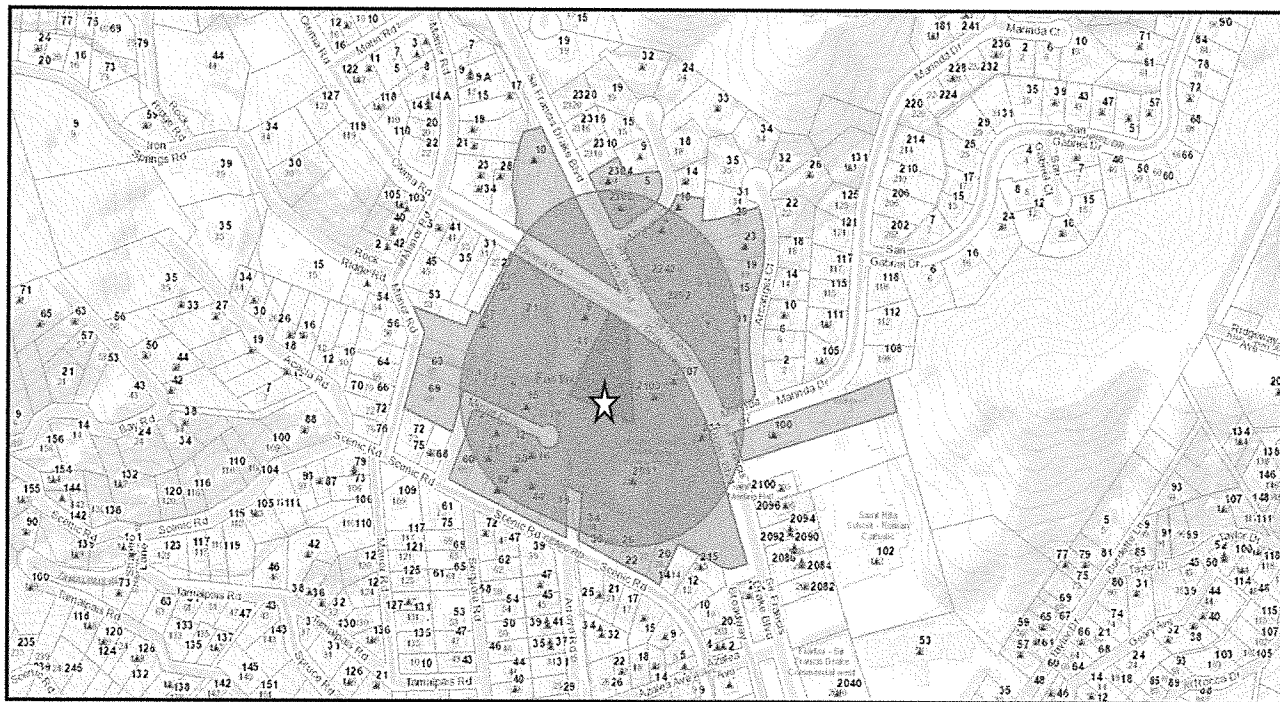


**TOWN OF FAIRFAX
STAFF REPORT
Department of Planning and Building Services**

TO: Fairfax Planning Commission
DATE: November 16, 2017
FROM: Linda Neal, Senior Planner
LOCATION: 7 Olema Road; Assessor's Parcel No. 001-131-08
PROJECT: Single-family residence and Accessory Dwelling Unit
ACTION: Design Review and Excavation permits
ZONING: Residential RD 5.5-7 Zone
APPLICANT: Advanced Building Solutions
OWNERS: Ray Bakowski and Margaret Ellis
CEQA STATUS: Categorically exempt section(s) 15303(a) and (d)



7 OLEMA ROAD

BACKGROUND

The 23,666 (.5 acre) square-foot vacant site has a 10% slope that roughly follows the slope of Olema Road that runs along its property frontage. The site was legally created by deed in 1943.

The site is located north of the Fairfax Branch of the Marin County Public Library. A pedestrian/bicycle path runs along the eastern side of the site and connects to the pedestrian bicycle path that continues north on Sir Francis Drake Boulevard to the northern boundary of the Town.

The site is a mixture of open and wooded, with several volunteer redwood trees at the front (northeast) corner, a grouping of oak trees along the rear property line at the southwest corner. Additional oaks, olive trees, fruit trees and 1 Monterey Pine are disbursed throughout the remainder of the property.

The property is located in the Residential RD 5.5-7 Zone, which allows single-family residences on lots of 5,500 square feet or more and duplexes on lots of 7,000 square-feet or more.

DISCUSSION

The applicants are proposing a 2,838 square-foot, 1 story, 3 bedroom, 2 ½ bathroom single-family residence, with a 675 square-foot attached 1 bedroom Accessory Dwelling Unit (ADU) and an attached 591 square-foot garage.

The project complies with all the setback, height, Floor Area Ratio (FAR) and lot coverage regulations for the RD 5.5-7 Zone as follows:

	Front Setback	Rear Setback	Combined Front/rear Setback	Side Setbacks	Combined Side Setbacks	FAR	Lot Coverage	Height
Required/ Permitted	6 ft.	16 ft.	25 ft.	5 ft. & 5 ft.	15 ft.	.40	.35	28.5 ft., 2 stories
Proposed	47 ft.	83 ft.	130 ft.	9 ft. & 9 ft.	18 ft.	.15	.22	26 ft. 3 in., 1 story

The applicant's' original submittal maintained only a 6 foot side setback from the eastern side property line. Additionally the plans appeared to indicate that there was going to be some grading extending into the oak grove at the rear (southeastern) corner of the site, and there was no paved connection planned along the property frontage, where pedestrians currently cut through from Olema Road to connect up to the formalized pedestrian/bicycle path that runs past the library.

Following a meeting staff held with the applicant and his architects on September 28, 2017, the applicants agreed to the following changes or clarifications: increase the setback between the building and the eastern side property line from 6 to 9 feet, so that an adequate landscaping buffer and fence could be installed between the public path and the proposed residence; provide details of the fence next to the path to clarify it's design features; clarify that no grading or tree removal would occur within the dripline of the grove of oaks at the rear southwest corner of the site, preserve the majority of the redwoods at the front of the site, and provide a connecting public sidewalk from the driveway apron to the public pedestrian/bicycle path .

Discretionary Permits

Design Review

Town Code § 17.020.030(A) requires that a Design Review Permit be obtained from the Planning Commission for new residences. In reviewing a Design Review permit the code requires that the Planning Commission apply the design review criteria listed in Town Code §17.020.040.

The house incorporates board and batten siding with covered front and rear entry porches reminiscent of the craftsman style residences and older farmhouses found throughout the neighborhood and Town. The structure's siding and trim are proposed to be painted Navajo White, which is a warm, relatively non-reflective white, while the window framing would be bronze aluminum and the roof singles would be charcoal grey composition shingles.

The roof plan would incorporate a long horizontal pitched roof over the center of the house with alternating pitched roof lines over the garage and ADU at the front, and the master bedroom and family room at the rear, with shed roof components over the front and rear porches and along the western side of the house over the 2 full bathrooms.

The mullioned windows would vary in size and shape, and along with the building articulation, varied roof pitches, board and batten siding and combination of farmhouse/craftsman architecture, result in a visually varied structure.

A new solid redwood fence is proposed along the front and side property lines. The fence structure would be 6 feet in height along the side eastern and western property lines, dropping to 4 feet at the front within the 6 foot front setback, and would feature design elements such as a cap rail and battens, to provide visual interest. The proposed fence plans is in compliance with the fence height regulations in Town Code § 17.044.080.

Construction of the residential structure will require the removal of 3 oak trees, 1 olive tree, 1 redwood tree and 3 small fruit trees (total 5 trees) but will retain 22 oaks, 1 olive and 4 redwoods (only 3 of the 5 existing redwood trees are identified on the site plan and the survey). Staff has included a condition of approval in the resolution

recommending approval that only the southwestern most redwood tree, closest to the front door of the structure may be removed from the redwood grove at the front of the site.

The oak grove at the rear southeastern corner of the lot would be preserved and disturbance within the trees driplines minimized. Four of the existing redwoods at the front, northeastern corner, 1 olive tree, and various other oaks scattered throughout the site would also be retained. Staff has included in the conditions of approval the requirement that an arborist report, by an arborist certified by the International Society of Arborists (ISA) be submitted along with the building permit application. The report must include an assessment of health of all the trees to be retained, mitigation measures to be implemented during and after construction to minimize construction impacts and ensure the continued good health of the trees. These mitigation measures would become conditions of approval, should the project be approved. The arborist would also be required to be on-site during the grading process, and to certify in writing that the mitigation measures were implemented per his or her recommendations in the report.

The proposed landscaping plan includes; 1) six multi-trunked strawberry trees on the western side of the structure; 2) two magnolia trees, one on either side of the driveway; 3) four flowering crabapples at the rear of the structure; and, 4) two flowering cherry trees on either side of the entry porch. All the trees would be 24-inch box trees. Additionally, 33 Bay Laurels are proposed to would screen the eastern side of the residence from the public pathway, and the western sides of the residence from the residences at 9 Olema and 11 Olema Road. A small lawn area is proposed off the rear porch, and four landscaping beds (two at the rear of the structure and two on either side of the front entry) that will incorporate ferns, yuccas, grasses and a variety of Ceanothus as groundcover. The landscaping would be irrigated by an automated irrigation system to minimize water use.

This property is not adjacent to any open space lands and is located in an area of Town where non-natives have become established. However, if the Commission is concerned that the landscaping plans does not incorporate enough native species, a condition could be included stipulating that the landscaping plan be revised to incorporate the use of a higher percentage of native California species, subject to the review and approval of the Planning Department prior to issuance of the building permit.

Staff has included conditions in the Resolution that the oaks planted on the site be Interior Live Oaks and that the applicants submit plans for the public sidewalk with the building permit application. The path detail shall demonstrate that there is adequate room for a 4 foot sidewalk connection from the driveway apron to the public path and shall include relocation of the front fence to provide adequate room if necessary.

The landscaping plan is subject to review and approval by the Marin Municipal Water District for compliance with District Code Title 13, Water Conservation.

At the request of staff, the owners are proposed to incorporate an extension of the public path, following the location of the informal path taken by pedestrians now. The paved path would travel from the public path running from the library, to the driveway apron. There is a substantial ditch and an existing oak tree on the Olema Road that precludes extending the pedestrian pathway all the way to the edge of the property frontage.

Residences in the immediate neighborhood on lots of similar sizes range in size from a 1,519 square-foot, 4 bedroom, 2 bathroom single-family residence on a 14,000 square-foot property (57 Manor Road), to two residences that together have a total living space square footage of 3,592 square-feet on a 14,408 square-foot property . The project site is almost twice as large as the previously mentioned properties. The underlying zoning allows 2 living units. Therefore, the proposed 3,513 square foot single-family residence and accessory dwelling unit are not out-of-scale or character with the surrounding neighborhood.

Excavation Permit

The project will require the excavation and fill of 350 cubic yards of material.

Town Code §17.20.080 requires Planning Commission approval of an excavation permit for any project that involves the proposed excavation and/or fill of 100 cubic yards or more of material. In order to approve an excavation permit, the Commission must be able to find that the health, safety and welfare of the public will not be adversely affected, that adjacent properties are adequately protected by project investigation and design from geologic and hydrologic problems, that the amount of excavation or fill proposed is not more that is required to allow the owner substantial use of his or her property, that the visual and scenic enjoyment of the area by others will not be adversely affected by the project more than is necessary, that natural landscaping will not be removed by the project more than is necessary and that the time of year during which the construction will take place is such that the work will not result in excessive siltation from storm run-off nor prolonged exposure of unstable slopes.

Due to the areas of previous fill discovered on the site, and the weak, unconsolidated nature of it and the natural soils underneath the fill, the site must be regraded and compacted consistent with the soils engineer's requirements, observation and testing , to avoid future sloughing, erosion and settlement problems . The soils report for the project has recommended, and the Town Engineer agrees, that potential future distress to the structure, garage slab, would be significantly reduced by removing the fill and weak natural soils and replacing them with properly compacted, engineered fill (Attachment B - soils engineering report).

Increased drainage from the new structure driveway will be collected and dispersed into the existing drainage swale at the front of the site on Olema Road. Drainage flowing

downslope from the structure towards the residences at 9 and 11 Olema Road will be directed to a rock stormwater dissipater pad via a swale that will run along the fence line between the site and the properties to the west of the site. A recommended condition of approval has been included requiring that the design of the swale be subject to the review and approval of the Town Engineer prior to issuance of the building permit, to ensure that the project does not increase any water flows to the downslope properties.

The Town Engineer has reviewed the soils information provided in the report dated May 26, 2017 by Reese Consulting Geotechnical Engineers, the excavation and fill amount necessary to comply with the geotechnical engineer's recommendation by BFK Engineers, Surveyors and Planners dated May 15, 2017 and the drainage report by BFK Engineers, Surveyors and Planners dated July 27, 2017. He has also reviewed the plans and performed a site inspection, and determined the project can be constructed as proposed without creating any negative geologic or hydrologic impacts on neighboring properties or the adjacent public improvements.

Staff has determined that the amount of excavation/fill is the minimum necessary to allow the owner a substantial use of the property.

No grading or fill will occur within the drip lines of the oaks at the rear of the project site. Grading and re-compaction of the soil will only occur to create the house pad, driveway and rear patio and lawn areas.

Staff has included a recommended condition of approval in the resolution recommending approval that all exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas and unpaved accesses) shall be watered two times per day.

Other Agency/Department Comments/Conditions

Ross Valley Fire Department

RVFD submitted written requirements which are summarized as follows:

Project requires installation of a fire sprinkler system that complies with the National Fire Protection Association regulation 13-D and local standards, all smoke and carbon monoxide detectors in the residence and ADU shall be provided with AC power and be interconnected for simultaneous alarm, and address numbers at least 4 inches tall must be in place adjacent to the front door and if not clearly visible from the street, additional numbers must be placed in location that is visible from the street and be illuminated. Alternative materials or methods may be proposed for any of the above conditions in accordance with Section 104.9 of the Fire Code, and all approved alternatives requests, and their supporting documentation, shall be included in the plan sets submitted for final approval by the Fire Department.

Marin Municipal Water District (MMWD)

MMWD submitted written requirements which are summarized as follows:

The project will required at least one new service installation and there will be connection fees required for the single-family residence and the accessory dwelling unit, the plans must comply with all the indoor and outdoor requirements of District Code Title 13, Water Conservation, the District's backflow prevention requirements must be met and the project must comply with Ordinance No. 429, requiring the installation of gray water recycling systems, when practicable.

