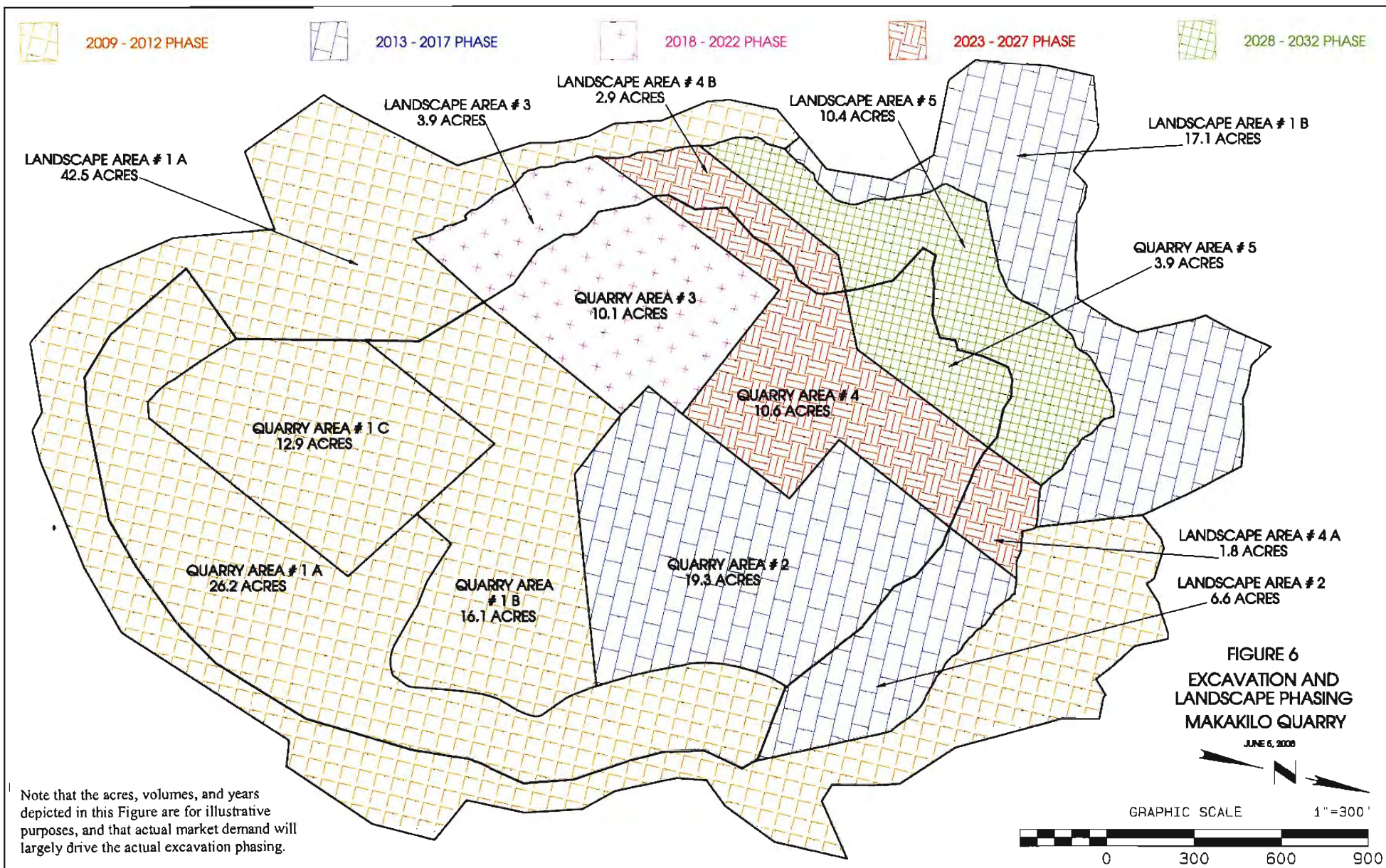


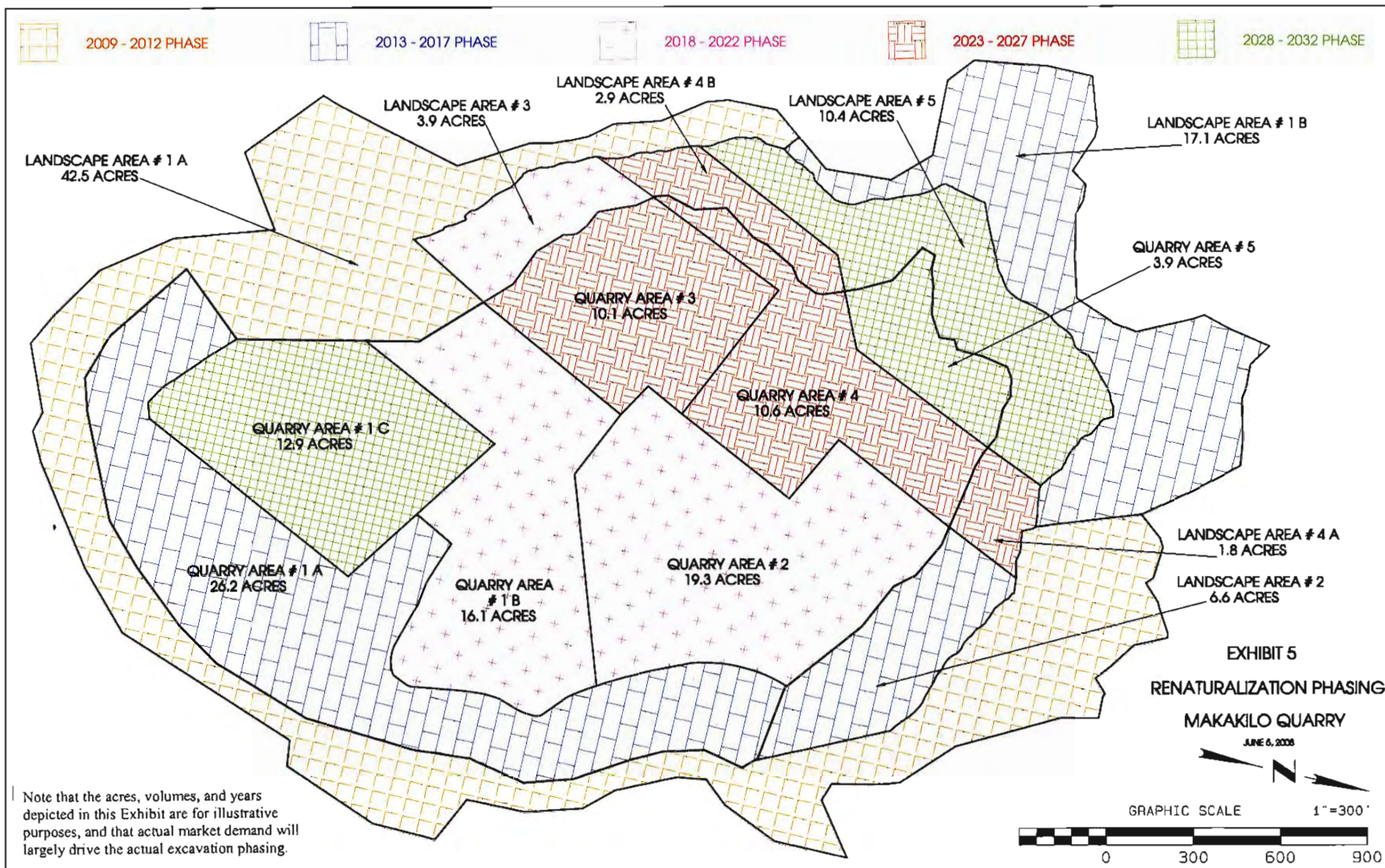


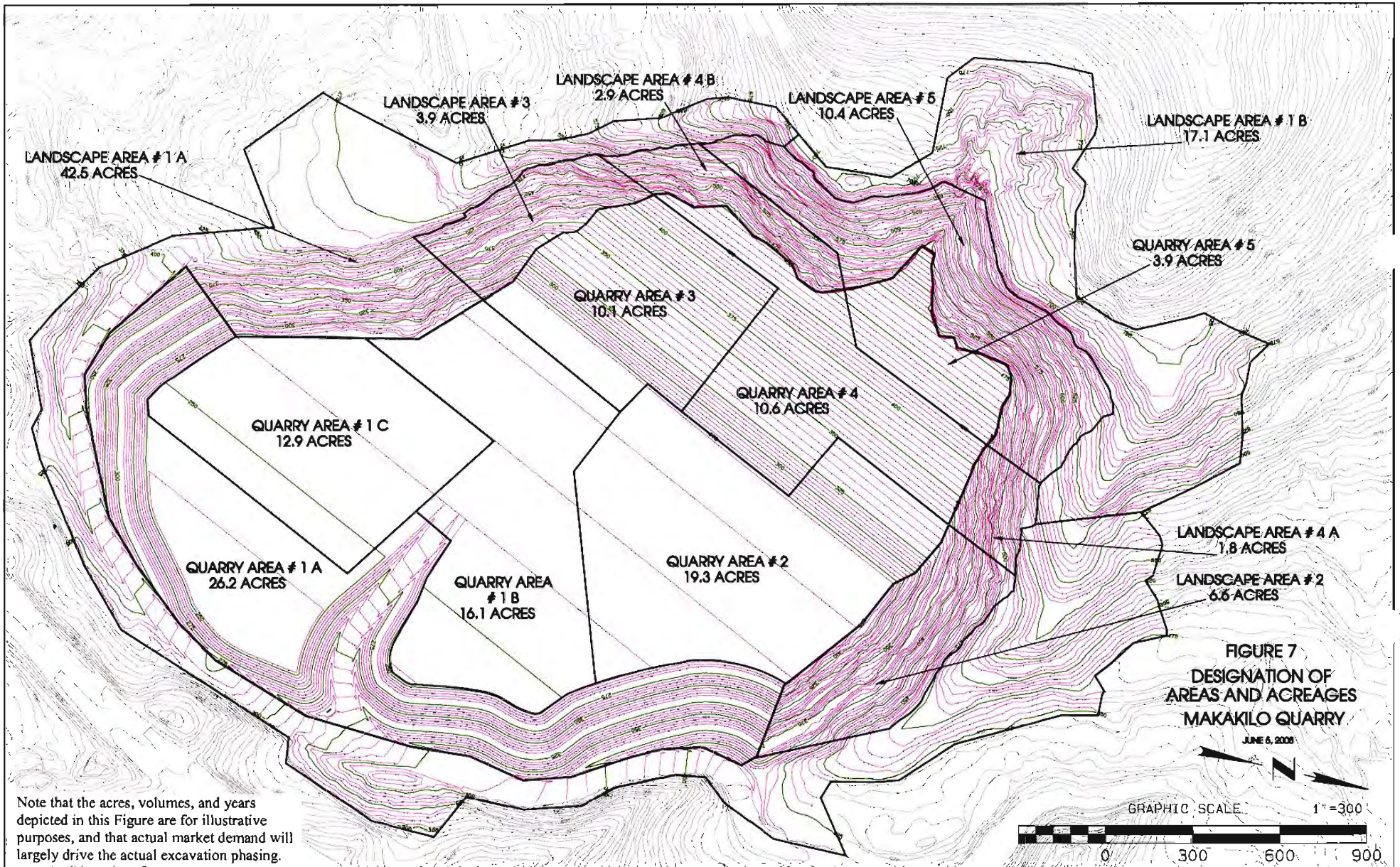
EXHIBIT 8—DPP EXHIBIT 28 CROSS-SECTION



Excavation Plan in 000's of Cubic Yards																		total
		quarry								landscape grading								quarry and landscape
		1 A	1 B	1 C	2	3	4	5	totals		1 A	1 B	2	3	4 A	4 B	5	totals
year																		
2009-2012	cut	516	716	457					1,688		750							750
	fill	(386)	(14)	(9)					(409)		(913)							(913)
2013-2017	cut				2,878				2,878			81	611					692
	fill								-		(266)	(1)						(266)
2018-2022	cut					3,093			3,093					793				793
2023-2027	cut						3,305		3,305						261	560		822
2028-2032	cut							1,114	1,114								1,243	1,243
		130	702	448	2,878	3,093	3,305	1,114	11,669		(163)	(185)	610	793	261	560	1,243	3,120
Excavation Plan in Acres																		total
		quarry								landscape grading								quarry and landscape
		1 A	1 B	1 C	2	3	4	5	totals		1 A	1 B	2	3	4 A	4 B	5	totals
year																		
2009-2012		26.2	16.1	12.9					55.2		42.5							42.5
2013-2017					19.3				19.3		17.1	6.6						23.7
2018-2022						10.1			10.1				3.9					3.9
2023-2027							10.6		10.6					1.8	2.9			4.7
2028-2032								3.9	3.9								10.4	10.4
		26.2	16.1	12.9	21.3	13.1	14.6	8.9	99.1		42.5	17.1	8.6	6.9	1.8	2.9	15.4	85.2
Renaturalization Plan in Acres																		total
		quarry								landscape grading								quarry and landscape
		1 A	1 B	1 C	2	3	4	5	totals		1 A	1 B	2	3	4 A	4 B	5	totals
year																		
2009-2012									-		42.5							42.5
2013-2017		26.2							26.2		17.1	6.6						23.7
2018-2022			16.1		19.3				35.4				3.9					3.9
2023-2027						10.1	10.6		20.7					1.8	2.9			4.7
2028-2032				12.9				3.9	16.8								10.4	10.4
		26.2	16.1	12.9	21.3	13.1	14.6	8.9	99.1		42.5	17.1	8.6	6.9	1.8	2.9	15.4	85.2
Renaturalization Plan in 000's of gallons per day																		total
		quarry								landscape grading								quarry and landscape
		1 A	1 B	1 C	2	3	4	5	totals		1 A	1 B	2	3	4 A	4 B	5	totals
year																		
2009-2012									-		106							106
2013-2017		52							52		34	13						47
2018-2022			32		39				71				8					8
2023-2027						20	21		41					4	6			9
2028-2032				26				8	34								21	21
		52	32	26	41	23	25	13	198		106	34	15	11	4	6	26	191

Note that the acres, volumes, and years depicted in this Exhibit are for illustrative purposes, and that actual market demand will largely drive the actual excavation phasing.





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

Deleted: Map

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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

Deleted: vegetation

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Appendix F - Not Used

APPENDICES

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Renaturalization Phasing	Exhibit 5

Appendix F - Not Used

The map is a topographic representation of the Makakilo Quarry site, showing the proposed closure grading plan for the year 2032. The site is divided into three main parcels: Parcel 12, Parcel 74, and Parcel 75. Parcel 12 is the central area, containing a large 'PRIMARY FINISH AND HOT MIX OPERATIONS AREA' and two 'DETENTION POND's. Parcel 74 is to the east, and Parcel 75 is to the south. The map highlights several 'EXISTING QUARRY AREA's in green, with areas of 20.8 acres and 78.4 acres. A 'QUARRY AREA' of 20.8 acres is also indicated. The map includes contour lines to show elevation and various cross-section lines labeled A through I. A 'GRAPHIC SCALE' bar at the bottom right indicates a scale of 1 inch = 300 feet, with markings for 0, 300, 600, and 900 feet. A north arrow is also present. The map is dated 'June 08, 2008' and is titled 'MAKAKILO QUARRY 2032 CLOSURE GRADING PLAN WITH CROSS SECTIONS'.

