A G E N D A

Scotts Valley Planning Commission

Date: March 14, 2019
Time: 6pm

CITY OF SCOTTS VALLEY	MEETING LOCATION	POSTING: The agenda was posted on March 8, 2019, at City Hall, SV Senior Center, SV Library and on the Internet at www.scottsvalley.org.
1 Civic Center Drive Scotts Valley, CA 95066 831-440-5630	City Council Chambers 1 Civic Center Drive Scotts Valley, CA 95066	

Appointed Officials	City Staff Members
Carlos Arcangeli, Vice Chair Lori Gentile, Commissioner Rosanna Hererra, Commissioner David Hodgin, Commissioner Chuck Maffia, Commissioner	Taylor Bateman, Community Development Director Brenda Stevens, Associate Planner

Notice regarding Planning Commission Meetings:
The Planning Commission meets regularly on the 2nd Thursday of each month (unless otherwise noticed) at 6pm in the City Hall Council Chambers located at 1 Civic Center Drive, Scotts Valley, CA 95066.

Agenda and Agenda Packet Materials:
The Planning Commission agenda is available for review the Friday before the Thursday meeting on the Internet at the City's website: www.scottsvalley.org and in the lobby of City Hall at 1 Civic Center Drive, Scotts Valley, CA. Pursuant to Government Code §54957.5, materials related to an agenda item, submitted after distribution of the agenda packet, are available for public inspection in the lobby of City Hall during normal business hours, Monday-Friday, 8am-Noon and 1-5pm. In accordance with AB 1344, such documents will be posted on the City's website at www.scottsvalley.org.

CALL TO ORDER
(The Planning Commission Chair calls the meeting to order.)

PLEDGE OF ALLEGIANCE and MOMENT OF SILENCE
(The Planning Commission Chair leads the pledge of allegiance.)

ROLL CALL
(Planning Department staff conduct roll call of the Planning Commission.)

ELECTION OF OFFICERS: The Planning Commission elects a Chair and Vice-Chair for the calendar year.

GPAC COMMITTEE SELECTION: The Planning Commission appoints a member of the body for the General Plan Action Committee.

PUBLIC COMMENT TIME
This is the opportunity for individuals to make and/or submit written or oral comments to the Commission on any items within the purview of the Commission, which are NOT part of the Agenda. No action on the item may be taken, but the Commission may request the matter be placed on a future agenda.

ALTERATIONS TO CONSENT AGENDA
(The Commission can remove or add items to the Consent Agenda.)

CONSENT AGENDA
(The Consent Agenda is comprised of items which appear to be non-controversial. Persons wishing to speak on any items may do so raising their hand to be recognized by the Chair. These items will be acted upon in one motion unless they are removed from the consent agenda for discussion by the Commission.)

Approve the Action Meeting Minutes from the January 24, 2019 meeting.

ALTERATIONS TO PUBLIC HEARING AGENDA
(Commission can remove or add items to the Regular Agenda.)

PUBLIC HEARING AGENDA
(Persons wishing to speak on any item may do so by raising their hand to be recognized by the Chair.)

ALTERATIONS TO REGULAR AGENDA
(Commission can remove or add items to the Regular Agenda.)

REGULAR AGENDA
(Persons wishing to speak on any item may do so by raising their hand to be recognized by the Chair.)

1. **Address:** 213 Blueberry Drive // APN 021-105-05
   Applicant / Property Owner: Jeff Mora
   Planning Permit Application No.: Design Review DR18-010, EA18-010
   Project Description: Consideration of a recommendation to the Scotts Valley Planning commission for a Design Review of a new 624 square foot, two story, single-family dwelling with a two car garage in grading in slopes over 30%.
   Staff: Brenda Stevens, Associate Planner, 440-5635 bstevens@scottsvalley.org

DISCUSSION ITEMS AND FUTURE AGENDA ITEMS

(The Planning Commission or Community Development Director may request to schedule items on future agendas.)

WRITTEN COMMUNICATIONS – FOR INFORMATION ONLY
(City Council Minutes or other items are provided if available.)

DIRECTOR UPDATES
(The Community Development Director may provide any department or city updates that are available.)

ADJOURNMENT
(Adjournment shall be no later than 11pm unless extended by a four-fifths vote of all Planning Commission members or a unanimous vote of the members present per City Municipal Code Section 2.21.010.)

The City of Scotts Valley does not discriminate against persons with disabilities. The City Council Chambers is an accessible facility. If you wish to attend a Planning Commission meeting and require assistance such as sign language, a translator, or other special assistance or devices in order to attend and participate at the meeting, please call the Community Development Department at 831-440-5630 five to seven days in advance of the meeting to make arrangements for assistance. If you require the agenda of a Planning Commission meeting be available in an alternative format consistent with a specific disability, please call the Community Development Department. The California State Relay Service (TTY/VCO/HCO to Voice: English 1-800-735-2929, Spanish 1-800-855-3000; or, Voice to TTY/VCO/HCO: English 1-800-735-2922, Spanish 1-800-855-3000), provides Telecommunications Devices for the Deaf and Disabled and will provide a link between the TDD caller and users of telephone equipment.

Minutes

Special Meeting of the
Scotts Valley Planning Commission

Date: January 24, 2019
Time: 6:00 PM

CITY OF SCOTTS VALLEY 1 Civic Center Drive Scotts Valley, CA 95066 (831) 440-5630	**MEETING LOCATION** City Council Chambers 1 Civic Center Drive Scotts Valley, CA 95066	**POSTING**: The agenda was posted at City Hall, SV Senior Center, SV Library and on the Internet at www.scottsvalley.org.

Appointed Officials	City Staff Members
Carlos Arcangeli, Vice Chair Rosanna Herrera, Commissioner Deborah Muth, Commissioner David Hodgin, Commissioner	Taylor Bateman, Community Development Director Brenda Stevens, Assistant Planner

CALL TO ORDER: 6:00 pm.

PLEDGE OF ALLEGIANCE and MOMENT OF SILENCE: The Planning Commission Chair led the pledge of allegiance.

ROLL CALL: Present: Arcangeli, Herrera, Hodgin, and Muth. Absent: None.

PUBLIC COMMENT: None.

ALTERATIONS TO CONSENT AGENDA: None.

CONSENT AGENDA: None scheduled.

A. Action Meeting Minutes from December 13, 2018 meeting.

M/S: Muth/Herrera
Carried: 3/0/1/0 (AYES: Arcangeli, Herrera and Muth. NOES: None; ABSTAIN: Hodgin; ABSENT: None)

ALTERATIONS TO REGULAR AGENDA: None.

PUBLIC HEARING AGENDA:

1. **Address:** 5400 Scotts Valley Drive // APN 022-042-15
   Applicant / Property Owner: Cori Landivar / Josh Simpson
   Planning Permit Application No's: Use Permit U18-012
   Project Description: Consideration of a recommendation to the Scotts Valley Planning Commission for a Use Permit for the operation of a veterinary clinic in the C-S Commercial Service zoning district.
   Staff: Brenda Stevens, Assistant Planner

   M/S: Muth/Herrera
   To approve the project via Resolution No. 1740 subject to conditions of approval**.**
   Carried: 4/0/0 (AYES: Arcangeli, Herrera, Hodgin and Muth; NOES: None; ABSENT: None)

REGULAR AGENDA:

1. **Address:** 260 Mount Hermon Road // APN 022-231-03
   Applicant / Property Owner: Corbett Wright // Hangar at Skypark, LLC
   Planning Permit Application No.: Design Review DR19-001
   Project Description: Consideration of a recommendation to the Scotts Valley Planning Commission for a Design Review for the installation of five freestanding metal sculpture displays of outdoor public art in the C-S Commercial Service zoning district.
   Staff: Brenda Stevens, Assistant Planner

   M/S: Herrera/Hodgin
   To approve the project via Resolution No. 1741 subject to conditions of approval**.**
   Carried: 4/0/0 (AYES: Arcangeli, Herrera, Hodgin and Muth; NOES: None; ABSENT: None)

DISCUSSION ITEMS AND FUTURE AGENDA ITEMS: None.

WRITTEN COMMUNICATIONS – FOR INFORMATION ONLY:

DIRECTOR UPDATES:

ADJOURNMENT: 6:50 pm.

Agenda Item No. 1
03/14/19 P.C. Mtg.
DR18-010

STAFF REPORT

Applicant / Owner:	Jeff Mora
Application:	Design Review No. DR18-010
Location:	213 Blueberry Drive / APN 021-102-05
General Plan/Zoning:	Residential (R-1-10)
Environmental Status:	Exempt from CEQA (Section 15303)
Request:	Consideration of a Design Review application for a 624 square foot single family dwelling located in a residential district subject to the Hillside Combining District Regulations and with grading proposed in slopes over 30 percent.
Staff Planner:	Brenda Stevens, Associate Planner

STAFF RECOMMENDATION

It is recommended that the Planning Commission review the plans for Design Review application No. DR18-010 and approve the application, subject to the attached conditions in Exhibit A.

BACKGROUND

In 2003, a previous property owner received approval from the Planning Commission for a Design Review and Variance to build a 3,111 square foot single family dwelling. The Variance application was required due to slopes, reduced front yard setbacks and increased front yard fence height. The City Council overturned the Planning Commission's approval of the Variance and Design review due to grading, drainage and erosion concerns raised by the appellants.

In June 2010, the previous owner submitted a new design to relocate the dwelling entirely out of the 40 percent slopes. The new design was approved but not built.

In 2018, a new property owner acquired the property and is proposing a new design for a single family dwelling as discussed in this report.

LOCATION

The project site is located at 213 Blueberry Drive (Attachment 1 – Location Map). There are two adjacent single family dwellings, 205 Blueberry Drive to the north and 125 Blueberry Drive to the east. The 12,500 square foot parcel is a steeply sloped, vacant, hillside lot located near the City limits in the southern area of the Whispering Pines neighborhood. The site is located within the Zayante Sandhills, endangered Mount Hermon June Beetle habitat. The project will be required to participate in the Interim Programmatic Habitat Conservation Plan for the Mount Hermon June Beetle as overseen by the United States Fish and Wildlife Service (USFWS) (Condition No. 3).

PROJECT DESCRIPTION

Current Application

The applicant is proposing to build a 624 square foot, single family dwelling, with a 624 square foot garage. The two story structure would have the garage located at street level and the single family home would be located below the garage. Entrance to the dwelling would be from an exterior staircase. From the street view the structure would appear to be one level. The rear view of the structure is two stories with a total height of 24 feet. A 180 square foot deck would run along the exterior of the rear (east) elevation, upper garage level, of the structure.

Potential Phase II

Although plans have not been submitted at this time, the property owner has indicated that there is likely to be a Phase II of development proposed for the site. Namely, to build a larger single family dwelling to the south of this proposed dwelling. In theory, the current project would become a secondary dwelling unit and the additional future dwelling would become the primary dwelling unit. The proposed design would determine the process of review required (i.e. Design Review application before the Planning Commission or Building Permit).

PROJECT DISCUSSION

Hillside Regulations

The City's Hillside Regulations (SVMC 17.40.060) apply to all lots having an average slope of more than 10 percent. When construction is proposed in slopes of 30 percent or more, Design Review and Planning Commission approval is required. The Design Review application is required to ensure that the design of the project is consistent with the both the City's Hillside Residential Combining District Regulations and the

Residential Design Handbook (RDH). Staff has reviewed the project for compliance with the City's regulations and requirements.

The Hillside Regulations require that construction on hillsides avoid unreasonable interference of views and privacy, preserve the natural landscape, minimize perception of excessive bulk and that bulk and height be compatible with the neighborhood. An analysis of the project for the Planning Commission's consideration is provided as follows:

Design Features

The average slope of the lot is 30.47 percent. Over 60 percent of the lot has slopes greater than 40 percent. Along the property frontage, there is a flat bench, followed by steep slopes that descend to the rear of the property. The two story design of the proposed single family dwelling has minimized the perception of excessive bulk in height by placing one story (the garage) at the street level for the appearance of a single story, while the overall 24 foot height of the two story structure is seen primarily from the rear of the structure.

Proposed design elements include Hardi Board vertical siding in "Countrylane Red" with corrugated metal roofing in either Terra Cotta or Raw. A color board will be presented at the meeting. A color layout is shown on Sheet A-2.0 of attached plans. The natural earth tone and materials will assist in blending the structure in with the natural setting of slopes and trees.

Soils Report

A Geologic Investigation report was prepared for the previous property owner (Attachment 2). The same engineering geology company reviewed the current property owner's plans and concluded that, the plans reviewed are geologically suitable for the design of the proposed structure (Attachment 3).

Trees

An Arborist Report was prepared for the site (Attachment 4). There are no trees proposed for removal with this project. Two protected trees that will be impacted are: a 30 inch diameter Coast redwood and a California bay laurel. Each of these trees will have moderate root loss, excavation and compaction, as a result of the proposed construction. The arborist recommends that to minimize root loss that the concrete footings be hand excavated. All arborist recommendations shall be incorporated as conditions of the project approval (Condition No.4).

ATTACHMENTS **PAGE #**

Resolution to Approve Design Review No. DR18-010

Project Plans ..... Attached

1. Location Map 11
2. Geologic Investigation Report prepared by Nolan, Zinn and Associates (2/10/2003) ..... Attached
3. Geologic Review letter by Erik Zinn (6-5-18) ..... Attached
4. Arborist Report prepared by Kurt Fouts (11-11-18) ..... Attached

RESOLUTION NO. _____

A RESOLUTION OF THE PLANNING COMMISSION OF THE CITY OF SCOTTS VALLEY APPROVING DESIGN REVIEW PERMIT NO. DR18-010 FOR A 624 SQUARE FOOT SINGLE FAMILY DWELLING LOCATED IN A RESIDENTIAL DISTRICT SUBJECT TO THE HILLSIDE COMBINING DISTRICT REGULATIONS AND WITH GRADING PROPOSED IN SLOPES EXCEEDING 30 PERCENT TO BE LOCATED AT 213 BLUEBERRY DRIVE // APN 021-102-05.

WHEREAS, the Planning Department of the City of Scotts Valley has received an application filed by property owner Jeff Mora, for Design Review Permit No. DR18-010 for a 624 square foot single family dwelling with grading proposed in slopes exceeding 30 percent to be located at 213 Blueberry Drive // APN 021-102-05; and,

WHEREAS, the application was reviewed for completeness and is determined to be a "project" as defined by the California Environmental Quality Act (CEQA); and,

WHEREAS, the project is Categorically Exempt, Class 3 (15303); and,

WHEREAS, the project was reviewed by the Planning Commission at a regularly scheduled meeting on Thursday, March14, 2019; and

NOW THEREFORE, the Planning Commission of the City of Scotts Valley hereby resolves as follows:

SECTION 1: The environmental determination represents the independent judgment of the City.

SECTION 2: The categorical exemption is hereby approved.

SECTION 3: The Planning Commission of the City of Scotts Valley does hereby specifically make the following findings, as further clarified in the staff report dated March 14, 2019:

A. *Proposed grading is limited to the minimum necessary for development of roads, building sites, utilities and driveways with the Hillside Regulations*. The proposed grading conforms with the Hillside Regulations. The proposed driveway utilizes the flat bench of soil that runs along the front of the property. Furthermore, the home has been designed to follow the contours of the hillside further reducing site grading.

B. *Mass grading will not reasonably affect the natural character of the area.* The proposed grading is considerate of the natural character of the area as it follows the contours of the hillside.

C. *The proposed buildings and other improvements are consistent with the policies described in the Residential Design Handbook.* The proposed structure complies with the principles of the Residential Design Handbook. The applicant has demonstrated that the project, as designed, complies with the Hillside Regulations and the Residential Design Handbook to the extent feasible.

D. *The proposed structure minimizes perceptions of bulk in relation to the immediate neighborhood.* As designed, the project incorporates design elements such as the rear deck on the upper level which serve to reduce bulk in relation to the immediate neighborhood. Visual impacts will be minimized by the location of the parcel in relation to the rest of the neighborhood.

SECTION 4: After careful consideration of the application and related materials, plans, maps, facts, exhibits, staff report, testimony and other evidence submitted in this matter, and incorporated herein by this reference, the Planning Commission of the City of Scotts Valley does hereby approve Design Review Permit #DR18-010 for a 624 square foot single family dwelling with grading proposed in slopes exceeding 30 percent to be located at 213 Blueberry Drive // APN 021-102-05, subject to the conditions set forth in the attached Exhibit A, which are incorporated herein by this reference.

SECTION 5: This Design Review #DR18-010 shall lapse and shall become void two years from the date of this resolution unless prior to the expiration date, a building permit is issued by the Building Division and construction has commenced and diligently pursued toward completion, or an extension of this approval is granted by the Planning Commission.

THE ABOVE AND FOREGOING RESOLUTION was duly adopted and passed by the Planning Commission of the City of Scotts Valley at a regularly scheduled meeting held on the 14th day of March, 2019, by the following vote:

AYES:
NOES:
ABSTAIN:
ABSENT:

_____
Vice Chair, Carlos Arcangeli

_____
Taylor Bateman, Community Development Director

E X H I B I T A

CONDITIONS OF APPROVAL

LEGAL

1. Developer has agreed to and shall defend, indemnify and hold harmless the City of Scotts Valley, its officers, agents and employees from any claim, action or proceeding against the City or its officers, agents or employees to attack, set aside, void or annul any action of the City in connection with approvals under the California Environmental Quality Act or with respect to approval of the project, which action is brought within the time period(s) prescribed by law. The City shall promptly notify the developer of any such claim, action or proceeding and shall fully cooperate in defense.

2. The Design Review Approval shall become null and void two years following the date the appeal period ends, unless prior to the expiration of said period, a building permit is issued and construction commenced.

3. All colors, materials, architectural plans shall be maintained as approved. Any changes to the approved plans must receive approval of the Planning Commission.

4. Applicant shall attach one copy of the approved and signed Conditions of Approval with building permit application.

5. All required building permits shall be obtained and the application shall pay all appropriate fees prior to commencement of construction on the property.

PLANNING DEPARTMENT

1. All Recommendations included in the Geologic Investigation Report and the Geologic Review letter prepared by Nolan, Zinn and Associates dated 2/10/2003 and 6/5/2018 shall be incorporated as conditions of the project

2. All landscaping and irrigation shall be in place prior to issuance of an Occupancy Permit.

3. The project will be required to participate in the Interim Programmatic Habitat Conservation Plan for the Mount Hermon June Beetle as overseen by the United States Fish and Wildlife Service (USFWS).

4. All recommendations included in the November 11, 2018 Arborist Report prepared by Kurt Fouts shall be incorporated as conditions of the project approval.

5. Prior to the issuance of any grading or building permits, the project arborist shall inspect tree protection fencing and the completion of pre-construction treatments.

6. The project arborist shall routinely inspect the development site through the term of the project.

7. The arborist review and implementation of conditions, site inspection and related work shall be borne by the applicant.

BUILDING

1. All requirements of the Building Department of the City of Scotts Valley shall be met.

2. The applicant shall affix a copy of the approving resolution and conditions of approval to each set of construction plans which will be submitted to the Building Department.

3. Site drainage erosion control and foundation plans must be reviewed and approved by a soils engineer.

PUBLIC WORKS

1. If required, a registered civil engineer shall provide storm (hydrologic and hydraulic) calculations for appropriate storm drain facilities to control on-site drainage and mitigate off-site impacts. The design shall follow the criteria contained in the City of Scotts Valley Standard Details and the data and analysis contained in the latest adopted City of Scotts Valley Storm Drainage Master Plan. Development shall not increase the rate of flow (cubic feet per second) or velocity (feet per second) of site run-off water to any off-site drainage areas beyond the measured or calculated pre-project rate and velocity.

FIRE

1. This project as proposed shall conform to the 2016 California Fire Code as amended by the Scotts Valley Fire Protection District.

2. An automatic sprinkler system shall be installed in all buildings in accordance with Chapter 9 of the California Fire Code, current NFPA 13 standards, and Santa Cruz County FPO standards. (Contact the Scotts Valley Fire Protection District to review the FPO standards)
    a. Automatic sprinkler system design plans and calculations shall be submitted directly to the Scotts Valley Fire Protection District for review and permit. Separate permits may be necessary for the "overhead" and "underground" parts of the system.
    b. The automatic sprinkler system drawings must be prepared and submitted for approval by a California State Licensed Contractor (Class A, or C-16) meeting the requirements of NFPA-13, " Standard for the Installation of Fire Sprinkler Systems". Designer/installer shall submit three (3) sets of plans and calculations to this agency for approval."

3. Required Water Supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the District.
    a. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6 and Appendix C or by an approved method by the Fire District.
    b. Existing fire hydrants on public streets are allowed to be considered as available. Existing fire hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads.
    c. Existing non-conforming fire hydrants will need to be upgraded to meet current NFPA standards.

4. A MINIMUM OF 48 HOURS NOTICE to the Fire District is required prior to any inspection.

5. Job copies of the building and fire systems plans and permits must be on-site during inspections

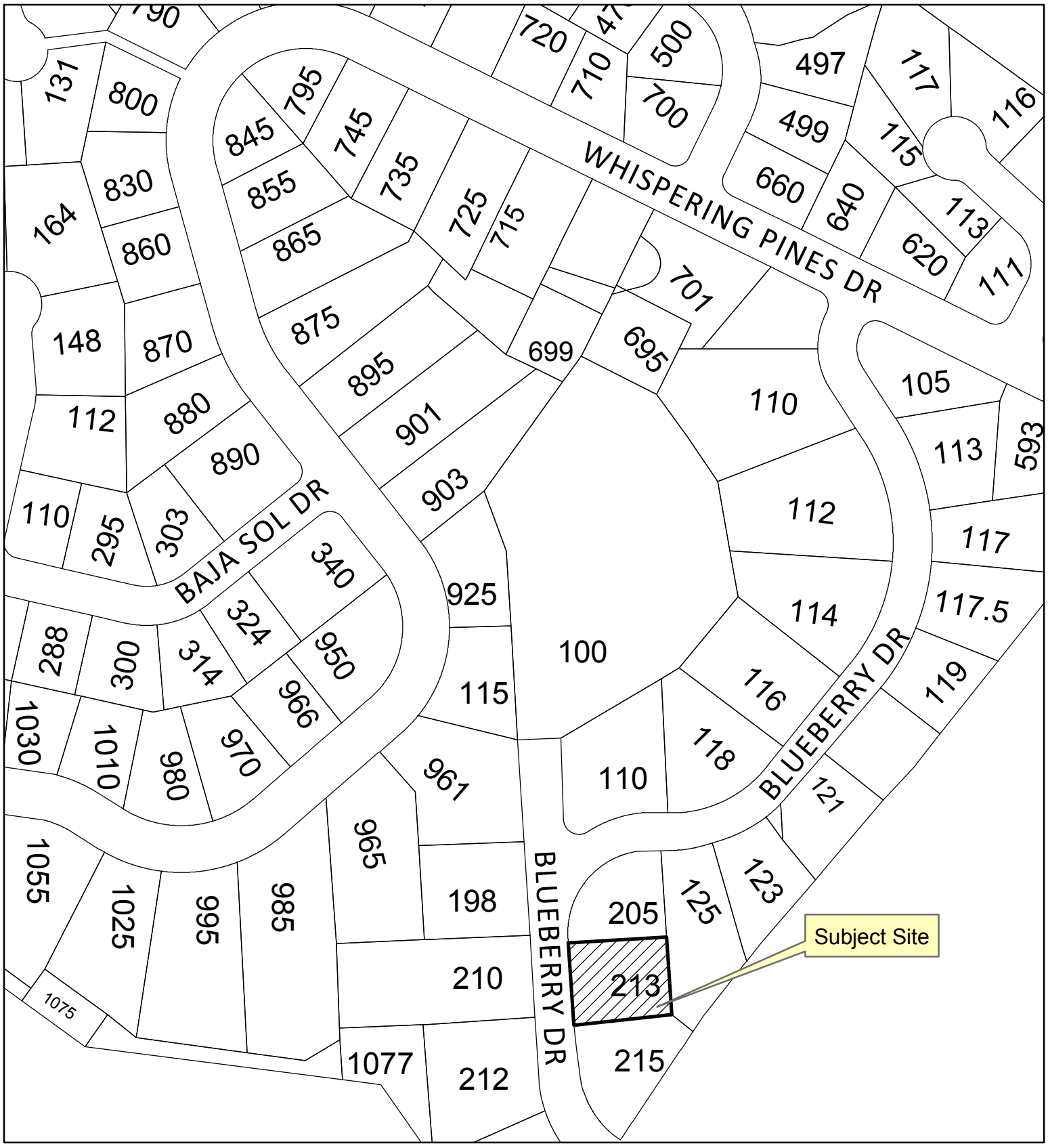
6. Building numbers shall be provided. Numbers shall be a minimum of four (4) inches in height on a contrasting background and visible from the street. Where numbers are not visible from the street, additional numbers shall be installed on a directional sign at the property driveway and the street. Final design and location of the building numbers are subject to Fire District approval.

7. No changes in building use or occupancy type shall be allowed without Fire District approval.

8. Prior to final, provide to the Scotts Valley Fire Protection District a general site plan that details hydrant locations, and water/gas/electrical shutoff locations. The site plan shall be provide in a digital (PDF) non-flattened version.

Signature of Property Owner _____ Date_____

Location Map



0 50 100 200 Feet

213 Blueberry Drive
APN 021-102-05

5 June 2018 Job #2016033-G-SC

Jeff Mora
P.O. Box 75
Felton, CA 95018
Cell: 530.945.8415
jeffmora8@sbcglobal.net

Re: Review plan set
213 Blueberry Drive
Scotts Valley, CA 95066
County of Santa Cruz APN 021-102-05

Dear Mr. Mora:

The purpose of our review was to ascertain if the plan cited below is in general conformance with geologic conditions encountered during our past investigation and with the findings and recommendations issued for the investigation, as well as for any supplemental analyses and letters if applicable.

PROJECT INFORMATION
Application Number: ?
Parcel # (APN): 021-102-05
Owner Name: Jeff Mora
Project Address/Location: 213 Blueberry Drive, Scotts Valley, CA 95066

ENGINEERING GEOLOGY REPORT INFORMATION

Company Name: Zinn Geology
Licensed Geologist In Responsible Charge: Erik N. Zinn
Date of Engineering Geology Report: 10 February 2003
Date of Updates/Supplemental Information: 5 January 2016

PROJECT PLAN SHEETS REVIEWED

Plan Sheet Number	Plan Prepared By	Date of Latest Revision
T-1	Spanner Systems	06/05/18
BMP-1, -2	Spanner Systems	06/05/18
S1	The Bronson Company	07/11/16
C-1.0, - 1.1, A-0.0, -1.0, -1.1, -2.0, -2.1, -3.0, EM-1,	Spanner Systems	06/05/18
Sheet S1.0, 2.0, 3.0, 4.0, 5.0, 6.0, 7.0,	Westfall Engineers	06/04/18
Sheet 8.0	Westfall Engineers	05/14/18

It is our opinion that the geological aspects of the plan reviewed is in general conformance with the geological conditions encountered during our ongoing geological investigation and with the recommendations issued in our report dated 10 February 2003, as well as our update letter dated 5 January 2016.

RECOMMENDATIONS

The recommendations presented herein and in the referenced report should not preclude more restrictive criteria by the governing agencies or by structural considerations.

1. In the event that any further changes are made to the plans, the revised plans should be forwarded to the Project Geologist Of Record to review for conformance with the previous recommendations.

2. All geological observation services must be provided by Zinn Geology during construction of the project. All cuts and pier holes must be observed by Zinn Geology to enable us to form an opinion as to the geological adequacy of the work, the degree of conformance to our report and to provide supplemental recommendations where warranted. Our observation of the pier hole drilling must occur during the drilling of the hole; any pier holes drilled without observation by our firm will be deemed unacceptable. Any cuts or pier holes performed without the direct knowledge and observation of Zinn Geology will render the recommendations of our report and this letter invalid.

LIMITATIONS

Our review was performed in accordance with the usual and current standards of the profession, as they relate to this and similar localities. No other warranty, expressed or implied, is provided as to the conclusions and professional advice presented in this review.

Our review of the plans cited at the beginning of this letter was limited to the **geological aspects only**. Review of all other aspects of the plans was beyond our purview on the project and are specifically excluded from the scope of this review. Our firm makes no warranty, expressed or implied, as to the adequacy of other aspects of the plans.

Conditions revealed during construction may vary with respect to the findings in the original investigation. Should this occur, the changed conditions must be evaluated by the Project Geologist Of Record and revised recommendations provided as required.

This letter is issued with the understanding that it is the responsibility of the Owner, or their Representative, to ensure that the information and recommendations presented herein are brought to the attention of the Architect and Engineers for the project and incorporated into the plans, and that the Contractor and Subcontractors implement such recommendations in the field.

This firm does not practice or consult in the field of safety engineering. We do not direct the Contractor's operations, and we are not responsible for other than our own personnel on the site; therefore, the safety of others is the responsibility of the Contractor. The Contractor should notify the Owner if he considers any of the recommended actions presented herein to be unsafe.

The findings of this review are considered valid as of the present date. However, changes in the conditions of a site can occur with the passage of time, whether due to natural events or human activity on this or adjacent sites. In addition, changes in applicable or appropriate codes and standards may occur as a result of legislation or a broadening of knowledge. Accordingly, this

review may become invalidated, wholly or partially, by changes outside our control. Therefore, this plan review is subject to review and revision as changed conditions are identified.

If you have any questions regarding this letter, please do not hesitate to contact our office.