Ross Valley Sanitary District

A Sanitary District sewer connection permit is required prior to the project final inspection and issuance of an occupancy permit for the residence.

Town Engineer

The design of the drainage swale and the run-off calculations used for the design of this system shall be subject to review and approval by the Town Engineer prior to issuance of the building permit.

Public Works

Prior to construction of the new drainage pipe and driveway apron, the applicant shall obtain an encroachment permit from the Fairfax Department of Public Works.

Fairfax Police Department

The Police Department did not comment on the project.

RECOMMENDATION

1. Conduct the public hearing.
2. Move to approve Application # 17-42 by adopting Resolution No. 17-40 setting forth the findings and conditions for the project approval.

ATTACHMENTS

Attachment A – Resolution No. 17-40

Attachment B – Applicant's engineering reports and calculations

Attachment C – Town Engineer's memorandum dated 8/28/17

RESOLUTION NO. 17-40

A Resolution of The Fairfax Planning Commission Approving Application No. 17-42 for a Design Review Permit and an Excavation Permit for a Single-Family Residence and an Accessory Dwelling Unit (ADU) at 7 Olema Road, Assessor's Parcel No. 001-131-08

WHEREAS, the Town of Fairfax has received an application from Ray Bakowski and Margaret Ellis to build a 2,838 square-foot, 3 bedroom, 2½ bathroom, single-family residence with an attached 592 square-foot, 2-car garage and a 675 square-foot, 1-bedroom, accessory residential second unit; and

WHEREAS, the Planning Commission held a duly noticed Public Hearing on November 16, 2017, at which time the Planning Commission determined that the project complies with the Design Review Ordinance and the Excavation Ordinance; and

WHEREAS, based on the plans and other documentary evidence in the record, the Planning Commission has determined that the applicant has met the burden of proof required to support the findings necessary to approve the Design Review and Excavation Permits; and

WHEREAS, the Commission has made the following findings:

1. The proposed development is consistent with the General Plan and other structures found throughout the Residential RD 5.5-7 Residential High Density Zone; and
2. The site planning preserves identified natural features as much as possible while allowing the owners a substantial use of their large 23,660 square-foot property; and.
3. Vehicular access and parking are adequate.
4. The proposed development harmonizes with surrounding residential development and meets the design review criteria contained in Town Code § 17.020.040.
5. The development and use of the property as proposed will not cause excessive or unreasonable detriment to adjoining properties or premises, or cause adverse physical or economic effects thereto, or create undue or excessive burdens in the use and enjoyment thereof, or any or all of which effects are substantially beyond that which might occur without approval or issuance of the use permit.
6. The health safety and welfare of the public will not be adversely affected;

7. Adjacent properties are adequately protected by project investigation and design from geologic hazards as a result of the work;
8. Adjacent properties are adequately protected by project design from drainage and erosion problems as a result of the work;
9. The amount of the excavation or fill proposed is not more than that required to allow the property owner substantial use of his or her property;
10. The visual and scenic enjoyment of the area by others will not be adversely affected by the project more than is necessary;
11. Natural landscaping will not be removed by the project more than is necessary; and
12. Town code § 17.072.090(c)(4) prohibits grading of hillside properties from October 1st through April 1st of each year. Therefore, the time of year during which construction will take place is such that work will not result in excessive siltation from storm runoff nor prolonged exposure of unstable excavated slopes.

WHEREAS, the Commission has approved the project subject to the applicant's compliance with the following conditions:

1. The development is limited to that shown in the plans by Jared Lewis Polsky, Architect, dated 10/19/17, pages A1.0, A1.1, A2.1, A2.2, engineering plans by BKF Engineers, Surveyors, Planners, dated 10/23/17 pages 1 and 2 and the landscaping plans by PA Pederson Associates Landscape Architects, undated, pages L-1 to L-3 and the topographic map by BKF Engineers, Surveyors, Planners, dated December 2016, except as amended by these conditions.
2. Prior to issuance of any of the building permits for the project the applicant or his assigns shall:
 - a. Submit a construction plan to the Public Works Department which may include but is not limited to the following:
 - Construction delivery routes approved by the Department of Public Works.
 - Construction schedule (deliveries, worker hours, etc.)
 - Notification to area residents
 - Emergency access routes
 - b. The applicant shall prepare, and file with the Public Works Director, a video tape of the roadway conditions on the public construction delivery routes (routes must be approved by Public Works Director).

c. Submit a cash deposit, bond or letter of credit to the Town in an amount that will cover the cost of grading, weatherization and repair of possible damage to public roadways. The applicant shall submit contractor's estimates for any grading, site weatherization and improvement plans for approval by the Town Engineer. Upon approval of the contract costs, the applicant shall submit a cash deposit, bond or letter of credit equaling 100% of the estimated construction costs.

d. The foundation and retaining elements shall be designed by a structural engineer certified as such in the state of California. Plans and calculations of the foundation and retaining elements shall be stamped and signed by the structural engineer and submitted to the satisfaction of the Town Structural Engineer.

e. The grading, foundation, retaining, and drainage elements shall also be stamped and signed by the site geotechnical engineer as conforming to the recommendations made by the project Geotechnical Engineer.

f. Prior to submittal of the building permit plans, the applicant shall secure written approval from the Ross Valley Fire Authority, Marin Municipal Water District and the Ross Valley Sanitary District noting the development conformance with their recommendations.

g. Submit 3 copies of the record of survey with the building permit plans.

h. The applicant shall secure a tree cutting permit, if required, from the Town prior to removal of any on-site trees subject to a permit under Town Code Chapter 9.36. An arborist report, by an arborist certified by the International Society of Arborists (ISA), shall also be submitted along with the building permit application. The report must include an assessment of health of all the trees to be retained, mitigation measures to be implemented during and after construction to minimize construction impacts and ensure the continued good health of the trees. These mitigation measures would become conditions of approval, should the project be approved. The arborist would also be required to be on-site during the grading process, and to certify in writing that the mitigation measures were implemented per his or her recommendations in the report. Any oak trees shown to be planted on the landscaping plan shall be Interior Live Oaks and only the most southwesterly redwood tree of the grove at the front of the site shall be removed and 4 of the trees shall be retained on site.

i. Submit with the building permit application and report prepared by an ISA certified arborist assessing the health of the trees to remain on the site and recommending mitigation measures to maintain the health of the trees during and after the project construction. All the recommendations shall be incorporated as conditions of approval for this project. The arborist shall be on-site during all site

excavation/fill to make sure the recommendations are complied with and shall provide the Town with a letter verifying compliance prior to the project final inspection and issuance of the certificate of occupancy.

3. During the construction process the following shall be required:
 - a. The geotechnical engineer shall be on-site during the grading process (if there is any grading remaining to be done) and shall submit written certification to the Town Staff that the grading has been completed as recommended prior to installation of foundation and/or retaining forms and piers.
 - b. Prior to the concrete form inspection by the building official, the geotechnical and structural engineers shall field check the forms of the foundations and retaining elements and the engineers shall provide written certification to the Town staff that the work to this point has been completed in conformance with their recommendations and the approved building plans. The Building Official shall field check the concrete forms prior to the pour.
 - c. All construction-related vehicles including equipment delivery, cement trucks and construction materials shall be situated off the travel lane of the adjacent public right(s)-of-way at all times. This condition may be waived by the Building Official on a case-by-case basis with prior notification from the project sponsor.
 - d. Any proposed temporary closures of a public right-of-way shall require prior approval by the Fairfax Police Department and any necessary traffic control, signage or public notification shall be the responsibility of the applicant or his/her assigns. Any violation of this provision will result in a stop work order being placed on the property and issuance of a citation.
 - e. All exposed surfaces (e.g. parking areas, staging areas, soil piles, graded areas and unpaved accesses) shall be watered two times per day.
4. Prior to issuance of an occupancy permit, the following shall be completed:
 - a. The geotechnical engineer shall field check the completed project and submit written certification to the Town Staff that the foundation, retaining, grading and drainage elements have been installed in conformance with the approved building plans and the recommendations of the soils report.
 - b. The Planning Department and Town Engineer shall field check the completed project to verify that all and planning commission conditions and required engineering improvements have been complied including installation of landscaping and irrigation prior to issuance of the certificate of occupancy.
5. Excavation shall not occur between October 1st and April 1st of any year. The Town Engineer has the authority to waive this condition depending upon the weather.

6. The roadways shall be kept free of dust, gravel and other construction materials by sweeping them, daily, if necessary.

7. Any changes, modifications, additions or alterations made to the approved set of plans will require a modification of Application # 17-42. Any construction based on job plans that have been altered without the benefit of an approved modification of Application 17-42 will result in the job being immediately stopped and red tagged.

8. Any damages to the public portions of Olema Road or Sir Francis Drake Boulevard or other public roadway used to access the site resulting from construction activities shall be the responsibility of the property owner.

9. The applicant and its heirs, successors, and assigns shall, at its sole cost and expense, defend with counsel selected by the Town, indemnify, protect, release, and hold harmless the Town of Fairfax and any agency or instrumentality thereof, including its agents, officers, commissions, and employees (the "Indemnitees") from any and all claims, actions, or proceedings arising out of or in any way relating to the processing and/or approval of the project as described herein, the purpose of which is to attack, set aside, void, or annul the approval of the project, and/or any environmental determination that accompanies it, by the Planning Commission, Town Council, Planning Director, or any other department or agency of the Town. This indemnification shall include, but not be limited to, suits, damages, judgments, costs, expenses, liens, levies, attorney fees or expert witness fees that may be asserted or incurred by any person or entity, including the applicant, third parties and the Indemnitees, arising out of or in connection with the approval of this project, whether or not there is concurrent, passive, or active negligence on the part of the Indemnitees. Nothing herein shall prohibit the Town from participating in the defense of any claim, action, or proceeding. The parties shall use best efforts, acting in good faith, to select mutually agreeable defense counsel. If the parties cannot reach agreement, the Town may select its own legal counsel and the applicant agrees to pay directly, or timely reimburse on a monthly basis, the Town for all such court costs, attorney fees, and time referenced herein, provided, however, that the applicant's duty in this regard shall be subject to the Town's promptly notifying the applicant of any said claim, action, or proceeding.

10. The applicant shall comply with all applicable local, county, state and federal laws and regulations. Local ordinances which must be complied with include, but are not limited to: the Noise Ordinance, Chapter 8.20, Polystyrene Foam, Degradable and Recyclable Food Packaging, Chapter 8.16, Garbage and Rubbish Disposal, Chapter 8.08, Urban Runoff Pollution Prevention, Chapter 8.32 and the Americans with Disabilities Act.

11. Conditions placed upon the project by outside agencies or by the Town Engineer may be eliminated or amended with that agency's or the Town Engineer's written notification to the Planning Department prior to issuance of the building permit.

12. The building permit plans shall be reviewed and approved by the Town Engineer, at the expense of the applicant, prior to issuance of the building permit. The project shall be inspected by the Town Engineer prior to issuance of the occupancy permit for the residential structures for compliance with the engineering plans.

Ross Valley Fire Department

13. Project requires installation of a fire sprinkler system that complies with the National Fire Protection Association regulation 13-D and local standards. The system will require a permit from the Fire Department and the submittal of plans and specifications for a system submitted by an individual or firm licensed to design and/or design-build sprinkler systems.

14. All smoke detectors in the residence shall be provided with AC power and be interconnected for simultaneous alarm. Detectors shall be located in each sleeping room, outside of each sleeping room in a central location in the corridor and over the center of all stairways with a minimum of 1 detector on each story of the occupied portion of the residence.

15. Carbon monoxide alarms shall be provided in existing dwellings when a permit is required for alterations, repairs, or addition and the cost of the permit exceeds \$1,000.00. Carbon monoxide alarms shall be located outside of each sleeping area in the immediate vicinity of the bedrooms and on every level of the dwelling, including basements.

16. Address numbers at least 4 inches tall must be in place adjacent to the front door. If not clearly visible from the street, additional numbers must be placed in location that is visible from the street. The numbers must be internally illuminated or illuminated by and adjacent light controlled by a photocell that can be switched off only by a breaker so it will remain illuminated all night.

17. Alternative materials or methods may be proposed for any of the above conditions in accordance with Section 104.9 of the Fire Code.

18. All approved alternatives requests, and their supporting documentation, shall be included in the plan sets submitted for final approval by the Fire Department.

Marin Municipal Water District

19. A high pressure water service permit is required for this project.

20. The plans must comply with all the indoor and outdoor requirements of District Code Title 13, Water Conservation. Plans must be submitted to the District and be approved.

21. The District's backflow prevention requirements must be met and if installation of a backflow device is required, the device shall be tested/inspected and be approved by a District Inspector prior to the project final inspection and issuance of the occupancy permit.

22. Comply with Ordinance No. 429, requiring the installation of gray water recycling systems, when practicable, for all projects required to install new water service and existing structures undergoing "substantial remodel" that necessitates an enlarged water service.

Ross Valley Sanitary District

23. A Sanitary District sewer connection permit is required prior to the project final inspection and issuance of an occupancy permit for the residence.

Town Engineer

24. The design of the drainage swale and the run-off calculations used for the design of this system shall be subject to review and approval by the Town Engineer prior to issuance of the building permit.

Public Works

25. Prior to construction of the new drainage pipe and driveway apron the applicant shall obtain an encroachment permit from the Fairfax Department of Public Works.

NOW, THEREFORE BE IT RESOLVED, the Planning Commission of the Town of Fairfax hereby finds and determines as follows:

The approval of the Design Review and Excavation Permits are in conformance with the 2010 – 2030 Fairfax General Plan and the Fairfax Zoning Ordinance, Town Code Title 17; and

Construction of the project can occur without causing significant impacts on neighboring residences and the environment.

The foregoing resolution was adopted at a regular meeting of the Planning Commission held in said Town, on the 16th, day of November, 2017 by the following vote:

AYES:

NOES:

ABSTAIN:

Chair, Norma Fragoso

Attest:

Ben Berto, Director of Planning and Building Services

134 LYSTRA COURT
TELEPHONE (707) 528-3078

REESE CONSULTING
& ASSOCIATES ENGINEERS
GEOTECHNICAL

SANTA ROSA, CA 95403
FACSIMILE (707) 528-2837

Report
Soil Investigation
Olema Road Residence
1 Olema Road
Fairfax, California

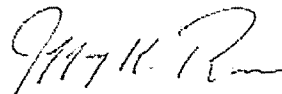
Prepared for
Advanced Building Solutions
855 Lakeville Street, Suite 200
Petaluma, CA 94952
Attention: Chris Scerri

By

REESE & ASSOCIATES
Consulting Geotechnical Engineers



Brian F. Piazza
Project Geologist



Jeffrey K. Reese
Civil Engineer No. 47753

Job No. 720.6.1
May 26, 2017



ATTACHMENT **B**

INTRODUCTION

This report presents the results of the soil investigation we performed for your proposed new residence in Fairfax, California. The property is located at 1 Olema Drive.