EXHIBIT 8A

MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "A"

MAY 16, 2008

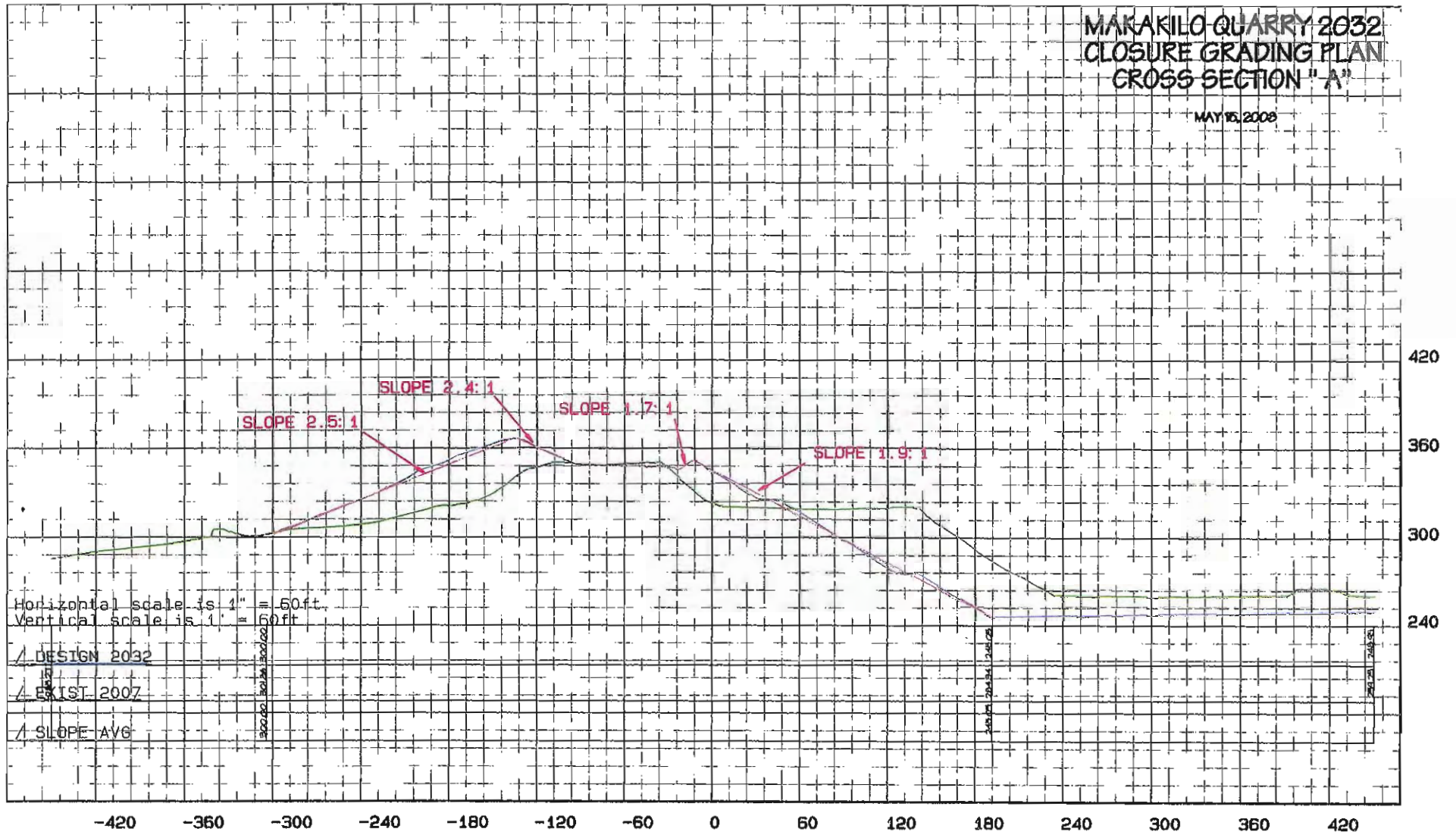


Figure 5b (part 1 of 9)

MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "B"

MAY 10, 2008

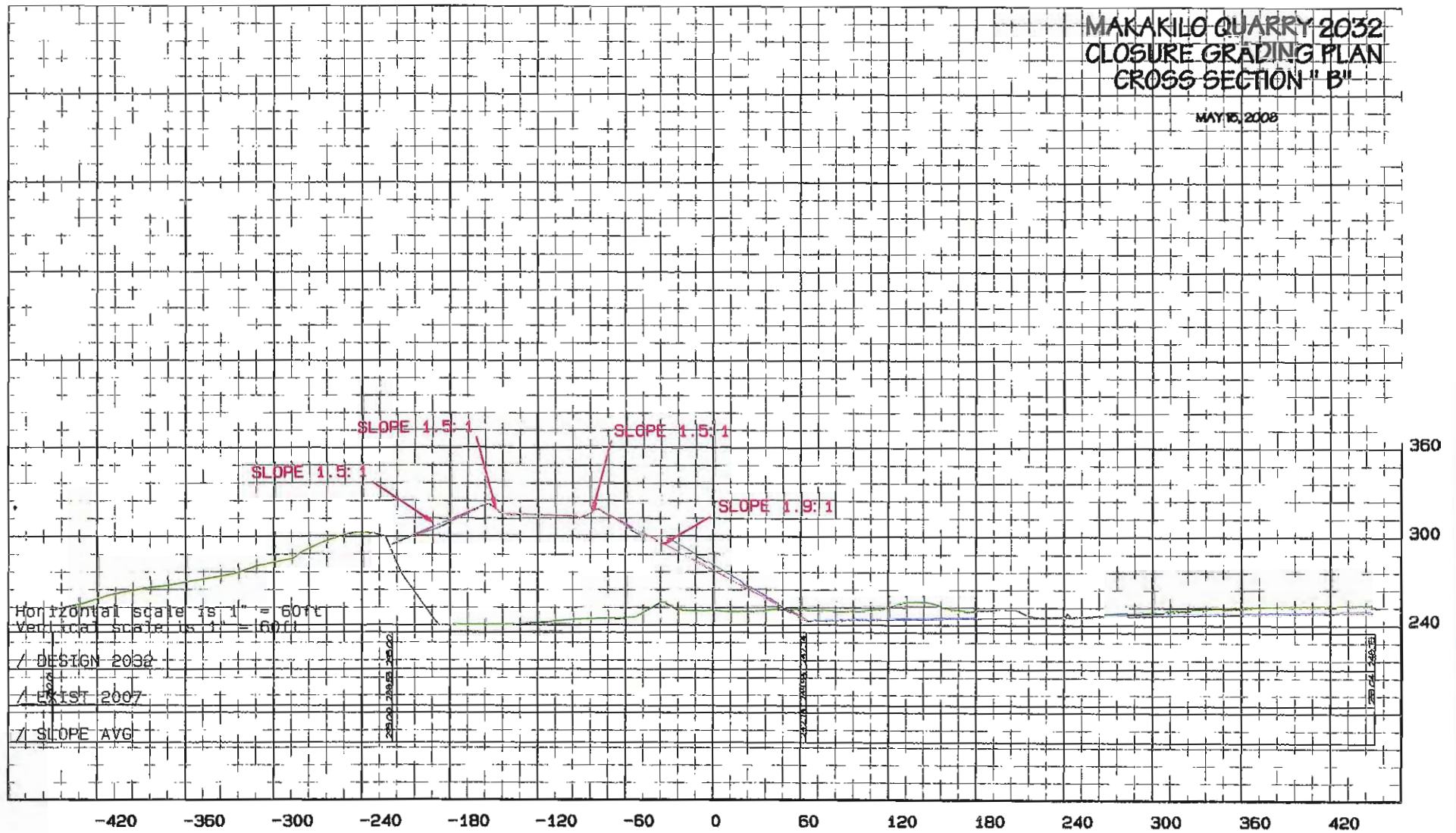


Figure 5b (part 2 of 9)

MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "C"

MAY 15, 2008

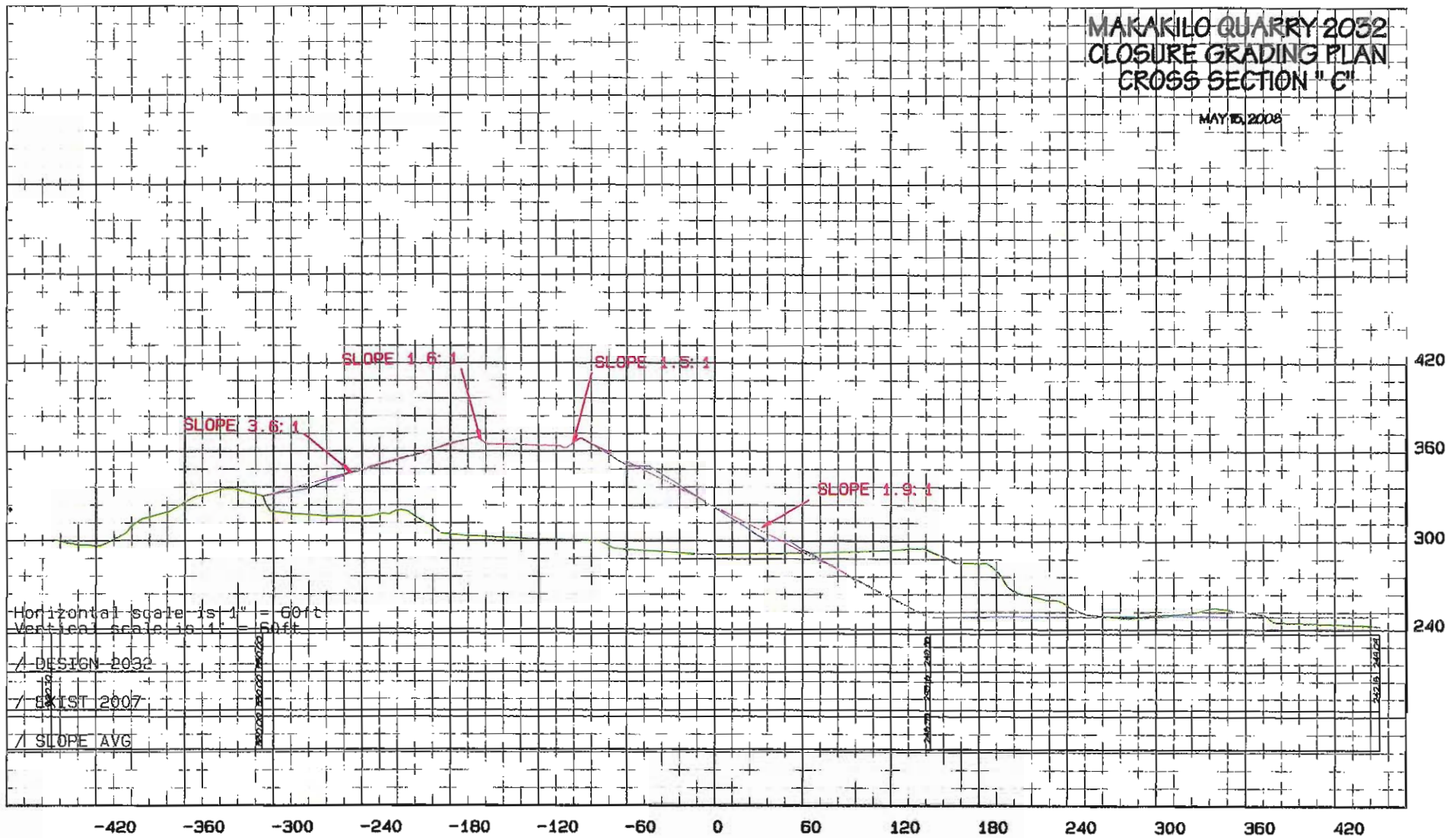
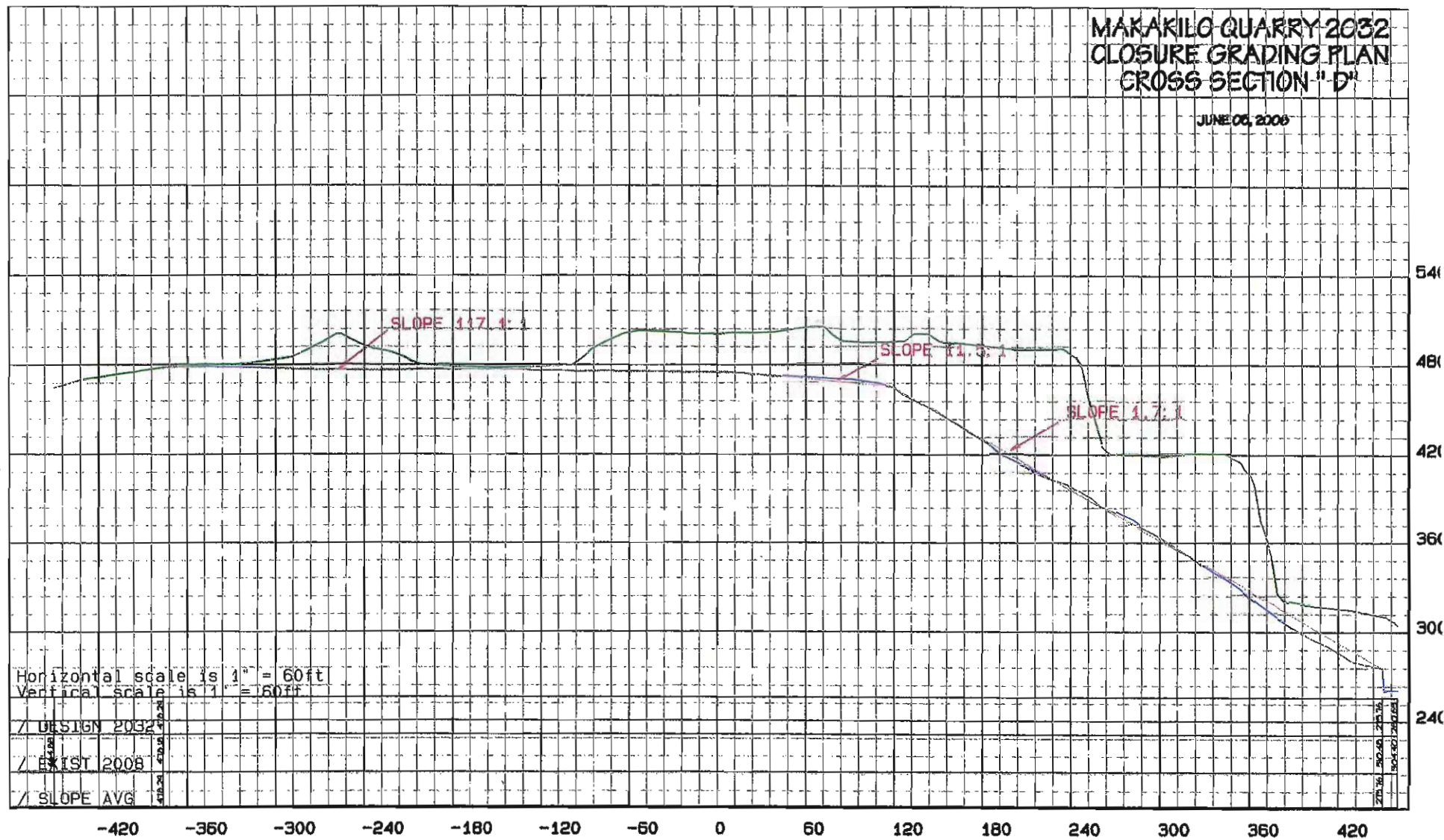


Figure 5b (part 3 of 9)



Revised Figure 5b (part 4 of 9)

