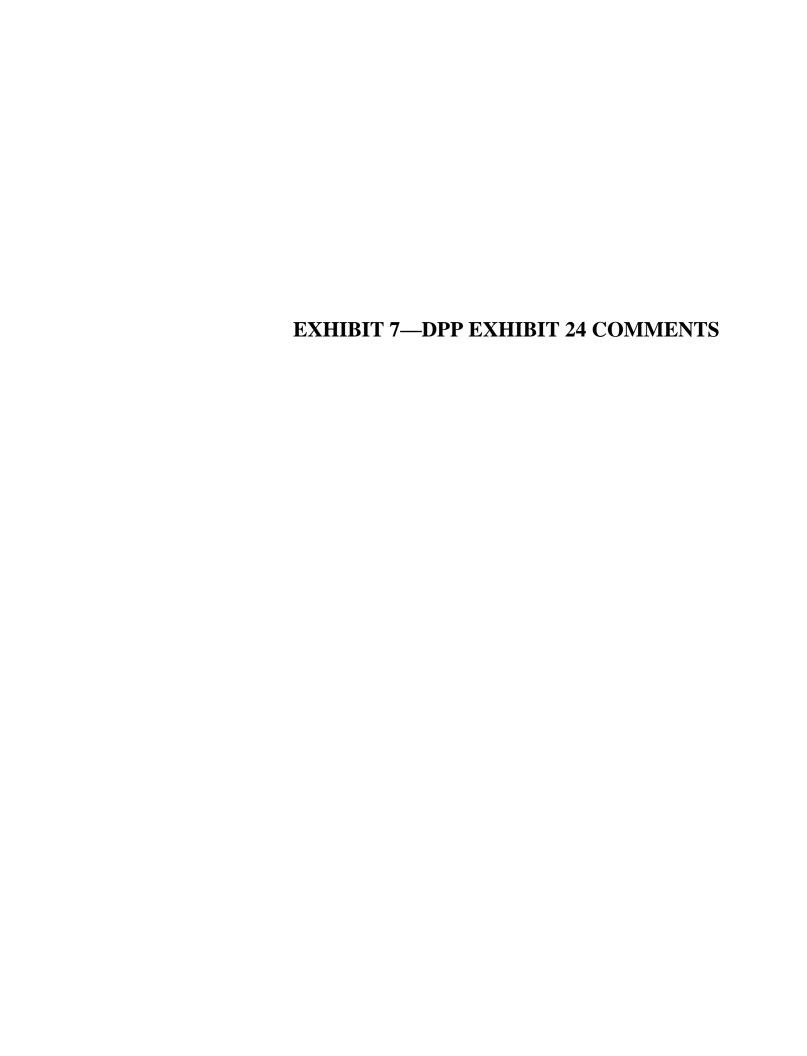
exposed surfaces with grasses and shrubs. This treatment will create the illusion that these faces are naturally formed and aged. The excavation pattern for the quarry will emphasize the uppermost benches first. It will be very important to complete landscape work in conjunction with the quarrying process to ensure the landscape installation is not hindered due to conflicts with mining procedures. Soil and amendments will be added to the surfaces immediately after completion, as it may be difficult to add any soil later. Soils used in the work will come from on-site stockpiles where possible. If imported soils are used, they will be matched with the structure and characteristics of on-site soils and will be inspected to prevent the introduction of noxious weeds and insects.

The plant materials used would be fast growing, drought tolerant and self-spreading varieties. Random placement of tree and shrub groupings will be under the direction of a Landscape Architect to select appropriate variation and density of clusters. Clusters of larger plants such as Kiawe and Opiuma will be planted in specific areas. Large tree or shrub plantings will not be planted along the entire length of benches to avoid reinforcing unnatural horizontal lines.

Irrigation is required to establish plant material on the faces. It will be particularly critical that a sturdy system is in place (even though considered of temporary quality) because of the potential future access problems. A PVC line system is recommended with lower trajectory and narrower coverage area impact heads due to the strong prevailing winds. Where adjacent benches occur within 25' of elevation change of each other, it is possible that one row on the upper bench could irrigate both levels. This would be determined on a case-by-case analysis in the field. Irrigation will be implemented for a two-year grow-in period. Irrigation mainlines will be buried in shallow 4" trenches to protect from UV and lengthen the usable life of the system. The irrigation system will be turned on periodically in times of drought to minimize potential fire hazards. As field stock materials will be used on the benches, no drip irrigation will be required. See Exhibits 4 and 5 of Appendix E for the re-naturalization schedule.

Access Road. From the existing Quarry, the access road skirts the lower edge of the adjacent Puu Makakilo property, and then turns into Old Palehua Road, crossing under the H-1 and terminating at Farrington Highway. The visibility of the access road varies depending on where it is being viewed from and the particular segment of the road being viewed. Wherever possible undulating re-naturalized berms of 6 feet in height planted with grasses, groundcovers, trees and shrubs will be maintained to screen the access road from view. Earth mounds and rock material laid in natural patterns should be used in certain areas where highest visibility exists. A continuous landscape treatment along the road is not desirable (such as a row of trees or a long berm) and would serve to draw more attention to the roadway. A limited number of field stock trees are recommended to soften the most critical areas immediately. The irrigation system provided will consist of a rotor head system, which will remain in place for the duration of the use of the access road use to revitalize plant materials, which are affected, by heavy vehicle use. A temporary drip irrigation system will be used to establish the field stock materials for an approximate 12-month period.

Existing Buffer at H-1, the "Adjacent Area". The portions of the existing Quarry parcel flanking the quarry, but not used for quarrying, are termed the "Adjacent Area" in the license agreement with the James Campbell Company. The Adjacent Area for the most part is untouched and has a natural appearance with kiawe, hauole koa and naturally occurring grasses. It is the intent of this Plan to maintain this area in its entirety as it currently exists and to a substantial degree emulate this "look" as much as possible in the surrounding areas to be naturalized.





July 7, 2008 2004.33.8000 / 08P-244

Mr. Henry Eng, Director Department of Planning and Permitting City and County of Honolulu 650 South King Street, 7th Floor Honolulu, HI 96813

ATTN: Raymond Young

Dear Mr. Eng:

08 JUL -7 P3:41

DEPT OF PLANHING
AND PERMITTING
CITY & COUNTY OF HONCOLD

Application to Amend Special Use Permit File No. 72/SUP-1 Makakilo Quarry – Response to Comments

On behalf of Grace Pacific, we are providing the following items as discussed with Mr. Raymond Young on June 24 and June 27, 2008:

1) Recap of Recent Submittals. A brief recap of how the content of the recent submittals of April 21st, May 23rd, June 6th and June 20th differs from the original application.

The Application as accepted as complete on November 9, 2007, contemplated the following:

- New Excavation Area Use of a total of 48 acres of Parcel 74 for two purposes: active quarrying (33 acres) and visual mitigation landscaping (15 acres).
- Expanded Buffer Zone Set aside of a total of 393 acres as a buffer zone between active quarrying and the adjacent properties; (Parcel 82, 115 acres and Parcel 74, 278 acres). Existing buffer zone is 178 acres. Net increase in buffer area = 215 acres.
- No Change to Operations on Parcel 82 Continued use of Parcel 82 for excavation, hauling and primary crushing; along with continued operation of concrete and asphalt recycling plant.
- No Change to Operations on Parcel 4 Continued use of Parcel 4 for finish crushing, hot-mix asphalt production, ready-mix concrete production, scale house, maintenance shop and administrative office.
- <u>Dump Truck Traffic</u> Parcel 4 = 80-85 round trips daily, accessing Farrington Highway at the entrance to Parcel 4. Parcels 82 and 74 = 80-85 round trips daily accessing Farrington Highway at Palehua Road. Upon completion of the North-South/H-1 Interchange, Parcels 82 and 74 would have direct freeway access.

Honolulu
Bangkok
Boulder
Guarn
Hong Kong
Manila
Seattle
Shenzhen

Singapore

- <u>Visual Mitigation</u> Balancing the ridges of the Pu'u by lowering the Makakilo ridge by 75 feet and constructing a 75-foot-high berm on the Kunia ridge. The quarry "face" on the Makakilo side would be gently sloped to appear non-man-made, while the mauka and Kunia quarry faces would be of the traditional bench and vertical face appearance of a quarry.
- <u>Duration of Operations</u> The operations on Parcels 4, 82 and 74 would continue for 25 years, or to the year 2032. Thereafter, several years would be necessary for removal of plant and equipment and the renaturalization of those areas.

Subsequent to November 2007, Grace Pacific's discussions with DPP and Grace Pacific's residential neighbors focused on the impact to residential neighborhoods from the operations on Parcel 4 and the visual appearance of the final quarried landform. Grace Pacific and DPP have agreed that conditions be placed upon the approval of the Application to give effect to the following:

- New Excavation Area Use of a total of 65 acres of Parcel 74 for active quarrying (21 acres of quarry floor, with a large portion of the difference from the 33 original acres now characterized as mitigation landscaping) and visual mitigation landscaping (44 acres).
- Expanded Buffer Zone The area of the proposed buffer zone remains the same, a total of 393 acres.
- Operations on Parcel 82 In addition to the continued use of Parcel 82 for excavation, hauling, primary crushing and aggregate recycling, within three years of approval, the following operations from Parcel 4 would be set up on Parcel 82: finish crushing, weekday operation of the hot mix asphalt plant, a maintenance shop for quarry equipment and an operations field office.

The hours of operation on Parcel 82 will remain the same after the relocation of the operations presently conducted on Parcel 4. Typically, excavation and crushing occurs from Monday through Saturday between the hours of 6 a.m. to 3:30 p.m. Blasting typically occurs four or five times a week between the hours of 8 a.m. and 12 noon. Sales from Parcel 82 will be limited to the hours of 7 a.m. to 4:30 p.m. Cleanup and maintenance will be scheduled from 3 p.m. to 6 p.m. Occasional night shift paving jobs will require incoming hauling (6 p.m. to 1 a.m.) for asphalt pavement rubble.

• Operations on Parcel 4 - Within three years of approval, all operations on Parcel 4 would cease. Both weekday and weekend/night operations of the hot-mix asphalt plant would shift to Campbell Industrial Park (CIP) for the first three years, and thereafter this plant would be used for night and weekend work. The weekday operation of the hot-mix asphalt plant would be re-established in the third year on Parcel 82. The readymix concrete plant and the maintenance shop for construction equipment would move

to CIP by the end of the third year. Following the shutdown of operations, an estimated three years would be necessary to dismantle, clean up, grade and establish ground cover on Parcel 4. It is estimated that Parcel 4 would be returned to the landowner, the James Campbell Company, by the year 2015.