We understand that the proposed residence will be a one- and two-story, wood-frame building with wood floors supported on joists above grade. The garage will have a concrete slab-on-grade floor. Preliminary plans prepared by Polsky Perlstein Architects indicate a finished floor elevation of 144 feet. We anticipate site grading will include cuts of up to about 4½ feet to prepare the building area. The plan indicates a fill of up to about 3 feet will be constructed in the rear terrace area. We understand you desire to balance cut and fill grading operations so as to avoid off-haul from the property.

The object of our investigation, as outlined in our proposal dated April 24, 2017, was to review selected, geologic references in our files, explore subsurface conditions, measure depth to groundwater, if encountered, determine physical properties of the soils encountered, and then perform engineering analyses to develop conclusions and recommendations concerning:

1. Proximity of the site to active faults.
2. Site preparation and grading.
3. Foundation support and design criteria.
4. Support of concrete slab-on-grade floors.
5. Retaining wall design criteria, if appropriate.

6. Soil engineering drainage.
7. Supplemental soil engineering services.

WORK PERFORMED

We reviewed selected soil and geologic information in our files and online including:

1. The "Geology for Planning in South and Southeastern Marin County. South Central Marin Geology," California Division of Mines and Geology, by Salem J. Rice and Theodore C. Smith, 1976.
2. Fault-Rupture Hazard Zones in California, 1997. CDMG Special Publication 42, by Earl W. Hart and William A. Bryant.
3. The "Geology of the San Francisco North Quadrangle, California," by Julius Schlocker, 1974, U.S. Geological Survey Professional Paper 782.
4. The "Geologic Map and Map Database of Parts of Marin, San Francisco, Alameda, Contra Costa, and Sonoma Counties," United States Geological Survey, by M.C. Blake Jr., R.W. Graymer and D.L. Jones, 2000.
5. The "Maps of Known Active Fault Near-Source Zones in California and Adjacent Portions of Nevada," Uniform Building Code (UBC), 1997.
6. Google Earth, 2013, (<http://earth.google.com>); includes historical aerial photos from 1993 to 2013.
7. Liquefaction Susceptibility Map, Association of Bay Area Governments website (www.abag.ca.gov), 2006.
8. Marin Map Geographic Information System website (www.marinmap.org), copyright 2007 - 16.

On April 27, 2017, we were at the site to observe surface features and explore subsurface conditions to the extent of five (5) test pits at the approximate locations indicated on Plate 1.

The pits were excavated to depths between about 6 and 12 feet with track-mounted excavator equipment. Our project geologist located the pits, observed the excavations, logged the conditions encountered, and obtained a few samples for visual classification and minor laboratory testing. In addition, we performed strength indicator tests in the walls of the pits with a penetrometer. Logs of the pits showing the soil conditions encountered are presented on Plate 2. The soils are classified in accordance with the Unified Soil Classification System explained on Plate 3. The rock was described in accordance with Physical Properties for Rock Descriptions as explained on Plate 4.

Selected samples were tested in our laboratory to determine moisture content, classification (percent free swell and Atterberg Limits). The laboratory test results, including the penetrometer data, are summarized on Plates 5. Detailed results of the Atterberg Limits tests are shown on Plate 6.

The pit locations shown on Plate 1 were determined by visually estimating from existing surface features. The locations should be considered no more accurate than implied by the methods used to establish the data. At the completion of the exploration, the pits were backfilled with the excavated materials, but without compaction.

SURFACE AND SUBSURFACE CONDITIONS

The project area is located within the north portion of downtown Fairfax, west of Sir Francis Drive Boulevard. The subject lot is bordered by Olema Road to the north, existing single-family residences to the west and south and the Fairfax Library to the east. Further to the

west and south, Fairfax Creek is present about 200 feet away. The subject lot is gently sloping as it extends southwest at an average gradient of about ten horizontal to one vertical (10:1) to 11:1. The elevation change across the lot is about 14 feet. Past grading has occurred on the lot in the form of filling in the approximately central portion of the property. The fill materials are mapped approximately, and depicted on Plate 1.

The test pits and laboratory tests indicate that the site is underlain by discontinuous layers of soft to stiff sandy clays and silts, underlain by rock materials of the Franciscan Complex. Existing fill materials were observed in Test Pits 4 and 5 to a depth of about 3 to 4½ feet below the existing ground surface. The existing fill materials consist of very sandy clays and exhibit a low expansion potential. That is, the materials would tend to undergo low strength and volume changes with seasonal variations in moisture content. Natural topsoils encountered beneath the existing fill materials and at the surface in Test Pits 1, 2 and 3 consist of porous, sandy silts of low expansion potential. Stiff sandy clays of moderate expansion potential were encountered below the topsoils in Test Pits 1 and 3. Test Pits 1 and 2 exposed stiff sandy clays with varying amounts of gravel to a depth of about 4½ feet. Residual soils were observed in Test Pits 3, 4 and 5. Residual soils result from deep weathering of underlying bedrock and retain some of the texture and fabric of the parent rock. The residual soils consist of slightly plastic sandy clays with variable amounts of sandstone rock fragments. All the pits bottomed into highly weathered sandstone bedrock materials of the Franciscan Complex.

No groundwater was observed in the borings during the exploration. However, we observed minor seepage of water in Test Pit 2 at a depth of about 5½ feet. We believe that groundwater levels vary annually and can fluctuate several feet, depending on seasonal climatic conditions.

Faulting and Seismicity

The project is within the seismically active California Coast Range geomorphic province. This region is characterized by northwest trending mountain ranges, narrow valleys and broad basins generally reflecting the underlying geologic structure. Numerous active faults are present in the region, and these faults are part of the active San Andreas system of faults. Faults in this system are typically northwest trending, strike-slip faults with a right-lateral sense of displacement. A number of the recognized active faults in the project vicinity include the Hayward fault located about 8½ miles to the northeast and the San Andreas fault located about 6½ miles to the southwest.

CONCLUSIONS

Based on the results of our field exploration, laboratory tests and engineering analyses, we conclude that, from a soil engineering standpoint, the site can be used for the proposed residential construction. The most significant soil engineering factors that must be considered in design and construction are the presence of:

1. Existing fill materials;
2. Weak compressible soils;
3. Moderately expansive, near surface clayey soils;
4. The potential for very strong seismic ground shaking.

We could find no evidence in our test pits to indicate that the existing fills were properly placed and compacted under soil engineering observation and testing services. Our experience indicates that such fills, if not properly placed and thoroughly compacted, are subject to distress such as sloughing, erosion, settlement. Also, we believe that the weak and compressible natural soils would similarly be subject to significant settlement when saturated under load. Where evaporation is inhibited by footings, concrete slabs, ponds, or fill, eventual saturation of the underlying soils can occur.

Potential distress to structures, concrete slab-on-grade floors and/or pavements underlain by compressible fill and weak porous soils could be significantly reduced by removing the fill and weak natural soils and replacing the materials as properly compacted fill. As an alternative to removal and replacement as compacted fill, potential distress to structures could also be mitigated by deepening foundation elements through the compressible soils and into firm, natural soil or bedrock. We understand that you would rather deepen foundation elements than remove and replace the materials as properly compacted fill. Therefore for the balance of this report is oriented toward that alternative.

Expansive soils can shrink and swell with seasonal changes in moisture content and can heave and/or distress lightly loaded footings or slabs. We have observed that significant seasonal changes in moisture content generally occur in the upper 2 to 3 feet. However, depending on factors such as seasonal rainfall totals, summer weather conditions and surface treatments, significant moisture variations in the soils can occur to substantially greater depths. Therefore, we conclude that the expansive clays are not suitable for foundation or slab support in their present condition.

Foundations must extend into firm underlying materials well below the existing fills, weak upper soils and the zone of significant seasonal moisture variation. Accordingly, we judge that the most suitable foundation support system would be the use of drilled piers and grade beams. The piers can be designed to gain support from firm underlying soil by skin friction.

Because of the presence of existing fills, weak compressible soils and moderately expansive clays and the associated risk of slab heave, settlement and/or tilting, we do not recommend the use of concrete slab-on-grade floors in the living areas unless rough grading is performed that would include removal and replacement of weak soils as properly compacted fill and/or special foundation techniques are utilized. We judge that the most suitable alternative would be the use of wood floors supported on joists above grade. Therefore, the balance of this report is oriented toward that alternative.

We judge that the garage slab and terrace slabs could be supported directly on properly prepared site soils. However, because of underlying weak soils and the presence of existing fills,

settlement and more than normal slab cracking should be anticipated. The risk of such slab distress could be reduced (but not eliminated) by upgrading a portion of the underlying weak soils by compaction. The risk of slab distress could be further reduced by separating the floor slabs from adjacent foundations and by reinforcing slabs with steel bars.

For foundation designed and installed in accordance with our recommendations, we judge that foundation settlements will be less than about 1 inch. Post-construction settlements should be about one-half this amount.

SEISMIC DESIGN CRITERIA

Because of the site proximity to the active Hayward and San Andreas Faults, as well as the presence of several other large active faults in the region, we judge that the potential exists for the project site to be subjected to very strong earthquake ground shaking during the project life. The intensity of seismic ground shaking at the site would depend on a number of factors including the magnitude of the earthquake, the distance to the earthquake epicenter, the nature of the fault motion, and the depth and physical characteristics of the soil and rock underlying the site.

We have determined seismic ground motion values in accordance with procedures outlined in Section 1613 of the 2016 California Building Code (CBC). Mapped acceleration parameters (S_s and S_1) were obtained by inputting approximate site coordinates (latitude and longitude) into earthquake ground motion software developed by the United States Geological Survey. Based on our review of available geologic maps and our knowledge of the subsurface

RECOMMENDATIONS

Site Grading

The areas to be graded should be cleared of surface obstructions and dense growths of grass. Designated trees should be removed and their root-balls excavated for their full depth. The cleared materials should be removed from the site. The surface then should be stripped of upper soils containing root growth and organic matter, where encountered. We anticipate that the depth of stripping will average about 3 inches. The strippings should be removed from the site or stockpiled for reuse as topsoil in landscaping areas.

Wells, septic tanks or other underground obstructions encountered during grading should be removed or abandoned in place. The resultant voids should be backfilled with soil or granular material that is properly compacted, as subsequently discussed, or capped with concrete. The method of removal/abandonment and void backfilling should be determined by the appropriate governing agency and/or the soil engineer.

To help reduce potential distress to concrete garage slabs and exterior concrete flatwork, we recommend that the upper 18 inches of compressible fill or weak natural soils in concrete slab areas be overexcavated and then replaced as compacted fill. The surface exposed by stripping or excavation should be scarified to a depth of at least 6 inches, moisture conditioned to at least 2 percentage points wet of optimum and compacted to at least 90 percent relative compaction.¹

¹ Relative compaction refers to the in-place dry density of fill expressed as a percentage of maximum dry density of the same material determined in accordance with the American Society for Testing and Materials (ASTM) Standard ASTM D 1557 laboratory compaction test procedure. Optimum moisture content refers to the moisture content at maximum dry density.

The moisture conditioning should be sufficient to close any shrinkage cracks for their full depth, or be replaced with compacted granular materials.

Approved, on-site or imported fill materials then should be spread in 8-inch-thick loose lifts, moisture conditioned (to at least 3 percent over optimum for on-site clayey soils) and compacted to at least 90 percent relative compaction. Site grading and fill placement should be observed and tested by the soil engineer

Imported fill, if used, should be low in expansion material and have a Plasticity Index of 15 or less. The fill material should be free of organic matter and rocks or hard fragments larger than 4 inches in diameter. The material proposed for use as nonexpansive fill should be tested and approved by the soil engineer prior to importation to the site.

Foundations

Drilled piers can be used for foundation support. Drilled piers should be at least 14 inches in diameter. Piers should be drilled through the existing fills, where applicable, and extend at least 7 feet into underlying firm natural soil, as determined in the field by the soil engineer. At the west side of the proposed residence, the existing fills are about 4 to 5 feet thick. Therefore, pier depths are anticipated to vary from about 14 feet at the west side of the residence to about 10 feet at the east side.

Vertical loads on the piers can be carried below the existing fills or upper 3 feet, whichever is deeper, in skin friction using a value of 600 pounds per square foot (psf). End bearing should be neglected because of the difficulty of cleaning out small diameter holes and the

uncertainty of mobilizing end bearing and skin friction simultaneously. The skin friction value can be increased by one-fourth when considering wind or seismic forces. In general, piers should be spaced no closer than three diameters, center to center.

Resistance to lateral loads on piers can be obtained from a passive equivalent fluid pressure of 200 pounds per cubic foot (pcf) applied over two pier diameters. Passive pressure can be assumed to commence at the ground surface, but should be neglected in the upper 3 feet. Piers beneath perimeter and bearing walls should be inter-connected with grade beams designed to support the calculated structural loads. In lieu of grade beams under bearing walls, the framing must be sufficient to carry the loads, as required by the CBC. Piers should be reinforced with bars as determined by the structural design engineer.

To retard wet concrete from settling, pier holes should not contain more than 3 inches of slough. It may be necessary to tamp the slough with a heavy timber prior to concrete placement, as determined in the field by the soil engineer.

No caving soils or groundwater was encountered within the anticipated pier depths during our exploration. However, caving soils and/or perched groundwater could be encountered during pier drilling operations. If caving soils are encountered, it may be necessary to case the holes. If groundwater is encountered, it may be necessary to dewater the holes or to place the concrete by an approved pumping method.

Soil Engineering Drainage

Ponding water will cause softening of the site soils and could be detrimental to foundations. It is important that the building site be sloped to drain away from foundations. The roofs should be provided with gutters, and the downspouts should be connected to nonperforated pipelines that discharge to existing or planned drainage facilities and away from the existing fills, as shown on Plate 1. We recommend that good, positive surface drainage away from the building consisting of at least 1/2-inch per foot extending at least 4 feet out be provided.