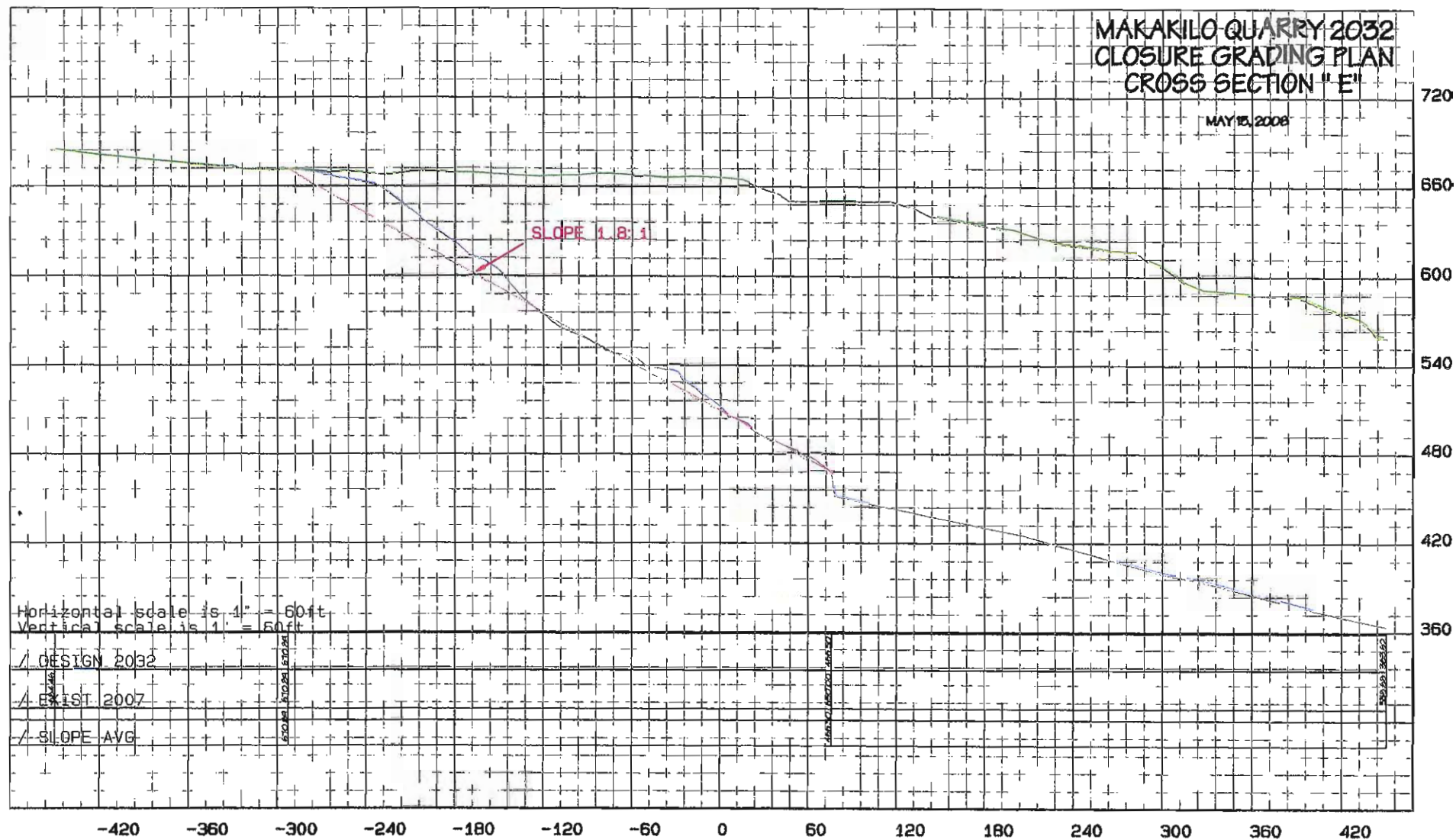


Figure 5b (part 5 of 9)

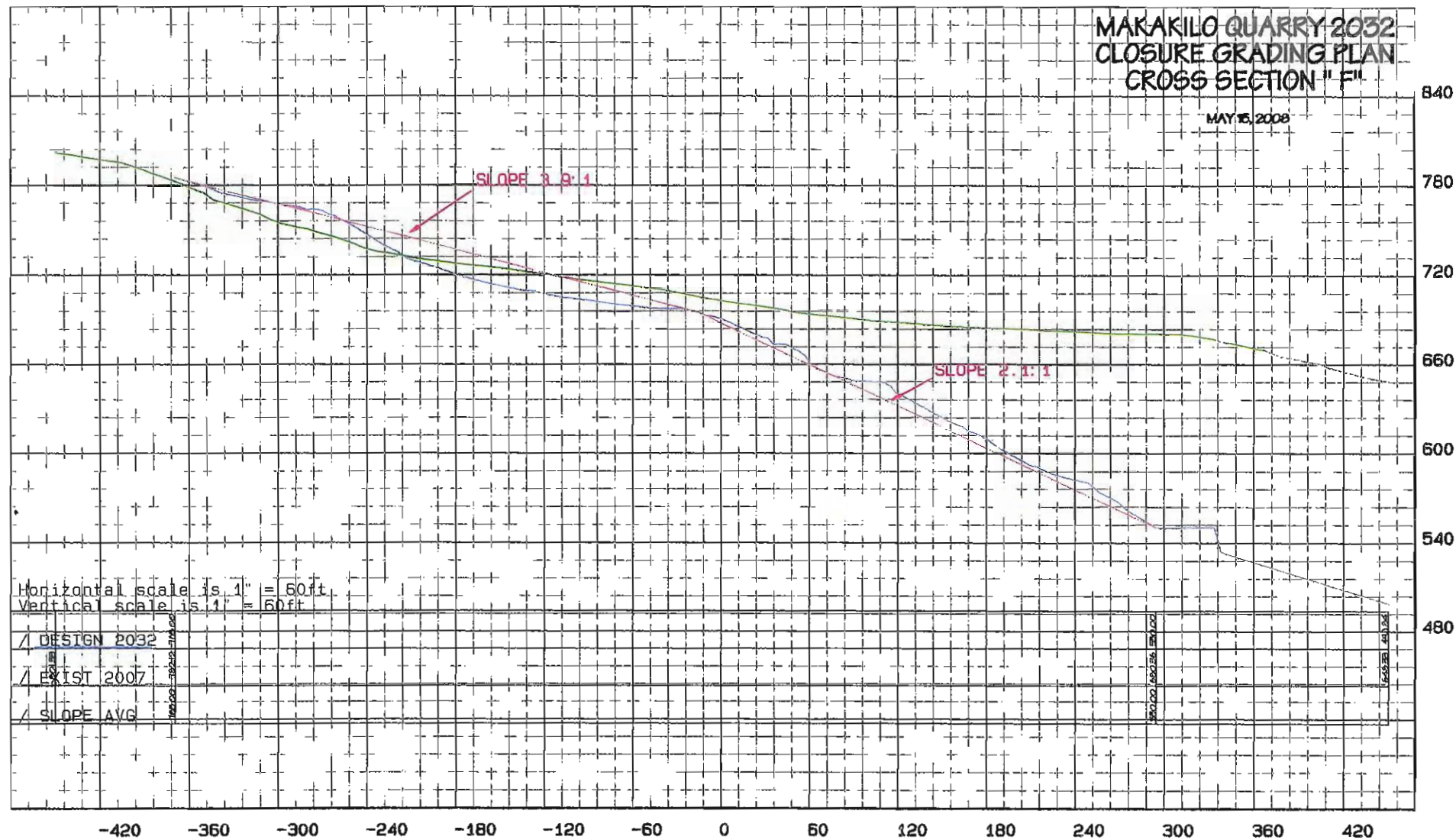


Figure 5b (part 6 of 9)

MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "G"

MAY 15, 2008

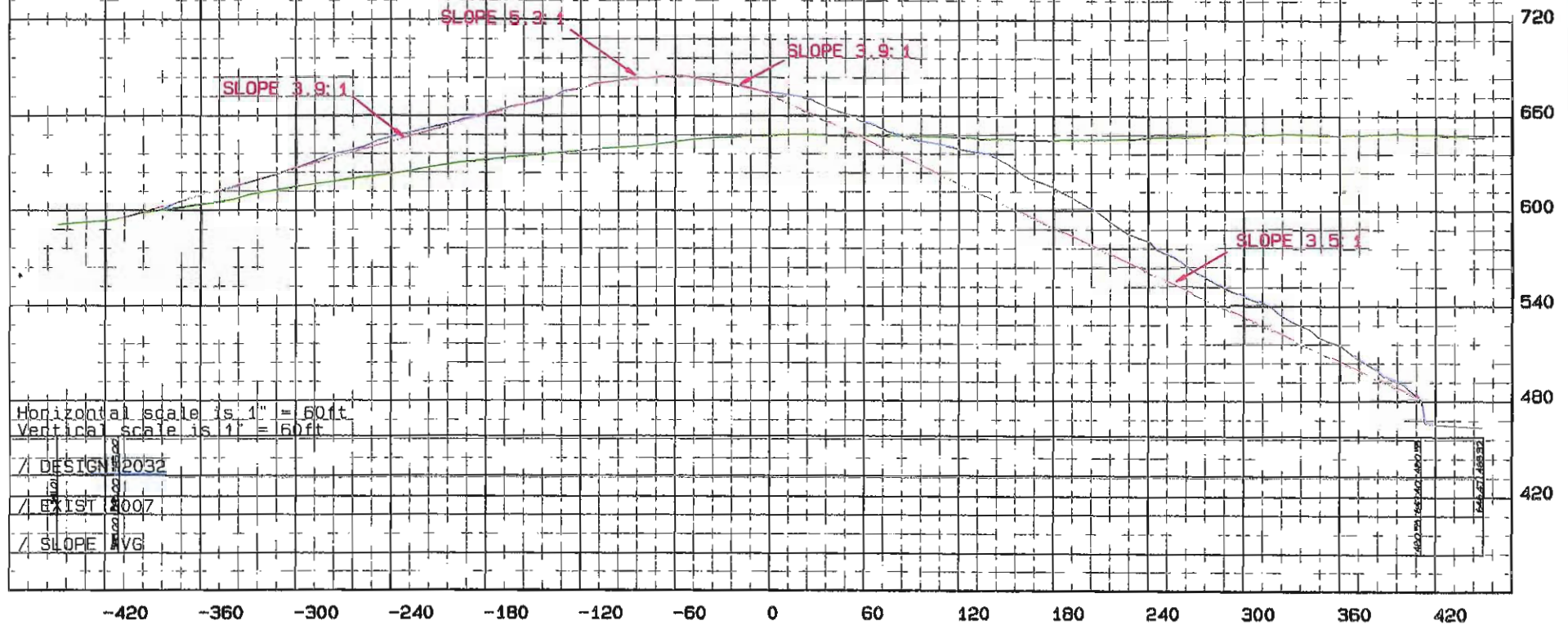
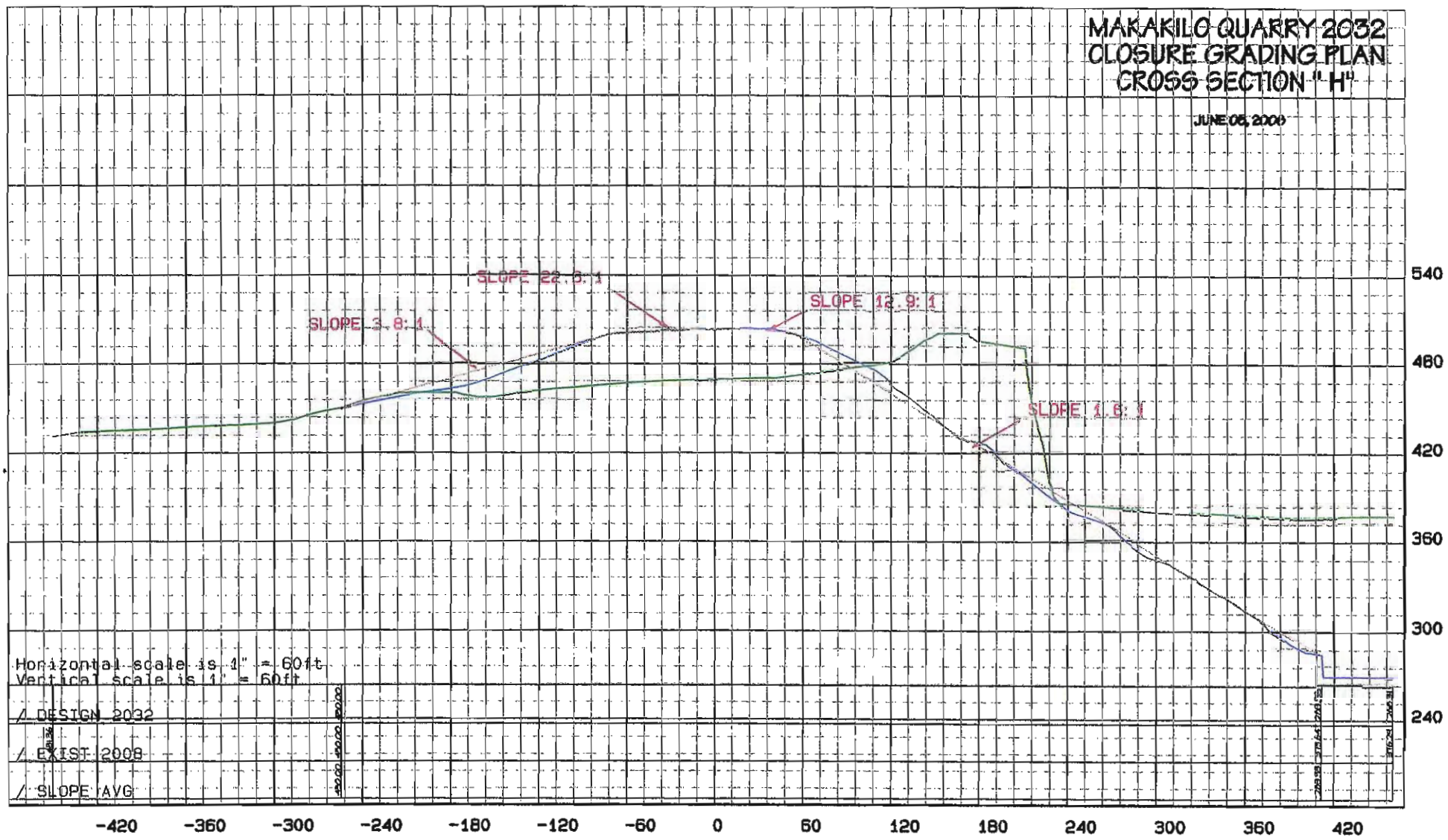


Figure 5b (part 7 of 9)



Revised Figure 5b (part 8 of 9)

MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "I"