- Operations on Parcel 74 There is no change in the use of Parcel 74, the excavation of rock, under the recent submittals.
- <u>Dump Truck Traffic</u> With the move of operations from Parcel 4 and the North South/H-1 Interchange being placed in service, within three years of approval, all truck traffic to and from Parcels 82 and 74 would have direct freeway access at the new interchange. Farrington Highway would no longer be used for access to any of the quarry or processing operations.
- <u>Visual Mitigation</u> The balancing of the ridges of the Pu'u remains central to the visual mitigation plan. In addition, Grace proposes (1) to renaturalize the "bowl" of the Pu'u, an additional six-acre area that the former golf developer had mass graded in anticipation of becoming a driving range, and (2) to extend the berm on the Kunia side to the pad of the former golf clubhouse, an additional area of 9 acres.

The most notable change of the recent submittals is the Revised Grading Plan of June 2008, under which the quarry "face" on all three sides, the Makakilo side, mauka and Kunia, would be gently sloped and textured to appear non-man-made. The gentler slopes would also more readily accommodate renaturalization. The quarrying process will change, taking advantage of highly accurate GPS systems to create the final landform as part of the excavation process. Under the Revised Grading Plan approximately 1 million cubic yards of material is not being excavated, when compared to the original application.

• <u>Duration of Operations</u> - The operations on Parcel 4 would continue for three years, to the year 2011. Thereafter, several years would be necessary for removal of plant and equipment (approximately one year) and the renaturalization of those areas (approximately two years).

The operations on Parcels 82 and 74 would continue for 24 years, or to the year 2032. Thereafter, several years would be necessary for removal of plant and equipment and the renaturalization of those areas.

2) <u>Kunia Berm Use and Extension</u>. Clarification on the storage of explosives and the benefits of extending the berm further mauka.

The berm on the Kunia side, as proposed in the Application accepted November 9, 2007, extended mauka to the 625-foot elevation. Under the latest proposal, the berm continues up the ridgeline to the 725-foot elevation. This is done for visual purposes not related to quarrying; essentially repairing the break in the ridgeline created by the grading cuts for the placement of the former golf clubhouse.

Following a similar line of thinking, the current modifications envision creating landforms in the bowl of the Pu'u, in the elevations from 700 to 750 feet, mimicking the ridges and gullies that existed prior to the golf driving range grading done in the early 1990s.

As to the storage of explosives, the berm will not be used to store explosives. The magazines are being moved from the ridge on the western corner of the existing quarry (Parcel 82) to the floor on the northern corner for security reasons.

- 3) <u>Truck Traffic Routing</u>. The following describes the truck traffic routing to and from the Quarry Site, Lower Processing Site and Campbell Industrial Park, now, with the North South/H-1 Interchange under construction, and after the Interchange is completed:
 - <u>Upper Quarry to CIP</u> (today and in the future) The truck route from the Upper Quarry (Parcel 82) to Campbell Industrial Park (CIP) today and upon completion of the North South /H-1 Interchange (estimated to be December 2008), will follow Palehua Road to the interchange, then enter the H-1 westbound, exit H-1 at the Palailai (Exit #1) and follow Kalaeloa Boulevard south into CIP.
 - <u>CIP to Upper Quarry (through December 2008)</u> The truck route from CIP to the Upper Quarry today is from Kalaeloa Boulevard onto the H-1 at the Palailai Interchange, then exiting the H-1 at the Kunia Interchange, turning left onto Kunia road, then turning left back onto the H-1 heading westbound, getting off at the North South/H-1 Interchange off ramp to Palehua Road and following Palehua Road to the quarry.
 - <u>CIP to Upper Quarry (after December 2008)</u> The truck route from CIP to the Upper Quarry upon completion of the North South /H-1 Interchange will be from Kalaeloa Boulevard onto the H-1 at the Palailai Interchange, then exiting H-1 at the North South/H-1 Interchange Kunia Interchange, turning left onto Palehua Road, and following Palehua Road to the quarry.
 - <u>Upper Quarry to Lower Processing Site (through December 2008)</u> The truck route from the Upper Quarry to the Lower Processing Site (Parcel 4) will be to take Palehua Road to the North South/H-I Interchange, enter the H-1 westbound, exit at Makakilo Drive (Exit #2), turning left onto Makakilo Drive, then turning left onto Farrington Highway, then turning left into the Lower Processing Site.
 - <u>Upper Quarry to Lower Processing Site</u> (after December 2008) The truck route from the Upper Quarry to the Processing Site, upon completion of the North South /H-1 Interchange, will be from Palehua Road through the North South/H-1 Interchange heading makai to Farrington Highway, right onto Farrington Highway then right again into the Lower Site. Note that traffic on this route will phase out with the move of operations from the Lower Site in three years.

- Lower Quarry to Upper Quarry (through December 2008) The truck route from the Lower Site to the Upper Quarry today is from Farrington Highway towards Waipahu, left onto Kunia Road, then left onto H-1 westbound, getting off at the North South/H-1 Interchange exit, onto Palehua Road to the Upper Quarry.
- Lower Quarry to Upper Quarry (after December 2008) The truck route from the Lower Site to the Upper Quarry upon completion of the North South /H-1 Interchange, will be from Farrington Highway towards Waipahu, left onto the new North South road heading mauka, under the H-1 Freeway, following Palehua Road to the Upper Quarry. Note that traffic on this route will phase out with the move of operations from the Lower Site in three years.
- CIP to Lower Processing Site (through December 2008, and after December 2008) The truck route from CIP to the Lower Processing Site today is from Kalaeloa
 Boulevard, turning right onto Kapolei Parkway, then left onto Kamokila Boulevard,
 through Kapolei City, following onto Farrington Highway then left into the Lower Site.
 Note that traffic on this route will phase out with the move of operations from the
 Lower Site in three years.
- 4) <u>Description of the Benefits of the Revised Grading Plan</u>. The Revised Final Grading Plan dated June 2008 ("Revised Grading Plan") has the following benefits when compared with the Final Grading Plan included in the Application as accepted in November of 2007 ("November 2007 Grading Plan"):
 - Minimizing man-made appearance of final landform.
 - Ensuring structural stability of final landform slopes.
 - Greater likelihood of success in renaturalization.
 - Allows for increased excavation in certain areas of quarry floor areas without affecting integrity of final landform.
 - Retains early-on landscape grading and renaturalization efforts, given constraint of available irrigation water.
- 5) Revised Figures, Exhibits. A "Revised Excavation Phasing" plan, Figure 6 in Appendix B of the Engineering Report, a "Revised Renaturalization Matrix," Exhibit 4 in Appendix E, and a "Revised Renaturalization Phasing" Exhibit 5 in Appendix E of the Engineering Report, are attached, each reflecting changes arising from the Revised Grading Plan of June 5, 2008.

- 6) New Figure of Areas and Acreages. A new "Designation of Areas and Acreages" as Figure 7 for Appendix B of the Engineering Report is included to assist in reviewing this submittal. It is important to emphasize at this point that the acres, volumes and years depicted in the "Excavation and Landscaping Phasing" (Figure 6), the Renaturalization Matrix (Exhibit 4) and Renaturalization Phasing (Exhibit 5) are for illustrative purposes, and that actual market demand will largely drive the actual excavation phasing. While the initial landscape grading described by Areas 1A and 1B will be take place in the 2009-2012 and 2013-2017 periods due to the availability of irrigation water, thereafter the landscape grading will follow actual quarry excavation.
- 7) Revised Table of Contents. The Engineering Report Table of Contents "Appendices" page has been updated to reflect the new Figures 5g and 5h included with the June 20th submittal, and the items described in 5) and 6) above. "Red-line" and "clean" copies are attached.

Thank you for the opportunity to respond to your comments. Should you have any questions about the information provided herein, please call me at 521-5361 or Bob Creps at 674-5201.

Very truly yours,

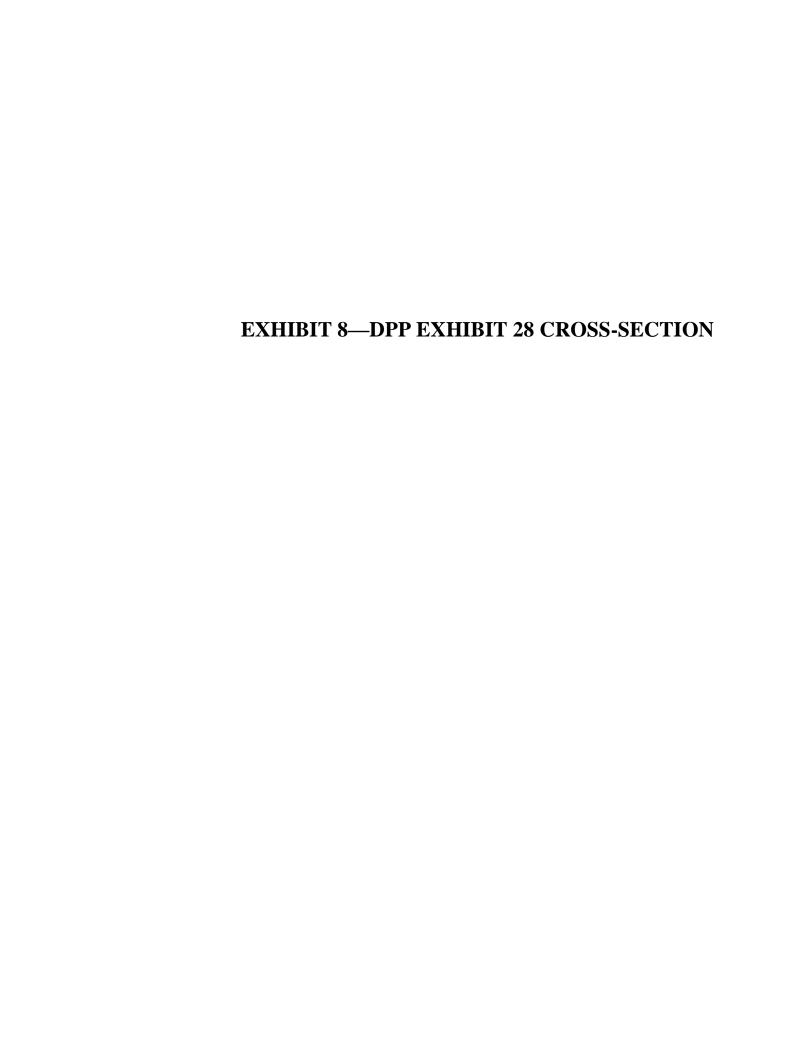
BELT COLLINS HAWAII LTD.

