



MEETING OF September 4, 2012

AGENDA ITEM NO. 5D

Application I.D.: 2012-0012

Application Type: Single Family Design Review

Location: 1512 Harbor Boulevard

Applicant: Geoffrey Campen – Klop Architecture

Owners: Matthias Hausner & Davina Hurt

APN: 045-281-020

Zoning: R-1A - Single Family Residential District

General Plan Designation: RL – Low Density Residential

Environmental Determination: Categorically Exempt, Section 15303, Class 3(a)

PROJECT DESCRIPTION

The applicant requests Single Family Design Review (SFDR) approval to construct a 771 square foot addition an existing single family residence for a total of 3,386 square feet that is below the zoning district permitted 3,500 square feet for the site.

RECOMMENDATION

Staff recommends that the Planning Commission **approve** the Single Family Design Review subject to the conditions of approval contained in the attached draft resolution¹.

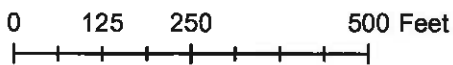
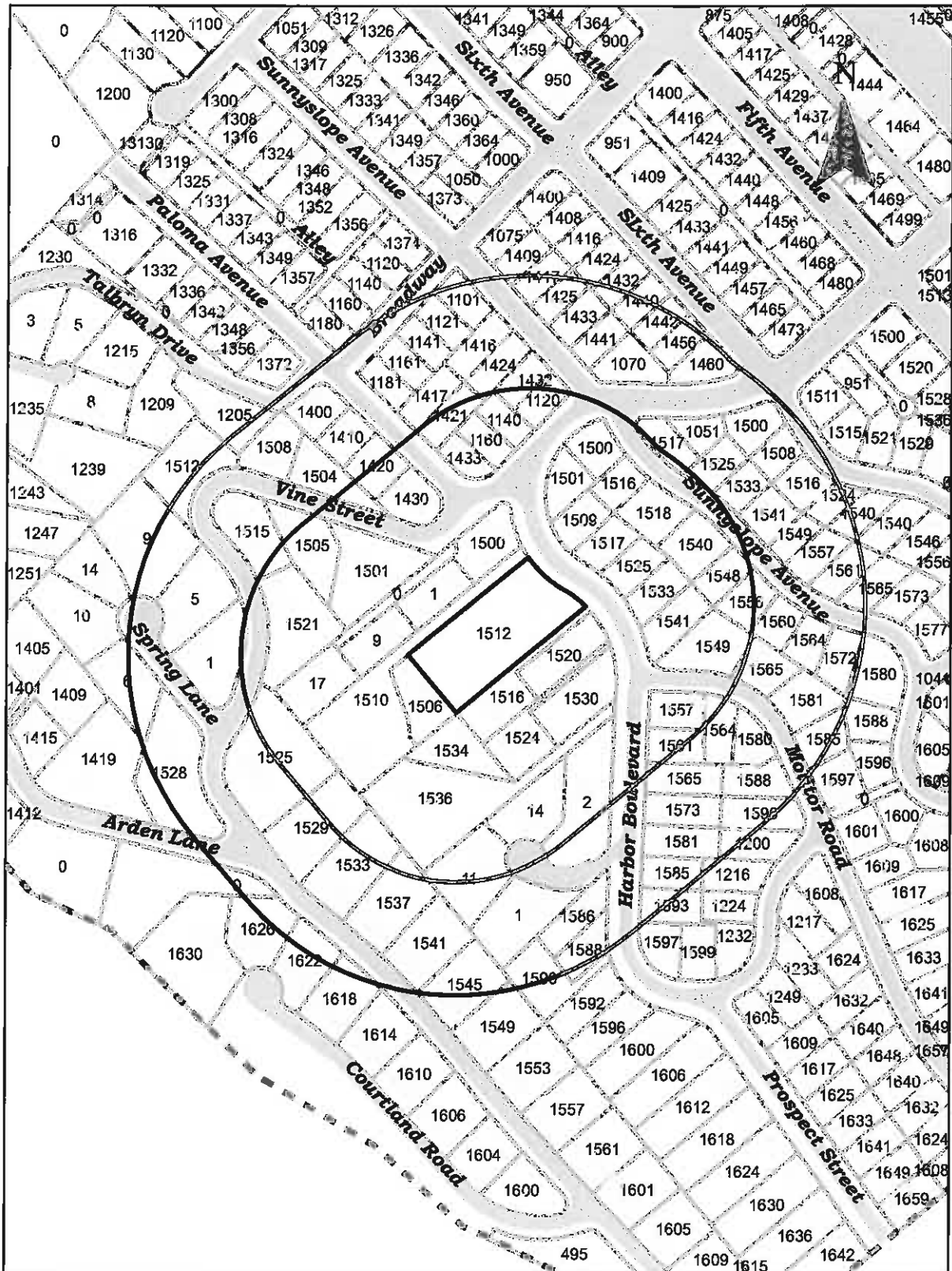
ZONING/GENERAL PLAN DESIGNATION

The proposed single-family residence is a permitted use in the designated R-1A (Single Family Residential) zoning district, and is conforming to the General Plan Designation RL - Low Density Residential.

PRIOR ACTIONS

The subject property was established as part of the “Bayview Heights” Subdivision in 1926. The existing single-family home was constructed on site in 1945. There have been no other planning projects for this property.

¹ Please note: This recommendation is made in advance of public testimony or Commission discussion of the project. At the public hearing, these two factors, in conjunction with the staff analysis, will be considered by the Commission in rendering a decision on the project.



SITE CONDITIONS

The roughly 37,000 sq. ft. subject property slopes downward approximately 8% from Harbor Boulevard to a flat building pad area at the center of the lot. Behind the building pad, the property slopes upward approximately 15% towards the rear of the lot. The site is developed with a single family dwelling, detached garage and an accessory building. The site is substantially landscaped with mature trees, grass and shrubs.

PROJECT ANALYSIS

The applicant proposes to remove an existing 363 sq. ft. accessory structure, and construct a 1,134 square foot addition (net 771 sq. ft.) to the existing single family residence on site. The home would be substantially remodeled and the existing garage would be attached to the residence. The project would consist of the following:

Floor Plans

Dwelling/Site Floor Area Summary	
Proposed Square Footage	Proposed Modifications/Additions
First Floor – 3,386 Sq. Ft.	<u>Proposed /Existing:</u> Two-car garage, living room, dining room, kitchen, open office area, utility room, open entry area, three bedrooms, and three bathrooms.
Total for Dwelling/Site = 3,386 Sq. Ft.	

Exterior Design/Materials/Colors

The proposed contemporary design would incorporate stucco siding with a partial stone veneer, painted wood beams, doors and window trim, and an asphalt shingle roof.

The proposed exterior materials and color palette would include:

Roof: Low slope – Cool Roof – Material not indicated

Exterior Walls: Integral color plaster - (off-white)

Exterior Walls: Integral color plaster feature wall- (blue)

Exterior Walls: Stone Veneer (tan and brown)

Trim/Exterior Beams: Painted wood (green)

Door and Window Frame: Wood and Metal (green)

Tree Removal / Landscaping

There are numerous regulated trees on site. The City Arborist has reviewed the project and identified twenty-seven protected trees that may be impacted by the proposed site modifications (demolition, grading, excavation, construction, etc.). The City Arborist prepared a report identifying project modifications and tree protection measures for project construction (see Attachment IV). The applicant reviewed the Arborist Report and has had an on-site meeting with the City Arborist. The applicant has modified project plans and agreed to all City Arborists recommendations for tree protections. Therefore, no protected or regulated trees are proposed to be removed, and none would require removal for the project. The landscape plan includes the following:

- Retaining the existing trees on site.
- Planting new trees along the front, right side and rear of the home (drought tolerant, locally acclimated)
- Planting new drought tolerant shrubs throughout the site.
- Replacing the existing lawn where needed.
- Installing flagstone pavers and stepping stones along the front of the home and adding gravel to the new exterior pathways.

Staff would note that the location of existing and proposed landscaping would complement the architecture of the residence, and mitigate for any potential bulk as seen from the street. However, the City Arborist has concerns regarding some planting choices. In particular, he indicates that the extensive list of new tree plantings which are mainly Japanese maples are very heavy water users requiring substantial drainage and consistent heavy irrigation water application to maintain good vigor. He recommends that all new plantings of any plant or tree material which requires moderate to heavy water, be avoided within 15 to 25 feet of a native coast live oak on site.

As such, staff is recommending a condition of approval that a final landscape plan be submitted for review and approval by the Community Development Department, in consultation with the City Arborist. Said plan would be required to incorporate the California native, or locally acclimated, drought-tolerant planting species, and the conditions outlined by the City Arborist. In addition, staff recommends the following condition for the protection of existing landscaping on site:

A photographic record of existing landscaping shall be filed with the Community Development Department prior to grading or building permit issuance. If any existing landscaping should be damaged during construction related activities, the applicant shall replace such landscaping in kind for the property, prior to issuance of a planning final.

Grading/Hardscape

Approximately 120 cubic yards of grading would be required for the project (78 cubic yards of cut and 42 cubic yards of fill). However, the applicant anticipates that the majority of the cut will be used as fill on site.

A hardscape plan is provided on Page AO.2 of the submitted plans. The proposed project would increase hardscape from the existing condition by 615 sq. ft., as shown in the following table.

Feature	Existing sq. ft. / Resulting %¹	Proposed sq. ft. / Resulting %¹	Proposed hardscape per feature (%)²
Residence ³	2,615 sq. ft. / (7.1%)	3,386 sq. ft. / (9.2%)	9.2%
Driveway	946 sq. ft. / (2.6%)	946 sq. ft. / (2.6%)	2.6%
Patios/Walkways ⁴	2,727 sq. ft. / (7.3%)	2,571 sq. ft. / (6.9%)	6.9%
Total	6,288 sq. ft. (17%)	6,903 sq. ft. (18.7%)	18.7%

¹ The resulting percentage is a running tally of total hardscape, which includes the hardscape of all previous features in the table. ² An individual hardscape percentage for each feature is found in the last column to the right. ³ Residence includes the garage and accessory building. ⁴ Runoff from the walkway would be reduced by 50% through the use of flagstone stepping stones over a pervious substrate.

The existing and proposed hardscape as a percentage of the total lot area (17% and 18.7%) would generally not be considered excessive. However, the total area of existing and proposed hardscape is fairly substantial (6,288 sq. ft. and 6,903 sq. ft.). In addition, there are areas of extraneous hardscape (i.e., hardscape not incorporated into the footprint of the home, or required for off-street parking) that could be modified to a more pervious surface. For example, the concrete along the left side of the home could be removed, and the additional parking area to the left of the garage and the patios to rear of the home could be constructed of pervious concrete and/or pavers over a pervious substrate without impacting the ability to park vehicles or the functionality of outdoor amenity areas.

As such, staff is recommending a condition of project approval that would require a final hardscape plan be submitted for review and approval by the Community Development Department, in consultation with the Department of Public Works. Said plan would need to demonstrate removal of unnecessary hardscape features, and an increase in permeability of extraneous hardscape features.

As proposed and conditioned, staff believes that the proposed grading and hardscape are not excessive in association with the addition to the existing single family home and are appropriate in the neighborhood context.

Groundwork and Geotechnical Recommendations

The applicant has submitted a Geotechnical Investigation, and response to comments letter prepared by Murray Engineers, Inc., dated October 5, 2011 and June 5, 2012. The report and letter were peer-reviewed by the City’s Consulting Geologist, Cotton, Shires & Associates, Inc., in letters dated May 9, 2012 and July 10, 2012. A copy of the report and letters are included as Attachment VI.

The geotechnical report concluded that the proposed residential development is suitable for the site from a geotechnical perspective, provided that the recommendations contained in the report are implemented in the design and construction. The City Geologist has peer reviewed the report and does not have feasibility objections to the layout of the proposed site improvements. The City Geologist has also provided recommendations for geotechnical review of final building and grading plans and field inspections during construction. All of the City Geologist recommendations have been included in the attached Conditions of Approval.

PROJECT DATA

Criteria	Existing	Proposed	Required or Max. Allowed
Lot Size	37,000 sq. ft.	No Change	No Change
Slope	8%	No Change	No Change
FAR	0.07	0.09	0.533
Square Footage	2,615 sq. ft.	3,386 sq. ft.	3,500 sq. ft.
Parking	Two car garage (19.2' x 24.3') two uncovered	Two-car garage Two uncovered	Two-car garage Two uncovered
Setbacks:			
Front	19 ft.	19 ft	15 ft
Left Side (south)	16 ft.	16 ft.	9 ft.
Right Side (north)	15 ft.	14 ft.	9 ft.
Rear	100+ ft.	100+ ft.	20 ft.
Driveway length	24 ft.	24 ft.	18 ft.
Height	16 ft.	16.7 ft.	28 ft.

GENERAL PLAN CONFORMANCE

The proposed addition for the single-family residence does not change the land use of the site. The residence is in conformance with the low-density residential general plan designation.

ZONING CONFORMANCE

The residence is in conformance with the permitted uses set out in Section 4.2.1, *Permitted Uses [in Residential Districts]*.

Section 8.1.4 of the BZO provides as follows:

There shall be provided and maintained not less than four vehicle spaces – two (2) automobile garage spaces and two (2) spaces which need not be covered – for each dwelling unit in any one or two family structure when any of the following occurs:

- *600 or more square feet of gross floor area is added to the dwelling*
- *Any floor area modification that results in a dwelling becoming 3,000 square feet or larger*
- *Any floor area modification that results in an increase in the number of bedrooms from three or fewer to four or more*
- *More than one bedroom is being added to such dwelling unit*

The proposed project would result in a home greater than 3,000 sq. ft. The existing home currently has a conforming two car garage and two uncovered parking spaces within the driveway apron. The project would alter the layout of the garage, but it would continue to maintain the minimum clearances for the parking of two vehicles. In addition, staff is recommending a standard condition of approval that would require a floor area reserve, for a garage upgrade, prior to the home reaching its maximum floor area. Thus, as proposed and conditioned, the proposed project would conform to Section 8.1.4 of the BZO.

NEIGHBORHOOD OUTREACH

The applicant reports performing neighborhood outreach by sending letters via U.S mail to all residents within 300 feet of the subject property. The applicant described the project and invited neighbors to comment at a subsequent meeting on site. The applicant reports that no negative comments were received. There have been no neighborhood comments as of the writing of this report. The applicant appears to have achieved the outreach strategy task.

ENVIRONMENTAL CLEARANCE (CEQA)

The proposed remodeled and expanded single-family home is categorically exempt from the provisions of the California Environmental Quality Act by provision of Section 15303, Class 3 (a):

“One single-family residence, or a second dwelling unit in a residential zone. In urbanized areas, up to three single-family residences may be constructed or converted under this exemption.”

The proposed addition to the residence meets the above requirements for CEQA exemption.

SINGLE FAMILY DESIGN REVIEW EVALUATION

The Belmont Zoning Ordinance establishes the following findings for review of single-family residential projects (Section 13A.5(A-H)). Each finding is listed below with staff’s analysis of whether this project meets each finding in the affirmative.

- A. *The buildings and structures shown on the site plan are located to be consistent with the character of existing development on the site and in the neighborhood, as defined; minimize disruptions of existing public views; protect the profile of prominent ridgelines.*

There are currently no public views across the site as seen from Harbor Boulevard. The design of the home includes materials (stucco siding, stone veneer, and wood trim), and a color palette (off-white, tan, green, blue) that would be consistent with the established character (earth tones, wood, stucco) of other homes in the neighborhood.

This finding can be made in the affirmative.

B. The overall site and building plans achieve an acceptable balance among the following factors:

- (1) building bulk*
- (2) grading, including*
 - (a) disturbed surface area and*
 - (b) total cubic yards, cut and fill*
- (3) hardscape, and tree removal*

Building bulk

The one-story residential structure has been designed with building offsets and a mix of colors and materials that assist in breaking the bulk and mass as seen from surrounding area. In addition, the proposed landscaping plan includes retention of several large mature trees that would serve to soften and screen the home as seen from Harbor Boulevard.

Grading/Hardscape

Approximately 120 cubic yards of grading would be required for the project (78 cubic yards of cut and 42 cubic yards of fill). However, the applicant anticipates that the majority of the cut will be used as fill on site. The existing and proposed hardscape as a percentage of the total lot area (17% and 18.7%) would generally not be considered excessive. However, the total area of existing and proposed hardscape is fairly substantial (6,288 sq. ft. and 6,903 sq. ft.). In addition, there are areas of extraneous hardscape (i.e., hardscape not incorporated into the footprint of the home, or required for off-street parking) that could be modified to a more pervious surface. For example, the concrete along the left side of the home could be removed, and the additional parking area to the left of the garage and the patios to rear of the home could be constructed of pervious concrete and/or pavers over a pervious substrate without impacting the ability to park vehicles or the functionality of outdoor amenity areas.

As such, staff is recommending a condition of project approval that would require a final hardscape plan be submitted for review and approval by the Community Development Department, in consultation with the Department of Public Works. Said plan would need to demonstrate removal of unnecessary hardscape features, and an increase in permeability of extraneous hardscape features.

As proposed and conditioned, staff believes that the proposed grading and hardscape are not excessive in association with the addition to the existing single family home and are appropriate in the neighborhood context.

Tree Removal

No protected trees are proposed for removal. Subject to conditions from the City Arborist no trees would need to be removed for the project. Therefore, as proposed and conditioned the project would be consistent with the City's Tree Ordinance.

All four factors (building bulk, grading, hardscape, and tree removal) appear to be appropriately addressed in the building design to achieve a complementary balance for the project. This finding can be made in the affirmative.

C. All accessways shown on the site plan and on the topographic map are arranged to provide safe vehicular and pedestrian access to all buildings and structures.

The existing driveway has clear access to Harbor Boulevard. Safe pedestrian access would be provided from inside the garage via an open office area into the entryway, and from the street and driveway area via a flagstone path to the front door. This finding can be made in the affirmative.

D. All proposed grading and site preparation have been adequately reviewed to protect against site stability and ground movement hazards, erosion and flooding potential, and habitat and stream degradation.

Excavation required to construct the improvements would not be excessive. The project plans have been reviewed by the Public Works Department, and all grading would be in compliance with the City's Grading Ordinance. In addition, standard conditions of approval would assure that project construction and operations do not result in off site soil or water erosion. Best Management Practices (BMP's) are a standard condition of approval which requires that soil, gravel and water do not migrate off site and cause erosion. BMP's require the use of soil and water erosion controls (i.e., waddles and storm water filtration, etc.) prior to water entering the storm drain system in order to prevent sedimentation of the storm drain system and watercourses. Grading is limited to the drier season (April 15- November 14) which also serves to prevent erosion.

Thus as proposed and conditioned, this finding can be made in the affirmative.

E. All accessory and support features, including driveway and parking surfaces, underfloor areas, retaining walls, utility services and other accessory structures are integrated into the overall project design.

An existing driveway would provide safe vehicular access to the existing home. This finding can be made in the affirmative.

F. The landscape plan incorporates:

- (1) *Native plants appropriate to the site's environmental setting and microclimate, and*
- (2) *Appropriate landscape screening of accessory and support structures, and*
- (3) *Replacement trees in sufficient quantity to comply with the standards of Section 25 (Trees) of the Belmont City Code*

The proposed landscape plan includes retention of existing trees (including mature native oak trees), and the planting of new landscaping along the front and rear of the home.

The location of existing and proposed landscaping would complement the architecture of the residence, and mitigate for any potential bulk as seen from the street. In addition, conditions of approval would require protection of existing landscaping on site, replacement of any landscaping damaged during construction, and review and approval of a final landscape plan, which incorporates California native, or locally acclimated, drought-tolerant planting species. Therefore, as proposed and conditioned, this finding can be made in the affirmative.

- G. *Adequate measures have been developed for construction-related impacts, such as haul routes, material storage, erosion control, tree protection, waste recycling and disposal, and other potential hazards.*

Review of staging areas, recycling and disposal procedures and adequacy of erosion control measures would be reviewed by the Building Division as part of the structural plan check. All construction would be completed in compliance with the California Building Code and NPDES standards as administered by the City of Belmont. This finding can be made in the affirmative.

- H. *Structural encroachments into the public right-of-way associated with the project comply with the standards of Section 22, Article 1 (Encroachments) of the Belmont City Code.*

The proposal includes no new structural encroachments into the public right-of-way. This finding can be made in the affirmative.

- I. *Substantial compliance with the Residential Design Guidelines.*

The buildings and structures shown on the site plan are consistent with the one and two story residences in the neighborhood; no public views or prominent ridgelines would be obstructed with construction of the proposed project. As proposed and conditioned, there is an acceptable balance of building bulk, grading (including disturbed surface area and total cubic yards, cut and fill), hardscape, and tree removal. There would be no obstruction of vehicular and pedestrian accessways shown on the site plan and topographical map.

All accessory and support features are integrated into the overall project design. As proposed and conditioned, the landscape plan will retain mature trees. There will be no new structural encroachments into the public right-of-way associated with construction of the project. As such, the project is in substantial compliance with the Residential Design Guidelines. This finding can be made in the affirmative.

CONCLUSION AND RECOMMENDATION

Based on the analysis and required findings, staff recommends approval of the Single-Family Design Review application with the Conditions of Approval in Attachment III.

ACTION ALTERNATIVES

1. Continue the application for redesign.
2. Deny the Single Family Design Review. The Commission will identify specific facts to support a denial, and a resolution would be returned to the Commission for final action.

ATTACHMENTS

- I. 500 foot radius map of project site (incorporated as Page 2 of report)
- II. Resolution approving the Single Family Design Review
- III. Conditions of Approval
- IV. Arborist Report
- V. Neighborhood Outreach Materials
- VI. Geotechnical Reports and Peer Reviews
- VII. Applicant's plans, materials board, and photos (Commission only)

Respectfully submitted,



Damon DiDonato
Senior Planner



Carlos de Melo
Community Development Director

RESOLUTION NO.
RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF BELMONT
APPROVING SINGLE FAMILY DESIGN REVIEW
AT 1512 HARBOR BOULEVARD (APPL. NO. 2012-0012)

WHEREAS, Geoffrey Campen from Klop Architecture, applicant, on behalf of Matthias Hausner and Davina Hurt, property owners, request Single Family Design Review approval to construct a 771 square foot addition to an existing single family residence for a total of 3,386 square feet that is below the zoning district permitted 3,500 square feet for the site; and

WHEREAS, a public hearing was duly noticed, and held on September 4, 2012, closed; and,

WHEREAS, the Planning Commission of the City of Belmont finds the project to be categorically exempt pursuant to the California Environmental Quality Act, Section 15303, and,

WHEREAS, the Planning Commission hereby adopts the staff report dated September 4, 2012 and the facts contained therein as its own findings of facts; and,

WHEREAS, the Planning Commission finds the required Single Family Design Review Findings, Section 13A.5 (A-H), are made in the affirmative as follows:

A. The buildings and structures shown on the site plan are located to be consistent with the character of existing development on the site and in the neighborhood, as defined; minimize disruptions of existing public views; protect the profile of prominent ridgelines.

There are currently no public views across the site as seen from Harbor Boulevard. The design of the home includes materials (stucco siding, stone veneer, and wood trim), and a color palette (off-white, tan, green, blue) that would be consistent with the established character (earth tones, wood, stucco) of other homes in the neighborhood. This finding is affirmed.

B. The overall site and building plans achieve an acceptable balance among the following factors:

- (1) building bulk*
- (2) grading, including
 - (a) disturbed surface area and*
 - (b) total cubic yards, cut and fill**
- (3) hardscape, and tree removal*

Building bulk

The one-story residential structure has been designed with building offsets and a mix of colors and materials that assist in breaking the bulk and mass as seen from surrounding area. In addition, the proposed landscaping plan includes retention of several large mature trees that would serve to soften and screen the home as seen from Harbor Boulevard.

Grading/Hardscape

Approximately 120 cubic yards of grading would be required for the project (78 cubic yards of cut and 42 cubic yards of fill). However, the applicant anticipates that the majority of the cut will be used as fill on site. The existing and proposed hardscape as a percentage of the total lot area (17% and 18.7%) would generally not be considered excessive. In addition, a condition of project approval that would require a final hardscape plan be submitted for review and approval by the Community Development Department, in consultation with the Department of Public Works. Said plan would need to demonstrate removal of unnecessary hardscape features, and an increase permeability of extraneous hardscape features.

Therefore, grading and hardscape elements are not excessive for the addition to the existing single family home and are appropriate in the neighborhood context.

Tree Removal

No protected or regulated trees are proposed for removal, and subject to the City Arborist's recommendations, none would need to be removed for the project. Therefore, as proposed and conditioned the project would be consistent with the City's Tree Ordinance.

All four factors (building bulk, grading, hardscape, and tree removal) appear to be appropriately addressed in the building design to achieve a complementary balance for the project. This finding is affirmed.

C. All accessways shown on the site plan and on the topographic map are arranged to provide safe vehicular and pedestrian access to all buildings and structures.

The existing driveway has clear access to Harbor Boulevard. Safe pedestrian access would be provided from inside the garage via an open office area into the entryway, and from the street and driveway area via a flagstone path to the front door. This finding is affirmed.

D. All proposed grading and site preparation have been adequately reviewed to protect against site stability and ground movement hazards, erosion and flooding potential, and habitat and stream degradation.

Excavation required to construct the improvements would not be excessive. The project plans have been reviewed by the Public Works Department, and all grading would be in compliance with the City's Grading Ordinance. In addition, standard conditions of approval would assure that project construction and operations do not result in off site soil or water erosion. Best Management Practices (BMP's) are a standard condition of approval which requires that soil, gravel and water do not migrate off site and cause erosion. BMP's require the use of soil and water erosion controls (i.e., waddles and storm water filtration, etc.) prior to water entering the storm drain system in order to prevent sedimentation of the storm drain system and watercourses.

Grading is limited to the drier season (April 15- November 14) which also serves to prevent erosion. Thus, as proposed and conditioned, this finding is affirmed.

E. All accessory and support features, including driveway and parking surfaces, underfloor areas, retaining walls, utility services and other accessory structures are integrated into the overall project design.

An existing driveway would provide safe vehicular access to the existing home. This finding is affirmed.

F. The landscape plan incorporates:

- (1) Native plants appropriate to the site's environmental setting and microclimate, and*
- (2) Appropriate landscape screening of accessory and support structures, and*
- (3) Replacement trees in sufficient quantity to comply with the standards of Section 25 (Trees) of the Belmont City Code*

The proposed landscape plan proposes retention of existing trees (including mature native oak trees), the planting new landscaping along the front and rear of the home.

The location of existing and proposed landscaping would complement the architecture of the residence, and mitigate for any potential bulk as seen from the street. In addition, conditions of approval would require protection of existing landscaping on site, replacement of any landscaping damaged during construction, and review and approval of a final landscape plan, which incorporates California native, or locally acclimated, drought-tolerant planting species. Therefore, as proposed and conditioned, this finding is affirmed.

G. Adequate measures have been developed for construction-related impacts, such as haul routes, material storage, erosion control, tree protection, waste recycling and disposal, and other potential hazards.