MAY 15, 2008

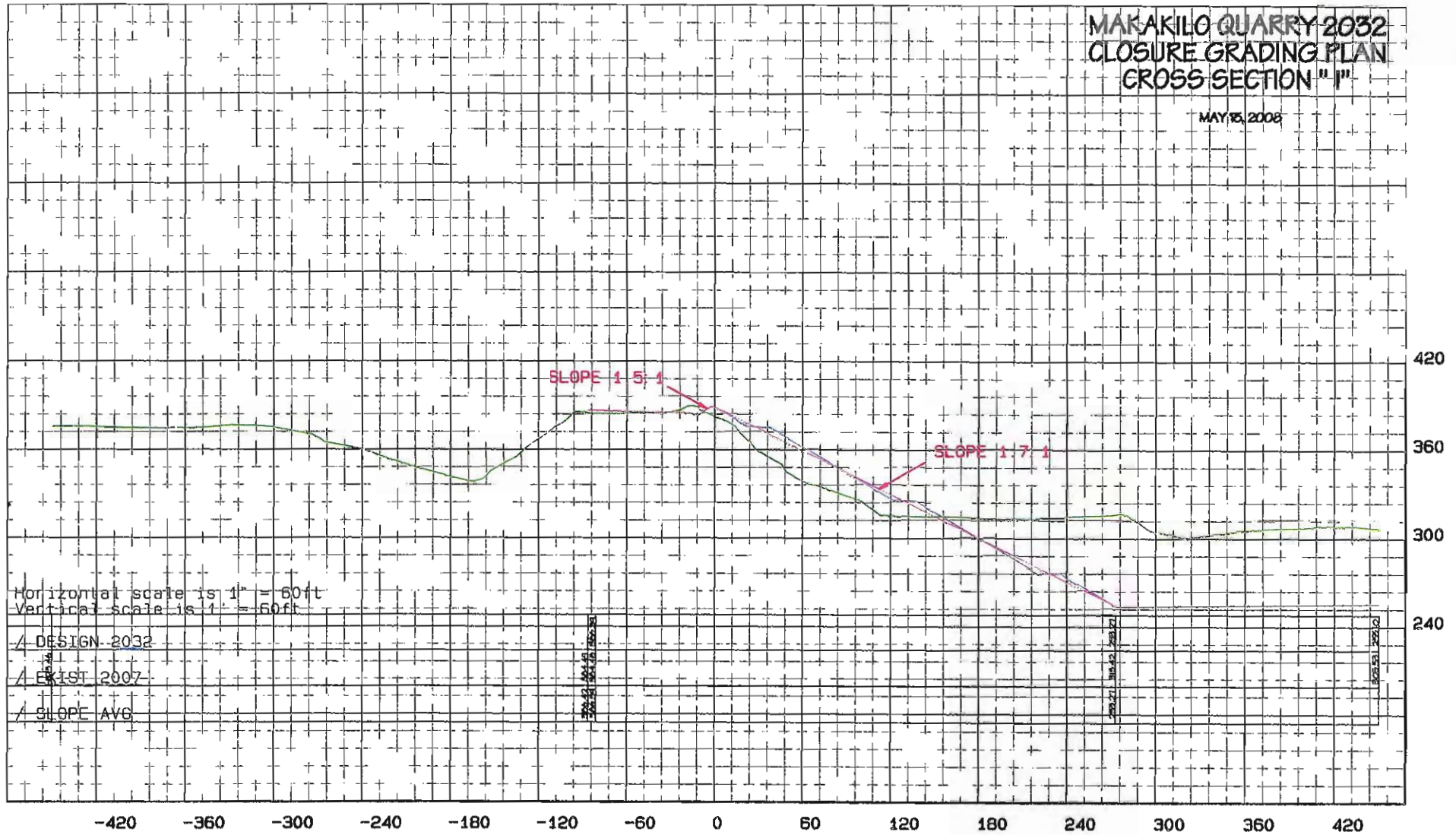


Figure 5b (part 9 of 9)

EXHIBIT 9—VIEW OF ‘EWA



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

EXHIBIT 10—PRIOR RE-USE PLAN

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 Ho'opili 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).

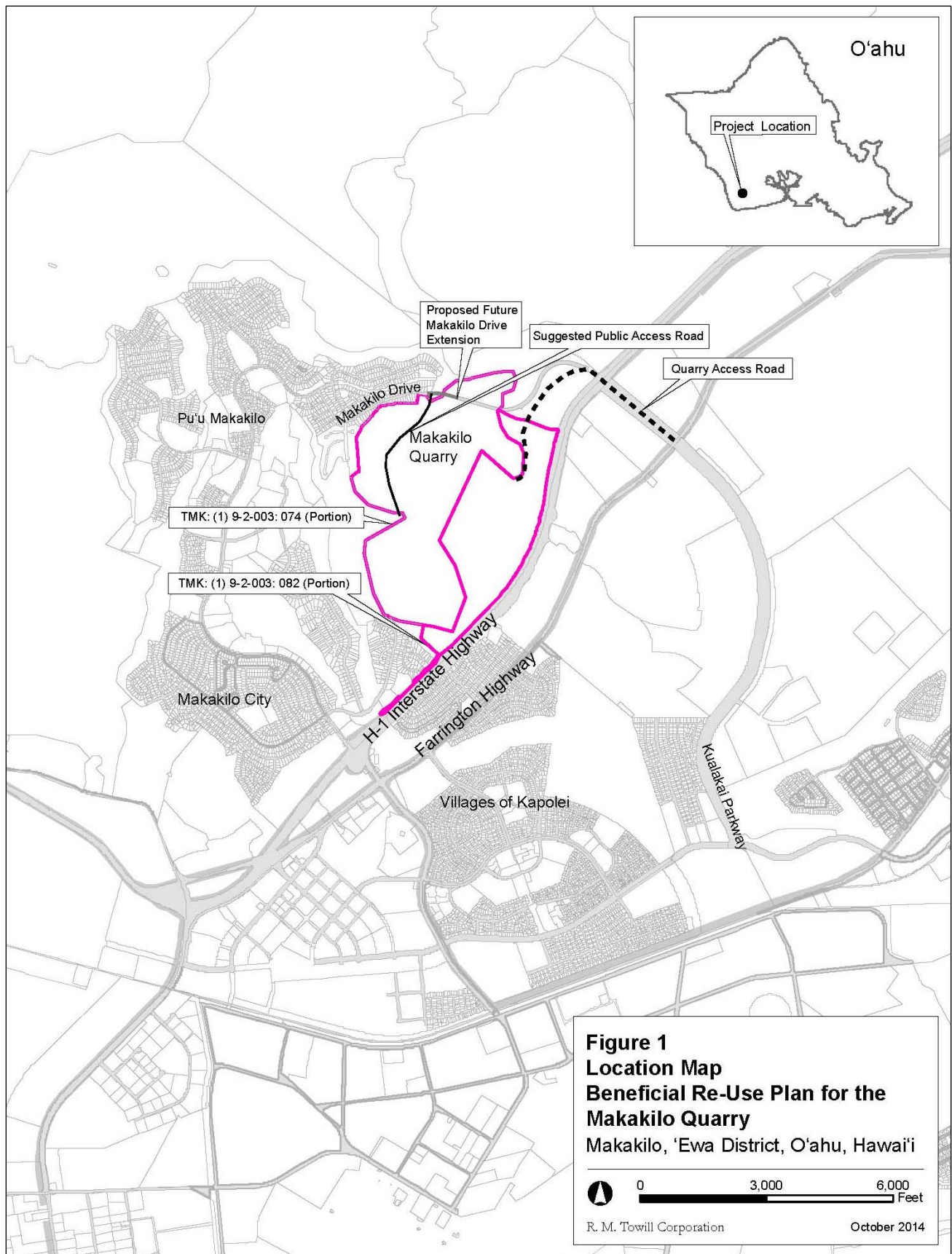
This Plan outlines alternatives that are permissible in the district in which it is situated. Circulation patterns in and around the Quarry are addressed by including the construction of a new access road that would connect to the future Makakilo Drive extension. All exposed soil in excavated areas will 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.

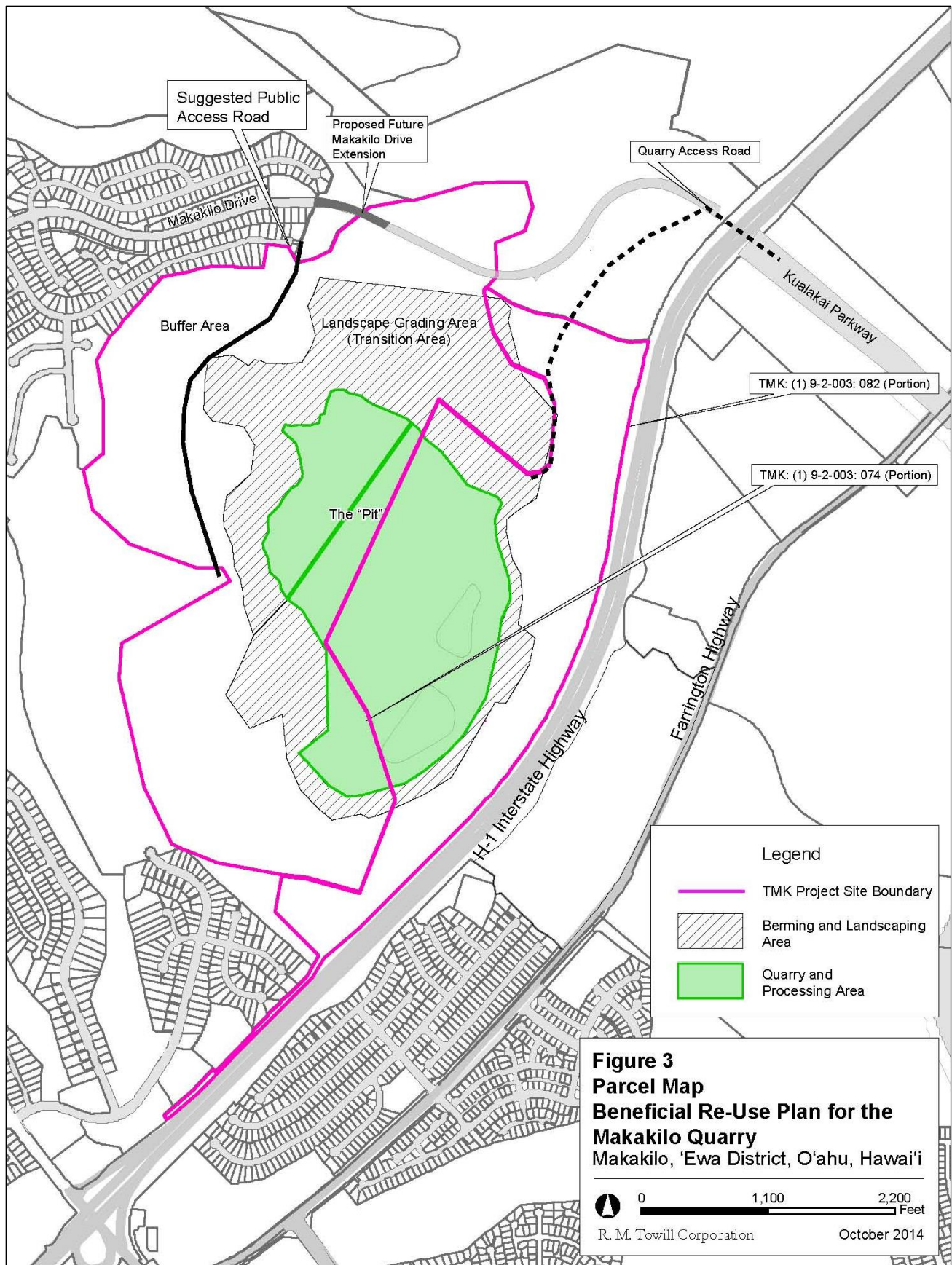
The remaining quarrying activities will continue to adhere to the requirements of the Land Use Ordinance (LUO), Section 21-5.520. Compliance for the exploitation phase of the Makakilo

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

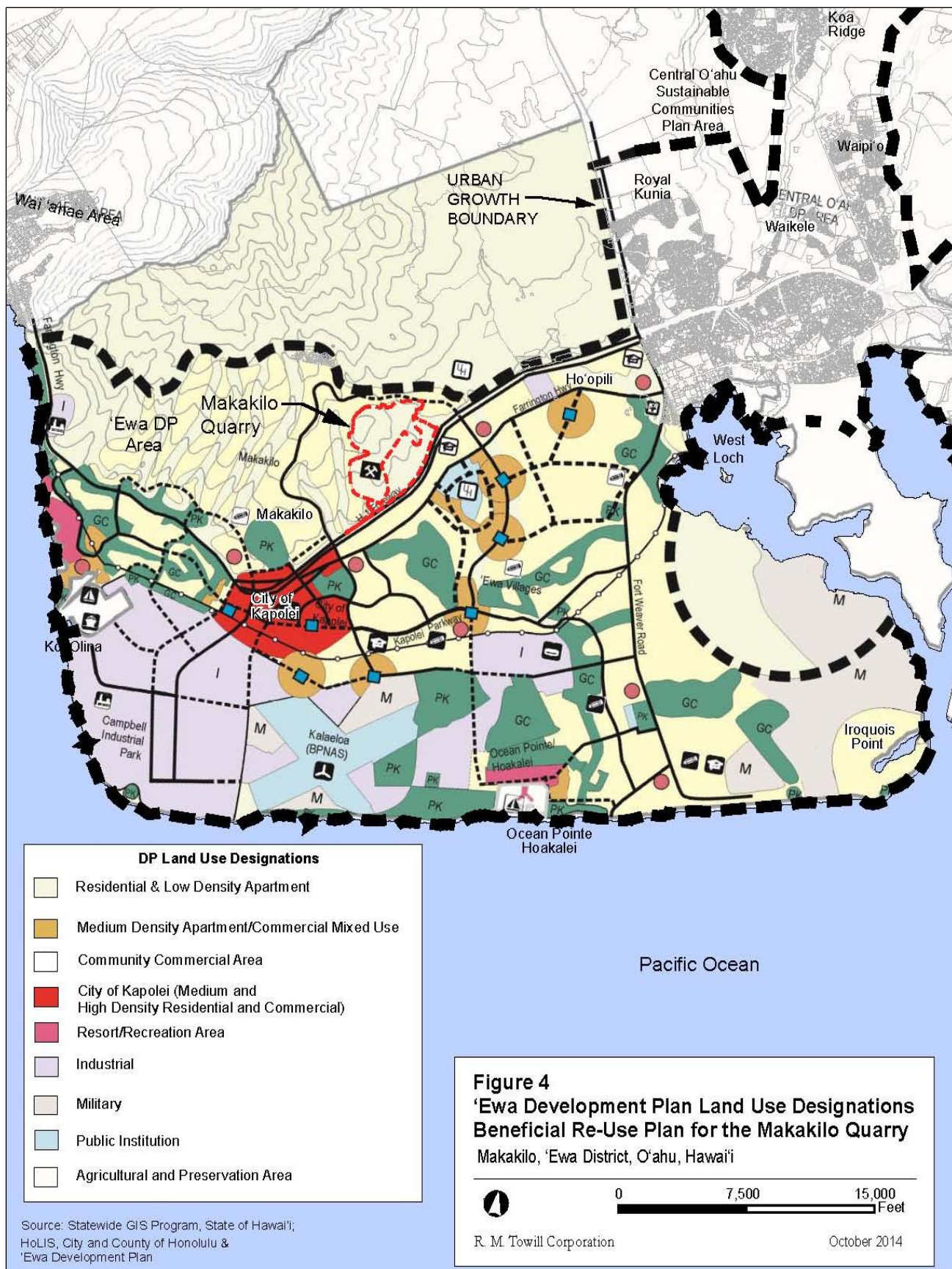
The Quarry site is located within the ‘Ewa DP area adopted in 2013.