Sincerely,
ZINN GEOLOGY

Erik N. Zinn
Principal Geologist
P.G. #6854, C.E.G. #2139

ec: Rick Bowen - Spanner Systems
John Kasunich - Haro, Kasunich & Associates
Karel Cymbal - Westfall Engineers

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

GEOLOGIC INVESTIGATION
Lands of Zamani
213 Blueberry Drive
Scotts Valley, California 95066-4617

Job #02040-SC
10 February 2003

1509 Seabright Avenue, Suite A2 Santa Cruz, CA 95062 · Tel. 831-423-7006 · Fax 831-423-7008 · email: nza@nolanzinn.com

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

10 February 2003 Job #02040-SC

Mr. Hassam Zamani
c/o Dennis Norton Design
4315 Capitola Road
Capitola, California 95010-3517

Re: Geologic investigation
213 Blueberry Drive
Scotts Valley, California 95066-4617

Dear Mr. Zamani:

Our geologic report for the proposed development on the subject property referenced above is attached. This report documents geologic conditions on the subject property and addresses potential hazards and accompanying risks due to landsliding and strong seismic shaking. Based on the information gathered and analyzed, it is our opinion that the proposed development is geologically suitable and will be subject to "ordinary risks" as defined in Appendix B, provided our recommendations are followed. Appendix B should be reviewed in detail by the developer and all property owners to determine whether an "ordinary" risk as defined in the appendix is acceptable. If this level of risk is unacceptable to the developer and the property owners, then the geologic hazards in question should be mitigated to reduce the corresponding risks to an acceptable level.

The primary type of landsliding that may occur on the property is formally known as a dry, open-slope sand flow (after Cruden and Varnes, 1996). We consider the potential for this type of slope movement to occur over the design life of the proposed residence to be moderate to high. *If left unmitigated*, the resulting risk accompanying the aforementioned landslide hazard is greater than an "ordinary" risk as defined in Appendix B. We recommend that you pursue at least one of the mitigation paths outlined in our recommendations section of this report in order to reduce the potential landslide hazard and risk to the proposed development. If one of our recommended mitigation paths are chosen, adequately designed and constructed, then the proposed development on the property will be subject to an "ordinary risk" due to this hazard.

Another geologic hazard likely to affect the subject property within the design life of the proposed development is intense seismic shaking due to an earthquake on one of the local fault systems, such as the Zayante or San Andreas faults. Your design consultants should carefully review our seismic shaking analysis and incorporate our recommendations where prudent. If the structures on the property are properly designed for the expected intensity and duration of seismic shaking, they will be subject to an "ordinary" risk due to this hazard (see Appendix B).

Sincerely,

Nolan, Zinn and Associates, Inc.

Erik N. Zinn
Principal Geologist
C.E.G. #2139

TABLE OF CONTENTS

PLATES - In pocket at back of report

NOTE: Plate must accompany text of report in order for report to be considered complete.

INTRODUCTION

This report presents the results of our geologic investigation of the property located at 213 Blueberry Drive, Scotts Valley, in central Santa Cruz County, California (Figure 1). The property is currently undeveloped. Proposed development for the property includes a single-family residence, located atop the crest of a steep slope, along the western edge of the property. Proposed access to the residence will be via a short driveway off of Blueberry Drive. It is assumed that the property will be serviced by the existing city sewer system.

The purpose of this investigation was to characterize the geologic hazard and accompanying risks that might be posed to the proposed development, and to issue geologic mitigation recommendations where warranted.

We have reviewed the following documents for this project:

"Geotechnical services performed at 205 Blueberry Drive, Scotts Valley, California APN 021-102-06" by JCP, dated 3 January 1990, project number JCP-2763.

"Preliminary geotechnical design criteria" by Haro, Kasunich and Associates, dated 17May 1990, job number SC2353.

"Geotechnical investigation for 205 Blueberry Drive, Scotts Valley, California", by Haro, Kasunich and Associates, dated 27 December 1989, job number SC2353.

"Geotechnical and geological investigation for proposed single family residence, 213 Blueberry Court, Scotts Valley, California" by E_2C, dated 29 December 1999, job number 1262SCO1.

"Subject: Peer review - 213 Blueberry Drive - Scotts Valley, California" by Steven Raas and Associates, dated 27 September 2000, Job number 0042-SZ50-H14.

"Subject: Peer review response - 213 Blueberry Drive - Scotts Valley, California" by E_2C, dated 15 April 2001, job number 1262SCO1.

"Subject: E_2C response - 213 Blueberry Drive - Scotts Valley, California" by Steven Raas and Associates, dated 3 September 2001, Job number 0042-SZ50-H14.

"Subject: Peer review response - 213 Blueberry Drive - Scotts Valley, California" by E_2C, dated 27 November 2001, job number 1262SCO1.

"Subject: E_2C response - 213 Blueberry Drive - Scotts Valley, California" by Steven Raas and Associates, dated 27 December 2001, Job number 0042-SZ50-H14.

"Subject: Peer review response - 213 Blueberry Drive - Scotts Valley, California" by E_2C, dated 17 January 2002, job number 1262SCO1.

"Re: 213 Blueberry Drive - Preliminary plan revisions" by City of Scotts Valley Planning and Building Department, dated 11 March 2002.

"Re: 213 Blueberry Drive - New single family residence - Request for variance - Stepping of house" by Dennis R. Norton, dated 19 May 2002.

"Subject: Plan review - 213 Blueberry Drive - Scotts Valley, California" by E_2C, dated 11 June 2002, job number 1262SCO1.

"Subject: June 11, 2002 E_2C letter - Geotechnical peer review - 213 Blueberry Drive - Scotts Valley, California" by Pacific Crest Engineering, dated 25 June 2002, Job number 0042-SZ50-H14.

An electronic copy of "Survey map - 213 Blueberry Drive - Scotts Valley - APN 021-102-05" and "Topo, Grading & Drainage Plan" by Dennis Norton - Home Design And Project Planning.

SCOPE OF INVESTIGATION

Work performed during this study included:

1. A review of published and unpublished maps, reports and letters relevant to the property.

2. Examination and interpretation of nine sets of stereo-pair vertical aerial photographs, to assess the past slope stability of the subject property.

3. Co-logging of six exploratory borings advanced by the project geotechnical engineer, Bauldry Engineering.

4. Discussions and meetings with the property owner, project designer and planner, Dennis Norton, project geotechnical engineer, Brian Bauldry of Bauldry Engineering, City of Scotts Valley Principal Planner, Jackie Young, and the peer-reviewing geotechnical engineer, Steven Raas of Pacific Crest Engineering.

5. Analysis and interpretation of the geologic data and preparation of this report.

REGIONAL GEOLOGIC SETTING

The subject property is located in the central Santa Cruz Mountains. The Santa Cruz Mountains are formed by a series of rugged, linear ridges and valleys following the pronounced northwest to southeast structural grain of central California geology. Underlying most of the Santa Cruz Mountains is a large, elongate prism of granitic and metamorphic basement rocks, known collectively as the Salinian Block. These rocks are separated from contrasting basement rock types to the northeast and southwest, respectively, by the San Andreas and San Gregorio strike-slip fault systems. Overlying the granitic basement rocks is a sequence of dominantly marine

sedimentary rocks of Paleocene to Pliocene age and non-marine sediments of Pliocene to Pleistocene age (Figure 2).

Throughout the Cenozoic Era, this portion of California has been dominated by tectonic forces associated with lateral or "transform" motion between the North American and Pacific lithospheric plates, producing long, northwest-trending faults such as the San Andreas and San Gregorio, with horizontal displacements measured in tens to hundreds of miles. Accompanying the horizontal (strike-slip) movement of the plates have been episodes of compressive stress, reflected by repeated uplift, deformation, erosion and deposition. Near the crest of the Santa Cruz Mountains, this tectonic deformation is most evident in the sedimentary rocks older than the middle Miocene and consists of steeply dipping folds, overturned bedding, faulting, jointing, and fracturing. Along the coast, the ongoing tectonic activity is most evident in the formation of a series of uplifted marine terraces. The Loma Prieta earthquake of 1989 is the most recent reminders of the geologic unrest in the region.

REGIONAL SEISMIC SETTING

California's broad system of strike-slip faulting has had a long and complex history. Some of these faults present a seismic hazard to the subject property. The most important of these are the San Andreas, Zayante, and San Gregorio faults and the Monterey Bay-Tularcitos fault zone (Figure 2). These faults are either active or considered potentially active (Buchanan-Banks et al., 1978; Burkland and Associates, 1975; Jennings et al., 1975; Greene, 1977; Hall et al., 1974; Schwartz et al., 1990, and Wallace, 1990; Working Group On Northern California Earthquake Potential [WGONCEP], 1996). Each fault is discussed below. Locations of epicenters associated with the faults are shown in Figure 3. The intensity of seismic shaking that could occur at the site in the event of a future earthquake on some of these faults will be discussed in a later section.

San Andreas Fault

The San Andreas fault is active and represents the major seismic hazard in northern California (Jennings, 1975; Buchanan-Banks et al., 1978; Hall et al., 1974). The main trace of the San Andreas fault trends northwest-southeast and extends over 700 miles from the Gulf of California through the Coast Ranges to Point Arena, where the fault extends offshore.

Geologic evidence suggests that the San Andreas fault has experienced right-lateral, strike-slip movement throughout the latter portion of Cenozoic time, with cumulative offset of hundreds of miles. Surface rupture during historical earthquakes, fault creep, and historical seismicity confirm that the San Andreas fault and its branches, the Hayward, Calaveras, and San Gregorio faults, are all active today.

Historical earthquakes along the San Andreas fault and its branches have caused significant seismic shaking in the Santa Cruz County area. The two largest historical earthquakes on the San Andreas to affect the area were the moment magnitude (M_w) 7.9 San Francisco earthquake of 18 April 1906 (actually centered near Olema) and the M_w 6.9 Loma Prieta earthquake of 17 October

1989. The San Francisco earthquake caused severe seismic shaking and structural damage to many buildings in the Santa Cruz Mountains. The Loma Prieta earthquake appears to have caused more intense seismic shaking than the 1906 event in localized areas of the Santa Cruz Mountains, even though its regional effects were not as extensive. There were also significant earthquakes in northern California along or near the San Andreas fault in 1838, 1865 and possibly 1890 (Sykes and Nishenko, 1984; WGONCEP, 1996).

Geologists have recognized that the San Andreas fault system can be divided into segments with "characteristic" earthquakes of different magnitudes and recurrence intervals (Working Group On California Earthquake Probabilities, 1988 and 1990). A more recent study by the Working Group On Northern California Earthquake Potential (WGONCEP) in 1996 has redefined the segments and the characteristic earthquakes for the San Andreas fault system in northern and central California. Two overlapping segments of the San Andreas fault system represent the greatest potential hazard to the subject property. The first segment is defined by the rupture that occurred from the Mendocino triple junction to San Juan Bautista along the San Andreas fault during the great M_w 7.9 earthquake of 1906. The WGONCEP (1996) has hypothesized that this "1906 rupture" segment experiences earthquakes with comparable magnitudes in independent cycles about two centuries long.

The second segment is defined by the rupture zone of the M_w 6.9 Loma Prieta earthquake, despite the fact that the oblique slip and focal depth of this event do not fit the typical, right-lateral strike-slip event on the San Andreas fault. Although it is uncertain whether this "Santa Cruz Mountains" segment has a characteristic earthquake independent of great San Andreas fault earthquakes, the WGONCEP (1996) has assumed an "idealized" earthquake of M_w 7.0 with the same right-lateral slip as the 1989 Loma Prieta earthquake, but having an independent segment recurrence interval of 138 years and a multi-segment recurrence interval of 400 years.

Zayante Fault

The Zayante fault lies west of the San Andreas fault and trends about 50 miles northwest from the Watsonville lowlands into the Santa Cruz Mountains. The southern extension of the Zayante fault, known as the Vergeles fault, merges with the San Andreas fault south of San Juan Bautista.

The Zayante fault has a long, well-documented history of vertical movement (Clark and Reitman, 1973), probably accompanied by right-lateral, strike-slip movement (Hall et al., 1974; Ross and Brabb, 1973). Stratigraphic and geomorphic evidence indicates the Zayante fault has undergone late Pleistocene and Holocene movement and is potentially active (Buchanan-Banks et al., 1978; Coppersmith, 1979).

Some historical seismicity may be related to the Zayante fault (Griggs, 1973). For instance, the Zayante fault may have undergone sympathetic fault movement during the 1906 earthquake centered on the San Andreas fault, although this evidence is equivocal (Coppersmith, 1979). Seismic records strongly suggest that a section of the Zayante fault approximately 3 miles long underwent sympathetic movement in the 1989 earthquake. The earthquake hypocenters

tentatively correlated to the Zayante fault occurred at a depth of 5 miles; no instances of surface rupture on the fault have been reported.

In summary, the Zayante fault should be considered potentially active. The WGONCEP (1996) considers it capable of generating a magnitude 6.8 earthquake with an effective recurrence interval of 10,000 years.

San Gregorio Fault

The San Gregorio fault, as mapped by Greene (1977), Weber and Lajoie (1974), and Weber et al. (1995) skirts the coastline of Santa Cruz County northward from Monterey Bay, and trends onshore at Point Año Nuevo. Northward from Año Nuevo, it passes offshore again, to connect with the San Andreas fault near Bolinas. Southward from Monterey Bay, it may trend onshore north of Big Sur (Greene, 1977), to connect with the Palo Colorado fault, or continue southward through Point Sur to connect with the Hosgri fault in south-central California. Based on these two proposed correlations, the San Gregorio fault zone has a length of at least 100 miles, and possibly as much as 250 miles.

The landward extension of the San Gregorio fault at Point Año Nuevo shows evidence of late Pleistocene (Jennings, 1975; and Buchanan-Banks et al., 1978) and Holocene displacement (Weber and Cotton, 1981). Although stratigraphic offsets indicate a history of horizontal and vertical displacements, the San Gregorio is considered predominantly right-lateral strike slip by most researchers (Greene, 1977; Weber and Lajoie, 1974; and Graham and Dickinson, 1978).

In addition to stratigraphic evidence for Holocene activity, the historical seismicity in the region is partially attributed to the San Gregorio fault (Greene, 1977). Due to inaccuracies of epicenter locations, even the magnitude 6+ earthquakes of 1926, tentatively assigned to the Monterey Bay fault zone, may have actually occurred on the San Gregorio fault (Greene, 1977).

The WGONCEP (1996) has divided the San Gregorio fault into the "San Gregorio" and "San Gregorio, Sur Region" segments. The segmentation boundary is located west of the Monterey Bay, where the fault appears to have a right step-over. The San Gregorio fault has been assigned a slip rate that results in a M_w 7.3 earthquake with a recurrence interval of 400 years. This is based on the preliminary results of a paleoseismic investigation at Seal Cove by Lettis and Associates (see WGONCEP, 1996), and on regional mapping by Weber et al. (1995). The Sur Region segment has been assigned a slip rate that results in a M_w 7.0 earthquake with an effective recurrence interval of 400 years (coincidental with respect to the recurrence interval for the other segment). The Sur Region earthquake was derived from an assumed slip rate similar to that of the Hosgri fault.

Monterey Bay-Tularcitos Fault Zone

The Monterey Bay-Tularcitos fault zone is 6 to 9 miles wide, about 25 miles long, and consists of many en échelon faults identified during shipboard seismic reflection surveys (Greene, 1977).

The fault zone trends northwest-southeast and intersects the coast in the vicinity of Seaside and Ford Ord. At this point, several onshore fault traces have been tentatively correlated with offshore traces in the heart of the Monterey Bay-Tularcitos fault zone (Greene, 1977; Clark et al., 1974; Burkland and Associates, 1975). These onshore faults are, from southwest to northeast, the Tularcitos-Navy, Berwick Canyon, Chupines, Seaside, and Ord Terrace faults. Only the larger of these faults, the Tularcitos-Navy and Chupines, are shown on Figure 2. It must be emphasized that these correlations between onshore and offshore portions of the Monterey Bay-Tularcitos fault zone are only tentative; for example, no concrete geologic evidence for connecting the Navy and Tularcitos faults under the Carmel Valley alluvium has been observed, nor has a direct connection between these two faults and any offshore trace been found.

Outcrop evidence indicates a variety of strike-slip and dip-slip movement associated with onshore and offshore traces. Earthquake studies suggest the Monterey Bay-Tularcitos fault zone is predominantly right-lateral, strike-slip in character (Greene, 1977). Stratigraphically, both offshore and onshore fault traces in this zone have displaced Quaternary beds and, therefore, are considered potentially active (Buchanan-Banks et al., 1978). One offshore trace, which aligns with the trend of the Navy fault, has displaced Holocene beds and is therefore active by definition (Buchanan-Banks et al., 1978).

Seismically, the Monterey Bay-Tularcitos fault zone may be historically active. The largest historical earthquakes *tentatively* located in the Monterey Bay-Tularcitos fault zone are two events, estimated at 6.2 on the Richter Scale, in October 1926 (Greene, 1977). Because of possible inaccuracies in locating the epicenters of these earthquakes, it is possible that they actually occurred on the nearby San Gregorio fault zone (Greene, 1977).

Another earthquake in April 1890 might be attributed to the Monterey Bay-Tularcitos fault zone (Burkland and Associates, 1975); this earthquake had an estimated Modified Mercalli Intensity of VII (Table 1) for Monterey County on a whole.

The WGONCEP (1996) has assigned an earthquake of M_w 7.1 with an effective recurrence interval of 2,600 years to the Monterey Bay-Tularcitos fault zone, based on Holocene offshore offsets. Petersen et al. (1996) have a similar earthquake magnitude, but for a recurrence interval of 2,841 years. Their earthquake is based on a composite slip rate of 0.5 millimeters per year (after Rosenberg and Clark, 1995).

TABLE 1
Modified Mercalli Intensity Scale

The modified Mercalli scale measures the intensity of ground shaking as determined from observations of an earthquake's effect on people, structures, and the Earth's surface. Richter magnitude is not reflected. This scale assigns to an earthquake event a Roman numeral from I to XII as follows:

I	Not felt by people, except rarely under especially favorable circumstances.
II	Felt indoors only by persons at rest, especially on upper floors. Some hanging objects may swing.
III	Felt indoors by several. Hanging objects may swing slightly. Vibration like passing of light trucks. Duration estimated. May not be recognized as an earthquake.
IV	Felt indoors by many, outdoors by few. Hanging objects swing. Vibration like passing of heavy trucks; or sensation of a jolt like a heavy ball striking the walls. Standing automobiles rock. Windows, dishes, doors rattle. Wooden walls and frame may creak.
V	Felt indoors and outdoors by nearly everyone; direction estimated. Sleepers wakened. Liquids disturbed, some spilled. Small unstable objects displaced or upset; some dishes and glassware broken. Doors swing; shutters, pictures move. Pendulum clocks stop, start, change rate. Swaying of tall trees and poles sometimes noticed.
VI	Felt by all. Damage slight. Many frightened and run outdoors. Persons walk unsteadily. Windows, dishes, glassware broken. Knickknacks and books fall off shelves; pictures off walls. Furniture moved or overturned. Weak plaster and masonry cracked.
VII	Difficult to stand. Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary buildings; considerable in badly designed or poorly built buildings. Noticed by drivers of automobiles. Hanging objects quiver. Furniture broken. Weak chimneys broken. Damage to masonry; fall of plaster, loose bricks, stones, tiles, and unbraced parapets. Small slides and caving in along sand or gravel banks. Large bells ring.
VIII	People frightened. Damage slight in specially designed structures; considerable in ordinary substantial buildings, partial collapse; great in poorly built structures. Steering of automobiles affected. Damage or partial collapse to some masonry and stucco. Failure of some chimneys, factory stacks, monuments, towers, elevated tanks. Frame houses moved on foundations if not bolted down; loose panel walls thrown out. Decayed pilings broken off. Branches broken from trees. Changes in flow or temperature of springs and wells. Cracks in wet ground and on steep slopes.
IX	General panic. Damage considerable in specially designed structures; great in substantial buildings, with some collapse. General damage to foundations; frame structures, if not bolted, shifted off foundations and thrown out of plumb. Serious damage to reservoirs. Underground pipes broken. Conspicuous cracks in ground; liquefaction.
X	Most masonry and frame structures destroyed with their foundations. Some well-built wooden structures and bridges destroyed. Serious damage to dams, dikes, embankments. Landslides on river banks and steep slopes considerable. Water splashed onto banks of canals, rivers, lakes. Sand and mud shifted horizontally on beaches and flat land. Rails bent slightly.
XI	Few, if any masonry structures remain standing. Bridges destroyed. Broad fissures in ground; earth slumps and landslides widespread. Underground pipelines completely out of service. Rails bent greatly.
XII	Damage nearly total. Waves seen on ground surfaces. Large rock masses displaced. Lines of sight and level distorted. Objects thrown upward into the air.

SITE GEOLOGIC SETTING

The Geologic Map, Cross Sections And Landslide Hazard Cross Sections (Plate 1) depict relevant topographic and geologic information for the property. See also the Local Geologic Map (Figure 4) and Landslide Map (Figure 5) for information of a more general nature.

Topography

The western edge of the subject property is occupied by a gently sloping surface that rolls off steeply to the east, toeing out into gentler valley-bottom terrain near the eastern edge of the property (Figure 1; Plate 1). Total vertical relief across the property is approximately 55 feet, with slopes as steep as 33 degrees.

Drainage

Natural surface drainage across the property occurs by overland sheet flow to the east toward the valley bottom terrain. Some of the rainfall on the property probably infiltrates the ground and enters the groundwater regime. We did not observe seeps, springs or any other surface manifestations of high groundwater levels on the property during our field investigation or in the exploratory borings advanced by Bauldry Engineering.

Earth Materials

Clark (1981) and Brabb et al. (1997) mapped the property as being underlain by Santa Margartia Sandstone (Figure 4). This previous work is partially consistent with observations made during our field reconnaissance and with the exploratory borings advanced by Bauldry Engineering.

It appears that the property is primarily underlain by Santa Margarita Sandstone at depth, which in turn is overlain by a number of surficial earth material units: colluvium, alluvial fan deposits, and artificial fill.

Santa Margarita Sandstone

The Santa Margarita Sandstone encountered in the exploratory borings on the property and exposed in the steep slope on the western side of Blueberry Drive closely matches the description given by Clark (1981) for the upper section of the formation:

> *"The Santa Margarita is typically very thick-bedded to massive, thickly crossbedded, well-sorted, slightly granular medium to fine arkosic sand (fig. 6). In fresh exposures the sand is yellowish gray but appears brilliant white along ridges."*

The lithology of the Santa Margarita Sandstone encountered in the exploratory borings and outcrops along Blueberry Drive is a fine to medium grained, well sorted (poorly graded), subrounded, massive, friable sandstone. Bedding measured in the outcrop along Blueberry Drive

dips approximately several degrees to the east. Depths to the Santa Margarita Sandstone in the proposed development area range between 11 and 39 feet below the ground surface (Plate 1).

Colluvium

The package of mixed sand, gravel, silt and clay that lies unconformably upon the Santa Margarita Sandstone on the property is likely colluvium (Plate 1). This deposit is relatively unconsolidated, and contains angular sand and gravel sized fragments of mudstone, as well as fine to medium grained sand sized particles of subrounded quartz. We have interpreted this unit as being deposited by slow downslope creep. The formational source of this deposit is evidently the Santa Margarita Sandstone and the Santa Cruz Mudstone (which conformably overlies the Santa Margarita Sandstone well above the subject property - see Figure 4), based on the abundance of quartz grains and angular mudstone fragments.

The contact between the Colluvium and Santa Margarita Sandstone is gently sloping along the western edge of the property, and then plunges downward to the east (see Plate 1). We considered the possibility that the geometry of this contact was indicative of landsliding within the Santa Margarita Sandstone and Colluvium, and closely scrutinized the samples taken by Bauldry Engineering in the field for evidence of shearing. No shears or preferential partings (indicative of shearing) were observed in any of the samples obtained from the exploratory borings advanced by Bauldry Engineering, including borings B-1 and B-3, which were continuously sampled across the entire thickness of Colluvium. Hence it is our opinion that the Colluvium was deposited through the process of slow downslope creep, and not catastrophic landsliding. Additionally, we noted that the landform upon the property is not consistent with landforms typical of landslide terrain, particularly when viewed upon the sundry historical aerial photographs.

Alluvium

We have mapped a unit labeled as Alluvium upon Plate 1. This unit wasn't encountered during any of the subsurface work, although surface exposures of the unit reveal a loose, silty, fine- to medium-grained sand. This unit is in essence a "geomorphic" unit, and is distinguished solely upon the basis of its position in the valley-bottom terrain present along the eastern edge of the property. We have portrayed the unit as interfingering with the Colluvium, but hasten to add that this interpretation is conjectural at best.

Alluvial Fan

The deposit that overlies the Colluvium is labeled Alluvial Fan. It is comprised of a loose, fine to medium grained, well sorted (poorly graded) sand containing angular fragments of Santa Cruz Mudstone as large as two inches in diameter. This deposit may have been laid down by gentle deposition or slow downslope creep (which would technically make it colluvium) resulting from the slow retreat of the slope underlain by Santa Margarita Formation. The presence of angular Santa Cruz Mudstone fragments indicates that the Santa Cruz Mudstone portion of the slope was

still retreating, although at a somewhat slower rate, and the fragments were incorporated into the unit as it washed and crept downslope. Thickness of the unit across the property is variable, but it appears to be as thick as 16 feet under the proposed development area.

Artificial Fill

The artificial fill on the property is composed of a loose, fine to medium grained sand to silty sand containing scattered angular fragments of gravel sized Santa Cruz Mudstone, ellipsoidal-shaped clay "blebs", some organics and an occasional granitic drain rock fragment. The distinction between the Artificial Fill and Alluvial Fan was based upon the presence or absence of incidental rock fragments and organics, and a slightly mixed appearance (within the artificial fill). This unit appears to have laid out upon an existing "shelf", with a thickness varying between 7 and 9 feet.

It is important to note that the distinction made between the Artificial Fill and Alluvial Fan units is strictly academic at this juncture, and doesn't have much bearing upon the engineering design of foundations or grading upon the site, since it appears that both units have very similar relative densities and engineering characteristics.

GEOLOGIC HAZARDS

In our opinion, the potential geologic hazards that could affect the proposed developments are landsliding and intense seismic shaking. The following sections address these hazards.

Landsliding

The primary type of landsliding that may occur on the property is formally known as a dry, open-slope sand flow (after Cruden and Varnes, 1996). The loose granular materials within the Artificial Fill and Alluvial Fan units may fail as a sheet with spatially continuous movement, containing closely spaced, short-lived surfaces of shear, and a mass resembling a viscous liquid. We consider the potential for this type of slope movement to occur over the design life of the proposed residence to be moderate to high. The basis of this opinion is as follows:

1. The existing residence on the adjacent northern property, 205 Blueberry Drive, was damaged during the 1989 Loma Prieta earthquake. The project geotechnical engineer, Haro, Kasunich and Associates (HKA), concluded that the most of the earthquake related distress was due to "either direct ground shaking or from lateral spreading and subsidence..." (HKA, 1989). Although the description of the damaging process isn't precisely identical to ours, it is likely just a conflict of semantics. It appears that the process of lateral spreading and subsidence they were describing was in fact the process of the underlying loose sand moving downslope during the intense seismic shaking generated by the 1989 Loma Prieta earthquake.

2. The geologic and geotechnical engineering setting on the subject property is very similar to that of the neighboring property on 205 Blueberry Drive, consisting of loose surficial materials overlying the relatively denser, intact Santa Margarita Sandstone.

3. The loose, fine- to medium-grained sand underlying the steep slope on the property is at the angle of repose (approximately 33 to 35 degrees slope angle) for that material.

4. The subject property is likely to experience seismic shaking of a similar (or greater) intensity and duration within the design life of the proposed residence.

If left unmitigated, the resulting risk accompanying the aforementioned landslide hazard is greater than an "ordinary" risk as defined in Appendix B. We have subsequently plotted an "Area Of Earth Materials That Will Potentially Flow" on the cross sections (Plate 1) to take this potential into account. In our opinion, the risk related to the landslide hazard may be reduced to "ordinary", if the proposed development is adequately engineered and constructed with our "Area Of Earth Materials That Will Potentially Flow" in mind.

An oversight of geologically viable mitigation schemes follows. We recommend that the property owner, project engineers and designers consider at least one of three mitigation paths.

The first path involves removing the earth materials labeled as "Area Of Earth Materials That Will Potentially Flow" (Plate 1) altogether from the property, and retaining any resulting oversteepened slopes or replacing the graded-out materials with engineered fill. If there is a net loss of earth materials at the top of the slope due to grading, this will have the effect of removing the surcharge load of earth materials at the top of the wedge of loose sand underlying the steep slope on the property, thereby lowering the likelihood (or at the very least raising the threshold) of future failures.

The second path is to pursue an engineering mitigation that will essentially "anchor" the residence to the stable earth materials below the "Area Of Earth Materials That Will Potentially Flow" with a deep foundation system, allowing the residence to remain standing, undamaged, in the event a future intense seismic shaking event should cause the loose sand to move downslope. Such a mitigation must involve a careful analysis of our geologic cross sections, as well as the forces that might act upon deep foundation systems, such as piers, if the column of loose sand identified upon our cross sections (Plate 1) were to move downslope. Solely pursuing this mitigation may have some minor effect of lowering the likelihood of future failures, depending upon the type of deep foundation system, although it is more likely that the effect on future slope failures will be negligible, particularly in the case of piers, since the loose sand will simply flow around the foundation.

The third path involves a hybrid of the two prior mitigation recommendations; remove some of the "Area Of Earth Materials That Will Potentially Flow", and construct a deep foundation system designed to allow the residence to remain undamaged if the column of loose sand moves downslope. Similar to first suggested path, this hybrid will have the net effect of lowering the

likelihood (or at the very least raising the threshold) of future failures, if there is a net loss of earth materials at the top of the slope due to grading.

During our interim meetings with the project geotechnical engineer, Brian Bauldry of Bauldry Engineering, and the designer, Dennis Norton, the design deemed most economical for this project was the hybrid path, involving excavation of a portion of the loose sand, followed by the anchoring of the residence into the stable earth materials at depth with a series of deep piers.