Review of staging areas, recycling and disposal procedures and adequacy of erosion control measures would be reviewed by the Building Division as part of the structural plan check. All construction would be completed in compliance with the California Building Code and NPDES standards as administered by the City of Belmont. This finding is affirmed.

H. Structural encroachments into the public right-of-way associated with the project comply with the standards of Section 22, Article 1 (Encroachments) of the Belmont City Code.

The proposal includes no new structural encroachments into the public right-of-way. This finding is affirmed.

I. Substantial compliance with the Residential Design Guidelines.

The buildings and structures shown on the site plan are consistent with the one and two story residences in the neighborhood; no public views or prominent ridgelines would be obstructed with construction of the proposed project. As proposed and conditioned, there is an acceptable balance of building bulk, grading (including disturbed surface area and total cubic yards, cut and fill), hardscape, and tree removal. There would be no obstruction of vehicular and pedestrian accessways shown on the site plan and topographical map.

All accessory and support features are integrated into the overall project design. As proposed and conditioned, the landscape plan will retain mature trees. There will be no new structural encroachments into the public right-of-way associated with construction of the project. As such, the project is in substantial compliance with the Residential Design Guidelines. This finding is affirmed.

WHEREAS, the Planning Commission did hear and use their independent judgment and considered all said reports, recommendations and testimony herein above set forth.

NOW, THEREFORE, BE IT RESOLVED that the Planning Commission approves the Single Family Design Review approval to construct a to construct a 771 square foot addition an existing single family residence for a total of 3,386 square feet at 1512 Harbor Boulevard, subject to the attached conditions in Exhibit "A".

* * * * *

Passed and adopted at a regular meeting of the Planning Commission of the City of Belmont held on September 4, 2012 by the following vote:

AYES, _____
COMMISSIONERS
NOES, _____
COMMISSIONERS
ABSENT, _____
COMMISSIONERS
ABSTAIN, _____
COMMISSIONERS
RECUSED, _____
COMMISSIONERS

Carlos de Melo
Planning Commission Secretary

EXHIBIT "A"

CONDITIONS OF PROJECT APPROVAL SINGLE FAMILY DESIGN REVIEW 1512 HARBOR BOULEVARD (APPL. NO. 2012-0012)

- I. COMPLY WITH THE FOLLOWING CONDITIONS OF THE COMMUNITY DEVELOPMENT DEPARTMENT:
 - A. The following conditions shall be shown on plans submitted for a building permit and/or site development permit or otherwise met prior to issuance of the first building permit (i.e., foundation permit) and shall be completed and/or installed prior to occupancy and remain in place at all times that the use occupies the premises except as otherwise specified in the conditions:

Planning Division

1. Plans submitted for building permit and all construction shall conform to the plans on file in the Planning Division for Appl. No. 2012-0012. The Director of Community Development may approve minor modifications to the plans.
2. All construction and related activities which require a City building permit shall be allowed only during the hours of 8:00 a.m. to 5:00 p.m. Monday through Friday, and 10:00 a.m. to 5:00 p.m. on Saturdays. No construction activity or related activities shall be allowed outside of the aforementioned hours or on Sundays and the following holidays: New Year's Day, President's Day, Memorial Day, 4th of July, Labor Day, Thanksgiving Day and Christmas Day. All gasoline powered construction equipment shall be equipped with an operating muffler or baffling system as originally provided by the manufacturer, and no modification to these systems is permitted.
3. Prior to issuance of building permits, the property owners shall file with the Director of Community Development, on forms provided by the City, an acknowledgment that they have read, understand and agree to these conditions of approval.
4. In accordance with the Belmont Zoning Ordinance, the permit(s) granted by this approval shall expire one (1) year from the date of approval, with said approval date indicated on the accompanying Planning Commission resolution. Any request for extension of the expiration date shall be made in accordance with the applicable provisions of the Belmont Zoning Ordinance.
5. In the event that this approval is challenged by a third party, the property owners and all assignees will be responsible for defending against this challenge, and agree to accept responsibility for defense at the request of the City. The property owners and all assignees agree to defend, indemnify and hold harmless the City of Belmont and all officials, staff, consultants and agents from any costs, claims or liabilities arising from the approval, including without limitation, any award of attorneys fees that might result from the third party challenge.

6. Prior to issuance of a Building Permit, the applicant shall submit a final hardscape plan for review and approval by the Community Development Department, in consultation with the Department of Public Works. Said plan shall demonstrate removal of unnecessary hardscape features, and an increase permeability of extraneous hardscape features.
7. Prior to issuance of a Building Permit, the applicant shall submit a final landscape/irrigation plan for review and approval by the Community Development Department in consultation with the City Arborist. The final landscape plan shall incorporate the California native, or locally acclimated, drought-tolerant planting species, and the conditions outlined by the City Arborist. The landscape plan will show all proposed plant materials, including species (with both scientific and common name), size and location. Irrigation plans shall also be provided and indicate all fixtures and control boxes. In addition to the planting pallet with common and scientific names, the landscape plan shall include California native, drought-tolerant, deer resistive, growth rate, and size/spread at maturity details for the plantings.
8. A photographic record of existing landscaping shall be filed with the Community Development Department prior to grading or building permit issuance. If any existing landscaping (shrubs and small trees) should be damaged during construction related activities, the applicant shall replace such landscaping in kind for the property prior to issuance of a planning final. Damage and/or removal of mature regulated or protected trees shall require payment of tree removal fees and replanting (and/or payment of in-lieu replanting fees).
9. During construction activities which require frequent vehicle movements onto and off of the site, such as grading and site work, the applicant shall be required to provide flag persons on each side of the to direct traffic to ensure that these vehicle movements can be done in safety.
10. The applicant shall provide a written plan for construction staging and storage areas. This information shall be submitted in conjunction with application for a building permit for City review and approval.

City Arborist

1. Pre-Construction Meeting between Project Team and Contract City Arborist (CCA):

Prior to finalization of or approval of the plans, members of the applicant's project team shall make an appointment for a pre-construction meeting with the Contract City Arborist and Staff at the Permit Center. The following items are up for discussion:

- a. Tree Protection: CCA will verify fence erection and trunk buffer installation locations with project team.
- b. Fees: Verify that tree-related fees are paid:
 - i. Monitoring fee (arborist fee) of \$3,200 plus 30% administration fee required by the City (total \$4,160) which covers monthly site inspections and letter reports throughout the life of the project from start of work until final signoff.

- ii. Tree fees: Applicant shall post a bond in the amount of the 2011-12 removal fees for trees in close proximity to proposed drain line trenching (trees #5, 6, 8, 10, 11, 12, 15 = \$12,730), unless the proposed drain pipe alignment is completely relocated, eliminated, or otherwise offset from trees such that root zone preservation is optimized (e.g. 20 feet horiz. offset).
 - iii. Impacts: Verify that the project team understands that the CCA will determine prior to final occupancy permit issuance if certain tree specimens were negatively impacted by site plan construction activity to the degree that a damage fee would be required to be paid in the amount of partial or full tree removal fees plus in-lieu fees as applicable.
- c. Staging/Storage/Ingress/Egress:

Identify all staging, storage, and ingress/egress areas. These must all be outside of the delineated TPZ fence perimeters protecting trees to be retained.

- d. Work Limits and Adjustments:

Verify the extent of driveway renovation work in relation to trees #1, 2, and #30 (e.g. depth of cut below existing surface elevation of asphalt, wall footings, curb footing, etc.). Plan to keep driveway baserock in-situ as-is to avoid damaging the root systems of these three trees.

Verify nature of grading, excavation, and landscape work in relation to root zones of trees #15, 17, 19, 20, 21.1, 22, 23, and 27 (e.g. horiz. offset of proposed work, max. depths of cut/fill, garden retaining wall footing excavation, etc.).

Determine where old footings and other existing subgrade items are proposed to be demolished near trees, and whether specific items should be remain in-ground as-is to avoid damaging tree root systems.

2. Trunk Buffer:

All twenty-seven (27) WLCA survey trees shall be provided with trunk buffers consisting of the following:

Trunk buffer shall cover the exposed lower trunk between grade elevation and approximately 10 feet above grade (or the lowest scaffold limbs). The buffer shall consist of orange plastic wrapped approximately 20 times to create a layer 2 inches thick (a single large tree uses up to 1 or 1.5 rolls of orange plastic fencing material).

Place 2X4 wood boards over the buffer, standing up side by side around the entire trunk circumference. Secure with duct tape or rope, or continue wrapping orange plastic over the wood boards and affix with UV resistant zip-ties. Do not use wires.

3. Tree Protection Fencing: Chain link

Install chain link fence per locations determined during the pre-construction meeting around all 27 WLCA survey trees. Fencing material used for all protective fences must be steel chain-link, at least five-feet in height, mounted on two-inch diameter galvanized iron posts 6-feet in length, driven a minimum of 24-inches into the ground. Posts for post and hook fencing must be mounted no wider than six-feet apart. This fence must be erected prior to any heavy machinery traffic or construction material arrival on site.

Use of free standing chain link fence panels is acceptable as an alternative. However, if using panels, the ends of each panel need to be securely wired down to 36 inch long layout stakes pounded 24 inches into the ground so that the fence alignment is non-mobile.

Fencing locations shall be per final determinations in the field during the pre-construction meeting between the general contractor and the CCA at site. See CCA's initial recommended fence routes depicted on the attached tree location map.

The protective fencing must not be temporarily moved during construction. No materials, tools, excavated soil, liquids, substances, etc. are to be placed or dumped, even temporarily, inside the TPZ/CRZ.

No storage, staging, work, or other activities will be allowed inside the TPZ.

4. Signage:

The TPZ fencing shall have one sign affixed with UV-stabilized zip ties to the chain link at eye level for every 20-linear feet of fencing, minimum 8"X11" size each, plastic laminated or otherwise waterproofed, stating:

TREE PROTECTION FENCE
DO NOT MOVE OR REMOVE WITHOUT AUTHORIZATION FROM
WALTER LEVISON, CONTRACT CITY ARBORIST (CCA)
CALL OR EMAIL 48-HRS ADVANCE FOR PERMISSION
Cell (415) 203-0990 <drtree@sbcglobal.net>

1. Root Pruning:

If any woody roots measuring 1 inch diameter or greater are encountered during site work such as drain line trenching, stop site plan work and call a qualified tree care contractor to prune roots at right angles to the root growth direction, using sharp tools such as an A/C powered Sawzall, lopper, professional pruning saw, etc. If roots are required to be left exposed for more than 24 hours, then cover with 6 layers of wet, muddy burlap. If possible, cover the root(s) completely with existing site soil and irrigate thoroughly to saturate the uppermost 24 inches of the soil profile. Cover the soil with wood chip mulch.

Call the CCA at cell 415-203-0990 immediately upon encountering the roots (prior to pruning) so that digital images of the root locations, depths, and densities can be archived.

If roots are shattered or broken, then “backdigging” protocol must be used prior to root pruning (see sample image below right).

2. Drain Line Trenching:

All drain line trenching on the west side of the site will be relocated, offset, or eliminated in such a manner that 20 feet offset can be achieved between the trench edge and the trunk edges of trees #5, 6, 8, 10, 11, 12, 15 (if possible). Alternatively, the trench could be hand-dug and all roots measuring 1 inch diameter or greater be left intact, with the drain pipe sliding through the roots (may or may not be feasible).

3. Irrigation Temporary:

Trees near to proposed subgrade work such as drain line trenching may require once or twice monthly irrigation to be supplied by a soaker hose or drip emitter line system (to be determined by the CCA).

The CCA will check soil moisture using a Lincoln probe on a once monthly basis to determine if relative soil moisture levels are adequate for proper cultural care of various individual site trees. Irrigation adjustments may be required depending on these monthly probe readings.

Ideal temporary irrigation is coupled with a 4 inch thick layer of chipper truck type wood chips lain over bare soil areas of a tree’s root zone

4. Asphalt Renovation:

Carefully peel off asphalt in such a manner as to allow old baserock to be retained with its accompanying lateral woody tree roots. Do not cut into the old baserock. Build new parking and driving surfaces up over the old baserock, using TriAx triaxial geogrid, geotextiles, and/or other materials to allow the old baserock materials to remain in-situ

5. Water Spray:

Spray off foliage of all trees using a high power garden hose to wash off both the upper and lower surfaces of foliage on all trees within 25 feet of construction. This helps keep the gas portals (stomata) unclogged for better gas exchange which is crucial for normal photosynthesis function

6. Pruning:

Retain a qualified ISA-Certified Arborist to perform pruning per current ANSI-A300 standards on an as- needed basis.

Refer to the approved vendor list in this report for local tree care contractors.

7. Guest House & Main Residence Demolition:

An arborist monitor such as the CCA and/or the project arborist shall be present on site during key periods such as demolition of existing structures in very close proximity to trees being retained (e.g. trees #5, 6, 7, 8, 10, 11, 24, 25, 26, 33, 34).

Allow footings and other subgrade elements to remain as-is in-situ if the CCA or project arborist determines that removal of the item(s) is/are a risk to the woody root systems of trees being retained (discuss during pre-construction meeting).

8. Landscape Development:

All new irrigation pipe trenching, electrical conduit (low voltage and 120V), and other subgrade items shall be offset 20 to 25 horizontal feet from the trunk edges of all existing trees being retained at site.

All proposed new plantings of high water use plants near dry-summer type oaks (e.g. native coast live oaks) shall be eliminated, and a buffer zone 15 to 25 horizontal feet be established between the trunk edges of oaks #10, 11, 12, and new plantings.

City Geologist

1. The applicant's geotechnical consultant shall review and approve all geotechnical aspects of the project building and grading plans (i.e., site preparation and grading, site drainage improvements and design parameters for foundations, retaining walls and driveway) to ensure that their recommendations have been properly incorporated. The results of the plan review should be summarized by the geotechnical consultant in a letter and submitted to the City Engineer prior to issuance of permits for project construction.
2. The geotechnical consultant should inspect, test (as needed), and approve all geotechnical aspects of the project construction. The inspections shall include, but not necessarily be limited to: site preparation and grading, site surface and subsurface drainage improvements, and excavations for foundations and retaining walls prior to the placement of steel and concrete. The results of these inspections and the as-built conditions of the project shall be described by the geotechnical consultant in a letter and submitted to the City Engineer for review prior to final (as-built) project approval.

Building Division

- A. The following conditions shall be shown on plans submitted for a building permit and/or site development permit or otherwise met prior to issuance of the first building permit (i.e., foundation permit) and shall be completed and/or installed prior to occupancy and remain in

place at all times that the use occupies the premises except as otherwise specified in the conditions.

1. Plans shall conform to approved project plans, and all of the requirements of the California Building Code.
- B. The following conditions shall be met prior to the issuance of the first building permit (i.e., foundation permit) and/or site development permits except as otherwise specified in the conditions.
1. Obtain all required permits.
 2. This project is subject to the School Facilities Fee. Proof of payment must be presented to the City of Belmont before the permit will be issued. Contact the Sequoia Union School District directly for further information.
 3. The City of Belmont is located in a region once inhabited by Native Americans. A significant archaeological site has been formally identified at the Northeast quadrant of the City. Human remains and artifacts have been discovered elsewhere within the city limits. Consequently, please amend the cover sheet of the plans to state in the event human remains are discovered work will be stopped and the County Coroner will be contacted immediately. In addition, it is a violation of Public Resources Code 5097.99 to retain any Native American Artifacts. Health and Safety Code 7050.5.
 4. This project is subject to the Green Building Ordinance. Based upon the scope of work, the project is required to achieve a compliance level of 70 Build it Green points using the New Home Checklist.
 5. Provide a record of survey.
 6. Post hours of operation and phone numbers for noise complaints.
 7. Provide space for recycling containers.
 8. Provide list of construction and demolition recycling service providers.
 9. Require contractors and subcontractors to make good faith effort to contact construction and demolition recycling providers.
 10. Notify all contractors and subcontractors of Belmont expectations of maximizing diversion of solid waste.
 11. Investigate opportunities for salvaging material for reuse.

12. Specify that the 2009 IBC, 2009 UPC, 2009 UMC and 2008 NEC as amended by the State of California and all applicable City of Belmont ordinances will be employed during this project.

II. COMPLY WITH THE FOLLOWING CONDITIONS OF THE PUBLIC WORKS DEPARTMENT:

- A. The following conditions shall be shown on plans submitted for a building permit and/or site development permit or otherwise met prior to issuance of the first building permit (i.e., foundation permit) and shall be completed and/or installed prior to occupancy and remain in place at all times that the use occupies the premises except as otherwise specified in the conditions.

1. Streets, sidewalks and curbs in need of repair within and bordering the project shall be repaired and/or removed and replaced in accordance with the Department of Public Works approved standards. Photographs or video of before condition are recommended.
2. New curb and gutter shall be installed in accordance with the Department of Public Works approved standards.
3. Roof leaders and site drainage shall be directed to the City stormwater drainage system. A dissipator box or other energy reduction method shall be used.
4. Roof downspout systems shall be designed to drain into designated, effective infiltration areas or structures (refer to the Bay Area Stormwater Management Agencies Association (BASMAA) Start at the Source Design Guidance Manual for Stormwater Quality Protection [available from BASMAA @ 510-622-2465]).
5. Wastewater from vehicle and equipment washing operations shall not be discharged to the storm drain system. Any wastewater discharges to the sanitary sewer are subject to approval by the Public Works Department.
6. Wastewater generated from the installation, cleaning, treating, and washing of the surface of copper features, including copper roof, shall be discharged to the sanitary sewers or landscaping or collect/haul off-site.

- B. The following conditions shall be met prior to the issuance of the first building permit (i.e., foundation permit) and/or site development permits except as otherwise specified in the conditions.

1. The property owner/applicant shall apply for and obtain temporary encroachment permits from the Department of Public Works for work in the City public right-of-way, easements or property in which the City holds an interest, including driveway, sidewalk, sewer connections, sewer clean-outs, curb drains, storm drain connections, placement of a debris box.
2. Property owner/applicant shall apply for and obtain a grading permit from the Department of Public Works. The grading permit fee is based on the total amount of earth moved including cut and fill.

3. Verify location of utility meters, valves, back flow preventers, and hydrants with appropriate utility company. Show relationship of each to site improvements, such as retaining walls.
4. The owner/applicant shall submit a grading plan prepared by a California-registered Civil Engineer in accordance with City Grading Ordinance, Chapter 9, Section 3 of the City Code, with a grading permit application, for approval by the Department of Public Works and Building Division prior to any grading or clearing being performed on-site.
 - a. The applicant should note that if the proposed grading meets one or more of the criteria outlined in Section 9-23 of the City Code, a Planning Commission review will be required. Caution: If the total grading quantity changes after Planning Commission approval, a new grading approval may be required. The applicant may choose to complete the grading plan and calculations early in the planning process to limit delays in scheduling this review. (See Section 9-28 of City Code for review process). The plan shall incorporate the following restrictions:
 - b. All soils stockpiled on the site during construction shall be covered or otherwise protected from wind and water erosion.
 - c. During construction, erosion and sedimentation control plans shall be implemented in order to retain sediments on-site.
 - d. Site grading and finished construction shall be designed and executed in such a manner as to avoid diverting runoff onto other properties.
 - e. Restrictions and recommendation of the Geologic and Soils report as approved by the City's Geologist.
5. The owner/applicant shall submit a dust control plan for approval by the Department of Public Works. To reduce dust levels, exposed earth surfaces shall be watered as necessary. The application of water shall be monitored to prevent runoff into the storm drain system. Spillage resulting from hauling operations along or across any public or private property shall be removed immediately. Dust nuisances originating from the contractor's operations, either inside or outside of the right-of-way shall be controlled. The measures shall also include:
 - a. Water all active construction sites at least twice daily.
 - b. Cover all trucks hauling soil, sand, and other loose materials or require all trucks to maintain at least two feet of freeboard.
 - c. Pave, apply water three times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking areas, and staging areas at construction sites.
 - d. Sweep daily (with water sweepers) all paved access roads, parking areas and staging areas at construction sites.
 - e. Sweep streets daily (with water sweepers) if visible soil material is carried onto adjacent public streets.

- f. Hydroseed or apply (non-toxic) soil stabilizers to inactive construction areas (previously graded areas inactive for ten days or more).
 - g. Enclose, cover, water twice daily, or apply non-toxic soil binders to exposed stockpiled materials.
 - h. Install sandbags or other erosion-control measures to prevent silt runoff to public roadways.
 - i. Replant vegetation in disturbed areas as quickly as possible.
 - j. Watering should be used to control dust generation during the break-up of pavement.
 - k. Cover all trucks hauling demolition debris from the site.
 - l. Use dust-proof chutes to load debris into trucks whenever feasible.
 - m. Water or cover stockpiles of debris, soil, sand or other materials that can be blown by the wind.
 - n. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be in proper running order prior to operation.
 - o. Diesel powered equipment shall not be left inactive and idling for more than five minutes, and shall comply with applicable BAAQMD rules.
 - p. Use alternative fueled construction equipment, if possible.
 - q. All vehicle speeds on unpaved roads shall be limited to 15 mph.
 - r. Post a visible sign with the telephone number and person to contact at the Lead Agency regarding dust complaints. This person shall respond and take corrective action within 24 hours. The Air District phone number shall also be visible to ensure compliance with applicable regulations.
6. The owner/applicant shall perform a video inspection of the sewer lateral from the house/building to the sewer main, submit the inspection to the Department of Public Works for review and make any necessary repairs to the lateral. This condition is required for: a) any remodeling/addition project with a cost of \$50,000 or more; b) addition of bedroom, bathroom, faucet/drain/sink in regardless of the total cost.
7. The applicant shall submit an erosion and sedimentation control plan describing Best Management Practices (BMPs) to be used to prevent soil, dirt, and debris from entering the storm drain system. The plan shall include the following items:
- a. A site plan showing the property lines, existing and proposed topography, and slopes; areas to be disturbed, locations of cut/fill and soil storage/disposal area; areas with existing vegetation to be protected; existing and proposed drainage patterns and structures; watercourses or sensitive areas on-site or immediately downstream of project; and designated construction access routes, staging areas and washout areas.
 - b. Erosion and sediment controls to be used during construction, selected as appropriate from the California Regional Water Quality Control Board, San Francisco Bay Region Erosion and Sedimentation Control Field Manual (available from: Friends of the San Francisco Estuary, P.O. Box 791, Oakland, CA 94604-0791).

- c. Methods and procedures to stabilize denuded areas and install and maintain temporary erosion and sediment control continuously until permanent erosion controls have been established.
 - d. Provision for preventing erosion and trapping sediment on-site, such as sediment basins or traps, earthen dikes or berms, fiber rolls, silt fence, check dams, storm drain inlet protection, soil blankets or mats, covers for soil stock piles and/or other measures.
 - e. Provisions for installing vegetative cover in disturbed areas, including areas to be seeded, planted, and/or mulched, and types of vegetation proposed.
 - f. Provision for diverting on-site runoff around exposed areas and diverting off-site runoff around the project site (e.g., swales and dikes).
 - g. Notes, specifications, and/or attachments describing the construction, operation and maintenance of erosion and sediment control measures, including inspection frequency; methods and schedule for grading, excavation, filling clearing of vegetation and storage and disposal of excavated or cleared material; types of vegetative cover and mulch, including methods and schedules for planting and fertilization; and provisions for temporary and permanent irrigation.
8. All plans shall conform to the requirements of the City NPDES stormwater discharge permit and the San Mateo Stormwater Pollution Prevention Plan (STOPPPP). The project plans shall include permanent storm water quality protection measures. The project plans shall identify Best Management Practices (BMPs) appropriate to the uses to be conducted on-site to effectively prohibit the discharge of pollutants with storm water run-off.
9. No wastewater (including equipment cleaning wash water, vehicle wash water, cooling water, air conditioner condensate, and floor cleaning washwater) shall be discharged to the storm drain system, the street or gutter.
- C. The following conditions shall be met prior to occupancy except as otherwise specified in the conditions.
1. After the City permits are approved but before beginning construction, the owner/applicant shall hold a preconstruction conference with Building and Public Works Department staff and other interested parties. The developer shall arrange for the attendance of the construction manager, contractor, and all subcontractors who are responsible for grading and erosion and sedimentation protection controls.
 2. Failure to comply with any permit condition may result in a “Stop Work” order or other penalty.
 3. All construction and related activities which require a City permit shall be allowed only during the hours of 8:00 a.m. to 5:00 p.m., Monday through Friday and 10:00 a.m. to 5:00 p.m., Saturdays. No construction activity or related activities shall be allowed outside of the aforementioned hours or on Sundays and the following holidays: New Year’s Day, President’s Day, Memorial Day, 4th of July, Labor Day, Thanksgiving Day and Christmas Day. All gasoline powered construction equipment shall be equipped with an operating muffler or baffling system as originally provided by the manufacturer, and no modification to these systems is permitted.

4. As-built" drawings for any public improvement including streets, sewers, etc. shall be submitted to the City in AutoCAD on CD ROM.
5. Grading shall be performed in accordance with the City Grading Ordinance, Chapter 9 of the City Code. Soil or other construction materials shall not be stockpiled in the public right-of-way unless an encroachment permit is obtained from the Department of Public Works. Grading shall neither be initiated nor continued between November 15 and April 15. Grading shall be done between the hours of 8:00 a.m. and 5:00 p.m., Monday through Friday unless otherwise specifically authorized by the Director of Public Works. The Stormwater Pollution Prevention Program Best Management Practices (BMPs) for construction shall be implemented to protect water quality.
6. The owner/applicant shall ensure that applicable Best Management Practices (BMPs) from the San Mateo Stormwater Pollution Prevention Program (STOPPP) are followed to prevent discharge of soil or any construction material into the gutter, stormdrain system or creek.
7. The owner/applicant shall ensure that all construction personnel follow standard BMPs for stormwater quality protection during construction of project. These includes, but are not limited to, the following:
 - a. Store, handle and dispose of construction materials and wastes properly, so as to prevent their contact with stormwater.
 - b. Control and prevent the discharge of all potential pollutants, including solid wastes, paints, concrete, petroleum products, chemicals, washwater or sediment, and non-stormwater discharges to storm drains and watercourses.
 - c. Use sediment controls, filtration, or settling to remove sediment from dewatering effluent.
 - d. Do not clean, fuel, or maintain vehicles on-site, except in a designated area in which runoff is contained and treated.
 - e. Delineate clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses with field markers or fencing.
 - f. Protect adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching or other measures as appropriate.
 - g. Perform clearing and earth moving activities only during dry weather (April 15 through November 14).
 - h. Limit and time applications of pesticides and fertilizers to prevent polluted runoff.
 - i. Limit construction access routes and stabilize designated access points.
 - j. Do not track dirt or other materials off-site; clean off-site paved areas and sidewalks using dry sweeping methods.
8. If construction is not complete by the start of the wet season (November 15 through April 15), prior to November 15 the developer shall implement a winterization program to

minimize the potential for erosion and sedimentation. As appropriate to the site and status of construction, winterization requirements shall include inspecting/maintaining/cleaning all soil erosion and sedimentation controls prior to, during, and immediately after each storm event; stabilizing disturbed soils through temporary or permanent seeding, mulching, matting, tarping or other physical means; rocking unpaved vehicle access to limit dispersion of mud onto public right-of-way; covering/tarping stored construction materials, fuels, and other chemicals. Plans to include proposed measures to prevent erosion and polluted runoff from all site conditions. As site conditions warrant, the Department of Public Works may direct the developer to implement additional winterization requirements.