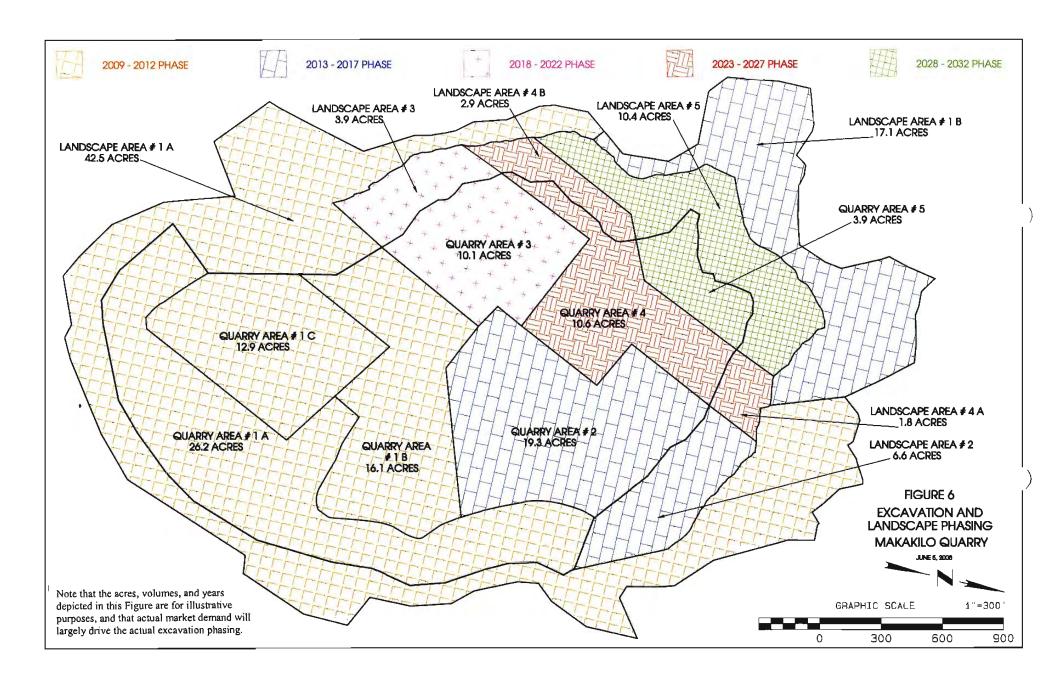
Lee W. Sichter Principal Planner

LWS:lf

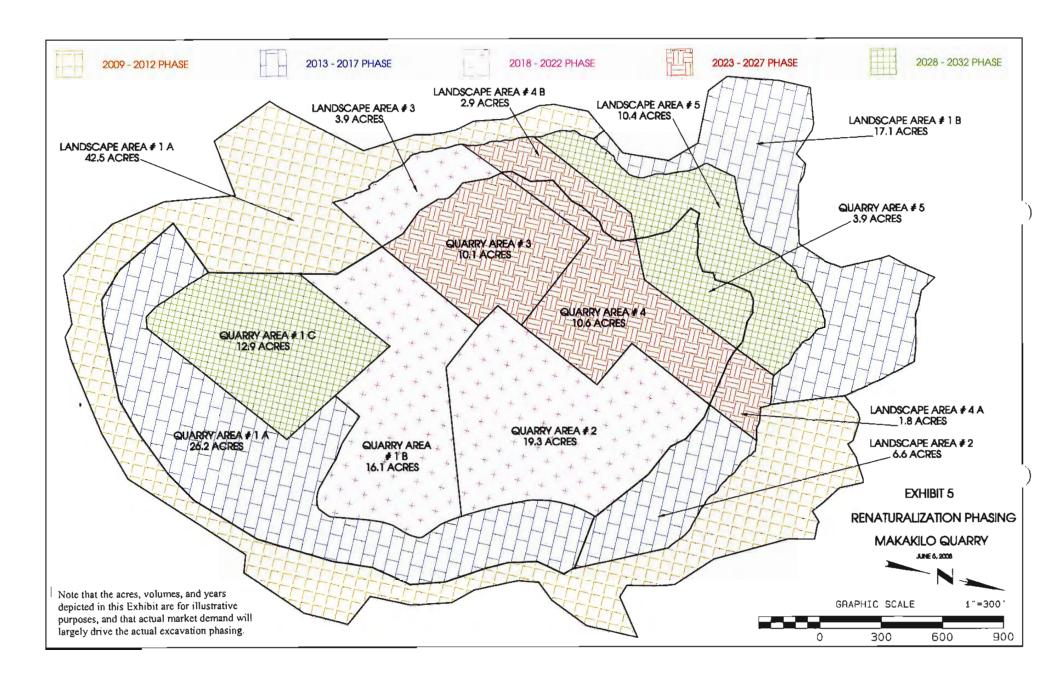
Attachments

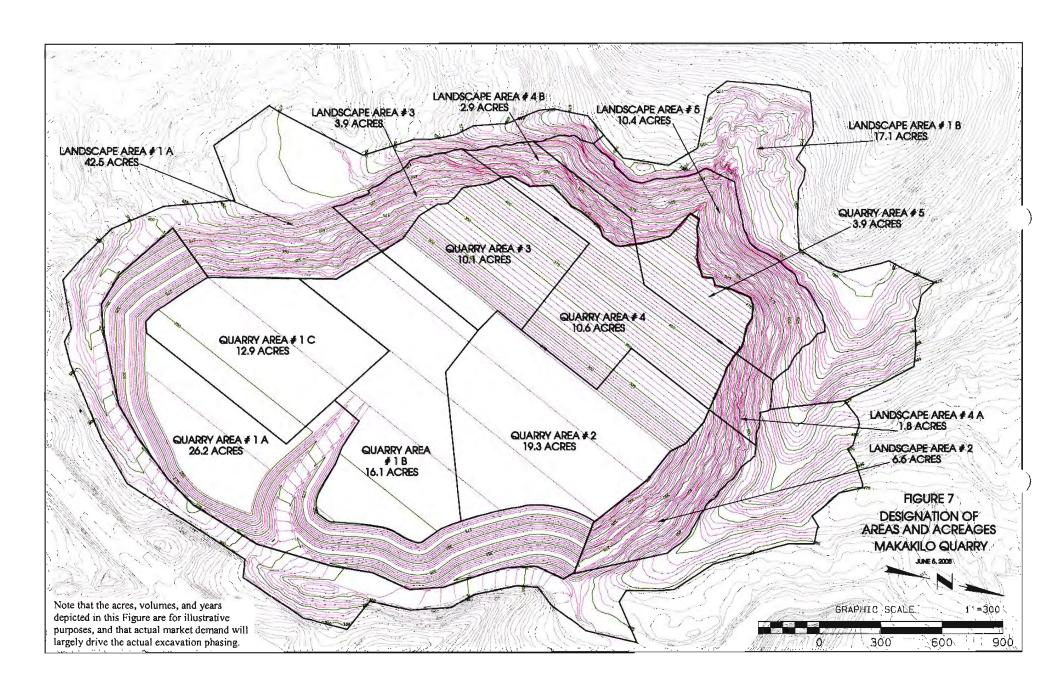
cc: Bob Creps





							Excavat	ion Plan i	n 000's of Cul	oic Yards								total
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	fill								-		(266)	(1)					(266)	(266
2018-2022	cut					3,093			3,093				793				793	3,885
2023-2027	cut						3,305		3,305					261	560		822	4,127
2028-2032	cut							1,114	1,114							1,243	1,243	2,357
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2023-2027						10.1	10.6		20.7			1		1.8	2.9		4.7	25.4
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APPENDICES

Appendix A - Restoration Grading Plan Recommendations
Agra Earth & Environmental (from July 1998 Engineering Report)

Appendix B - Grading Figures, Plans and Sections	
Map of 100 Year Rainfall, Oahu, Hawaii	Figure 1
Existing Drainage	Figure 2
Developed Drainage	Figure 3
Overall Site Plan (Closure Grading Plan)	Figure 4
Closure Grading Plan with Index	Figure 5a
Cross Sections AA through II	Figures 5b1 - b9
Slope Ratio to Percentage	Figure 5c
Planting Slope Index	Figure 5d
Aerial Photo with Planting Slope Index	Figure 5e
Planting Slope Cross Sections AA through HH	Figure 5f
Landform Profile - Castle Junction Landslide Mitigation	Figure 5g
Illustration of Final Grading - East Kapolei Reservoir	Figure 5h
Excavation and Landscape Phasing,	Figure 6
Designation of Areas and Acreages	figure 7

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Appendix C - Storm Drainage Calculations

- C-1 Existing Runoff and Rainfall Storage Calculations
- C-2 Developed Runoff and Rainfall Storage Calculations
- C-3 Berm Surface Water Calculations
- C-4 Storage-Elevation Tables

Appendix D - Not Used

Appendix E - Revised Mitigation/Revegetation Plan

Existing Vegetation	Exhibit 1
Location of View Planes	Exhibit 2-0
Viewplane Exhibits	Exhibits 2-1 - 2-9
Recommended Plant Palette	Exhibit 3
Renaturalization Matrix	Exhibit 4
Renaturalization Phasing	Exhibit 5