Regardless of the mitigation, we recommend that engineers consider affects of intense seismic shaking. The following section summarizes the results of our deterministic seismic shaking analysis.

Deterministic Seismic Shaking Analysis

For the purpose of evaluating deterministic peak ground accelerations for the site, we have considered two seismic sources: the San Andreas and Zayante faults. While other faults or fault zones in this region may be active, their potential contribution to deterministic seismic hazards at the site is overshadowed by these two faults.

Table 2 shows the moment magnitude of characteristic or maximum earthquakes, estimated recurrence interval and the distance from the site for each of these fault systems. We took the fault data from "Database of potential sources for earthquakes larger than magnitude 6 in Northern California" (WGONCEP, 1996) and Petersen et al. (1996). Also shown on Table 2 are calculated on-site accelerations from the listed earthquakes derived using alternative methods. These accelerations are based on attenuation relationships derived from the analysis of historical earthquakes. Because the historical data can be interpreted in different ways, there are a number of different attenuation relationships available. We have employed two fairly conservative attenuation relationships for rock/shallow soil sites in deriving the acceleration values listed in Table 2. As can be seen in the table, the results from these attenuation curves are somewhat similar.

The "maximum considered earthquake ground motion," as defined by FEMA (1998), is also listed in Table 2. FEMA (1998) and the National Earthquake Hazards Reduction Program suggest that in regions of high seismicity, such as coastal California, the appropriate design level for ground shaking is the deterministically derived mean peak horizontal ground acceleration multiplied by 1.5. Applying this method to the subject property results in ground shaking parameters roughly equivalent to the deterministically derived mean values plus one dispersion.

If the deterministically derived accelerations are used for engineering analysis on the subject property, we recommend utilizing the attenuation relationship developed by Abrahamson and Silva (1997). Although the different authors arrived at their values using slightly different techniques of analysis, the end results are roughly the same, as may be noted from Table 2. It is important to note that predicting seismic shaking intensity is a field that is dominated heavily by theory, with a paucity of near-field station readings in rock and shallow soil settings. It should

also be noted that the accelerations listed in Table 2 are only average values. Therefore, we caution that the listed values are approximations, rather than precise predictions. Actual measured "free-field" accelerations may be larger.

TABLE 2
Faults, Earthquakes and Deterministic Seismic Shaking Data

Fault	Moment Magnitude of Characteristic or Maximum Earthquake (M_w)	Estimated Recurrence Interval (years)	Distance from Site (km)	Estimated Mean Peak Ground Acceleration (g)	Estimated Mean + One Dispersion Ground Acceleration (g)	Maximum Considered Earthquake Ground Motion[3] (g)
San Andreas (1906 rupture)	7.9	210	13.2	0.39[1] 0.42[2]	0.60[1] 0.61[2]	0.58[1] 0.62[2]
Zayante	6.8	10,000	7.8	0.43[1] 0.41[2]	0.67[1] 0.63[2]	0.64[1] 0.61[2]

[1] Abrahamson and Silva, 1997
[2] Sadigh et al., 1997
[3] FEMA, 1998

Based on the results listed in Table 2, the estimated mean peak ground acceleration expected at the subject property will be 0.43g, the maximum earthquake ground motion (mean acceleration plus one dispersion) expected at the subject property will be approximately 0.67g, based on a M_w 6.8 earthquake centered on the Zayante fault, 7.8 kilometers northeast of the site.

Naeim and Anderson (1993) found that "effective peak acceleration" (EPA) is more typically about 75 percent of the peak acceleration. Effective peak acceleration is comparable to "repeatable high ground acceleration" (after Ploessel and Slossen, 1974) and is generally considered to represent the large number of lower amplitude peaks on an accelerogram recording. This suggests that the mean peak horizontal ground acceleration of 0.43 g would generate an EPA of approximately 0.32 g.

The duration of strong shaking is dependent on magnitude. Dobry et al. (1978) have suggested a relationship between magnitude and duration of "significant" or strong shaking expressed by the formula:

$$\text{Log } D = 0.432\ M - 1.83$$ (where D is the duration and M is the magnitude).

On the basis of the above relationship, the duration of strong shaking associated with a magnitude 6.8 earthquake (the maximum earthquake for the Zayante fault) is estimated to be about 13 seconds. In contrast, the duration of strong shaking associated with a magnitude 7.9 earthquake (the characteristic earthquake for the San Andreas fault) is estimated to be about 38 seconds. Considering the recurrence intervals of the San Andreas and Zayante faults, the existing residence is much more likely to experience the characteristic event on the San Andreas fault,

with lower peak accelerations than the design earthquake on the Zayante fault but lasting about three times as long (see Table 2). Bear in mind that the duration of strong seismic shaking may be even more critical as a design parameter than the peak acceleration itself.

REVIEW OF PRELIMINARY DESIGN PLANS

We have reviewed a set of preliminary building plans prepared by Dennis Norton - Home Design And Project Planning including the following sheets: "Topo, Grading & Drainage Plan", Sheet 2a, revised 16 May 2002, "Slope Analysis", Sheet 2b, revised 19 May 2002; and "213 Blueberry Drive - S.V. - Elevations", Sheet 5A, "Elevations", Sheet 5b and "Elevations", Sheet 5c, drawn 16 December 2002. The plans portray a residence located near the top of the steep slope, nestled into a cut pad. The cut is portrayed as a 13 to 14 foot high compound sloping and retained cut slope. The retained portion is located along the western edge of the lower floor, and is about 8 to 9 feet high. No foundation details were available at this time, but it is our understanding that Dennis Norton is working closely with the project geotechnical and structural engineers to develop a foundation that will take our "Area Of Earth Materials That Will Potentially Flow" shown on Plate 1 into account. It also appears that surface water drainage collected by the residence will be directed onto Blueberry Drive.

The net effect of the proposed grading plan, as in the prior "Landsliding" section will be to remove a portion of the surcharge load of earth materials at the top of the wedge of loose sand underlying the steep slope on the property, thereby lowering the likelihood (or at the very least raising the threshold) of future failures. Additionally, issuing surface water drainage onto Blueberry Drive will serve to improve any drainage or erosion problems that might exist on the property. In essence, the project will improve the existing slope conditions, as it is currently proposed. Although we haven't assessed the potential geologic hazards and attendant risks posed to existing residences downslope from the subject property by landsliding and drainage issues, we feel it is fair to say that the proposed development will lower the potential for those hazards to impact the residences in the future.

CONCLUSIONS

Based on the information gathered and analyzed, it is our opinion that the proposed development is geologically suitable, provided our recommendations are followed. Residential development on the subject property will be subject to "ordinary risks" as defined in Appendix B. Appendix B should be reviewed in detail by the developer and all property owners to determine whether an "ordinary" risk as defined in the appendix is acceptable. If this level of risk is unacceptable to the developer and the property owners, then the geologic hazards in question should be mitigated to reduce the corresponding risks to an acceptable level.

The primary type of landsliding that may occur on the property is formally known as a dry, open-slope sand flow (after Cruden and Varnes, 1996). We consider the potential for this type of slope movement to occur over the design life of the proposed residence to be moderate to high. *If left unmitigated*, the resulting risk accompanying the aforementioned landslide hazard is greater than

an "ordinary" risk as defined in Appendix B. We have subsequently plotted an "Area Of Earth Materials That Will Potentially Flow" on the cross sections (Plate 1) to take this potential hazard into account. In our opinion, the risk related to the landslide hazard may be reduced to "ordinary", if the proposed development is adequately engineered and constructed with our "Area Of Earth Materials That Will Potentially Flow" in mind.

The subject property is located in an area of high seismic activity and will be subject to strong seismic shaking in the future. Modified Mercalli Intensities of IX are possible. The controlling seismogenic source for the subject property is the Zayante fault, 7.8 kilometers to the northeast. The design earthquake on this fault should be a M_w 6.8. Deterministic analysis for the site yields a mean peak ground acceleration of 0.43 g (which in turn yields an EPA of 0.32) and a mean peak ground acceleration plus one dispersion of 0.67 g. Expected duration of strong shaking for this event is about 13 seconds. Considering the recurrence intervals of the San Andreas and Zayante faults, the existing residence is much more likely to experience the characteristic event on the San Andreas fault, with lower peak accelerations than the design earthquake on the Zayante fault but lasting about three times as long (see Table 2). Bear in mind that the duration of strong seismic shaking may be even more critical as a design parameter than the peak acceleration itself.

RECOMMENDATIONS

1. We recommend the project geotechnical and structural engineers evaluate our report and the accompanying maps and cross sections and pursue a course of mitigation that will lower the risk to the proposed development due to the landsliding to an "ordinary" risk (as defined in Appendix B). We recommend that the property owner consider at least one of three primary mitigation paths.

The first path involves grading out the earth materials labeled as "Area Of Earth Materials That Will Potentially Flow" (Plate 3) and retaining any resulting oversteepened slopes or replacing the graded-out materials with engineered fill. If there is a net loss of earth materials at the top of the slope due to grading, this will have the effect of removing the surcharge load of earth materials at the top of the wedge of loose sand underlying the steep slope on the property, thereby lowering the likelihood (or at the very least raising the threshold) of future failures.

The second path is to pursue an engineering mitigation that will essentially "anchor" the residence to the stable earth materials below the "Area Of Earth Materials That Will Potentially Flow" with a deep foundation system, allowing the residence to remain standing, undamaged, in the event a future intense seismic shaking event should cause the loose sand to move downslope. Such a mitigation must involve a careful analysis of our geologic cross sections, as well as the forces that might act upon deep foundation systems, such as piers, if the column of loose sand identified upon our cross sections (Plate 1) were to move downslope. Solely pursuing this mitigation may have some minor effect of lowering the likelihood of future failures, depending upon the type of deep foundation system, although it is more likely that the effect upon future

slope failures will be negligible, particularly in the case of piers, since the loose sand will simply flow around the foundation.

The third path involves a hybrid of the two prior mitigation recommendations; remove some of the "Area Of Earth Materials That Will Potentially Flow", and construct a deep foundation system designed to allow the residence to remain undamaged if the column of loose sand moves downslope. Similar to first suggested path, this hybrid will have the net effect of lowering the likelihood (or at the very least raising the threshold) of future failures, if there is a net loss of earth materials at the top of the slope due to grading.

2. The project engineers should consider our deterministic analysis for the site yielding an effective peak acceleration (EPA) of 0.32 g, a mean peak ground acceleration of 0.43 g, and a mean peak ground acceleration plus one dispersion of 0.67 g.

3. Aside from the mitigation schemes recommended above, we recommend that all drainage from improved surfaces such as walkways, patios, roofs and driveways be collected in impermeable gutters or pipes and carried to Blueberry Drive. At no time should any concentrated discharge be allowed to spill directly onto the ground adjacent to the residence, nor should it be discharged onto the steep slope below the proposed development.

4. We request the privilege of reviewing all new geotechnical engineering reports and civil engineering and architectural plans pertaining to the proposed development.

5. We recommend that Nolan, Zinn and Associates be retained to inspect all cuts made during grading for the foundation, prior to construction of the footings.

INVESTIGATION LIMITATIONS

1. The conclusions and recommendations noted in this report are based on probability and in no way imply the site will not possibly be subjected to ground failure or seismic shaking so intense that structures will be severely damaged or destroyed. The report does suggest that pursuing mitigation measures structures at the subject site, in compliance with the recommendations noted in this report, will result in an "ordinary" risk to the residence as defined in Appendix B.

2. This report is issued with the understanding that it is the duty and responsibility of the owner or his representative or agent to ensure that the recommendations contained in this report are brought to the attention of the architect and engineer for the project, incorporated into the plans and specifications, and that the necessary steps are taken to see that the contractor and subcontractors carry out such recommendations in the field.

3. If any unexpected variations in soil conditions or if any undesirable conditions are encountered during construction or if the proposed construction will differ from that planned at the present time, Nolan, Zinn and Associates should be notified so that supplemental recommendations can be given.

REFERENCES

Aerial Photographs

DATE FLOWN	FLIGHT LINE	PHOTO NUMBERS	PRINTS
1942	CJA-1B	42 & 43	Black & white
5/5/48	CDF5-2	117 & 118	Black & white
5/5/56	CJA 4R	86 & 87	Black & white
5/16/68	GS-VBZK	172-174	Black & white
10/14/75	SCZCO 2	101 & 102	Black & white
01/08/82	USGS JSC 8	5-7	Black & white
6/17/89	WAC - 89 CA 34	48 & 49	Black & white
6/22/94	15	8 & 9	Black & white
9/20/97	WAC-97CA 15	38 & 39	Black & white

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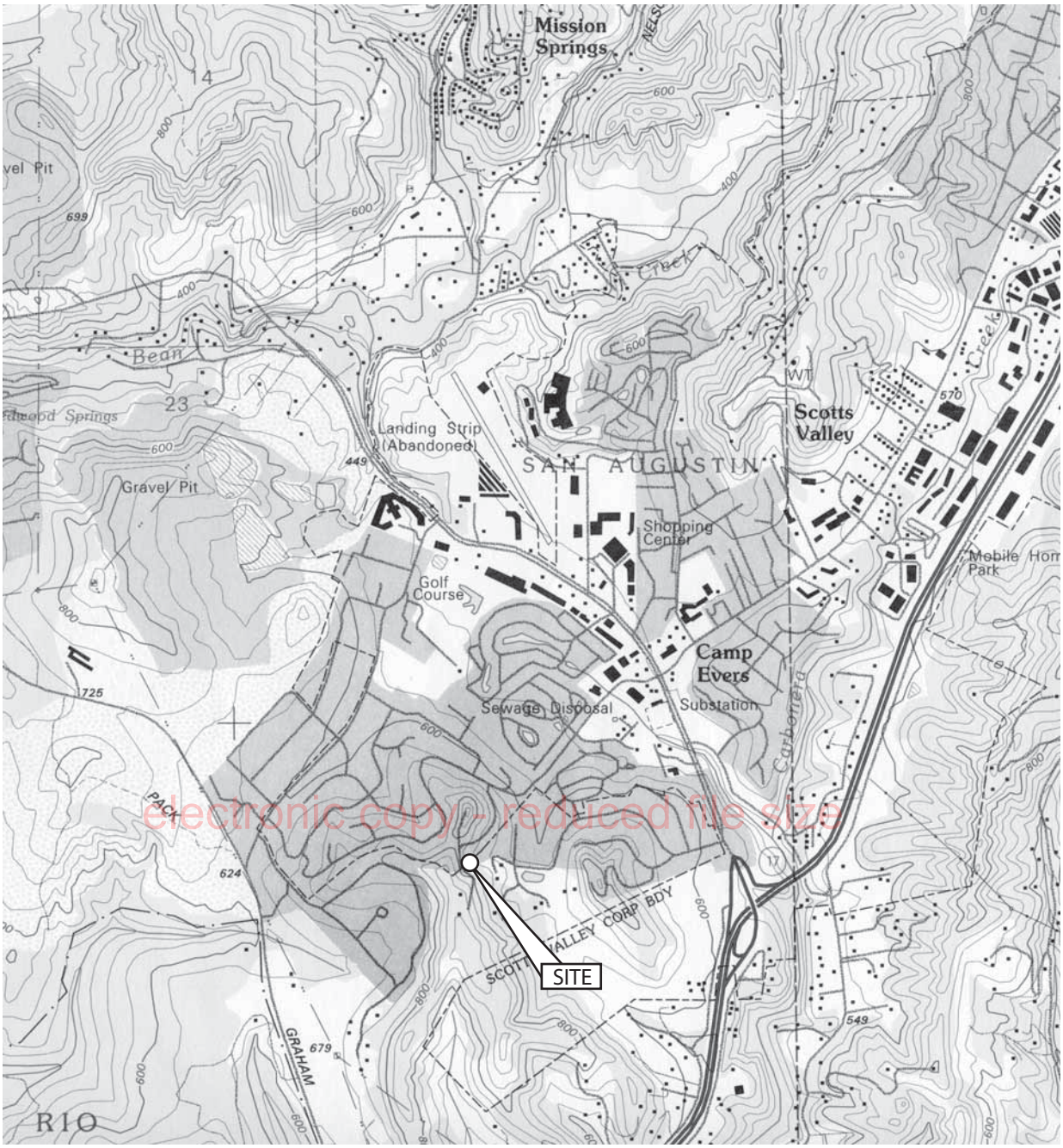
APPENDIX A

FIGURES



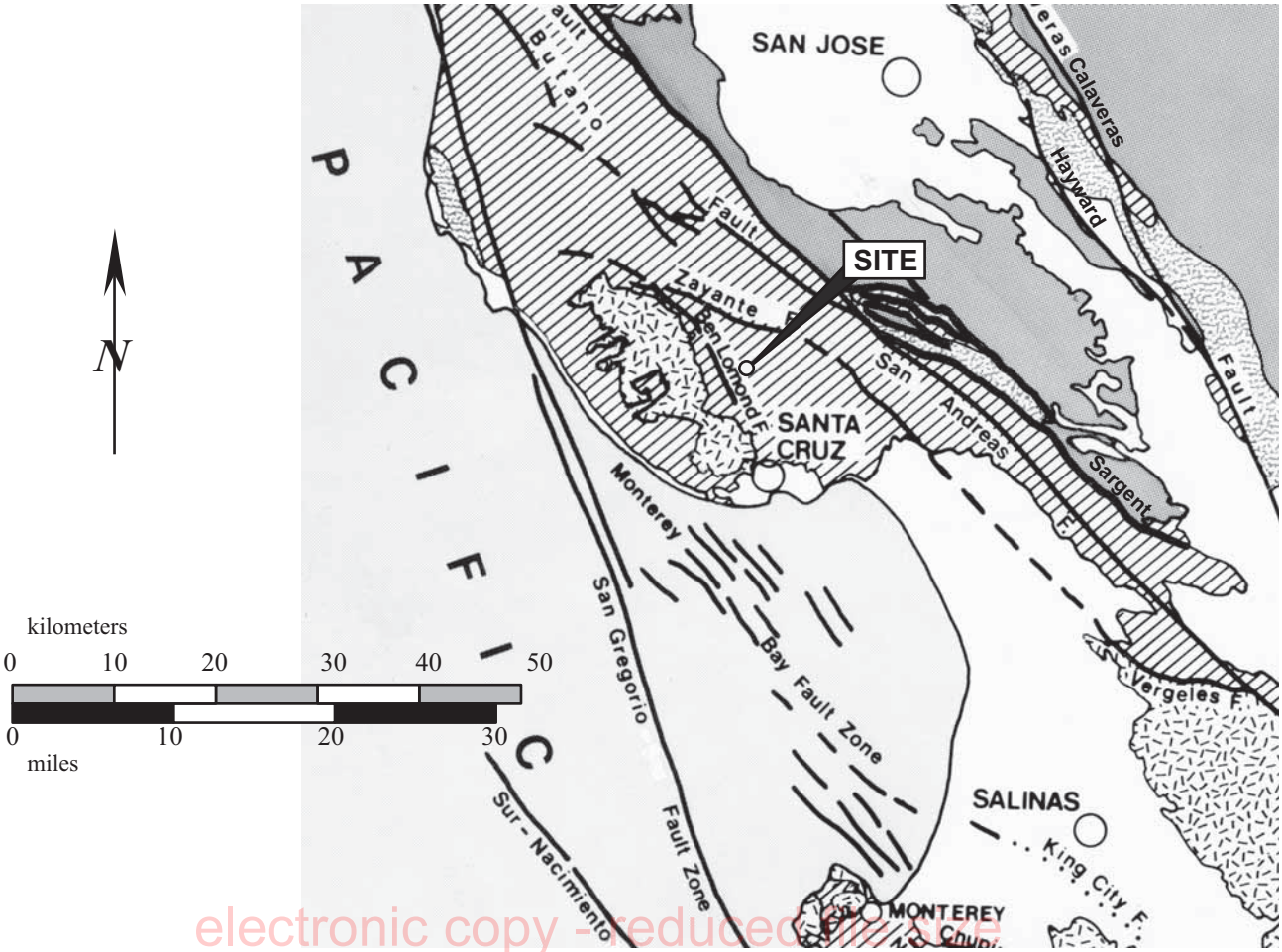
Base Map: Felton, California U.S. Geological Survey 7.5' quadrangle, 1955, scale: 1"=2000'

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

Topographic Index Map
Lands Of Zamani
213 Blueberry Drive
Scotts Valley, California

FIGURE #
1
JOB #
02040-SC



This map is based on the Geologic Map of California compiled by C.W. Jenning, R.G. Strand, and T.H. Rogers, 1969-1973

EXPLANATION

ROCK UNITS

Quaternary Sediments - marine and nonmarine deposits, some Pliocene and Pleistocene nonmarine deposits

Tertiary Sediments - marine and nonmarine deposits, some volcanics

Cretaceous and Tertiary-Cretaceous Sediments - Upper and Lower Cretaceous marine sediments, some Tertiary-Cretaceous marine sediments

Basement Rocks

Franciscan Complex - Cretaceous and Jurassic sediments, fragmented and sheared melange, some metamorphic and ultramafic rocks

Plutonic, Igneous and Metamorphic Rocks - Mesozoic granitic rocks, Paleozoic or Mesozoic and Precambrian schists, pre-Cenozoic metasedimentary and metavolcanic rocks, minor Palezoic or Mesozoic limestone

SYMBOLS

Geologic boundary

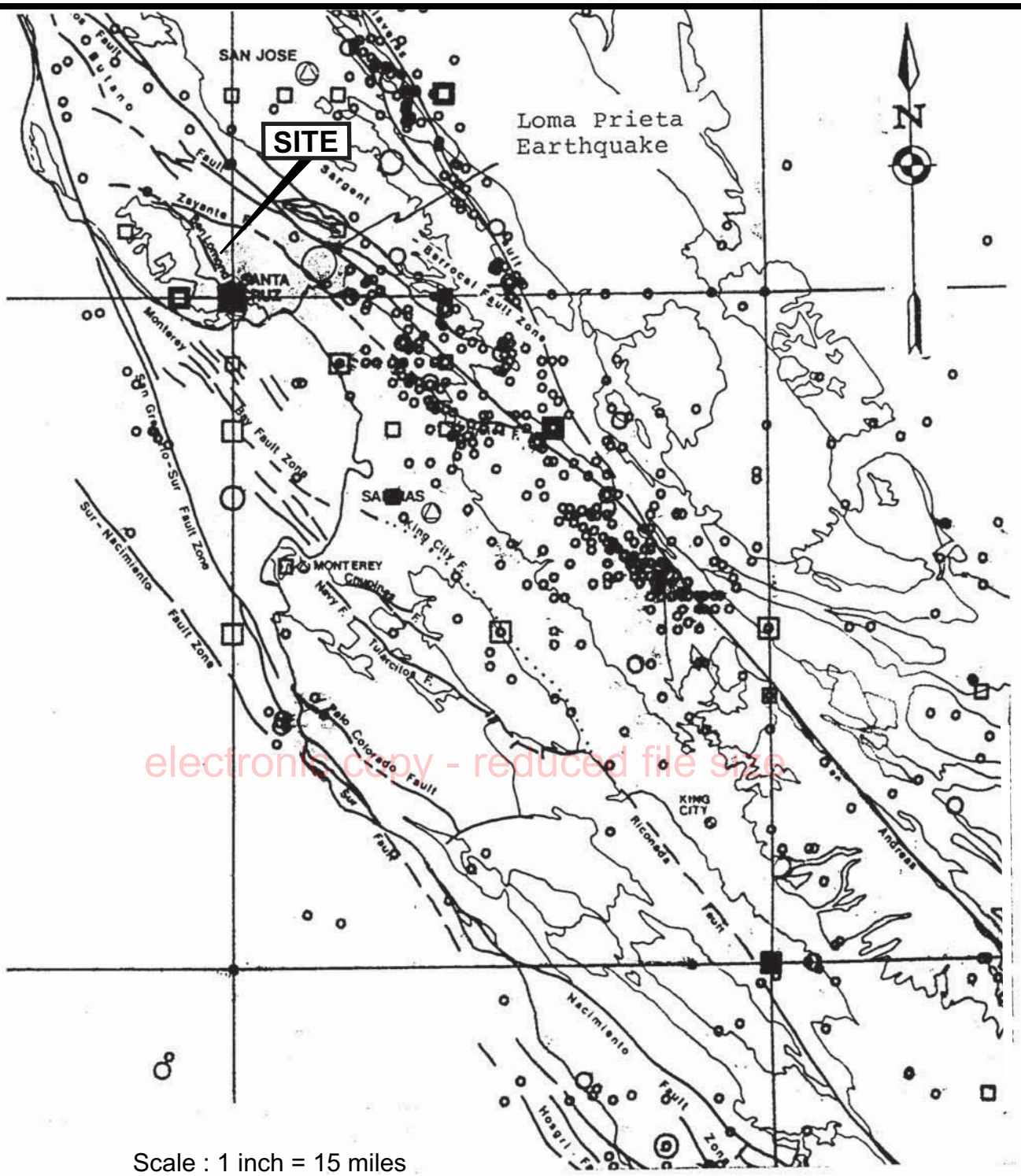
Fault trace

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

Regional Geologic Map
Lands Of Zamani
213 Blueberry Drive
Scotts Valley, California

FIGURE # 2
JOB # 02040-SC



Intensities

III - V	□
VI - VIII	□
IX - XII	□

Earthquake epicenters plotted by National Geophysical Data Center / NOAA, Boulder, Colorado

Magnitudes

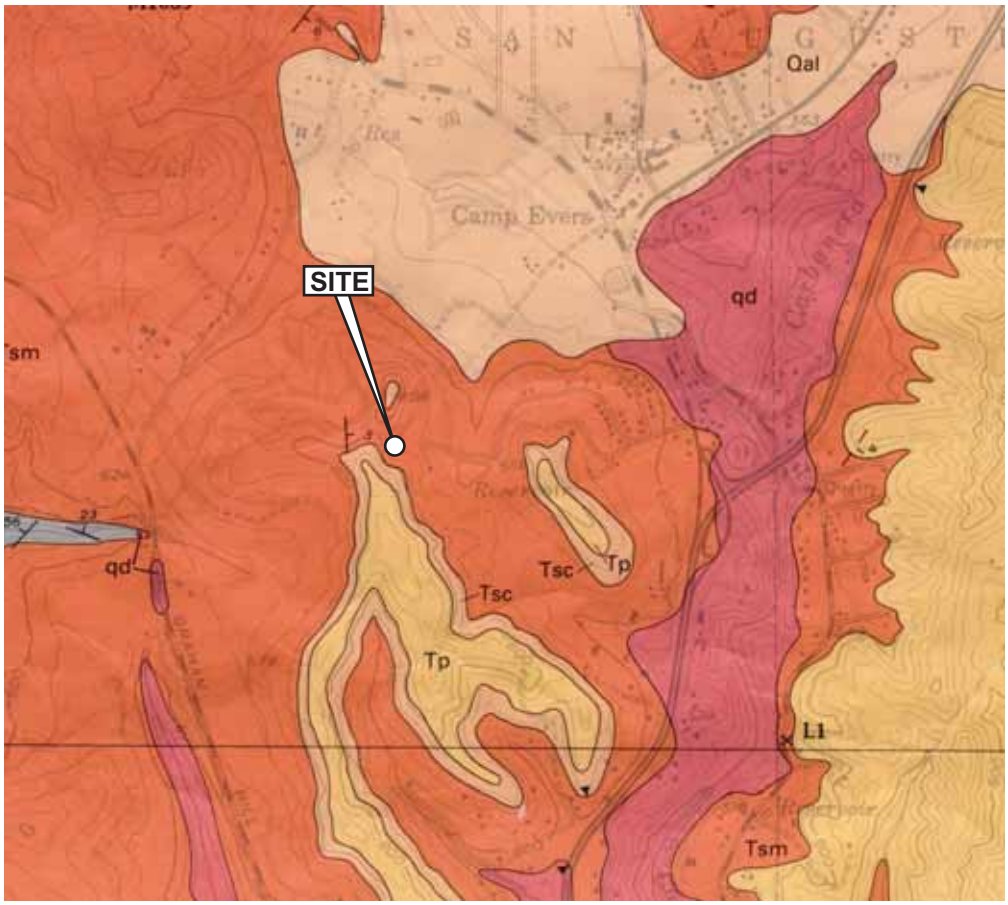
3.5 - 4.9	○
5.0 - 6.0	○
6.1 - 7.0	○
> 7.0	○

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

Regional Seismicity Map
Lands of Zamani
213 Blueberry Drive
Scotts Valley, California

FIGURE # 3
JOB # 02040-SC



EXPLANATION

Qal	Alluvial deposits
Tsm	Santa Margarita Sandstone
Tsc	Santa Cruz Mudstone
Tp	Purisima Formation
qd	quartz diorite

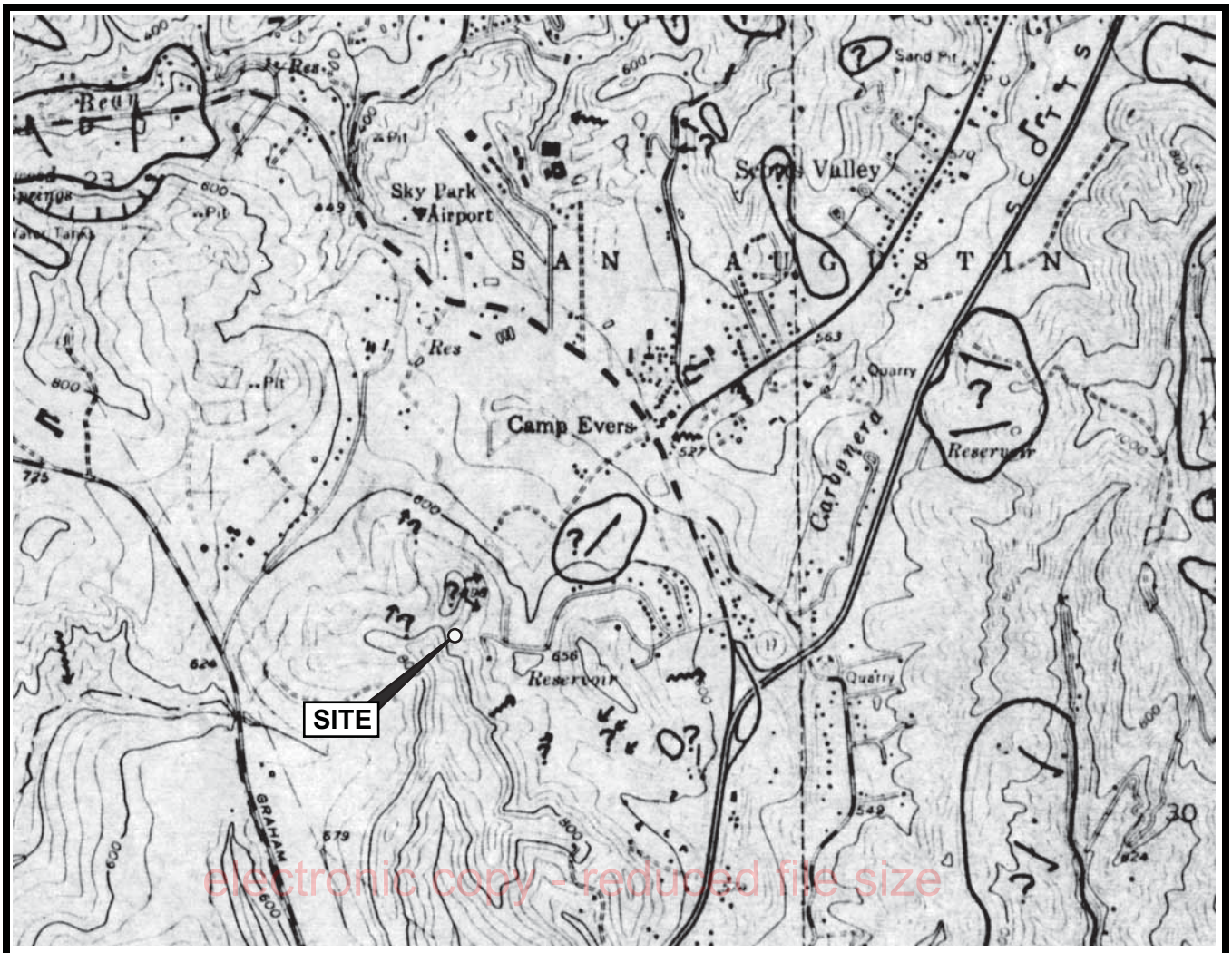
Earth materials contact

30° Bedding attitude; broken where estimated

N

0 feet 2000

BASE MAP: CLARK, J.C. GEOLOGIC MAP AND SECTIONS OF THE FELTON-SANTA CRUZ AREA, SANTA CRUZ COUNTY, CALIFORNIA, U.S. GEOLOGICAL SURVEY, 1981, SCALE: 1:24,000



N

0 feet 2000

EXPLANATION

Landslide deposit; d=definite landslide, p=possible landslide, ?= questionable landslide

Landslide escarpment

Small landslide deposit and gully

Soil creep

Base Map: *"Preliminary Map of Landslide Deposits In Santa Cruz County, California,"* by Cooper-Clark and Associates, 1975, Scale 1:62,500 (compilation map scale 1:24,000).