D. Conditions required on Building Permit Plans

1. New driveway approach shall be constructed and indicated on Building Permit plans.
2. Driveway slope shall be indicated on Building Permit plans.
3. Staging area shall be indicated on Building Permit plans.

III. COMPLY WITH THE FOLLOWING CONDITIONS OF THE POLICE DEPARTMENT

1. All activities shall be subject to the requirements of the Belmont Noise Ordinance.
2. No debris boxes or building materials shall be stored on the street.
3. Flag persons shall be positioned at both ends of blocked traffic lanes.
4. 24-hour written notice to the Police Department is required before any lane closure.

IV. COMPLY WITH THE REQUIREMENTS OF THE BELMONT FIRE DEPARTMENT:

1. Address numbers shall be provided on the main dwelling, or located on the property where clearly visible from the street upon which it fronts. Address numbers shall be illuminated Arabic numerals or alphabet letters.
2. Based upon Section R313 of the 2010 CRC the building is required to be provided with an automatic fire sprinkler system designed in accordance with CRC313 and 2010 Ed - NFPA 13-D.
3. A spate submittal and permit is required for the fire sprinkler system. Application shall be made by either a registered engineer or by a licensed fire sprinkler contractor who will be performing the work.
4. All underground fire service lines shall be pressure tested and flushed prior to connecting to the fire sprinkler riser, and witnessed by the fire inspector.

5. No fire sprinkler system shall be concealed within any permanent construction without prior approval of both the building and fire inspectors.

Certification of Approved Final Conditions:

Damon DiDonato
Senior Planner

Date

Attachment IV

Arborist Report



Walter Levison
CONSULTING ARBORIST



PNW-ISA Certified Tree Risk Assessor #593

ASCA Registered Consulting Arborist #401

ISA Certified Arborist #WC-3172

**Assessment of and recommendations for 27 protected trees
at
1512 Harbor
Belmont, California**

Prepared at the Request of:

**Damon DiDonato, Senior Planner
Planning and Community Development Department
1 Twin Pines Lane, Suite 310
Belmont, CA 94002**

Site Visit:

Walter Levison, Contract City Arborist (CCA)

4/27/2012

Report:

(CCA)

5/1/2012



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Attached:

Tree Data Charts, 5 Pages (WLCA)
Tree Location Map (Klopf Architecture)



1 Assignment and Background

Walter Levison, Contract City Arborist (CCA), otherwise known as "WLCA", was requested by Mr. Damon DiDonato, Senior Planner, to assess and comment in writing on protected trees near proposed site plan construction elements at 1512 Harbor. There are 27 protected size trees in close proximity to proposed work, some of which will be severely negatively affected by the work if performed as currently proposed on the April 2012 set of plans.

The author (WLCA) visited the site on 4/27/2012 to tag trees with permanent aluminum numbered tags which correspond to the tree numbers noted on applicant sheet A0.1 "Landscape/Tree Plan" dated 4/2/2012. Note however that tree #8, a very large sweetgum specimen, is noted on the plans as tree #9 (the applicant accidentally transposed the locations of trees #8 and #9).

Tree data charts attached to this report include standard arboriculture data, as well as additional information such as impacts from proposed work, suggested adjustments to the site plan to mitigate some damages, notes on pests, diseases, and other issues, and suggested protection and maintenance items required to be performed prior to commencement of site plan work. This document is therefore a valuable tool for Staff and for site contractor(s) as a reference for all tree maintenance and protection needs.

The summary section of this report consists mainly of two useful matrices below: a tree disposition matrix, and a tree impact matrix which illustrates all foreseeable tree impacts in relation to proposed site plan work, and suggested mitigation measures designed to optimize root zone preservation. These matrices are a quick reference for Staff and for the Project Team.

Full recommendations for maintaining and protecting individual trees are found in the mitigation section of this report. These are designed to guide planning department staff and planning commissioners throughout the decision-making process, as well as provide written documentation for contractors involved with tree preservation measures for this site. These mitigation items are considered the planning division conditions of project approval (COA), and will be deemed so if itemized by Staff in the official Staff report for this project and approved by commission vote.

Tree protection inspections will be performed by the CCA before, during, and after initiation of the site plan project (at the discretion of the planning director). The demolition, grading, and building permits will not be issued without prior city arborist inspection and approval of site tree protection measures.



2 Summary

2.1 Tree Disposition Matrix

Item	Total Number of Trees	Tree Tag Numbers	Removal Fees (if removed)
Protected trees total (near construction).	27	1, 2, 3, 5, 6, 8, 10, 11, 12, 15, 16, 17, 19, 20, 21.1, 22, 23, 24, 25, 26, 27, 29, 30, 33, 34, 35, 36.	(See attached tree data charts for individual tree removal fees).
Protected trees to be potentially impacted per site plan.	27	(Same as above)	(See attached tree data charts for individual tree removal fees).

2.2 Impact Mitigation Matrix

Impact Expected	Trees Tag Numbers Potentially Affected	Suggested Mitigation
Driveway renovation (grading, excavation, curbs, walls, etc.)	#1, 2, 30	Use trunk buffer and tree protection fencing (chain link only). Scarify or peel existing asphalt with arborist monitor present. Do not cut down through the baserock layer, as it likely contains tree roots coursing through this shallow, oxygenated zone. Build new driveway surfacing up over existing baserock layer elevations.



Impact Expected	Trees Tag Numbers Potentially Affected	Suggested Mitigation
Drain line trenching	#5, 6, 8, 10, 11, 12, 15	<p>Adjust drain line routes to be tightlined against the new residence foundation footprint, with a minimum horizontal separation of 15 to 20 feet out from tree trunk edges where possible.</p> <p>Sections of the drain line trench where the above-noted minimum horizontal separation cannot be met (e.g. near trees #5, 6, 8) may require hand-digging with arborist monitoring such that roots measuring 1 inch or greater in diameter are retained in the trench.</p> <p>Alternatively, drain line alignments can be completely relocated or eliminated to achieve the required minimum separation.</p>
Grading/Excavation/Landscape Work	#15, 17, 19, 20, 21.1, 22, 23, 27	<p>Redesign or adjust proposed site plan elements with arborist input to optimize preservation of root zone areas large enough to support safe, healthy growth of individual tree specimens identified at left.</p>



Impact Expected	Trees Tag Numbers Potentially Affected	Suggested Mitigation
Demolition of Existing Main Residence and Guest House	#5, 6, 8, 10, 11, 24, 25, 26, 33, 34, 35, 36	<p>Install trunk buffers and chain link tree protection fencing prior to start of any work at site.</p> <p>Identify areas where demolition will involve removal of subgrade foundation footings and/or other items that could potentially damage or destroy the root systems of trees noted at left.</p> <p>Determine method(s) of mitigating these potential damages accordingly (e.g. allowing subgrade footings to remain in-situ instead of demolishing them, etc.)</p>

2.3 Monitoring Fees

The applicant will need to deposit an arborist monitoring fee plus a 30% administration fee per City requirement, prior to issuance of permits. The arborist fee is the contract rate for monitoring construction and preparing monthly reports for trees expected to be retained and protected at the site in close proximity to the work area as delineated on the current site plan submittal.

Total fee for monitoring and reporting on 27 trees (2004 contract rate): \$3,200 X 1.3 = \$4,160.

2.4 Landscape Plan Issues

The applicant has submitted a landscape plan sheet A0.1 dated 4/2/2012. This sheet shows an extensive list of "new tree plantings" which are mainly Japanese maples (*Acer palmatum* cultivars), and notes them as "moderate water" users. In my experience, Japanese maples are very heavy water users requiring excellent drainage and consistent heavy irrigation water application to maintain good vigor.

This issue is somewhat important, as three (3) of the tree cultivars on this list of proposed new trees/plants are proposed to be installed in close proximity to dry-summer soil regime type coast live oaks #10, 11, and #12 being retained and protected along the west boundary of the site.

A solution to this issue would be to avoid all new plantings of any plant or tree material which requires moderate to heavy water, within 15 to 25 feet of a native coast live oak on site (see the landscape issue matrix below):



Landscape Plan Issue	Existing Trees Affected	Suggested Mitigation
Moderate to heavy water use plants and trees (e.g. camellia, Japanese maple, saucer magnolia) proposed to be installed near dry-summer type existing coast live oaks.	Coast live oaks #10, 11, 12	Eliminate all plantings and irrigation line trenching within 15 feet of these three trees, in order to maintain a dry-summer type soil moisture regime around native oaks.
Canopy dimensions of existing trees are portrayed smaller than actual	(Various)	No action required, though trees such as oak #12 should be shown with actual dripline dimension drawn on plan sheets to determine if there are canopy conflicts with demolition of existing residence.

3 Protected Trees

Protected trees are defined in the new 2011-12 Belmont tree ordinance as all trees with trunk diameter(s) totaling 10 inches or greater at 4.5 feet above grade.

There are no exceptions for junk species or poor tree condition for trees situated on land proposed for development/entitlements.

Removal of any protected tree (10 inches and greater in diameter , single or multi-stem total) requires a removal fee based on the chart in the City's 2011-12 Master Fee Schedule.

In addition, removal of protected trees may or may not require mitigation at up to a 3:1 ratio using 15 gallon or 24" box size native oaks or other approved species, or an in-lieu fee of up to (\$497X3 plantings=\$1,491) per single protected tree removed, at the discretion of the planning commission.



4 City of Belmont Master Fee Schedule 2011-12

**CITY OF BELMONT
MASTER REVENUE SCHEDULE
EFFECTIVE JULY 1, 2011**

8. TREE REMOVAL FEES- DEVELOPMENT PROJECTS OR GENERAL PROPERTY MAINTENANCE

Tree removal fees are assessed for the removal of trees required for the development or general maintenance of property. They are collected to mitigate the loss of trees from the City's tree population. Fees are deposited in the City Tree Planting and Establishment Fund.

FEE BASIS:

<u>Tree Size (DBH)</u>	<u>Protected Trees</u>	<u>All Other Species</u>
24" or greater	\$4,968	\$2,484
18" but less than 24"	\$3,725	\$1,241
10" but less than 18"	\$2,484	\$932
6" but less than 10"	\$1,241	\$621
Less than 6"	No Fee	No Fee

NOTES:

- Protected Trees as defined in Chapter 25 of the City Code include: Oaks (all species), Bay, California Buckeye, Monterey Cypress, Coast Redwood, Giant Sequoia and Madrone.
- All Other Species include all other trees except: Acacia (all species), Eucalyptus globulus, Eucalyptus globulus "Compacta" and Monterey Pine.
- Tree size is defined by diameter at breast height (DBH), which means the diameter (at the widest point) of the tree trunk measured at 4.5 feet above natural grade. In the case of multiple stemmed trees, the measurement shall be the sum of the diameter of all stems measured at DBH.
- Payment shall be made prior to the issuance of a grading permit. If no grading permit is required, payment shall be made prior to the issuance of a building permit. If no building permit is required, payment shall be made prior to removal of any protected tree.

9. TREE PLANTING IN-LIEU FEES - DEVELOPMENT OR GENERAL MAINTENANCE PROJECTS

When a requirement to plant trees on the subject property cannot be met, the applicant shall pay a tree planting in-lieu fee to the City Tree Planting and Establishment Fund.

FEE BASIS

<u>Size of Tree to be Planted</u>	<u>In-lieu Fee</u>
24" Box	\$497

10. PUBLIC NOTICE FEE

\$285



5 Suggested Conditions of Approval

Directions to Staff or Contract Staff associated with this project:

Please enter the following into the Belmont CRW PermitTrack file for this project to prevent permit issuance prior to the City Arborist's evaluation of initial tree protection measures at the site:

'STATUS' field: 'HOLD'

'REMARKS' field: 'PENDING INITIAL TREE PROTECTION INSPECTION AND SIGNOFF'

1. Pre-Construction Meeting between Project Team and Contract City Arborist (CCA):

Prior to finalization of or approval of the plans, members of the applicant's project team shall make an appointment for a pre-construction meeting with the Contract City Arborist and Staff at the Permit Center. The following items are up for discussion:

- a. Tree Protection: CCA will verify fence erection and trunk buffer installation locations with project team.

b. Fees:

Verify that tree-related fees are paid:

- i. Monitoring fee (arborist fee) of \$3,200 plus 30% administration fee required by the City (total \$4,160) which covers monthly site inspections and letter reports throughout the life of the project from start of work until final signoff.
- ii. Tree fees: Applicant shall post a bond in the amount of the 2011-12 removal fees for trees in close proximity to proposed drain line trenching (trees #5, 6, 8, 10, 11, 12, 15 = \$12,730), unless the proposed drain pipe alignment is completely relocated, eliminated, or otherwise offset from trees such that root zone preservation is optimized (e.g. 20 feet horiz. offset).
- iii. Impacts: Verify that the project team understands that the CCA will determine prior to final occupancy permit issuance if certain tree specimens were negatively impacted by site plan construction activity to the degree that a damage fee would be required to be paid in the amount of partial or full tree removal fees plus in-lieu fees as applicable.

c. Staging/Storage/Ingress/Egress:

Identify all staging, storage, and ingress/egress areas. These must all be outside of the delineated TPZ fence perimeters protecting trees to be retained.

d. Work Limits and Adjustments:



Verify the extent of driveway renovation work in relation to trees #1, 2, and #30 (e.g. depth of cut below existing surface elevation of asphalt, wall footings, curb footing, etc.). Plan to keep driveway baserock in-situ as-is to avoid damaging the root systems of these three trees.

Verify nature of grading, excavation, and landscape work in relation to root zones of trees #15, 17, 19, 20, 21.1, 22, 23, and 27 (e.g. horiz. offset of proposed work, max. depths of cut/fill, garden retaining wall footing excavation, etc.).

Determine where old footings and other existing subgrade items are proposed to be demolished near trees, and whether specific items should be remain in-ground as-is to avoid damaging tree root systems.

PRE-PROJECT ITEMS

2. Trunk Buffer:

All twenty-seven (27) WLCA survey trees shall be provided with trunk buffers consisting of the following:

Trunk buffer shall cover the exposed lower trunk between grade elevation and approximately 10 feet above grade (or the lowest scaffold limbs). The buffer shall consist of orange plastic wrapped approximately 20 times to create a layer 2 inches thick (a single large tree uses up to 1 or 1.5 rolls of orange plastic fencing material).

Place 2X4 wood boards over the buffer, standing up side by side around the entire trunk circumference. Secure with duct tape or rope, or continue wrapping orange plastic over the wood boards and affix with UV resistant zip-ties. Do not use wires. See sample images at right.

3. Tree Protection Fencing:

Chain link

Install chain link fence per locations determined during the pre-construction meeting around all 27 WLCA survey trees. Fencing material used for all protective fences must be steel chain-link, at least five-feet in height, mounted on two-inch diameter galvanized iron posts 6-feet in length, driven a minimum of 24-inches into the ground. Posts for post and hook fencing must be mounted no wider than six-feet apart. This fence must be erected prior to any heavy machinery traffic or construction material arrival on site.

Use of free standing chain link fence panels is acceptable as an alternative (see images below right). However, if using panels, the ends of each panel need to be securely wired down to 36 inch long layout stakes pounded 24 inches into the ground so that the fence alignment is non-mobile.





Fencing locations shall be per final determinations in the field during the pre-construction meeting between the general contractor and the CCA at site. See CCA's initial recommended fence routes depicted on the attached tree location map.

The protective fencing must not be temporarily moved during construction. No materials, tools, excavated soil, liquids, substances, etc. are to be placed or dumped, even temporarily, inside the TPZ/CRZ.

No storage, staging, work, or other activities will be allowed inside the TPZ.



4. Signage:

The TPZ fencing shall have one sign affixed with UV-stabilized zip ties to the chain link at eye level for every 20-linear feet of fencing, minimum 8"X11" size each, plastic laminated or otherwise waterproofed, stating:

TREE PROTECTION FENCE

DO NOT MOVE OR REMOVE WITHOUT AUTHORIZATION FROM
WALTER LEVISON, CONTRACT CITY ARBORIST (CCA)

CALL OR EMAIL 48-HRS ADVANCE FOR PERMISSION

Cell (415) 203-0990 <drtree@sbcglobal.net>

DURING-PROJECT ITEMS

5. Root Pruning:

If any woody roots measuring 1 inch diameter or greater are encountered during site work such as drain line trenching, stop site plan work and call a qualified tree care contractor to prune roots at right angles to the root growth direction, using sharp tools such as an A/C powered Sawzall, lopper, professional pruning saw, etc. If roots are required to be left exposed for more than 24 hours, then cover with 6 layers of wet, muddy burlap. If possible, cover the root(s) completely with existing site soil and irrigate thoroughly to saturate the uppermost 24 inches of the soil profile. Cover the soil with wood chip mulch. See image at right for example of correct root pruning.





Call the CCA at cell 415-203-0990 immediately upon encountering the roots (prior to pruning) so that digital images of the root locations, depths, and densities can be archived.

If roots are shattered or broken, then "backdigging" protocol must be used prior to root pruning (see sample image below right).

6. Drain Line Trenching:

All drain line trenching on the west side of the site will be relocated, offset, or eliminated in such a manner that 20 feet offset can be achieved between the trench edge and the trunk edges of trees #5, 6, 8, 10, 11, 12, 15 (if possible). Alternatively, the trench could be hand-dug and all roots measuring 1 inch diameter or greater be left intact, with the drain pipe sliding through the roots (may or may not be feasible).

7. Irrigation Temporary:

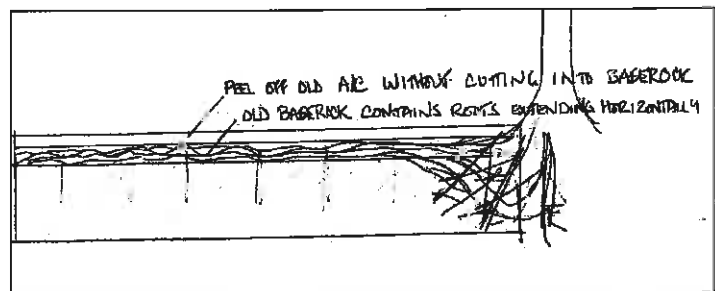
Trees near to proposed subgrade work such as drain line trenching may require once or twice monthly irrigation to be supplied by a soaker hose or drip emitter line system (to be determined by the CCA).

The CCA will check soil moisture using a Lincoln probe on a once monthly basis to determine if relative soil moisture levels are adequate for proper cultural care of various individual site trees. Irrigation adjustments may be required depending on these monthly probe readings.

Ideal temporary irrigation is coupled with a 4 inch thick layer of chipper truck type wood chips lain over bare soil areas of a tree's root zone (see images at right).

8. Asphalt Renovation:

Carefully peel off asphalt in such a manner as to allow old baserock to be retained with its accompanying lateral woody tree roots. Do not cut into the old baserock. Build new parking and driving surfaces up over the old baserock, using TriAx triaxial geogrid, geotextiles, and/or other materials to allow the old baserock materials to remain in-situ (see sketch at right).





9. Water Spray:

Spray off foliage of all trees using a high power garden hose to wash off both the upper and lower surfaces of foliage on all trees within 25 feet of construction. This helps keep the gas portals (stomata) unclogged for better gas exchange which is crucial for normal photosynthesis function (see image below right).



10. Pruning:

Retain a qualified ISA-Certified Arborist to perform pruning per current ANSI-A300 standards on an as-needed basis.

Refer to the approved vendor list in this report for local tree care contractors.

11. Guest House & Main Residence Demolition:

An arborist monitor such as the CCA and/or the project arborist shall be present on site during key periods such as demolition of existing structures in very close proximity to trees being retained (e.g. trees #5, 6, 7, 8, 10, 11, 24, 25, 26, 33, 34).

Allow footings and other subgrade elements to remain as-is in-situ if the CCA or project arborist determines that removal of the item(s) is/are a risk to the woody root systems of trees being retained (discuss during pre-construction meeting).

12. Landscape Development:

All new irrigation pipe trenching, electrical conduit (low voltage and 120V), and other subgrade items shall be offset 20 to 25 horizontal feet from the trunk edges of all existing trees being retained at site.

All proposed new plantings of high water use plants near dry-summer type oaks (e.g. native coast live oaks) shall be eliminated, and a buffer zone 15 to 25 horizontal feet be established between the trunk edges of oaks #10, 11, 12, and new plantings.

6 Consultant's Qualifications

- Contract Project Arborist, Hetch Hetchy Water System Improvement Program (WSIP)
San Francisco Public Utilities Commission
10/10-present
- PNW-ISA Certified Tree Risk Assessor #593
- PNW-ISA Certified Tree Risk Assessor Course graduate, 2009
Vancouver, B.C., Canada
- ASCA Registered Consulting Arborist #401
- Millbrae Community Preservation Commission (Tree Board)



2001-2006

- ASCA Arboriculture Consulting Academy graduate, class of 2000
- ISA Certified Arborist #WC-3172
- B.A. Environmental Studies/Soil and Water Resources
UC Santa Cruz, Santa Cruz, California 1990
- Peace Corps Soil and Water Conservation Extension Agent
Chiangmai Province, Thailand 1991-1993
- Associate Consulting Arborist
Barrie D. Coate and Associates
4/99-8/99
- Contract City Arborist to the City of Belmont Department of Planning and Community Development
5/99-present
- Continued education through attendance of arboriculture lectures and forums sponsored by The American Society of Consulting Arborists, The International Society of Arboriculture (Western Chapter), and various governmental and non-governmental entities.

(My full curriculum vitae is available upon request)

7 Assumptions and Limiting Conditions

Any legal description provided to the consultant/appraiser is assumed to be correct. Any titles and ownership to any property are assumed to be good and marketable. No responsibility is assumed for matters legal in character. Any and all property is appraised and evaluated as through free and clean, under responsible ownership and competent management.

It is assumed that any property is not in violation of any applicable codes, ordinance, statutes, or other government regulations.

Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/appraiser can neither guarantee nor be responsible for the accuracy of information provided by others.

The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.

Unless required by law otherwise, the possession of this report or a copy thereof does not imply right of publication or use for any other purpose by any other than the person to whom it is addressed, without the prior expressed written or verbal consent of the consultant/appraiser.

Unless required by law otherwise, neither all nor any part of the contents of this report, nor copy thereof, shall be conveyed by anyone, including the client, to the public through advertising, public relations, news, sales, or other media, without the prior expressed conclusions, identity of the consultant/appraiser, or any reference to any professional society or institute or to any initiated designation conferred upon the consultant/appraiser as stated in his qualifications.

This report and any values expressed herein represent the opinion of the consultant/appraiser, and the consultant's/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

Sketches, drawings, and photographs in this report, being intended for visual aids, are not necessarily to scale and should not be construed as engineering or architectural reports or surveys unless expressed otherwise. The reproduction of any information generated by engineers, architects, or other consultants on any sketches, drawings, or photographs is for the express purpose of coordination and ease of reference only.



Inclusion of said information on any drawings or other documents does not constitute a representation by Walter Levison to the sufficiency or accuracy of said information.

Unless expressed otherwise:

- a. information contained in this report covers only those items that were examined and reflects the conditions of those items at the time of inspection; and
- b. the inspection is limited to visual examination of accessible items without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the plants or property in question may not arise in the future.

Loss or alteration of any part of this report invalidates the entire report.

Arborist Disclosure Statement:

Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Tree are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborist cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like any medicine, cannot be guaranteed.

Treatment, pruning, and removal of trees may involve considerations beyond the scope of the arborist's services such as property boundaries, property ownership, site lines, disputes between neighbors, and other issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist should then be expected to reasonably rely upon the completeness and accuracy of the information provided.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate the trees.

8 Certification

I hereby certify that all the statements of fact in this report are true, complete, and correct to the best of my knowledge and belief, and are made in good faith.