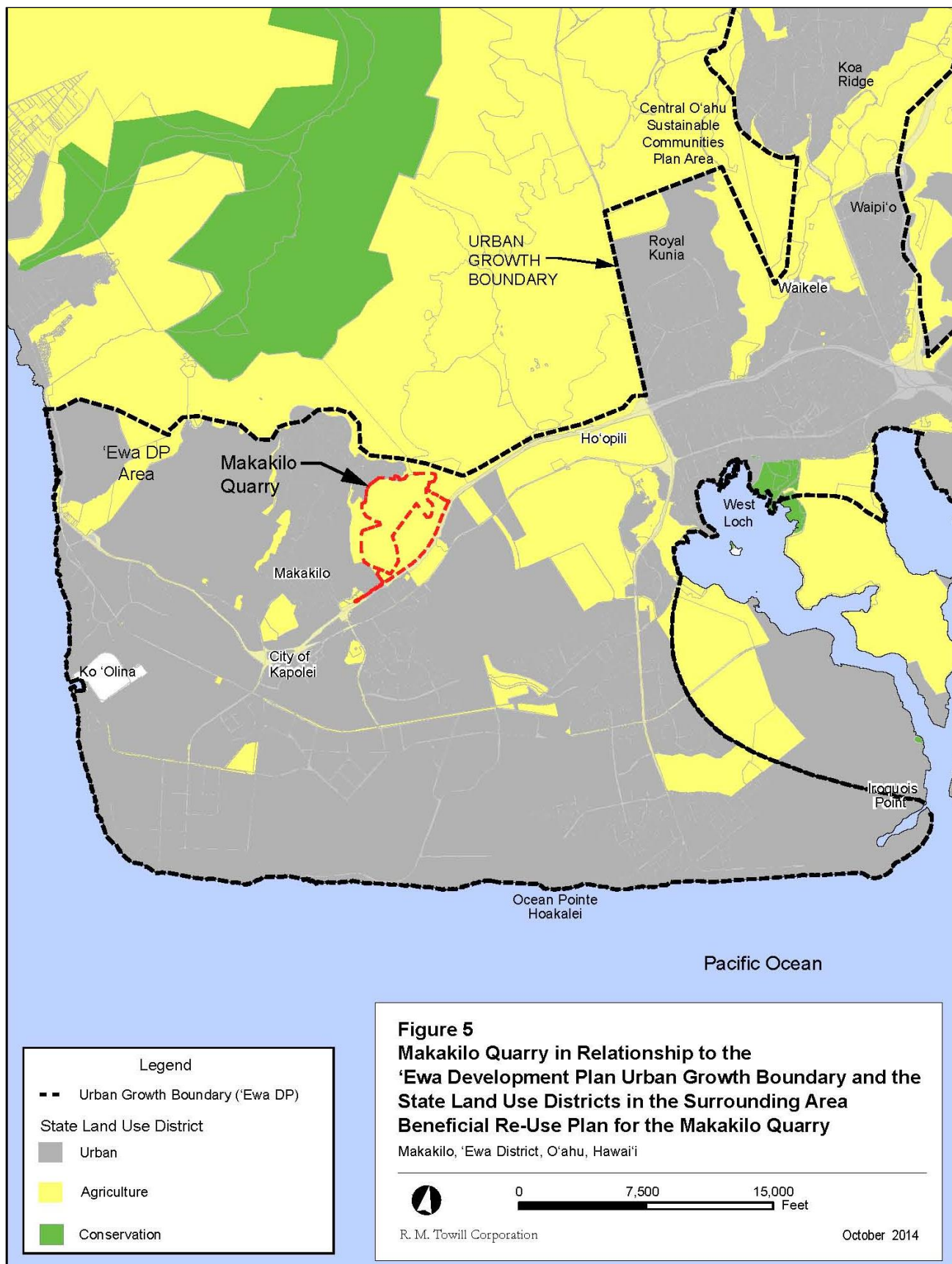
The stated objectives of the ‘Ewa DP includes:

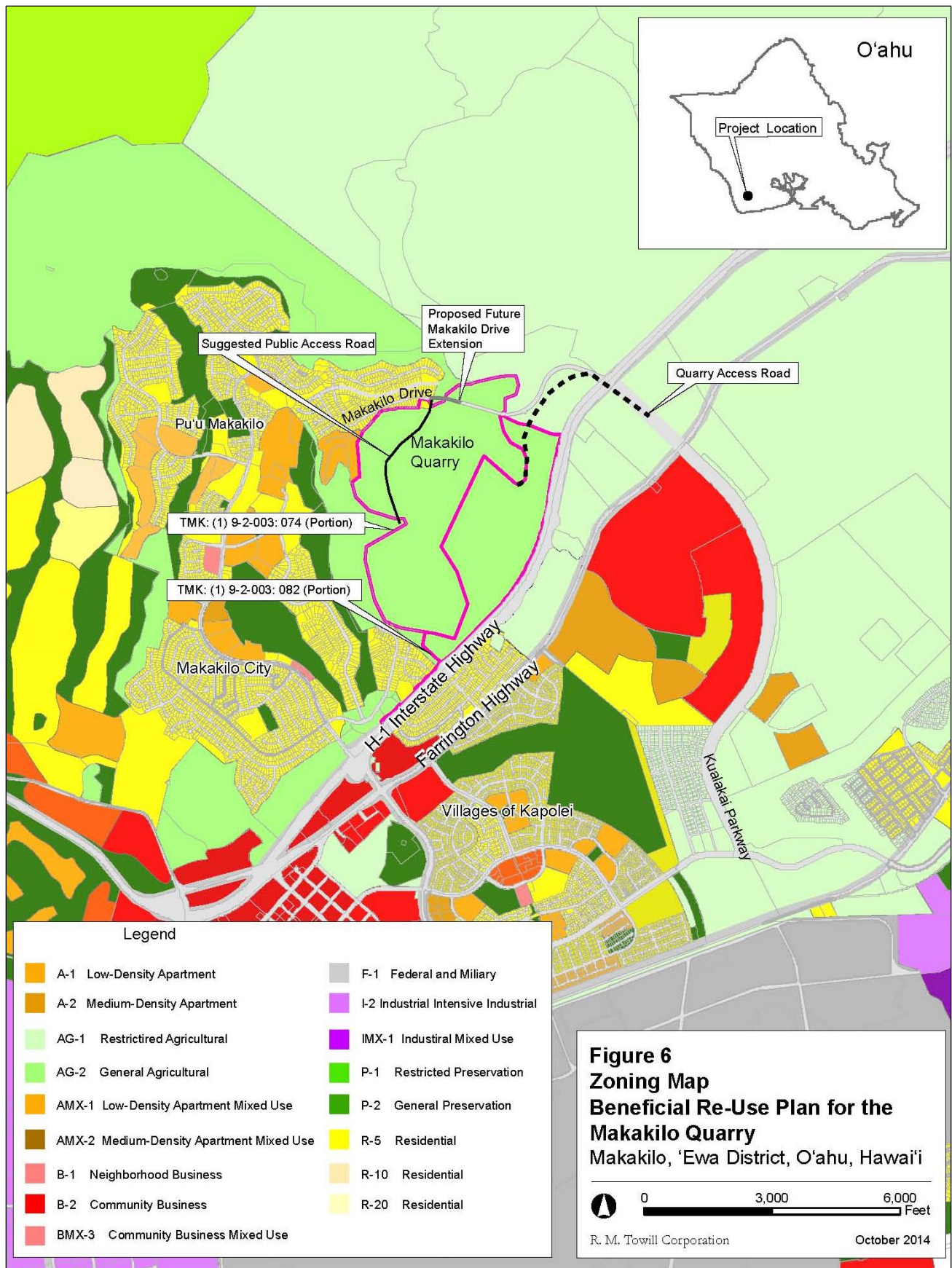
“The [2013 ‘Ewa Development] Plan protects prime agricultural lands; supports development of the Secondary Urban center at Kapolei; establishes a regional open space network; protects natural, historical and cultural resources; promotes master planned communities; and requires provisions of adequate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

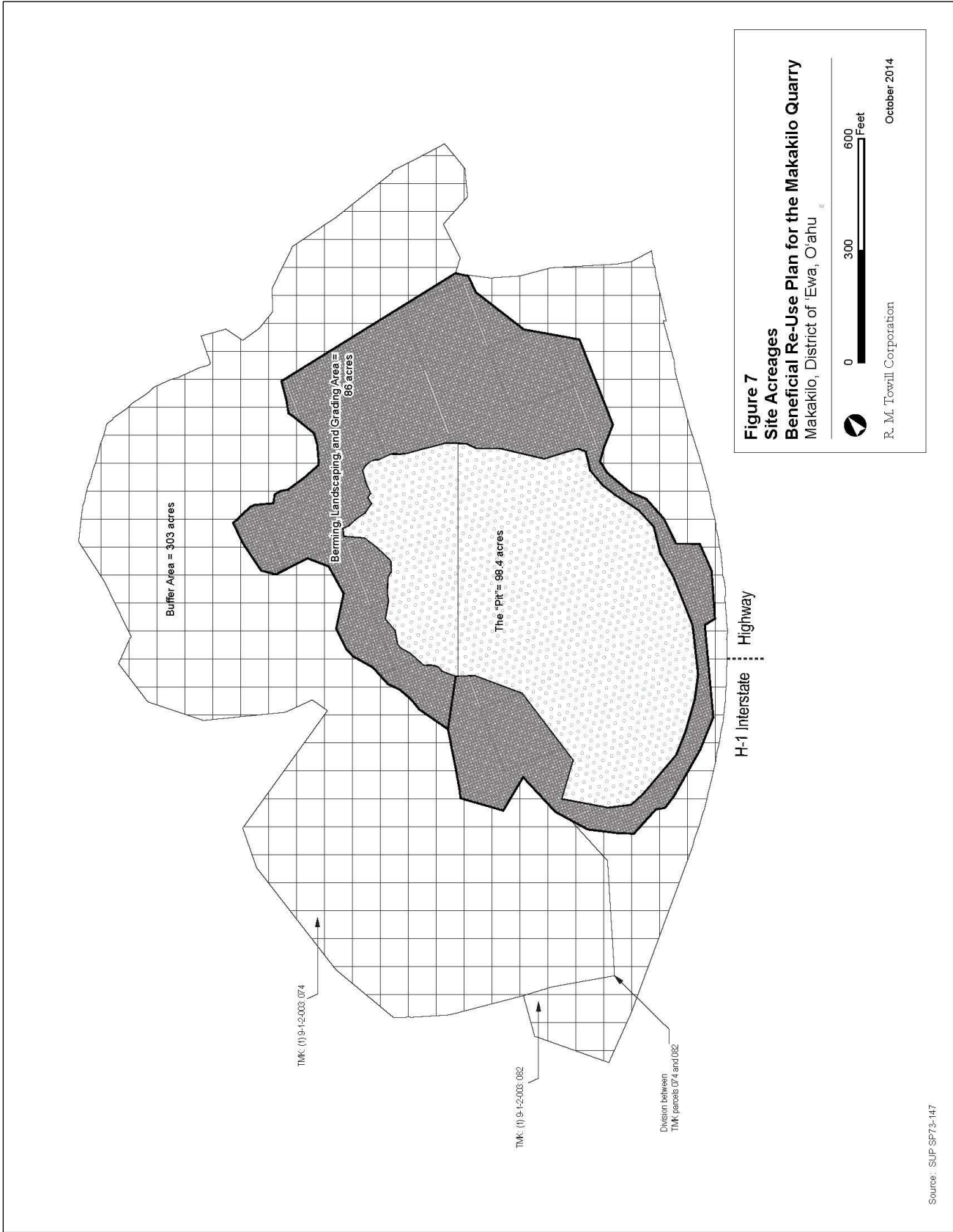
The ‘Ewa DP designates the Makakilo Quarry for agricultural and preservation uses. In addition, the ‘Ewa DP located the Quarry within the Urban Growth Boundary. See **Figure 4, ‘Ewa Development Plan Land Use Designations** and **Figure 5, Makakilo Quarry in Relationship to the ‘Ewa Development Plan Urban 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

acreage. An illustration, dated August 18, 2008, of Pu‘u Makakilo and Makakilo Quarry in 2008 and 2032 is included as **Exhibit 6, View of ‘Ewa**, and was also included as Exhibit 34 of the Planning Commission’s record.

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.)

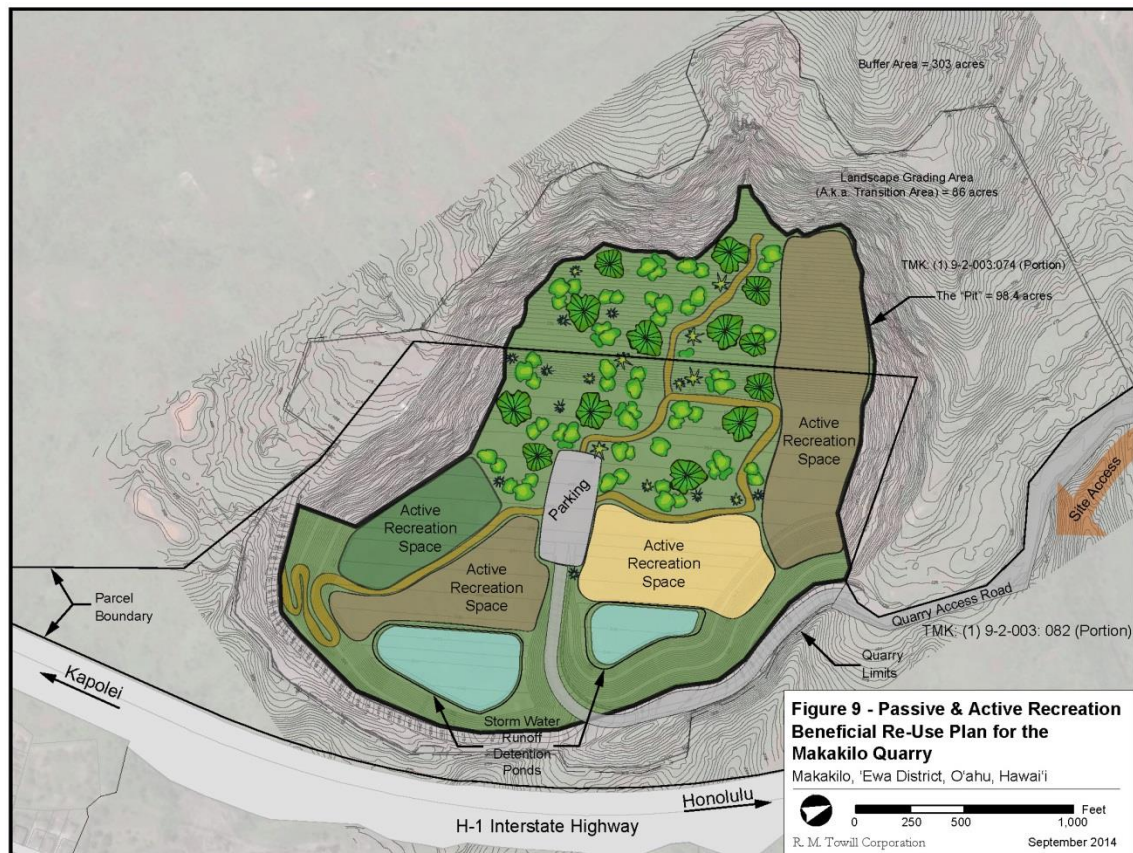
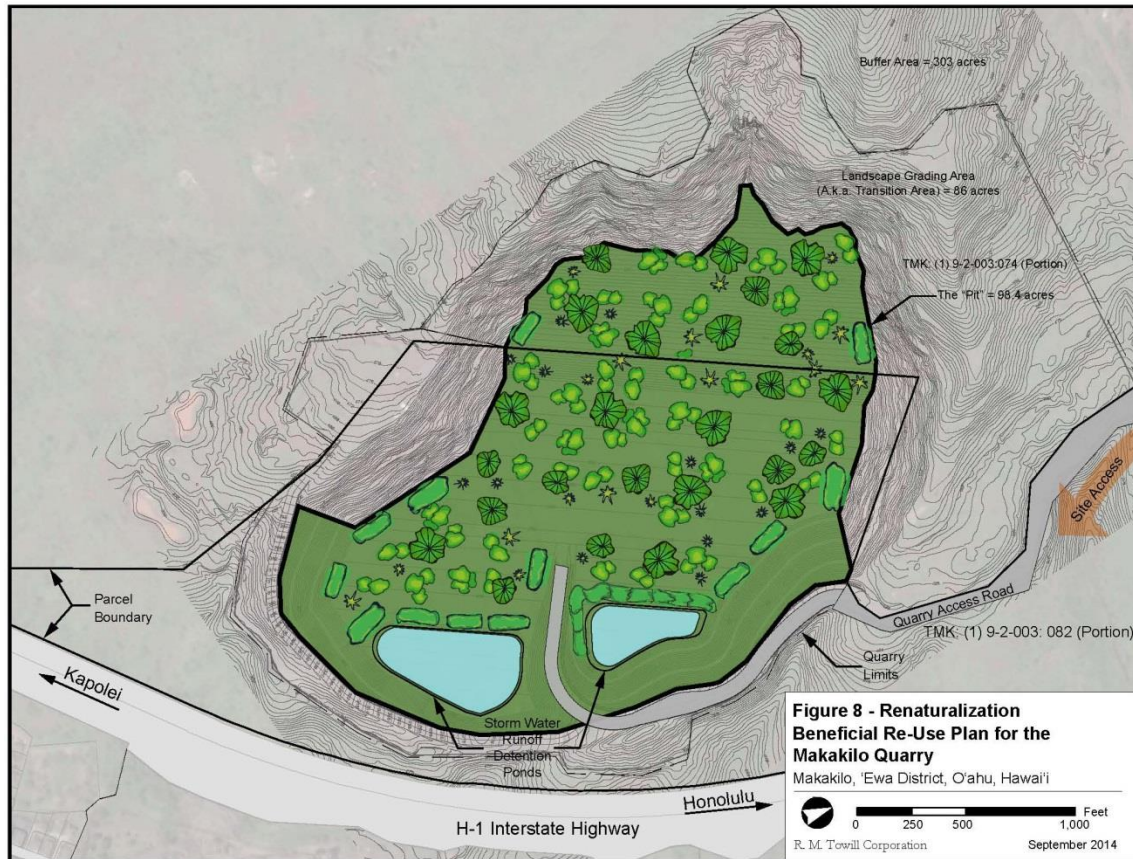
4.2 Scenario Two: Re-Use Based on Change in Land Use Entitlements