Foundation subdrains should be provided along the uphill (east) side of the foundation and may be needed at intermediate grade beam levels. Foundation subdrains should consist of trenches about 12 inches wide by about 18 inches deep that are filled with free-draining gravel or crushed rock. The trench should extend at least 8 inches below the bottom of the adjacent grade beam. A 3-inch-diameter, perforated plastic pipe should be installed in the trench on a bed of drainrock. The drainrock should conform to the quality requirements for Class 2 Permeable Materials per Caltrans Standard Specifications. As an alternative, any clean, washed durable rock product containing less than 1 percent soil from the soil bank by a nonwoven, geotextile fabric, such as Mirafi 140N or equivalent, weighting at least 4 ounces per square foot. The rock should extend to within 6 inches of the surface and at least 4 inches above the bottom of the grade beam. The upper 6 inches should consist of compacted, excavated soil to inhibit surface water infiltration. The perforated pipe should extend to a suitable gravity discharge point, as discussed above. A typical cross-section of a foundation subdrain is shown on Plate 7.

With a drilled pier and grade beam foundation, there is a potential for outside water to seep under grade beams and collect in underfloor areas. Fine or finish grading around the house should be performed carefully. Loose or poorly compacted materials should not be allowed adjacent to grade beams. It should be recognized that fences, walks, patio slabs, lawns, planters, etc., can impede water flow and promote surface soil saturation and seepage into underfloor areas. Also, the installation of underfloor drainage pipelines, swales and/or subdrains should be considered. We can provide specific recommendations, if desired.

Roof downspouts and surface drains should be maintained entirely separate from foundation subdrains and underfloor drainage systems.

Supplemental Services

We should review final foundation plans for conformance with the intent of our recommendations. During construction, we should be notified to observe and test site grading work, if any. The soil engineer should observe pier drilling operations to verify that suitable bearing materials are encountered and to modify our recommendations, if warranted. Foundation forms and reinforcing should be checked by the Building Department.

LIMITATIONS

We have performed the investigation and prepared this report in accordance with generally accepted standards of the soil engineering profession. No warranty, either express or implied, is given. This scope of work is limited to evaluating the physical properties of earth

materials considered typical of geotechnical engineering practice and does not include other concerns such as soil chemistry, corrosion potential, mold, and soil and/or groundwater contamination.

Subsurface conditions are complex and may differ from those indicated by surface features or encountered at test pit locations. Therefore, variations in subsurface conditions not indicated on the test pit logs could be encountered.

If the project is revised or if conditions different from those described in this report are encountered during construction, we should be notified immediately so that we can take timely action to modify our recommendations, if warranted.

Supplemental services as recommended herein are performed on an as-requested basis. We can accept no responsibility for items we are not notified to check, or for use or interpretation by others of the information contained herein. Such services are in addition to this soil investigation, and are charged for on an hourly basis in accordance with our Standard Schedule of Charges.

Site conditions and standards of practice change. Therefore, we should be notified to update this report if construction is not performed within 24 months.

LIST OF PLATES

Plate 1	Test Pit Location Plan and Site Vicinity Map
Plate 2	Log of Test Pits 1 through 5
Plate 3	Soil Classification Chart and Key to Test Data
Plate 4	Physical Properties for Rock Descriptions
Plate 5	Laboratory Test Data
Plate 6	Plasticity Index Test Results
Plate 7	Typical Cross-Section Foundation Subdrain Detail

DISTRIBUTION

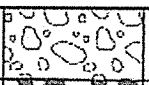





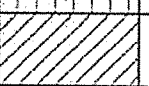

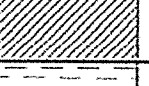



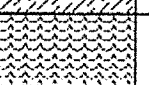
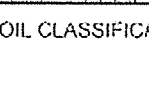
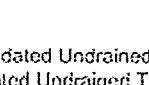
Copies Submitted: 5

Advanced Building Solutions
855 Lakeville Street, Suite 200
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Attention: Chris Scerri
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BKF Engineers
Attention: Eric Wade
ewade@bkf.com

BFP/JKR:may/ra/Job No. 720.6.1

UNIFIED SOIL CLASSIFICATION SYSTEM

MAJOR DIVISIONS			TYPICAL NAMES		
COARSE GRAINED SOILS <small>MORE THAN HALF IS LARGER THAN No. 200 SIEVE</small>	GRAVEL <small>MORE THAN HALF OF COARSE FRACTION IS LARGER THAN No. 4 SIEVE SIZE</small>	CLEAN GRAVEL WITH LESS THAN 5% FINES	GW		WELL GRADED GRAVEL, GRAVEL-SAND MIXTURE
		GRAVEL WITH OVER 12% FINES	GP		POORLY GRADED GRAVEL, GRAVEL-SAND MIXTURE
		GRAVEL WITH OVER 12% FINES	GM		SILTY GRAVEL, GRAVEL-SAND-SILT MIXTURE
			GC		CLAYEY GRAVEL, GRAVEL-SAND-CLAY MIXTURE
	SAND <small>MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN No. 4 SIEVE SIZE</small>	CLEAN SAND WITH LESS THAN 5% FINES	SW		WELL GRADED SAND, GRAVELLY SAND
		SAND WITH OVER 12% FINES	SP		POORLY GRADED SAND, GRAVELLY SAND
		SAND WITH OVER 12% FINES	SM		SILTY SAND, GRAVEL-SAND-SILT MIXTURE
			SC		CLAYEY SAND, GRAVEL-SAND-CLAY MIXTURE
FINE GRAINED SOILS <small>MORE THAN HALF IS SMALLER THAN No. 200 SIEVE</small>	SILT AND CLAY <small>LIQUID LIMIT LESS THAN 50</small>	ML		INORGANIC SILT, ROCK FLOUR, SANDY OR CLAYEY SILT WITH LOW PLASTICITY	
		CL		INORGANIC CLAY OF LOW TO MEDIUM PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAY (LEAN)	
		OL		ORGANIC CLAY AND ORGANIC SILTY CLAY OF LOW PLASTICITY	
	SILT AND CLAY <small>LIQUID LIMIT GREATER THAN 50</small>	MH		INORGANIC SILT, MICACEOUS OR DIATOMACEOUS FINE SANDY OR SILTY SOIL, ELASTIC SILT	
		CH		INORGANIC CLAY OF HIGH PLASTICITY, GRAVELLY, SANDY OR SILTY CLAY (FAT)	
		OH		ORGANIC CLAY OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILT	
HIGHLY ORGANIC SOILS			PT		PEAT AND OTHER HIGHLY ORGANIC SOILS

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

KEY TO TEST DATA

EI - Expansion Index	TxUU - Unconsolidated Undrained Triaxial	320	(2600)	
Consol - Consolidation	TxCU - Consolidated Undrained Triaxial	320	(2600)	
LL - Liquid Limit (in %)	DSCD - Consolidated Drained Direct Shear	2750	(2000)	
PL - Plastic Limit (in %)	FVS - Field Vane Shear	470		
PI - Plasticity Index	LVS - Laboratory Vane Shear	700		
SA - Sieve Analysis	UC - Unconfined Compression	2000		
G _s - Specific Gravity	UC(P) - Laboratory Penetrometer	700		
■ "Undisturbed" Sample				
□ Bulk Sample				

Notes: (1) All strength tests on 2.8" or 2.4" diameter samples unless otherwise indicated.

* Compressive Strength

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 GEOTECHNICAL
 ENGINEERS

Job No: 720.6.1

Date: 5-26-17

Appr: B.P.

SOIL CLASSIFICATION CHART
 AND KEY TO TEST DATA
 OLEMA ROAD RESIDENCE
 FAIRFAX, CALIFORNIA

PLATE

3

A: CONSOLIDATION OF SEDIMENTARY ROCKS; usually determined from unweathered samples.

Largely dependent on cementation

1. U - unconsolidated
2. P - poorly consolidated
3. M - moderately consolidated
4. W - well consolidated

B: BEDDING OF SEDIMENTARY ROCKS

Splitting Property	Thickness (in feet)	Stratification
1. Massive	Greater than 4.0 ft	very thick bedded
2. Blocky	2.0 to 4.0 ft	thick bedded
3. Slabby	0.2 to 2.0 ft	thin bedded
4. Flaggy	0.05 to 0.2 ft	very thin bedded
5. Shaly or platy	0.01 to 0.05 ft	laminated
6. Papery	Less than 0.01 ft	thinly laminated

C: FRACTURING

Intensity	Size of Pieces (in feet)
1. Very little fractured	Greater than 4.0 ft
2. Occasionally fractured	1.0 to 4.0 ft
3. Moderately fractured	0.5 to 1.0 ft
4. Closely fractured	0.1 to 0.5 ft
5. Intensely fractured	0.05 to 0.1 ft
6. Crushed	Less than 0.05 ft

D: HARDNESS

1. Soft - Reserved for plastic material alone.
2. Low hardness - can be gouged deeply or carved easily with a knife blade.
3. Moderately hard - can be readily scratched by a knife blade; scratch leaves a heavy trace of dust and is readily visible after the powder has been blow away.
4. Hard - can be scratched with difficulty; scratch produces little powder and is often faintly visible
5. Very hard - cannot be scratched with knife blade; leaves a metallic streak

E: STRENGTH

1. Plastic - of very low strength.
2. Friable - Crumbles easily by rubbing with fingers.
3. Weak - An unfractured specimen of such material will crumble under light hammer blows.
4. Moderately strong - Specimen will withstand a few heavy hammer blows before breaking.
5. Strong - Specimen will withstand a few heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.
6. Very strong - Specimen will resist heavy ringing hammer blows and will yield with difficulty only dust and small flying fragments.

F: WEATHERING - The physical and chemical disintegration and decomposition of rocks and minerals by natural processes such as oxidation, reduction, hydration, solution, carbonation, and freezing and thawing

1. Deep - Moderate to complete mineral decomposition; extensive disintegration; deep and thorough discoloration; many fractures, all extensively coated or filled with oxides, carbonates and/or clay or silt.
2. Moderate - Slight change or partial decomposition of minerals; little disintegration; cementation little to unaffected. Moderate to occasional intense discoloration. Moderately coated fractures.
3. Little - No megascopic decomposition of minerals; little or no effect on normal cementation. Slight and intermittent, or localized discoloration. Few stains on fracture surfaces.
4. Fresh - Unaffected by weathering agents. No disintegration or discoloration.

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ENGINEERS

Job No: 720.6.1

Date: 05-26-17

Appr: RRP

**PHYSICAL PROPERTIES FOR
ROCK DESCRIPTIONS**

**OLEMA ROAD RESIDENCE
1 OLEMA ROAD
FAIRFAX, CALIFORNIA**

PLATE

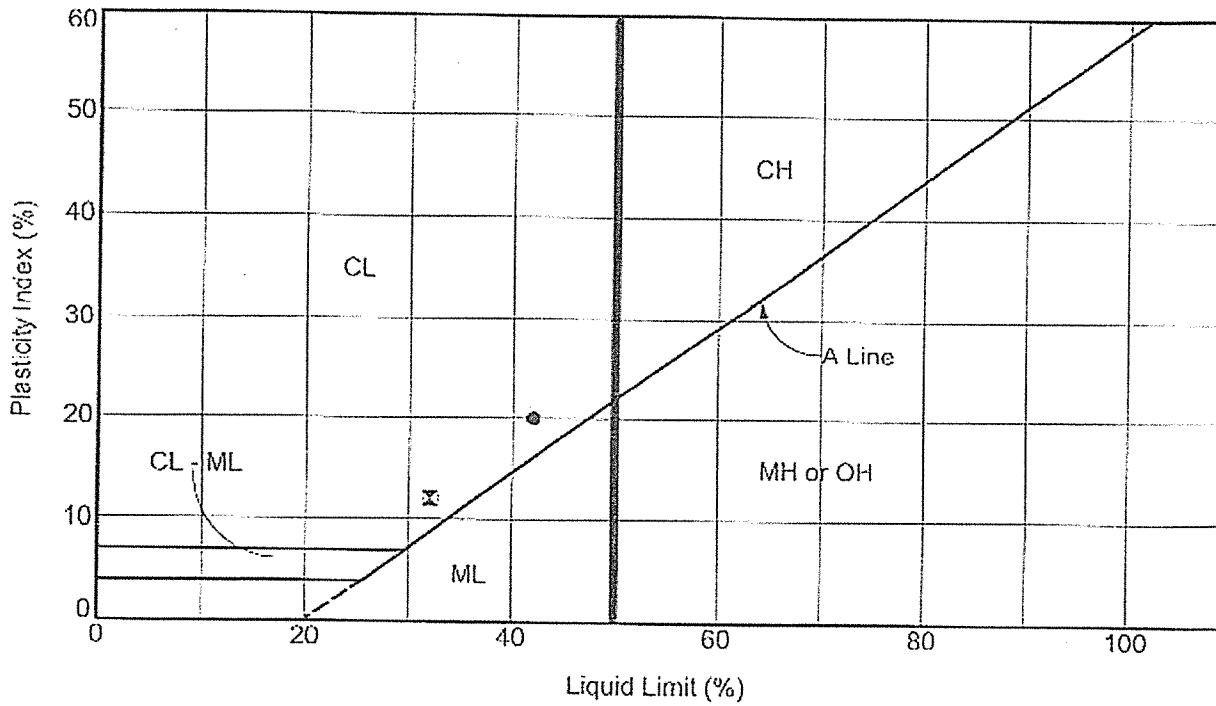
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<u>PIT NUMBER</u>	<u>DEPTH</u>	<u>TEST TYPE*</u>	<u>TEST RESULTS</u>
1	0.5	FS	35
	1.0	UC(P)	500
	1.5	FS	40
	1.5	-200	57.6
	2.0	UC(P)	1500
	3.0	UC(P)	3000
	3.0	FS	50
	3.5	FS	50
	4.0	UC(P)	3000
	5.0	UC(P)	4500+
2	1.0	UC(P)	1500
	1.0	FS	50
	3.0	UC(P)	3000
	3.5	FS	50
	4.0	UC(P)	3500
	6.5	UC(P)	4500
3	1.0	UC(P)	1000
	3.0	FS	65
	3.0	-200	60.1
	3.0	UC(P)	2500
4	0-3.0	FS	35
	0-3.0	-200	52.7
	1.0	UC(P)	1500
	2.0	UC(P)	1500
	3.0	UC(P)	2000
	5.0	UC(P)	2000

*Test Type

- M Moisture Content (percent of dry weight)
- MD Moisture Content (percent of dry weight)/dry density (pounds per cubic foot)
- UC(P) Penetrometer - strength indicator (pounds per square foot)
- UC Unconfined Compression (pounds per square foot)
- 200 Percent Passing No. 200 sieve by weight
- FS Percent Free Swell