Signature of Consultant

9 Approved Vendors List 2012

Service	Company	What they offer	Contact
Transplanting	Tree Movers Inc.	Large specimen trees, transplant services.	650-968-6117
Pruning	Advanced Tree Care	Pruning, root crown excavation, fertilization, tree installation, support systems for high risk trees, SOD phosphate sprays.	650-839-9539



	Maguire Tree Care	Pruning performed directly by an ISA Certified Arborist	650-245-2620
	Trees 360	Pruning performed directly by an ISA Certified Arborist (upon request).	408-866-1010
Tree Sources	Specialty Oaks, Lower Lake, CA	California native oak species	www.specialtyoaks.com
	Oracle Nursery	Various oaks and hybrid elms. Only local purveyor of hard to find Italian oak (<i>Q. frainetto</i> 'Forest Green')	www.oracleoaknursery.com

10 Images

Tree Tag #

Image

Tree Tag #

Image

1



3



2



5





Tree
Tag
#

Image

Tree
Tag #

Image

6



11



8



12



10



15





Tree
Tag
#

Image

Tree
Tag #

Image

16



20



17



21.1



19



22





Tree
Tag
#

Image

Tree
Tag #

Image

23



26



24



27



25



29





Tree
Tag
#

Image

Tree
Tag #

Image

30



35



33



36



34



Tree Assessment Chart / *Partial Size Assessment*
 1512 Harbor
 Belmont, CA

Tree Tag #	Trunk Diameter1 (in. dbh - measured 4 ft)	Trunk Diameter2	Trunk Diameter3	Trunk Diameter4	Total Sum of Trunk Diameters (in.)	Common Name	Botanical Name	Height/Spread (ft.)	Health/Structure (0 to 100% each)	Overall Condition Rating (0 to 100%)	Protected Tree	Suitability for Preservation (not related to proposed development)	Comment 1	Comment 2	Comment 3	Removal Per Site Plan	Expected Significant Site Plan Impacts	Suggested Site Plan Adjustments (Drain lines, Utilities, Foundation, Grading)	Protection and Maintenance Codes (W/LCA)	Tree Removal Fee (not including mitigation requirements) per 2013-13 Fee
1	22.4				22.4	coast redwood	<i>Sequoia sempervirens</i>	30/20	70/40	47% Poor	Yes	Mod	Good TDE	Poor structure due to pruning to clear existing overhead high voltage wires.	Woody roots breaking up the existing driveway. Proposed redevelopment will negatively impact the root system.		X	Adjust driveway base elevation to allow for new baserock and asphalt to "float" over existing baserock, avoiding damage to existing roots if possible.	TB, TPZ, W	\$ 3,725
2	16.1				16.1	coast live oak	<i>Quercus agrifolia</i>	25/25	80/95	70% Good	Yes	Good	Tree exhibits good TDE, but has been crown-raised.	Four codominant mainstems fork at 5 feet.	Tree may or may not be impacted from proposed work, if a curtilinear wall is built with footing along the driveway.		X	Build all new walls over grade or with max. 6 inches cut below existing grade elevations to avoid severing the root system.	TB, TPZ	\$ 2,784
3	4	2	2	1	9.0	Grecian laurel	<i>Laurus nobilis</i>	18/12	65/95	45% Poor	Yes	Poor	This tree has more than four stems, including 12 inches.	Lower trunk area has sustained injury from rodents or cats scratching the bark, phloem, xylem.	Good TDE. No impacts expected.				TB, TPZ	\$ 621
5	8.1	4.7			10.8	black malipo	<i>Pithecolobium tenuifolium</i>	24/20	30/30	30% Poor	Yes	Poor	Canopy leaved toward street.	Bark cankers noted on lower three feet of trunks, with wood tissue decay beneath the bark cankers.	Impacts from drain line trenching expected.		X	D	TB, TPZ, W	\$ 932
6	22				22.0	black malipo	<i>Pithecolobium tenuifolium</i>	46/26	70/60	60% Fair	Yes	Mod	This is one of the largest pithecolobium specimens I have ever seen.	Codominant mainstems have fused and exhibit deformed cross sections between 2 and 8 feet above grade.	Adjust grading and trenching accordingly to optimize root zone preservation within zero and 20 feet from tree.		X	D, G	TB, TPZ, W	\$ 1,241

Overall Condition Rating Range: Very Poor 0-25%, Poor 26-49%, Fair 50-69%, Good 70-90%, Excellent 90-100% // Nomenclature: "TDE" = Live current season twig density and extension

Tree Assessment Chart / "Partial Site Assessment"
 1512 Harbor
 Belmont, CA

Tree Tag #	Trunk Diameter1 (in.)	Trunk Diameter2	Trunk Diameter3	Trunk Diameter4	Total Sum of Trunk Diameters (in.)	Common Name	Botanical Name	Height/Spread (ft.)	Health/Structure (0 to 100% each)	Overall Condition Rating (0 to 100%)	Protected Tree	Suitability for Preservation (not related to proposed development)	Comment 1	Comment 2	Comment 3	Removal Per Site Plan	Expect Significant Site Plan Impacts	Suggested Site Plan Adjustments (Drain lines, Utilities, Foundation, Grading)	Protection and Maintenance Codes (W/LCA)	Tree Removal Fee (not including mitigation requirements) per 2011-13 Fee
8	10.6				10.6	Blackgum	<i>Liquidambar styraciflua</i>	55/30	70/35	47% Poor	Yes	Poor	Two codominant mainstems with bark inclusion at 20 feet.	Arborist cable installed between trees appears to be non-ANSI standard diameter cable.	Tree is noted on plans as "19 inch maple" and says "9" (tree #8 and #9 are misplaced on sheet #0.1). Tree appears to be affected by drain line trenching and other work. Tree will be considered a "removal" due to these projected impacts.		X	D, G	TP, TPZ, W	\$ 932
10	13.2				13.2	coast live oak	<i>Quercus agrifolia</i>	50/16	70/80	85% Fair	Yes	Good	Narrow remnant canopy.	Tree appears to be clear of severe impacts, though proposed drain line trenching will likely affect the root system to some degree.		?	D	TB, TPZ	\$ 2,484	
11	10.9				10.9	coast live oak	<i>Quercus agrifolia</i>	45/15	70/80	66% Fair	Yes	Good	Narrow canopy overhangs existing residence.	Canopy lopsided south.	Trunk location is located further east than tree #10. Root system will be negatively affected by proposed drain line trenching and other work. Tree will be considered a removal for fee purposes.		X	D	TB, TPZ	\$ 2,484
12	10.4				10.4	coast live oak	<i>Quercus agrifolia</i>	50/35	85/75	80% Good	Yes	Good	Wide fork with two codominant mainstems at 20 feet.	Canopy lopsided south.	Tree appears to be impacted by proposed drain line trench, and will be considered a removal for fee purposes (if drain alignment is adjusted eastward, then many of these trees can be preserved, and fees reduced).		X	D	TB, TPZ	\$ 3,725

Overall Condition Rating Range: Very Poor 0-25%, Poor 26-49%, Fair 50-69%, Good 70-90%, Excellent 90-100% / Nomenclature: "TDE" = Live current season twig density and extension

Tree Assessment Chart / "Parbal Site Assessment"
 1512 Harbor
 Belmont, CA

Tree Tag #	Trunk Diameter 1 (in.) (measured)	Trunk Diameter 2	Trunk Diameter 3	Trunk Diameter 4	Total Sum of Trunk Diameters (in.)	Common Name	Botanical Name	Height Spread (ft.)	Health Structure (ft to rock each)	Overall Condition Rating (0 to 100%)	Protected Tree	Suitability for Preservation (not related to proposed development)	Comment 1	Comment 2	Comment 3	Removal Per Site Plan	Expected Significant Site Plan Impacts	Suggested Site Plan Adjustments (Off-path trees, (P)reservation, (G)radation, (R)emoval)	Protection and Maintenance Codes (W/LCA)	Tree Removal Fee (not including mitigation requirements) per 2013-12 Fee	
13	10.7				10.7	blackwood acacia	<i>Acacia melanocoryon</i>	35/15	80/50	60% Fair	Yes	Mod	Low value species.	Species performs very well in coastal northern California.	Grading is proposed to occur within canopy dripline, which will negatively affect root zone unless performed with very small machines, using less than 6 inches of cut or fill.	X		G	TB, TPZ	\$ 932	
16	6	6	6	5	23.0	glossy privet	<i>Ligustrum lucidum</i>	30/25	60/50	50% Fair	Yes	Mod	Very low value tree species.	Expect minimal impacts from nearby proposed grading.					TB, TPZ	\$ 1,241	
17	12				12.0	coast live oak	<i>Quercus agrifolia</i>	20/16	45/46	46% Poor	Yes	Poor	Trunk leans West 36 to 45 degrees off vertical.	Tree has been topped to reduce loading forces, effectively dwarfing the tree, but reducing its overall condition.	Possible negative impacts from nearby grading, depending on the depth of cut/fill and whether large machinery is used which would compact the soil throughout the tree's root zone.	?		G	TB, TPZ	\$ 2,484	
18	8.5	5.4			11.0	California pepper tree (non-native)	<i>Schinus molle</i>	20/15	10/10	10% Very Poor	Yes	Very Poor	Negative impacts from nearby grading expected.				X		G	TB, TPZ	\$ 932
20	20.1	0	0		20.1	Mexican fan palm	<i>Washingtonia robusta</i>	35/8	70/30	78% Good	Yes	Good	Tree may be negatively affected by proposed grading.	I recommend creating a tree well to allow some of the root system of this tree to remain at original grade.			X		G	TB, TPZ	\$ 1,241
21.1	0	0	6	6	22.0	cabbage palm	<i>Livistona australis</i>	20/10	76/76	76% Good	Yes	Good	Tree not surveyed by project team.	Tree location is approximately 4 feet north of tree #20.	Tree will be negatively affected by grading.	X		G	TB, TPZ	\$ 1,241	
22	7	6	5		17.0	glossy privet	<i>Ligustrum lucidum</i>	20/16	50/50	50% Fair	Yes	Poor	Appears to be removed per site plan.				X		G		\$ 932

Overall Condition Rating Range: Very Poor 0-25%, Poor 26-49%, Fair 50-69%, Good 70-90%, Excellent 90-100% Nomenclature: "TDE" = Live current season twig density and extension

Tree Assessment Chart / "Partial Site Assessment"
 1512 Harbor
 Belmont, CA

Tree Tag #	Trunk Diameter1 (inches)	Trunk Diameter2	Trunk Diameter3	Trunk Diameter4	Total Sum of Trunk Diameters (in.)	Common Name	Botanical Name	Height (ft.)	Spread (ft.)	Health/Structure (0 to 100% each)	Overall Condition Rating (0 to 100%)	Protected Tree	Suitability for Preservation (not related to proposed development)	Comment 1	Comment 2	Comment 3	Removal Per Site Plan	Expect Significant Site Plan Impacts	Suggested Site Plan Adjustments (Drain lines, Utilities, Foundation, Grading)	Protection and Maintenance Codes (W/LCA)	Tree Removal Fee (not including mitigation requirements) per 2013-14 Fee	
23	10	5	4		19.0	Japanese maple	<i>Acer palmatum</i>	15/20	90/60	75% Good	75% Good	Yes	Good	Appears to be removed per site plan.				X	F		\$ 1,241	
24	12.2				12.2	coast live oak	<i>Quercus agrifolia</i>	25/25	75/75	76% Good	76% Good	Yes	Good	Will require substantial protection during demolition of the existing guest house.				?		MON, TB, TPZ, W	\$ 2,481	
25	12.8				12.8	coast live oak	<i>Quercus agrifolia</i>	30/18	80/60	70% Good	70% Good	Yes	Good	Tree was incorrectly pruned to remove inner wood and foliage (i.e. "lion tailing").	Incorrect pruning reduced this tree's health and structural ratings significantly.				?		MON, TB, TPZ, W	\$ 2,481
26	6	5			11.0	Ukrainian box	<i>Pittosporum undulatum</i>	25/15	65/40	40% Poor	40% Poor	Yes	Poor	Sweep-form trunks topped in northwest.	Decay noted at old pruning out wounds.						TB, TPZ	\$ 932
27	10.1				10.1	European white birch	<i>Betula pendula</i>	45/25	60/35	46% Poor	46% Poor	Yes	Poor	Dogleg form S-trunk with decay noted at 11 feet.	Landscape plan sheet shows work encroaching to trunk edge of this tree.				?	G	TB, TPZ	\$ 932
29	10.9				10.9	coast live oak	<i>Quercus agrifolia</i>	30/18	30/75	78% Good	78% Good	Yes	Good	We will need to keep machinery and materials out of the dripline of this tree.						TB, TPZ	\$ 2,414	
30	17.3				17.3	Chinese elm cultivar	<i>Ulmus parvifolia</i> Cult.	35/60	55/45	49% Poor	49% Poor	Yes	Mod	Tree has been pruned to clear overhead high voltage wires.	Poor structure, with lanky stem growth extending laterally to great distances, relatively prone to failure.	Poor to moderate TDE.					TB, TPZ	\$ 932
33	15.1				15.1	dollar gum eucalyptus	<i>Eucalyptus polyanthemos</i>	55/30	85/75	65% Fair	65% Fair	Yes	Mod	Need to manage branch and weight by performing end weight reduction pruning.	The main issue here is trunk protection during demolition of the existing guest house structure.						P, TB, TPZ	\$ 932
34	10.5	8.1			27.6	argyle apple eucalyptus	<i>Eucalyptus cinerea</i>	35/25	70/45	67% Fair	67% Fair	Yes	Mild	Tree appears to have been topped.	May require structural pruning to renovate.	The main issue here is trunk protection during demolition of the existing guest house structure.					P, TB, TPZ	\$ 2,484

Overall Condition Rating Range: Very Poor 0-25%, Poor 26-49%, Fair 50-69%, Good 70-90%, Excellent 90-100% / Nomenclature: "TDE" = Live current season twig density and extension

Tree Assessment Chart / "Partial Site Assessment"
 1512 Harbor
 Belmont, CA

Tree Tag #	Trunk Diameter1 (in.)	Trunk Diameter2 (in.)	Trunk Diameter3 (in.)	Trunk Diameter4 (in.)	Total Sum of Trunk Diameters (in.)	Common Name	Botanical Name	Height (ft.)	Health/Structure (0 to 100% each)	Overall Condition Rating (0 to 100%)	Protected Tree	Suitability for Preservation (not related to proposed development)	Comment 1	Comment 2	Comment 3	Removal Per Site Plan	Expected Significant Site Plan Impacts	Suggested Site Plan Adjustments (Drain lines, Utilities, Foundation, Pruning, etc.)	Protection and Maintenance Codes (WLCA)	Tree Removal Fee (not including mitigation requirements) per 2011-12 Fee
35	20.1				20.1	dollar gum eucalyptus	<i>Eucalyptus polyanthemos</i>	61.20	80/75	77% Good	Yes	Good	As with the other eucs, the issue is trunk protection during demolition of the existing guest house.						TB, TPZ	\$ 1,371
36	10.5				10.5	dollar gum eucalyptus	<i>Eucalyptus polyanthemos</i>	46.15	77.75	75% Good	Yes	Good	As with the other eucs, the issue is trunk protection during demolition of the existing guest house.						TB, TPZ	\$ 932

Notes:

1. WLCA tagged and assessed only those tree specimens which were (a) larger than 10 inches diameter (single or multi-stem total) at 4.5 feet above grade (i.e. Belmont protected size trees), and (b) in close proximity to some element of the site plan work as shown on one or more sheets of the applicant's submittal set dated April 2012.

Protection and Maintenance Codes per Contract City Arborist (WLCA):

TPZ: Tree protection fence, chain link, with 2" diameter iron posts driven 24" into the ground, 6 to 8 feet on center max. spacing, with TENAX silt fence installed on uphill side of fence and zipped to the chain link.
 RB: Root buffer consisting of wood chip mulch laid over existing soil as a 12 inch thick layer, contain with 1 inch or greater plywood strapped together with metal plates. This root buffer or soil buffer should be placed over the entire width of the construction corridor between tree trunks and construction.
 TB: Trunk buffer constructed as indicated above in the tree charts, consisting of either a straw wattle wrapped around the trunk, or 10 to 20 wraps of orange plastic snow fencing to create a 2 inch thick buffer over the lowest 8 feet of tree trunk. Secure buffer using duct tape (not wires).
 F: Fertilization with Granulbait 22-14-14 tree formula.
 M: 4 inch thick layer of wood chip mulch (Lyngso, self pickup).
 W: Irrigate using various methods to be determined through discussion between City Arborist and General Contractor. Irrigation frequency and duration to be determined through discussion. Permanent irrigation must be on-grade only, with no pipe trenching deeper than 6 inches below grade. Netfilm professional grade emitter line is the preferred alternative "treeless" drip irrigation product.
 P: Pruning per specifications noted elsewhere. All pruning must be performed only under direct site supervision of an ISA Certified Arborist, or performed directly by an ISA Certified Arborist.
 MON: Requires that Contract City Arborist (CCA) be present to monitor demolition or construction-related activity within 20 feet of tree.
 RC: Root crown excavation by an ISA Certified Arborist, using dull rounded hand tools to reestablish original soil grade elevations around the trunk base such that buttress root "flares" are visible.
 RP: Remove fill soil by hand using shovels and wheelbarrows to reestablish original grade and increase aerobic function of tree root zone area under canopy/corridor.

Overall Condition Rating Range: Very Poor 0-25%, Poor 26-49%, Fair 50-69%, Good 70-90%, Excellent 90-100% Nomenclature: "TDE" = Live current season twig density and extension

PCL XL error
Error: MissingData
Operator: LineRelPath
Position: 109354

Attachment V

Neighborhood Outreach Materials

Matthias Hausner and Davina Hurt
1512 Harbor Boulevard, Belmont, California 2012

June 11, 2012

RECEIVED

TO: Damon DiDonato
Senior Planner
CITY OF BELMONT
1070 Sixth Avenue, #200
Belmont, California 94002

SUBJECT: Neighborhood Outreach
RE: Hausner Residence Building Application
1512 Harbor Boulevard

JUN 11 2012
CITY OF BELMONT
BUILDING

Per Belmont building application requirements, we conducted a Neighborhood Outreach meeting on May 12, 2012 informing our neighbors on the details of our proposed project. All in all, we had only positive comments about our project and well wishes for its completion. Attached are detailed results of our neighborhood outreach, which include the following documents:

- A. Neighborhood Outreach Letter and Mailing Receipt From Belmont Post Office (3pgs)
- B. Neighborhood Outreach Feedback on May 12, 2012 Meeting & Selection of Pictures Presented (6 pgs)
- C. Neighborhood Outreach Feedback Received by Mail and Email (4 pgs)
- D. Neighborhood Outreach Verbal Approval Results (1pg).

If you have any questions and/or comments, please contact us at 650.575.0656 or hausner@gmail.com. Thank you for your time and consideration. We look forward to successfully progressing through the building application.

Respectfully Submitted,
Matthias Hausner

Davina Hurt

BELMONT POST OFFICE
BELMONT, California
940029998
0567830101 -0096
05/02/2012 (650)591-9588 11:18:38 AM

Product Description	Sales Receipt		Final Price
	Sale Qty	Unit Price	
(Forever) Four Flags Double Sided Bklt/20	3	\$9.00	\$27.00
Total:			\$27.00

Paid by:
MasterCard \$27.00
Account #: XXXXXXXXXXXXX2750
Approval #: 04111P
Transaction #: 230
23 903470029

Order stamps at usps.com/shop or call 1-800-Stamp24. Go to usps.com/clicknship to print shipping labels with postage. For other information call 1-800-ASK-USPS.

Get your mail when and where you want it with a secure Post Office Box. Sign up for a box online at usps.com/poboxes.

Bill#: 1000402510175
Clerk: 13

All sales final on stamps and postage
Refunds for guaranteed services only
Thank you for your business

HELP US SERVE YOU BETTER

Go to: <https://postalexperience.com/Pos>
TELL US ABOUT YOUR RECENT
POSTAL EXPERIENCE

YOUR OPINION COUNTS

Neighborhood Outreach
Customer Copy
Stamp

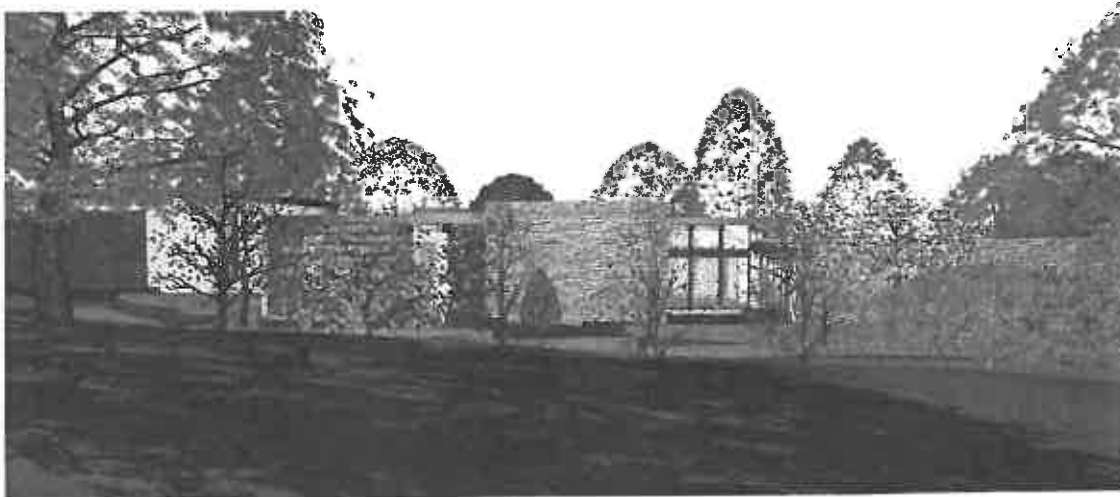
Dear Neighbors of 1512 Harbor Boulevard,

We – Davina, Matthias and Anika – are writing to inform you about our intention to rebuild our house at 1512 Harbor Boulevard in Belmont, and to invite you to give us your feedback on our plans.

Our current house was built in 1946. It is a mid-century ranch style home with 2 bedrooms. The original owners passed away in the 1980's. The house was then empty for some time, later was rented for twenty years and slowly fell in disrepair. When we bought it in 2004, it was sold as a tear-down property. Many of you may remember the neglected front yard.



With lots of "elbow grease" we made the house livable for us. Nevertheless it still has many problems with the foundation and drainage. Meanwhile, our family has grown and we would love to have a bit more space, not least for guests and a home office. Working with our architect, we determined that due to the many problems it is not practical or economical to extend the existing structure. We have decided to build a new house instead, keeping only the existing, detached garage.



We have taken great care to keep the profile of the new building low. As seen from the street, the new house will be about the same height as the current building, and on the north-west (downhill) side it will even be significantly lower. The expansion is mostly towards our backyard.



We love trees and beautiful gardens. One of the greatest features of our property is the large backyard with more than 60 mature trees. We designed the new structure so that none of these trees are impacted.

We like architecture from the 1950's era. We worked with our architect, Klop Architecture, to design a post-and-beam style structure which is an updated version of our existing house. As seen from the street, the main feature are two natural stone walls, separated by a courtyard garden around which the house is built. We believe that even though the house remains almost invisible from the street, the design will complement the neighborhood.

We would be happy to share more detailed plans and answer your questions at an informal meeting on **Saturday, May 12th between 2 and 3:30 PM** at our house. You can also call us or send us your feedback and thoughts (concerns as well as support) to the address below.

We are looking forward to hearing from you, and/or meeting you on May 12th.

Matthias Hausner, Davina Hurt, Anika

1512 Harbor Blvd
94002 Belmont
email: hausner@gmail.com
phone: (650) 575-0656



1512 Harbor Blvd Reconstruction Project
Neighborhood Outreach Feedback
May 12 2012

Name: Babak Navid

Address: 1533 Vine St.

Contact info: 650-339-1738
(optional) BN356 @ Hotmail.com

Comments: New house plan is great & Beautifull.

1512 Harbor Blvd Reconstruction Project
Neighborhood Outreach Feedback
May 12 2012

Name: HEDY KONINGS

Address: 1510 HARBOR BLVD

Contact info:
(optional) 650-592-4890

Comments:

GREAT PLANS.

