COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: January 9, 2019

TO: Planning Commission

FROM: Planning Staff

SUBJECT: EXECUTIVE SUMMARY: Consideration of a Coastal Development Permit and adoption of an Initial Study and Mitigated Negative Declaration to drill a domestic well to determine water quality/quantity to serve the existing Pescadero Middle/High School and potential future fire station located at 350-360 Butano Cutoff in the unincorporated Pescadero area of San Mateo County. The project is appealable to the California Coastal Commission.

County File Number: PLN 2018-00351 (County of San Mateo)

PROPOSAL

The County proposes to drill a domestic well to determine the viability of a well to serve the existing middle/high school and potential future fire station on La Honda-Pescadero Unified School District (LHPUSD) property. Three well locations are identified as potential well sites but only one well will be constructed and certified. If viable, connecting the well may occur in the future subject to a separate permitting process. Well drilling is anticipated to occur on the property during the mid-winter school break (February 18 – February 22) to minimize potential impacts to students and staff.

The County and the LHPUSD have entered into an agreement in order to perform due diligence on this property and have identified a potential fire station project area which includes the proposed well sites (located in the southwest portion of the property between the existing parking lot and Butano Cutoff).

As discussed in this staff report, the parcel size is 28.61 acres, the project area is 76,000 sq. ft. (potential fire station area), and each project site (area of well construction) is approximately 4 square feet.

RECOMMENDATION

That the Planning Commission certify the Mitigated Negative Declaration and approve the Coastal Development Permit, County File Number PLN 2018-00351, by making the required findings and adopting the conditions of approval listed in Attachment A.

SUMMARY

In November 2012, the San Mateo County voters approved Measure A which created a one-half cent sales and use tax for a period of ten years. The tax has since been extended as Measure K. The sales tax is intended to support a variety of public services including public safety. In 2013, the Board of Supervisors allocated Measure K funding to construct a new County Pescadero Fire Station (Station #59) to replace the existing fire station barracks and apparatus buildings constructed in 1957. The existing facility has a number of issues related to its current location within a flood plain, proximity to potential tsunami inundation area, as well as structural noncompliance as identified in the 2014 Site Assessment Report prepared by Ratcliff Architects.

In collaboration with the Pescadero Fire Station Steering Committee, the County held multiple community workshops and meetings in an effort to identify a new suitable location to meet the needs of both County Fire and the community. In a letter, the Steering Committee recommended the Middle/High School parcel as most favorable for the fire station. The County is seeking this Coastal Development Permit (CDP) as part of its due diligence in evaluating the recommended fire station location; specifically to determine whether adequate water is available to serve the school and fire station.

The project has been reviewed for conformance with General Plan and Local Coastal Program policies relating to Sensitive Habitats, Soils Resources, Visual Quality, Agricultural Resources, Cultural Resources, and Hazards and has found to be compliant with the applicable policies.

A preliminary biological assessment was performed for the project area due to the proximity to the wetlands located within a drainage ditch along Cloverdale Road and the potential for San Francisco garter snake and California red-legged frog within the project area. A condition of approval includes a pre-construction survey prior to well drilling activities.

A Cultural Resources Survey was completed for the project area. The report concluded that no archaeological resources appear to be present in the project area, which is of low sensitivity for buried prehistoric resources. In the unlikely instance that cultural materials are encountered during well construction, conditions of approval require work to stop in the area until a qualified archaeologist can evaluate the nature and significance of the find.

Further, a Fault Evaluation Report was completed due to the project area's location within a mapped fault zone. A study of the trench excavations performed in the project area resulted in no evidence of faulting, folding or warping of the exposed trench soils.

Environmental Review. An Initial Study and Mitigated Negative Declaration were posted from November 28, 2018 to December 18, 2018. No comments were received.

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COUNTY OF SAN MATEO
PLANNING AND BUILDING DEPARTMENT

DATE: January 9, 2019

TO: Planning Commission

FROM: Planning Staff

SUBJECT: Consideration of a Coastal Development Permit, pursuant to Zoning Regulations Section 6328, and adoption of an Initial Study and Mitigated Negative Declaration pursuant to the California Environmental Quality Act (CEQA) to drill a domestic well to determine water quality/quantity to serve the existing Pescadero Middle/High School and potential future fire station located at 350-360 Butano Cutoff in the unincorporated Pescadero area of San Mateo County. The project is appealable to the California Coastal Commission.

County File Number: PLN 2018-00351 (County of San Mateo)

PROPOSAL

Background

In November 2012, the San Mateo County voters approved Measure A which created a one-half cent sales and use tax for a period of ten years. The tax has since been extended as Measure K. The sales tax is intended to support a variety of public services, including public safety. In 2013, the Board of Supervisors allocated Measure K funding to construct a new County Pescadero Fire Station (Station #59) to replace the existing fire station barracks and apparatus buildings constructed in 1957. The existing facility has a number of issues related to its current location within a flood plain, proximity to potential tsunami inundation area, as well as structural noncompliance as identified in the 2014 Site Assessment Report prepared by Ratcliff Architects.