REESE & ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS	Job No: <u>720.6.1</u>	<u>LABORATORY TEST DATA</u> OLEMA ROAD RESIDENCE 1 OLEMA ROAD FAIRFAX, CALIFORNIA	PLATE
	Date: <u>05-26-17</u>		5
	Appr: <u>BP</u>		



ASTM D 4318-98

Symbol	Classification and Source	Liquid Limit (%)	Plastic Limit (%)	Plasticity Index (%)	Free Swell (%)
●	MOTTLED ORANGE-DARK BROWN SANDY CLAY (CL) Test Pit 3 at 3.0 feet	42	22	20	65
⊠	MOTTLED ORANGE-DARK BROWN VERY SANDY CLAY (CL) Test Pit 4 at 3.0 feet	32	20	12	35

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Job No: 720.6.1

Date: 5-26-17

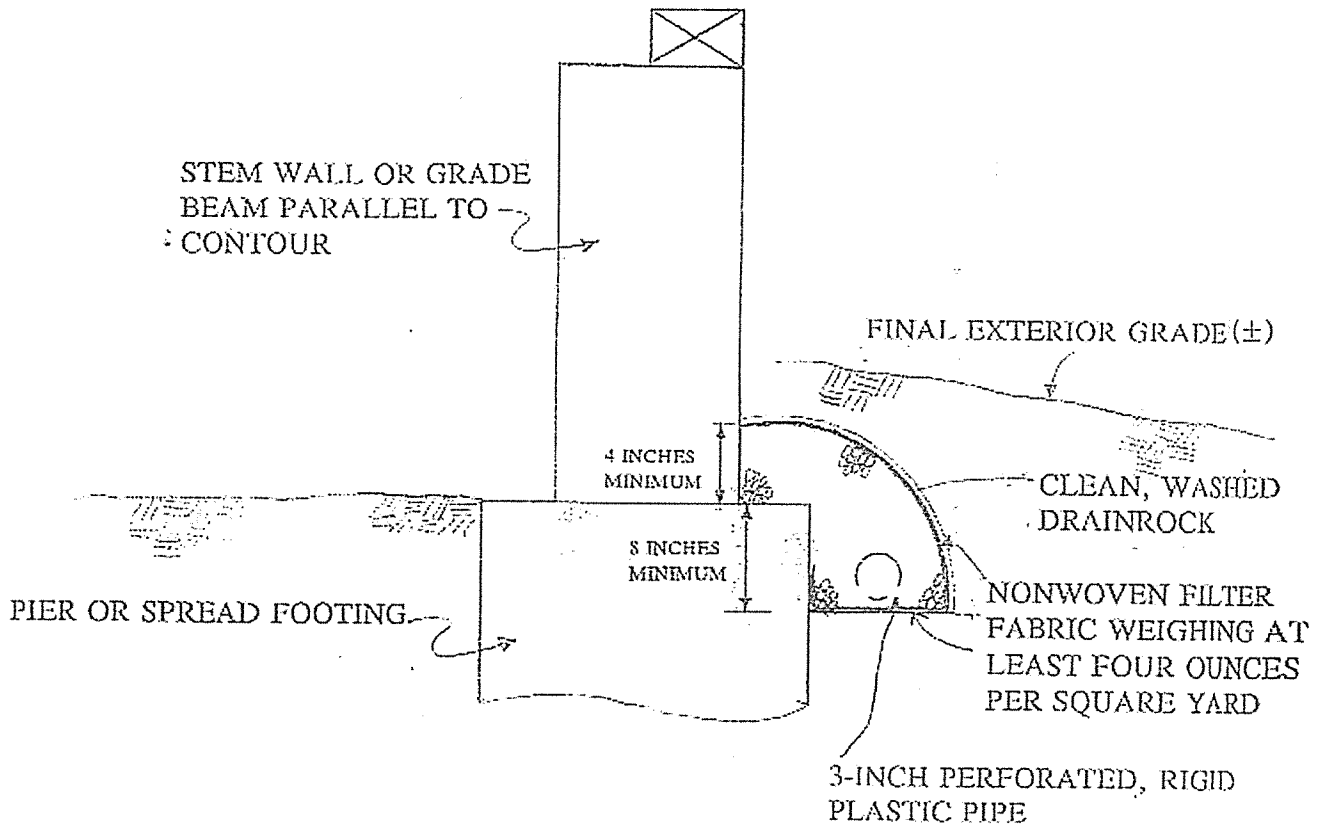
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ATTERBERG LIMITS TEST RESULTS

OLEMA ROAD RESIDENCE
FAIRFAX, CALIFORNIA

PLATE

6



FOUNDATION SUBDRAIN

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Job No: 720.6.1

Date: 05-26-17

Appr: RF

TYPICAL CROSS-SECTION
 FOUNDATION SUBDRAIN
 OLEMA ROAD RESIDENCE
 1 OLEMA ROAD
 FAIRFAX, CALIFORNIA

PLATE

7

JUN 07 2017

RECEIVED

May 15th, 2017

BKF Ref#: 20169144-10

Chris Scerri
Advanced Building Solutions
Sent via email

**Subject: Opinion of Probable Earthwork Quantity for the proposed residence
APN 001-131-08 in the Town of Fairfax, CA.**

Dear Mr. Scerri,

This letter has been prepared to state an approximate quantity of earthwork that is expected during the construction of the new residence at the above referenced property.

The quantity of earthwork reflected below is based on the proposed house footprint and finished ground contours shown on sheet L-1 of the preliminary Landscape drawings by Pedersen Associates assuming a finished floor elevation of 144' and the preliminary recommendations provided by the Geotechnical Engineer in Attachment A to this letter.

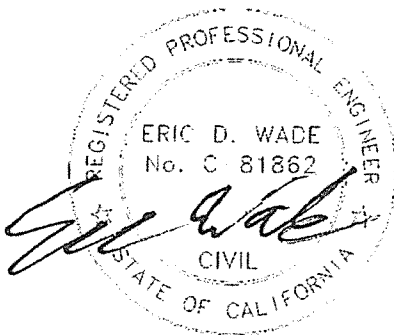
A summary of the expected earthwork quantity is as follows:

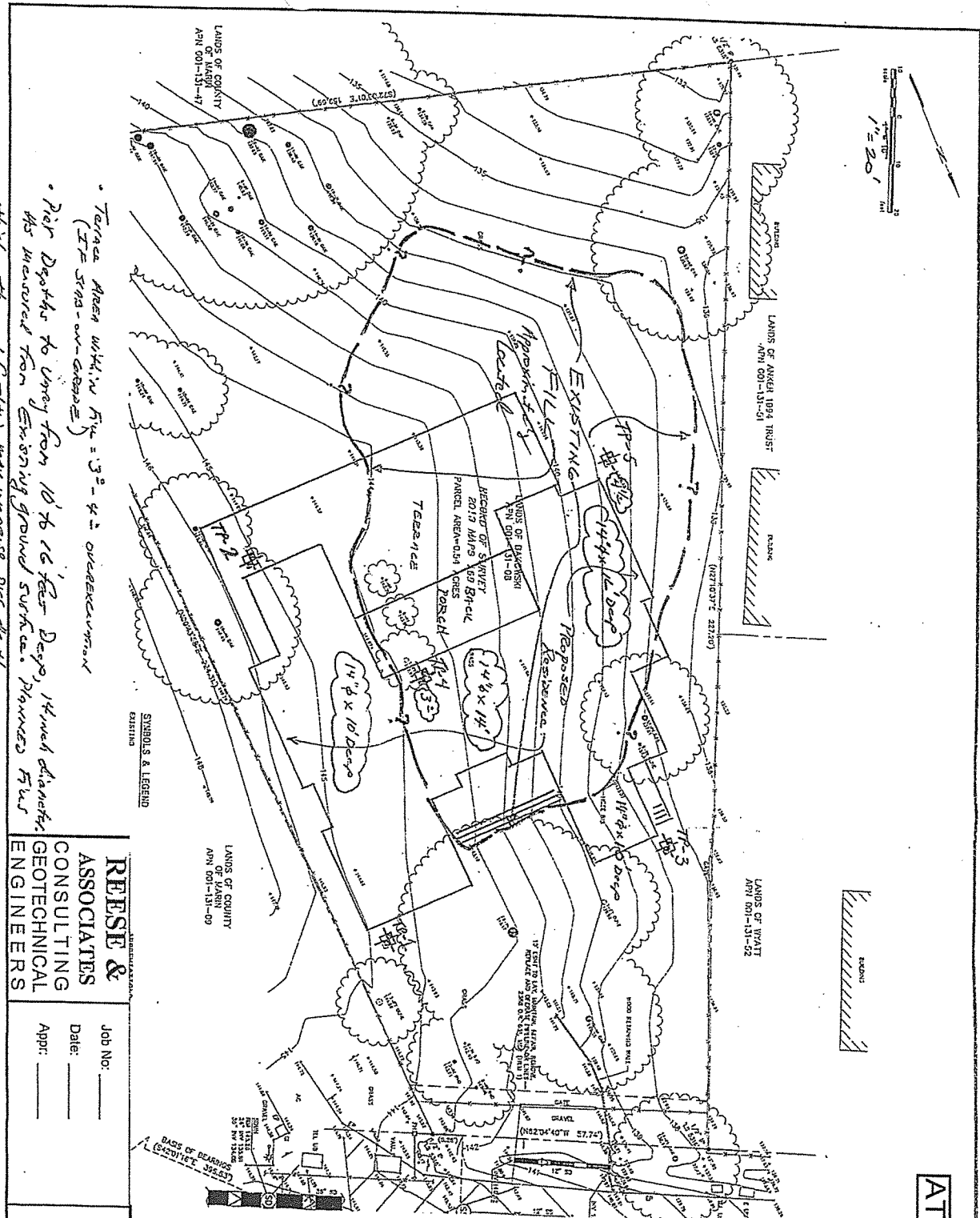
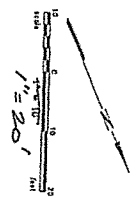
1) Surface grading: material moved on site:	270 cubic yards
2) <u>Soil remediation: overexcavation & recompaction:</u>	<u>80 cubic yards</u>
Total Earthwork:	350 cubic yards

Attachment B to this letter consists of sheet L-1 with the proposed house and site improvements, areas of excavation, fill placement, and over-excavation and re-compaction of an existing fill where a slab-on-grade may occur. Excavated material (cut) reused on site as fill is considered material moved on site and is only counted once. This analysis is for planning purposes as the actual amount of earthwork may vary with the development of construction drawings and as work progresses.

Sincerely,

Eric D. Wade, P.E.
BKF Engineers
(707)583-8513





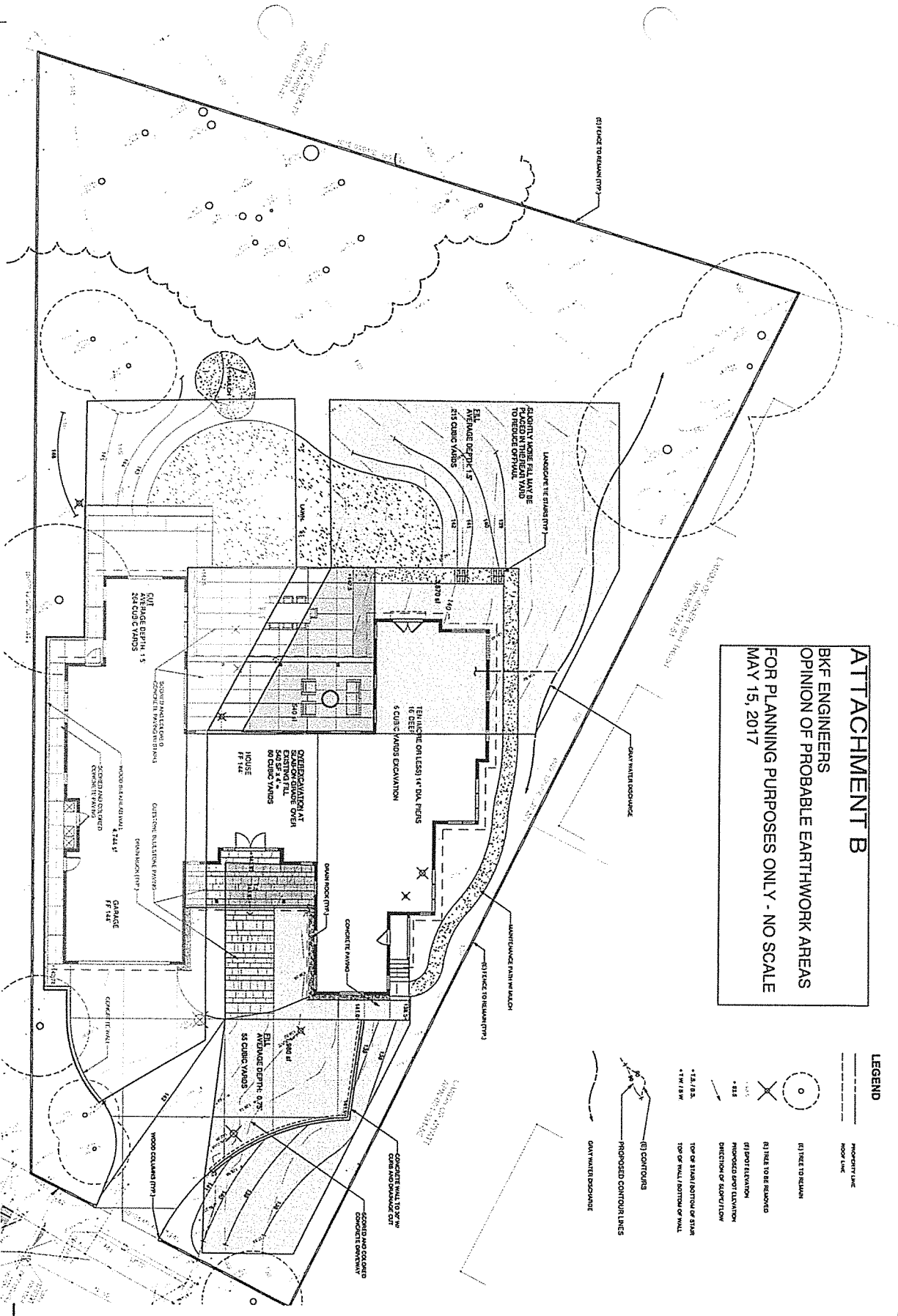
Terrace Area within $F_{1/2} = 3' - 2' - 4'$ OVEREXCAVATION
 (IF 5'00" - or - greater)
 Pier Depths to Vary from 10' to 16' feet Deep, 14' inch diameter,
 As measured from Existing ground surface. Pinned Piers
 thicker than 1 foot (4') may increase pier depth