I APPROVE

1512 Harbor Blvd Reconstruction Project
Neighborhood Outreach Feedback
May 12 2012

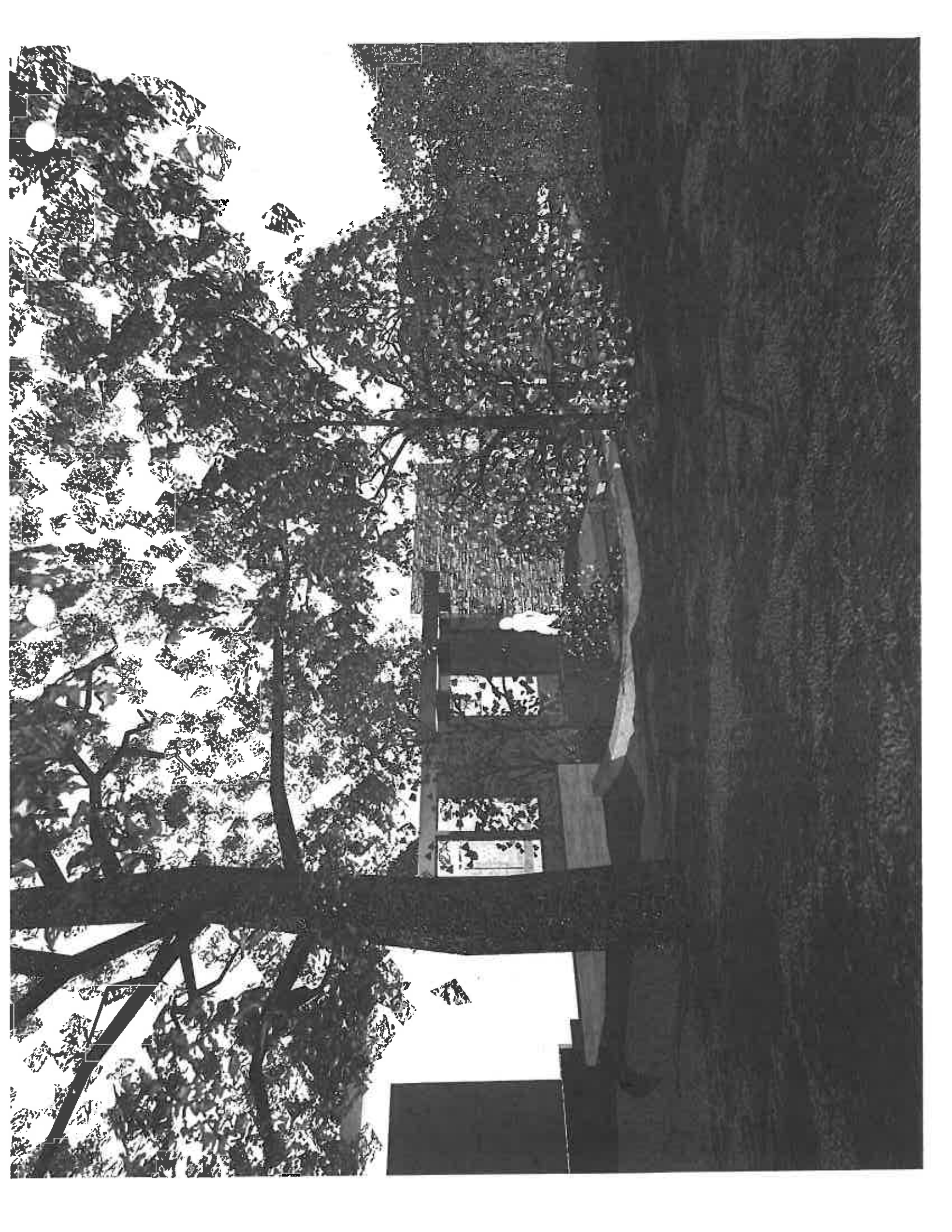
Name: Chris Keller

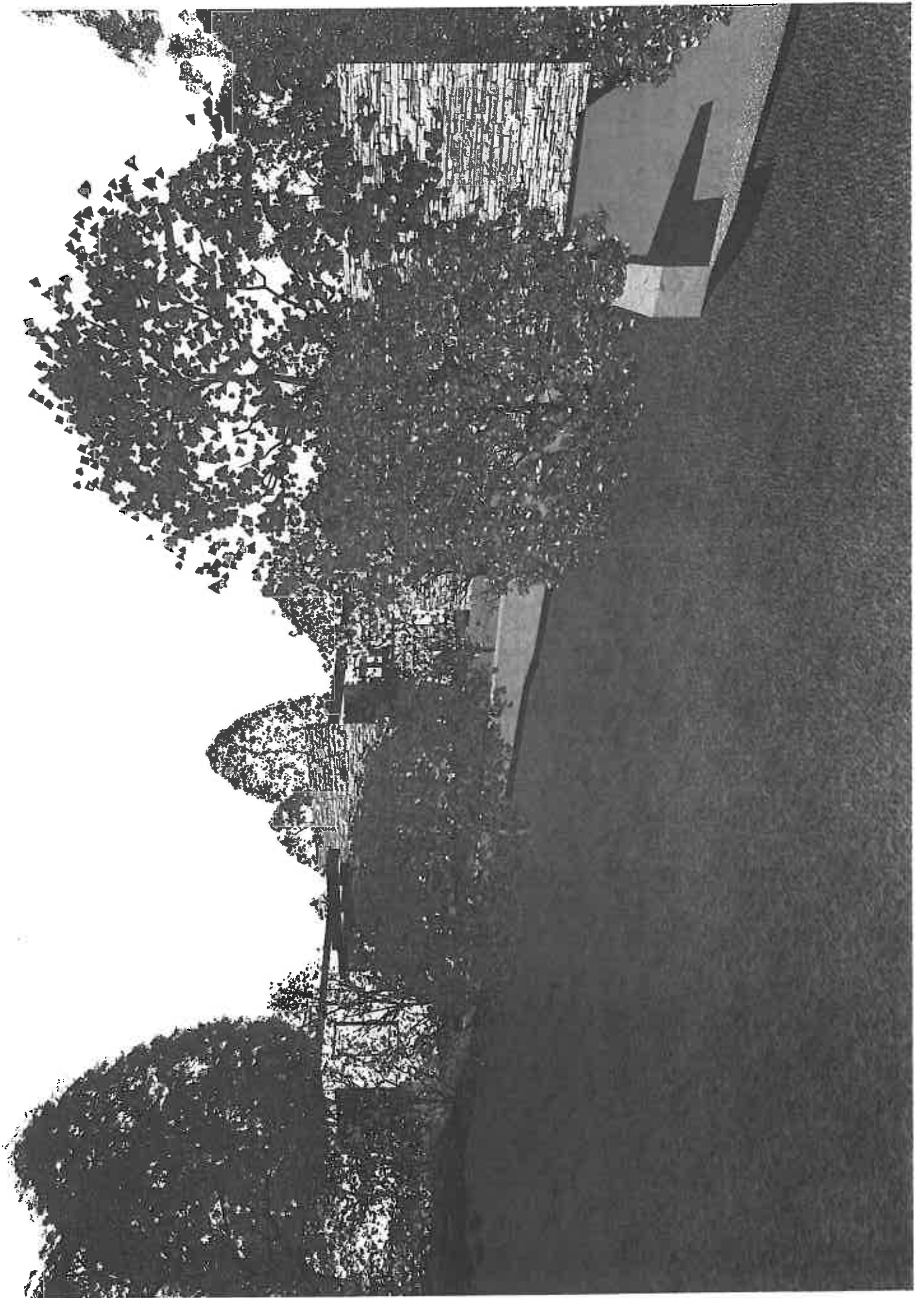
Address: 1525 Harbor Blvd, Belmont

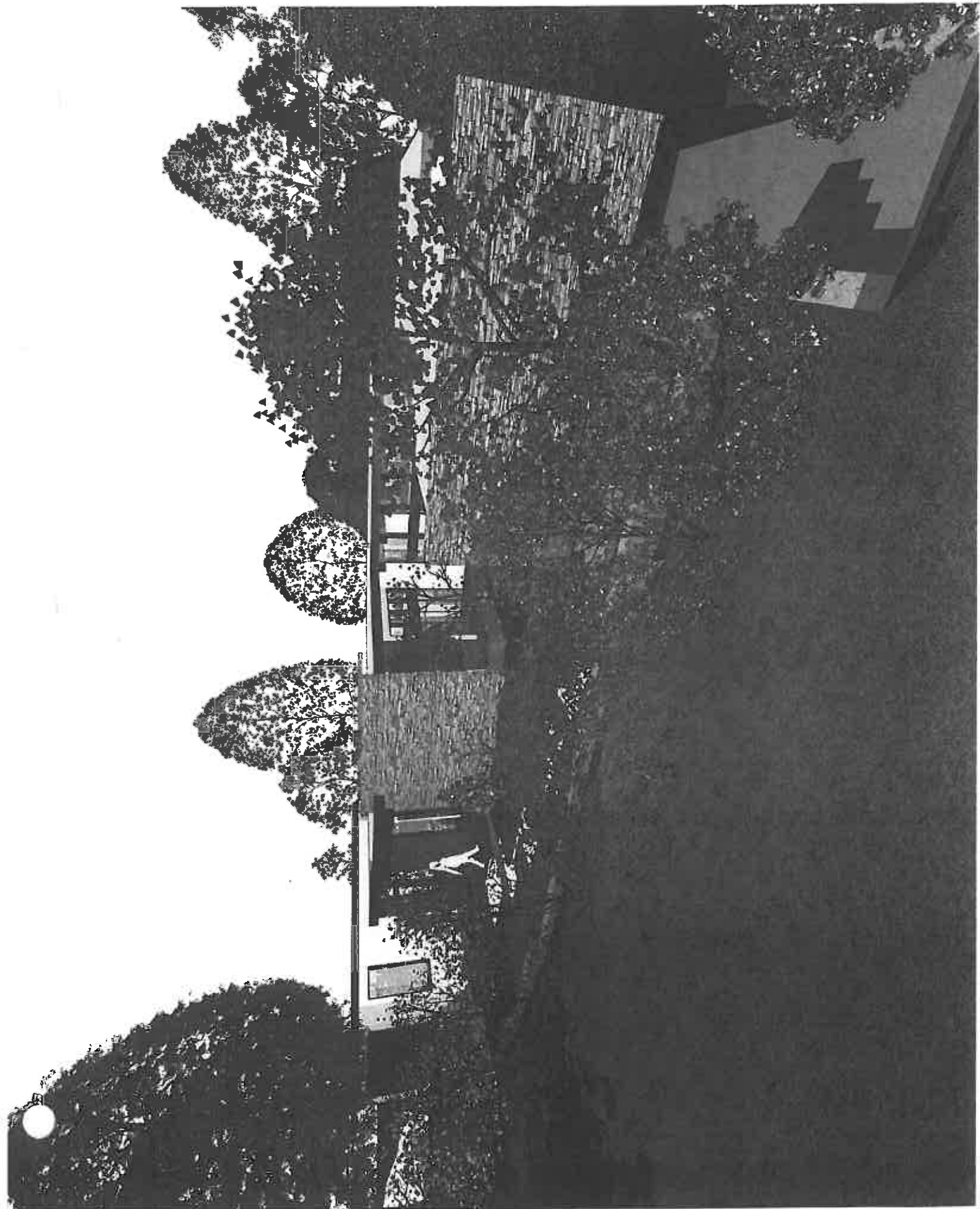
Contact info: 650.740.1393
(optional) poodle rescue @ comcast.net

Comments:

I think the new house will be beautiful









Re: Received your letter about your house

Matthias Hausner <hausner@gmail.com>
To: Chris Keller <poodlerescue@comcast.net>
Cc: Davina Hurt <davinahurt@gmail.com>

Fri, May 4, 2012 at 10:18 AM

Hi Chris

Thank you for your kind words of support. We are looking forward to seeing you on May 12.

Thank you also for the heads-up about the driveway and retaining wall work. No worries about the construction noise.

Kind regards,

Matthias

On Fri, May 4, 2012 at 9:04 AM, Chris Keller <poodlerescue@comcast.net> wrote:

Hi Matthias, Davina, and Anika,

I'm Chris Keller, your neighbor right across the street at 1525 Harbor. I was so happy to get your letter and to see that you are finally going to tear down that house and build a beautiful new structure. I appreciate being invited to see the plans and will come to your meeting on May 12th.

You have such a nice piece of property. It will be terrific for you to have a new house that takes advantage of the property and will retain as many of the trees as possible.

FYI, I am having my driveway and retaining wall rebuilt starting Monday so there will be about 7 days of demo and construction going on. It will be noisy for a couple of days while they demo, but things should settle down after that. And the result will be a huge improvement over my current, cracked driveway. My house was also built in 1946 and the driveway is original, as is the retaining wall.

Thank you for sending the letter about your house and I look forward to learning more on the 12th. I wish you the best of luck with your project.

Chris Keller

poodlerescue@comcast.net

www.bayareapoodlerescue.org



Re: Your plans look beautiful

Matthias Hausner <hausner@gmail.com>
To: Judy Vander Sluis <jvandersluis@gmail.com>
Cc: Davina Hurt <davinahurt@gmail.com>

Fri, May 4, 2012 at 10:25 AM

Hi Judy

Thank you very much for your kind words of support for our project. We are happy to show you more detailed plans on any of the evenings next week if you would like to come by.

Kind regards,

Matthias

On Fri, May 4, 2012 at 6:51 AM, Judy Vander Sluis <jvandersluis@gmail.com> wrote:
Matthias, Davina and Anika,

Thanks so much for sending me the letter about your building plans. The architectural images you included are very handsome; I also admire mid-century architecture and design. I appreciate your intent to rebuild while keeping so many existing trees in tact too. I would love to meet you on May 12 but I will on my way to a wedding in the east bay that day. I hope to meet you at some other time.

I wish you much success with the project. I see it as good news for our neighborhood!

Kind regards,

Judy Vander Sluis
1160 Harbor Blvd.

May 30, 2012

Dear Neighbors at 1512 Harbor:

We are sorry that we could not come to see your house a few days ago. We had other commitments that day.

We know the place quite well and must congratulate you for the plans you have. I certainly would not worry if the new house is taller than the present one - might even help a lot.

I was curious about your mention of the drainage problem. We have seen large puddles of standing water after heavy rains in previous years and wondered about how you have resolved the problem.

Again: we think your ideas are great about building a new house.
Congratulations!

Best wishes,

The Johnsons - 1525 Vine St

Dee and Elmer

From: Michael L. Davidson<mldesq@pacbell.net>
Date: Wed, Jun 6, 2012 at 1:57 PM
Subject: 1512 Harbor Boulevard, Belmont
To: PlanningComm@belmont.gov
Cc: hausner@gmail.com, MLDESQ@mac.com

TO: BELMONT PLANNING COMMISSION

FROM: LAURIE & MICHAEL DAVIDSON

We have resided at 1500 Harbor Boulevard in Belmont since 1975 and live next door to Matthias Hausner, Davina Hurt and their daughter, Anika. We are aware of their plans to do a major renovation on their house and have absolutely no problem with their plans and purpose of rebuilding. They have focused on a simple (low impact) design and complementary landscaping and their finished project will certainly be an asset to our neighborhood.

We completed the construction/renovation project on our home over ten years ago and faced incredible opposition from the City of Belmont. Hopefully, the Hausner/Hurt building project at 1512 Harbor Boulevard will proceed without delay and with the approval and support of the Planning Commission.

Thank you for your attention and interest in this matter.

Laurie & Michael Davidson (650) 888-4000

MLDESQ@MAC.COM

1512 Harbor Boulevard Neighborhood Outreach
Verbal Approval Results:

- Eric and Amy Goldfarb (1506 Harbor Blvd)
- Cindy and Dave D'Arche (1509 Harbor Blvd)
- Nancy and Steve Hayes (1517 Harbor Blvd)
- Don Alexander (1516 Harbor Blvd)

Attachment VI

Geotechnical Reports & Peer Reviews



July 10, 2012
B5052A

TO: Damon DiDonato
Senior Planner
CITY OF BELMONT
1070 Sixth Avenue, #200
Belmont, California 94002

SUBJECT: **Supplemental Geotechnical Peer Review**
RE: Hausner Residence
1512 Harbor Boulevard

At your request, we have completed a supplemental geotechnical peer review of the application for the proposed site development using:

- Response to Geotechnical Peer Review (letter) prepared by Murray Engineers, dated June 5, 2012;
- Geotechnical Investigation, Hausner Residence (report) prepared by Murray Engineers, dated October 5, 2011; and
- Architectural Plans (4 sheets, various scales) prepared by Klope Architecture, dated April 2, 2012.

In addition, we have reviewed pertinent technical documents from our office files, reviewed air photos, and completed a recent site reconnaissance.

DISCUSSION

The applicant proposes to demolish an existing residence and construct a new residence on a previously developed property in a hillside area of the City. In our previous project geotechnical peer review (letter dated May 9, 2012), we recommended that the Project Geotechnical Consultant prepare supplemental evaluations and recommendations regarding foundation design, fill placement, and drainage improvements prior to geotechnical approval of pending applications.

CONCLUSIONS AND RECOMMENDED ACTION

The proposed new structure is constrained by the presence of potentially expansive and/or compressible colluvium, localized high groundwater, undocumented fill, and strong seismic ground shaking. The Project Geotechnical Consultant has satisfactorily addressed the comments of our previous geotechnical peer review. Recently supplied information indicates that the proposed residence will utilize interior slabs supported on piers extending into bedrock, criteria for fill placement has been clarified, and only reduced flow from subsurface drainage is to be directed to the planned absorption trench. Consequently, we recommend geotechnical approval of permits for project construction with the following conditions:

1. **Geotechnical Plan Review** – The Project Geotechnical Consultant should review and approve all geotechnical aspects of the final project building and grading plans (i.e., site preparation and grading, building set-backs, site drainage improvements and design parameters for foundations, retaining walls and driveway) to ensure that their recommendations have been properly incorporated.

The results of the geotechnical plan review should be summarized by the geotechnical consultant in a letter and submitted to the City for review prior to issuance of building permits.

2. **Geotechnical Field Inspection** - The geotechnical consultant should inspect, test (as needed), and approve all geotechnical aspects of the project construction. The inspections should include, but not necessarily be limited to: site preparation and grading, site surface and subsurface drainage improvements, and excavations for foundations and retaining walls prior to the placement of steel and concrete. A geotechnical inspection should be performed of final drainage improvements to verify conformance with geotechnical standards.

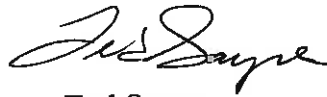
The results of these inspections and the as-built conditions of the project should be described by the geotechnical consultant in a letter and submitted to the City Engineer for review prior to final (granting of occupancy) project approval.

LIMITATIONS

This supplemental geotechnical peer review has been performed to provide technical advice to assist the City in its discretionary permit decisions. Our services have been limited to review of the documents previously identified, review of aerial photographs, and a visual review of the property. Our opinions and conclusions are made in accordance with generally accepted principles and practices of the geotechnical profession. This warranty is in lieu of all other warranties, either expressed or implied.

Respectfully submitted,

**COTTON, SHIRES AND ASSOCIATES, INC.
CITY GEOTECHNICAL CONSULTANT**



Ted Sayre
Principal Engineering Geologist
CEG 1795



Patrick O. Shires
Senior Principal Geotechnical Engineer
GE 770

TS:POS:kd



June 5, 2012
Project No. 1317-1L1

Matthias Hausner
1512 Harbor Boulevard
Belmont, California 94002

**RE: RESPONSE TO GEOTECHNICAL
PEER REVIEW COMMENTS,
HAUSNER RESIDENCE,
1512 HARBOR BOULEVARD,
BELMONT, CALIFORNIA**

Dear Mr. Hausner:

This letter includes our response to three comments presented by Cotton, Shires, and Associates, Inc.(CSA) in their geotechnical peer review letter, dated May 9, 2012, for the referenced project. As you know, we performed a geotechnical investigation for the project and presented the results in our report dated October 5, 2011. The responses provided below are also based on our brief preliminary review of the current project plan set (Design Review Set with cover sheet dated April 2, 2012).

Comment No. 1 – Supplemental Geotechnical Evaluations and Design Recommendations

Although this comment requests that a separate geotechnical evaluation and report be prepared in response, based on our recent discussions with Phil Johnson at CSA, we understand that presenting our responses in this letter format should be acceptable. Please see our itemized responses to the bulleted sub-comments within Comment No. 1 below.

Bullet 1 – *“The subconsultant should re-evaluate their recommendations for spread footing foundations and consider the advantages of footings bearing solely in bedrock.”*

We agree that it is preferable from a geotechnical standpoint to support the planned residence entirely on foundations bearing in bedrock. Based on our discussions with Geoff Campen of Klop Architecture, the project architect, we understand that the planned new residence and interior slabs will be supported on drilled piers extending into bedrock.

Bullet 2 – *“The consultant should re-evaluate their recommendations for compaction of on-site fill with the understanding that the standard of practice in the City calls for a minimum 90% relative compaction for structural fill.”*

We agree that low or non-expansive fill placed to raise site grades, particularly beneath structures and hardscapes, should be compacted a minimum of 90 percent relative compaction, as noted in our report. Our recommendation for 88 to 90 percent relative compaction at 3 to 5 percentage points over optimum moisture is intended specifically for preparation of the upper 6 inches of in-place highly expansive subgrade soils beneath exterior concrete slabs-on-grade.



Bullet 3 – *“The consultant should consider providing supplemental recommendations for non-expansive fill to be used beneath structures.”*

We agree that low or non-expansive soils should generally be used as engineered fill, particularly beneath structures, hardscapes, and for moderately steep fill slopes. However, we have made recommendations in our referenced report to accommodate expansive soil conditions underlying pier-supported structures, including void forms beneath structural slabs and grade beams, and we understand the planned residence, including the interior slab, will be supported on a pier foundation. Therefore, the expansion potential of site soils placed beneath the planned residence should not be critical provided the improvements are performed in substantial conformance with our foundation and fill placement recommendations.

Bullet 4 – *“The consultant should review the project grading and drainage plans and evaluate the potential onsite and offsite impacts of the proposed retention and absorption trench.”*

Based on our discussions with the project architect and civil engineer, we understand that the location and type of site drainage discharge is influenced by several factors. We understand that discharge of site drainage into the existing buried storm drain line in the easement extending across the site will likely not be allowed by the City. Additionally, we understand that the location of the planned retention/absorption trench is currently a low area within an existing swale running through the central portion of the site, where surface runoff collects, ponds, and (during/after larger rain storms) overflows across the offsite driveway that runs along the north side of the site and into an inlet on the north side of the driveway. We do not anticipate the planned retention/absorption trench would have a significant impact for nearby on-site structures supported on piers, such as the planned residence and site retaining walls. However, creating a new overall site drainage system that concentrates significant volumes of surface and roof runoff within close proximity to the existing off-site driveway may not be prudent due to the potential for long-term saturation and weakening of the soils underlying the driveway. We suggest that the planned retention/absorption trench be located as far upslope as practical from the northern property line, and that the amount of surface water directed to the trench be minimized such as by allowing all roof downspouts to discharge onto splash blocks or via buried pipes to small near-surface energy dissipaters located in the existing swale farther upslope from the trench. The drainage plan should clearly indicate which downspouts will be provided with splash blocks versus routed via buried pipes. We anticipate that discharge from the planned perimeter subsurface drain into the trench should be relatively low compared to the surface drainage systems, provided the subdrain and surface drainage controls are installed in conformance with our recommendations. Therefore, we anticipate that dedicating the planned retention/absorption trench primarily or solely as a discharge for subsurface drainage would substantially reduce the potential for impacts from the planned system.

Comment No. 2 – Geotechnical Plan Review

We concur and understand we will be given the opportunity to review and comment on the project plan set from a geotechnical perspective. We will provide the results of our review in a letter for submittal to the City.

Comment No. 3 – Geotechnical Field Inspection

We agree that we should periodically observe and test (as needed) the geotechnical aspects of the planned construction and document our observations in interim and/or final summary letters for submittal to the City.

Our services have been performed in accordance with geotechnical engineering principles and practices generally accepted at this time and location. We make no warranty, either expressed or implied.

Sincerely,

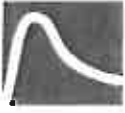
MURRAY ENGINEERS, INC.



William P. Carter, P.E.
Senior Engineer

Copies: Addressee (via email)
Klopf Architecture (3)
Attn: Geoff Campen
Berry & Associates (via email)
Attn: John Berry





May 9, 2012
B5052

TO: Damon DiDonato
Senior Planner
CITY OF BELMONT
1070 Sixth Avenue, #200
Belmont, California 94002

SUBJECT: Geotechnical Peer Review
RE: Hausner Residence
1512 Harbor Boulevard

At your request, we have completed a geotechnical peer review of the application for the proposed site development using:

- Geotechnical Investigation, Hausner Residence (report), prepared by Murray Engineers, dated October 5, 2011;
- Architectural Plans (4 sheets, various scales), prepared by Klope Architecture, dated April 2, 2012;
- Topographic Survey Plan (1 Sheet, 1"=20'), prepared by MacLeod Associates, dated January 3, 2004;
- Site Grading and Drainage Plan (1 Sheet, 1"=10'), prepared by Berry and Associates, undated;
- Drainage Report (hand-written report with calculations), prepared by Berry and Associates, dated March 12, 2012; and
- Erosion Control Plan (1 Sheet, 1"=10'), prepared by Berry and Associates, undated.

In addition, we have reviewed pertinent technical documents from our office files, reviewed air photos, and completed a recent site reconnaissance.

DISCUSSION

Based on our review of the referenced documents, we understand that the applicant proposes to demolish an existing residence and construct a new residence on a previously developed property in a hillside area of the City. An existing driveway, detached garage, and accessory building will not be demolished, and the new residence will be constructed in approximately the same location as the existing residence. Some additional grading will be necessary for the proposed construction. Access to the property will be via the existing driveway from Harbor Boulevard.

SITE CONDITIONS

The subject property includes a north flowing swale that extends through the center of the property flanked by west-facing and east-facing slopes. The west-facing slope is characterized by a flat to gentle fill pad where the existing residence is located, moderately steep to steep (23 to 37 percent inclination) low fill slopes, and local retaining walls up to approximately 3 feet in height. The east-facing slope consists of a gentle to moderately steep (11 to 18 percent inclination) natural slope with local areas of thin landscape fill. A mantle of colluvium covers the Franciscan Complex sandstone across the site. Locally, the colluvium is overlain by undocumented fill. Bedrock exposures were not observed at the site.

Drainage at the site is generally characterized by sheetflow toward the central, north-flowing swale. According to the referenced drainage report and site grading and drainage plan, water tends to pond at a low point in the swale, near the northwest boundary of the property.

The active San Andreas fault is located approximately 3.6 miles (5.8 km) to the southwest of the site, and the Canada fault is located approximately 3.3 miles (5.3 km) to the southwest. Active faults have not been mapped within the subject property.

CONCLUSIONS AND RECOMMENDED ACTION

The proposed new structure is constrained by the presence of potentially creeping, expansive and/or compressible colluvium, localized high groundwater, undocumented fill, and strong seismic ground shaking.

Based on our review of the referenced geotechnical report and our site reconnaissance, we recommend that supplemental geotechnical engineering evaluations and design recommendations be prepared for the project. In the referenced report, the Project Geotechnical Consultant provides recommendations for pier and grade beam foundations as well as a spread footing foundation option. In their recommendations for design of spread footings, the consultant states, "the residence may be supported on conventional, continuous spread footings bearing in the underlying colluvial soil and/or bedrock". By definition, colluvial soils are prone to creep and, therefore, unsuitable for supporting foundations. According to the referenced report, the on-site colluvium is highly expansive, and the consistency of the colluvium indicates that it may also tend to be compressible. Thus, the consultant should re-evaluate their design recommendations for spread footing foundations. If a pier and grade beam foundation is chosen to support the residence, then the above comment is not pertinent and, therefore, does not need to be addressed.

Laboratory testing results provided in the referenced report show that the colluvial soil has a liquid limit of 44 and a plasticity index of 31. These data indicate that the material is expansive and would be unsuitable for use as structural fill. The consultant should provide supplemental recommendations for non-expansive fill to be used beneath structures.

In the referenced report, the consultant provides recommendations for compaction of on-site soils that range from 88% to 90% relative compaction. The standard of practice in the City calls for a minimum 90% relative compaction for

structural fill.

The consultant should provide supplemental recommendations for suitable site development discharge and review the grading and drainage plan to confirm that their recommendations have been incorporated. Currently, the plans indicate that site drainage will discharge into a retention and absorption trench located on the northwest side of the subject property with overflow directed to a neighboring property. The consultant should consider the potential for adverse impacts of this planned retention and absorption trench to onsite and offsite improvements.

We recommend that the Project Geotechnical Consultant address the following items prior to geotechnical approval of the pending applications:

1. **Supplemental Geotechnical Evaluations and Design Recommendations** – The Project Geotechnical Consultant should evaluate the following items and provide necessary additional information:

- The consultant should re-evaluate their recommendations for spread footing foundations and consider the advantages of footings bearing solely in bedrock.
- The consultant should re-evaluate their recommendations for compaction of on-site fill with the understanding that the standard of practice in the City calls for a minimum 90% relative compaction for structural fill.
- The consultant should consider providing supplemental recommendations for non-expansive fill to be used beneath structures.
- The consultant should review the project grading and drainage plans and evaluate the potential onsite and offsite impacts of the proposed retention and absorption trench.

The results of the supplemental geotechnical evaluations should be summarized in a report with appropriate illustrations to be submitted to the City for review by the City Geotechnical Consultant prior to project geotechnical approval.

2. **Geotechnical Plan Review** – The Project Geotechnical Consultant should review and approve all geotechnical aspects of the project building and grading plans (i.e., site preparation and grading, building set-backs, site drainage improvements and design parameters for foundations, retaining walls and driveway) to ensure that their recommendations have been properly incorporated.

The results of the geotechnical plan review should be summarized by the geotechnical consultant in a letter and submitted to the City for review prior to issuance of building permits.

3. **Geotechnical Field Inspection** - The geotechnical consultant should inspect, test (as needed), and approve all geotechnical aspects of the project construction. The inspections should include, but not necessarily be limited to: site preparation and grading, site surface and subsurface drainage improvements, and excavations for foundations and retaining walls prior to the placement of steel and concrete.

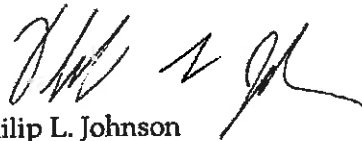
The results of these inspections and the as-built conditions of the project should be described by the geotechnical consultant in a letter and submitted to the City Engineer for review prior to final (granting of occupancy) project approval.

LIMITATIONS

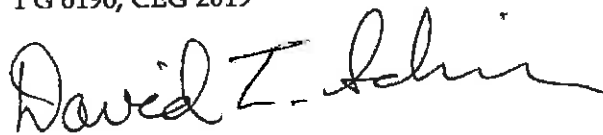
This geotechnical peer review has been performed to provide technical advice to assist the City in its discretionary permit decisions. Our services have been limited to review of the documents previously identified, review of aerial photographs, and a visual review of the property. Our opinions and conclusions are made in accordance with generally accepted principles and practices of the geotechnical profession. This warranty is in lieu of all other warranties, either expressed or implied.

Respectfully submitted,

**COTTON, SHIRES AND ASSOCIATES, INC.
CITY GEOTECHNICAL CONSULTANT**



Philip L. Johnson
Supervising Engineering Geologist
PG 6196, CEG 2019



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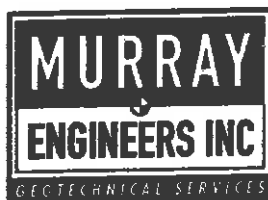
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GEOTECHNICAL INVESTIGATION
HAUSNER RESIDENCE
1512 HARBOR BOULEVARD
BELMONT, CALIFORNIA

THIS REPORT HAS BEEN PREPARED FOR:

**MATTHIAS HAUSNER
1512 HARBOR BOULEVARD
BELMONT, CALIFORNIA 94002**

OCTOBER 2011





October 5, 2011
Project No. 1317-1R1

Matthias Hausner
1512 Harbor Boulevard
Belmont, California 94002

**RE: GEOTECHNICAL INVESTIGATION,
HAUSNER RESIDENCE,
1512 HARBOR BOULEVARD,
BELMONT, CALIFORNIA**

Dear Mr. Hausner:

We are pleased to present the results of our geotechnical investigation relating to design and construction of the new residence and associated improvements at 1512 Harbor Boulevard in Belmont, California. This report summarizes the results of our field, laboratory and engineering work, and presents conclusions and recommendations concerning the geologic and geotechnical engineering aspects of the project.

Our report is contingent upon our review of the project plans and our observation of the earthwork, foundation, and drainage installation phases of the construction.

If you have any questions concerning our investigation, please call.