In collaboration with the Pescadero Fire Station Steering Committee, the County held multiple community workshops and meetings in an effort to identify a new suitable location to meet the needs of both County Fire and the community. In a 2016 letter, the Steering Committee recommended the Middle/High School parcel as most favorable for the fire station. The County is seeking this Coastal Development Permit (CDP) as part of its due diligence in evaluating the recommended fire station location; specifically to determine whether adequate water is available to serve the school and fire station.

Proposal

The County proposes to drill a domestic well to determine the viability of a well to serve the existing middle/high school and potential future fire station on La Honda-Pescadero Unified School District (LHPUSD) property. Three locations are identified as potential well sites but only one well will be constructed and certified depending on the availability of water. If viable, connecting the well may occur in the future subject to a separate permitting process. Well drilling is anticipated to occur on the property during the mid-winter school break (February 18 – February 22) to minimize potential impacts to students and staff.

The County and the LHPUSD have entered into an agreement in order to perform due diligence on this property and have identified a potential fire station project area which includes the proposed well sites (located in the southwest portion of the property between the existing parking lot and Butano Cutoff).

As discussed in this staff report, the parcel size is 28.61 acres, the project area is 76,000 sq. ft. (potential fire station area), and each well project site (area of well construction) is approximately 4 square feet.

RECOMMENDATION

That the Planning Commission adopt the Mitigated Negative Declaration and approve the Coastal Development Permit, County File Number PLN 2018-00351, by making the required findings and adopting the conditions of approval listed in Attachment A.

BACKGROUND

Report Prepared By: Melissa Ross, Senior Planner, 650/599-1559

Applicant: County of San Mateo

Owner: La Honda Pescadero Unified School District

Location: 350-360 Butano Cutoff, Pescadero

APN: 087-053-010

Size: 28.61 acres

Existing Zoning: RM-CZ/CD (Resource Management-Coastal Zone/Coastal Development)

General Plan Designation: Institutional Rural

Local Coastal Plan Designation: Agriculture and Institutional

Williamson Act: Not contracted.

Existing Land Use: Agricultural field and Pescadero Middle and High School

Water Supply: Existing well.

Sewage Disposal: Existing septic system.

Flood Zone: Multiple. Zone X (area of minimal flooding); Zone X (0.2% annual chance flood hazard); Zone AE (areas subject to inundation by the 1-percent-annual-chance flood event determined by detailed methods); Zone AE with floodway (regulatory floodway).

Environmental Evaluation: Initial Study and Mitigated Negative Declaration issued with a public review period from November 28, 2018 through December 18, 2018.

Setting: The parcel is located approximately 0.16-mile south of Pescadero Creek Road at the intersection of Cloverdale and Butano Cutoff Roads. The parcel is relatively flat and is bounded on the east side by Pescadero Creek. Development on the site includes the existing Pescadero Middle and High School. An agricultural field is located along Cloverdale Road. The parcel is located in a rural area surrounding by agricultural fields and agriculturally related development, and located approximately 0.98-mile from the Town of Pescadero.

DISCUSSION

A. KEY ISSUES

1. Conformance with the General Plan and Zoning Regulations

All new development in the Coastal Zone including County projects must comply with Local Coastal Program policies. Applicable General Plan policies, which must also be addressed, are discussed below.

Vegetative, Water, Fish and Wildlife Resources Policies

Policy 1.28 (*Regulate Development to Protect Sensitive Habitats*) regulates land uses and development activities within and adjacent to sensitive habitats in order to protect critical vegetative, water, fish and wildlife resources; protect rare endangered, and unique plant and animals from reduction in their range or degradation of their environment; and protect and maintain the biological productivity of important plant and animals habitats.

A Preliminary Biological Assessment (Assessment) was conducted in March 2017 for a potential fire station to be located on this parcel within the project area. Though it has not been determined if a fire station will be

located on this parcel, portions of the Assessment are applicable to the current well project. The parcel is bounded by Pescadero Creek approximately 870 feet northeast of the project area and a drainage ditch (wetland) approximately 420 feet west of the proposed well locations. Due to the distance and existing development (e.g., driveway, buildings) between Pescadero Creek and the project area, the Assessment did not evaluate impacts on the creek.

Special-status plant and animal species were identified within the drainage ditch along Cloverdale Road and are discussed below due to its proximity to the potential well locations.

Special-Status Plant Species

Vegetation within the drainage ditch, which runs outside of the west property line, consists predominately of cattails, horsetail, blackberry, and wild radish. Sensitive plant species known to occur in the vicinity of the project area include Choris' popcorn-flower and coastal marsh milk vetch. A site survey conducted during the blooming period (June 2016) for Choris' popcorn-flower and coastal marsh milk vetch did not result in either species being detected. Although coastal milk vetch has not been documented within 1/2-mile radius of the project area, there is potential suitable habitat within the drainage ditch. The biological assessment concluded that the project area contains low quality habitat for special-status species. Given the distance of the well sites to the drainage ditch it is not anticipated that this project will result in significant adverse impacts to protected plants species.