ATTACHMENT A

REISE & ASSOCIATES CONSULTING GEOTECHNICAL ENGINEERS	Job No. _____	1 OLENA Road Fairfax, CA	PLATE 1
	Date: _____		
	Appr: _____		

PRELIMINARY

ATTACHMENT B
BKF ENGINEERS
OPINION OF PROBABLE EARTHWORK AREAS
FOR PLANNING PURPOSES ONLY - NO SCALE
MAY 15, 2017



LEGEND

	PROPERTY LINE
	ROAD LINE
	TREE TO BE RETAINED
	TREE TO BE REMOVED
	SPOT ELEVATION
	PROPOSED SPOT ELEVATION
	DIRECTION OF SLOPE
	TOP OF SLAB / BOTTOM OF SLAB
	TOP OF WALL / BOTTOM OF WALL
	PROPOSED CONTOUR LINES
	DRAIN WATER DISCHARGE

PA
PEDERSEN ASSOCIATES
LANDSCAPE ARCHITECTS
1 OLEMA ROAD
FARMAC, CA
APR. 05/13/14

PROJECT TITLE OLEMA RT. PK
ORIGINAL DRAWING DATE 7/23/14
SCALE 1/8" = 1'-0"

MATERIALS PLAN
SHEET #
L-1

PROJECT TITLE OLEMA RT. PK
ORIGINAL DRAWING DATE 7/23/14
SCALE 1/8" = 1'-0"

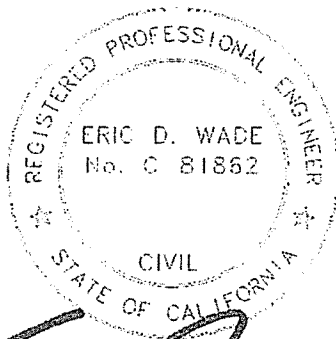
DRAINAGE NARRATIVE

OLEMA ROAD RESIDENCE

FAIRFAX, CA

APN 019-150-008

JULY 2017



Eric D. Wade
BKF Engineers

JUL 27 2017

This study was performed under the hydrology manual simplified instructions established by County of Marin, Department of Public Works, revised 8/2/2000.

GENERAL

The following drainage narrative is intended to provide a high-level view of the proposed single family residential project for the purposes of planning. The information presented here is limited to offsite topography obtained from the Marin Map GIS website and the current site development plan which is subject to change with the development of construction drawings.

The site where this project is proposed is on an undeveloped parcel near the intersection of Olema Road and Sir Francis Drake Blvd in Fairfax. The site is covered by mostly grass and isolated stands of trees, and contains slopes between 3% and 18%, although the residence will be sited on the flatter portion of the site as much as practical. An existing gravel driveway with a wood retaining wall currently provides access to the site, with an existing 12" corrugated metal culvert under the driveway. The site is bordered by Olema Road on the north, a parking area for the library and paved path to the west, a community garden to the south, and single family residential lots to the west. The majority of the site currently appears to drain towards the residential lots to the west, with a smaller area draining to the south towards the creek.

A new residence and improved driveway are proposed on the site. To mitigate the effect of runoff from the new residence, a drainage swale along the westerly property boundary is planned to divert water from flowing on to the neighboring residential lots and instead directing it to a rock stormwater dissipater pad to help reduce the velocity of the water and to spread out the flow. Runoff from the new driveway will be directed out to the drainage ditch along the property frontage, further reducing the amount of runoff which would otherwise flow onto the neighboring residential lot. The existing 12" driveway culvert is proposed to be reused more or less in place with a new standard grated inlet connected at the upstream end of the culvert.

HYDROLOGY

The 60 minute duration 100-year event rainfall intensity and rainfall zone were determined using Map I and Map V in the County of Marin Hydrology Manual. Copies of those maps with the site location identified are included in the Appendix of this report along with Chart K which was used to determine the design rainfall intensity at each drainage area concentration point.

As shown in the drainage exhibit in the Appendix, runoff coefficient C values assumed for the developed condition range from 0.7 to 1 in accordance with the Marin County Public Works Hydrology Manual.

A summary of the calculated flows are as follows:

Area A: driveway culvert & grate inlet

Area= 0.67 acres, C=0.9

Flow length= 330-feet, Δh = 12-ft, S= 0.036

$T_c = [1.8(1.1-C)(L^{0.5})] / [(S*100)^{0.33}] + 5 \text{ min} = 9 \text{ min}$

$i = 3.3 \text{ in/hr}$ (from chart K)

$Q = (0.9)(3.3)(0.67) = 2.0 \text{ cfs}$

Area B: swale

Area= 0.46 acres, C=0.84

Flow length= 250-ft, Δh = 11-ft, S=0.044

$T_c = [1.8(1.1-C)(L^{0.5})] / [(S*100)^{0.33}] + 5 \text{ min} = 9 \text{ min}$

$i = 3.3 \text{ in/hr}$ (from chart K)

$Q = (0.84)(3.3)(0.46) = 1.3 \text{ cfs}$

HYDRAULIC SIZING

INLET

An inlet control chart labeled "Grate Flow Capacities for Standard Galvanized Steel Grates" is included in the Appendix of this report to show the proposed grated inlet passes the 100-year design flow.

DRIVEWAY CULVERT

The tributary area of the culvert was assessed using publicly available topographic information from the Marin Map GIS website. This drainage area is overly conservative since most of the area uphill of the culvert on the library site appears to drain to a nearby existing inlet on the east side of the bike path. Computations are included in the appendix of this report to show that the culvert has been sized sufficiently to handle the 100-year storm based on the assumptions made in this report.

SWALE

Computations are included in the appendix of this report to show that the downhill swale collecting water from area B will contain the flows generated by the 100-year storm event. The uphill swale in the project has similar geometry but less tributary flow so is not included.

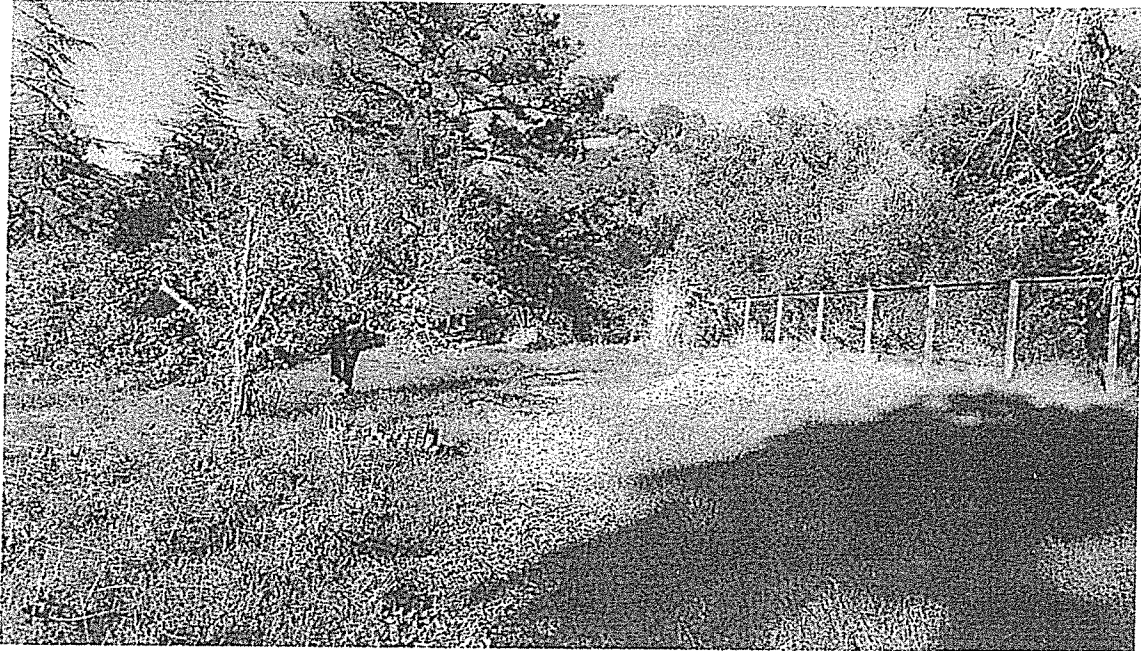


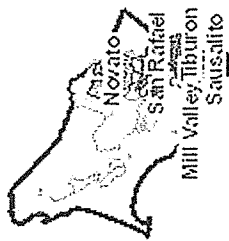
Photo of house site looking north – December 2016

APPENDIX A











Hydrology Map

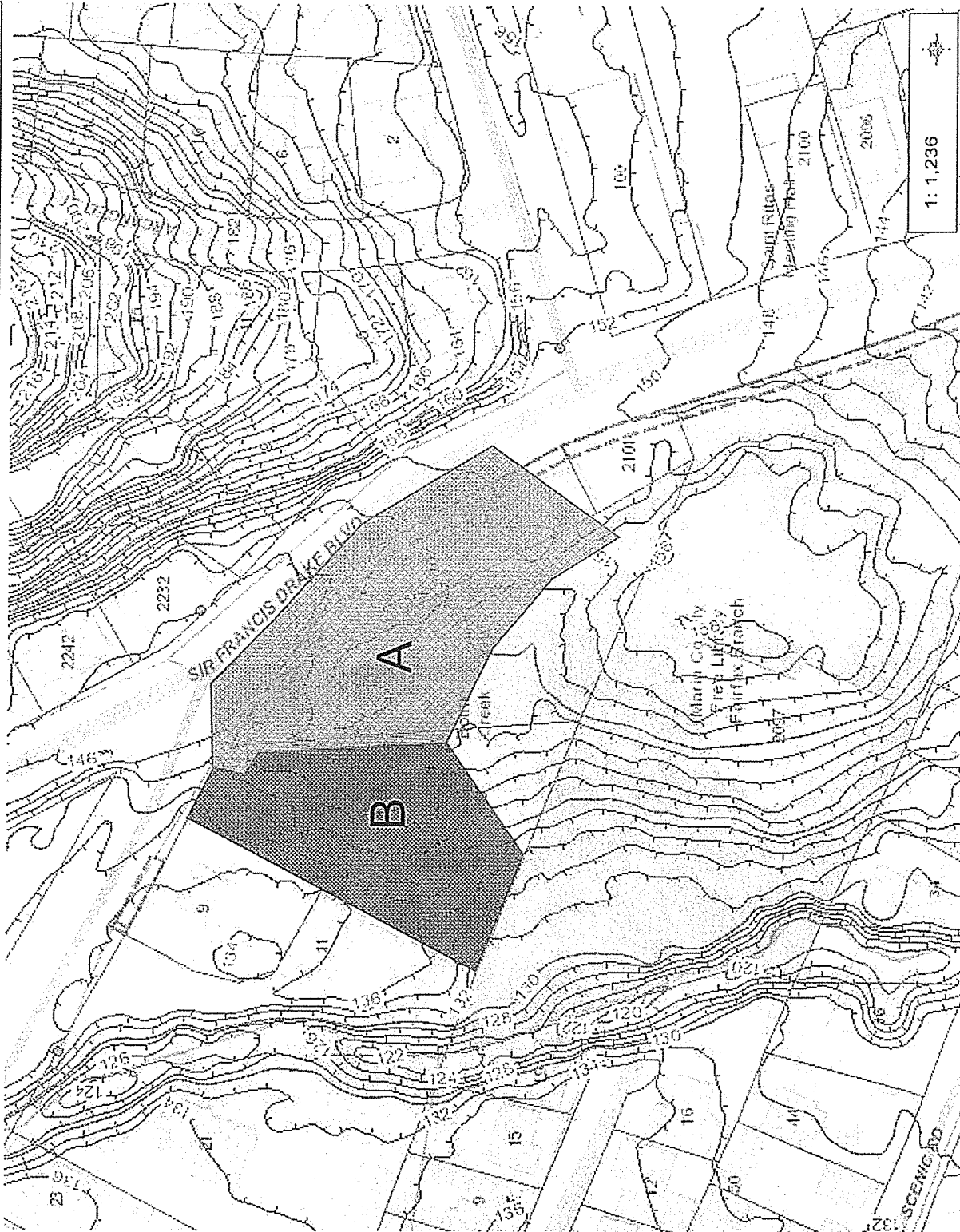
Hydraulic calculation excerpts

Olema Road Residence Drainage map



Legend

-  Parcel
-  Marin County Legal Boundary
-  Other Bay Area County
-  2-foot Elevation NAVD88
-  Interior
-  Index
-  Catch Basin
-  Manhole
-  Structure
-  MMWD Easement