Appendix F - Not Used

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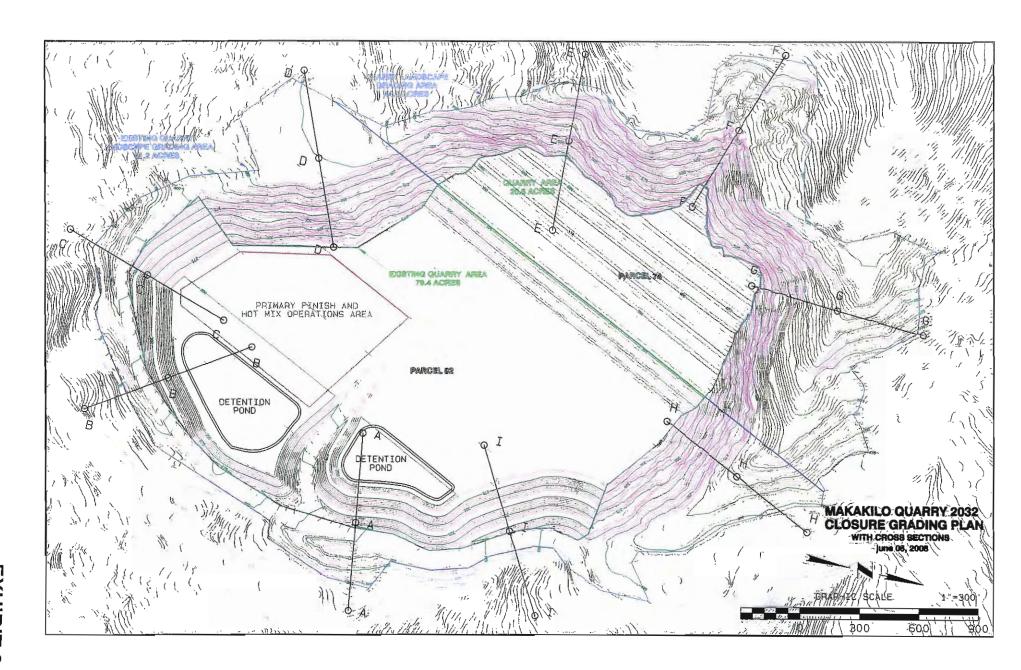
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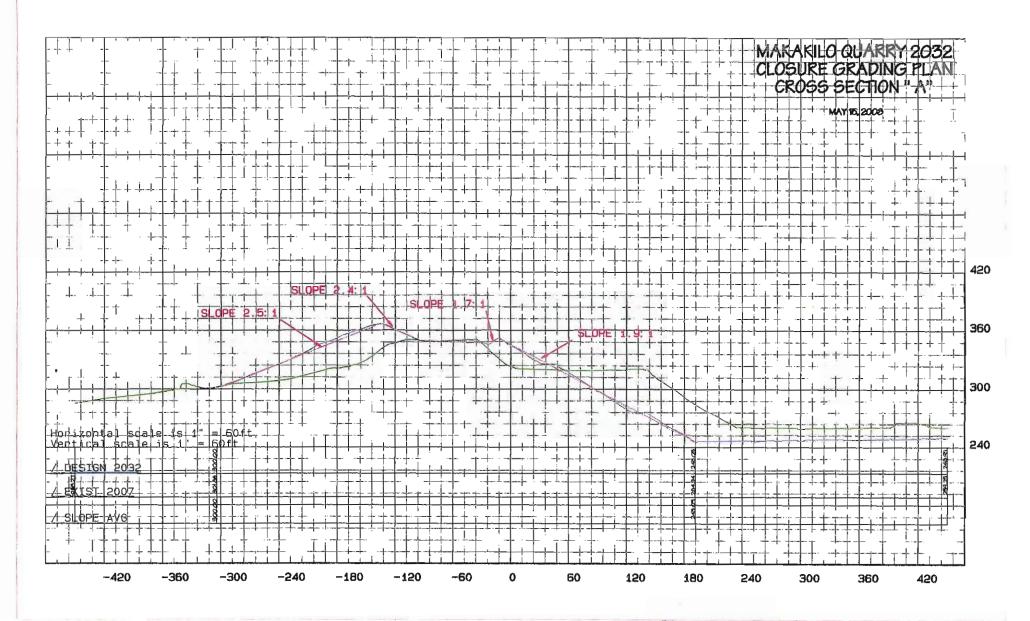


Figure 5b (part 1 of 9)

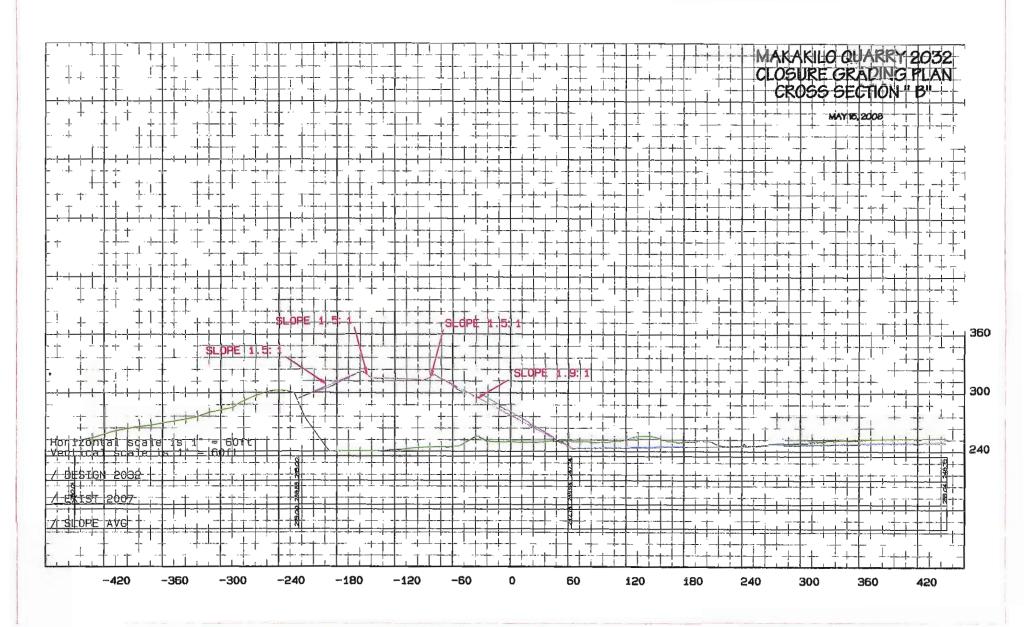


Figure 5b (part 2 of 9)

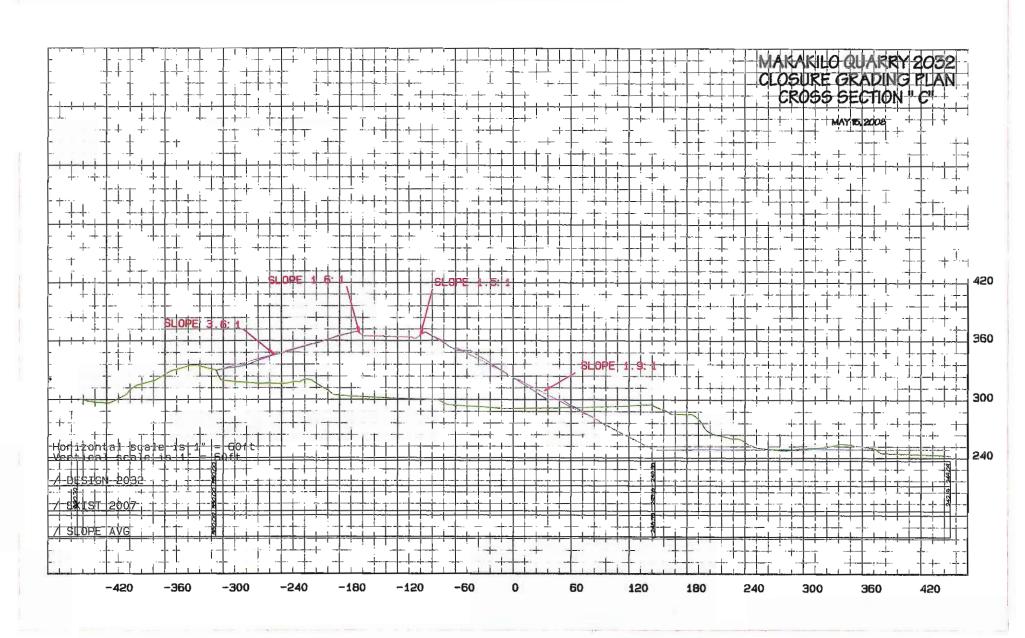
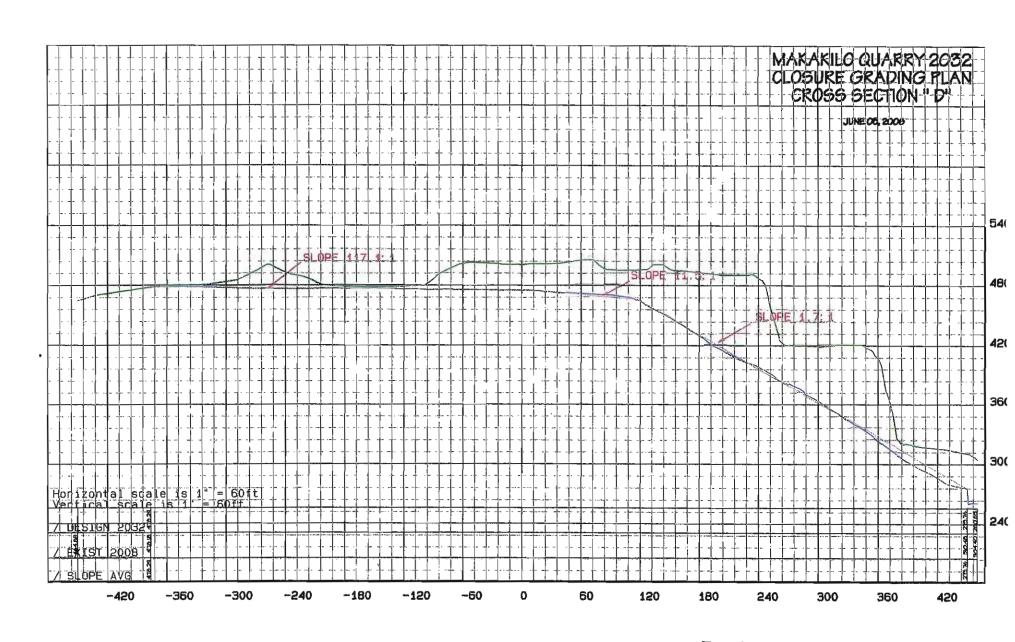


Figure 5b (part 3 of 9)



Revised Figure 5b (part 4 of 9)

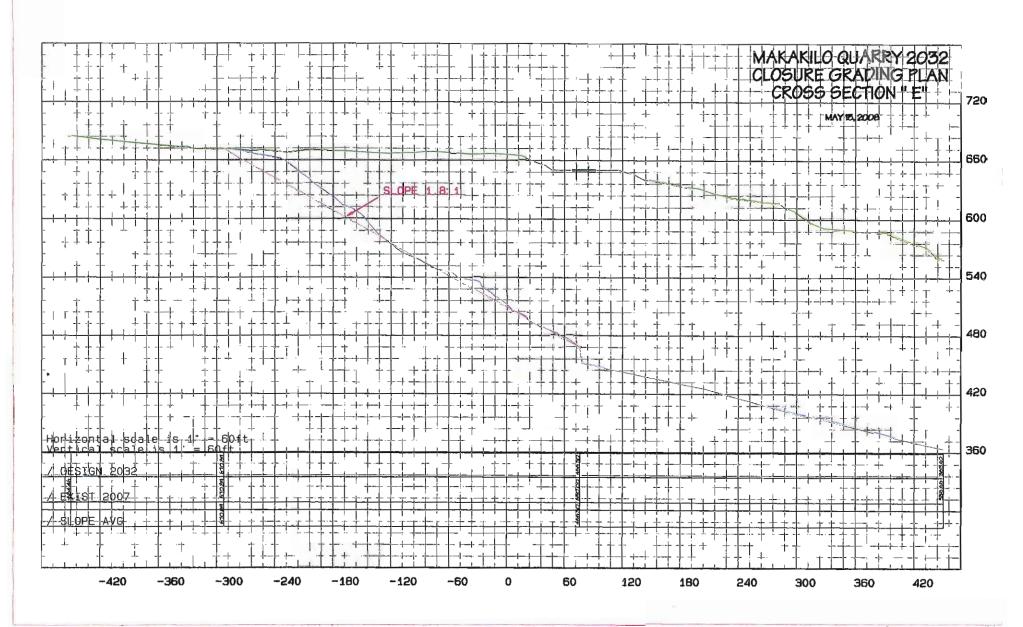


Figure 5b (part 5 of 9)