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates

Santa Cruz County Landslide Map
Lands of Zamani
213 Blueberry Drive
Scotts Valley, California

FIGURE # 5
JOB # 02040-SC

APPENDIX B

SCALE OF ACCEPTABLE RISKS FROM GEOLOGIC HAZARDS

SCALE OF ACCEPTABLE RISKS FROM SEISMIC GEOLOGIC HAZARDS

Risk Level	Structure Types	Extra Project Cost Probably Required to Reduce Risk to an Acceptable Level
Extremely low[1]	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intake systems, plants manufacturing or storing explosives or toxic materials.	No set percentage (whatever is required for maximum attainable safety).
Slightly higher than under "Extremely low" level.[1]	Structures whose use is critically needed after a disaster: important utility centers; hospitals; fire, police and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also dams.	5 to 25 percent of project cost.[2]
Lowest possible risk to occupants of the structure.[3]	Structures of high occupancy, or whose use after a disaster would be particularly convenient: schools, churches, theaters, large hotels, and other high rise buildings housing large numbers of people, other places normally attracting large concentrations of people, civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	5 to 15 percent of project cost.[4]
An "ordinary" level of risk to occupants of the structure.[3,5]	The vast majority of structures: most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.	1 to 2 percent of project cost, in most cases (2 to 10 percent of project cost in a minority of cases).[4]

1 Failure of a single structure may affect substantial populations.

2 These additional percentages are based on the assumptions that the base cost is the total cost of the building or other facility when ready for occupancy. In addition, it is assumed that the structure would have been designed and built in accordance with current California practice. Moreover, the estimated additional cost presumes that structures in this acceptable risk category are to embody sufficient safety to remain functional following an earthquake.

3 Failure of a single structure would affect primarily only the occupants.

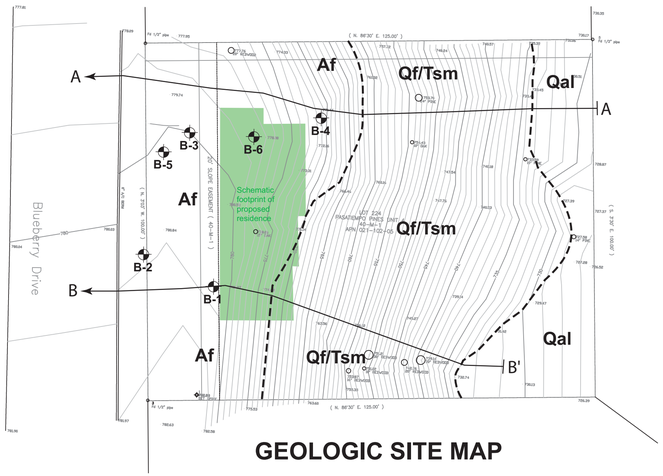
4 These additional percentages are based on the assumption that the base cost is the total cost of the building or facility when ready for occupancy. In addition, it is assumed that the structures would have been designed and built in accordance with current California practice. Moreover the estimated additional cost presumes that structures in this acceptable-risk category are to be sufficiently safe to give reasonable assurance of preventing injury or loss of life during and following an earthquake, but otherwise not necessarily to remain functional.

5 "Ordinary risk": Resist minor earthquakes without damage: resist moderate earthquakes without structural damage, but with some non-structural damage; resist major earthquakes of the intensity or severity of the strongest experienced in California, without collapse, but with some structural damage as well as non-structural damage. In most structures it is expected that structural damage, even in a major earthquake, could be limited to repairable damage. (Structural Engineers Association of California)

Source: *Meeting the Earthquake,* Joint Committee on Seismic Safety of the California Legislature, Jan. 1974, p.9.

SCALE OF ACCEPTABLE RISKS FROM NON-SEISMIC GEOLOGIC HAZARDS[6]		
Risk Level	Structure Type	Risk Characteristics
Extremely low risk	Structures whose continued functioning is critical, or whose failure might be catastrophic: nuclear reactors, large dams, power intake systems, plants manufacturing or storing explosives or toxic materials.	1. Failure affects substantial populations, risk nearly equals nearly zero.
Very low risk	Structures whose use is critically needed after a disaster: important utility centers; hospitals; fire, police and emergency communication facilities; fire station; and critical transportation elements such as bridges and overpasses; also dams.	1. Failure affects substantial populations. Risk slightly higher than 1 above.
Low risk	Structures of high occupancy, or whose use after a disaster would be particularly convenient: schools, churches, theaters, large hotels, and other high rise buildings housing large numbers of people, other places normally attracting large concentrations of people, civic buildings such as fire stations, secondary utility structures, extremely large commercial enterprises, most roads, alternative or non-critical bridges and overpasses.	1. Failure of a single structure would affect primarily only the occupants.
"Ordinary" risk	The vast majority of structures: most commercial and industrial buildings, small hotels and apartment buildings, and single family residences.	1. Failure only affects owners /occupants of a structure rather than a substantial population. 2. No significant potential for loss of life or serious physical injury. 3. Risk level is similar or comparable to other ordinary risks (including seismic risks) to citizens of coastal California. 4. No collapse of structures; structural damage limited to repairable damage in most cases. This degree of damage is unlikely as a result of storms with a repeat time of 50 years or less.
Moderate risk	Fences, driveways, non-habitable structures, detached retaining walls, sanitary landfills, recreation areas and open space.	1. Structure is not occupied or occupied infrequently. 2. Low probability of physical injury. 3. Moderate probability of collapse.

[6] Non-seismic geologic hazards include flooding, landslides, erosion, wave runup and sinkhole collapse



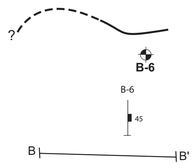
GEOLOGIC SITE MAP

EXPLANATION

EARTH MATERIALS

Af	Artificial fill
Qf	Alluvial fan
Qf/Tsm	Alluvial fan overlying Santa Margarita Sandstone
Qc	Colluvium - shown on cross sections only
Qal	Alluvium
Tsm	Santa Margarita Sandstone

SYMBOLS



Earth materials contact - dashed where approximate, queried where uncertain

Exploratory boring advanced by Bauldry Engineering

Exploratory boring advanced by Bauldry Engineering; Small rectangles indicate where samples were taken; integers next to rectangles are blow counts for that sample, normalized to a Terzaghi sampler - shown on cross sections only.

Geologic cross section

• Engineering Geology
• Coastal Geology
• Hydrogeology

Nolan, Zinn, and Associates
1509 Seabright Ave., Suite A2
Santa Cruz, CA 95062

Date: 10 February 2003
Revised:
Project: 02040-SC

GEOLOGIC MAP, CROSS SECTIONS AND LANDSLIDE HAZARD CROSS SECTIONS
Lands Of Zamani
213 Blueberry Drive
Scotts Valley, California

Scale: 1"=20', h=v
Drawn by: ENZ/enz/alb

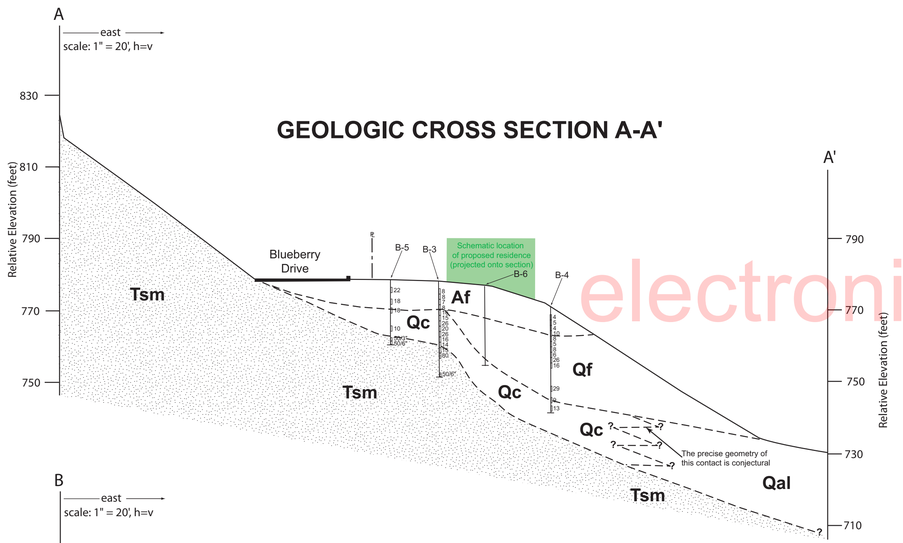
Plate 1

BASE MAP: Electronic copy of "Topographic Survey Of Assessor's Parcel No. 021-102-05" by Carey Edmundson & Associates Land Surveying, Job #98024, dated 9 April 1998, 1 sheet, scale 1"=10'.

NOTES

1. Geologic map and cross section were constructed using the supplied topographic map and supplemental tape and brunton surveying.

2. Final location and foundation depth of the proposed residence has not been decided upon as of the publication of this report. The residence shown on the map and cross sections are schematic and are intended only to aid the reader in understanding where the residence might approximately lie upon the existing ground surface with respect to the underlying geologic structure.



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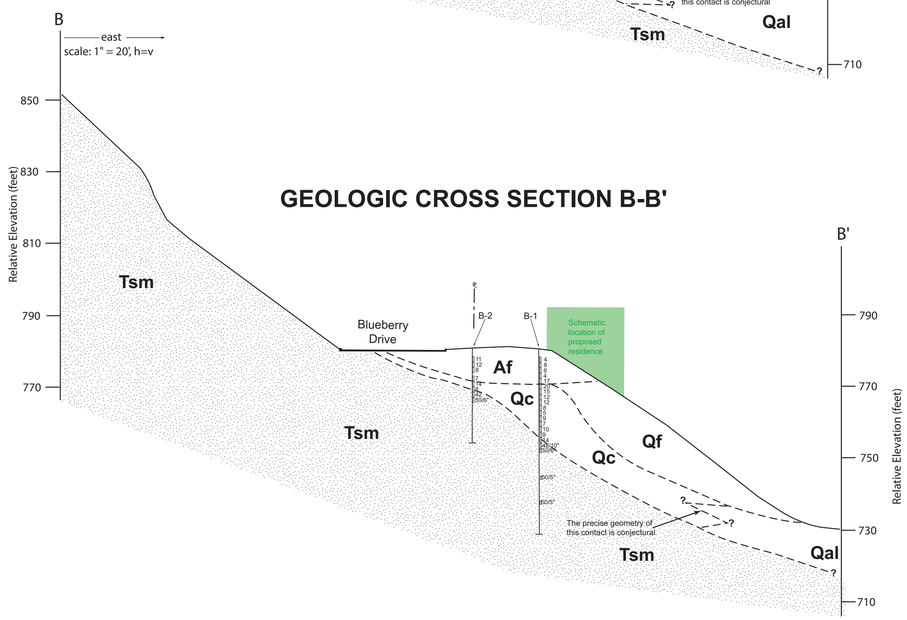

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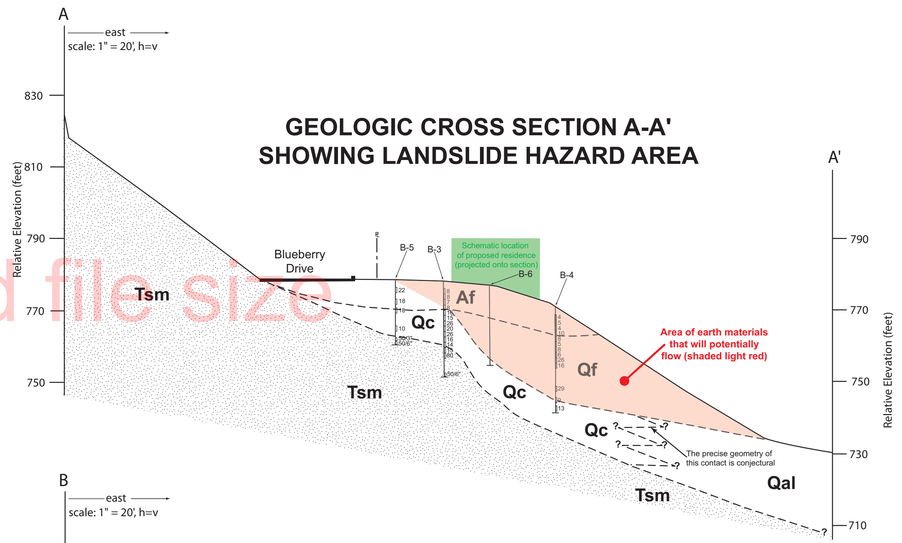
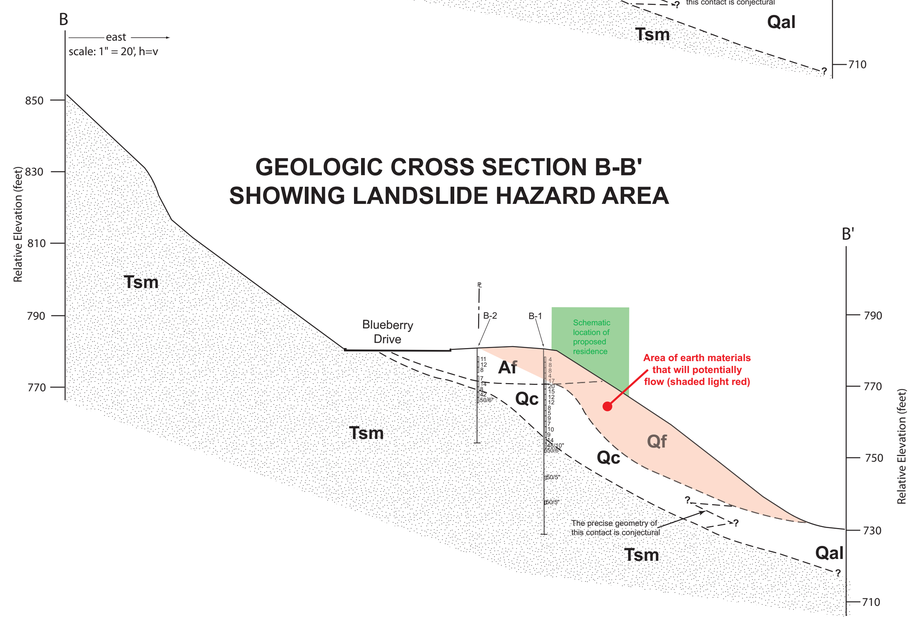


GEOLOGIC CROSS SECTION A-A'
SHOWING LANDSLIDE HAZARD AREA



GEOLOGIC CROSS SECTION B-B'
SHOWING LANDSLIDE HAZARD AREA

ARBORIST REPORT-

Tree Resource Analysis, Construction Impacts & Protection Plan for:

213 Blueberry Drive, APN: 021-102-05

Scotts Valley, CA

November 11, 2018

Prepared for:

Mr. Jeff Mora
213 Blueberry Drive
Scotts Valley, CA 95066

Prepared by:

Kurt Fouts
Arborist Consultant

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SUMMARY

- A new two-story one-bedroom home with two car garage and basement will be constructed on a vacant lot at 213 Blueberry Drive, Scotts Valley.
- Eight "protected" trees within the project limits were inventoried.
- The eight "protected" trees are comprised of four species. Six are in good to fair condition and two trees are in poor condition.
- The proposed improvements will moderately impact two "protected" trees, mitigation methods are specified, and they can be retained.
- The proposed improvements will have a low impact to the remaining six trees and they can be retained.
- Mitigation measures for retained trees are specified and protection methods detailed.
- No trees are proposed for removal for this project.

Background

Plans will be submitted to the City of Scotts Valley Planning Department, for construction of a two-story, one-bedroom home with two car garage and unheated daylight basement at 213 Blueberry Drive, Scotts Valley. Mr. Jeff Mora has requested my services, to assess the condition of ten trees on the applicant's property and two trees on an adjacent property with canopies that overhang the project boundaries, and the construction impacts that may affect them. Further, to provide a report with my findings and recommendations to meet City of Scotts Valley planning requirements.

Assignment

Provide an arborist report that includes an assessment of the trees within the project area. The assessment is to include the species, size (trunk diameter, height and canopy spread), condition (health and structure), and suitability for preservation ratings.

To complete this assignment, the following services were performed:

- **Tree Resource Evaluation:** Inventory, evaluate and assign suitability for preservation ratings for subject trees.
- **Plan Review: Reviewed provided plans including:** Architectural Site and Grading Plans dated 11/6/2018 & Topographic Survey dated 11/6/2018.
- **Construction Impact Assessment:** Combine tree resource data with anticipated construction impacts, to provide recommendations for removal or retention of trees.
- **Mapping:** Tree canopies were plotted onto: Architectural Site Plan, dated 11/6/ 2018.

Limits of the Assignment

The information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection on

The inspection is limited to visual examination of accessible items without climbing, dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees in questions may not arise in the future.

Purpose and use of the report

The report is intended to identify all the trees within the plan area that could be affected by a project. The report is to be used by the developer, their agents, and the City of Scotts Valley as a reference for existing tree conditions and to help satisfy the City of Scotts Valley planning requirements.

Resources

All information within this report is based on site plans as of the date of this report. Resources are as follows:

- Architectural Site and Grading Plans dated 11/6/2018 & Topographic Survey dated 11/6/2018.
- Site Visit, Tree Inventory & Condition Evaluation at, 213 Blueberry Drive, Scotts Valley on November 11, 2018
- City of Scotts Valley Municipal Code –Section 17.44.080 Tree Protection Regulations (applicable sections).

OBSERVATIONS

The property is on a steeply sloped parcel. There are 9 trees within the project area, all are "protected", and most are located at the property edges. The tree species on the north edge include one each coast redwood (*Sequoia sempevirens*), California bay laurel (*Umbellularia californica*) and Monterey Pine (*Pinus radiata*). Tree species on the south edge include four coast redwood. The is one coast live oak (*Quercus agrifolia*), in the northeast section of the project boundary.

The trees are in good to fair condition, except two coast redwoods are in poor condition. The growth of these two redwoods has been suppressed by the larger adjacent redwoods. Most of the trees are mature, except the planted coast redwood at the top of the property, which is young and maturing. The Monterey pine located below the project boundaries, has a 10-degree lower trunk lean that self corrects in the upper trunk. None of the trees present any significant risk.

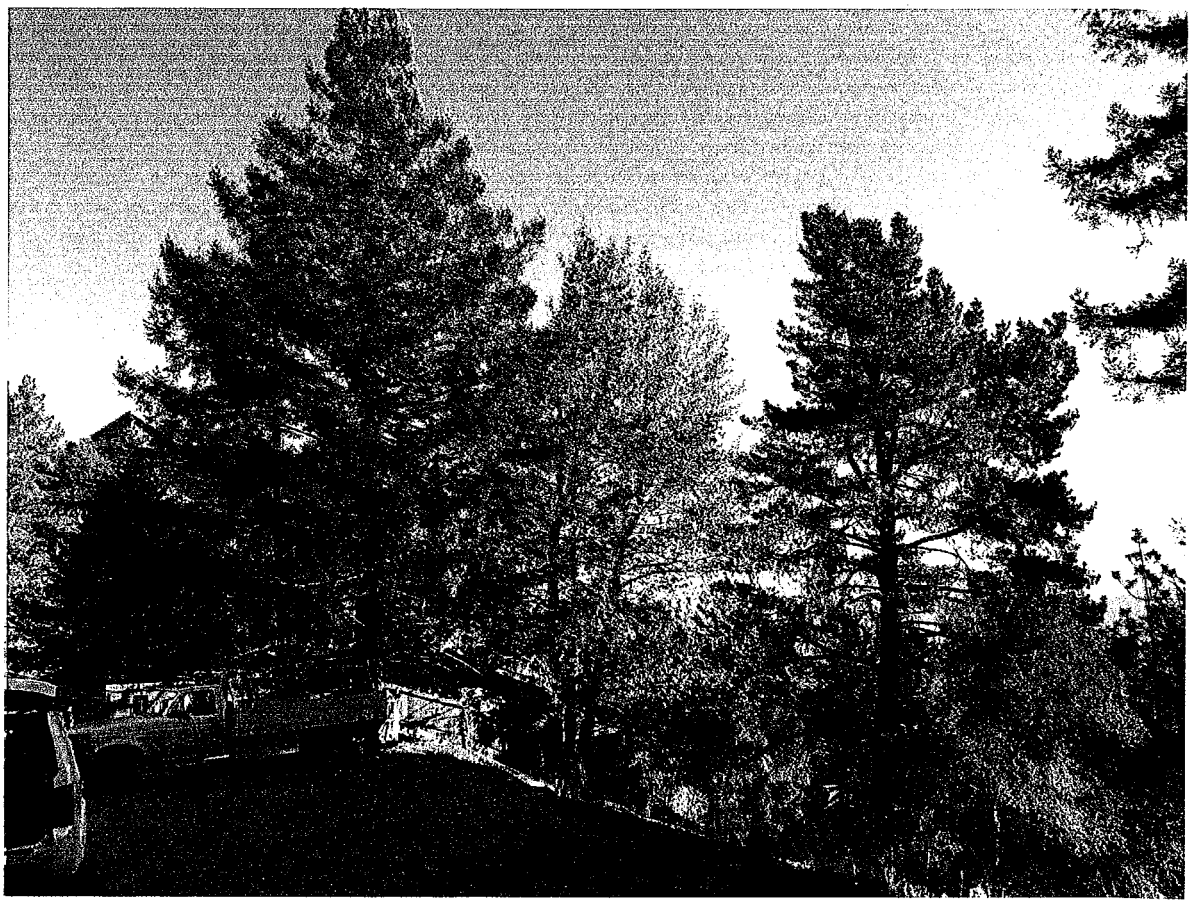

Image #1 – Trees T1, T2, T3 & T4 – Coast redwood, California bay laurel, Monterey pine & coast live oak, left to right.

Image #2 – Trees T5,T6,T7 & T8 – coast redwood. Trees to right of red line are on adjacent property.

DISCUSSION

Two "protected" trees will be impacted by the new home construction. Tree T1 a coast redwood and T2, a California bay laurel. The Critical Root Zone for the 30-inch diameter coast redwood (3 to 5 times the trunk diameter), is 7.5 to 12.5 feet from the trunk. A vertical cut for the new home foundation wall will take place *within* the Critical Root Zone or 10 feet from the trunk of this tree.

The Critical Root Zone for the 13- inch, 12- inch & 10- inch diameter bay laurel (trunk diameter averaged at 25 inches) , is 6 to 10 feet from the trunk. The vertical cut for the new home foundation wall will take place at the *edge* of the Critical Root Zone or 10 feet from the trunk of the bay laurel.

Pre-construction hand trenching and root pruning, just outside the staking for the foundation, and prior to machine excavation, will occur at 9.5 feet from both tree trunks. This will minimize root damage from excavation machinery and promote proper root recovery (Tree Protection Plan T1 for hand trenching location).

An outdoor stairway will be installed between the foundation wall and the trees. The stairway will be on top of grade, with concrete footings for support. To minimize root loss, the footings will be hand excavated.

The amount of root loss that is anticipated to occur as a result of the construction impacts described above, is within tolerances for these trees based on their age, species, condition and tolerance to root loss. Coast redwoods have a good tolerance to root loss, and California bay laurel has a moderate tolerance to root loss (Matheny & Clark, *Trees & Development,* 1998). If mitigation measures are followed, I expect both trees to continue to thrive for many years.

Species List

TOTAL SUBJECT TREES: 8 Trees

Protected: 8

5	Coast Redwood	(*Sequoia sempervirens)*
1	California bay laurel	(*Umbellularia californica*)
1	Monterey Pine	(*Pinus radiata*)
1	Coast live oak	(*Quercus agrifolila*)

Tree Evaluation and Recording Methods

Site evaluations were made on 11/11/2018. *The inventory included all trees on the property within the project limits.* The health and structural **condition** of each tree was assessed and recorded. Based on the trees health and structural condition, each trees **suitability for preservation** was rated and recorded.

The recorded data is included in the *Tree Assessment Chart, Appendix A,* of this report. Tree numbers were plotted on the attached *Tree Protection Plan sheet, T1.* **To correlate the data in the Tree Assessment Chart to the tree's location on the site, refer to the Tree Protection Site Plan sheet - Appendix C.**

Condition Rating

A trees condition is determined by an assessing both the **health** and **structure**, then combining the two factors to reach a *condition rating*. Tree condition is rated as poor, fair or good. The quantity of trees assigned for each category (good, fair or poor), is indicated below:

Tree Condition Rating

- Good - 1
- Fair - 5
- Poor - 2

Suitability for Preservation

A trees suitability for preservation is determined based on its health, structure, age, species characteristics and longevity using a scale of good, fair or poor. The quantity of trees assigned to each category (good, fair or poor), is listed below.

Suitability Rating

- Good - 1
- Fair – 5
- Poor - 2

Impact Level

Impact level rates the degree a tree may be impacted by construction activity and is primarily determined by how close the construction procedures occur to the tree. Construction impacts are rated as low, moderate, high. The quantity of trees assigned for each category (low, moderate, high), is indicated below:

Impact Rating

- Low - 6
- Moderate – 2
- High - 0

Tree Protection Zone

The tree protection zone (TPZ), is a defined area within which certain activities are prohibited or restricted to minimize potential injury to designated trees during construction.

The size of the optimal TPZ can be determined by a formula based on: 1) trunk diameter 2) species tolerance to construction impacts, and 3) tree age (Matheny, N. and Clark, J 1998). In some instances, tree drip line is used as the TPZ. Development constraints can also influence the final size of the tree protection zone.

Fencing is installed to delineate the (TPZ), and to protect tree roots, trunk, and scaffold branches from construction equipment. *The fenced protection area may be smaller than the optimal or designated TPZ area in some circumstances.* Tree protection may also involve the armoring of the tree trunk and/or scaffold limbs with barriers to prevent mechanical damage from construction equipment. *See Tree Protection Guidelines & Restrictions* – Appendix E.

Once the TPZ is delineated and fenced (prior to any site work, equipment and materials move in), construction activities are only to be permitted within the TPZ if allowed for and specified by the project arborist.

Where tree protection fencing cannot be used, or as an additional protection from heavy equipment, tree wrap may be used. Wooden slats at least one inch thick are to be bound securely, edge to edge, around the trunk. A single layer or more of orange plastic construction fencing is to be wrapped and secured around the outside of the wooden slats. Major scaffold limbs may require protection as determined by the City arborist or Project arborist. Straw wattle may also be used as a trunk wrap and secured with orange plastic fencing.

Data has been entered in the *Tree Assessment Chart – Appendix A,* which indicates the optimal Tree Protection Zone for each tree.