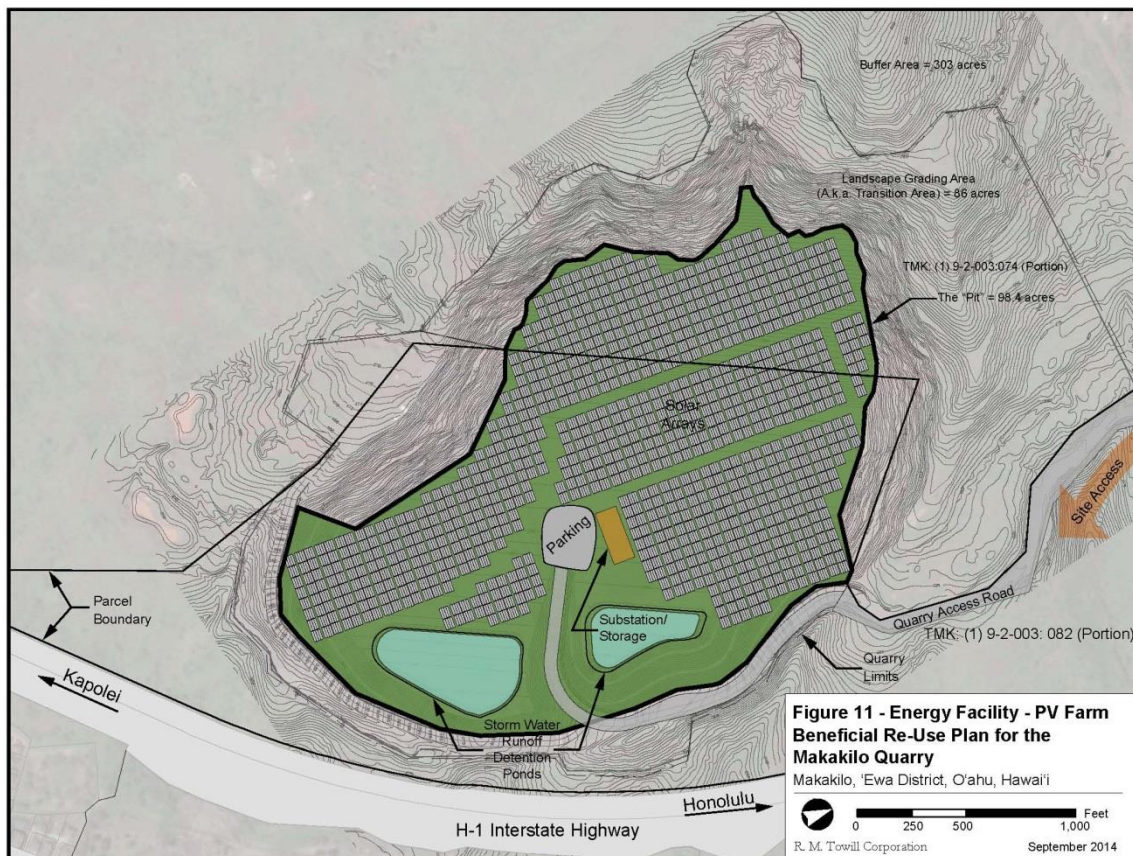
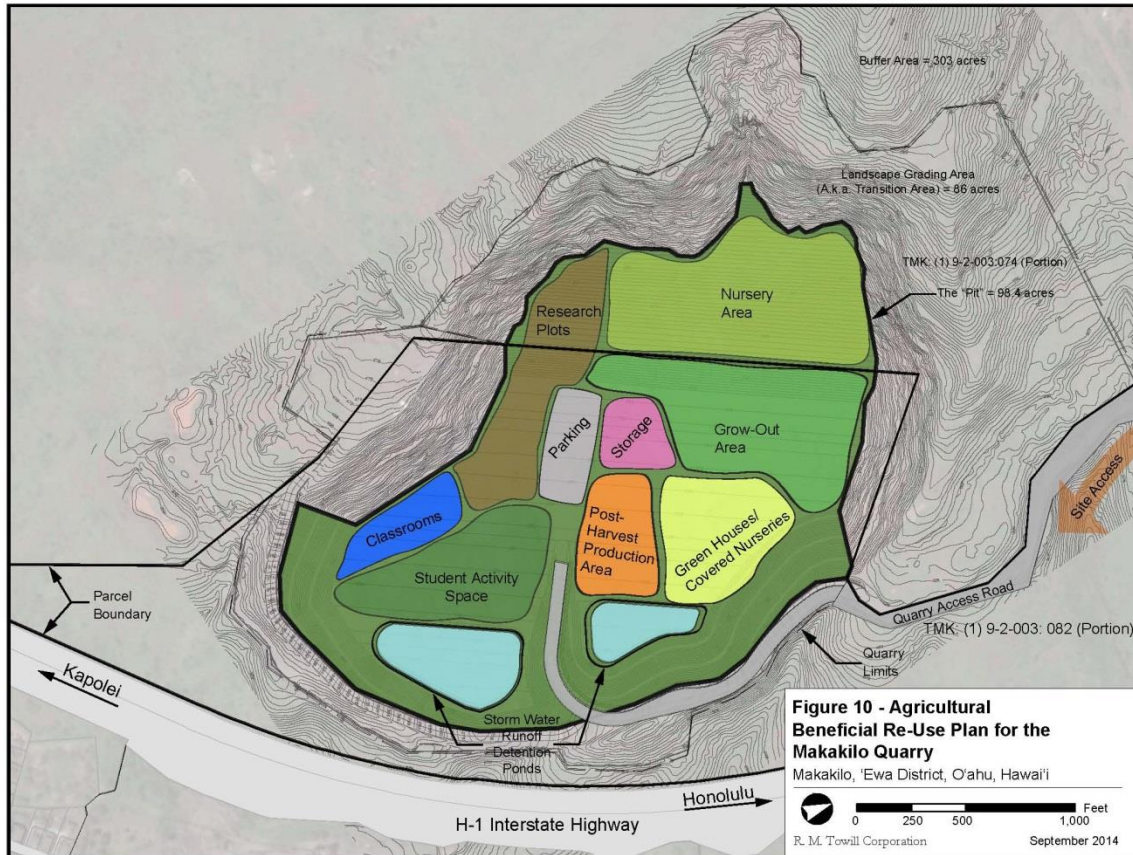
This alternative reuse scenario is based on a hypothetical future change in State and County land use entitlements from agriculture to an “urban” use, allowing for development such as residential, commercial, or industrial use. Grace Pacific LLC currently does not have definitive plans for an “urban” 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 11—SUMMARY OF RESOURCE EXTRACTION
TO DATE**

The volumes below reflect the amount of cut and fill conducted at the quarry from 2014 to 2022, the amount planned to the current date of quarry closure, and the volume expected if the date of quarry closure is extended to 2047.

Volume from 2014 to 2022

Cut = 3,725,784 Cu. Yd.

Fill = 993,988 Cu. Yd.

Net = 2,731,796 Cu. Yd. Cut

Volume from present 2022 to 2032 Closure Grading Plan

Cut = 11,714,453 Cu. Yd.

Fill = 1,453,891 Cu. Yd.

Net = 10,260,562 Cu. Yd. Cut

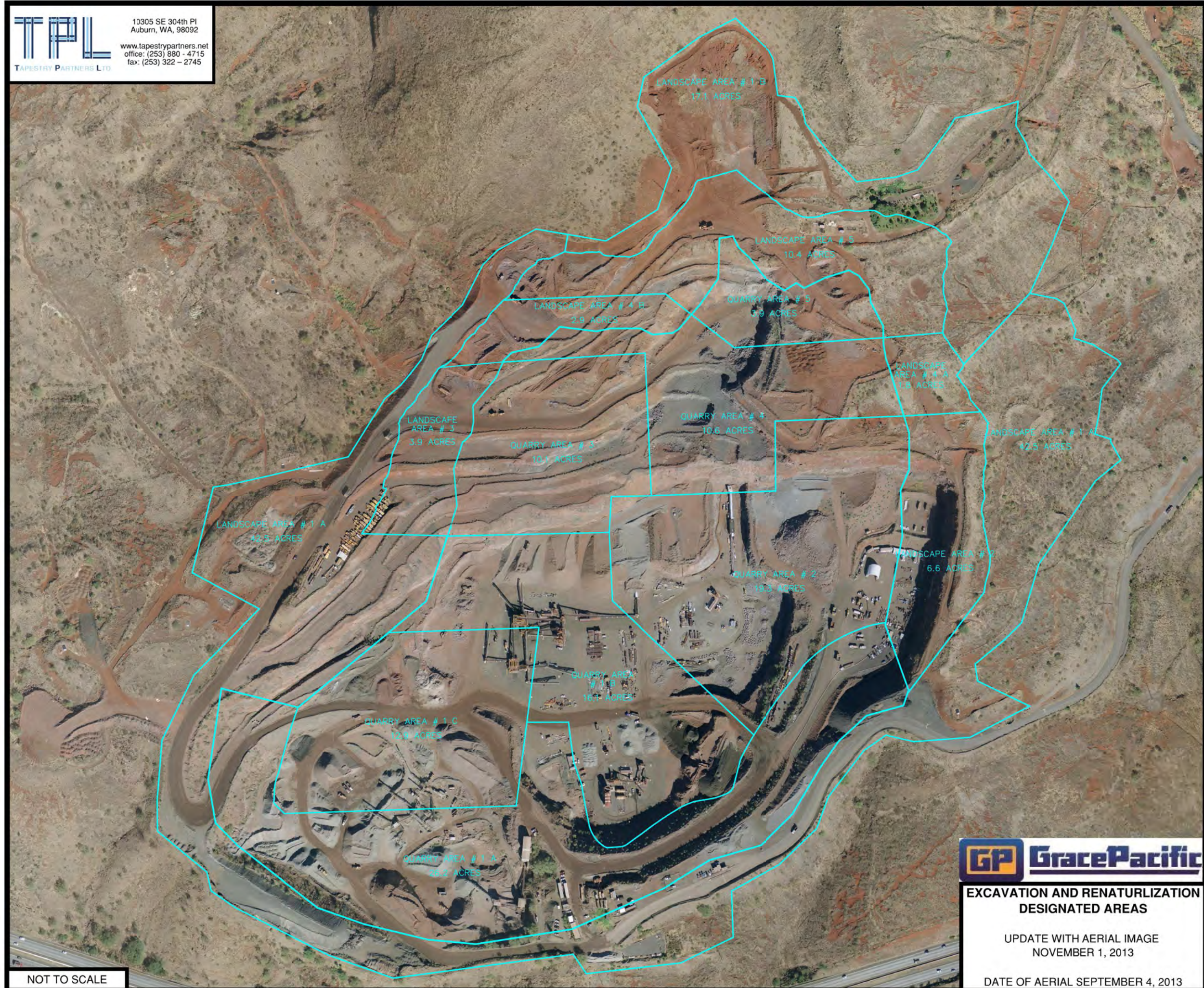
Volume from 2022 to Proposed Closure Grading

Cut = 15,822,887 Cu. Yd.

Fill = 749,205 Cu. Yd.