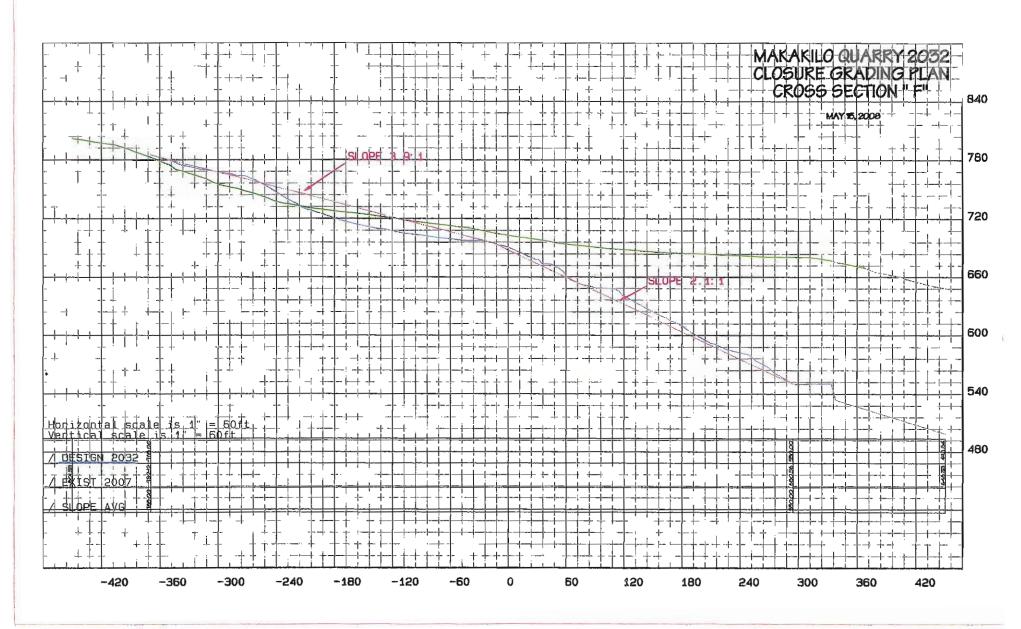


Figure 5b (part 6 of 9)

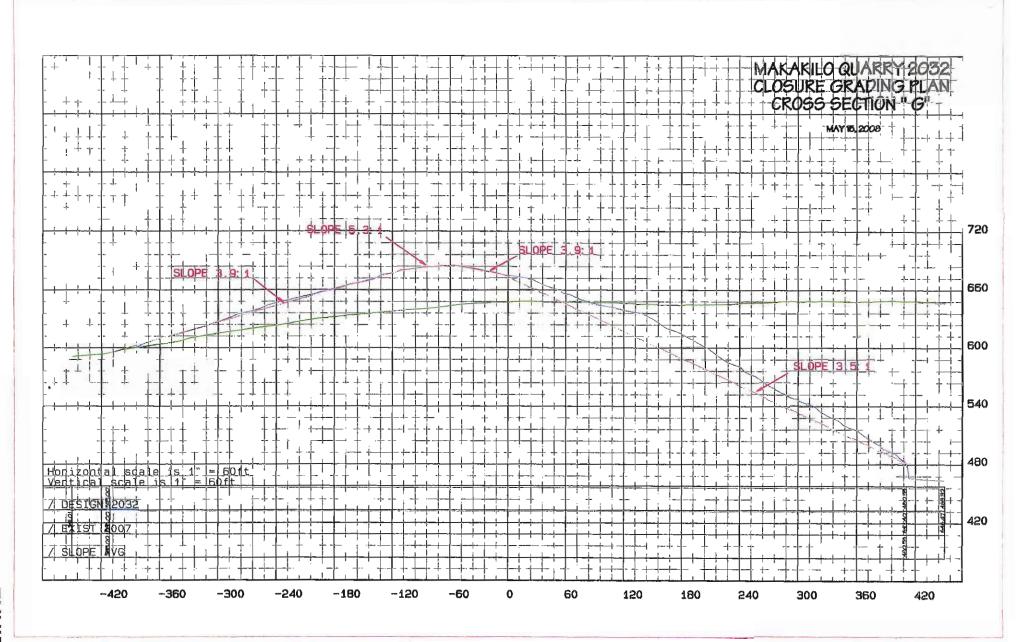
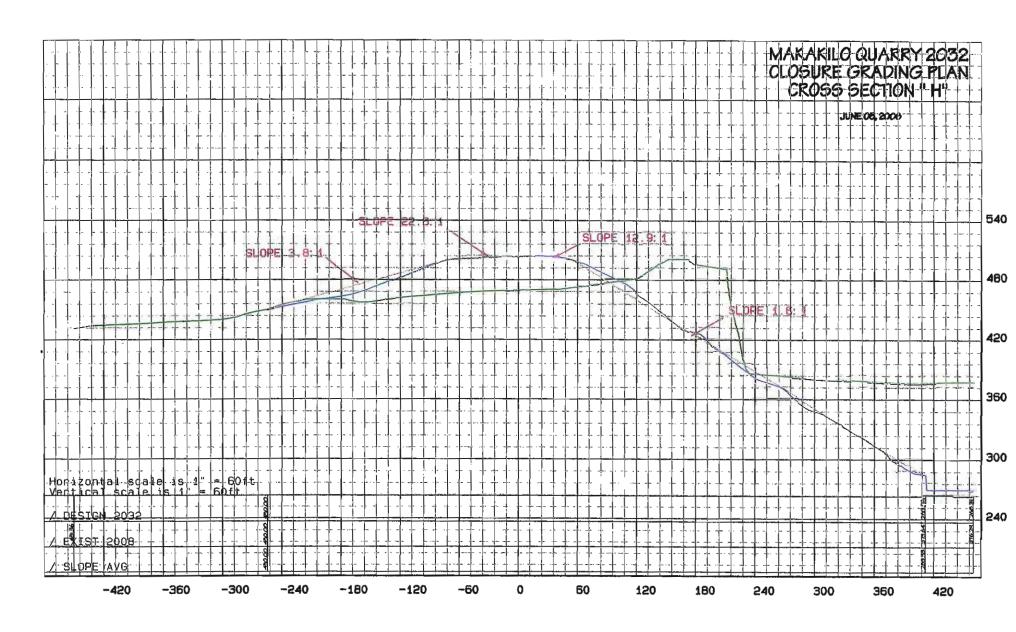


Figure 5b (part 7 of 9)



Revised Figure 5b (part 8 of 9)

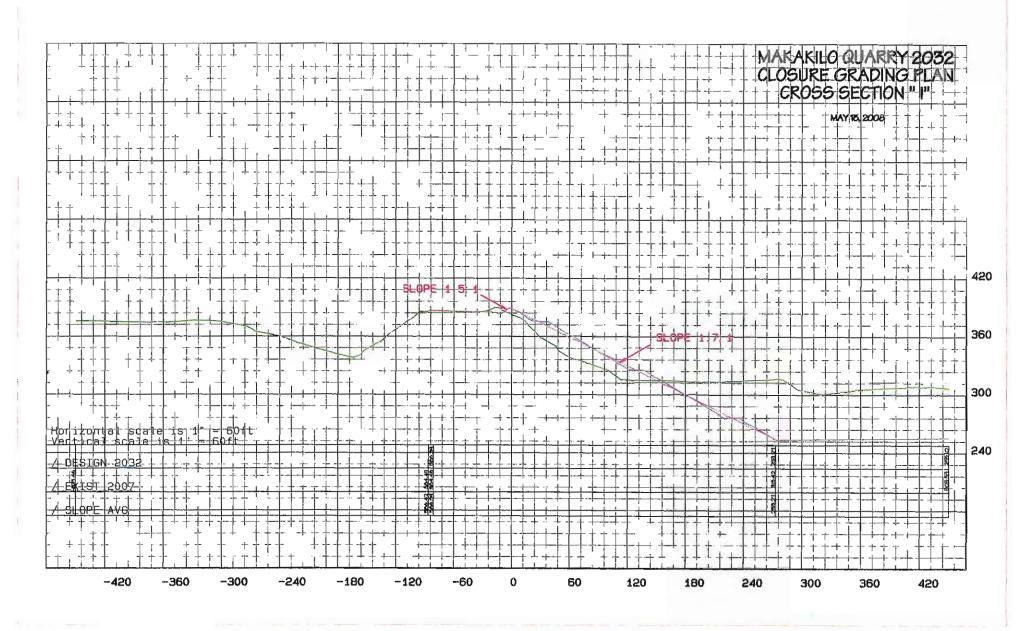
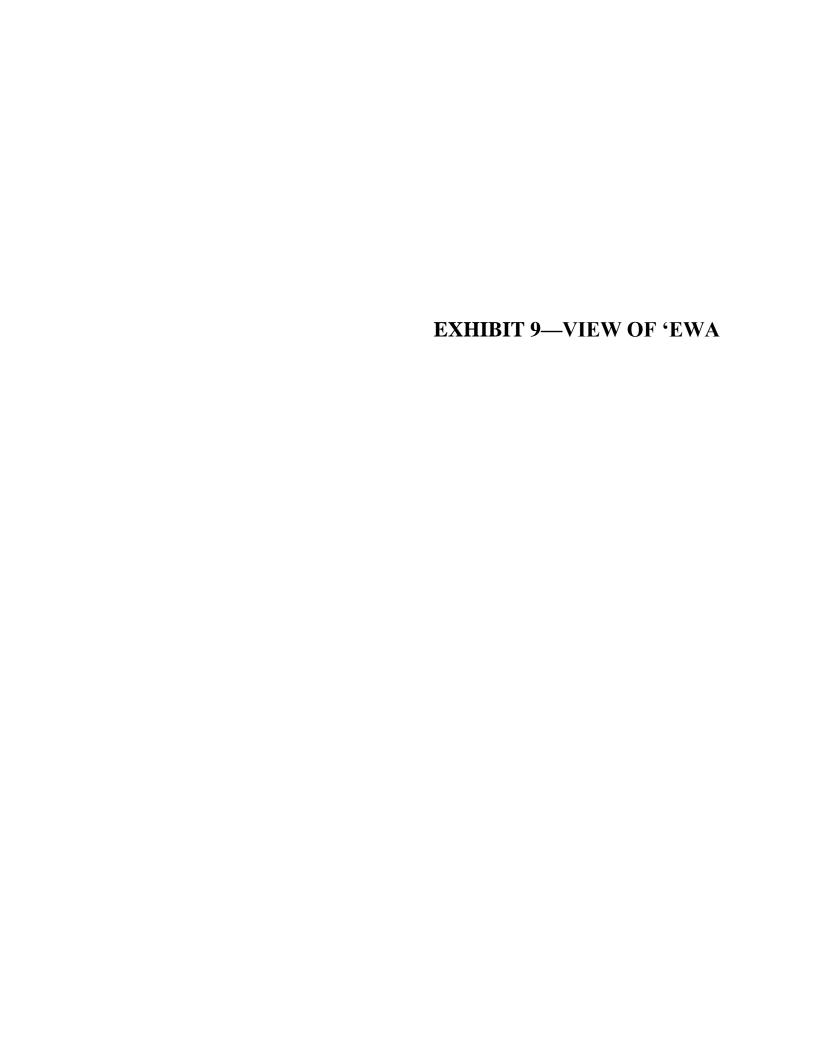