Additional general tree protection guidelines are included in *Tree Protection Guidelines & Restrictions* – Appendix G.

Critical Root Zone

Critical Root Zone (CRZ) is the area of soil around the trunk of a tree where roots are located that provide critical stability, uptake of water and nutrients required for a tree's survival. The CRZ is the minimum distance from the trunk that trenching that requires root cutting should occur and can be calculated as three to the five times the trunk Diameter at Breast Height (DBH). For example, if a tree is one foot in trunk diameter than the CRZ is three to five feet from the trunk location. We will often average this as four times the trunk diameter or 1ft. DBH = 4ft. CRZ (Smiley, E.T., Fraedrich, B. and Hendrickson, N. 2007).

Construction Impacts to Subject Trees

Construction Phases Affecting Subject Trees –

1. Installation of foundation wall on south side of new home.
2. Installation of step footings for stairway on south side of home.

Impacts to Subject Trees by Tree Number –

<u>Construction Phases:</u>

Construction Phases Affecting Subject Trees –

1. Installation of foundation wall on south side of new home, will impact trees T1 and T2.
2. Installation of step footings on south side of home will impact trees T1 & T2.

Mitigation Measures for Retained Trees

The trees retained on this project will require the following methods to protect them from the impacts described above and to minimize root or canopy damage during the demolition and construction phases.

- **Tree Protection Fencing.**
- **Supervised hand excavation.**
- **Supervised, selective & non- selective root pruning.**

Detailed descriptions of the protection requirements (mitigation methods), listed above are **specified below. Some of the demolition and construction work will affect the *critical root zones* of selected trees and mitigation methods including project arborist supervision is specified.** ***The*** *<u>Tree Protection Specifications & Recommended Sequence</u> listed below, are included on the attached Tree Protection Plan sheet T1.*

Note: The Tree Protection Plan sheet is to be copied and shall become an element of the final plan set. The owner, contractor and architect are all responsible for knowledge of the information included in this arborist report and adhering to the conditions provided.

Tree Protection Specifications & Recommended Sequence

Construction Phases:

1. Pruning - Clearance prune trees T1 & T2, to provide a minimum of 3 feet clearance from proposed home.
2. Irrigation System- A temporary irrigation system shall be installed in the TPZ of trees T1 & T2, to compensate for loss of some absorbing root area. Apply one inch of water weekly with soaker hoses. Locate hoses 10 feet inside the drip line and extending out to dripline. Continue to provide supplemental irrigation throughout the duration of the project, whenever rainfall is absent or until the permanent irrigation system is installed.
3. Tree Protection Fencing – Fencing shall be installed according to the specifications shown on the Tree Protection Plan and in the locations indicated.
4. Foundation - A trench shall be dug 9 ½ feet from the trunks of trees T1 & T2, and in the location indicated on Tree Protection Plan. The trench shall be dug 30 inches deep using hand methods or electric spade. If roots are encountered 1" in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning.
5. Stairway Footings – Excavation for stairway footings shall be by hand methods. If roots are encountered 2" in diameter or less, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning. If roots are encountered 2" or greater the footing location should be adjusted to allow retention of the root.

CONCLUSION

- A new two-story one-bedroom home with two car garage and basement will be constructed on a vacant lot at 213 Blueberry Drive, Scotts Valley.
- Plan sets have been completed and the impacts to the trees have been evaluated.
- Eight "protected" trees within the project limits were inventoried.
- The eight "protected" trees are comprised of four species. Six are in good to fair condition and two trees are in poor condition.
- The proposed improvements will moderately impact two "protected" trees, mitigation methods are specified, and they can be retained.
- The amount of root loss that is anticipated to occur as a result of the construction impacts, is within tolerances for these trees based on their age, species, condition and tolerance to root loss.
- Coast redwoods have a good tolerance to root loss, and California bay laurel has a moderate tolerance to root loss (Matheny & Clark, *Trees & Development*, 1998). If mitigation measures are followed, I expect both trees to continue to thrive for many years.
- The proposed improvements will have a low impact to the remaining six trees.
- Mitigation measures for retained trees are specified and protection methods detailed.
- No trees are proposed for removal for this project.

RECOMMENDATIONS

1. Obtain all necessary permits prior to removing or significantly altering any trees on site.
2. Clearance prune trees T1 & T1 to provide a minimum of 3 feet clearance from proposed home.
3. Install a temporary irrigation system as specified on Tree Protection Plan sheet T1.
4. Hand trench and root prune as necessary for trees T1 & T2.Remove tree T4 prior to excavation for home foundation.
5. Hand excavate for stairway footings and root prune as necessary.

Respectfully submitted,

Kurt Fouts
Kurt Fouts 11/14/18
Kurt Fouts ISA Certified Arborist WE0681A

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Tree Assessment Chart - Appendix A

Suitability for Preservation Ratings:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment

Retention or Removal Code:

RT: Retain Tree
RI: Remove Due to Construction Impacts

I.M. Impacts Can Be Mitigated With Pre-Construction Treatments **R.C.** Remove Due to Condition

Protected Tree City of Scotts Valley Any tree 13 inches or greater in diameter measured at 4.5 feet above grade. Any oak 8 inches or greater. Any tree 8 inches or greater if within 20' of a slope > 20%.

Tree #	Species	Trunk Diameter @ 48 inches a.g.	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T1	coast redwood (*Sequoia sempervirens*)	30"	Yes	80'X35'	Good	Good	Good	20'	Moderate (Root loss: excavation & compaction)	RT	Maturing specimen with good vigor.
T2	California bay laurel (*Umbellularia californica*)	13",12", 10"	Yes	65'X30'	Fair	Fair	Fair	14'	Moderate (Root loss: excavation & compaction)	RT	Co-dominant trunks (3), at one foot above grade.

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11/11/2018

213 Blueberry Drive, Scotts Valley

Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 48 inches a.g.	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T3	Monterey pine (*Pinus radiata*)	35"	Yes	95'X45'	Fair	Fair	Fair	27'	Low (root loss: excavation)	RT	Lower trunk leans 10 degrees and self corrects in upper trunk. Minor infestation of red terpentine beetle (*Dendroctonus valens*)
T4	coast live oak (*Quercus agrifolia*)	11',7"6"	No	35'X25'	Fair	Fair	Fair	14'	Low (root loss: excavation)	RT	Growth is suppressed by larger adjacent Monterey pine.
T5	coast redwood (*Sequoia sempervirens*)	16"	Yes	45'X10'	Poor	Fair	Fair	12'	Low to none.	RT	Growth is suppressed by larger adjacent redwoods.
T6	coast redwood	36"	Yes	110'X35'	Fair	Fair	Fair	27'	Low to none.	RT	Within footprint of new home.

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11/11/2018

213 Blueberry Drive, Scotts Valley

Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 48 inches a.g.	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T7	coast redwood (*Sequoia sempervirens*)	28"	Yes	70'X20'	Poor	Fair	Fair	21'	Low to none.	RT	Growth is suppressed by larger adjacent redwoods.
T8	coast redwood	44"	No	110'X35'	Good	Fair	Fair	33'	Low to none.	RT	3' from new home foundation. Crowded growing conditions.
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APPENDIX B—CRITERIA FOR TREE ASSESSMENT CHART

Following is an explanation of the data used in the tree evaluations. The data is incorporated in the *Tree Assessment Chart, Appendix A.*

Trunk Diameter and Number of Trunks:

Trunk diameter as measured at 4.5 feet above grade. The number of trunks refers to a single or multiple trunked tree. Multiple trunks are measured at 4.5 feet above grade.

Health Ratings:

Good: A healthy, vigorous tree, reasonably free of signs and symptoms of disease

Fair: Moderate vigor, moderate twig and small branch dieback, crown may be thinning and leaf color may be poor

Poor: Tree in severe decline, dieback of scaffold branches and/or trunk, most of foliage from epicormics

Structure Ratings:

Good: No significant structural defects. Growth habit and form typical of the species

Fair: Moderate structural defects that might be mitigated with regular care

Poor: Extensive structural defects that cannot be abated.

Suitability for Preservation Ratings:

Rating factors:

Tree Health: Healthy vigorous trees are more tolerant of construction impacts such as root loss, grading and soil compaction, then are less vigorous specimens.

Structural integrity: Preserved trees should be structurally sound and absent of defects or have defects that can be effectively reduced, especially near structures or high use areas.

Tree Age: Over mature trees have a reduced ability to tolerate construction impacts, generate new tissue and adjust to an altered environment. Young to maturing specimens are better able to respond to change.

Species response: There is a wide variation in the tolerance of individual tree species to construction impacts.

Rating Scale:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures.

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment. Trees can be expected to decline or fail regardless of construction impacts or management . **The species or individual may possess characteristics that are incompatible or undesirable in landscape settings or unsuited for the intended use of the site.**

Construction Impacts:

Rating Scale:

High: Development elements proposed that are located within the Tree **Protection Zone that would severely impact the health and /or stability of the tree. The tree impacts cannot be mitigated without design changes. The tree may be located within the building footprint.**

Moderate: Development elements proposed that are located within the Tree Protection Zone that will impact the health and/or stability of the tree and can be mitigated with tree protection treatments.

Low: Development elements proposed that are located within or near the Tree Protection Zone that will **have a minor** impact **on** the health of the tree and can be mitigated **with tree protection treatments.**

None: Development elements will have no impact on the health and stability of the Tree.

Tree Protection Zone (TPZ):

Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, particularly during construction or development.

PRE-CONSTRUCTION ROOT PRUNING

Excavation shall only occur within the TPZ (Tree Protection Zone), of retained trees, when designated by the Project Arborist. Excavations within (*or outside of the TPZ, as designated*), the Tree Protection Zone, will be executed by hand, in order to preserve roots two (2") inches in diameter or greater during the excavation process. All root pruning will be conducted under supervision of the Project Arborist. These activities will be documented, and a monitoring report will be provided to the City Arborist. Under direction of the Project Arborist, it may be necessary to temporarily remove the Tree Protection Fencing to allow access for root pruning activities.

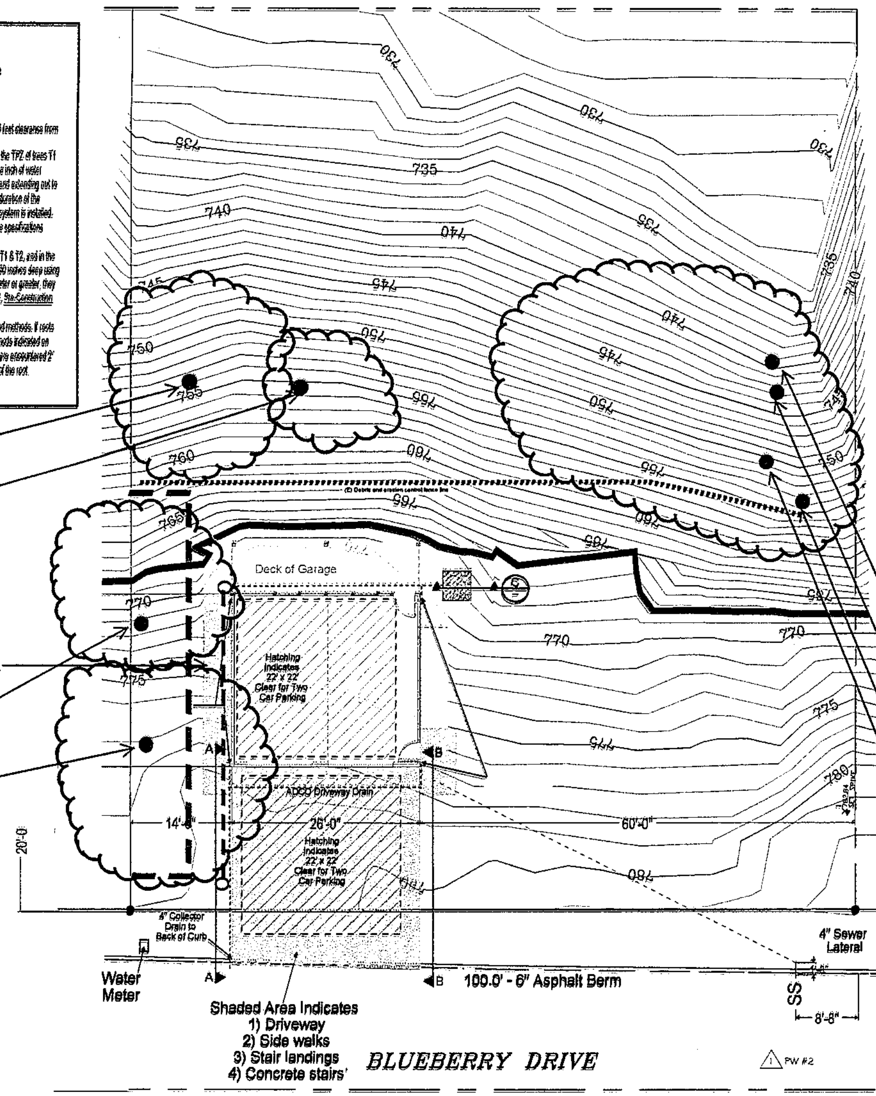
Trenches for root pruning will be hand dug according to locations of the Tree Protection Plan sheet:

- Trenches will be dug one foot behind staking on tree side of stakes.
- The depth of the trench will equal the depth required for installation of the adjacent element.
- Cleanly prune and roots encountered 2 inches in diameter or smaller. Use loppers, hand saw or Sawzall. A sharp spade may be used for palm roots. The pruned roots should be covered with burlap layers or carpeting and kept moist until the trench is backfilled.
- If roots are encountered 2" in diameter or greater, the Project Arborist shall be notified, and a determination shall be made to prune the root or retain the root by "bridging" the trench and installing the piping under the root.
- Reinstall the Tree Protection Fencing to its original location.

Tree Protection Specifications & Recommended Sequence

Construction Phases:

1. Pruning - Clearance prune trees T1 & T2, to provide a minimum of 3 feet clearance from proposed home.
2. Irrigation System- A temporary irrigation system shall be installed in the TPZ of trees T1 & T2, to compensate for loss of some absorbing root area. Apply one inch of water weekly with soaker hoses. Locate hoses 10 feet inside the drip line and extending out to dripline. Continue to provide supplemental irrigation throughout the duration of the project, whenever rainfall is absent or until the permanent irrigation system is installed.
3. Tree Protection Fencing = Fencing shall be installed according to the specifications shown on the Tree Protection Plan and in the locations indicated.
4. Foundation - A trench shall be dug 9 ½ feet from the trunks of trees T1 & T2, and in the location indicated on Tree Protection Plan. The trench shall be dug 30 inches deep using hand methods or electric spade. If roots are encountered 1" in diameter or greater, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning.
5. Stairway Footings = Excavation for stairway footings shall be by hand methods. If roots are encountered 2" in diameter or less, they shall be pruned by methods indicated on Tree Protection Plan sheet, Pre-Construction Root Pruning. If roots are encountered 2" or greater the footing location should be adjusted to allow retention of the root.



Legend

Tree Location & Number	●
Tree Protection Fencing	----
Tree Canopy Extents	
Hand Trenching & Root Pruning	O----O
Remove Tree	X

Warning

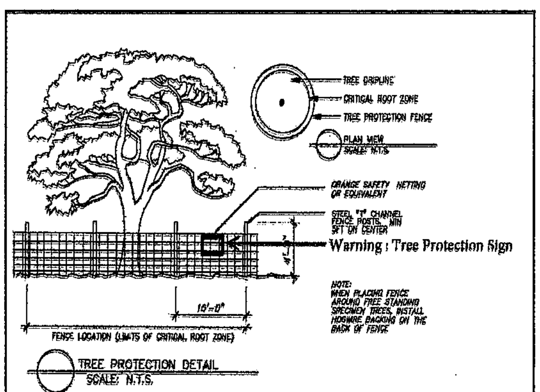
Tree Protection Zone

Keep Out

NOTICE: PROTECTIVE FENCING IS REQUIRED ON THIS JOB SITE, REMOVAL OR DAMAGE OF THIS FENCING MAY RESULT IN A FINE

This sign must be prominently displayed. Fencing may not be moved or removed without permission of the Project Arborist.
During demolition and construction, all reasonable steps necessary to prevent damage, or the destruction of protected trees is required. Failure to comply with all precautions may result in a STOP WORK order being issue by the regulating agency.

No Entry without Project Arborist Authorization
Kurt Fouts - Arborist Consultant 831 - 359 - 3607



TREE PROTECTION DETAIL
SCALE: N.T.S.

For additional tree protection information see arborist report dated 11/11/2018.

Site Plan
Scale 1/8" = 10'- 0"

Lot Size 12,500 Sq. Ft.

Tree Protection Plan

213 Blueberry Drive, Scotts Valley

Sheet T1 of 1

K. F. 11/11/2018

APN: 021-102-05

Kurt Fouts
Arborist Consultant

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Appendix E - TREE PROTECTION GUIDELINES AND RESTRICTIONS

Protecting Trees During Construction:

1) Before the start of site work, equipment or materials move in, clearing, excavation, construction, or other work on the site, every tree to be retained shall be securely fenced- off as delineated in approved plans. Such fences shall remain continuously in place for the duration of the work undertaken in connection with the development.

2) If the proposed development, including any site work, will encroach upon the tree protection zone, special measures shall be utilized, as approved by the project arborist, to allow the roots to obtain necessary oxygen, water, and nutrients.

3) Underground trenching shall avoid the major support and absorbing tree roots of protected trees. If avoidance is impractical, hand excavation undertaken under the supervision of the project arborist may be required. Trenches shall be consolidated to service as many units as possible. Boring/tunneling under roots should be considered as an alternative to trenching.

4) Concrete or asphalt paving shall not be placed over the root zones of protected trees, unless otherwise permitted by the project arborist.

5) Artificial irrigation shall not occur within the root zone of native oaks, unless deemed appropriate on a temporary basis by the project arborist to improve tree vigor or mitigate root loss.

6) Compaction of the soil within the tree protection zone shall be avoided.

7) Any excavation, cutting, or filling of the existing ground surface within the tree protection zone shall be minimized and subject to such conditions as the project arborist may impose. Retaining walls shall likewise be designed, sited, and constructed to minimize their impact on protected trees.

8) Burning or use of equipment with an open flame near or within the tree protection zone shall be avoided. All brush, earth, and other debris shall be removed in a manner that prevents injury to the tree.

9) Oil, gas, chemicals, paints, cement, stucco or other substances that may be harmful to trees shall not be stored or dumped within the tree protection zone of any protected tree, or at any other location on the site from which such substances might enter the tree protection zone of a protected tree.

10) Construction materials shall not be stored within the tree protection zone of a protected tree.

Development Site Tree Health Care Measures

RECOMMENDED TO PROVIDE OPTIMUM GROWING CONDITIONS, PHYSIOLOGICAL INVIGORATION AND STAMINA, FOR PROTECTION AND RECOVERY FROM CONSTRUCTION IMPACT.

Establish and maintain TPZ fencing, trunk and scaffold limb barriers for protection from mechanical damage, and other tree protection requirements as specified in the arborist report.

Project arborist to specify site-specific soil surface coverings (wood chip mulch or other) for prevention of soil compaction and loss of root aeration capacity.

Soil, water and drainage management is to follow the ISA BMP for "Managing Trees During Construction" and the ANSI Standard A300(Part 2)- 2011 Soil Management (a. Modification, b. 'Fertilization, c. Drainage.)

Fertilizer / soil amendment product(s) amounts and method of application to be specified by certified arborist.

City of Scotts Valley - Protected Tree List*

A. Any size tree located within five (5) feet of a public right-of-way or street.

B. Any single-trunk **oak tree** greater than or equal to eight (8) inch diameter (25 inch circumference).**

C. Any multi-trunk **oak tree** with any trunk greater than or equal to four (4) inches diameter (12 inch circumference).**

D. Any tree greater than or equal to eight (8) inch diameter (25 inch circumference)** if located within 20 feet of a moderate slope (greater than 20% slope).

E. Any single-trunk tree greater than or equal to 13-inch diameter (40 inch circumference).**

F. Any multi-trunk tree with any trunk greater than or equal to eight (8) inch diameter (25 inch circumference).**

G. Any tree, regardless of size, required as part of a permit approved by the Planning Department, Planning Commission or City Council, or required as a replacement tree for a removed tree.

H. Any **Heritage Tree**, as specified in Municipal Code Section 17.44.080 and Exhibit A. A list and map of Heritage Trees are available at the Planning Department. Fees for removal of Heritage Trees are higher than other protected tree removals and applications must be approved at a public hearing before the Planning Commission.

* **Note:** No tree removal permit is required to remove:
- Monterey Pine trees that are infected with pitch canker; ***proof of infection is required***;
- Blue Gum Eucalyptus or Acacia trees;
- Bay Laurel trees ***if*** they are growing under the drip-line of an established oak tree; or,
- Fruit trees.

** Tree measurement shall be taken 4½ feet (54 inches) above the ground.

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided by the appraiser/consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as the quality of any title.
2. The appraiser/consultant can neither guarantee nor be responsible for accuracy of information provided by others.
3. The appraiser/consultant shall not be required to give testimony or to attend court by reason of this appraisal unless subsequent written arrangements are made, including payment of an additional fee for services.
4. Loss or removal of any part of this report invalidates the entire appraisal/evaluation.
5. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person(s) to whom it is addressed without written consent of this appraiser/consultant.
6. This report and the values expressed herein represent the opinion of the appraiser/consultant, and the appraiser/consultant's fee is in no way contingent upon the reporting of a specified value nor upon any finding to be reported.
7. Sketches. Diagrams. Graphs. Photos. Etc., in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys.
8. This report has been made in conformity with acceptable appraisal/evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.
9. When applying any pesticide, fungicide, or herbicide, always follow label instructions.
10. No tree described in this report was climbed, unless otherwise stated. We cannot take responsibility for any defects which could only have been discovered by climbing. A full root collar inspection, consisting of excavating around the tree to uncover the root collar and major buttress roots, was not performed, unless otherwise stated. We cannot take responsibility for any root defects which could only have been discovered by such an inspection.

CONSULTING 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 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. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed.

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 all trees.

Kurt Fouts
Arborist Consultant

826 Monterey Avenue
Capitola, CA 95010
831-359-3607
kurtfouts1@outlook.com

MEMBER ISA

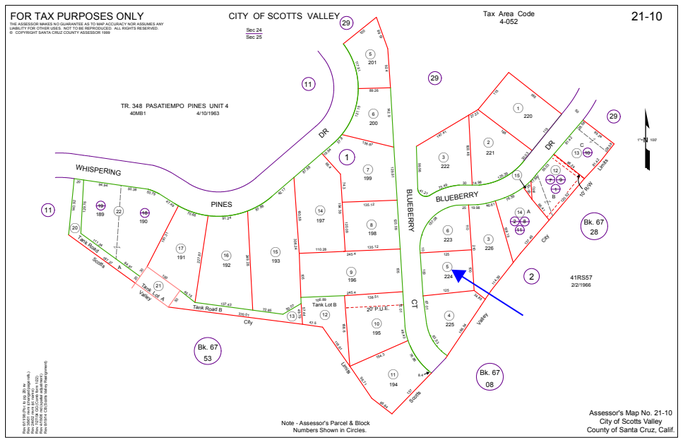
Residence for

Jeff Mora

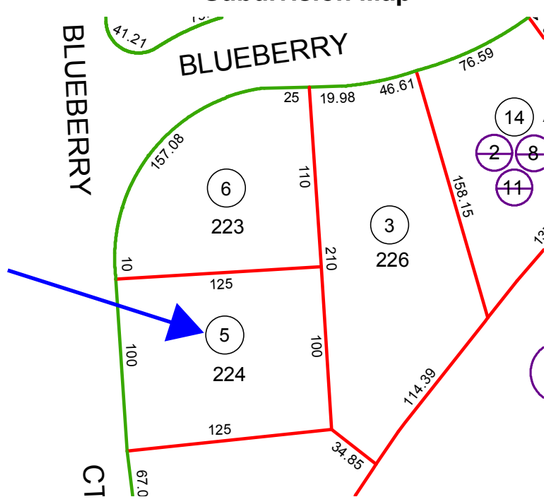
213 Blueberry Drive - Scotts Valley, CA 95066

Design Review

Delta 2 02-26-19 Per meeting with Taylor Bateman & Brenda Stevens on Wednesday, February 13, 2019 1:30 PM-2:00 PM and decisions driven by Owner Jeff Mora to address Planning Comments from that meeting. 2



Subdivision Map



Enlarged Subdivision Map with Dimensions

Owner:

Jeff Mora
P O Box 75
Felton, California 95018
Cell: 530-945-8415
jeffmora8@sbcglobal.net

General Contractor:

Jeff Mora
P O Box 75
Felton, California 95018
Cell: 530-945-8415
CCL # 303761

Geotechnical Engineer:

Haro, Kasunich and Assoc., Inc
116 East Lake Ave.
Watsonville, CA 95076
Office: 831-722-4175
Contact: John Kasunich
Cell: 831-247-5466

Structural Engineer:

Westfall Engineers, Inc.
14583 Big Basin Way
Saratoga, California 95070
Contact: Karel Cymbal
Tel: 408-867-0244
Fax: 408-867-6261
karel@westf.com

Geoligist

Zinn Geology
2231 40th Avenue
Santa Cruz, CA 95062
Voice 831-334-4833
Contact: Erik N. Zinn
enzinn@gmail.com

Drawings Prepared By:

Spanner Systems
4701 California Avenue
Oakdale, CA 95361
Rick Bowen 408-210-8048

Project Data

Zoning;	R-1
Occupancy Group	R-3
Construction Type	V-B / U
Parcel Size	12500 SF
Total Heated Area	624 SF
Rear Deck	180 SF
Fire District	SV-FPD
Fire Service Area	SCO-FSA
Water District	SLVWAT
Fault Zone	N / A
Fire Hazard	No

Drawing Index

Scope of Work

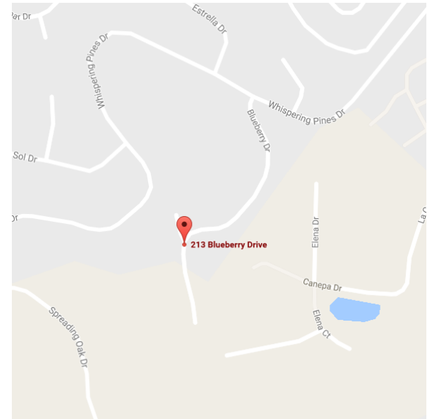
Construct a 26' x 24' Single Family Dwelling at a Daylight Basement with a Two Car Garage above.

Governing Codes

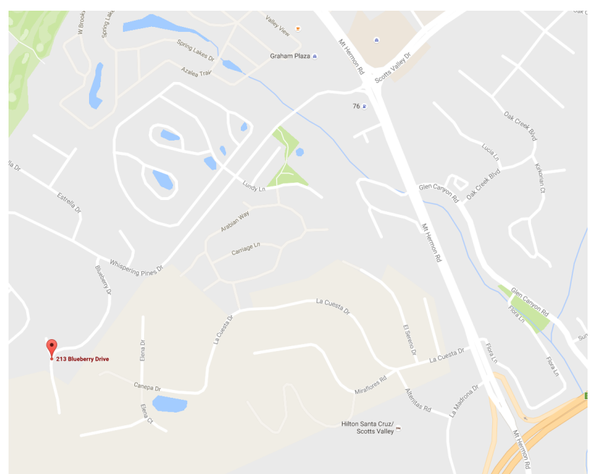
2013 California Building Code (CBC)
2013 California Electrical Code
2013 California Plumbing Code
2013 California Energy Code
2013 California Plumbing Code
2013 California Mechanical Code
California Green Building Code 2010 Edition
2013 California Fire Code

Santa Cruz County
APN 021-102-05

North



Location Map



Vicinity Map

Rev. 1 11-06-18
Rev. 2 02-27-19
Rev.
Rev.

SPANNER SYSTEMS
4701 California Avenue
Oakdale, California 95361
Tel 408-210-8048
spannersystems@comcast.net

Title Sheet & Project Data

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

T-1
Design Review

774.90
JOB BM = PHOTO PANEL

Scale 1" = 10'
Contour Interval 1 Foot

SLOPE ANALYSIS

$$S = \frac{.000229\ I\ L}{A}$$

S = AVERAGE SLOPE
I = CONTOUR INTERVAL (FEET)
L = TOTAL LENGTH OF CONTOUR LINES (FEET)
A = AREA ACRES)

$$S = \frac{.00229 \times 1 \times 5623.2}{.286}$$

S = 45.02%

AREA LESS THAN 40% = 4733 SQ. FT.
AREA OVER 40% = 7767 SQ. FT.

LEGEND

- Survey control point found as noted
- Survey control point set as noted
- Property line, lands of Zamani
- Other property line
- Edge of pavement
- ( ) Record data

Elevations are based on City of Scotts Valley datum. Bench Mark = Photo control panel at intersection of Blueberry Dr. & Blueberry Ct. Elevation 774.90 Feet

NOTE: This is not a boundary survey. Property lines are shown for orientation only and are based on recorded data. They may be discovered to be different, subject to the results of a complete boundary survey.