Net = 15,073,681 Cu. Yd. Cut

**EXHIBIT 12—MAKAKILO QUARRY EXCAVATION AND
RENATURALIZATION AREAS**

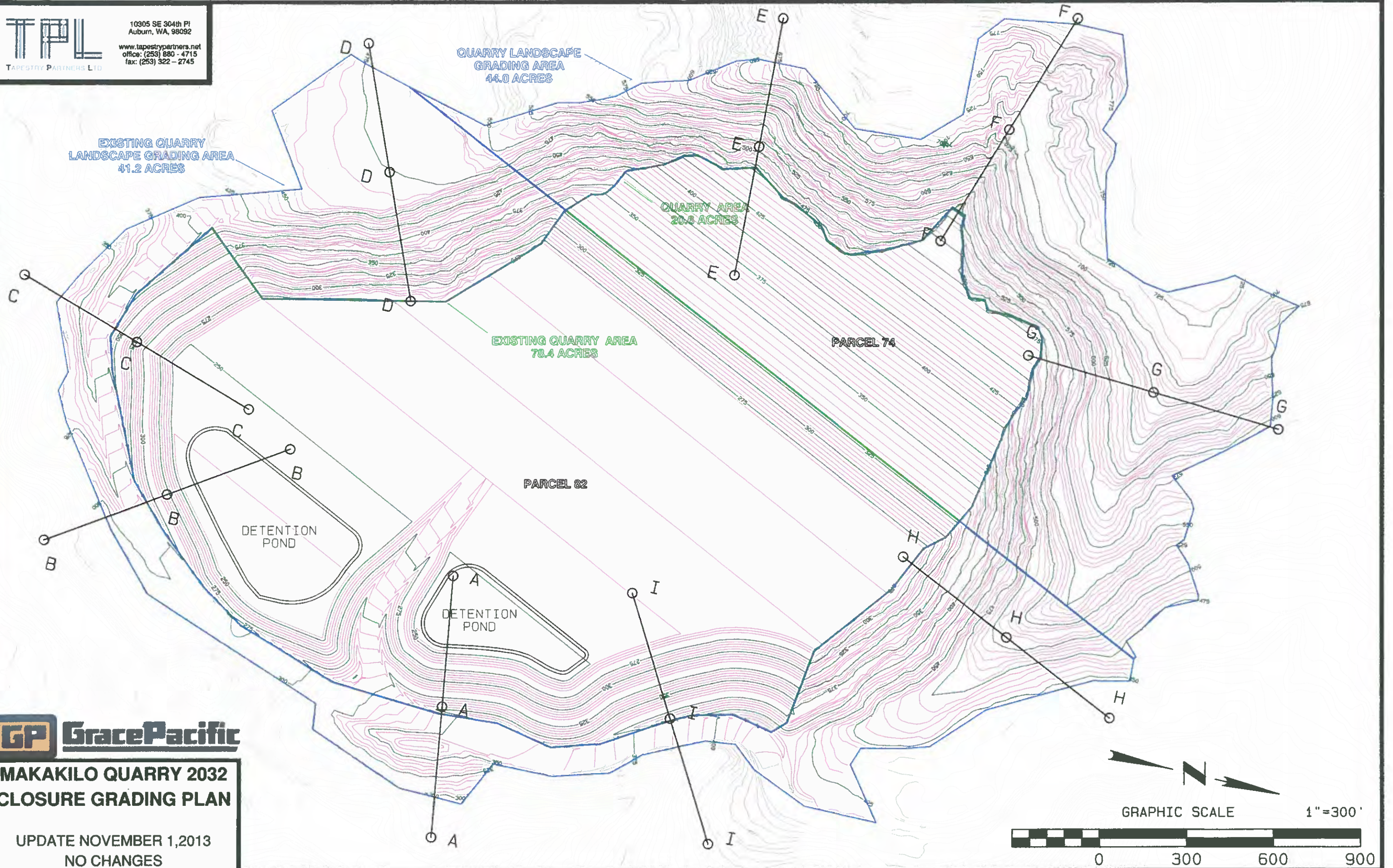


NOT TO SCALE

**EXHIBIT 13—CLOSURE GRADING PLAN
(CROSS-SECTIONS)**



10305 SE 304th Pl
Auburn, WA, 98092
www.tapestrypartners.net
office: (253) 880 - 4715
fax: (253) 322 - 2745



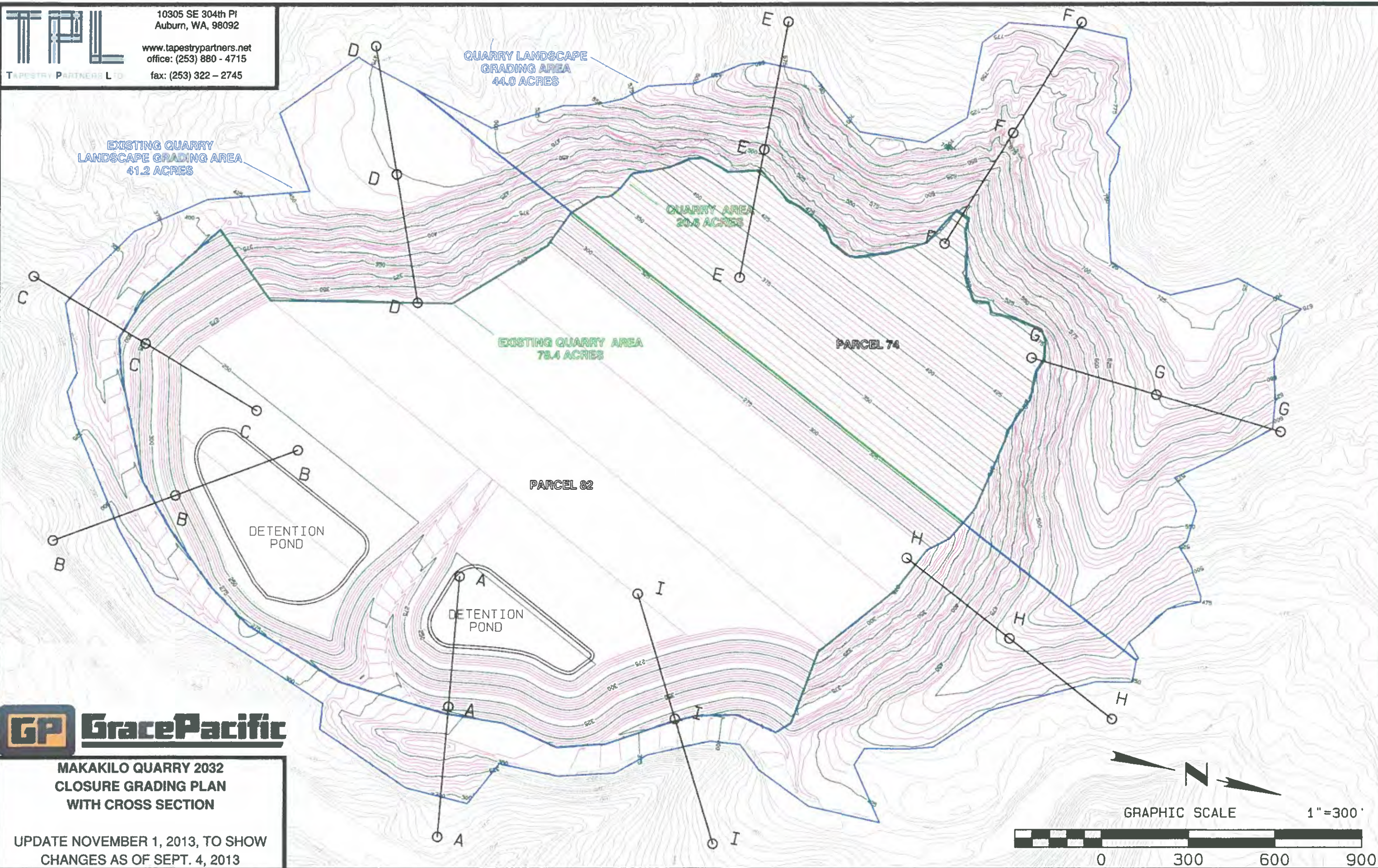
MAKAKILO QUARRY 2032 CLOSURE GRADING PLAN

UPDATE NOVEMBER 1, 2013
NO CHANGES



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fax: (253) 322 - 2745

TAPESTRY PARTNERS LTD



MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
WITH CROSS SECTION

UPDATE NOVEMBER 1, 2013, TO SHOW
CHANGES AS OF SEPT. 4, 2013



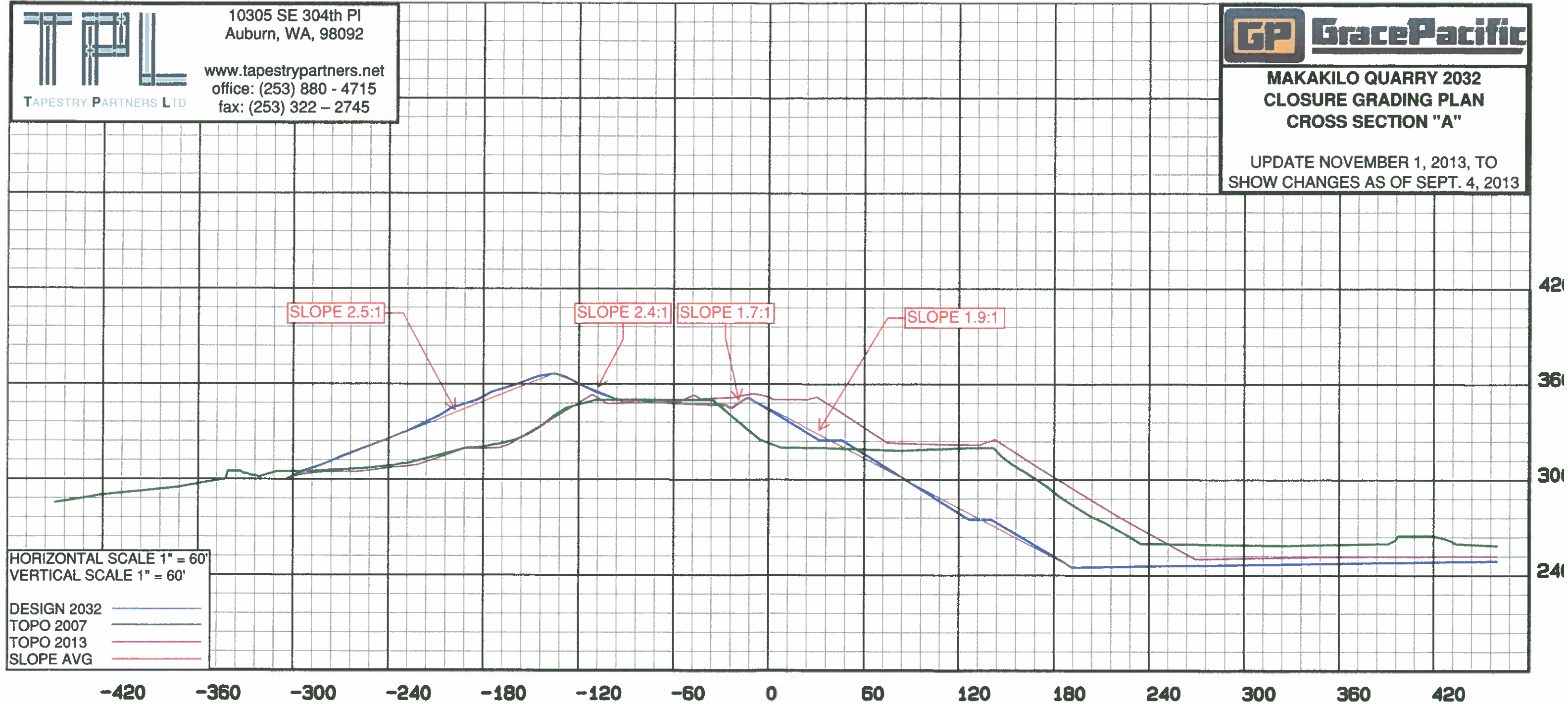
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fax: (253) 322 - 2745



**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "A"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 60'

DESIGN 2032
TOPO 2007
TOPO 2013
SLOPE AVG



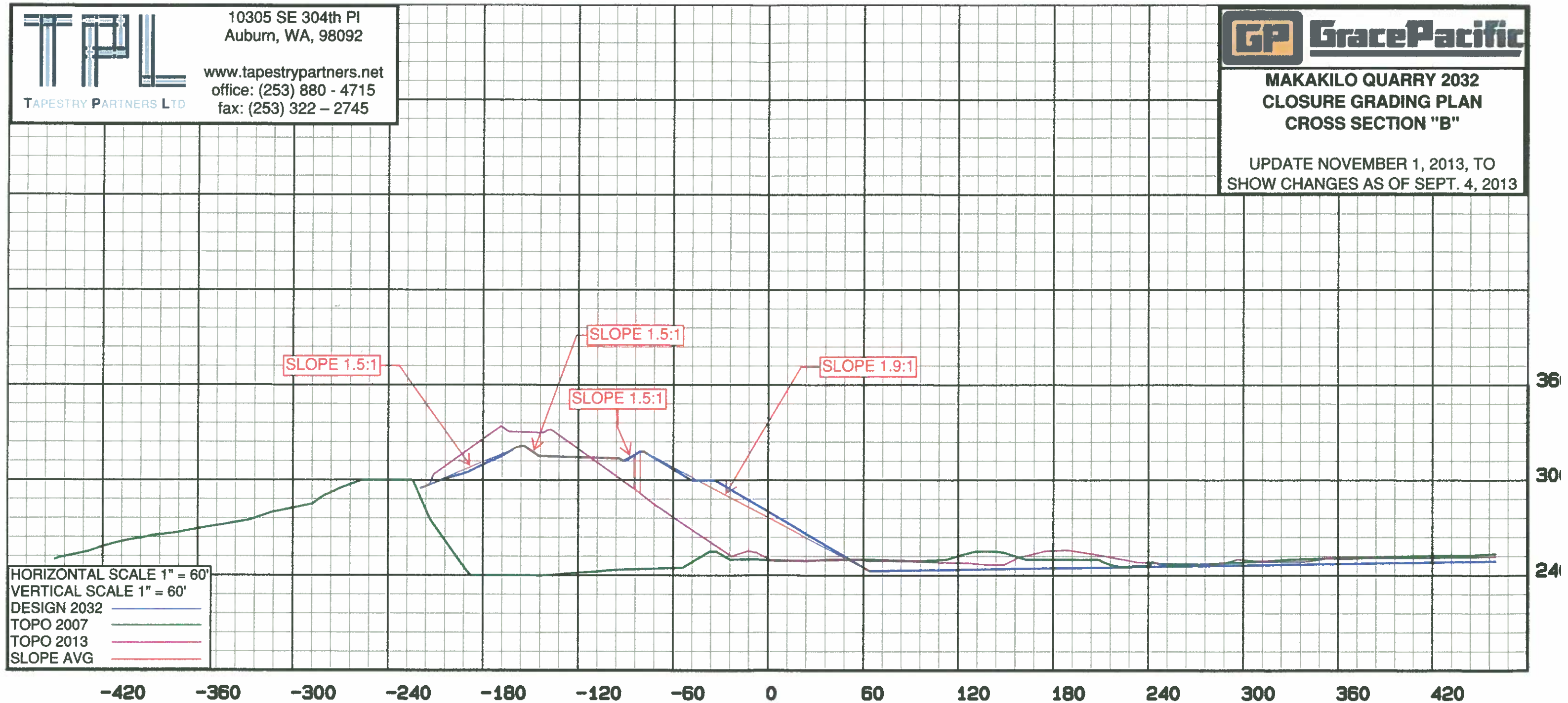
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fax: (253) 322 - 2745



**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "B"**

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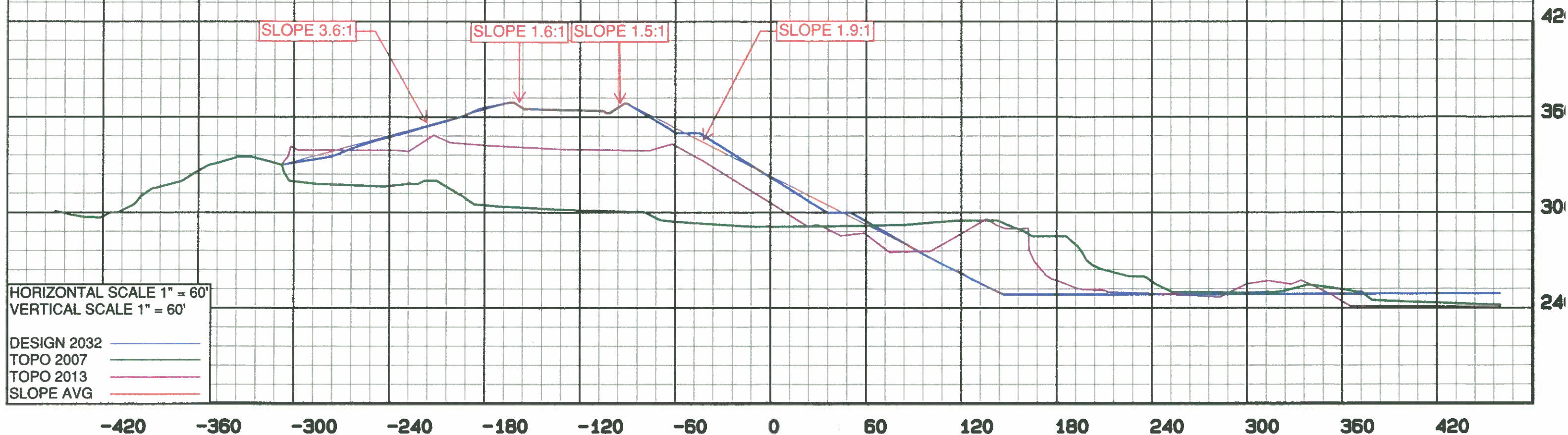
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fax: (253) 322 - 2745