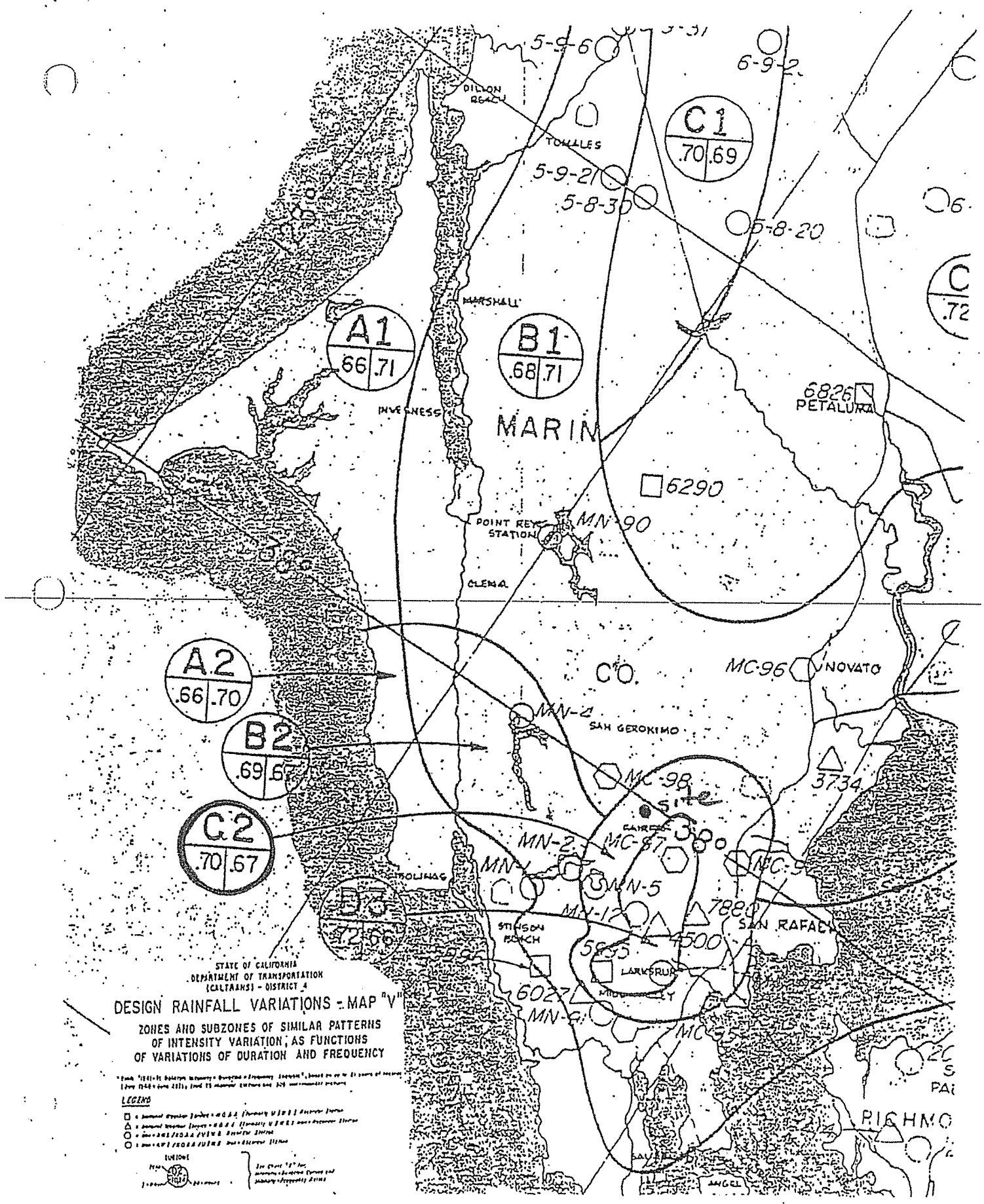


1: 1,236

206.0 0 102.99 206.0 Feet

This map is a user generated static output from an Internet mapping site and is for reference only. Data layers that appear on this map may or may not be accurate, current, or otherwise reliable.
THIS MAP IS NOT TO BE USED FOR NAVIGATION

Notes



STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 (CALTRANS) - DISTRICT 4

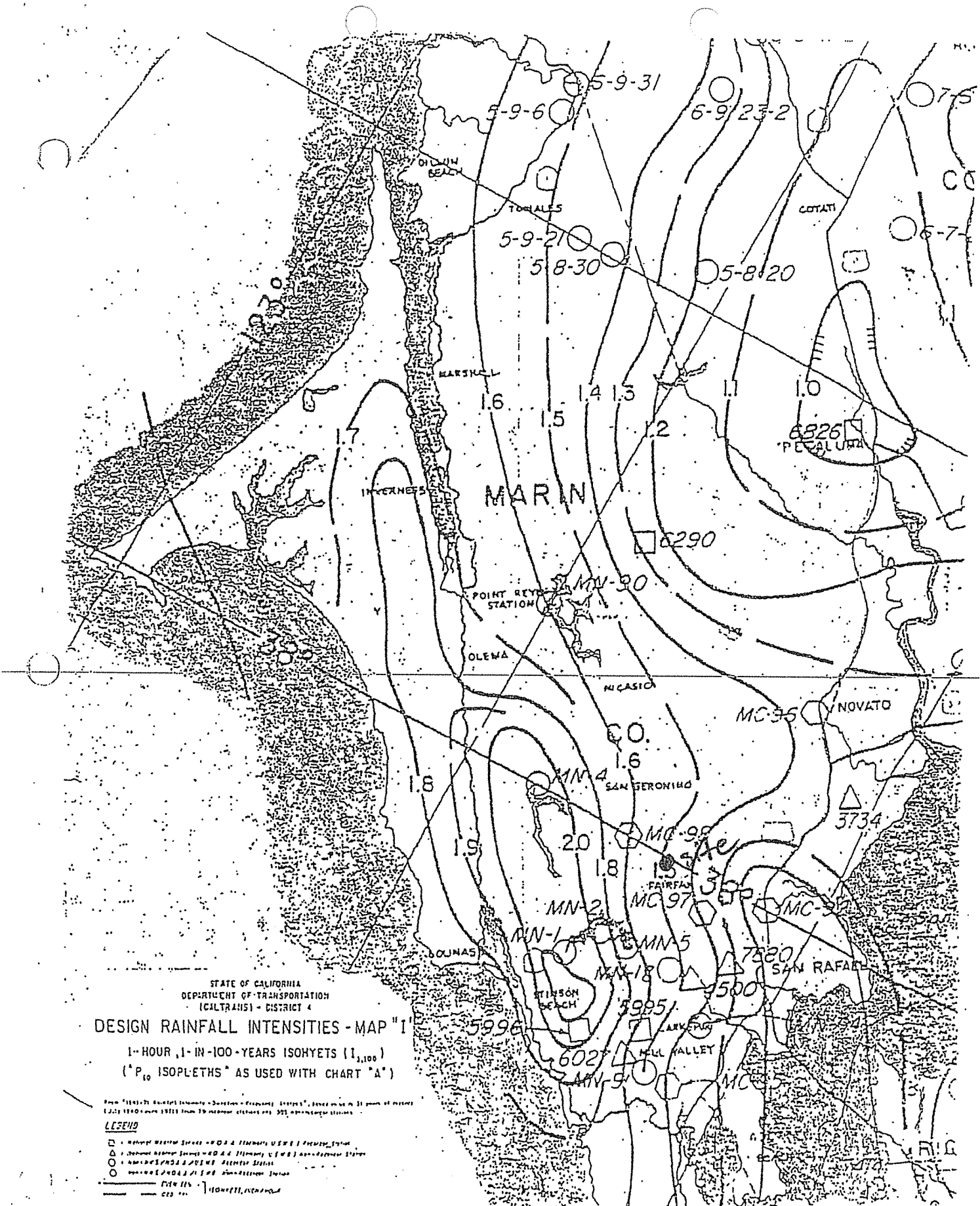
DESIGN RAINFALL VARIATIONS - MAP "V"
 ZONES AND SUBZONES OF SIMILAR PATTERNS
 OF INTENSITY VARIATION, AS FUNCTIONS
 OF VARIATIONS OF DURATION AND FREQUENCY

*Based on 1931-51 Station History - Duration of Frequency - Isohyets, based on up to 21 years of record
 (70% (24.5) from 211); and 15 minute (60% and 20% return periods)

LEGEND

- Annual Maximum (based on 24.5) (Intensity 100%)
- △ Annual Maximum (based on 24.5) (Intensity 100%)
- 15-MINUTE FREQUENCY (Intensity 100%)
- 15-MINUTE FREQUENCY (Intensity 100%)

UNION
 In Case of
 any questions
 contact the
 District Engineer



STATE OF CALIFORNIA
 DEPARTMENT OF TRANSPORTATION
 (CALTRANS) - DISTRICT 4
DESIGN RAINFALL INTENSITIES - MAP "I"
 1-HOUR, 1-IN-100-YEARS ISOHYETS (1₁₀₀)
 ("P₁₀ ISOPLETHS" AS USED WITH CHART "A")

From "1103-71" Bureau of Meteorology - San Francisco, California, 1971, Series 1103-71, 31 pages of figures
 (20) 1103-71 (1103) from 20 separate sheets and 202 separate figures

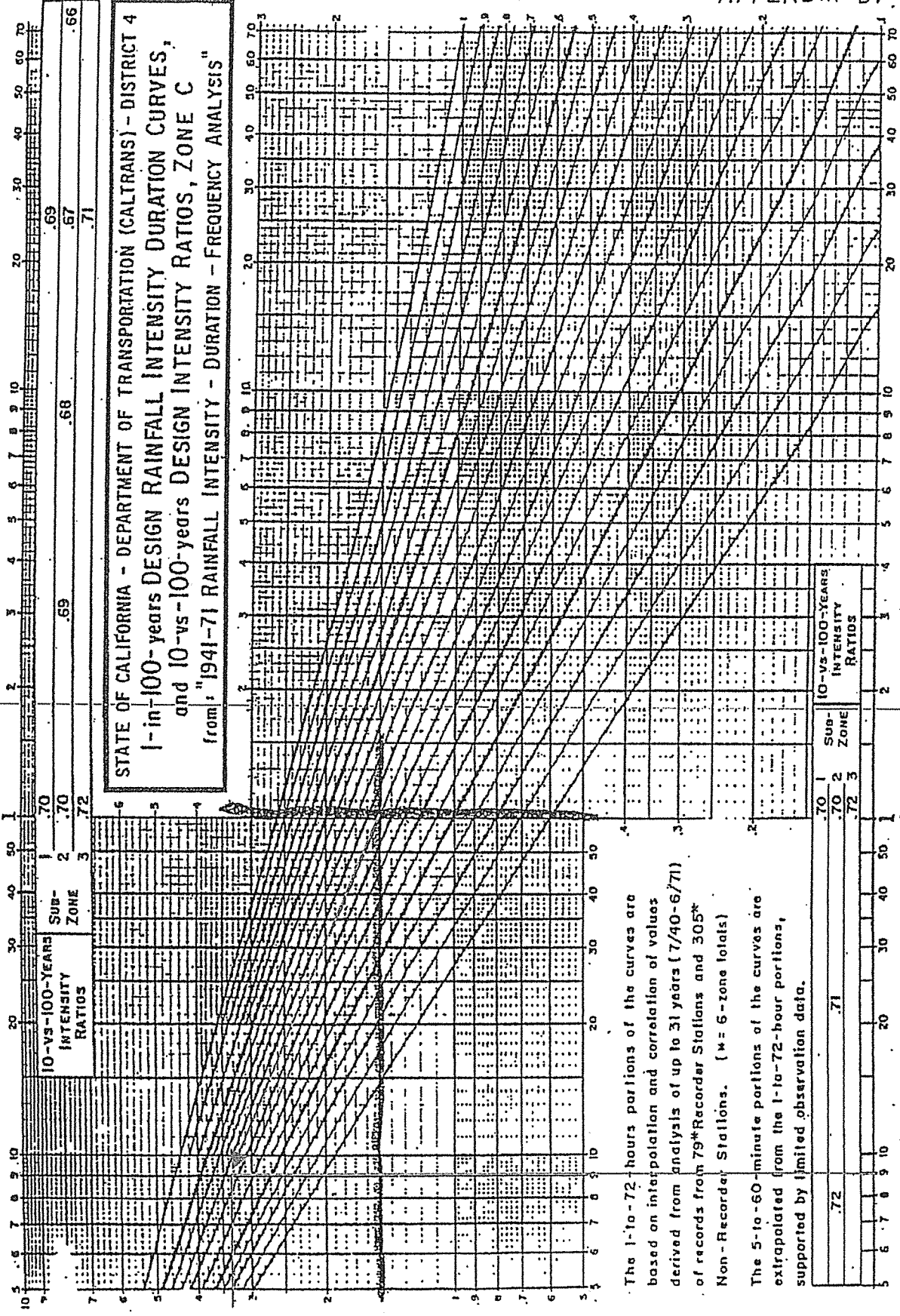
LEGEND

- National Weather Service - WDA 4 (Timothy, USWB) Precip. Station
- △ National Weather Service - WDA 4 (Timothy, USWB) Precip. Station
- National Weather Service - WDA 4 (Timothy, USWB) Precip. Station
- National Weather Service - WDA 4 (Timothy, USWB) Precip. Station

Scale 1:100,000

5.1
 13 112

Q = CIA



10-VS-100-YEARS INTENSITY RATIOS	1	2	3	4	5	6	7	8	9	10	20	30	40	50	60	70
SUB-ZONE	1	2	3													
	.70	.70	.72	.69	.68	.69	.68	.69	.67	.71	.69	.68	.69	.67	.71	.66

10-VS-100-YEARS INTENSITY RATIOS	1	2	3
	.70	.70	.72
SUB-ZONE	1	2	3
	.71	.71	.72

The 1-to-72 hours portions of the curves are based on interpolation and correlation of values derived from analysis of up to 31 years (7/40-6/71) of records from 79**Recorder Stations and 305* Non-Recorder Stations. (w = 6-zone totals)

The 5-to-60-minute portions of the curves are extrapolated from the 1-to-72-hour portions, supported by limited observation data.