LICENSED LAND SURVEYOR
CARY D. EDMUNDSON
No. 5114
(Exp 6/30/99)
STATE OF CALIFORNIA

CARY EDMUNDSON & ASSOCIATES LAND SURVEYING
1512 SEABRIGHT AVENUE-SUITE A
SANTA CRUZ, CA 95062
PHONE (408) 425-1796
FAX (408) 425-1795

TOPOGRAPHIC SURVEY MAP
OF ASSESSOR'S PARCEL NO. 021-102-05

Scale 1" = 10'	City of Scotts Valley	File 98024T.DWG
April 9, 1998	Santa Cruz County, California	FB 109/45
	Prepared for Hassan Zamani	
Lot Size 12,500 Sq. Ft.		Job #98024

Rev. 1 11-06-18
Rev. 2 02-27-18
Rev. No changes
Rev. this Sheet

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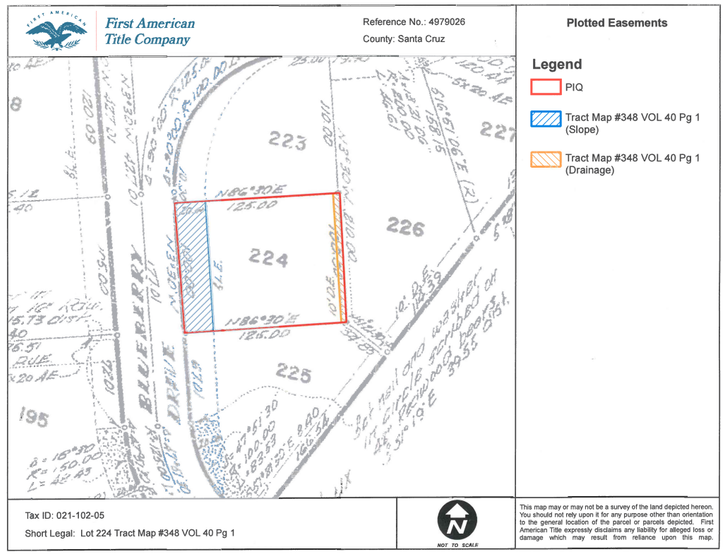
Oakdale, California 95361
Tel 408-210-8048
spannersystems@comcast.net

Topography Survey
April 9, 1998

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

C-1.0
Design Review



PW # 1

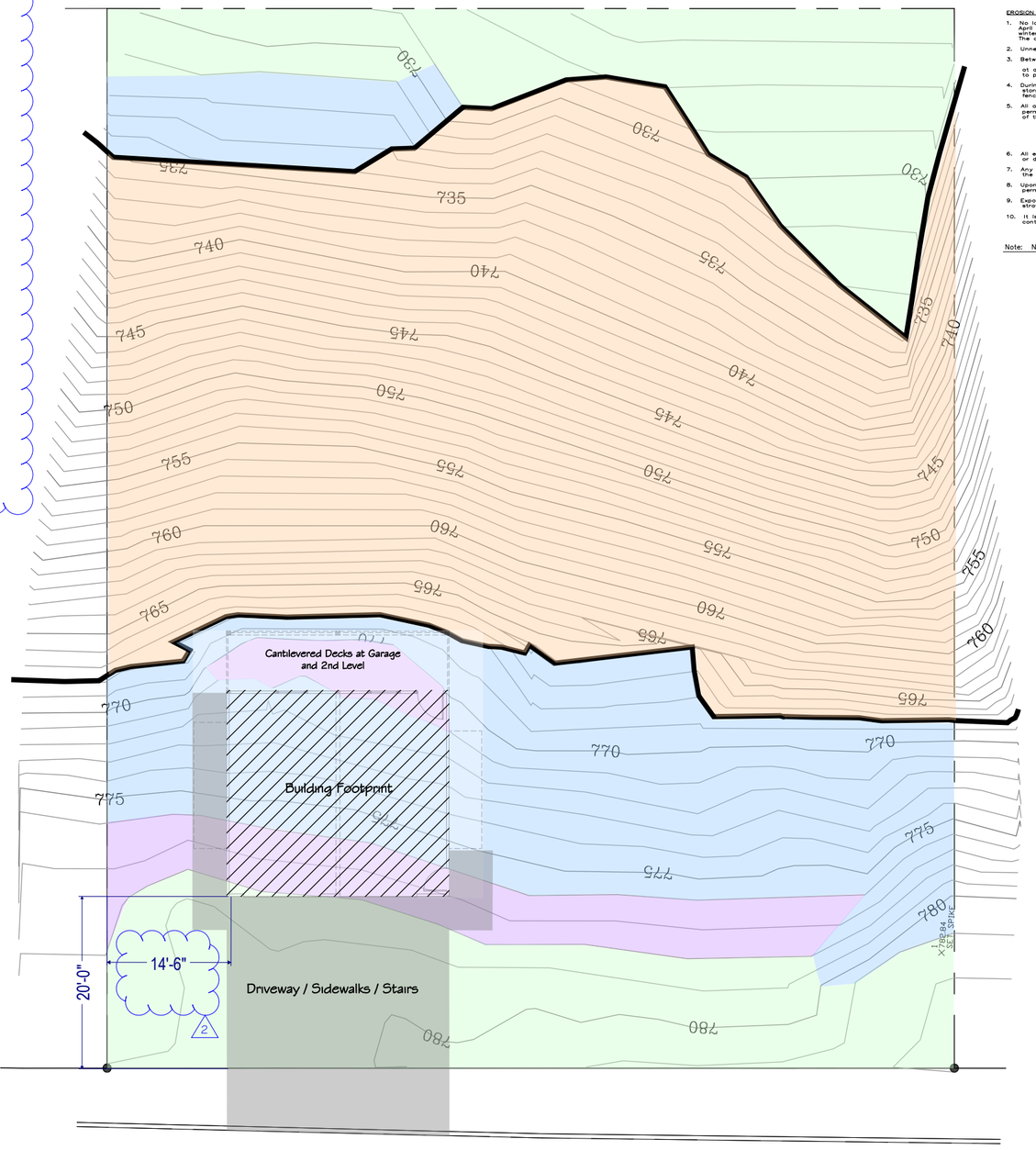
SCOTTS VALLEY FIRE PROTECTION DISTRICT

7 Erba Lane, Scotts Valley, California 95066 (831) 438-0211 Fax (831) 438-0383

General Requirements:

1. This project as proposed shall conform to the 2016 California Fire Code as amended by the Scotts Valley Fire Protection District.
2. An automatic sprinkler system shall be installed in all buildings in accordance with Chapter 9 of the California Fire Code, current NFPA 13 standards, and Santa Cruz County FPO standards. (Contact the Scotts Valley Fire Protection District to review the FPO standards)
   a. Automatic sprinkler system design plans and calculations shall be submitted directly to the Scotts Valley Fire Protection District for review and permit. Separate permits may be necessary for the "overhead" and "underground" parts of the system.
   b. The automatic sprinkler system drawings must be prepared and submitted for approval by a California State Licensed Contractor (Class A, or C-16) meeting the requirements of NFPA-13, " Standard for the Installation of Fire Sprinkler Systems". Designer/installer shall submit three (3) sets of plans and calculations to this agency for approval."
3. Required Water Supply. An approved water supply capable of supplying the required fire flow for fire protection shall be provided to premises upon which facilities, buildings or portions of buildings are hereafter constructed or moved into or within the District.
   a. Fire hydrant systems shall comply with Sections 507.5.1 through 507.5.6 and Appendix C or by an approved method by the Fire District.
   b. Existing fire hydrants on public streets are allowed to be considered as available. Existing fire hydrants on adjacent properties shall not be considered available unless fire apparatus access roads extend between properties and easements are established to prevent obstruction of such roads.
   c. Existing non-conforming fire hydrants will need to be upgraded to meet current NFPA standards.
4. A MINIMUM OF 48 HOURS NOTICE to the Fire District is required prior to any inspection.
5. Job copies of the building and fire systems plans and permits must be on-site during inspections
6. Building numbers shall be provided. Numbers shall be a minimum of four (4) inches in height on a contrasting background and visible from the street. Where numbers are not visible from the street, additional numbers shall be installed on a directional sign at the property driveway and the street. Final design and location of the building numbers are subject to Fire District approval.
7. No changes in building use or occupancy type shall be allowed without Fire District approval.
8. Prior to final, provide to the Scotts Valley Fire Protection District a general site plan that details hydrant locations, and water/gas/electrical shutoff locations. The site plan shall be provide in a digital (PDF) non-flattened version.

FD # 1



BLUEBERRY DRIVE

EROSION CONTROL NOTES

1. No land clearing, grading, or excavation shall be done between October 15th and April 15th. Any deviation from this condition requires review and approval of a separate winter erosion control plan by Environmental Planning prior to beginning such construction. The developer shall be responsible for implementing and maintaining site erosion control at all times.
2. Unnecessary grading and distributing of soil shall be avoided.
3. Between October 15th and April 15th exposed soil shall be protected from erosion at all times. Hay bales, filer berms, silt fences or other means shall be employed to prevent sediment from leaving the site or entering any watercourse.
4. During construction, no turbid water shall be permitted to enter the channel or storm drain system. Use of silt and grease traps, filter berms, hay bales or silt fences shall be used to prevent such discharge.
5. All areas on- and off-site exposed during construction activities, if not permanently landscaped per plan, shall be protected by mulching and/or planting of the following SCS approved erosion control mix at a rate of 35 lbs per acre.

Blando Brome	30%
Zorro (gallet inoculated)	30%
Creeping Red Fescue	15%
Zorro Annual Fescue	Trace
Wildflowers	Trace

6. All excavated material shall be removed to an approved S.C. County disposal site or disposed of on-site in a manner that will not cause erosion.
7. Any material stockpiled on-site shall be covered with plastic, especially during the winter months or during periods of rain.
8. Upon completion of construction, all remaining exposed soils shall be permanently revegetated per landscaping plan.
9. Exposed soil on slopes greater than 20% shall be seeded, covered with 2 inches of straw, and an erosion control blanket. The erosion control blanket shall be staked in place.
10. It is the developer's responsibility to see that additional measures, necessary to control site erosion and prevent sediment transport off-site are implemented.

Note: No grading required

00.00% - 25.00% Slope
25.01% - 30.00% Slope
30.01% - 39.99% Slope
Over 40.00% Slope

SLOPE ANALYSIS

$$S = \frac{.00229 \times I \times L}{A}$$

S = AVERAGE SLOPE
I = CONTOUR INTERVAL (FEET)
L = TOTAL LENGHT OF CONTOUR LINES (FEET)
A = AREA (ACRES

$$S = \frac{.00229 \times 1 \times 917.079}{.068962}$$

S = 30.45%

Slope Map

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

FD # 1

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Rev. 2 02-27-18
Rev.
Rev.

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Oakdale, California 95361
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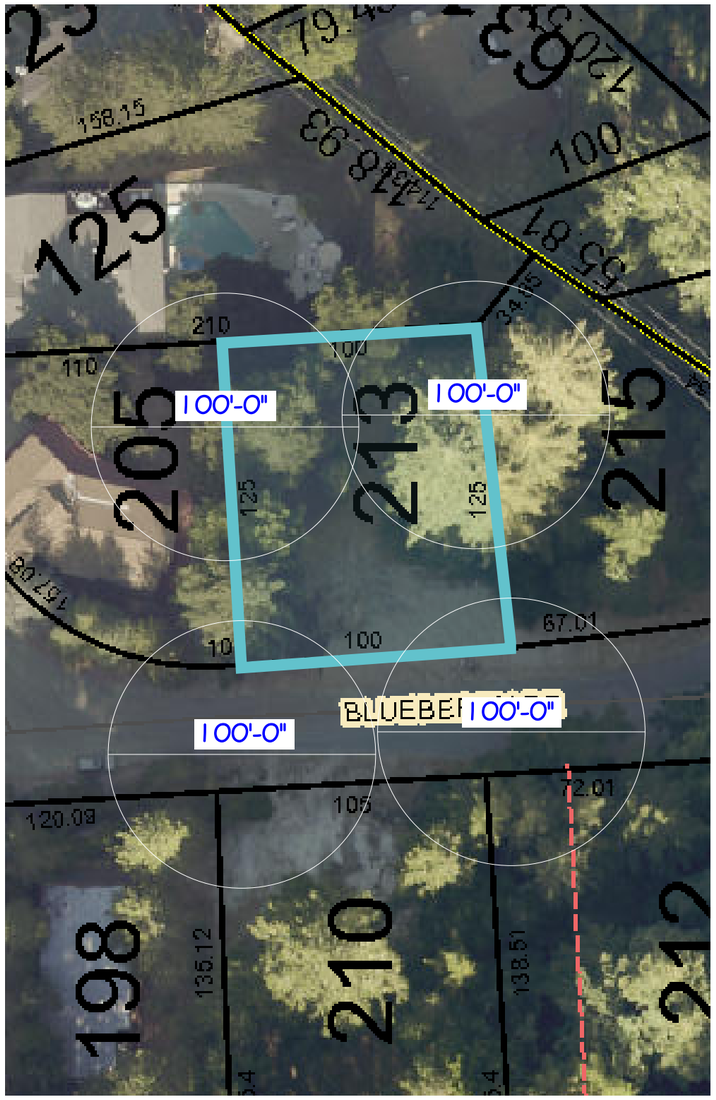
spannersystems@comcast.net

Slope Map

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

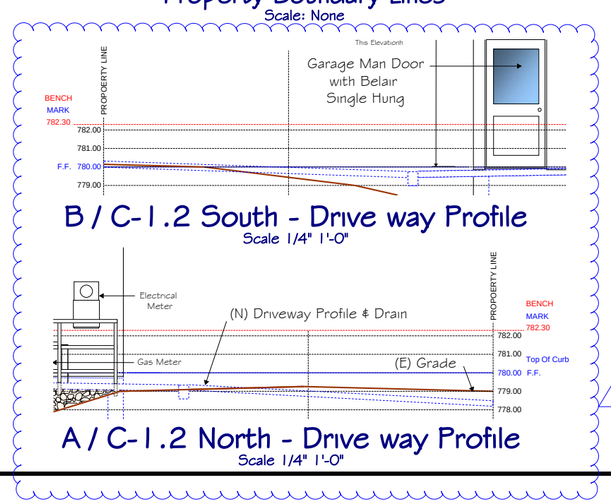
Date: 11-06-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

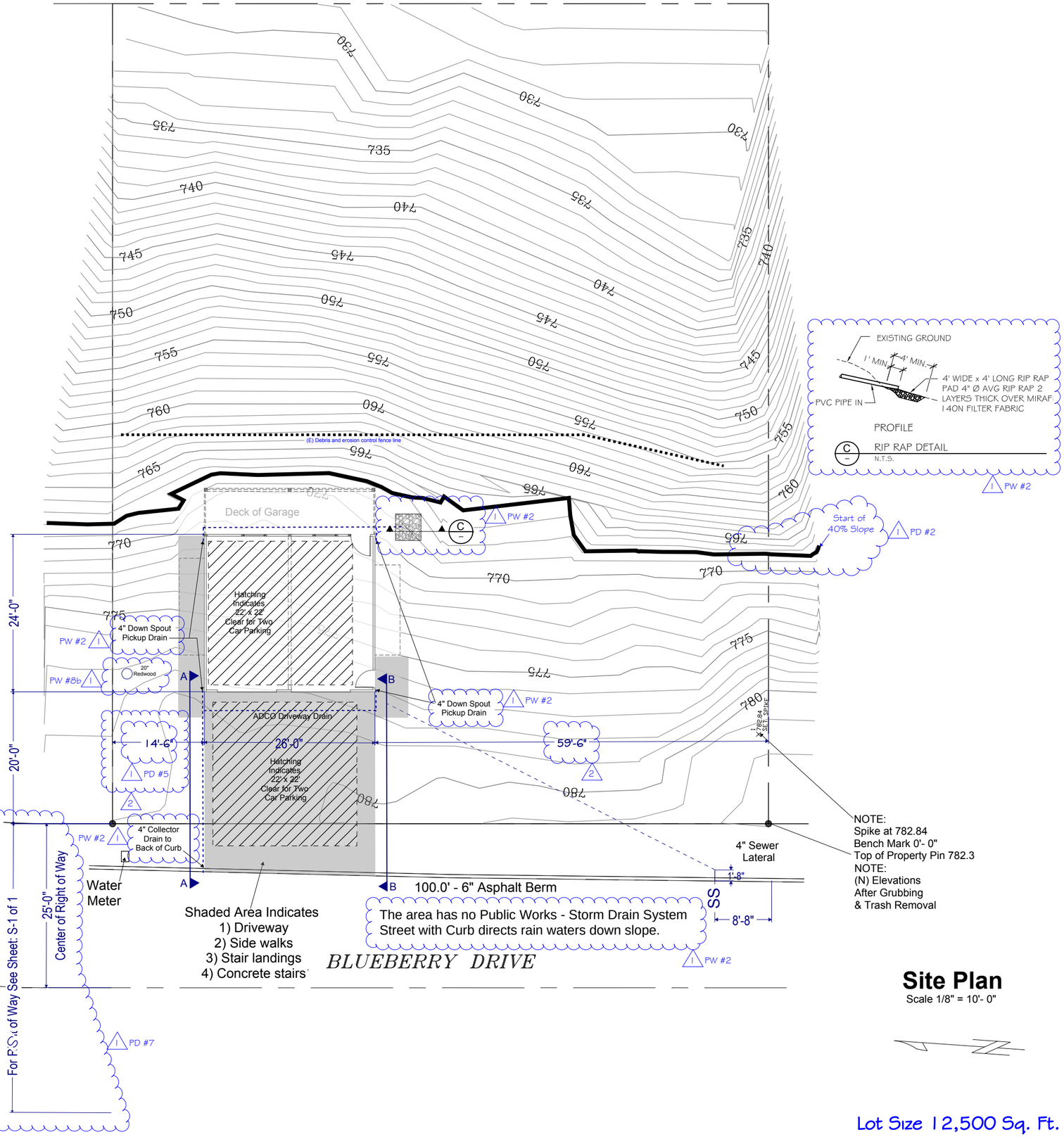
C-1.1
Design Review



Structures within 50'- 0" of Subject Property Boundary Lines

Scale: None





Site Plan

Scale 1/8" = 10'- 0"

Lot Size 12,500 Sq. Ft.

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Rev.

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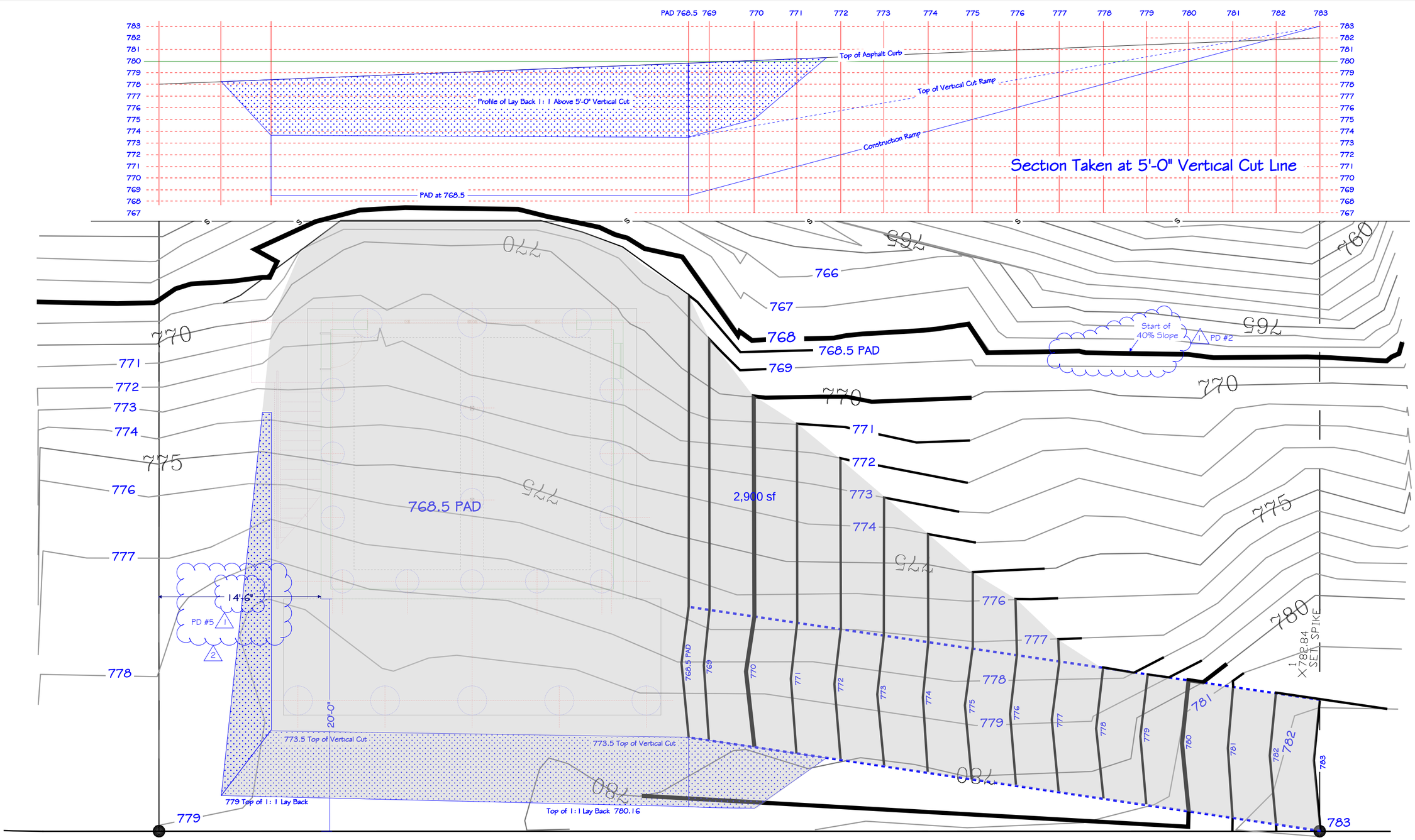
spannersystems@comcast.net

Site Plan

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

C-1.2
Design Review



SLOPE ANALYSIS

$$S = \frac{.00229 \times I \times L}{A}$$

S = AVERAGE SLOPE
I = CONTOUR INTERVAL (FEET)
L = TOTAL LENGHT OF CONTOUR LINES (FEET)
A = AREA (ACRES

$$S = \frac{.00229 \times 1 \times 917.079}{.068962}$$

S = 30.45%

TOTAL EXCAVATION AT CONSTRUCTION

Width	Face at		Factor at	Cubic	Cubic FT	
Length	Cut SF	Cubic Feet	Slope	Feet	Per Yard	Cubic Yards
11.5	33	379.5	2	189.75	27	7.03
25.5	273	6961.5	2	3480.75	27	128.92
44	364	16016	2	8008	27	296.59
6.5	13	84.5	2	42.25	27	1.56
6.5	71	461.5	2	230.75	27	8.55
3	71	213	2	106.5	27	3.94
				Total		
				12058		Total
				27		Cubic Yards
				446.59		446.59

STOCK PILE AND OFF HAUL QUANITIES

Task	Width	Face at		Factor at	Cubic	Cubic FT	
	Length	Cut SF	Cubic Feet	Slope	Feet	Per Yard	Cubic Yards
Stock Pile	11.5	33	379.5	2	189.75	27	7.03
Stock Pile	25.5	273	6961.5	2	3480.75	27	128.92
Stock Pile	11	364	4004	2	2002	27	74.15
Off Haul	33	364	12012	2	6006	27	222.44
Stock Pile	6.5	13	84.5	2	42.25	27	1.56
Stock Pile	6.5	71	461.5	2	230.75	27	8.55
Stock Pile	3	71	213	2	106.5	27	3.94
					Total		
					Cubic Feet		Cubic Yards
				Stock Pile	6052		224.15
				Off Haul	6006		222.44

BLUEBERRY DRIVE

Grading Plan

Scale: 1/4" = 1'-0"

Lot Size 12,500 Sq. Ft.

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Rev. 2 02-27-19
Rev.
Rev.

SPANNER SYSTEMS
4701 California Avenue
Oakdale, California 95361
Tel 408-210-8048
spannersystems@comcast.net

Grading Plan

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

C-1.3
Design Review

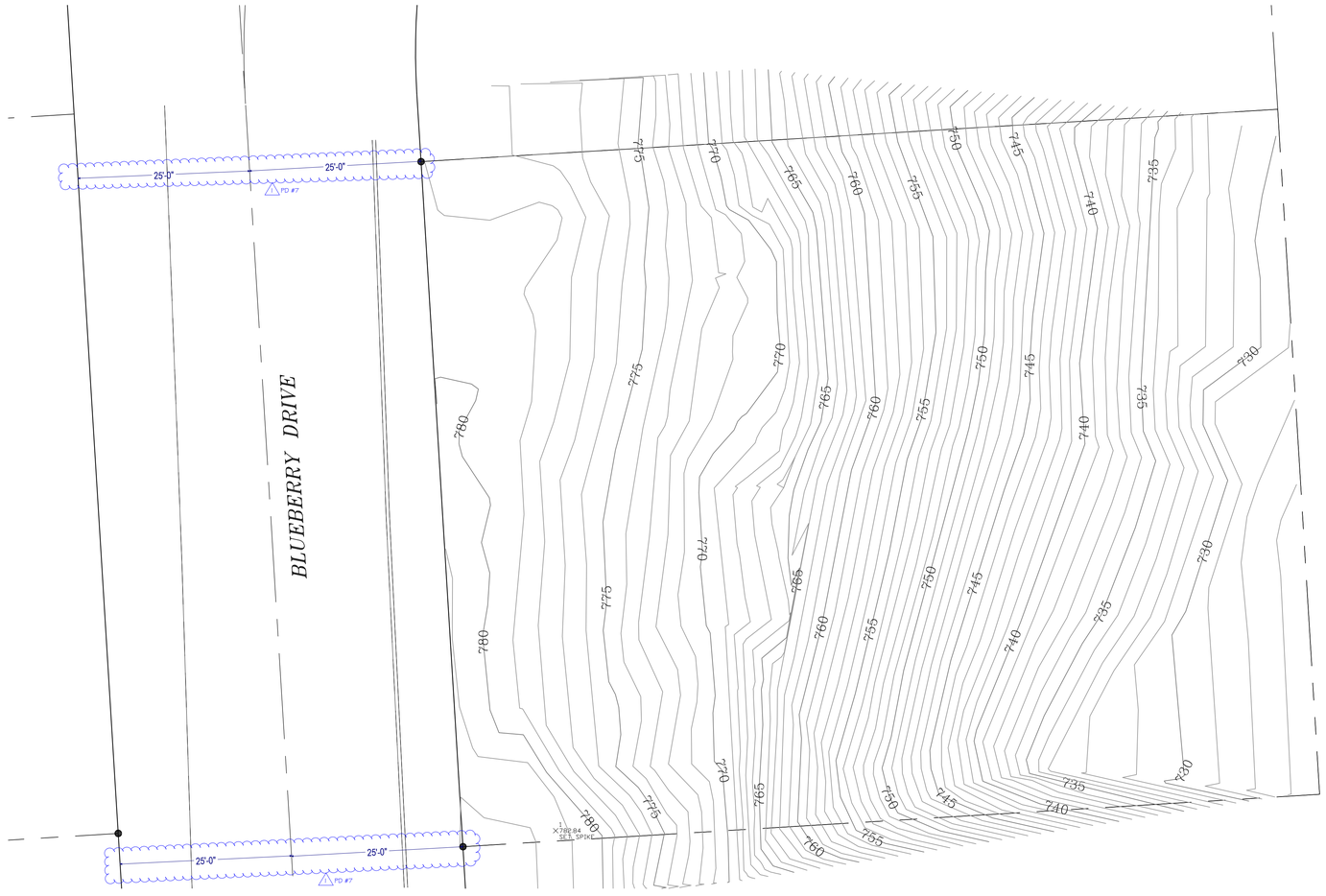
TOPOGRAPHIC & BOUNDARY SURVEY OF

213 BLUEBERRY DRIVE
SCOTTS VALLEY, CA

SCALE : 1"=10'

LEGEND

- ASPHALT
- CONCRETE
- PAVING BRICK
- CURB AND GUTTER
- SANITARY SEWER LINE
- SANITARY SEWER MANHOLE
- SANITARY SEWER CLEANOUT
- ELECTRIC OVERHEAD LINE
- COMMUNICATION OVERHEAD LINE
- JP JOINT POLE
- GM GAS METER
- EM ELECTRIC METER
- WOOD FENCE
- BENCH MARK
- FOUND MONUMENT PER REFERENCES



BENCHMARK

A CITY OF SCOTTS VALLEY FLIGHT CONTROL PANEL AT THE INTERSECTION OF BLUEBERRY DRIVE & BLUEBERRY COURT, HAVING AN ELEVATION OF 774.90', IS THE BASIS OF ALL ELEVATIONS SHOWN ON THIS MAP.

REFERENCES

R1 BOOK 40 MAPS 01, SANTA CRUZ COUNTY RECORDS

UTILITY NOTES:

THE UTILITIES AS DRAFTED ARE AS THEY ARE BELIEVED TO EXIST BASED ON SURFACE EVIDENCE. UTILITIES MAY EXIST THAT ARE NOT INDICATED. NO SUBSURFACE INVESTIGATIONS WERE PERFORMED.