**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "C"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 60'

DESIGN 2032 ———
TOPO 2007 ———
TOPO 2013 ———
SLOPE AVG ———



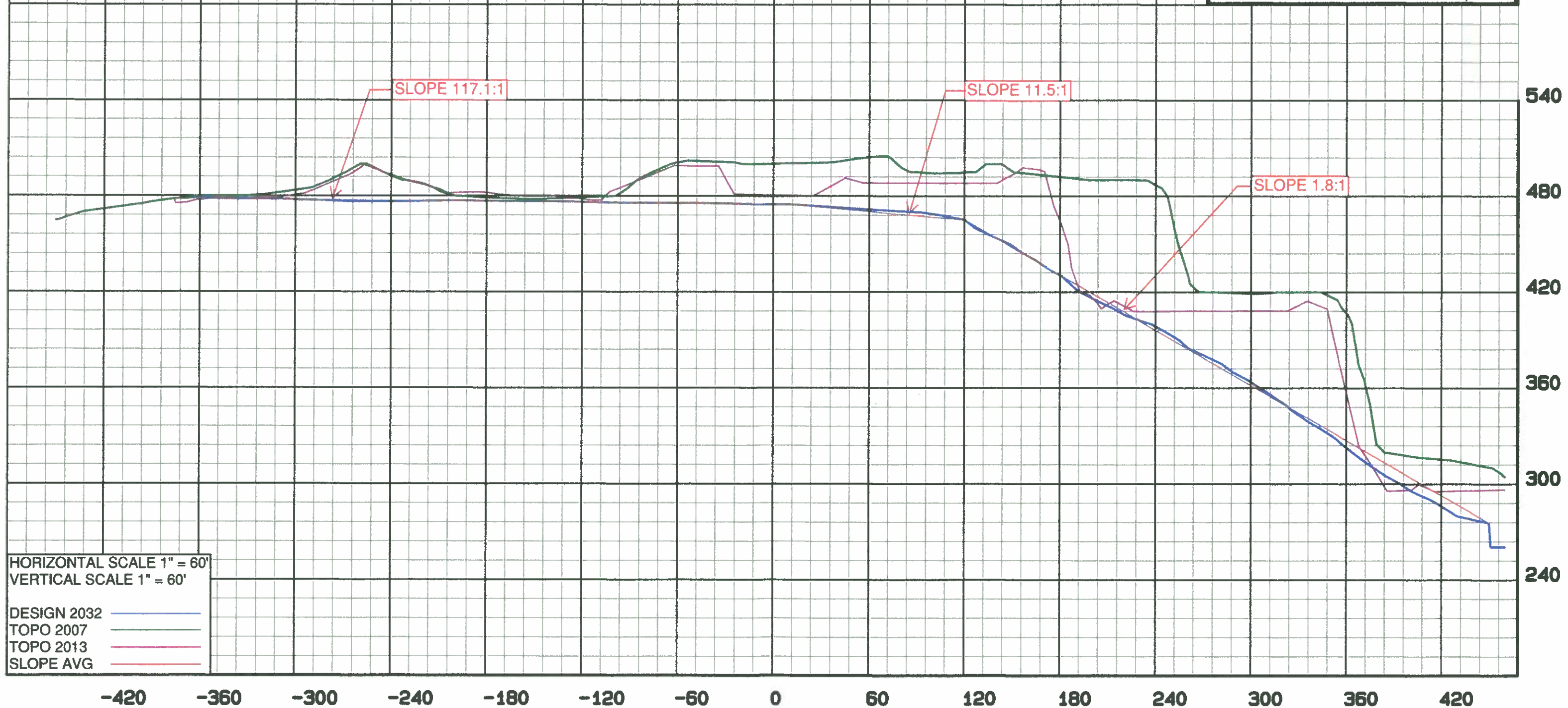
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fax: (253) 322 - 2745



**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "D"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 60'

DESIGN 2032
TOPO 2007
TOPO 2013
SLOPE AVG



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**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "E"**

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SHOW CHANGES AS OF SEPT. 4, 2013





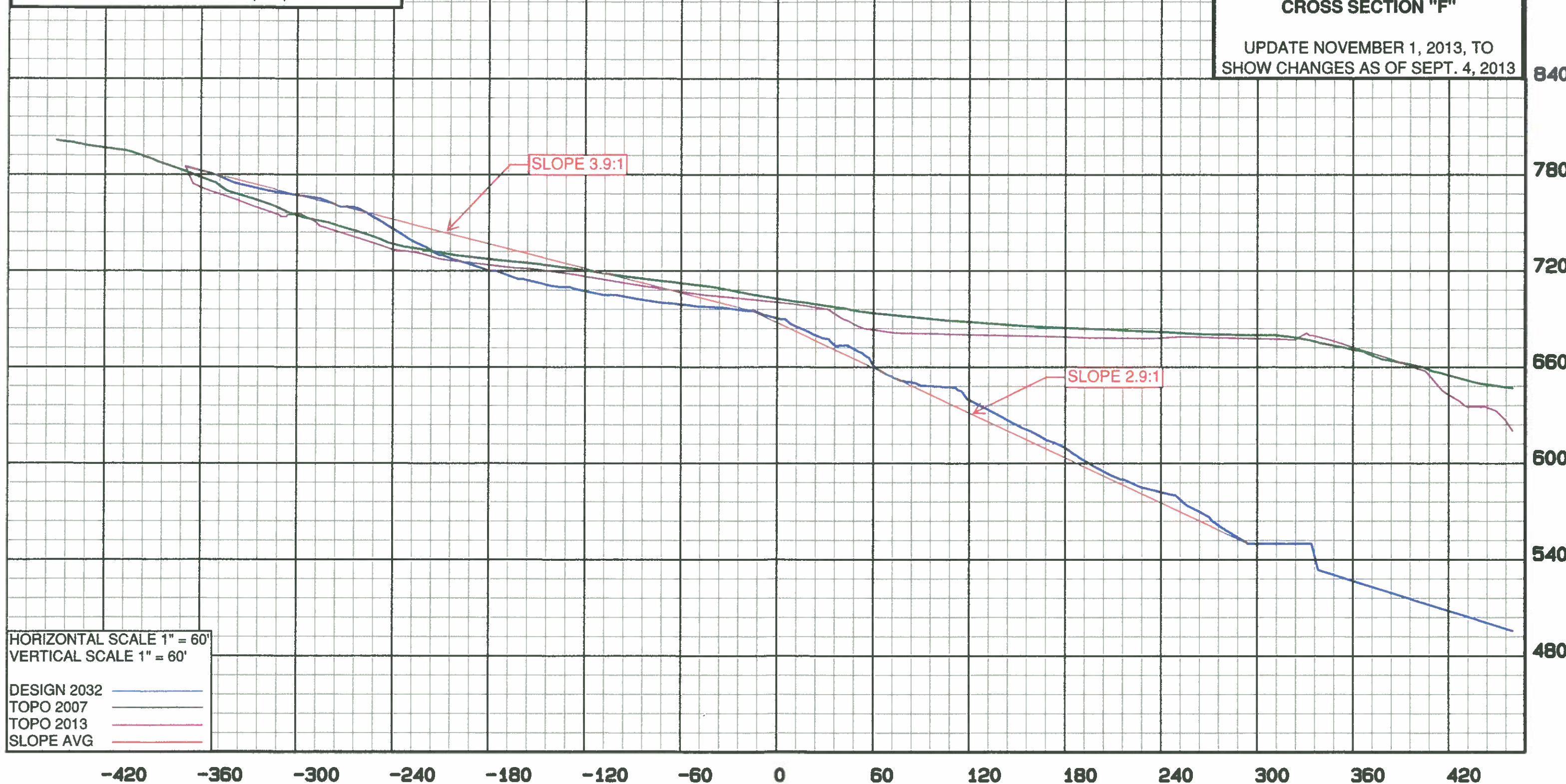
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**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "F"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 60'

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TOPO 2007 ———
TOPO 2013 ———
SLOPE AVG ———



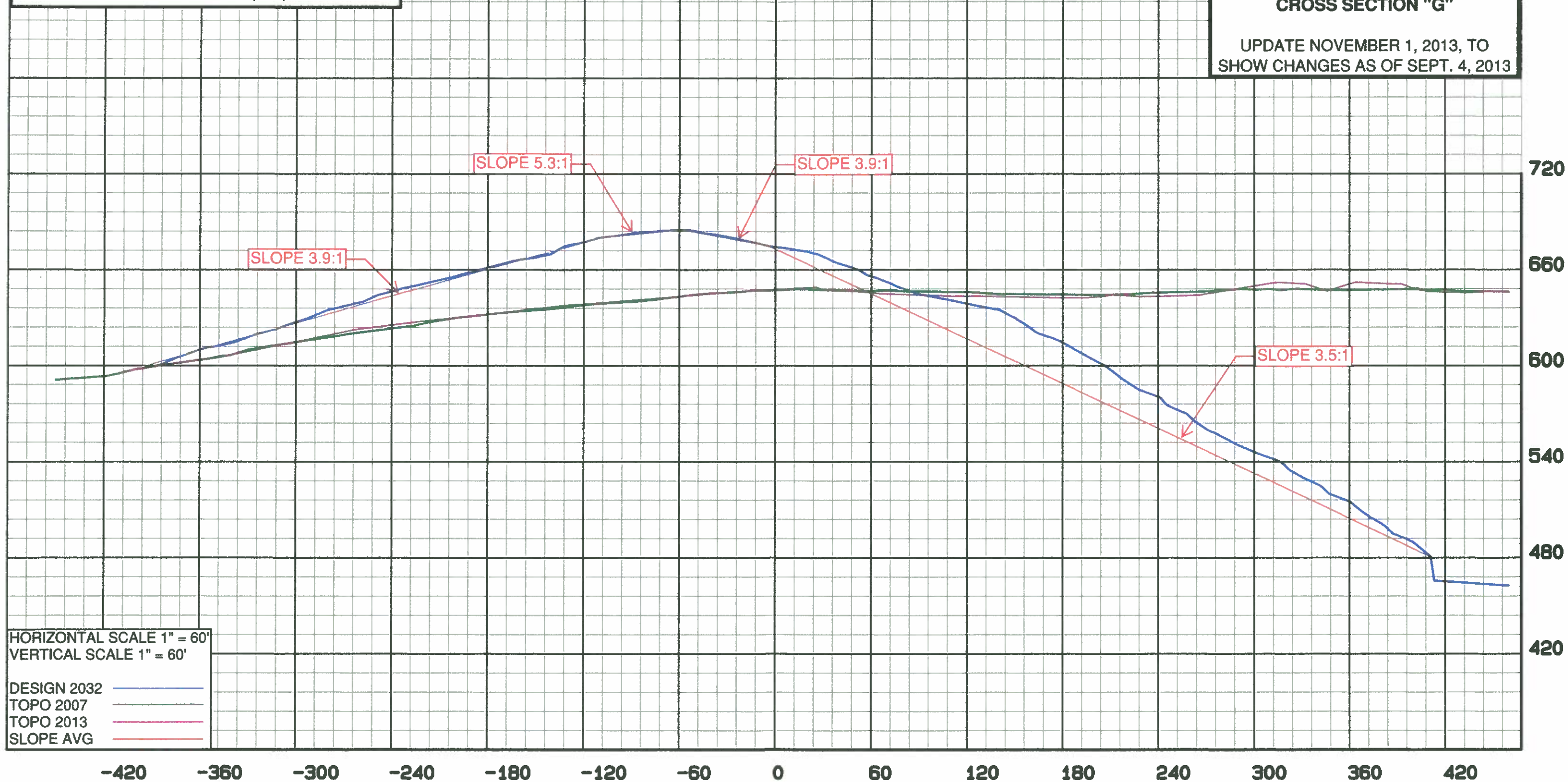
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**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "G"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013





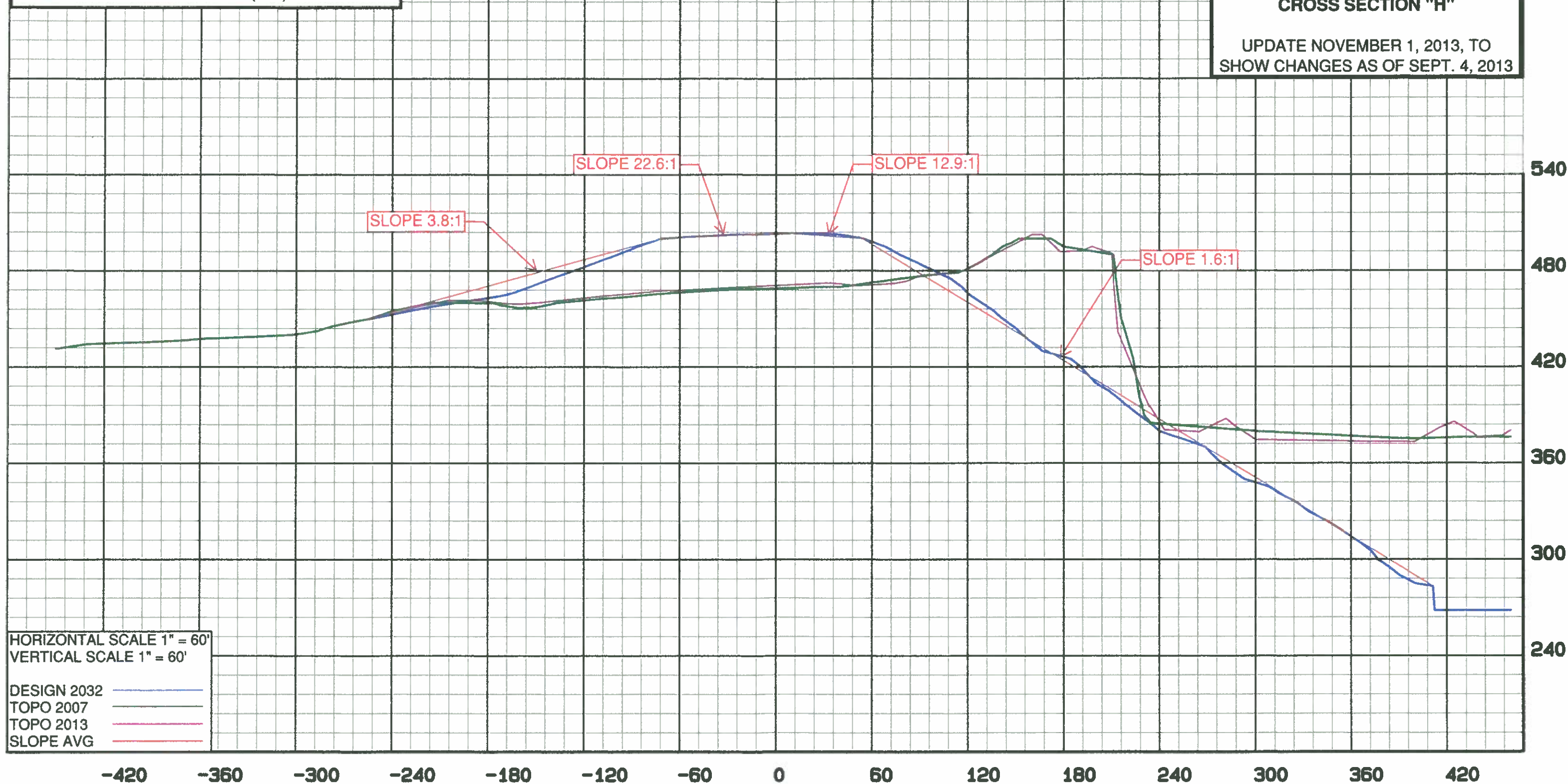
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**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "H"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013



HORIZONTAL SCALE 1" = 60'
VERTICAL SCALE 1" = 60'

DESIGN 2032 ———
TOPO 2007 ———
TOPO 2013 ———
SLOPE AVG ———



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**MAKAKILO QUARRY 2032
CLOSURE GRADING PLAN
CROSS SECTION "I"**

UPDATE NOVEMBER 1, 2013, TO
SHOW CHANGES AS OF SEPT. 4, 2013