3.3 in/hr

Channel Report

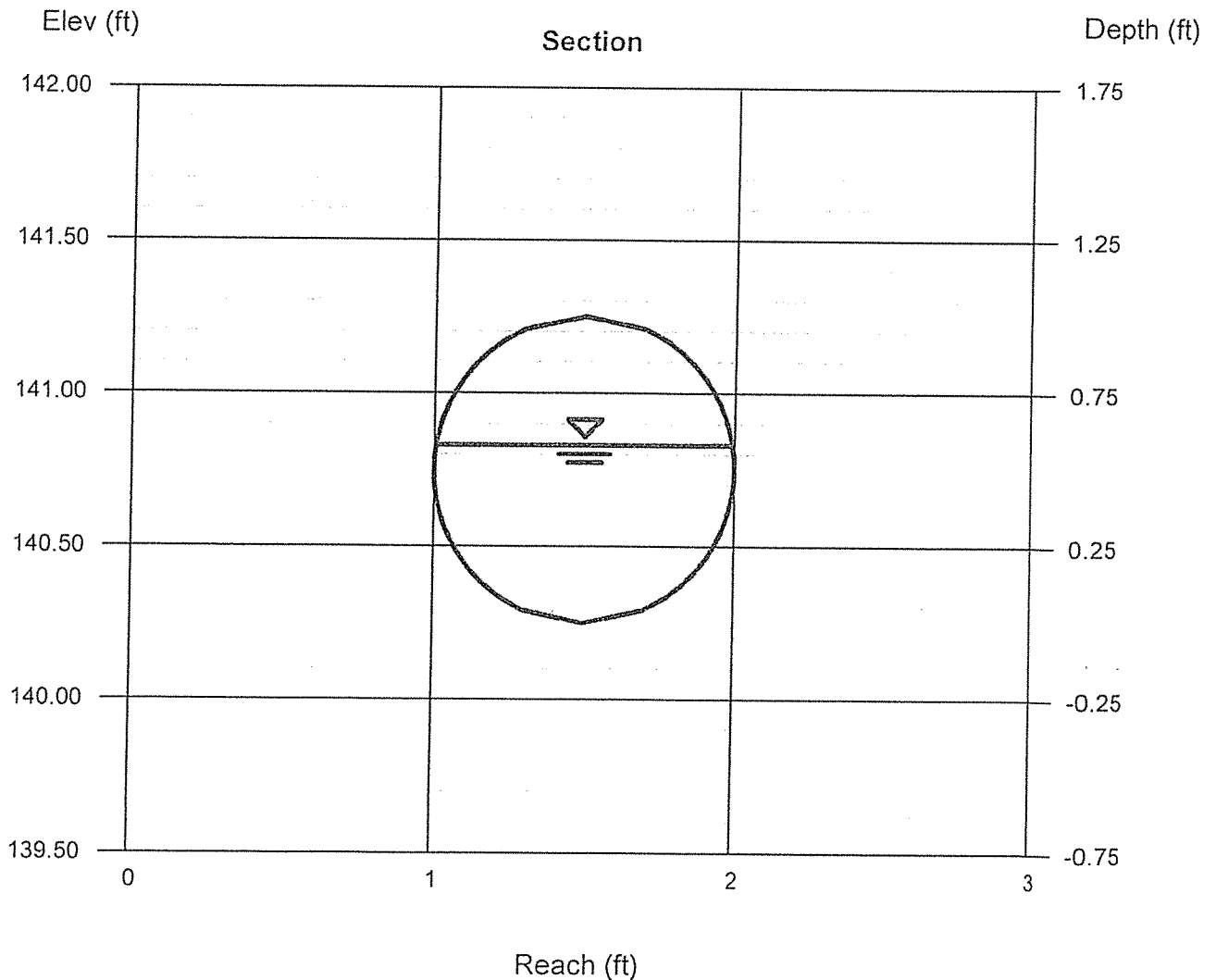
12-inch diameter CMP driveway culvert

Circular
Diameter (ft) = 1.00

Invert Elev (ft) = 140.25
Slope (%) = 5.00
N-Value = 0.033

Calculations
Compute by: Known Q
Known Q (cfs) = 2.00

Highlighted
Depth (ft) = 0.58
Q (cfs) = 2.000
Area (sqft) = 0.47
Velocity (ft/s) = 4.22
Wetted Perim (ft) = 1.73
Crit Depth, Y_c (ft) = 0.61
Top Width (ft) = 0.99
EGL (ft) = 0.86





Title: GRATE FLOW CAPACITIES FOR STANDARD GALVANIZED STEEL GRATES	Date: JULY 1985	Draw. No.
	Rev. AUG. 1988	Page No.

Santa Rosa Cast Products Company 471 WEST COLLEGE AVE. • SANTA ROSA, CA 95401 • (707) 548-5010

DESIGN CRITERIA

1. GRATE IS IN SUMP AREA (LOW POINT)

2. $Q = 3.0 \times P \times H^{3/2}$ = WEIR DISCHARGE IN C.F.S.
WHERE

P = 1/2 PERIMETER IN FEET (ASSUME 35 → 40 PERCENT OF THE PERIMETER IS BLOCKED WITH DEBRIS AND 10 → 15 PERCENT IS TAKEN UP BY THE GRATE BEARING BARS)

H = WATER DEPTH IN FEET ABOVE GRATE (WATER DEPTHS GREATER THAN 0.4 FEET ARE NOT APPLICABLE. RECOMMENDED DEPTH FOR DESIGN PURPOSES IS 0.2 FEET)

3. $A = Q/CI$ = AREA IN ACRES

WHERE

Q = WEIR DISCHARGE IN C.F.S.

C = 0.9 FOR PAVED AREAS

I = 2.1 INCHES PER HOUR FOR T = 10 MINUTES

ALTHOUGH THE PROPOSED "CK" INLET IS NOT SHOWN HERE, THE "BK" INLET IS SMALLER SO BASED ON THESE ALLOWABLE FLOW RATES, THE INLET IS ANTICIPATED TO PASS THE DESIGN STORM WATER FLOW.

S.R.C.P. MODEL	INSIDE GRATE DIMENSION: a' x b'	P = a+b IN FEET	H = 0.1'		H = 0.2'		H = 0.3'		H = 0.4'	
			Q cfs	Acres	Q	A	Q	A	Q	A
EK	12 x 12	2.00	0.19	0.10	0.54	0.28	0.99	0.52	1.52	0.80
BK	16 x 16	2.67	0.25	0.13	0.72	0.38	1.32	0.70	2.03	1.07
1K	16 x 24	3.33	0.32	0.17	0.89	0.47	1.64	0.87	2.53	1.34
2K	24 x 24	4.00	0.38	0.20	1.07	0.57	1.97	1.04	3.04	1.61
3K	24 x 30	4.50	0.43	0.23	1.21	0.64	2.22	1.17	3.42	1.81
5K	30 x 30	5.00	0.47	0.25	1.34	0.71	2.46	1.30	3.79	2.01
1L	24 x 36	5.00	0.47	0.25	1.34	0.71	2.46	1.30	3.79	2.01
1M	36 x 36	6.00	0.57	0.30	1.61	0.85	2.96	1.56	4.55	2.41
3L	24 x 48	6.00	0.57	0.30	1.61	0.85	2.96	1.56	4.55	2.41
3M	36 x 48	7.00	0.66	0.35	1.88	0.99	3.45	1.83	5.31	2.81
1R	48 x 48	8.00	0.76	0.40	2.15	1.14	3.94	2.09	6.07	3.21

Channel Report

Hydraflow Express Extension for Autodesk® AutoCAD® Civil 3D® by Autodesk, Inc.

Thursday, Jul 27 2017

downhill swale

Trapezoidal

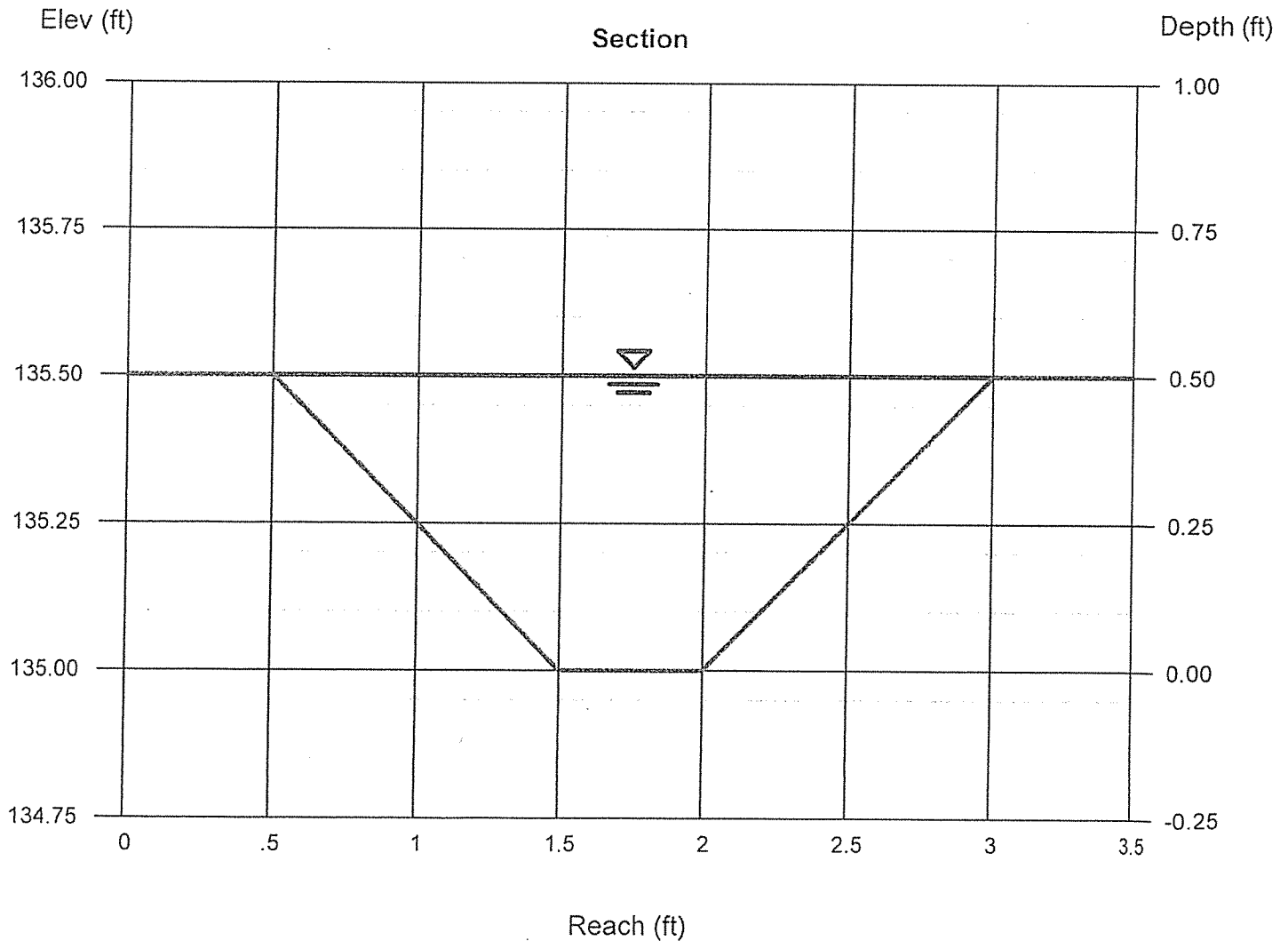
Bottom Width (ft) = 0.50
Side Slopes (z:1) = 2.00, 2.00
Total Depth (ft) = 0.50
Invert Elev (ft) = 135.00
Slope (%) = 1.00
N-Value = 0.035

Highlighted

Depth (ft) = 0.50
Q (cfs) = 1.300
Area (sqft) = 0.75
Velocity (ft/s) = 1.73
Wetted Perim (ft) = 2.74
Crit Depth, Yc (ft) = 0.38
Top Width (ft) = 2.50
EGL (ft) = 0.55

Calculations

Compute by: Known Q
Known Q (cfs) = 1.30





TOWN OF FAIRFAX

142 BOLINAS ROAD, FAIRFAX, CALIFORNIA 94930
PHONE (415) 453-1584 / FAX (415) 453-1618

MEMORANDUM

To: Linda Neal – Principal Planner

Date: August 28, 2017
Page 1 of 2

From: Ray Wrysinski
Town Engineer

Subject: New Single Family Residence
Southerly of Olema Road at Sir Francis Drake Boulevard
Fairfax, CA

A.P. 001-131-08

I have reviewed the documents provided with your 8/1/17 transmittal. The items reviewed included a two sheet set of Site Improvement plans from BKF Engineers, dated July, 2017, a topographic map, dated 4/5/17 from BKF Engineers & Surveyors, a recorded record of survey of the site by Delta Surveying, Inc. a drainage narrative from BKF Engineers, dated July, 2017, a 5/15/17 letter from BKF Engineers related to grading with Attachment A and B for that letter, a 7/31/17 application for excavation permit, a preliminary title report from Stewart Title, dated 11/21/16, a number of deeds related to the property including a grant deed recorded 8/29/16 and a soils investigation by Reese & Associates Consulting Geotechnical Engineers, dated 5/26/17

The required recorded record of survey was submitted along with the required title report and the fee title deed. Easement information must be shown on the topographic survey along with the boundary information. If there are no easements, the Code requires a note stating that must be placed on the survey. Existing easements must be shown on the survey along with a note stating that all easements known for this site by the surveyor are shown. The Code required note was not provided but the title report tends to indicate that existing easements are shown so I suggest a condition that the required easement note be placed on the project site plan at the building permit application stage of the project. The required copy of the topographic survey at the same scale as the project site plan and project grading and drainage plan has been provided.

The required licensed geotechnical engineer's report for this project site has been provided with one reservation. The report is signed by a licensed Civil Engineer and the report is noted to be provided by Reese & Associates Consulting Geotechnical Engineers. A licensed civil engineer can do soils engineering work but the State requires special approval to offer work as a Geotechnical Engineer. The State Board of Registration for Professional Engineers, Land Surveyors and Geologists could not provide any information on this firm having the approval to use the title Geotechnical Engineer so prior to processing the building permit application, there must be a requirement that Reese & Associates provide that information to the Town.

ATTACHMENT C

The required site grading and drainage plan, prepared by a licensed civil engineer, has been provided. Property line dimensions must be added to that plan. There will be increased stormwater runoff from the new impermeable surfaces created by the construction. The drainage was required to be designed so that it does not adversely affect the adjoining properties existing drainage pattern. This has generally been done however the driveway is designed to drain to the street and this will aggravate the existing drainage problem at the walkway entry to the Wyatt property west of the driveway. This new driveway drainage, within the site must be intercepted and drained to the proposed drainage swale shown to go along the westerly boundary of the site. A trench drain or some other feature can be placed to intercept this new drainage flow.

The required drainage calculations have been provided.

The required site grading quantities for general excavation and fill work along with quantities for foundation excavation and excavation for utility trenching have been shown. The site plan and the BKF letter provide information on grading material movement quantities. The letter includes a statement that onsite excavated material used as fill is counted only once which is not the way Fairfax counts these quantities. The site excavation quantity and the fill quantity are totaled. Material hauled away from the site is not counted as part of project site material movement quantity. The plan indicates 500 cubic yards of excavation and 300 Cubic yards of fill for a total of 800 cubic yards. This quantity requires Planning Commission approval under Code Section 12.20.080. It appears there will be some material hauled away from the site.

The required driveway entry has been shown except there is a conflict in details. Note 5 indicates the required 5" AC pavement. Detail 4 for the driveway in the right of way indicates crushed rock and that does not apply. The driveway culvert has been sized in the drainage calculations as required. The proposal is to use the existing pipe. Use of that pipe, with the proposed cover, must still be shown, as a condition of approval, to carry heavy wheel loads as previously required. The area uphill of the driveway shall be paved to provide a minimum 5' wide walkway (4' is shown) up to the existing bicycle and pedestrian path.

All utility services to the site must be underground. Trench locations for these utility services must be shown and this has generally been done but the joint utility trench still must be shown. That could be a condition of approval. Prior to construction, an encroachment permit must be obtained from the Director of Public Works for trenching work in the Public Right of Way. Trenches to serve the project to be shown include sewer, water, gas, electric, telephone and cable TV.

The site plan provides a stormwater pollution prevention plan.

I recommend that the processing of this project proceed.



Ray Wrynski, P. E.
Town Engineer