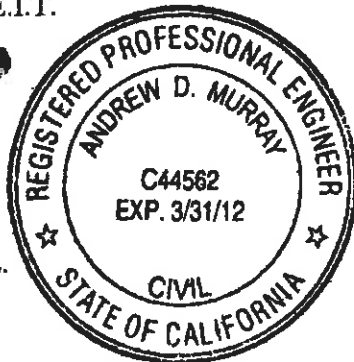
Very truly yours,
MURRAY ENGINEERS, INC.

Christopher T. Pumo, E.I.T.
Senior Staff Engineer

Andrew D. Murray, P.E.
Principal Engineer

CTP:WPC:ADM

Copies: Addressee (5)
Klopf Architecture (1)
Attn: Mr. John Klopf



William P. Carter, P.E.
Senior Engineer



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**GEOTECHNICAL INVESTIGATION
HAUSNER RESIDENCE
1512 HARBOR BOULEVARD
BELMONT, CALIFORNIA**

INTRODUCTION

This report presents the results of our geotechnical investigation relating to design and construction of a new residence and associated improvements on the Hausner property at 1512 Harbor Boulevard in Belmont, California. The project location is indicated on the Vicinity Map, Figure A-1. The purpose of our investigation was to evaluate the site's subsurface conditions and provide geotechnical design recommendations for the project.

Project Description

We understand that the project will include demolition of the existing residence located on a relatively level to slightly sloped building pad in the front portion of the gently- to moderately-sloping lot and the construction of a new single-story residence in approximately the same location. Both slab-on-grade and raised wood interior floors are being considered for the new residence. We anticipate that site and/or interior residence retaining walls will be required to accommodate changes in grade across the residence building area. Additional improvements will include new patios and raised decks along the rear of the residence. The existing driveway, detached garage and accessory building in the southeast corner of the property are planned to remain. We anticipate that structural loads for the improvements will be relatively light and typical of wood-framed residential construction.

We also understand based on our initial site observations and discussions with you that the site has a history of excessive soil moisture and that you would like us to recommend solutions to mitigate these conditions on the site. In particular, we understand that excessive moisture has been observed in the existing residence crawlspace, as evidenced by standing water in areas of the existing partial day-lighting basement and significant efflorescence throughout the crawlspace and partial basement. The layout of the existing and proposed improvements is shown on the Partial Site Plan, Figure A-2.

Scope of Services

We performed the following services in accordance with our agreement with you dated July 26, 2011 (executed August 25, 2011):

- Reviewed geologic and seismic conditions in the site vicinity and evaluated geologic hazards that could potentially impact the site and the proposed improvements



- ⊕ Performed a reconnaissance of the site in the area of the proposed improvements
- ⊕ Explored the subsurface conditions by advancing three borings in the area of the proposed improvements
- ⊕ Performed laboratory testing on selected soil samples for soil classification and to evaluate engineering properties of the subsurface materials
- ⊕ Performed geotechnical engineering analyses to develop geotechnical engineering design criteria for the proposed residence and associated improvements
- ⊕ Prepared this report containing a summary of our investigation and our geotechnical conclusions and recommendations

GEOLOGIC & SEISMIC CONDITIONS

Geologic Overview

The subject property is located along the eastern margins of the low foothills northeast of the Santa Cruz Mountains, a northwest-trending range in the California Coast Ranges geomorphic province. The local topography is characterized by moderately steep hills dissected by northeast flowing streams. Specifically, the property is generally situated on a northeast-facing hillside along the northeastern side of Belmont Hill, and locally along the side of a broad, subdued northwest-trending swale. According to the USGS topographic map of the area, the site is situated at an approximate elevation of 135 feet above mean sea level (see Figure A-1). Belmont Creek flows within a local valley to the northwest of the site.

According to the Geologic Map of the Montara Mountain and San Mateo Quadrangles (Pampeyan, 1994), the site is located in an area underlain by Cretaceous and Jurassic age (approximately 65 to 206 million years old) sandstone (fs) bedrock of the Franciscan Complex. The Franciscan sandstone is generally described as Cretaceous and Jurassic age greenish-gray to buff, fine- to coarse-grained graywacke sandstone with interbedded siltstone and shale. According to the map, the bedrock in the lower elevations around the site is blanketed with slope wash or colluvium (Qsr), an unconsolidated to moderately consolidated soil deposit. A copy of the relevant portion of the geologic map is presented on the Vicinity Geologic Map, Figure A-3.

According to the geologic map, the Geotechnical Hazard Synthesis Maps for San Mateo County (Leighton and Associates, 1976), and the Preliminary Map of Landslide Deposits in San Mateo County (Brabb & Pampeyan, 1972), there do not appear to be any active landslides mapped on the subject property.

Seismicity

The San Francisco Bay Area, which is affected by the San Andreas fault system, is recognized by geologists and seismologists as one of the most active seismic regions in the United States. In the Bay Area there are three major faults trending in a northwest direction within the San Andreas fault system, which have generated about 12 earthquakes per century large enough to cause significant structural damage. These faults include the San Andreas, Hayward, and Calaveras faults. The San Andreas fault is located approximately 3.3 miles southwest of the site. The Hayward and Calaveras faults are located approximately 15 and 22 miles northeast of the site, respectively. The potentially active Monte Vista-Shannon fault zone is located approximately 5.5 miles southwest of the site. In addition, the Belmont Hill Fault is mapped approximately 750 feet to the southwest of the site (see Figure A-3).

Seismologic and geologic experts convened by the U. S. Geological Survey, California Geological Survey, and the Southern California Earthquake Center conclude that there is a 63 percent probability for at least one "large" earthquake of magnitude 6.7 or larger in the Bay Area before the year 2038. The northern portion of the San Andreas fault is estimated to have a 21 percent probability of producing a magnitude 6.7 or larger earthquake by the year 2038 (2007 WGCEP, 2008).

SITE EXPLORATION & RECONNAISSANCE**Exploration Program**

Our field investigation was performed on September 1, 2011 and included a site reconnaissance and the excavation and logging of three exploratory borings to depths ranging from 5.8 to 9.3 feet at the locations shown on Figure A-2. The boring locations were approximately determined by measuring distance from known property lines and should be considered accurate only to the degree implied by the mapping technique used.

The borings were advanced using continuous sampling methods. Soil samples were collected with split-spoon samplers that were driven with a 140-pound hammer repeatedly dropped from a height of 30 inches with a rope and cathead attached to a sampling tripod. We utilized three split-spoon samplers, including 3-inch outside diameter (OD), 2.5-inch (OD), and 2-inch (OD) Standard Penetration Test (SPT) samplers. The sampler types used are indicated on the logs at the appropriate depths. The hammer blows required to drive the samplers were recorded in 6-inch increments. The associated blow count data, which is the sum of the second and third 6-inch increment, are presented on the boring logs. The blow count data has not been corrected for sampler type or hammer efficiency. The logs of the borings are presented in Appendix B as Figures B-1 through B-3. Also included in

Appendix B is Figure B-4, Key to Boring Logs; Figure B-5, Unified Soil Classification System; and Figure B-6, Key to Bedrock Descriptions.

Our staff engineer logged the borings in general accordance with the Unified Soil Classification System and Key to Bedrock Descriptions. The boring logs show our interpretation of the subsurface conditions at the location and on the date indicated and it is not warranted that these conditions are representative of the subsurface conditions at other locations and times. In addition, the stratification lines shown on the logs represent approximate boundaries between the soil materials; however, the transitions may be gradual.

Site Description

The site is located along the northeastern flank of a northwest-trending drainage swale on the southwest side of Harbor Boulevard in a moderately hilly, rural-residential area in Belmont. The roughly rectangular-shaped, approximately 0.9-acre property measures approximately 295 feet at its deepest point by 135 feet at its widest point, and is bounded by Harbor Boulevard to the east and neighboring residential properties on all other sides. The site grades slope down moderately from Harbor Boulevard along the east side of the site and from the neighboring property to the south, to a gently sloping building pad, which is occupied by the existing residence. The grades off the northern end of the residence slope down moderately to a shared driveway grade that borders the northern property boundary and is at an elevation roughly 4 feet below the residence building pad. Beyond the western end of the residence building pad the grades transition into a broad, subdued, roughly north-trending swale feature, and then slopes up moderately to west and the rear of the property at gradients of roughly 3.5:1 (horizontal to vertical).

An asphalt driveway extends into the southeastern corner of the property from Harbor Boulevard, at an elevation roughly 4 to 6 feet higher than the main building pad, to access the existing detached, 2-car garage in that area. The garage structure steps down a moderate slope between the driveway and the residence, and appears to consist of a stepped perimeter footing/wall, which retains fill beneath the interior garage slab-on-grade. A detached accessory structure appears to be situated on a small cut/fill pad along the north side of the driveway to the west of the driveway. The existing residence appears to be supported primarily on spread footings that step down the gently-sloped building pad, with the exception of a small partial, day-lighting basement at the northern end of the structure. Concrete walkways, stairs, and planters are located along the front and sides of the residence, while concrete and flagstone-over-concrete patios border the rear of the structure. Undeveloped portions of the site are vegetated or landscaped with young to mature trees, bushes, shrubs, flowerbeds, and lawn. Low concrete site retaining walls accommodate small changes in grade across the building pad area.

The existing residence, which we understand was constructed in the mid 1940s, appears to be supported on a combination of continuous, perimeter spread footing foundations and isolated interior footings. The northwest end of the structure consists of a combination of raised wood floors over a gently sloping crawlspace and the small partial basement with a slab-on-grade floor. At the time of our field observations, the residence appeared to be in fair condition considering the age of the structure, with minor to moderate exterior stucco cracks extending from various building openings, such as doors, windows, crawlspace vents, and around building corners. Moderate cracks were noted within the partial basement floor and low retaining walls between the crawlspace and basement. Indications of excess moisture accumulation are evident within the partial basement and crawlspace areas, including significant efflorescence along the basement retaining walls and footings within the crawlspace. We note that we did not observe the condition of the residence interior living spaces at the time of our field observations.

At the time of our field observations, we noted moderate cracking of the interior slab and exterior stucco within the detached garage structure, and moderate cracking in the stucco along the exterior of the detached accessory building. The asphalt-surfaced driveway, concrete- and flagstone-over-concrete surfaced patios, and concrete site retaining walls appeared to be in fair condition, with minor to moderate cracking observed. In our opinion, the cracking of the referenced improvements is likely associated with a combination of geotechnical factors, including: (1) inadequate slab underlayment thickness, (2) differential compaction of fill and younger colluvial soils of varying consistencies blanketing the site, (3) the expansion and contraction of underlying highly plastic soils (see below), and (4) the potential settlement of hardscape support soils upon saturation, following water infiltration through the resultant hardscape cracks.

Drainage across the property is generally characterized as uncontrolled sheet flow down the moderate western slope from west to east and down the moderate to gentle slopes in the eastern portion from south to north. Natural sheet flow is interrupted by the residence and detached accessory structure building pads. In general, the existing residence appears to be equipped with roof gutters and downspouts that discharge adjacent to the residence foundations, resulting in a potential scenario for saturated soil conditions and standing water in some of these areas. In addition, the surface gradients in some areas appear inadequate to drain surface water away from the existing structure. A few isolated downspouts were noted to discharge into closed pipes whose outfall location is unknown.

Subsurface

In general, the exploratory borings encountered similar sequences of subsurface materials, including landscape fill and highly expansive, fine-grained colluvium overlying sandstone bedrock associated with the Franciscan Complex. The locations of the borings are shown on Figure A-2 and detailed logs of each boring are presented in Appendix B. A general description of the subsurface conditions and the approximate location of each exploratory boring are described below.

Boring B-1, located to the southwest of the existing residence, encountered approximately 1 foot of landscape fill consisting of very stiff sandy clay underlain by 6 feet of colluvium consisting of very stiff to stiff sandy clay. The colluvium was underlain by sandstone bedrock to the full depth explored of approximately 9.3 feet, where effective sampling refusal was encountered.

Boring B-2, located at the south end of the existing residence, encountered approximately 2 feet of landscape fill consisting of soft sandy clay underlain by 2 feet of colluvium consisting of very stiff sandy clay. The colluvium was underlain by sandstone bedrock to the full depth explored of approximately 6.2 feet, where effective sampling refusal was encountered.

Boring B-3, located to the northeast of the existing residence, encountered approximately 0.5 feet of landscape fill consisting of soft sandy clay underlain by 3 feet of colluvium consisting of soft to very stiff sandy clay. The colluvium was underlain by sandstone bedrock to the full depth explored of approximately 5.8 feet, where effective sampling refusal was encountered.

Laboratory Test Results

Atterberg limits testing was performed on a sample of the silty clay colluvium encountered in Boring B-2 at a depth of 2 to 4 feet. The testing of the colluvium yielded a plasticity index of 31 and a liquid limit of 44 percent, which indicates that this material has a high potential for expansion with increases in moisture content (see Liquid & Plastic Limits Test Report, Figure C-1).

Groundwater

Free groundwater was encountered at a depth of roughly 4 feet below grade in Boring B-2 at the time of drilling, and rose to a depth of 1.5 feet after five days. It appears that this shallow groundwater in Boring B-1 is likely perched water associated with landscape irrigation infiltration, rather than representative of a regional groundwater level. Although no free groundwater was observed in Boring B-1 at the time of drilling, we measured groundwater at a depth of 7.8 feet five days after drilling. No free groundwater was

encountered in Boring B-3 while drilling or when re-measured, five days after drilling. We note that fluctuations in the level of groundwater can occur due to variations in rainfall, landscaping, and other factors that may not have been evident at the time our measurements were made.

CONCLUSIONS

Based on our investigation, it is our opinion that, from a geotechnical perspective, the site is suitable for the proposed improvements, provided that the recommendations contained in this report are implemented in the design and construction. In our opinion, the primary geotechnical constraints to the proposed improvements include the potential for differential compaction of the minor surficial fills and younger colluvial soils of varying consistencies present beneath the site, the potential for expansion/contraction of the highly expansive clayey surficial soil, and the potential for strong ground shaking at the site as a result of a moderate to large earthquake on the San Andreas Fault or other nearby active fault. In our opinion, these constraints should not have a significant impact on the proposed improvements provided that they are designed and constructed in accordance with the recommendations of this report.

Based on our investigation, the excessive moisture in the crawlspace and partial basement beneath the existing residence is likely attributable to a combination of the following factors: 1) uncontrolled surface run off towards the building pad from upslope areas, 2) inadequate control of surface drainage adjacent to the residence, 3) infiltration of surface water into shallow perched zones and migration beneath the residence, and 4) inadequate (or lack of) subsurface drainage behind partial basement retaining walls. Additionally, because the partial basement is open to the adjacent residence crawlspace soils, any level of moisture in the crawlspace is free to effect the basement as well. In our opinion, excessive moisture accumulation beneath the planned new residence can be mitigated with the surface and subsurface drainage improvements suggested in the following sections of this report. We note that while it is nearly impossible to completely eliminate potential future moisture intrusion into residence crawlspaces, the recommendations below describe commonly employed construction methods to reduce the potential for excessive crawlspace moisture.

Geologic Hazards

As part of our investigation, we evaluated the potential for geologic hazards to impact the site and the proposed improvements. The results of our review are presented below:

- **Expansive Soil** – Based on our investigation, the site appears to be blanketed by a relatively thin layer of fill and/or colluvial soil underlain by Franciscan Complex

bedrock to the depth explored of 9.3 feet. In our opinion, the colluvium and/or bedrock should provide adequate support for the proposed new foundations. Based on our laboratory testing, it appears that the near surface material is highly expansive. In general, expansive soil can undergo volume changes with changes in moisture content. Specifically, when wetted as during the rainy season, expansive soil tends to swell and when dried as during the summer months, this material shrinks. Structures and flatwork supported on expansive soil tend to experience cyclic, seasonal heave and settlement. In our opinion, shrink and swell of the surficial soil should not have a significant impact on the structural integrity of the proposed improvements, provided that they are designed and constructed in accordance with the recommendations presented in this report. In our opinion, these recommendations should mitigate the potential for significant heave, but will not eliminate this potential.

- ④ Fault Rupture – Based on our site reconnaissance and our review of published maps, it is our opinion that no active or potentially active faults cross the property. Therefore, in our opinion, the potential for fault rupture to occur at the site is negligible.
- ④ Ground Shaking – As noted in the Seismicity section above, moderate to large earthquakes are probable along several active faults in the greater Bay Area. Therefore, strong ground shaking should be expected at some time during the design life of the proposed development. The improvements should be designed in accordance with current earthquake resistant standards, including the 2010 CBC guidelines and design parameters presented in this report. It should be clearly understood that these guidelines and parameters will not prevent damage to structures; rather they are intended to prevent catastrophic collapse.
- ④ Differential Compaction – During moderate and large earthquakes, soft or loose, natural or fill soils can become densified and settle, often unevenly across a site. Because bedrock was encountered at shallow depth, and the overlying colluvial soil encountered at the site is generally cohesive and stiff to very stiff, in our opinion, the potential for differential compaction of this material is low. It is our opinion that there is a moderate potential for differential compaction of the fill material and soft younger colluvial soil encountered in the borings. However, in our opinion, if the improvements are constructed on foundations designed in accordance with the recommendations in our report, the potential for damage from differential compaction should be negligible.
- ④ Liquefaction – Liquefaction is a process by which soil deposits below the water table temporarily lose strength and behave as a viscous liquid rather than a solid, typically

during a moderate to large earthquake. In general clean fine- to medium-grained sand and silts with low plasticity fines are most susceptible to liquefaction. Earthquake-induced ground shaking can cause the loose material to consolidate, resulting in increased pore water pressures and an upward movement of groundwater that may result in a liquefied condition. Structures situated above such temporarily liquefied soils may sink or tilt, causing significant structural damage. Given the predominantly clayey soils encountered in the upper 3.5 to 7 feet and the presence of bedrock at relatively shallow depths, in our opinion, the potential for liquefaction to occur at the site and/or to significantly affect the planned improvements is low.

RECOMMENDATIONS

In our opinion, the residence should be supported on drilled, cast-in-place, concrete piers gaining support in the competent bedrock underlying the site. In addition, we have also provided the option of supporting the residence on conventional, continuous spread footings designed to accommodate some differential soil movement and distribute the foundation movement over broader areas. In our opinion, piers will perform slightly better than footings. However, spread footings can be expected to perform reasonably well from a gross structural perspective. A disadvantage of the spread footing option would be that significant footing excavations in excess of approximately 3.5 feet would be required to attain our recommended embedment depth below the existing fill and soft colluvium. Additionally, a drilled pier foundation would offer significantly greater assurance against the potential impacts of the expansion and contraction of the near surface highly expansive clay-rich soils that could result in out-of-level floors and minor to moderate cracking of interior drywall or exterior stucco surfaces.

We recommend that proposed site retaining walls preferably be supported on drilled piers gaining support in the competent bedrock underlying the site. However, if excavations for the proposed walls remove all of the non-supportive fill and colluvial soil, exposing competent native soil and/or bedrock, it may be acceptable to support those walls on conventional spread footings. We recommend against using both piers and footings for any single wall. Wood deck improvements may also be supported on spread footings, although these foundations may be shallower than those recommended for the residence and site retaining walls.

To mitigate the potential for expansive soil movement, interior slabs floors, such as might be used within the new residence, should be constructed as structural slabs or conventional slabs-on-grade supported over a relatively thick section of compacted aggregate baserock.

Exterior slabs may be constructed as free-floating slabs-on-grade supported over compacted aggregate baserock; however, since according to our borings such slabs would overlie about 3 to 6 feet of highly expansive material, it should be anticipated that some degree of differential slab movement and cracking could occur. The degree of differential slab movement and resulting distress may be limited by removal and recompaction of the on-site soils to the desired compaction and moisture range and utilizing a relatively thick section of aggregate baserock. In addition, we note that where existing fill is present within areas of new hardscape, such as patios and walkways, portions of the fill should be removed and replaced as a properly engineered fill as deemed necessary by our field representative during construction. Alternately, if slight to moderate slab movement and cracking is unacceptable, we suggest that slabs be designed and constructed as structural slabs. In our opinion, the use of structural slabs would best serve to reduce cracking of the slab surfaces.

In addition, although we anticipate that surface drainage controls should substantially mitigate the presence of excessive moisture in the crawlspace, it may also be prudent to install a subsurface drain around the perimeter of the new residence to limit the presence of excessive moisture in the near-surface soils beneath the residence. Detailed foundation, grading, and drainage recommendations and geotechnical design criteria are presented below. We should review the proposed layout and design, prior to completion of the final plans, to verify that the following recommendations are appropriate and have been properly interpreted and incorporated into the plans. Our detailed recommendations are presented in the following sections of this report.

2010 CBC EARTHQUAKE DESIGN PARAMETERS

We have developed site-specific earthquake design parameters based on the procedures described in Chapter 16, Section 1613 of the 2010 California Building Code (California Building Standards Commission, 2010). These procedures utilize State standardized spectral acceleration values for maximum considered earthquake ground motion taking into account historical seismicity, available paleoseismic data, and activity rates along known fault traces, as well as site-specific soil and bedrock response characteristics. Contour maps of Class B bedrock horizontal spectral acceleration values for the State of California are included as figures in Chapter 16 of the 2010 CBC, representing both short (0.2 seconds) and long (1.0 second) periods of spectral response and taking into account 5 percent of critical damping. Leyendecker and others (2011) have prepared a software program for public use that allows for site-specific adjustments of these acceleration values for different subsurface conditions, which are defined by site classes. Given a representative latitude of 37.514 and longitude of -122.274, in accordance with guidelines presented in the 2010 CBC, the following seismic design parameters will apply for this site:

- ⦿ Site Class C – Soil Profile Name: Very Dense Soil and Soft Rock (Table 1613.5.2)
- ⦿ Mapped Spectral Accelerations for 0.2 second Period: $S_S=1.784$ (Site Class B)
- ⦿ Mapped Spectral Accelerations for a 1-second Period: $S_1=0.915$ (Site Class B)
- ⦿ Design Spectral Accelerations for 0.2 second Period: $S_{DS}=1.189$ (Site Class C)
- ⦿ Design Spectral Accelerations for a 1-second Period: $S_{D1}=0.793$ (Site Class C)

FOUNDATIONS

Drilled Pier & Grade Beam

Drilled piers for the residence should be at least 16 inches in diameter and should extend at least 8 feet into the underlying bedrock. Drilled piers for site retaining walls should be at least 16 inches in diameter and should extend at least 4 feet below bottom of wall or at least 1.5 times as deep (below bottom of wall) as the retained soil height, whichever is greater. Please note, that these are recommended minimum pier dimensions and that other structural criterion, such as the need to resist lateral forces, may force the pier design depths to be greater. In general, drilled piers should be spaced no closer than three pier-diameters, center-to-center.

The piers should be designed to resist dead plus live loads using an allowable skin friction value of 450 pounds per square foot for the depth of the pier in the bedrock with a one-third increase allowed for transient loads, including wind and seismic forces. Any portion of the piers in fill and colluvium, and any point-bearing resistance should be neglected for support of vertical loads.

Due to the gentle slopes on the site, active lateral loads from creep of surficial soils should be negligible. Other lateral loads may be resisted by passive earth pressure based upon an equivalent fluid pressure of 400 pounds per cubic foot, acting on 1.5 times the projected area for the depth of the pier in the bedrock. In areas where soft soil or fill is encountered, the upper 2-3 feet should be neglected for lateral support. The structural engineer should establish additional pier reinforcing, as necessary, based on structural requirements.

Because of the potentially expansive nature of the surficial soil, the tops of piers should be prevented from “mushrooming.” This may be accomplished by placing Sonotubes within the upper 2 to 3 feet of the pier excavations where bedrock is not encountered at the surface prior to placement of concrete or by other construction methods. If Sonotubes are used, they should fit snugly within the pier excavations and should extend 2 inches above the bottom of grade beam excavations to account for the placement of a void form at the bottom of the grade beam (see below). Pier reinforcing should be determined by the project

structural engineer based on the preceding design criteria and structural requirements. However, as a minimum, we suggest that piers should be reinforced with a cage of four No. 5 steel reinforcing bars for the full length of the piers.

Based on our engineering judgment, thirty-year differential foundation movement due to static loads is not expected to exceed approximately 1/2-inch across any 20-foot span of the pier-supported portions of the improvements.

Pier Construction Considerations

The contractor should be advised that hard bedrock may be encountered while excavating the foundation piers for the residence addition. "Refusal" to drilling with lightweight equipment (e.g. augers mounted on a backhoe tractor) should be evaluated by our field representative and may not be considered acceptable, necessitating heavier equipment being brought to the site to demonstrate "refusal."

The bottoms of the pier excavations should be substantially free of loose cuttings and soil slough prior to the installation of reinforcing steel and the placement of concrete. In addition, any accumulated water in the pier excavations should be displaced using the tremie method when placing concrete. Our representative should observe pier drilling, to establish that piers are bearing in competent materials and that the pier excavations are properly prepared. Concrete should be cast as soon as practical after pier drilling to limit the potential for delays due to the possibility of soil caving. Since shallow groundwater was encountered during our exploratory drilling, the foundation contractor should be prepared to provide steel casing if caving soils are encountered.

Grade Beams

All piers for the residence should be interconnected with grade beams; no isolated drilled piers should be incorporated in the foundation design. Perimeter grade beams for the residence should extend at least 6-inches below the crawlspace grade or bottom of slab subgrade to help mitigate the potential for infiltration of surface runoff under the at-grade portions of the structures. In addition, we recommend that all grade beams overlying the potentially expansive surficial soil be formed over 2-inch thick cardboard void forms, such as manufactured by SureVoid to mitigate the potential impacts of uplift from soil expansion. Void forms are not necessary where excavations for grade beams expose the granular, non-expansive bedrock.

Grade beam reinforcing should be established by the project structural engineer based on the preceding design criteria and structural requirements. However, as a minimum, we recommend grade beams include a minimum of two No. 5 reinforcing bars, two at the top

and two at the bottom, to provide structural continuity and to permit the spanning of local irregularities.

Spread Footings

As noted above, as an alternative to drilled piers, the residence may be supported on conventional, continuous spread footings bearing in the underlying colluvial soil and/or bedrock. Continuous spread footings for the residence should have a minimum width of 15 inches and should extend at least 36 inches deep below final adjacent exterior grade, at least 24 inches deep below crawlspace grade or bottom of slab elevation, and be embedded a minimum of 12 inches into competent colluvial soil and/or bedrock, whichever is deeper. We anticipate footing depths of up to approximately 3.5 feet below existing exterior site grades may be required in some areas.

Site retaining walls supporting cuts into bedrock may be founded on spread footings supported in the bedrock. Other conditions may also be acceptable for spread footings in conjunction with retaining walls, but we should review the proposed layout prior to designing with spread footings. Continuous spread footings for site retaining walls should have a minimum width of 15 inches and should be embedded at least 12 inches into the underlying competent bedrock. Isolated footings supporting deck improvements should be a minimum of 18 inches square and should extend a minimum of 24 inches below grade and 6 inches into competent soil and/or bedrock, whichever is deeper. All spread footings may be designed using an allowable bearing pressure of 2,500 pounds per square foot for dead plus live loads, with a one-third increase allowed for total loads including wind and seismic forces. The weight of the footings may be neglected for design purposes.