Design Review

SURVEY PREPARED FOR
JEFF MORA
JULY 11, 2016

THE BRONSON COMPANY
SURVEYING SERVICES
6206 EPPS DRIVE
WINTON, CA 95388
(209)606-7340 kevin@thebronsonco.com

TOPOGRAPHIC SURVEY OF
LOT 224, 40M01
CCPUNTY OF SANTA CRUZ,
STATE OF CALIFORNIA

NO.	REVISION	DATE
1	11-06-18	
2	02-26-19 No changes this sheet	

PROJECT MANAGER
Kevin Bronson

DRAWN BY: KB
CHECKED BY:

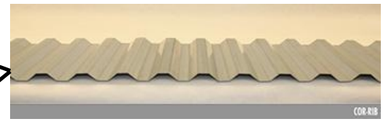
DATE
JULY 2016

CAD FILE

JOB NUMBER
3233

SHEET
S1 OF 1

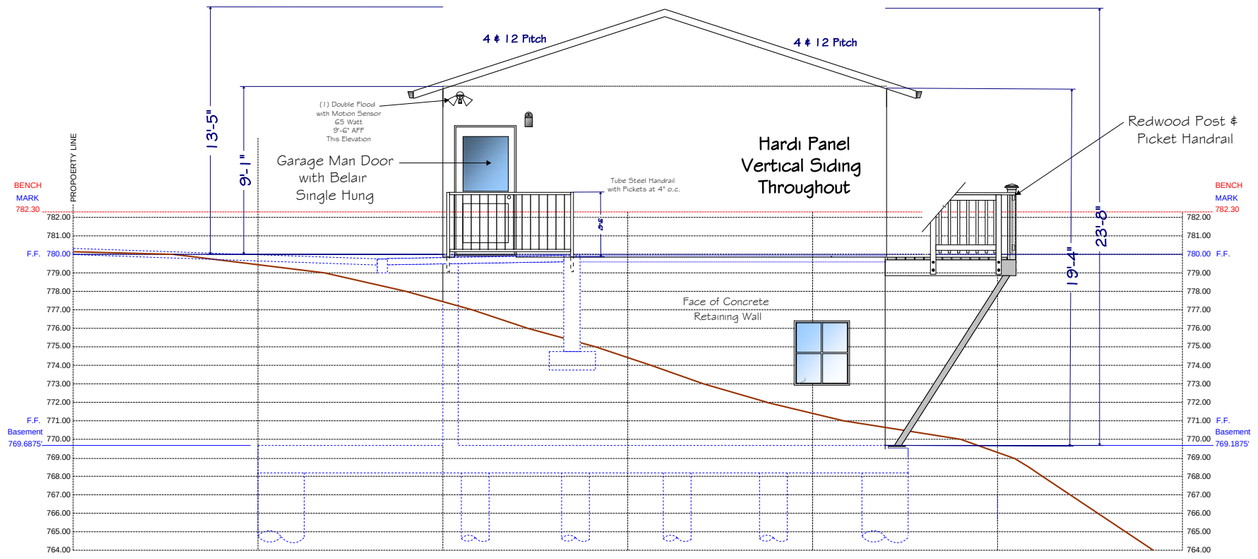
Two Choices Due to Availability



Roofing Metal

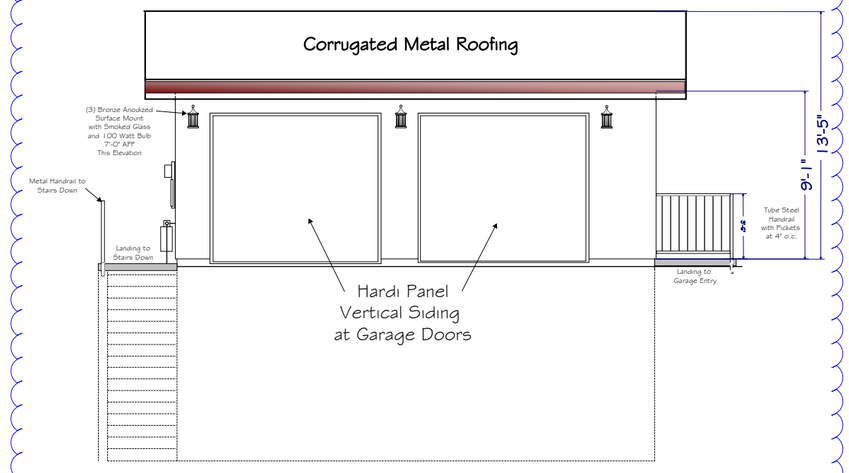
COLOR LEGEND

Trim.....Re-sawn Spruce.....White
Siding.....Hardi Board.....Countrylane Red
Windows .....Vinyl .....White
Condenser.....Metal.....Light Green
Man Doors.....Wood Panel.....White
Handrails.....Redwood Smooth.....Stained Natural
Deck Fascia.....Wood Smooth.....White
Post & Beam.....Pressure Treat DF.....Autumn Brown
Concrete Retaining Walls...Sand Texture.....Pearl Gray



Right Side - South Elevation

1/4" = 1'- 0"



Front - West Elevation

1/4" = 1'- 0"

Rev. 1 11-06-18
Rev. 2 02-27-19
Rev.
Rev.

SPANNER SYSTEMS
4701 California Avenue
Oakdale, California 95361
Tel 408-210-8048
spannersystems@comcast.net

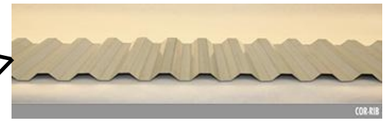
Front - West Elevation & Right Side - South Elevation

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

A-2.0
Design Review

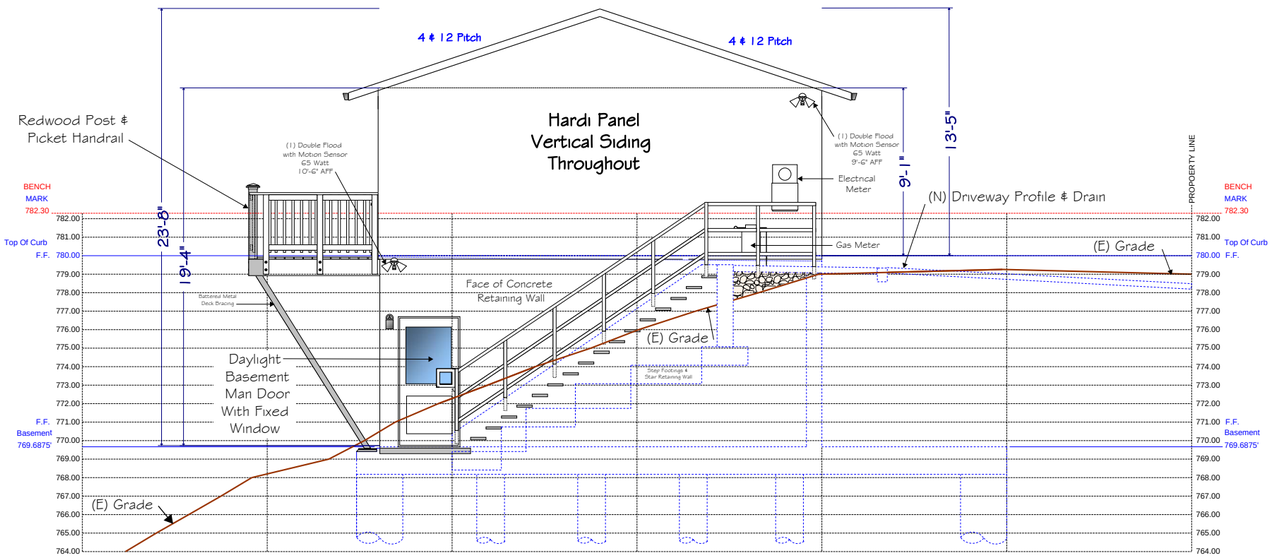
Two Choices Due to Availability



Roofing Metal

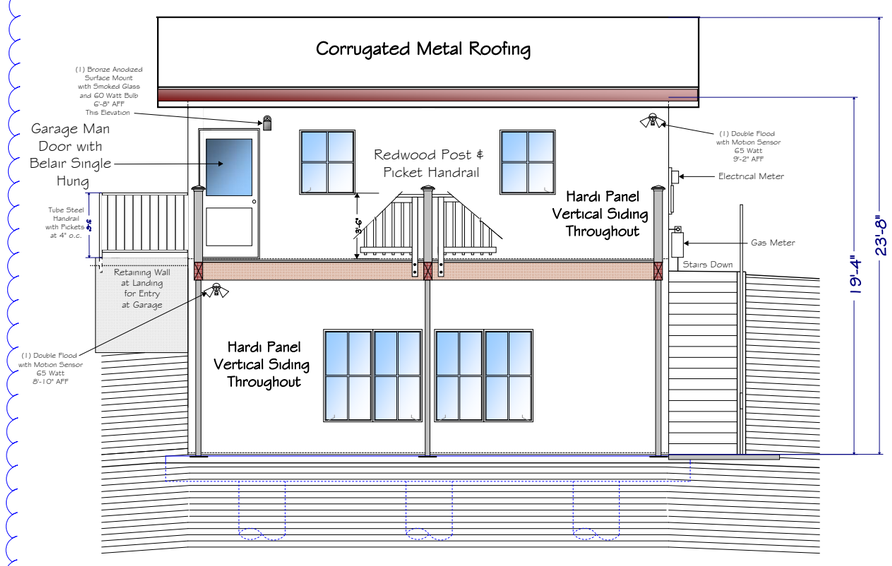
COLOR LEGEND

Trim.....Re-sawn Spruce.....White
Siding.....Hardi Board.....Countrylane Red
Windows .....Vinyl .....White
Condenser.....Metal.....Light Green
Man Doors.....Wood Panel.....White
Handrails.....Redwood Smooth.....Stained Natural
Deck Fascia.....Wood Smooth.....White
Post & Beam.....Pressure Treat DF.....Autumn Brown
Concrete Retaining Walls...Sand Texture.....Pearl Gray



Left Side - North Elevation

1/4" = 1'- 0"



Rear - East Elevation

1/4" = 1'- 0"

Rev. 1 11-06-18
Rev. 2 02-27-19
Rev.
Rev.

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Rear - East Elevation & Left - North Elevation

JEFF MORA
213 BLUEBERRY DRIVE - SCOTTS VALLEY, CA 95066
RESIDENCE

Date: 08-22-18
Project: Mora-16
Drawn: R.Bowen
Scale: See Plan

A-2.1
Design Review

Plant Legend

KEY	QTY	SIZE GALLONS	SPACING	WUCOLS RATING	BOTANICAL NAME	COMMON NAME
Ground Covers						
L	12	1	3'	LOW	Lavandula Grosso or Wings of Night	Lavender
R	42	1	2.5'	LOW	Rosmarinus Huntington Carpet	Prostrate Rosemary

1

WATER EFFICIENT COMPLIANCE CHECKLIST NOTES - TURF, PLANTING, SOIL MANAGEMENT

1 THERE IS NO TURF LAWN SPECIFIED FOR THE LANDSCAPE

2 AT LEAST 80% OF NON-TURF AREA CONSISTS OF NATIVE OR LOW WATER USE PLANTS
PLANTS WITH SIMILAR WATER NEEDS ARE GROUPED WITHIN HYDROZONES. EACH HYDROZONE SHALL BE CONTROLLED BY A SEPARATE GROUP OF VALVES

4 AT LEAST 6 CUBIC YARDS OF COMPOST (BFI SUPER HUMUS) AND 16 POUNDS OF 12-12-12 FERTILIZER SHALL BE THOUROUGHLY TILLED INTO THE TOP 8 INCHES OF SOIL (EXCEPT UNDER CANOPY OF EXISTING TREES TO BE SAVED) OR FOLLOW THE AMENDMENT AND FERTILIZER RECOMMENDATIONS OF A SOIL FERTILITY TEST AND ANALYSIS FROM A SOIL LAB (HIGHLY RECOMMENDED)

5 INSTALL 3 INCH DEEP LAYER OF TOP DRESS MULCH ON ALL EXPOSED SOIL SURFACES OF PLANTING AREAS EXCEPT IN AREAS OF DIRECT SEEDING APPLICATION OR SOD LAWN. OWNER TO APPROVE CHOICE OF MULCH PRIOR TO SIGNING INSTALLATION CONTRACT

6 GRADING SHALL BE DESIGNED TO MINIMIZE SOIL EROSION, RUN-OFF AND WATER WASTE ADDITIONAL NOTES

7 SEE SHEETS L3 AND L4 FOR PLANTING AND IRRIGATION DETAILS AND SPECIFICATIONS

8 DON'T TRENCH TOO CLOSE TO STRUCTURES WITHOUT THE APPROVAL OF THE BUILDING ARCHITECT, CIVIL, OR STRUCTURAL ENGINEER

9 PRIOR TO ORDERING PLANTS OR SIGNING FINAL CONTRACT FOR WORK MAKE SURE YOU HAVE THE MOST CURRENT SET OF APPROVED PLANS AND MAKE SURE THERE ARE NO CHANGES TO THE PLANT CHOICES

10 ADJUST FINAL LOCATIONS OF PLANTS TO AVOID CONFLICTS WITH UTILITIES, LIGHTS, AND IRRIGATION COMPONENTS. SCREEN VALVES AND UTILITIES WITH PLANTS. DON'T PUT PLANTS TOO CLOSE TO PAVING OR BUILDINGS

1 11 THERE IS 487 SF OF PLANTING AND IRRIGATION

12 ALL SHRUBS AND GROUND COVERS TO BE DRIP IRRIGATED. SEE THE IRRIGATION PLAN

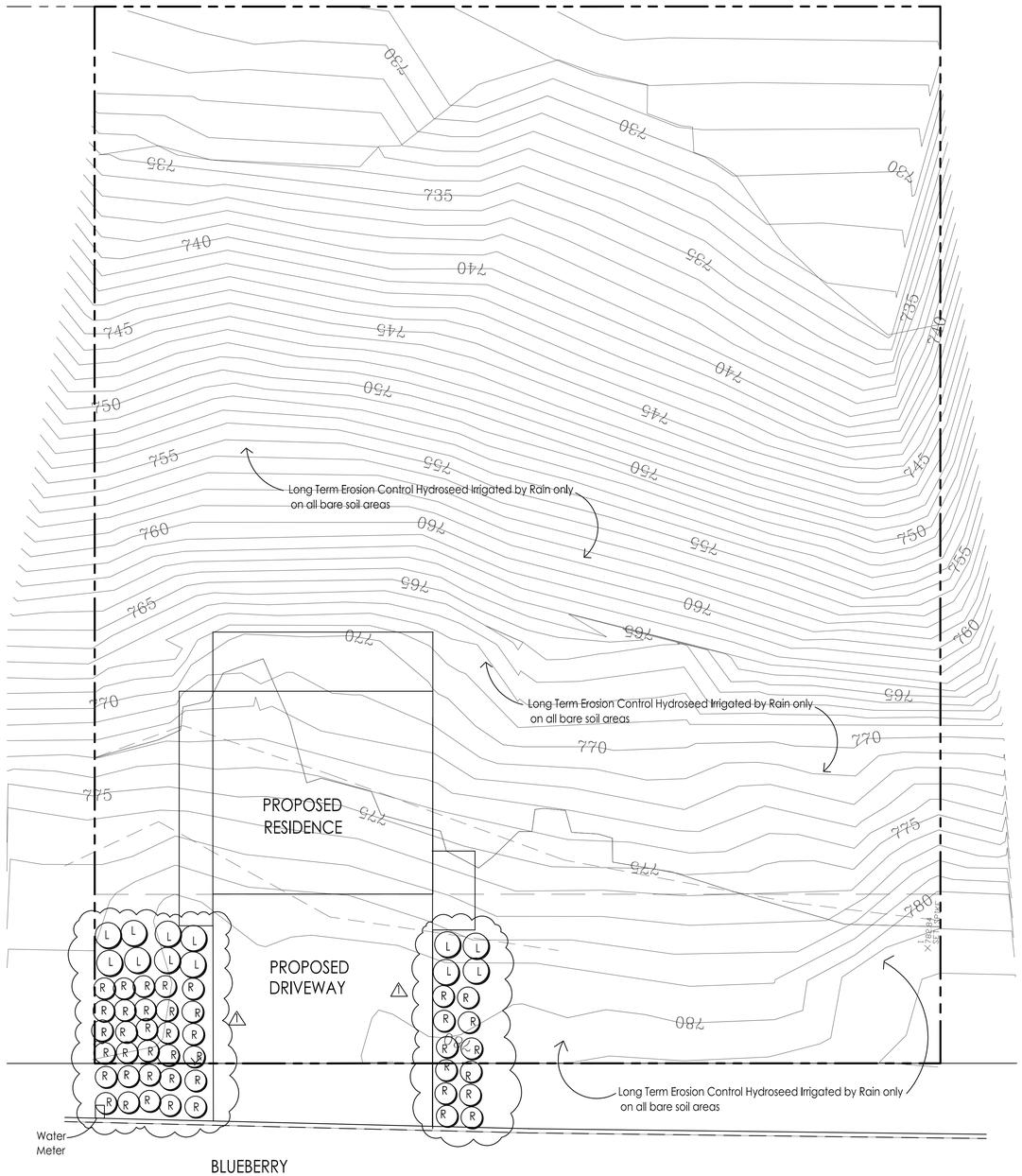
Hydroseeding Mixes

Long term erosion control hydroseeding on graded areas
Use a straw erosion control blanket on steeper slopes 3:1 and over
No supplimental irrigation is being proposed. This is watered by rain.
Success of the growth will vary according to the amount and timing of rain.
Supplimental irrigation may be required to get it established if regular rain doesn't happen

Native Erosion Control Mix from Pacific Coast Seed (925) 373-4417

Species/Common Name
Bromus carinatus
Elymus glaucus
Vulpia microstachys
Trifolium wildenovii or ciliatum
45 lbs. per acre total

HYDROSEED SLURRY FOR SEED MIXES
Seed mix as specified
Fertilizer @ 800 lbs./acre Biosol 7-3-1 Organic
Tackifier @ 80 lbs./acre - Psyllium Based such as M Binder
Fiber @ 2000 lbs.acre Cellulose Mulch



Planting Plan

1/8"=1'-0"
0' 8' 16'

Revision
1 10/24/18
2 02-26-19 No Changes this sheet

GREGORY LEWIS LANDSCAPE ARCHITECT #2176
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LICENSED LANDSCAPE ARCHITECT GREGORY LEWIS No. 2176 GregLewis 4/30/2020 10/24/18 STATE OF CALIFORNIA

Mora Residence
213 Blueberry , Scotts Valley, CA

Date 8/9/18
Scale As Noted
Drawn Greg
Job
Sheet L1
of 4

Irrigation Notes

WATER EFFICIENT LANDSCAPE CHECKLIST - IRRIGATION

1 THE AUTOMATIC IRRIGATION CONTROLLER USES EVAPOTRANSPIRATION DATA AND UTILIZES A RAIN SENSOR
2 THE IRRIGATION CONTROLLER DOES NOT LOSE PROGRAMMING DATA IN THE EVENT THE PRIMARY POWER SOURCE IS INTERRUPTED
3 PRESSURE REGULATORS SHALL BE INSTALLED ON THE IRRIGATION SYSTEM TO ENSURE THE DYNAMIC PRESSURE OF THE SYSTEM IS WITHIN THE MANUFACTURER'S RECOMMENDED PRESSURE RANGE
4 MANUAL SHUT-OFF VALVES ARE INSTALLED AS CLOSE TO POSSIBLE TO THE POINT OF CONNECTION OF THE WATER SUPPLY
5 ALL IRRIGATION EMISSION DEVICES MUST MEET THE REQUIREMENTS SET IN THE ANSI STANDARD, ASABE/ICC 802-2014 "LANDSCAPE IRRIGATION SPRINKLER AND EMITTER STANDARD". ALL SPRINKLER HEADS INSTALLED IN THE LANDSCAPE MUST DOCUMENT A DISTRIBUTION UNIFORMITY LOW QUARTER OF 0.65 OR HIGHER USING THE PROTOCOL DEFINED IN ASABE/ICC 802-2014
6 IRRIGATION SUBMETERS ARE REQUIRED FOR RESIDENTIAL PROJECTS WITH MORE THAN 5000 SQ.FT. OF LANDSCAPE AREA - this project has less than 5000 sq.ft. of planting area
7 THERE IS NO POOL OR WATER FEATURE ON THIS PROJECT. THERE IS NO LAWN.

ADDITIONAL NOTES

8 SEE SHEET L3 AND L4 FOR DETAILS AND SPECIFICATIONS
9 THIS SYSTEM IS DESIGNED TO OPERATE WITH MINIMUM 5 GPM AT MINIMUM 50 P.S.I. AT THE POINT OF CONNECTION. IF THIS CONDITION IS NOT MET CONTACT THE LANDSCAPE ARCHITECT FOR POSSIBLE REDESIGN. (YOU CAN ADD SOME VALVES TO REDUCE THE FLOW THRU THE VALVES WITH MORE FLOW). IF PRESSURE EXCEEDS 75 PSI AT POINT OF CONNECTION INSTALL A WILKINS 600 1" PRESSURE REGULATOR. THIS SITE HAS APPROX. ____ PSI.
10 THE ROUTING OF SPRINKLER LINES IS SCHEMATIC ON THE PLAN. DO NOT PUT VALVES TOO CLOSE TO TREES. STAY 8' TO 10' AWAY IF POSSIBLE. DO NOT PUT PRESSURE LINES UNDER TREES. INSTALL LINE IN PLANTING AREAS INSTEAD OF UNDER PAVING WHENEVER POSSIBLE.
11 POINT OF CONNECTION WILL TYPICALLY BE JUST BEFORE WATER ENTERS HOUSE OR AS SHOWN ON THE PLAN. INSTALL 3/4" TEE AND A 1" BALL VALVE AND RUN 1" SCH 40 PVC TO VALVE LOCATIONS. KEEP ANTI SIPHON VALVES IN INCONSPICUOUS PLACES, INSTALLED 6" TO 12" ABOVE HIGHEST SPRINKLER OR DRIP EMITTER ON THE CIRCUIT. KEEP VALVES OUT OF PATHS.
12 MAKE PROVISIONS TO ADD AN EXTRA CONTROL WIRE TO THE LOCATIONS OF THE VALVES WITH LARGE GPM FLOWS SO THAT EXTRA VALVES CAN BE ADDED IF THERE ISN'T ENOUGH WATER VOLUME AVAILABLE AT THE NECESSARY PRESSURE
13 BE SURE AND FOLLOW THE PLANS. YOU MIGHT BE REQUIRED TO HAVE A LICENSED/CERTIFIED LANDSCAPE PROFESSIONAL OBSERVE THE LANDSCAPE CONSTRUCTION AT PERIODIC INTERVALS AND FILL OUT A CERTIFICATE OF INSTALLATION. THIS PERSON WILL ALSO BE RESPONSIBLE FOR PROVIDING AN IRRIGATION SCHEDULE FOR NEW PLANTINGS AND MATURE PLANTINGS AND A LANDSCAPE AND IRRIGATION MAINTENANCE SCHEDULE.
14 IRRIGATION RUN TIMES TO BE BETWEEN 8:00 PM and 10:00 AM UNLESS UNFAVORABLE WEATHER PREVENTS IT OR RENDERS IRRIGATION UNNECESSARY

Drip Irrigation Notes

1) SECURE LARGER 3/4" DRIP TUBING 1" BELOW GRADE WITH 7" OR 11" U-SHAPED STAKES 3 FEET ON CENTER OR CLOSER SO THAT THE TUBING CAN BE FOUND EASILY BUT DOES NOT SHOW IF THE MULCH GETS BRUSHED AWAY. COVER TUBING WITH SOIL AND MULCH AND INSTALL MANUAL FLUSH VALVES AT ENDS OF TUBING AND MARK THEM SO THEY CAN BE FOUND EASILY.
2) RUN LARGE TUBING OVER AND NEXT TOROOTBALL OF PLANTS TO MINIMIZE LENGTH OF SMALLER 1/4" TUBING. SECURE EMITTERS ON 3/4" TUBING AT PLANT ROOT BALLS. WHEN NECESSARY RUN SHORT LENGTHS OF 1/4" TUBING FROM EMITTERS TO PLANT ROOT BALLS. INSTALL STAKES ON 1/4" TUBING AT 12" ON CENTER AND COVER TUBING WITH 1" OF SOIL PLUS MULCH.
3) AS THE PLANT AND PLANT ROOTBALL INCREASE IN SIZE, THE LOCATIONS OF THE EMITTERS MAY NEED TO BE ADJUSTED SO THEY ARE EVENLY SPACED OVER THE ROOTBALL.
4) INSTALL PRESSURE COMPENSATING EMITTERS (WITH MINIMAL DIFFERENCE IN FLOW BETWEEN 10 PSI AND 40 PSI) AT EACH PLANT ON ROOT BALL (NOT RIGHT AT STEM). USE AGRIFIM PC PLUS (PRESSURE COMPENSATING EMITTERS). USE THE ONES THAT 1/4 TUBING CAN BE CONNECTED TO. OTHER EMITTERS MAY HAVE A HIGHER DISCHARGE RATE AT STARTUP REQUIRING LARGER PIPE SIZES.

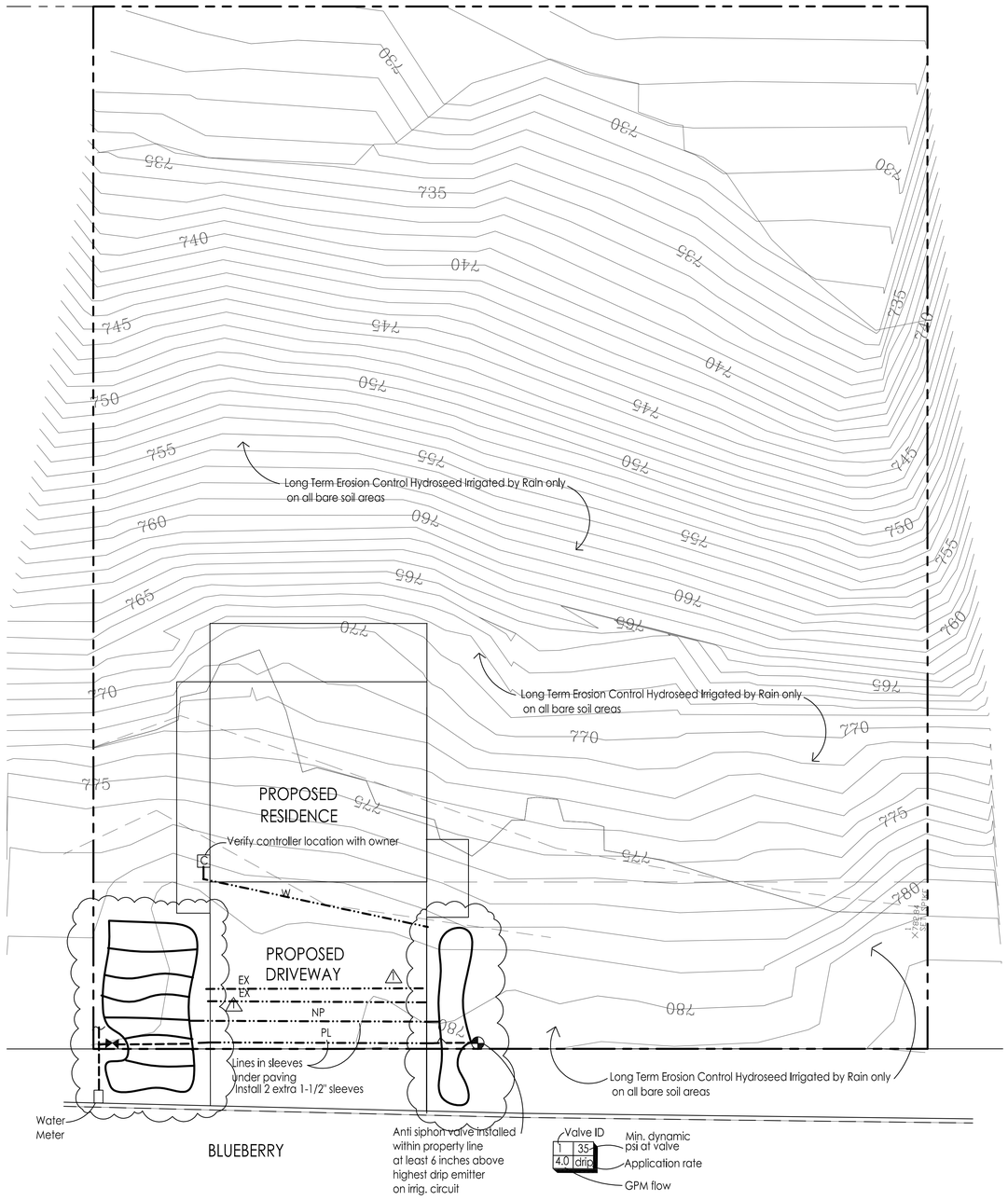
EMITTER SCHEDULE:
TWO 2 GPH EMITTERS AT SMALL SHRUBS (EVENTUAL SIZE) L,R
THREE 2 GPH EMITTERS AT MEDIUM SHRUBS (none on this plan)
FOUR 2 GPH EMITTERS AT LARGE SHRUBS (none on this plan)
WITH SHRUBS THAT HAVE MULTIPLE EMITTERS, PUT SOME OVER ROOT BALL (NOT RIGHT ON STEM) AND SOME OUT UNDER FUTURE CANOPY. SPACE EMITTERS EVENLY IN ROOT ZONE AREA.
FOR TREES INSTALL FIVE 2 GPH EMITTERS ON AND AT EDGE OF ROOTBALL AND AN ADDITIONAL TEN 1 GPH EMITTERS AT 2 FOOT GRID UNDER FUTURE CANOPY (none on this plan)

Irrigation Legend

KEY	MANUF.	MANUF. #	DESCRIPTION
D L3 C	Hunter	IC-600 PL	6 station controller with enough modules for 6 stations exterior wall mount with multiple
	Hunter	SOLARSYNC	programing, cycle start, and calender program Install Wireless Solarsync weather sensor in sunny location that receives rain System will adjust valve run times according to weather
C L3	Hunter	PGV-ASV 075	3/4" antisiphon valve with 3/4" Amiad Filter, Senniger PR30 pressure regulator, and adaptor to drip tubing
			Run 1" Sch 40 PVC pressure line from point of connection to valves
A L3			1" manual brass ball valves
B L3		3/4"	Nonpressure line - Sch 40 PVC 3/4" unless noted for larger
		1"	size - 12" of cover
			Pressure line - Sch 40 PVC : 1" unless noted for smaller size - 18" of cover
			LINES UNDER PAVING
		PL	Pressure line - 1" Sch 40 PVC 24" deep
		NP	Non Pressure line 3/4" Sch 40 PVC 24" deep
		W	Elec. control wire conduit 1-1/4" gray Sch 40 PVC 24" deep
		EX	Extra 1-1/2" Sch 40 PVC 24" deep - cap and mark ends
E L3			3/4" PE drip tubing with compression fittings - see drip notes

Lines under paving to be in sleeve 2x size of line

At this time there is only 487 sq.ft. of landscaping (less than 500) so the MWELO ordinance does not apply to it.
However, I have followed many of the MWELO rules. All planting is low water use on drip irrigation.