Figure 5b (part 9 of 9)





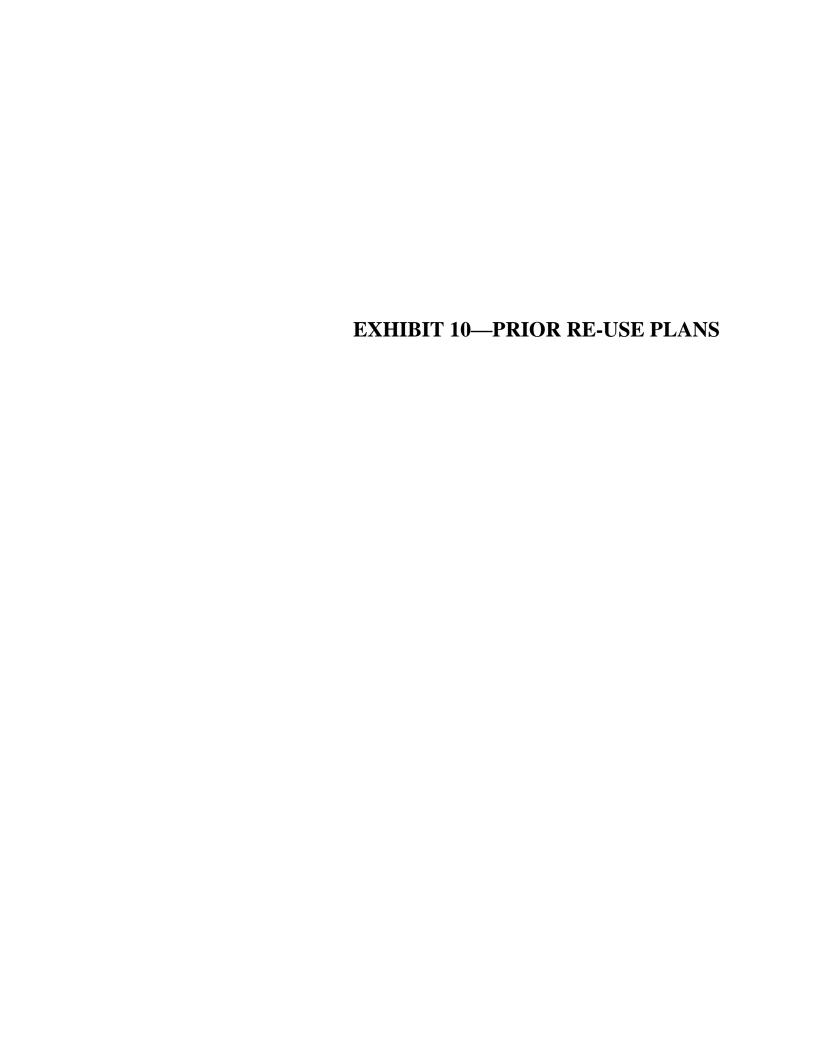
Existing 2008 Revised August 18, 2008 Exhibit 2-8-A

View From Ewa Golf Course



Finish 2032 Revised August 18, 2008 Exhibit 2-8-B

View From Ewa Golf Course



Grace Pacific LLC **EXHIBIT 7**

Makakilo Quarry Beneficial Re-use Plan November 11, 2013

Prior Re-use Plans

A review of prior re-use plans is helpful in assessing the current plan. The following is a listing of relevant documents that address the end-use of the upper quarry:

Special Permit SP73-147,

LUC Staff Memo dated March 23, 1973

Area 2 – Rock Quarrying and Allied Operations

"The petitioner states that the area "will have been leveled to a predetermined plan for residential construction in concert with the City's detailed land use map" and that site preparation costs will be nil since all final quarry grades are designed for home and school buildings.

Maps submitted by the petitioner show that the completion of the quarrying operation will result in a series of 4 benches which are proposed for single family residential use. The lowest bench abutting the H-1 is proposed for a school and park site. The elevation ranges from about 250 feet at the lowest level to 365 feet at the uppermost level, with a 30 to 45 feet differences between levels. A 56 foot access road is shown leading to Makakilo City and in the direction of Palehua Road."

County Recommendation

Condition No. 2

"2. The applicant shall prepare and submit to the Planning Director for his review and approval a revised grading plan for the quarry area."

(Notes to County Recommendation)

"Condition #2 was included as a result of the City Planning Director's concern over the final configuration of the site after quarrying operations have been completed. He felt that other alternatives should be considered which would 'maximize the potential for residential development that would be consistent with the surrounding natural areas' In short, it was felt that the concept of a large flat area near the freeway with narrow, upper benches does not allow for flexibility in residential design."

City Council Resolution No. 95 approving Conditional Use Permit 72/CUP-15

Condition No. 2

"2. The applicant shall prepare and submit to the Planning Directors for his review and approval a revised grading plan for the quarry area."

Approval of Condition No. 2 of Resolution No. 95

<u>Letter dated October 19, 1998</u>, Jan Sullivan, Director of Planning and Permitting to Robert Creps, Grace Pacific:

"We have reviewed the engineering report and grading plans prepared by Parametrix Inc. dated July 1998, and determined that they meet Condition 2 of resolution No. 95.

As previously discussed, upon satisfaction of Condition 2, Grace Pacific intended to establish a landfill operation at the above site. However, we understand that plans have changed and land use permits to allow the landfill operation will not be forthcoming. Nevertheless, your efforts to comply with the conditions of Resolution No. 95 are appreciated."

Parametrix Engineering Report dated July 1998 (excerpts from)

- "1.1 Purpose. This Makakilo Quarry Engineering Report is to assist Grace Pacific Corporation obtain City approval of the final grading plan, as directed by the Conditional Use Permit No. 72/CUP-15 and Resolution No. 95."
- "2.1 Grading. The attached grading plan (Appendix B) shows the final grades prior to reclamation of the quarry. The plan is to maximize quarry operations within the tract of land and then restore the land in a manner suitable for residential or commercial development.

The front of the quarry, which consists of retained rock and constructed berms, parallels the H-1 highway. This buffer will remain undisturbed and will provide a noise and sight barrier from the highway. The quarry sides and back will utilize staggered benches which will help provide a better visual effect yet maximize quarry operations. The pit floor will generally slope from the back and sides to the front at an approximately 2 percent grade.

Restoration grading recommendations prepared by a geotechnical engineer are attached as Appendix A. Several key methods are recommended to provide an adequate foundation for access roads, residential and lightly loaded commercial development."

- "2.2 Alternate Floor Reclamation If future utilization plans change from residential or commercial development to a park setting or open space use, the quarry can be indirectly reclaimed to increase infiltration. After the quarry has been shaped to match the grading plan, the pit floor can be regarded to provide a rough, irregular surface. This method will increase water infiltration and slow erosion by keying the replaced soil into the substrate. This can be achieved by either blasting or ripping the pit floor."
- "2.3 Bench Reclamation Typically, the benches are 24 feet wide by 36 feet high and will be sloped toward the highwall to help trap moisture and soil. Topsoil will be placed on the benches and planted. However, since the quarry is located in an arid area, the linear features of the benches will probably no be obscured by significant vegetation. Therefore, other methods may be necessary to break up some of the linear features including post-production blasting to form staggered benches. Strategic blasting can create chutes, spurs, and rough vertical cliff faces can be created. The desired effect depends on the rock type, structural geology and blasting agent from a choice of blasting patterns, delays and stemming depths. The appropriate methods will be chosen when final quarry grades are achieved and rock faces can be evaluated.

The quarry reclamation will use a combination of vegetative benches along with staggered benches to create a more natural appearance. Appendix E present the current vegetation plan for screening and restoration of the quarry."

"4.1 Revegetation Plan – Introduction Successful revegetation of a quarry in an arid area depends in adequate soil depth, placement and presence of organic matter, proper plant selection;

appropriate timing of planting; adequate fertilization; and irrigation. Revegetation of the quarry is important because of the following:

Reduces erosion

Reduces stormwater run-off

Provides habitat

Reduces visual and noise impacts

Increase the value of the property

However, even in the best of conditions, plant growth can not be guaranteed immediately after mining and it may take several seasons to establish widespread healthy vegetation."

4.2 Strategies Generally, appropriately selected native plants species cost less, require less labor, and more readily survive on natural precipitation than no-native plants. In addition, native plants often out-compete introduced species over time and offer a preferable natural view with the surroundings. Also, phased or segmented closures are a beneficial method for determining which species will be successful. Those areas in which plants fail to establish or plants requiring intensive labor, can be replanted with more appropriate vegetation. This method proves to be cost effective since it is cheaper to re-establish a segment as opposed to the entire quarry.

Conceptual landscape schemes, recommendations, and specifications prepared by a landscape architect are attached in Appendix E."

Belt Collins Engineering Report dated March 2004 (excerpts from)

1.1 Purpose This is an amendment to Makakilo Quarry Conditional Permit No. 72/Cup-15 Engineering Report prepared by Parametrix, Inc. in July 1998, hereafter referred to as the "Original Report". The Original Report was approved by the City and County of Honolulu Department of Planning and Permitting on October 19, 1998.