Lateral loads may be resisted by friction between the footings and the supporting subgrade using a friction coefficient of 0.30 for concrete formed on soil. In addition to the preceding frictional resistance, lateral resistance may be provided by passive pressures acting against foundations poured neat in excavations into competent material using an equivalent fluid pressure of 300 pounds per cubic foot.

All footings located adjacent to utility lines or other footings should bear below a 1:1 plane extended upward from the bottom edge of the utility trench or footing. We also suggest that all continuous footings be reinforced with a minimum of two No. 5 reinforcing bars, top and bottom, to provide structural continuity and to permit spanning of local irregularities.

The footing excavations should be substantially free of all loose soil, prior to placing reinforcing steel and concrete. Our representative should observe the footing excavations prior to placing concrete forms and reinforcing steel to evaluate that they are founded in

competent bearing materials and have been properly cleaned. In addition, any loose soil in the footing excavations resulting from the placement of forms and reinforcing steel should be removed prior to placing concrete.

Based on our engineering judgment, the thirty-year differential foundation movement due to static loads is not expected to exceed approximately 1-inch across any 20-foot span of the footing-supported improvements.

BUILDING & SITE RETAINING WALLS

Building and site retaining walls should be supported on foundations designed in accordance with the recommendations provided above. Waterproofing or damp-proofing of retaining walls should be included in areas where wall moisture would be undesirable or where wall finishes could be impacted by moisture. The project architect or a waterproofing consultant should provide detailed recommendations for waterproofing or damp proofing, as necessary.

Lateral Earth Pressures

Retaining walls should be designed to resist lateral earth pressure from the adjoining natural soils, backfill, and any anticipated surcharge loads. Assuming that the backfill behind the wall will be level (e.g., not sloping upward) and that adequate drainage will be incorporated as recommended below, we recommend that unrestrained retaining walls be designed to resist an equivalent fluid pressure of 45 pounds per cubic foot (pcf) plus one-third of any anticipated surcharge loads. Walls restrained from movement at the top should be designed to resist an equivalent fluid pressure of 45 pcf plus a uniform pressure of $8H$ pounds per square foot (psf), where H is the height in feet of the retained soil. Restrained walls should also be designed to resist an additional uniform pressure equal to one-half of any surcharge loads applied at the surface.

In accordance with the 2010 CBC, new retaining walls where applicable should also be designed to resist lateral earth pressure from seismic loading. We recommend that the seismic loading be based on a uniform pressure of $12H$ pounds per square foot (psf)/foot of wall height, where H is the height in feet of the retained soil. We also note that the allowable passive pressures provided for retaining wall foundations may be increased by one-third for short-term seismic forces.

Where backfill behind the wall will be sloping upward from the wall, we recommend that the equivalent fluid pressures given above be increased by 3 pcf for each 4-degree increase in slope inclination. For sloping conditions steeper than 2:1, we should review the proposed design when it is available and provide specific lateral pressure recommendations upon completion of our review.

Retaining Wall Drainage

We recommend that retaining walls include a subsurface drainage system to mitigate the buildup of water pressure from surface water infiltration and other possible sources of water. Retaining wall backdrains should consist of a minimum 4-inch diameter, perforated rigid pipe, Schedule 40 or SDR 35 (or equivalent) with the perforations facing down, resting on a thin layer of crushed rock at the base of the wall. For building retaining walls, the perforated pipe should be placed within a minimum 8-inch deep by 12-inch wide trench, and the base of the trench and the pipe inlets should be lower than the adjacent crawlspace grade or bottom of slab subgrade. Subdrain pipes should be bedded and backfilled with 1/2- to 3/4-inch clean crushed rock separated from the native soil with a geotextile filter fabric, such as TC Mirafi 140N or equivalent. The crushed rock backfill should extend vertically to within 12 inches of the finished grade and laterally at least 12 inches from the rear face of the wall. The crushed rock should be compacted with a jumping jack or vibratory plate compactor in lifts not exceeding 12 inches in loose thickness. The upper 12 inches of backfill should consist of native soil, which should be compacted in accordance with the Compaction section of this report to mitigate infiltration of surface water into the subdrain systems.

As an alternative to crushed rock, Miradrain, Enkadrain, or other geosynthetic drainage panels approved by this office may be used for retaining wall drainage. If used, the drainage panels should extend from a depth of 18 inches below finish grade to the base of the retaining wall. A 2-foot section of crushed rock wrapped in filter fabric should be placed around the drainpipe, as discussed previously. Geosynthetic drainage panels should be installed in strict compliance with manufacturer's recommendations with filter fabric against the crushed rock and soil backfill.

Subdrain pipes should be sloped at a minimum of 1.5 percent and should be connected to rigid, solid (non-perforated) discharge pipes to convey any collected water to a suitable discharge location downslope from the proposed improvements. The subdrain pipes should be provided with cleanout risers at their up-gradient ends and at most sharp directional changes to facilitate maintenance. All surface drainage pipes, including those connected to downspouts and area drains should be kept completely separate from the retaining wall drainage systems.

Backfill

Backfill placed behind retaining walls should be compacted in accordance with the recommendations provided in the Compaction section of this report, using light compaction equipment. If heavy compaction equipment is used, the walls should be temporarily braced. Please refer also to the Earthwork section of this report for important recommendations

regarding retaining wall backfill.

CONCRETE SLABS

We anticipate that concrete slabs may be used for interior residence slabs, exterior patios, and walkways. We recommend that slab floors for the residence be constructed as either structural slabs supported on foundations designed in accordance with the recommendations provided above or slabs-on-grade supported over a relatively thick section of aggregate baserock.

Exterior slabs may be constructed as free-floating slabs-on-grade supported over compacted baserock; however, since such slabs would overlie about 3 to 6 feet of highly expansive material, it should be anticipated that some degree of differential slab movement and cracking could occur. The degree of differential slab movement and resulting distress may be limited by removal and recompaction of the on-site soils to the desired compaction and moisture range and utilizing a relatively thick section of aggregate baserock. In addition, we note that where existing fill is present within areas of new hardscape, such as patios and walkways, portions of the fill should be removed and replaced as a properly engineered fill as deemed necessary by our field representative during construction. Alternately, if slight to moderate slab movement and cracking is unacceptable, we suggest that exterior slabs be designed and constructed as structural slabs. In our opinion, the use of structural slabs would best serve to reduce cracking of the slab surfaces. Detailed recommendations are presented in the following sections of this report.

Structural Slabs

For greater assurance against the potential for future cracking that may result either from expansive soils, or from slight settlement of the underlying soils, residence floors and more critical exterior concrete hardscape may be designed as structural slabs supported on foundations designed in accordance with the recommendations provided above. In addition, a 2-inch thick void form should underlie any structurally supported slabs to mitigate excessive uplift forces against the bottom of the slab. The void formers may be placed directly on the uniformly graded subgrade soils.

To limit slab dampness from soil moisture vapors, we recommend that a heavy-duty impermeable membrane be placed over the void form to limit slab dampness from soil moisture vapors. In particular, for structural slabs that will be formed over void forms, we suggest the use of an integrally bonded vapor barrier, such as Florprufe™ (Grace Construction Products), which will remain in direct contact with the slab when the cardboard void-former deteriorates. Please refer to the Vapor Barrier Considerations section below for additional information. Please note that these recommendations do not comprise

a specification for "waterproofing." For greater protection against concrete dampness, we recommend that a waterproofing consultant be retained.

Slabs-on-Grade

Concrete slabs for the residence should either be constructed as structural slabs supported on foundations designed in accordance with the recommendations provided previously or as conventional slabs-on-grade underlain by at least 24 inches of Class 2 aggregate baserock. We note that the placement of the above thickness of baserock beneath proposed slabs will in our opinion substantially mitigate but not completely eliminate the potential for differential performance of these slabs.

Exterior slabs-on-grade should be underlain by at least 12 inches of Class 2 aggregate baserock. Where non-expansive soil or bedrock is exposed at the subgrade level, the recommended thickness of select granular fill may be reduced to 6 inches. In addition, where existing fill is present within areas of new hardscape, portions of the fill should be removed and replaced as engineered fill as deemed necessary by our field representative during construction.

Prior to placement of the baserock, the subgrade soils should be scarified and moisture conditioned, as necessary, to a depth of approximately 6 inches and recompact in accordance with the Compaction section of this report. In addition, if highly expansive subgrade soils are encountered, they should be scarified to a depth of approximately 6 to 12 inches, moisture conditioned to approximately 3 to 5 percent over optimum moisture content, and compacted to between 88 percent to 90 percent relative compaction. Because of the highly expansive nature of the surficial soil, over-compaction of this material should be avoided. In our opinion, these recommendations should mitigate the potential for significant heave, but will not eliminate this potential.

Slabs-on-grade should be provided with control joints at spacing of not more than about 10 feet. The project structural engineer should provide slab reinforcing based on anticipated use and loading.

Select granular fill should be compacted in accordance with the Compaction section of this report. Where slab surface moisture would be a significant concern, such as for the residence slabs, we recommend that the slabs be underlain by a vapor retarder consisting of a highly durable membrane not less than 10 mils thick (such as Stego Wrap Vapor Barrier by Stego Industries, LLC or equivalent), underlain by a capillary break consisting of 4 inches of ½- to ¾-inch crushed rock. The capillary break may be considered the equivalent thickness as the upper 4 inches of select granular fill recommended above. Please also refer to the

Vapor Retarder Considerations section below for additional information. Please note that these recommendations do not comprise a specification for “waterproofing.” For greater protection against concrete dampness, we recommend that a waterproofing consultant be retained.

Vapor Retarder Considerations

Based on our understanding, two opposing schools of thought currently prevail concerning protection of the vapor retarder during construction. Some believe that 2 inches of sand should be placed above the vapor retarder to protect it from damage during construction and also to provide a small reservoir of moisture (when slightly wetted just prior to concrete placement) to benefit the concrete curing process. Still others believe that protection of the vapor retarder and/or curing of concrete are not as critical design considerations when compared to the possibility of entrapment of moisture in the sand above the vapor retarder and below the slab. The presence of moisture in the sand could lead to post-construction absorption of the trapped moisture through the slab and result in mold or mildew forming at the upper surface of the slab.

We understand that recent trends are to use a highly durable vapor retarder membrane (at least 10 mils thick) without the protective sand covering for interior slabs surfaced with floor coverings including, but not limited to, carpet, wood, or glued tiles and linoleum. However, it is also noted that several special considerations are required to reduce the potential for concrete edge curling if sand will not be used, including slightly higher placement of reinforcement steel and a water-cement ratio not exceeding 0.5 (Holland and Walker, 1998). We recommend that you consult with other members of your design team, such as your structural engineer, architect, and waterproofing consultant for further guidance on this matter.

SITE DRAINAGE

Surface Drainage

Control of surface water is critical for projects constructed in both hillside and expansive soil areas. The finished grades near the residence should be designed to drain surface water away from the structures and exterior slabs and the residence should be provided with roof gutters and downspouts. In particular, the finished ground surface should have positive gradient away from the residence. Where such surface gradients are difficult to achieve, we recommend that area drains or surface drainage swales be installed to collect surface water and convey it away from the structures.

Surface runoff should be prevented from flowing over the top of any artificial slope. The ground surface at the top of the slope should be graded to slope away from the slope or a

berm or lined drainage ditch should be provided at the top of the slope. In addition, retaining walls at the bases of descending slopes should be provided with lined drainage swales along their uphill side to collect surface water from above.

We recommend that annual maintenance of the surface drainage systems be performed. This maintenance should include inspection and testing to make sure that roof gutters and downspouts are in good working order and do not leak; inspection and flushing of area drains to make sure that they are free of debris and are in good working order; and inspection of surface drainage outfall locations to verify that introduced water flows freely through the discharge pipes and that no excessive erosion has occurred. If erosion is detected, this office should be contacted to evaluate its extent and to provide mitigation recommendations, if needed.

Subsurface Drainage

To further limit the potential for excessive moisture in the residence crawlspace, it may also be prudent to construct a subdrain system extending along all sides of the residence. The subdrain should extend to a minimum depth of 3 feet below the nearest residence crawlspace grade or slab subgrade. The elevation of the bottom of the trench at any point along the subdrain should also be at least 12 inches below the lowest elevation of the crawlspace. The bottom of the subdrain trench should be placed far enough from the residence perimeter foundation such that it is above a 1:1 plane projected downward from the base of the adjacent perimeter residence footing (if used). The subdrain should consist of a 4-inch diameter, perforated PVC pipe (SDR 35 or better) located near the bottom of a 12-inch wide trench with 1 to 2 inches of 1/2- to 3/4-inch clean crushed rock underlying the pipe. The perforated pipe should be enclosed in 1/2- to 3/4-inch clean crushed rock wrapped in filter fabric, which extends to within 12 inches of the ground surface. The perforated pipe itself should not be wrapped with filter fabric because, in our opinion, this practice increases the likelihood of clogging the small perforations in the pipe. The upper 12 inches of the subdrain trench and the portions of the trench with solid pipe should be backfilled with compacted native soil to mitigate surface water infiltration into the subdrain.

The perforated pipe should be provided with a clean-out riser at its up-gradient end and at 90-degree bends to facilitate maintenance. The perforated pipe should be connected to solid (non-perforated) discharge lines to convey collected water to discharge. The subdrain system should be a dedicated system, completely separate from the surface drainage and crawlspace drainage control systems. The perimeter subdrain detail is shown schematically on Figure A-5, Perimeter Subdrain Schematic.

EARTHWORK

A moderate amount of earthwork is anticipated as part of the proposed construction, including the drilled pier and/or spread footing excavations, retaining wall drainage and backfill, compaction of subgrade and baserock beneath slabs-on-grade, and utility trench backfill. Proposed earthwork should be performed in accordance with the following recommendations.

Clearing & Site Preparation

Initially, the proposed improvement areas should be cleared of obstructions, including existing foundations, flatwork, utilities, and trees not designated to remain. Holes or depressions resulting from the removal of underground obstructions below proposed subgrade levels, such as root balls, should be backfilled with engineered fill, placed and compacted in accordance with the recommendations provided below. After clearing, the proposed improvement areas should be adequately stripped to remove surface vegetation and organic-laden topsoil. The stripped material should not be used as engineered fill; however, it may be stockpiled and used for landscaping purposes.

Material for Fill

All on-site soils below the stripped layer having an organic content of less than 3 percent organic material by volume (ASTM D 2974) should be suitable for use as engineered fill provided the material has a low potential for expansion. In general, fill material should not contain rocks or pieces larger than 6 inches in greatest dimension, and should contain no more than 15 percent larger than 2.5 inches. Any required imported fill should be predominantly granular material or low plasticity material with a plasticity index of less than approximately 15 percent. Any proposed fill for import should be approved by Murray Engineers, Inc. prior to importing to the site. Our approval process may require index testing to establish the expansivity of the soil; therefore, it is important that we receive samples of any proposed import material at least 3 days prior to planned importing. Class 2 aggregate baserock should meet the specifications outlined in the Caltrans Standard Specifications, latest edition.

Compaction

Prior to placing engineered fill, the subgrade soil should be scarified and compacted, as necessary. Material used for fill should be placed in uniform lifts, no more than 8-inches in uncompacted thickness. The fill material should be moisture conditioned, as necessary, and compacted in accordance with the specifications listed in Table 1 below. The relative compaction and moisture content specified in Table 1 are relative to ASTM D 1557 (latest edition). Compacted lifts should be firm and non-yielding under the weight of compaction equipment prior to the placement of successive lifts.

Table 1. Compaction Specifications

Fill Element	Relative Compaction*	Moisture Content*
General imported fill for driveways, patio areas, and raising of site grades	90 percent	Near optimum
Upper 6 inches of highly expansive subgrade soil in slab-on-grade areas	88 to 90 percent	3 to 5% over optimum
Aggregate base under slabs-on-grade	95 percent	Near optimum
½- to ¾-inch Crushed Rock - Compact with at least 3 passes of a vibratory plate with lift-thickness < 12 inches.	see note at left	Near optimum
Backfill of utility trenches using on-site soils	90 percent	Near optimum
Backfill of utility trenches using imported sand	90 percent	Near optimum

- Relative to ASTM D 1557, latest edition.

Construction of Fill Benches

Because of the relatively gentle slopes across the proposed building area, keyways are not required. However, any proposed fill should be placed on near-level benches excavated into the bedrock to provide a firm, stable base for support of the fill. Benches should be provided with a downward slope of approximately 2 percent in the uphill direction to provide resistance to lateral movement.

Temporary Slopes & Trench Excavations

The contractor should be responsible for the stability of all temporary cut slopes and trenches excavated at the site, and design and construction of any required shoring. Shoring and bracing should be provided in accordance with all applicable local and state safety regulations, including the current OSHA excavation and trench safety standards. Because of the potential for variable soil conditions, field modifications of temporary cut slopes may be required. Unstable materials encountered on the slopes during the excavation should be trimmed off, even if this requires cutting the slope back at flatter inclinations.

REQUIRED FUTURE SERVICES

Plan Review

To better assure conformance of the final design documents with the recommendations contained in this report, and to better comply with the building department's requirements, Murray Engineers, Inc. must review the completed project plans prior to construction. The plans should be made available for our review as soon as possible after completion so that we can better assist in keeping your project schedule on track. We recommend that the following note be added to the architectural, structural, and civil plans:



- All earthwork and site drainage, including site clearing, drilled pier and/or spread footing excavations, retaining wall drainage and backfill, preparation of subgrade beneath slabs-on-grade, placement and compaction of engineered fill, and surface drainage should be performed in accordance with the recommendations of the geotechnical report prepared by Murray Engineers, Inc., dated October 5, 2011. Murray Engineers, Inc. should be provided at least 48 hours advance notification (650-326-0440) of any earthwork operations and should be present to observe and/or test as necessary the earthwork and foundation installation phases of the project.

Construction Observation Services

Murray Engineers, Inc. should observe and test (as necessary) the earthwork and foundation phases of construction in order to a) confirm that subsurface conditions exposed during construction are substantially the same as those interpolated from our limited subsurface exploration, on which the analysis and design were based; b) evaluate compliance with the geotechnical design concepts, specifications, and recommendations; and c) allow design changes in the event that subsurface conditions differ from those anticipated. The recommendations in this report are based on limited subsurface information. The nature and extent of variation across the site may not become evident until construction. If variations are exposed during construction, it may be necessary to re-evaluate our recommendations.

LIMITATIONS

This report has been prepared for the sole use of Matthias Hausner, specifically for developing geotechnical design criteria relating to design and construction of the new residence, as discussed above, at 1512 Harbor Boulevard in Belmont, California. The opinions presented in this report are based upon information obtained from borings at widely separated locations, site reconnaissance, review of field data made available to us, and upon local experience and engineering judgment, and have been formulated in accordance with generally accepted geotechnical engineering practices that exist in the San Francisco Bay Area at the time this report was prepared. Further, our recommendations are based on the assumption that soil and geologic conditions at or between borings do not deviate substantially from those encountered. In addition, geotechnical issues may arise that are not apparent at this time. No other warranty, expressed or implied, is made or should be inferred. We are not responsible for data provided by others.



The recommendations provided in this report are based on the assumption that we will be retained to provide the Future Services described above in order to evaluate compliance with our recommendations. If we are not retained for these services, Murray Engineers, Inc. cannot assume any responsibility for any potential claims that may arise during or after construction as a result of misuse or misinterpretation of Murray Engineers, Inc.' report by others. Furthermore, if another geotechnical consultant is retained for follow-up service to this report, Murray Engineers, Inc. will at that time cease to be the Engineer-of-Record.

The opinions presented in this report are valid as of the present date for the property evaluated. Changes in the condition of a property can occur with the passage of time, whether due to natural processes or the works of man, on this or adjacent properties. In addition, changes in applicable standards of practice can occur, whether from legislation or the broadening of knowledge. Accordingly, the opinions presented in this report may be invalidated, wholly or partially, by changes outside of our control. Therefore, this report is subject to review and should not be relied upon after a period of three years, nor should it be used, or is it applicable, for any property other than that evaluated.

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Be:SGS Topographic Map,San Mateo 3-Minute Quadrangle,19 Scale:1 inch =2000 feet

MURRAY
ENGINEERS INC
GEO-TECHNICAL SERVICES

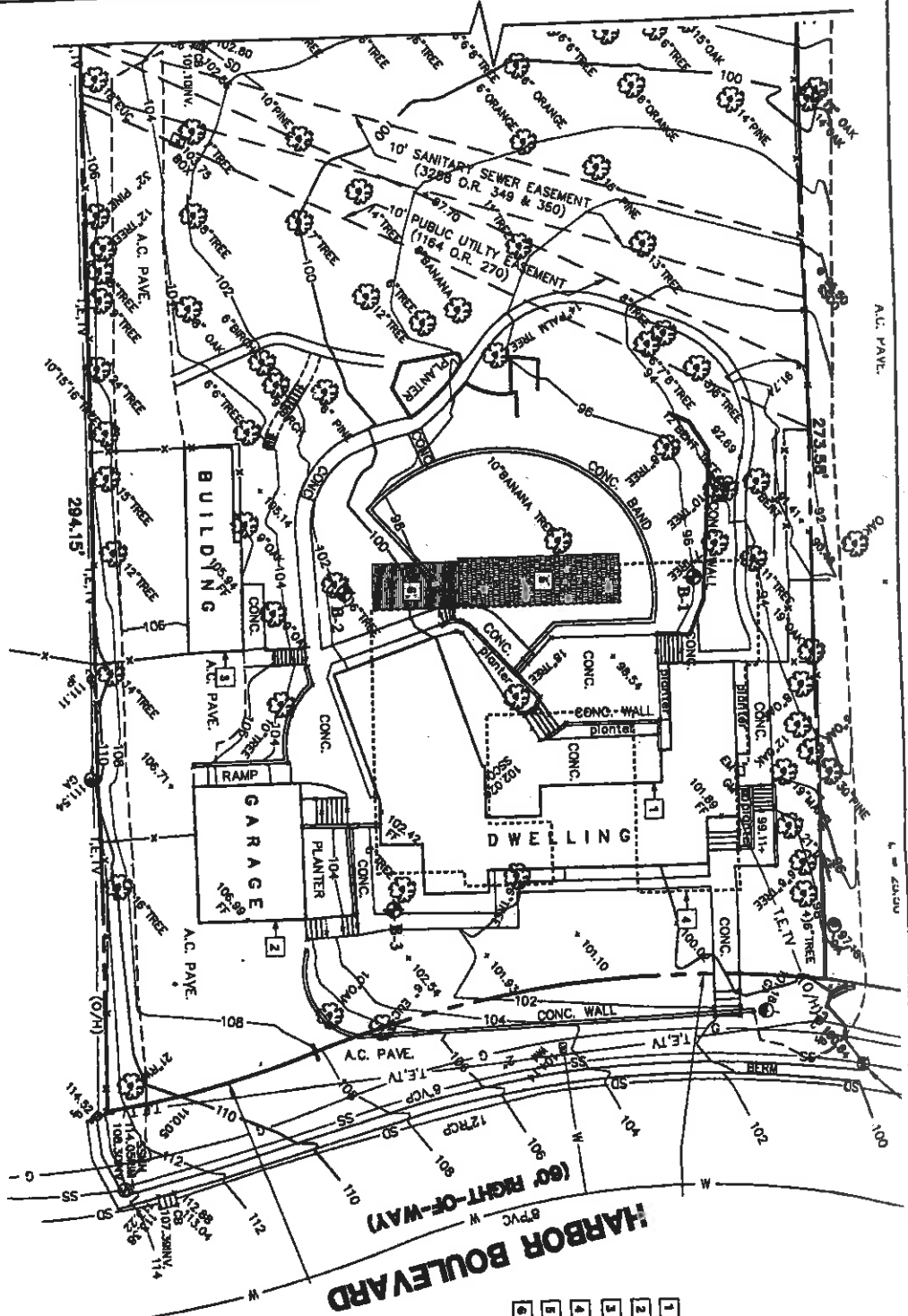
HAUSNER RESIDENCE
1512 HARBOR BOULEVARD
BELMONT, CALIFORNIA

VICINITY MAP

PROJECT NO. 1317-1R1

OCTOBER 2011

FIGURE A-1



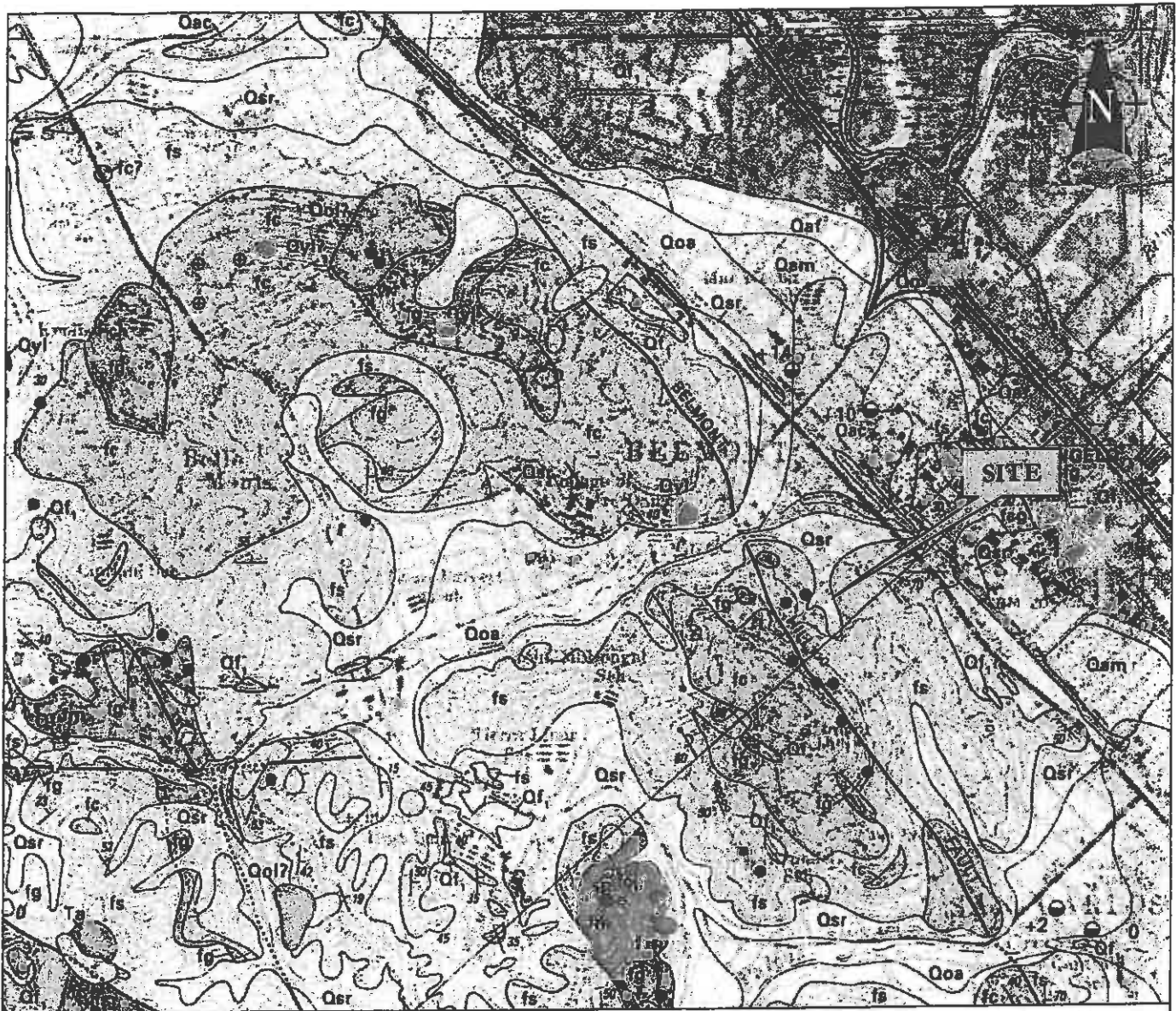
- KEY NOTES**
- 1 (B) Residence to be Demolished (Solid)
 - 2 (B) Detached Garage to Remain (Solid)
 - 3 (B) Accessory Building to Remain (Solid)
 - 4 Proposed Residence (Dashed)
 - 5 Proposed Patio Area
 - 6 Proposed Deck Area