Irrigation Plan

1/8"=1'-0"

0' 8' 16'

Revision

1 10/24/18

2 02-26-19 No Changes this sheet

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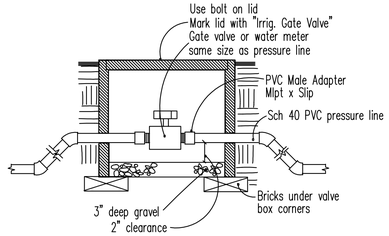
Mora Residence

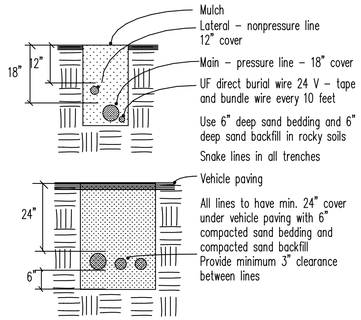
213 Blueberry , Scotts Valley, CA

Date 8/9/18
Scale As Noted
Drawn Greg
Job
Sheet L2
of 4



Manual Gate Valve
No Scale

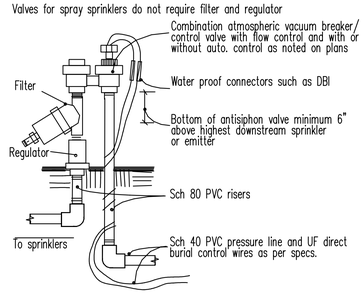
A



Trenches/Lines
No Scale

B

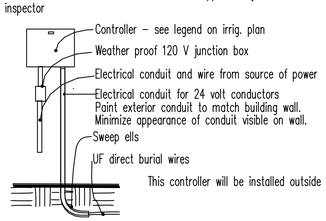
Valves for spray sprinklers do not require filter and regulator



Auto. Antisiphon Valve
with Filter and Regulator for Drip
No Scale

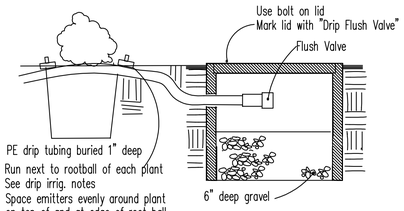
C

Install as per local code and manuf. instructions – Secure controller to wall with suitable anchors as approved by inspector



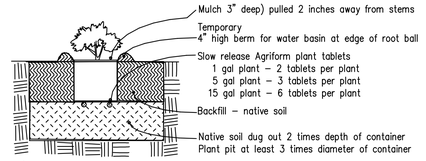
Wall Mount Controller
No Scale

D



Drip Emitter and Flush Valve
No Scale

E



1) 8 – 12 hours before installation, water all plants while still in containers sufficiently to thoroughly wet root balls
2) Dig the plant hole at least 3 times the dia. and 2 times the depth of the plant container.
3) Replace this mixture in bottom half of hole and walk on it. The level of it should be such that when the plant is installed and settled it will be slightly above grade of existing soil. Fill hole with water .
4) Remove rootball carefully from container by tapping out, not pulling out by the stem. Scarify rootball walls in 3 vertical cuts and bottom to 1/2" deep, or by cutting roots of 1/2" or larger with shears. Do not pull roots apart.
5) Install fertilizer packets under rootball of plant. Set rootball on prepared surface and fill hole to 1/2 the depth, tamping soil around rootball. Fill hole with water.
6) Fill the remainder of the hole with backfill and pack it but do not tamp rootball.
7) Make the water basin.
8) Water shrub thoroughly within 1 hour of planting by filling the basin and allowing the water to percolate in, doing this 3 times or more until root ball and backfill is wet
9) Install mulch

Shrub Planting
No Scale

Revision

10/24/18
No changes this sheet

02-26-19
No Changes this sheet

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10/24/18
STATE OF CALIFORNIA

Mora Residence
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Date 8/9/18
Scale As Noted
Drawn Greg
Job
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Details

GENERAL CONDITIONS – SOIL PREPARATION, PLANTING, AND IRRIGATION

1.1 QUALITY ASSURANCE:
A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this section.
B. It is the Contractor's responsibility to verify all information contained in the plans and specifications and to notify the Architect of any discrepancy prior to ordering products or commencing with the work.
C. Check and verify dimensions, reporting any variations to the Architect before proceeding with the work.

1.2 CONTRACTOR COORDINATION
A. It is the responsibility of the Landscape Contractor to familiarize himself with all grade differences, location of walls, retaining walls, etc., and to coordinate work with the General Contractor.

1.3 DIMENSIONS AND SCALE
A. Dimensions are to take precedence over scale at all times. Large scale details are to take precedence over those at small scale. Dimensions shown on plans shall be adhered to insofar as it is possible, and no deviation from such dimensions shall be made except with the consent of the Architect. The Contractor shall verify all dimensions at the site and shall be solely responsible for same or deviations from same.

1.4 LAWS AND REGULATIONS
A. The Contractor shall conform to and abide by all city, county, state and federal building, labor and sanitary laws, ordinances, rules, and regulations.

1.5 LICENSES AND PERMITS
A. The Contractor shall give all notices and procure and pay for all permits and licenses that may be required to complete the work.

1.6 SUBMITTALS
A. At the request of the owner or the Landscape Architect, submit manufacturer's and/or supplier's specifications and other data needed to prove compliance with the specified requirements including certificates stating quantity, type, composition, weight, and origin of all amendments, chemicals, import soil, planter mix, plants, and irrigation equipment used on the site.

1.7 PRODUCT SUBSTITUTIONS
A. Any product substitutions shall be requested in writing. The Landscape Architect must approve or refuse any substitutions in writing. Lack of written approval will mean the substitution is not approved. Any difference in cost to the Contractor of a less expensive substitution shall be credited to the Owner's

1.8 ERRORS AND OMISSIONS
A. The Contractor shall not take advantage of any unintentional error or omission in the drawings or specifications. He will be expected to furnish all necessary materials and labor that are necessary to make a complete job to the true intent and meaning of these specifications. Should there be discrepancies in the drawings or specifications, the contractor shall immediately call the attention of the Architect to same and shall receive the complete instructions in writing.

1.9 INSPECTIONS/REVIEWS DEFINITION
A. Inspection or observation as used in these specifications means visual observation of materials, equipment, or construction work on an intermittent basis to determine that the work is in substantial conformance with the contract documents and the design intent. Such inspection or observation does not constitute acceptance of the work nor shall it be construed to relieve the contractor in any way from his responsibility for the means and methods of construction or for safety on the construction site. Inspection or observation will be done by the Landscape Architect only if requested by the owner in writing. This service will require a written contract for additional fees.

LANDSCAPE IRRIGATION

PART 1 – GENERAL

1.1 WORK INCLUDED

A. The work includes but is not necessarily limited to the furnishing of all materials, equipments, and labor required to install a complete irrigation system.

1.2 GUARANTEE. The entire sprinkler system shall be guaranteed by the Contractor in writing to be free from defects in material and workmanship for a period of one year from acceptance of the work. The guarantee shall include repair of any trench settlement occurring within the guarantee period, including related damage to paving, landscaping, or improvements of any kind.

1.3 REVIEWS
A. Request the following reviews prior to progressing with the work: (1) Layout of system (2) Depth of lines prior to backfilling (3) Coverage adjustment of all heads, valve boxes and operation of system.

1.4 WATER PRESSURE
A. Verify the existence of the minimum acceptable volume of water at the minimum acceptable dynamic pressure as per plan at the point of connection at the earliest opportunity, reporting insufficient volume and/or pressure to the Landscape Architect. Contractor is responsible for cost of installation of pressure regulator if pressure exceeds 80 psi.

1.5 UTILITIES
A. Verify the location of all existing utilities and services in the line of work before excavating. Take all precautionary measures necessary to avoid damaging

1.6 ELECTRICAL CONNECTION
A. Verify existence of 110 Volt 20 Amp. circuit for irrigation controller (by others) at location noted on plan for installation of controller.

PART 2 – PRODUCTS

2.1 PIPE
A. Plastic pipe is to be polyvinyl chloride, marked 1120–1220, and bearing the seal of the National Sanitation Foundation. Use Schedule 40 polyvinyl chloride, type I–II fittings bearing the seal of the National Sanitation Foundation, and complying with ASTM D2466 for pressure line and also for any water lines under asphalt paving. Use Sch 40 PVC for lateral lines in planting areas unless stronger pipe is specified in the irrigation legend. For joining, use a solvent complying with ASTM D2466 and recommended by the manufacturer of the approved pipe. Pipe is to be continuously and permanently marked with the manufacturer's name, pipe size, schedule number, type of material, and code number.
B. Galvanized steel pipe is to comply with ASTM A120 or ASTM A53, galvanized, Schedule 40, threaded, coupled, and hot–dip galvanized. Use 150 lb. rated galvanized malleable iron, banded pattern fittings. Wrap all galvanized pipe below grade with 2" wide, 10 mil. plastic wrapping tape (#50 Scotch wrap or equal).
C. Drip tubing is to be as noted on plans. Use compression fittings.

2.2 CONTROL WIRE
A. Use type UF direct burial wire minimum size #14, copper, U.L. approved for irrigation control use for runs of 1000 feet or less. For longer runs consult with Landscape Architect. Use 3M DBY Direct Bury Wire Splice Kits or dry splice type wire connectors at splices. No underground splices will be allowed without a splice box.

2.3 OTHER MATERIALS
A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS
A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.

3.2 EXCAVATION
A. Trenches may be excavated either by hand or machine, but shall not be wider than is necessary to lay the pipes. Care should be taken to avoid damage to existing water lines, utility lines, and roots of plants to be saved.
B. Minimum depth of cover for buried pipelines shall be: 1. Eighteen (18) inches for mainline pressure piping. 2. Eighteen (18) inches for 24 volt wiring from controllers to remote control valves. 3. Twelve (12) inches for lateral distribution lines. 4. Twenty–four (24) inches, minimum cover, with 6" sand bedding and 6" sand cover for any pipe or wire sleeve under A.C. paving.
C. Under existing paving, piping may be installed by jacking, boring, or hydraulic driving except that no hydraulic driving will be permitted under asphalt concrete pavement (most pipes and sleeves under A.C. paving are to be installed prior to installation of the paving). Where cutting or breaking of existing pavement is necessary, secure permission from the Architect before cutting or breaking the pavement, and then make necessary repairs and replacements to the approval of the Architect and at no additional cost to the Owner.

3.3 INSTALLATION OF PIPE
A. Handling and assembly of pipe, fittings, and accessories shall be by skilled tradesmen using methods and tools approved by the manufacturers of the pipe and equipment and exercising care to prevent damage to the materials or equipment.
B. Metal pipe threads shall be sound, clean cut, and cored to full inside diameter. Threaded joints shall be made up with the best quality pure joint compound carefully and smoothly placed on the male threads only throughout the system.
C. On plastic threaded connections use the sealer recommended by the manufacturer of the plastic valve or fitting. Do not use paste sealer products on plastic valves. Tighten plastic threaded connections with light wrench pressure only.
D. Connections and controls shall be functionally as shown on the drawings, but physically shall be the most direct and convenient method while imposing the least hydraulic friction. Install lines in planting areas whenever possible.
E. Thread male PVC connections into metal female connections rather than the opposite.
F. Interior of pipe fittings, and accessories shall be kept clean at all times, and all openings in piping runs shall be closed at the end of each day's work or otherwise as necessary to prevent the entry of foreign materials. Bending of galvanized steel pipe will not be permitted. Install plastic pipe with the markings turned up to be seen from above until the pipe is buried. "Snake" the pipe in the trenches so that there will be a small amount of excess length in the line to compensate for contraction and expansion of the pipe.
G. Place backfill in 6" layers such that there will be no settling. The top 6" of soil is to be the top soil and soil amendment mixture. All backfill shall be free of rock and debris. Test pipe for leaks prior to backfilling joints. Obtain approval of the owner's representative before backfilling joints.

3.4 INSTALLATION OF EQUIPMENT
A. Flush lines clean prior to installation of valves, sprinkler heads, or hose bibs. Install valves, sprinkler heads, controllers, backflow preventors, hose bibs, and other equipment as per the Irrigation Plan and details.

3.5 ELECTRICAL WORK
A. The line voltage work shall consist of connecting the controller to the nearest available 115 volt supply. The line voltage connection shall be in conduit, in accordance with local electrical code. Controllers mounted inside buildings can be plugged into outlets. The low voltage work shall include all necessary wiring from the controller to the automatic sprinkler valves, installed in accordance with the manufacturer's recommendations. A loop of extra wire, a minimum of eighteen (18) inches long shall be provided at each automatic valve. Appropriate expansion loops shall be provided throughout the system to assure that no wiring will be under stress.
B. All splices and connections on the 24 volt system shall be made using 3M DBY Direct Bury Splice Kits, Rain Bird Pentite connector, or equal.
C. Wiring, wherever possible, shall be placed in the same trench with, and alongside of, the irrigation main water line. Tape and bundle wire every ten feet. All wiring placed under paving shall be put in adequately sized Sch 40 PVC pipe sleeves prior to paving operations.
D. Wire for 24 volt control lines shall be size #14 UF direct burial irrigation wire. Unless noted differently on the plan, common grounds shall be white, size #14 UF direct burial wire. For wire runs over 1000 feet consult with Landscape Architect for wire size. Under no circumstances, on multiple controller installations, will a single common ground, shared by each controller, be permitted. Each controller shall have its own separate common ground wire.

3.6 TESTING
A. All testing shall be done in the presence of the Owner's Representative. Center–load all pipelines with clean soil approximately every four feet to resist hydraulic pressures, but leave fittings exposed for inspection. Piping under paving shall be tested before paving is in place. Install a 0 to 160 P.S.I. gauge on lines to be tested. All valves shown on Plans shall be in place and shall be in the closed position. Mains shall be tested at 100 P.S.I., and laterals at 65 P.S.I. If available static water pressure is under 100 P.S.I., provide suitable pump for tests. Fill pipelines slowly to avoid pipe damage, and bleed all air from lines as they are being filled. After closing valve at water source, mains shall hold 100 P.S.I. gauge pressure for two hours with no leaks. Laterals are expected to have minor seepage at multiple swing joint assemblies. Major leaks are not acceptable. Laterals shall be tested for one hour at 65 P.S.I. solely to reveal any piping or assembly flaws. The laterals are not expected to hold gauge pressure. For testing laterals, cap risers or turn adjusting screws on nozzles to the "off" position, as appropriate. Repair any flaws discovered in mains or laterals, then retest in same fashion as outlined in presence of the Landscape Architect until all lines have been approved. Provide required testing equipment and personnel.

3.7 SYSTEM ADJUSTMENT
A. The entire sprinkler system shall be properly adjusted before final acceptance. Adjustments shall include but not necessarily be limited to: (1) Adjustment of arc and distance control devices on sprinklers, including changing nozzle sizes if necessary to assure proper coverage of planted areas. (2) Relocation or addition of sprinkler heads if necessary to properly cover planted areas, without causing excessive water to be thrown onto building, walks, paving, etc. (3) Throttling of automatic valves as necessary to operate sprinklers at manufacturer's recommended pressure. (4) Adjustment and testing of all automatic control devices to assure their proper function, both automatically and manually. (5) Installation of pop–up heads anywhere there is a chance of pedestrians or vehicles hitting heads even if pop–ups are not shown on the plan. (6) Installation of check valves to keep sprinkler head drainage from eroding landscape areas, wasting water, or creating soggy spots in the landscaping.

3.8 AS–BUILT DRAWINGS AND INSTRUCTION
A. Regularly update a print of the system noting any changes which are made by dimensioning features below grade from surface features with at least two dimensions. Prior to final approval, give the Owner 2 copies of clean blueprints marked to show changes during construction. The most important features to mark on the plan are valves, pressure lines, wires, and hose bibs.
B. After the system has been completed, inspected, and approved, instruct the Owner's maintenance personnel in the operation and maintenance of the system. Give the Owner completed warranty cards for the irrigation equipment and keys to controllers and hose bibs.

SOIL PREPARATION AND PLANTING

PART 1 – GENERAL

1.1 DESCRIPTION
A. The work includes, but is not necessarily limited to, the furnishing of all materials, equipment, and labor required to do the installation and complete placement of topsoil, fine grading, soil conditioning, and planting.

1.2 QUALITY ASSURANCE
A. Plant Identification and Quality
1. Plants are to be true to name, with one of each bundle or lot tagged with the name of the plants in accordance with standards of practice of the American Association of Nurserymen. In all cases, botanical names take precedence over common names.
2. Plants shall be vigorous, of normal growth habit, free of diseases, insects, eggs, larvae, excessive abrasions, sun scalds, or other objectionable disfigurements, and shall conform to the standards as outlined by the California Association of Nurserymen. Tree trunks shall be sturdy and well "hardened off". All plants shall have normal well developed branch system, and vigorous, fibrous root systems which are not root bound. Ground cover plants (rooted cuttings) shall have well developed root systems and be kept moist prior to and during installation. Plants shall be nursery grown and of size indicated on Drawings. All plants not conforming to those requirements will be considered defective, removed from the site and replaced with acceptable new plants at the Contractor's expense.
3. Sod shall have a well developed root system. Yellowing, brown, diseased, dried, or pest infested sod shall be rejected. Sod is to be cleanly mowed within 72 hours of delivery to the site. Sod is to be delivered to the site within 24 hours after being harvested and installed immediately after being delivered. Sod shall not be stored on the site overnight. Any sod delivered to the site that cannot be installed the same day shall be removed and not used on the site.
4. Ground cover is to have well developed roots and foliage. It is to be grown in and delivered to the site in flats.

1.3 SUBMITTALS
A. Provide the results of lab tests done on representative samples of existing soils and imported soils to be used for the top 12" or more of landscape area. Tests are to be done by a reputable soils lab (i.e., Perry Lab, Watsonville or Santa Clara Soil and Plant Lab). Samples to be tested are to be collected by lab personnel. Soil samples are to be tested for:
1. Particle size distribution (clay, silt, sand).
2. Agricultural suitability including any excess problems; i.e., salinity (calcium, magnesium), boron, sodium, pH level.
3. Fertility – amounts of available nitrogen, potassium, phosphorous, iron, magnesium, copper, zinc, and boron.
4. Chemicals and/or poisons that would hinder plant growth. The owner is to decide if tests for poisons will be done since there is a small chance that any exist and the cost of testing for them is expensive and difficult.
An interpretation of the test results and their affect on plant performance done by the lab staff or an approved horticultural consultant should be included in the report. The Owner is responsible for the cost of initial testing and for any additional chemicals and amendments that are required that are not already included in the Specifications or Drawings. Soils tests must be done as soon as possible and prior to ordering or installing soil amendments or plant materials. Plant selections and soil amendment specifications are subject to change depending on the results of the soil tests.
5. If bidding is done prior to soil fertility tests, bid 6 cu yds. of nitrolized RWD sawdust and 16 lbs. of 12–12–12 fertilizer per 1000 sq.ft. tilled or dug into the top 6" to 8" of soil in all planting areas for bidding purposes only. Revise bid when results of soil fertility tests are obtained.

1.4 GUARANTEE
A. Trees shall be guaranteed 1 year – all other plant material 120 days following final acceptance. Any plant material needing replacement because of weakness or probability of dying will be replaced with material of similar type and size to that of the surrounding area. The replacement plants will have the same guarantee as the original plants or trees, starting the day of their replacement. The Contractor is not responsible for losses due to vandalism if he has taken reasonable measures for protection of the plants.

1.5 PRODUCT HANDLING
A. Protect plants before and during installation, maintaining them in a healthy condition. Application(s) of anti–dessicant may be required to minimize damage. The Contractor is responsible for vandalism, theft, or damage to plant material until commencement of the maintenance period.

1.6 REVIEWS
A. Request the following reviews by the Owner's Representative at least three (3) days in advance (in writing): (1) Rough grading (of landscape area) (2) Soil test (3) Verification of incorporation depths (4) Finish grade (5) Plant material quality approval (6) Plant material layout (7) Plant pit sizes (prior to planting plants) (8) Preliminary inspection (9) Final inspection (5 day advance notice required)

PART 2 – PRODUCTS

2.1 TOPSOIL
A. Native topsoil or import landscape soil

2.2 NATIVE TOPSOIL
A. Native soil on site without admixture of subsoil, free from rocks over two cubic inches, debris, and other deleterious material. Native topsoil is to be stripped, stockpiled, and reinstalled.

2.3 IMPORT LANDSCAPE SOIL
A. Import landscape soil must be tested and meet the following specification:
1. TEXTURE:
Sandy loam to loam
2. GRADING:

SEIVE SIZE	PERCENT PASSING SIEVE
25.4 mm (1")	95 – 100
9.51 mm (3/8")	85 – 100
53 Micron (270 mesh)	10 – 30

3. CHEMISTRY – SUITABILITY CONSIDERATIONS:
a. Salinity: Saturation Extract Conductivity (ECe x 103 @ 25 degree C.) Less than 4.0
b. Sodium: Sodium Adsorption Ration (SAR) Less than 9.0
c. Boron: Saturation Extract Concentration Less than 1.0 PPM
d. Reaction: pH of Saturated Paste: 5.5 – 7.5
e. Lime: less than 3% by weight
4. PESTS:
a. The population of any single species of plant pathogenic nematode: fewer than 500 per pint of soil.
5. ORGANIC MATTER
a. Soil is to have 5% to 10% organic matter at below 18 inches in depth.
Soil is to have less than 30% organic matter at 0 to 18 inches in depth
Organic matter to be less than 1" dia. Do not use mushroom compost.
No noxious weeds are allowed.
6. FERTILITY CONSIDERATIONS:
a. Soil is to contain sufficient quantities of available nitrogen, phosphorous, potassium, calcium, and magnesium to support normal plant growth. In the event of nutrient inadequacies, provisions shall be made to add required materials to overcome inadequacies prior to planting.
7. COMPACTION
a. Compact the soil enough so it doesn't settle more when walked on and not significantly over time where the flow of drainage will be affected or soil needs to be added. Don't over compact or work soil when it has too much moisture.
Dig bottom layer of import soil into existing soil. Compact in 6 inch lifts.

2.4 ORGANIC SOIL AMENDMENT
A. Redwood sawdust, 0–1/4" in diameter, that is nitrogen stabilized by the supplier, and contains a wetting agent. Also see note on planting plan

2.5 ORGANIC MULCH
A. See Planting Plan

2.6 PLANTER SOIL MIX
A. See Planting Plan and Details.

2.7 BACKFILL FOR PLANT PITS
A. For native soils with 50% or more clay content – 75% topsoil and 25% organic amendment thoroughly mixed and incorporated together with no topsoil clods larger than 1/2" diameter. In heavy clay soils or other soils with large clods this will require mixing the backfill in a stockpile at the site or at the supplier. For soils with less clay content amend only the top 8" of the plant pit backfill as per the soils lab recommendations.

2.8 FERTILIZER
A. Fertilizer needs and amounts will be based on the results of the soil test

B. Sod lawn areas (there is no lawn on the plan)

2.9 PLANT MATERIAL SUBSTITUTES
A. Substitutes will not be permitted except when proof is submitted that plants specified are not available and then only upon approval of the Landscape Architect and Owner.

2.10 OTHER MATERIALS
A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Landscape Architect.

PART 3 – EXECUTION

3.1 SURFACE CONDITIONS
A. Examine the areas and conditions under which the work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the work. Do not proceed until unsatisfactory conditions are corrected.
B. Weed and Debris Removal – All ground areas to be planted shall be cleaned of all weeds and debris prior to any soil preparation or grading work. Weeds and debris shall be disposed of off the site.
C. Contaminated Soil – Do not perform any soil preparation work in areas where soil is contaminated with cement, plaster, paint or other construction debris. Bring such areas to the attention of the Owner's Representative and do not proceed until the contaminated soil is removed and replaced.
D. Moisture Content – Soil shall not be worked when moisture content is so great that excessive compaction will occur, nor when it is so dry that dust will form in the air or that clods will not break readily. Water shall be applied, if necessary, to bring soil to an optimum moisture content for tilling and planting.

3.2 ROUGH GRADING AND TOPSOIL PLACEMENT
A. Request a review by the Owner's Representative to verify specified limits and grades of work completed to date before starting soil preparation work. Place topsoil as required to obtain an 12" minimum depth of topsoil or as noted otherwise on the Plans. (Topsoil may already exist in the planting areas). Integrate topsoil layer into subsoil or existing compacted topsoil layer by ripping.
Complete rough grading as necessary to round top and toe of all slopes, providing naturalized contouring to integrate newly graded area with the existing topography. Verify that rough grading is completed in accordance with civil engineering drawings and/or any landscape grading drawings. Break through any compacted layers of subgrade material (sometimes left from building or paving pad compaction) that will not allow water in planting areas to percolate through, causing a boggy, over saturated soil condition. You may have to use a backhoe or rotohammers to break up and turn soil to a minimum depth of 12". If proposed planters are in areas of existing paving or baserock, remove at least 12" of material and bring in top soil up to grade required by grading plan. Rough grading in planting areas is to be such that when amendment is incorporated and the mulch is installed, the grade will be +– 1" to finish grade.
B. Soil Preparation: (1) Distribute soil (organic) amendment and fertilizer in the amounts recommended by the soils lab over all planting areas unless noted otherwise on the Plans. (2) Rip and/or till the amendment and fertilizer into the top 6" to 8" of soil until they are thoroughly mixed in. Hand work areas inaccessible to mechanical equipment. (3) Moisten to uniform depth for settlement and regrade to establish elevations and slopes indicated on Drawings.

3.3 FINISH GRADING
A. The Contractor shall make himself familiar with the site and grading plans and do finished grading in conformance with said Plans and as herein specified.
B. Grades not otherwise indicated shall be uniform levels or slopes between points where elevations are given or between points established by walks, paving, curbs, or catch basins. Finish grades shall be smooth, even, and on a uniform plane with no abrupt changes of surface. Minor adjustments of finish grades shall be made at the direction of the Landscape Architect, if required.
C. All grades shall provide for natural runoff of water without low spots or pockets. Finish grades shall be accurately set and shall be not less than 2% gradient wherever possible. Grades shall slope away from building foundations unless otherwise noted on Plans. All finish grades (top of mulch) are 1" below finish grade of walks, pavements, curbs, and valve boxes unless otherwise noted.

3.5 MULCHING
A. Recultivate soils compacted by planting or other operations and smooth the soil areas prior to applying mulch. Mulch all planting areas to a depth as noted on plans. This depth should be as per the plans even after being settled and stepped on 30 days after installation. Water lightly to settle mulch. Do not bury ground cover with mulch. Place and settle mulch in such a way that it does not get washed onto paving or block drain swales or inlets.

3.6 WEED CONTROL
A. The Contractor is responsible for pre–emergent weed control. Follow the manufacturer's directions. The Contractor is responsible for the replacement of any plants (other than weeds) that are hurt or killed due to the misuse of weed control products or use of the wrong product. Clay soils can increase the affect of certain pre–emergents. Adjust the application rate accordingly. Some owners may prefer hand weeding to chemical weed control although it is usually more expensive.

3.7 MAINTENANCE
A. Maintenance shall begin immediately after each plant is installed.
B. Maintenance will include:
1. Continuous operations of watering, weeding, cultivating, fertilizing, spraying, insect, pest, fungus, and rodent control, and any other operations to assure good normal growth.
2. Fertilizing: In addition to fertilizing of trees, shrubs and ground covers, herein specified, furnish and apply any additional fertilizers necessary to maintain plantings in a healthy, green vigorous growing condition during the maintenance period.
3. Weeding, Cultivating and Clean Up: Planting areas shall be kept neat and free from debris at all times and shall be cultivated and weeded at no more than 10–day intervals.
4. Insect, Pest and Disease Control: Insects and diseases shall be controlled by the use of approved insecticides and fungicides. Moles, gophers, and other rodents shall be controlled by traps, approved pellets inserted by probe gun, or other approved means.
5. Protection: Work under this Section shall include complete responsibility for maintaining adequate protection for all areas. Any damaged areas shall be repaired at no additional expense to the Owner.
6. Replacements: Immediately replace any plant materials that die or are damaged. Replacements shall be made to the Specifications as required for original plantings.
7. Hand Watering: Even when planting areas are watered with automatic irrigation, the soil surrounding the plant pits can be moist while the sawdust/sand root ball is dry. This can cause the plants to deteriorate or not grow (even during the winter). The plants will do best (especially during the hot season) if they are hand watered deeply until their roots grow out into the surrounding soil.

3.8 PRELIMINARY INSPECTION
A. As soon as all the planting is installed, the Contractor will request the Owner's Representative (in writing) to make a preliminary inspection. The 30 calendar day maintenance period will start when the work is approved. Replacement and/or repairs may be required for approval. The Contractor is to notify the Owner and the Owner's Representative in writing when the 30 day maintenance period begins.

3.9 FINAL INSPECTION
A. At least 5 days prior to the anticipated end of the maintenance period, the Contractor shall submit a written request for final inspection. The planting areas shall be weeded, neat and clean. The work shall be accepted by the Owner exclusive of the plant materials upon written approval of the work by the Owner's Representative.

Landscape Specifications

Revision
1 10/24/18
No changes this sheet
2 02-26-19
No Changes this sheet

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LICENSED LANDSCAPE ARCHITECT REGISTERED No. 2176 GREGORY LEWIS 4/30/2018 RENEWAL 10/24/18 STATE OF CALIFORNIA

Mora Residence
213 Blueberry , Scotts Valley, CA

Date 8/9/18
Scale As Noted
Drawn Greg
Job
Sheet L4
of 4