<u>Section 2, Grading Plan</u>, was revised to incorporate visual mitigation measures to enhance the natural look of the quarry from offsite locations.

<u>Section 4, Revegetation Plan</u>, is revised to incorporate additional revegetation and visual mitigation measures. A new Revegetation/Mitigation Plan prepared by Belt Collins Hawaii in August 2003 replaces Appendix E of the Original Report.

<u>2.1 Grading</u> The attached revised grading plan (Appendix B) shows the final grades prior to reclamation of the quarry in the year 2017. The plan maximizes quarry operations while minimizing the visual and environmental impacts to the surrounding areas.

Most of the design criteria are from the approved grading plan of Original Report. For instance, the basin floor is still graded at 2%, the same offsite drainage area enters the quarry, and the same drainage area is directed around the site. There are, however, some differences. Namely, there are now three drain basins, instead of the one proposed in the Original Report. These basins were designed such that storm events up to a 100-year storm intensity will be completely retained within the quarry. A more detailed explanation of the site drainage is provided in the next section, Drainage Plan.

The following is a description of the grading plan highlighting the similarities and differences with the original grading plan. The grading plan summary starts with the east side of the property and continues clockwise around the rim of the basin, and ending with the quarry floor.

- 2.1.1 East (Makai) Rim The front of the quarry parallels the H-1 Freeway. Screening is presently provided by a row of banyan trees at the 275-foot elevation. An additional feature proposed with this grading plan raises the berm to 310 feet to provide a noise and sight barrier from the freeway. The foot on the east side of the berm ties into the existing 225-foot elevation where there is a gully between the berm and the H-1 Freeway. This gully discharges runoff into multiple concrete pipe culverts, which convey storm water under the freeway. The roadway of the H-1 Freeway is between 245 and 250-foot elevation along the quarry property. The difference of 60 to 65 feet between the roadway elevation and the raised berm will ensure that any equipment in the quarry will remain unseen.
- 2.1.2 Southwest Rim The limits of grading shall be restricted to within the hedge/tree row along the south property line. The existing vegetation is growing on a naturally formed berm and provides a barrier for unwanted off-site runoff. An exception to this rule is the last 300 feet along the access road at the SW property comer near the entrance of the proposed storage bunker. This area already has positive drainage away from the site, so the vegetation is not needed to deflect any runoff.

Adjacent to this tree preservation area will be a 40-foot wide roadway generally graded to a slope of 12 to 15%. From the edge of the road a 2:1 slope is necessary to maximize success in renaturalizing this face, which is presently visible from the approach to Kapolei on the H-1 Freeway. There will also be two benches at the foot of this 2:1 face; one at elevation 350 and the other at elevation 300. Each will have a vehicle access road connecting to the 40' road at the southernmost ends.

2.1.3 Northwest (Mauka) Rim The 310-foot long hedge/tree row outside of the northwest property comer boundary shall also be preserved just as the row on the southwest side was. This hedgerow is located just uphill of the proposed storage bunker facility and 25' wide access road. The preservation of this hedge/tree row is essential in diverting off-site runoff.

The 25-foot access road will run along the northwest property line. In the midpoint along the side it will meander offsite for about 200-linear feet to circumvent a natural channel, which drops approximately 150 vertical feet into the quarry. The last 500-feet of the access road at the north property comer shall be sloped away from the quarry and toward the high side at a cross-slope of 5%.

As proposed with the original grading plan, the quarry will utilize staggered benches which will help provide a better visual effect yet maximize quarry operations. The grading plan shows benches uniform in height and widths. Actual heights and widths will vary depending upon the material encountered. Varying dimensions will also minimize the engineered appearance and help create a more natural-looking hillside.

2.1.4 Northeast Rim The northeast rim will have benches and two access roads. The access road along the property line should also slope away from the quarry to direct offsite runoff. The lower access road, which leads to the quarry floor, should also slope toward the higher benches and away from the center of the quarry. This is provided simply for the additional safety of the vehicles traversing down the 10% slope. Both of these roads will have a cross slope of 4%.

The existing quarry entrance at Old Cane Haul Road, about midpoint along this side will continue to be used.

2.1.5 Quarry Floor As per the original grading plan, the pit floor will generally slope from the back and sides to the front at an approximately 2% grade. For the Quarry Floor, a tolerance of plus or minus two feet is considered acceptable as long as there is positive drainage toward the retention basins.

An additional measure proposed with this Amendment is the construction of an energy dissipation basin. The basin is to be located on the quarry floor at the midpoint of the northwest rim. An

area 90 feet by 120 feet should be excavated to a depth of 10 feet below the quarry floor. This basin will reduce the erosive velocities of the incoming offsite runoff.

The lowest area of the quarry floor shall be developed with three drainage basins. The drain basins will have bottom elevations of 240-feet with 2: 1 side slopes and top of berm elevation of 245 feet. Above the elevation of245, the available storage is combined between the three basins. The top of the berm surrounding the existing 96" culvert shall be at elevation 255-feet.

- 2.3 Bench Reclamation Typically, the benches are 25 feet wide and 50 feet high with the horizontal surfaces being flat. To mitigate the engineered appearance of these faces, a series of random benches of various heights and lengths will created to vary the appearance of the sides of the quarry providing a more natural appearance than straight benches and slopes. A technique termed "restoration blasting" will be used to create gullies and talus slopes on the quarry faces. Topsoil will be placed on the benches and planted.
- 4.1 Revegetation Plan Introduction The Revegetation Plan included in Appendix E of the Original Report was written by Belt Collins and Associates in January 1990. A new Mitigation/Revegetation Plan prepared by Belt Collins Hawaii in August 2003 is incorporated into this Amendment.

The improvements of this Plan over its predecessor are:

- 1) the existing gullies of Puu Makakilo along the H-1 freeway will not be excavated to the elevation of the freeway, which would expose the quarry operations to passing traffic;
- 2) the height of the existing berm along the H-1 Freeway will be increased by 35 feet and be re-naturalized for screening purposes; and
- 3) the western comer of the quarry will be sculpted with a 2:1 slope above the 350 foot elevation and re-naturalized to enhance the view on the H-1 approach to Kapolei.

The revised Mitigation/Revegetation Plan lists specific measures to:

- 1) Minimize or eliminate the visual recognition of the quarry from off-site locations.
- 2) Screen the guarry machinery and equipment from public view.
- 3) Minimize (and essentially eliminate) the long-term use of irrigation water.
- 4) Minimize long-term maintenance in the re-naturalized areas.
- 5) Avoid an "engineered appearance" to the completed project.
- 6) Quickly establish a re-naturalized appearance.
- 7) Protect existing vegetation surrounding the site from quarry activities.
- 8) Minimize costs associated with the re-naturalization efforts.
- <u>4.2 Strategies</u> Generally the revegetation recommendations stated in the Original Report are still valid and are still included in this Amendment. For example, it is emphasized that native plant species in the surrounding landscape should be used as they will be more apt to survive in the arid climate.

For full description of specific recommendations, see Appendix E Mitigation/Revegetation plan prepared by landscape architects from Belt Collins Hawaii in August 2003.

EXHIBIT 11— SUMMARY OF RESOURCE EXTRACTION TO DATE

Grace Pacific LLC Makakilo Quarry Beneficial Re-use Plan

Calculation of cubic yards to be excavated to achieve elevations of 2032 Closure Grading Plan, as of September 2013 November 1, 2013

NOVEMBER 1, 2013 UPDATE			
AREA AND TOPO DATE COMPARED TO 2032	CUT CUBIC YDS.	FILL CUBIC YDS.	ACREAGE
LANDSCAPE AREA # 1 A 20130904	609,699	601,606	43.1
LANDSCAPE AREA # 1 B 20130904	51,266	290,060	17.0
LANDSCAPE AREA # 2 20130904	602,398	82	6.5
LANDSCAPE AREA # 3 20130904	695,683	=	3.9
LANDSCAPE AREA # 4 A 20130904	256,635	1	1.8
LANDSCAPE AREA # 4 B 20130904	518,343	-	2.8
LANDSCAPE AREA # 5 20130904	1,176,332	110	10.1
QUARRY AREA # 1 A 20130904	672,201	218,394	25.9
QUARRY AREA # 1 B 20130904	368,319	108	15.9
QUARRY AREA # 1 C 20130904	353,970	12,036	12.8
QUARRY AREA # 2 20130904	2,261,080	-	19.1
QUARRY AREA # 3 20130904	2,663,287	-	9.9
QUARRY AREA # 4 20130904	2,679,915	258	10.5
QUARRY AREA # 5 20130904	886,990	-	3.8
REMAINDER TO ACHIEVE 2032 CLOSURE DESIGN	13,796,117.30	1,122,653.30	183.2