LEGEND

B-1 Approximate Location of Soil Boring by Murray Engineers, Inc., September 1, 2011
 Base: Topography Survey Plan by Mascled and Associates, dated January 30, 2004
 Approximate Scale: 1 inch = 20 feet

MURRAY ENGINEERS INC.	
PARTIAL SITE PLAN	
HAUSNER RESIDENCE 1512 HARBOR BOULEVARD BELMONT, CALIFORNIA	
PROJECT NO. 1517-1B1	FIGURE A-2
OCTOBER 2011	

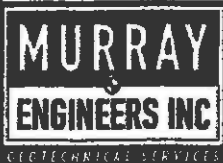




Legend Selected Map Symbols

- | | | | |
|------------|---|-----------|-------------------|
| Qsr | Slope wash, ravine fill, and colluvium (Holocene) | fc | Franciscan Chert |
| Qoa | Older alluvium (Pleistocene) | ● | Shallow Landslide |
| fs | Franciscan Sandstone | ~ | Contact |

Base: Geologic Map of the Montara Mountain and San Mateo 7.5" Quadrangles, San Mateo County, Pampeyan, 1994. Please refer to the Geology section of this report for a description of geologic symbols noted above.
 Scale: 1 inch = 2,000 feet



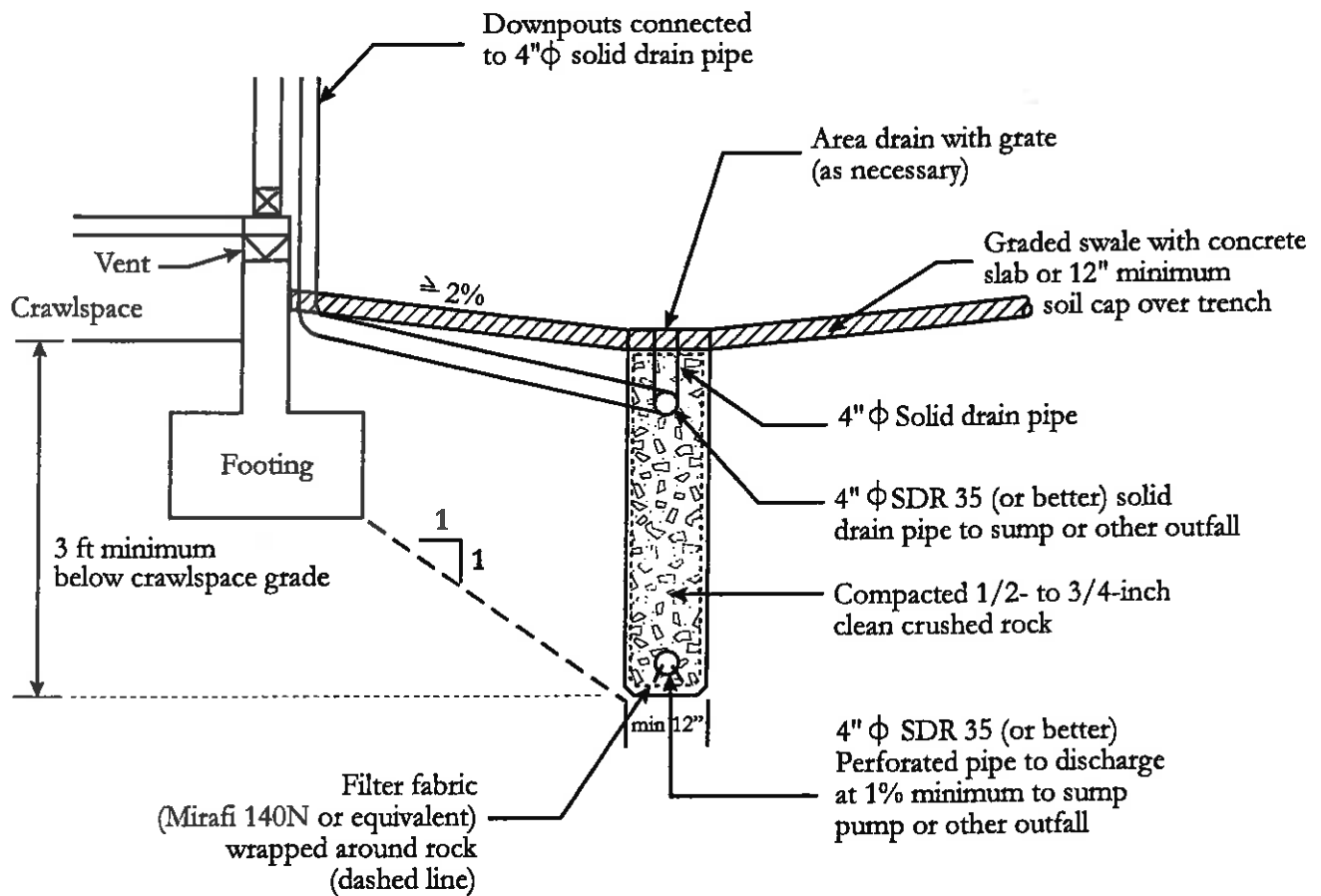
**HAUSNER RESIDENCE
 1512 HARBOR BOULEVARD
 BELMONT, CALIFORNIA**

**VICINITY
 GEOLOGIC MAP**

PROJECT NO. 1317-1R1

OCTOBER 2011

FIGURE A-3




DRAIN DETAIL
(not to scale)

Date(s) Drilled	September 10	Logged By	KK	Checked By	WPC
Drilling Method	Continuous Sampling	Drill Bit Size/Type	N/A	Total Depth of Borehole	9 feet bgs
Drill Rig Type	Sampling Tripod	Drilling Contractor	Access Soil Drilling, Inc.	Approximate Surface Elevation	6 feet (relative)
Groundwater Level and Date Measured	Not Encountered ATD; 3 feet five days later	Sampling Method(s)	30D, 20D, 10D SPT Split Spoon Samplers	Hammer Data	6b, 6n dbp, rope & ahead
Borehole Backfill	Cuttings	Location	Southwest of existing residence		

Elevation, feet	Depth, feet	Sample Type	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	MATERIAL DESCRIPTION	Water Content, %	Torvane Shear Strength (TSF)	Pocket Pen Comp. Strength, TSF
6	0			Very Stiff	CL	LANDSCAPE FILL: SANDY CLAY, dark yellowish brown, homogeneous, moderate plasticity, trace subangular rock and concrete fragments, trace rootlets, slightly moist	8		
	38			Very Stiff to Stiff	CL-CL	SANDY CLAY, dark yellowish brown to yellowish brown, homogeneous, moderate to high plasticity, fine-grained sand, minor iron oxide mottling, moist to very moist (Colluvium)	10	0.5	4.3
	34						10		
9	5		18				12	0.3	1.3
							15		
	27			Soft*	BR	SANDSTONE, yellowish brown, severely weathered, saturated to moist (Franciscan Complex) *designates hardness of bedrock (see Figure B-6)	21		
			50/5"				11		
			50/5"				9		
6						Bottom of Boring at 9.3 feet bgs			

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	HAUSNER RESIDENCE 1512 HARBOR BOULEVARD BELMONT, CALIFORNIA		LOG OF BORING B-1
	PROJECT NO. 1317-1R1	OCTOBER 2011	FIGURE B-1

Date(s) Drilled	September 10	Logged By	KK	Checked By	WPC
Drilling Method	Continuous Sampling	Drill Bit Size/Type	N/A	Total Depth of Borehole	6 feet bgs
Drill Rig Type	Sampling Tripod	Drilling Contractor	Access Soil Drilling, Inc.	Approximate Surface Elevation	feet (relative)
Groundwater Level and Date Measured	3 feet ATD, 1 feet after 5 days	Sampling Method(s)	30D, 20D, 30D SPT Split Spoon Samplers	Hammer Data	6b, 6n dbp, rope & thread
Borehole Backfill	Cottings	Location			

Elevation, feet	Depth, feet	Sample Type	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	MATERIAL DESCRIPTION	Water Content, %	Torvane Shear Strength (TSF)	Pocket Pen Comp. Strength, TSF
0	0			Soft	CL	LANDSCAPE FILL: SANDY CLAY, dark brown, heterogeneous, moderate plasticity, trace rootlets, very moist (after 5 days)	25		
	4			Very Stiff	CL-CH	SANDY CLAY, dark yellowish brown, homogeneous, moderate to high plasticity, fine-grained sand, minor iron oxide mottling, moist (Colluvium) PI=31%; LL=44% (sample from 2 to 4 feet)	16	0.8	3.0
	26			Soft*	BR	SANDSTONE, yellowish brown, homogeneous, severely weathered, moist (Franciscan Complex) *designates hardness of bedrock (see Figure B-6)	13		
	90/11"								
	50/3"						10		
						Bottom of Boring at 6.2 feet bgs			

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HAUSNER RESIDENCE
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LOG OF BORING B-2

FIGURE B-2

Date(s) Drilled	September 10	Logged By	KK	Checked By	WPC	
Drilling Method	Continuous Sampling	Drill Bit Size/Type	N/A	Total Depth of Borehole	3 feet bgs	
Drill Rig Type	Sampling Tripod	Drilling Contractor	Access Soil Drilling, Inc.	Approximate Surface Elevation	feet (relative)	
Groundwater Level and Date Measured	Not Encountered ATD; or five days later	Sampling Method(s)	30D, 20D, 40D SPT Split Spoon Samplers	Hammer Data	6b, 6n tdp, rope & ahead	
Borehole Backfill	Cuttings	Location				Northeast of existing residence

Elevation, feet	Depth, feet	Sample Type	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	MATERIAL DESCRIPTION	Water Content, %	Torvane Shear Strength (TSF)	Pocket Pen Comp. Strength, TSF
0	0			Soft	CL	LANDSCAPE FILL: SANDY CLAY, very dark grayish brown, homogeneous, moderate plasticity, very moist			
	5			Soft to Very Stiff	CL-CH	SANDY CLAY, dark yellowish brown, homogeneous, moderate to high plasticity, fine-grained sand, minor iron oxide mottling, very moist (Colluvium)	18	0.5	2.0
	34						20	0.5	2.5
	50/4"			Soft*	BR	SANDSTONE, yellowish brown, homogeneous, severely weathered, moist (Franciscan Complex) *designates hardness of bedrock (see Figure B-6)	11		
	50/5"						10		
						Bottom of Boring at 5.8 feet bgs			

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	HAUSNER RESIDENCE 1512 HARBOR BOULEVARD BELMONT, CALIFORNIA		LOG OF BORING B-3
	PROJECT NO. 1317-1R1	OCTOBER 2011	FIGURE B-3

Elevation, feet	Depth, feet	Sample Type	Sampling Resistance, blows/foot	Relative Consistency	USCS Symbol	MATERIAL DESCRIPTION	Water Content, %	Torvane Shear Strength (TSF)	Pocket Pen Comp. Strength, TSF
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1 2 3 4 5 6 7 8 9 10

COLUMN DESCRIPTIONS

- 1 **Elevation, feet:** Elevation (MSL, feet)
- 2 **Depth, feet:** Depth in feet below the ground surface.
- 3 **Sample Type:** Type of soil sample collected at the depth interval shown.
- 4 **Sampling Resistance, blows/foot:** Number of blows to advance driven sampler foot (or distance shown) beyond seating interval using the hammer identified on the boring log.
- 5 **Relative Consistency:** Relative consistency of the subsurface material.
- 6 **USCS Symbol:** USCS symbol of the subsurface material.
- 7 **MATERIAL DESCRIPTION:** Description of material encountered. May include consistency, moisture, color, and other descriptive text.
- 8 **Water Content, %:** Water content of the soil sample, expressed as percentage of dry weight of sample.
- 9 **Torvane Shear Strength (TSF):** Shear Strength of the soil
- 10 **Pocket Pen Comp. Strength, TSF:** The percent fines (soil passing the No. 200 Sieve) in the sample. WA indicates a Wash Sieve, SA indicates a Sieve Analysis.

FIELD AND LABORATORY TEST ABBREVIATIONS

CHEM: Chemical tests to assess corrosivity
COMP: Compaction test
CONS: One-dimensional consolidation test
LL: Liquid Limit, percent
PI: Plasticity Index, percent

SA: Sieve analysis (percent passing No. 200 Sieve)
UC: Unconfined compressive strength test, Qu, in ksf
WA: Wash sieve (percent passing No. 200 Sieve)

TYPICAL MATERIAL GRAPHIC SYMBOLS

<ul style="list-style-type: none"> Sandstone Well graded GRAVEL (GW) Poorly graded GRAVEL (GP) Well graded GRAVEL with Silt (GW-GM) Well graded GRAVEL with Clay (GW-GC) Poorly graded GRAVEL with Silt (GP-GM) Poorly graded GRAVEL with Clay (GP-GC) Silty GRAVEL (GM) Clayey GRAVEL (GC) Well graded SAND (SW) Poorly graded SAND (SP) 	<ul style="list-style-type: none"> Well graded SAND with Silt (SW-SM) Well graded SAND with Clay (SW-SC) Poorly graded SAND with Silt (SP-SM) Poorly graded SAND with Clay (SP-SC) Silty SAND (SM) Clayey SAND (SC) SILT, SILT w/SAND, SANDY SILT (ML) Lean CLAY, CLAY w/SAND, SANDY CLAY (CL) SILT, SILT w/SAND, SANDY SILT (MH) Fat CLAY, CLAY w/SAND, SANDY CLAY (CH) SILT, SILT with SAND, SANDY SILT (ML-MH) 	<ul style="list-style-type: none"> Lean-Fat CLAY, CLAY w/SAND, SANDY CLAY (CL-CH) SILTY CLAY (CL-ML) Lean CLAY/PEAT (CL-OL) Fat CLAY/SILT (CH-MH) Fat CLAY/PEAT (CH-OH) Silty SAND to Sandy SILT (SM-ML) Silty SAND to Sandy SILT (SM-MH) Clayey SAND to Sandy CLAY (SC-CL) Clayey SAND to Sandy CLAY (SC-CH) SILT to CLAY (CL/ML) Silty to Clayey SAND (SC/SM)
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TYPICAL SAMPLER GRAPHIC SYMBOLS

2 inch-OD Unlined Split Spoon (SPT)	Shelby Tube (thin-walled, fixed head)	Pitcher Sample
2.5 inch-OD Unlined Split Spoon	Grab Sample	Other Sampler
3 inch-OD Unlined Split Spoon	Bulk Sample	

OTHER GRAPHIC SYMBOLS

- Water level (at time of drilling, ATD)
- Water level (after waiting a given time)
- Minor change in material properties within a stratum
- Inferred or gradational contact between strata
- Queried contact between strata

GENERAL NOTES

1. Soil classifications are based on the Unified Soil Classification System. Descriptions and stratum lines are interpretive, and actual lithologic changes may be gradual. Field descriptions may have been modified to reflect results of lab tests.
2. Descriptions on these logs apply only at the specific boring locations and at the time the borings were advanced. They are not warranted to be representative of subsurface conditions at other locations or times.

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MURRAY ENGINEERS INC
 GEOTECHNICAL SERVICES

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KYO BORING LOGS

FIGURE B-4

PRIMARY DIVISIONS			SOIL TYPE	SECONDARY DIVISIONS
COARSE GRAINED SOILS (> 50% Fines)	GRAVEL	CLEAN GRAVEL (≤ 5% Fines)	GW	Well graded gravel, gravel-sand mixtures, little or no fines.
		GRAVEL with FINES	GP	Poorly graded gravel or gravel-sand mixtures, little or no fines.
			GM	Silty gravels, gravel-sand-silt mixtures, non-plastic fines.
	SAND	CLEAN SAND (≤ 5% Fines)	GC	Clayey gravels, gravel-sand-clay mixtures, plastic fines.
			SW	Well graded sands, gravelly sands, little or no fines.
		SAND WITH FINES	SP	Poorly graded sands or gravelly sands, little or no fines.
SM	Silty sands, sand-silt mixtures, non-plastic fines.			
FINE GRAINED SOILS (> 50% Fines)	SILT AND CLAY Liquid limit < 50%		SC	Clayey sands, sand-clay mixtures, plastic fines.
			ML	Inorganic silts and very fine sands, with slight plasticity.
			CL	Inorganic clays of low to medium plasticity, lean clays.
	SILT AND CLAY Liquid limit > 50%		OL	Organic silts and organic clays of low plasticity.
			MH	Inorganic silt, micaceous or diatomaceous fine sandy or silty soil.
			CH	Inorganic clays of high plasticity, fat clays.
		OH	Organic clays of medium to high plasticity, organic silts.	
HIGHLY ORGANIC SOILS			Pt	Peat and other highly organic soils.

RELATIVE DENSITY

SAND & GRAVEL	BLOWS/FOOT*
VERY LOOSE	0 to 4
LOOSE	4 to 10
MEDIUM DENSE	10 to 30
DENSE	30 to 50
VERY DENSE	OVER 50

CONSISTENCY

SILT & CLAY	STRENGTH [^]	BLOWS/FOOT*
VERY SOFT	0 to 0.25	0 to 2
SOFT	0.25 to 0.5	2 to 4
FIRM	0.5 to 1	4 to 8
STIFF	1 to 2	8 to 16
VERY STIFF	2 to 4	16 to 32
HARD	OVER 4	OVER 32

GRAIN SIZES

BOULDERS	COBBLES	GRAVEL		SAND			SILT & CLAY
		COARSE	FINE	COARSE	MEDIUM	FINE	
12"	3"	3/4"	4"	4	10	40	200
SIEVE OPENINGS				U.S. STANDARD SERIES SIEVE			

Classification is based on the Unified Soil Classification System; fines refer to soil passing a No. 200 sieve.

* Standard Penetration Test (SPT) resistance, using a 140 pound hammer falling 30 inches on a 2 inch O.D. split spoon sampler; blow counts not corrected for larger diameter samplers.

^ Shear strength in tons/sq. ft. as estimated by SPT resistance, field and laboratory tests, and/or visual observation.



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UNIFIED SOIL
CLASSIFICATION
SYSTEM

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FIGURE B-5

WEATHERING

Fresh

Rock fresh, crystals bright, few joints may show slight staining. Rock rings under hammer if crystalline.

Very Slight

Rock generally fresh, joints stained, some joints may show thin clay coatings, crystals in broken face show bright. Rock rings under hammer if crystalline.

Slight

Rock generally fresh, joints stained, and discoloration extends into rock up to 1 inch. Joints may contain clay. In granitoid rocks some occasional feldspar crystals are dull and discolored. Crystalline rocks ring under hammer.

Moderate

Significant portions of rock show discoloration and weathering effects. In granitoid rocks, most feldspars are dull and discolored; some are clayey. Rock has dull sound under hammer and shows significant loss of strength as compared with fresh rock.

Moderately Severe

All rock except quartz discolored or stained. In granitoid rocks, all feldspars dull and discolored and majority show kaolinization. Rock shows severe loss of strength and can be excavated with geologist's pick. Rock goes "clunk" when struck.

Severe

All rock except quartz discolored or stained. Rock "fabric" clear and evident, but reduced in strength to strong soil. In granitoid rocks, all feldspars kaolinized to some extent. Some fragments of strong rock usually left.

Very Severe

All rock except quartz discolored and stained. Rock "fabric" discernible, but mass effectively reduced to "soil" with only fragments of strong rock remaining.

Complete

Rock reduced to "soil". Rock fabric not discernible or discernible only in small scattered locations. Quartz may be present as dikes or stringers.

HARDNESS

Very hard

Cannot be scratched with knife or sharp pick. Hand specimens requires several hard blows of geologist's hammer.

Hard

Can be scratched with knife or pick only with difficulty. Hard blow of hammer required to detach hand specimen.

Moderately Hard

Can be scratched with knife or pick. Gouges or grooves to 1/4 inch deep can be excavated by hard blow of point of a geologist's pick. Hard specimen can be detached by moderate blow.

Medium

Can be grooved or gouged 1/16 inch deep by firm pressure on knife or pick point. Can be excavated in small chips to pieces about 1 inch maximum size by hard blows of the point of a geologist's pick.

Soft

Can be gouged or grooved readily with knife or pick point. Can be excavated in chips to pieces several inches in size by moderate blows of a pick point. Small thin pieces can be broken by finger pressure.

Very Soft

Can be carved with knife. Can be excavated readily with point of pick. Pieces 1 inch or more in thickness can be broken with finger pressure. Can be scratched readily by fingernail.

JOINT BEDDING AND FOLIATION SPACING

Spacing	Joints	Bedding and Foliation
Less than 2 in.	Very Close	Very Thin
2 in. to 1 ft.	Close	Thin
1 ft. to 3 ft.	Moderately Close	Medium
3 ft. to 10 ft.	Wide	Thick
More than 10 ft.	Very Wide	Very Thick

ROCK QUALITY DESIGNATOR (RQD)

RQD, as a percentage	Descriptor
Exceeding 90	Excellent
90 to 75	Good
75 to 50	Fair
50 to 25	Poor
Less than 25	Very Poor



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BELMONT, CALIFORNIA**

**KEY TO BEDROCK
DESCRIPTIONS**

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FIGURE B-6

APPENDIX C
LABORATORY TESTS

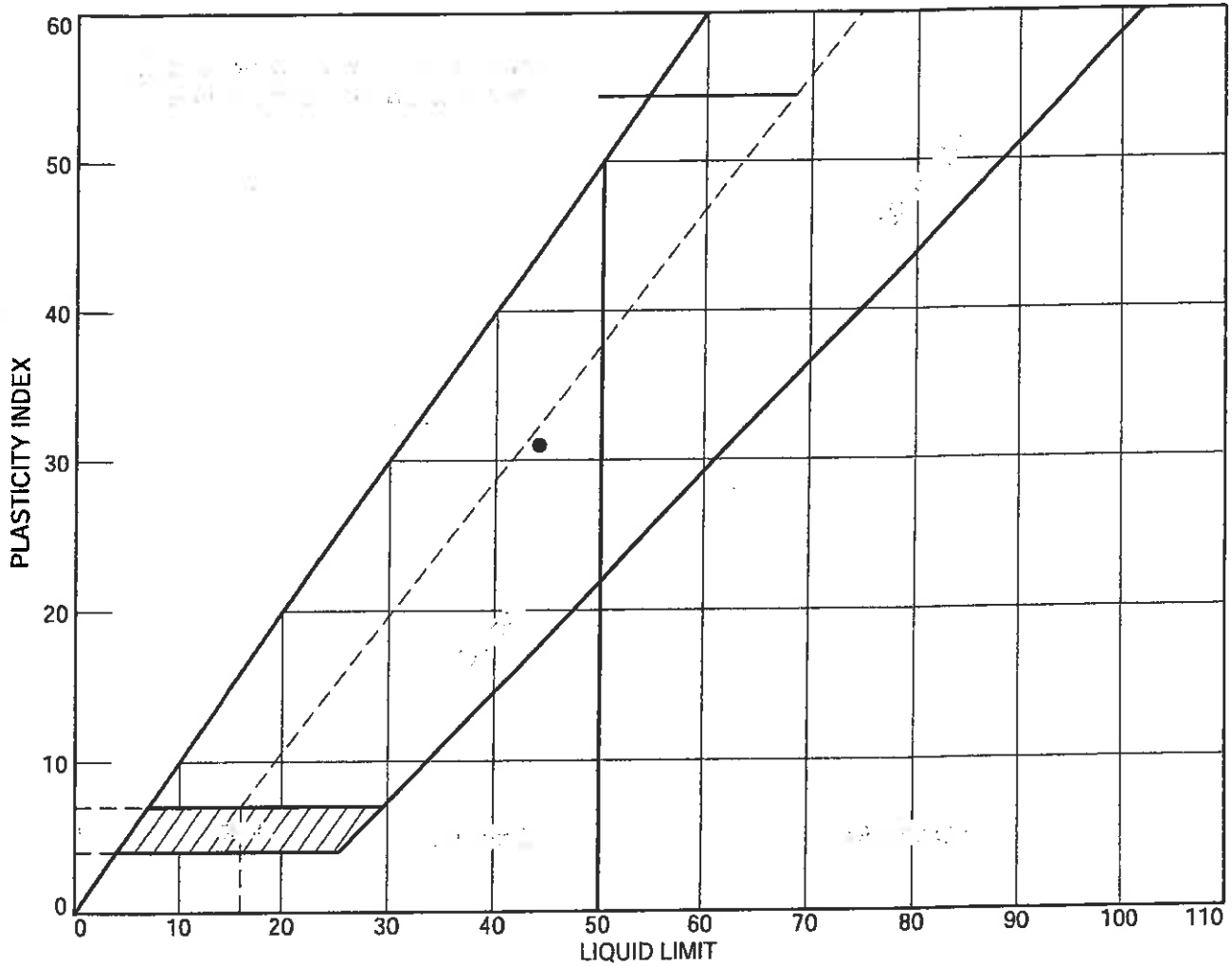
Samples from the subsurface exploration were selected for tests to establish the physical and engineering properties of the soils. The tests performed are briefly described below.

The natural moisture content was determined on most samples and the dry density was determined on select samples recovered from the borings. The samples were initially trimmed to obtain volume and wet weight measurements and subsequently dried in accordance with ASTM D2216. After drying, the weight of each sample was obtained to determine the moisture content and dry density representative of field conditions and time the samples were collected. The results are presented on the boring logs, at the appropriate sample depths.

The Atterberg Limits were determined on one sample in accordance with ASTM D 4318. The Atterberg limits are the moisture content within which the soil is workable or plastic. The results of this test are presented in Figure C-1 and on the boring logs, at the appropriate sample depth.



LIQUID AND PLASTIC LIMITS TEST REPORT (ASTM D 2487)



SOIL DATA								
SYMBOL	SOURCE	SAMPLE NO.	DEPTH	NATURAL WATER CONTENT (%)	PLASTIC LIMIT (%)	LIQID LIMIT (%)	PLASTICITY INDEX (%)	USCS
●	Boring 2	1	2' to 4'	16.4	13	44	31	CL



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LIQUID & PLASTIC
LIMITS TEST REPORT

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FIGURE C-1