Grace Pacific LLC													
Makakilo Quarry													
Beneficial Re-use Plan	1												
November 10, 2013													
14070111301 10, 2013													
NEW AREAS JULY 06	2008				NEW AREAS SEPTEM	1BER 4, 2013				VOLUME REMOVED	2008 TO 2013		
AREA	SQ. FT.	ACREAGE	CUT CU. YDS	FILL CU. YDS.	AREA	SQ. FT.	ACREAGE	CUT CU. YDS	FILL CU. YDS.	AREA	ACREAGE	CUT CU. YDS	FILL CU. YDS.
LANDCCARE # 4.A	4.040.000	12.5	750 220	042.240	LANDSCARE #4 A	4.040.000	42.4	500 500	504.505	LANDCCARE #4.A	0.6	(4.40.5.40)	(244 642)
LANDSCAPE # 1 A	1,849,900	42.5	750,239	913,248	LANDSCAPE # 1 A	1,849,900	43.1	609,699	601,606	LANDSCAPE # 1 A	0.6	(140,540)	(311,642)
LANDSCAPE # 1 B	746,999	17.1	80,961	265,745	LANDSCAPE # 1 B	746,999	17.0	51,266	290,060	LANDSCAPE # 1 B	(0.1)	(29,695)	24,315
LANDSCAPE # 2	285,647	6.6	610,947	512	LANDSCAPE # 2	285,647	6.5	602,398	82	LANDSCAPE # 2	(0.1)	(8,549)	(430)
LANDSCAPE # 3	170,286	3.9	792,495	-	LANDSCAPE # 3	170,286	3.9	695,683	-	LANDSCAPE # 3	(0.0)	(96,812)	-
LANDSCAPE # 4 A	78,875	1.8	261,278	-	LANDSCAPE # 4 A	78,875	1.8	256,635	1	LANDSCAPE # 4 A	(0.0)	(4,643)	1
LANDSCAPE # 4 B	126,625	2.9	560,402	-	LANDSCAPE # 4 B	126,625	2.8	518,343	-	LANDSCAPE # 4 B	(0.1)	(42,059)	-
LANDSCAPE # 5	450,984	10.4	1,243,403	-	LANDSCAPE # 5	450,984	10.1	1,176,332	110	LANDSCAPE # 5	(0.3)	(67,071)	110
SUB TOTALS	3,709,317	85.2	4,299,725	1,179,506	SUB TOTALS	3,709,317	85.2	3,910,356	891,859	SUB TOTALS	0.0	(389,369.1)	(287,646.8)
QUARRY # 1 A	1,139,213	26.2	515,593	385,695	QUARRY # 1 A	1,139,213	25.9	672,201	218,394	QUARRY # 1 A	(0.3)	156,608	(167,301)
QUARRY # 1 B	699,578	16.1	715,600	13,509	QUARRY # 1 B	699,578	15.9	368,319	108	QUARRY # 1 B	(0.2)	(347,281)	(13,401)
QUARRY # 1 C	561,557	12.9	456,959	9,282	QUARRY # 1 C	561,557	12.8	353,970	12,036	QUARRY # 1 C	(0.1)	(102,989)	2,755
QUARRY # 2	838,733	19.3	2,878,091	-	QUARRY # 2	838,733	19.1	2,261,080	-	QUARRY # 2	(0.2)	(617,011)	-
QUARRY # 3	439,624	10.1	3,092,598	-	QUARRY # 3	439,624	9.9	2,663,287	-	QUARRY # 3	(0.2)	(429,311)	-
QUARRY # 4	462,591	10.6	3,305,141	-	QUARRY # 4	462,591	10.5	2,679,915	258	QUARRY # 4	(0.1)	(625,226)	258
QUARRY # 5	169,043	3.9	1,113,840	-	QUARRY # 5	169,043	3.8	886,990	-	QUARRY # 5	(0.1)	(226,850)	-
SUB TOTALS	4,310,340	99.0	12,077,822	408,486	SUB TOTALS	4,310,340	97.9	9,885,762	230,796	SUB TOTALS	(1.1)	(2,192,060.4)	(177,689.8)
TOTALS	8,019,656	184.1	16,377,548	1,587,992	TOTALS	8,019,656	183.1	13,796,118	1,122,655	TOTALS	(1.0)	(2,581,429.5)	(465,336.6)
			14,789,556	NET TOTAL				12,673,463	NET TOTAL			(2,116,092.9)	NET TOTAL

EXHIBIT 12— COMPARISON OF RESOURCE EXTRACTION PROJECTIONS TO ACTUAL DATA

0 0 0 0	1		1																		T	
Grace Pacific LLC																						
Makakilo Quarry																						
Beneficial Re-use Pla	an																					
November 10, 2013																						
																			2008 plan		2013 plan	
							Excavation	on Plan in (000's of Cubic	Yards									total		total	
					q	uarry						land	dscape grad	ding					quarry and	net of	quarry and	net of
		1 A	1 B	1 C	2	3	4	5	totals	1 A	1 B	2	3	4 A	4 B	5	totals		landscape	cut/fill	landscape	cut/fill
year																						
plan																						
2009-2012	cut	516	716	457					1,688	750							750		2,438			
	fill	(386)	(14)	(9)					(409)	(913)							(913)		(1,322)			
actual	I								1,280								(163)			1,117		
2009-2013	cut	(157)	347	103	617	429	625	227	2,192	141	30	9	97	5	42	67	389				2,581	
	fill		(13)	3			0		(178)	(312)	24	(0)		0		0	(288)				(465)	
		, ,	, ,						2,014	,		()					102				, ,	2,116
plan 2008																						_,
2013-2017	cut				2,878				2,878		81	611					692		3,570			
2013 2017	fill				2,070				2,070		(266)	(1)					(266)		(266)			
plan rev 2013	_								2,878		(200)	(1)					426		(200)	3,304		
2014-2017	+	300	368		500	500	500		2,168	300	51	200	318	75	150		1,094			3,304	3,262	
2014 2017	fill		300	(12)	300	300	300		(230)	(602)	(290)	200	310	73	150		(892)				(1,122)	
	- ''''	(210)		(12)					1,938	(002)	(230)						202				(1,122)	2,140
2018-2022	cut					3,093			3,093				793				793		3,885	3,885		2,140
2018-2022 rev 2013		372		354	300	600	600	200	2,426	100		150	234	75	150	500	1,209		3,003	3,003	3,635	3,635
2016-2022 TEV 2013	cut	3/2		334	300	000	000	200	2,420	100		130	254	/5	130	300	1,209				3,033	5,055
2023-2027	out.						3,305		3,305					261	F60		822		4,127	4,127		
	cut				600	002		200		100		150	144		560	400			4,127	4,127	2.464	2.464
2023-2027 rev 2013	cut				600	863	700	300	2,463	100		150	144	57	150	400	1,001				3,464	3,464
2028-2032	cut							1,114	1,114							1,243	1,243		2,357	2,357		
2028-2032 rev 2013					861	700	880	387	2,828	110		102		50	68	276	606		,	,	3,434	3,434
plan 2008		130	702	448	2,878	3,093	3,305	1,114	11,669	(163)	(185)	610	793	261	560	1,243	3,120			14,790	3, .3 .	14,789
p.a 2000		100	,,,		_,0,0	3,033	3,555	-,	11,000	(200)	(200)	010	7.55			1,2 .0	3,220			2.,,,,,		2 .,, 05
plan rev 2013		130	702	448	2,878	3,092	3,305	1,114	11,669	(163)	(185)	610	793	262	560	1,243	3,120					
promise and a		(0)		(0)	(0)		0	0	(0)	0	(0)	(0)		0	(0)	(0)	(0)					
		(0)	(0)	(0)	(0)	(0)	-		(0)		(0)	(0)			(0)	(0)	(0)					
						Fycav	ation Plan	n in Acres -	- Final Elevatio	ns Reached									total			
					a	uarry	acioni i iai	1111710103	Tillal Elevatio	no neucricu		land	dscape grad	ding								
		1 A	1 B	1 C	2	3	4	5	totals	1 A	1 B	2	3	4 A	4 B	5	totals		quarry and I 2008 plan	2013 rev		
year		171	- 10	- 10		3			totais		10			171			totais		2000 plan	2013161		
2009-2012		26	16	13					55	43							43		98			
2009-2013 act		6	14	11					31	13							13		30	44		
2003 2013 400	•	0	17						31	13							- 13					
2013-2017					19				19		17	7					24		43			
2014-2017 rev	,	15	2		8				25	15	7	,					22		45	47		
2014-2017 feV	'	13			0				25	13	,									4/		
2018-2022						10			10				4				4		14			
2018-2022 2018-2022 rev	,	5		2	4	4			15	5	10	3	2	1	1	3			14	39		
2019-2027 LGA	'	5		2	4	4			12	5	10	3		1	1	5	24			39		
2023-2027							11		11					2	2				15			
2023-2027 2023-2027 rev	,				4	2	11		11	5		2	2	2	3	2	5		15	26		
2023-2027 rev	<u>'</u>				4	3	6		13	5		2	2	1	1	3	14			26		
2020 2022	1							A	4							10	10		1.4			
2028-2032					2	2	-	4		-		3		4	4	10	10		14	30		
2028-2032 rev	<u>'</u>				3	3	5	4	15	5		2		1	1	4	13			28		
2008 plan	-	26	16	13	19	10	11	Л	99	43	17	7	Л	2	2	10	85		184			
2008 plan 2013 revision		26	16	13	19		11	4		43	17	7	4		3	10	85		164	184		
ZU13 revision	Ц	20	10	13	19	10	11	4	99	43	1/	/	4		3	10	85			184		

Grace Pacific LLC																					
Makakilo Quarry																					
Beneficial Re-use Plan	1																				
November 10, 2013																					
	Renaturalization Plan in Acres																		total		
		quarry									land	dscape grad	ding					quarry and I	andscape		
		1 A	1 B	1 C	2	3	4	5	totals	1 A	1 B	2	3	4 A	4 B	5	totals		2008 plan	2013 rev	
year																			•		
2009-2012									-	43							43		43		
2009-2013 act									-	13							13			13	
2013-2017		26							26		17	7					24		50		
2014-2017 rev		6							6	15	7						22			28	
2018-2022			16		19				35				4				4		39		
2018-2022 rev		10			4				14	5	10	3	2	1	1	3	24			38	
2023-2027						10	11		21					2	3		5	-	25		
2023-2027 rev		5			4	6	6		21	5		2	2	1	1	3	14			35	
2028-2032				13				4	17							10	10		27		
2028-2032 rev					3	4	5	4	16	5		2		1	1	4	13			29	
2002 2007		_																			
2032-2035 rev		5	16	13	8				42								-			42	
2008 plan		26	16	13	19	10	11	4	99	43	17	7	4	2	3	10	85	╅┼	184		
2008 plan		26	16	13	19	10	11 11	4	99	43	17	7	4	2	3	10	85		104	184	
2013 (EVISIOI)		20	10	13	19	10	11	- 4	33	43	17	,	4	2	3	10	83			104	
						Rei	naturalizat	ion Plan in	000's of gallons	ner day									total		
					aı	uarry			occ o o. gamens	pe. aay		land	dscape grad	ding					quarry and I	andscape	
		1 A	1 B	1 C	2	3	4	5	totals	1 A	1 B	2	3	4 A	4 B	5	totals		2008 plan	2013 rev	
year																					
2009-2012									-	106							106		106		
2009-2013 act									-								-			-	
2013-2017		52							52		34	13					47		99		
2014-2017 rev		16							16	38	18						55			71	
2018-2022			32		39				71				8				8	\Box	79		
2018-2022 rev		20			8				28	10	20	5	4	1	2	6	48			76	
2023-2027						20	21		41					4	6		9		50		
2023-2027 rev		10			8	12	12		42	10		4	4	1	2	6	27			69	
2028-2032				26				8	34							21	21	_	55		
2028-2032 rev					6	8	9	8	31	10		4		1	2	9	26	\vdash		57	
																		\vdash			
2032-2035 rev		10	32	26	17				85								-	\vdash		85	
														_				+			
2008 plan		52	32	26	39	20	21	8	198	106	34	13	8	4	6	21	191	-	389	~- -	
2013 revision		56	32	26	39	20	21	8	201	68	38	13	8	4	6	21	156			358	

EXHIBIT 13— MAKAKILO QUARRY EXCAVATION AND RENATURALIZATION AREAS