Special-Status Animal Species

California red-legged frog (CRLF). CRLF typically inhabit marshes, ponds, and slow-moving streams with well-developed riparian canopy. Breeding habitat occur in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, among others. CRLF have been observed in the Cloverdale drainage ditch and are expected to occur within the project area.

San Francisco garter snake (SFGS). This semi-aquatic species is often found hunting in ponds, slow moving streams, and ephemeral wetlands occupied by their prey, Pacific chorus frog and CRLF. SFGS have been documented in the vicinity of the project area and it is likely that this species could occur within the project area.

San Francisco Dusky-footed Woodrat (SFDW). SFDW is expected to occur in the coastal scrub habitat on the west side of Cloverdale Road and within riparian habitat along Pescadero Creek. California Natural Diversity Database (CNDDB) records do not identify SFDW within a 1/2-mile radius of

the project area and suitable habitat/nest areas were observed over 800 feet from the project area. SFDW are expected to occur within the vicinity of the project area however, impacts to this species are not anticipated due to the distance from suitable habitat/nest areas.

Western Pond Turtle (WPT). WPT habitat occurs near permanent or semi-permanent water sources including ponds, lakes, streams, and irrigation ditches, among others. There are no CNDDB records for WPT within 2 miles of the project area and no WPT were observed during the site survey. Impacts to WPT are not anticipated.

Saltmarsh Common Yellowthroat. No known CNDDB occurrences within 1/2-mile radius were identified and no suitable habitat is present within the project area. Impacts to this species are not anticipated.

White-Tailed Kite. No known CNDDB occurrences within 1/2-mile radius were identified, however, this species has been observed by County staff in the vicinity of Pescadero Creek. Given the distance of the creek to the well locations, impacts to this species are not anticipated.

Yellow Warbler. The yellow warbler is a seasonal resident of California during the months of April through October and breeds in the coastal riparian woodlands and wetlands. No occurrences within 1/2-mile radius were identified in the CNDDB. Suitable habitat may be present within the Pescadero Creek riparian habitat; however, the species was not observed within the project area. It is unlikely that this species will be impacted.

Due to the potential for CRLF and SFGS to occur within the project area, a condition of approval is recommended that requires preconstruction survey(s) to be performed by a qualified biologist prior to the start of well drilling activities.

Soils Resources Policies

Policy 2.17 (*Regulate Development to Minimize Soil Erosion and Sedimentation*) regulates development to minimize soil erosion and sedimentation.

Well drilling activities are expected to occur over the mid-winter holiday break (February 18 – February 22) to minimize construction impacts on students and staff. As such, drilling will occur during the wet season and has the potential to result in erosion and sedimentation. To reduce these potential impacts, conditions are recommended pursuant to Chapters 4.68 *Wells* and 4.100 *Stormwater Management and Discharge Control* of the San Mateo County Ordinance Code requiring well drilling and construction to be limited to the minimum amount of disturbance necessary to gain

access; to prohibit drilling fluids and other drilling materials produced or used to discharge onto or into streets, waterways, or sensitive habitats; to require site restoration and erosion control measures after construction; and to implement stormwater runoff best management practices.

Visual Quality Policies

Policy 4.47 (*Regulation of Development in Scenic Corridors*) discusses special control to regulate both site and architectural design of structures located within the rural scenic corridors in order to protect and enhance the visual quality of select rural landscapes.

Both Pescadero Creek Road and Cloverdale Road are County designated Scenic Corridors. However, the nature of the project is such that construction of the well will not be visible from Pescadero Creek Road and only minimally visible from Cloverdale Road. No tree removal and only minor vegetation removal will occur for construction of the well.

2. Conformance with the Local Coastal Program

Locating and Planning New Development Component

Policy 1.25 (*Protection of Archaeological/Paleontological Resources*) discusses determining whether or not sites proposed for new development are located within areas containing potential archaeological/paleontological resources and require mitigation and adequate protection of the resource as part of the project.

A referral of the project to the Northwest Information Center (NWIC) at Sonoma State University California Historical Resources Information System was completed and resulted in no previous cultural resources studies for the project area. Based on other known sites within the area, NWIC has identified the project area as having a moderate to high potential for unrecorded historic-period resources and has recommended a field survey of the project area and contact with the local Native American tribes.

On September 10, 2018, a Sacred Lands File and Native American Contacts List request was made to the Native American Heritage Commission (NAHC) whose mission is to identify and catalog cultural resources (i.e., places of special religious or social significance to Native Americans, and known graves and cemeteries of Native Americans on private lands) in California. NAHC's review of the project was negative. However, NAHC identified six local Native American tribes that may have knowledge of cultural resources in the project area. Tribal consultation letters were mailed to each of the tribes on September 20, 2018. To date, no tribes have contacted staff.

As recommended, a Cultural Resources Survey was completed in November 2018 by Dr. Daniel Shoup, RPA. A paper study of past cultural resources in the vicinity of the parcel was conducted as was a field study. Percolation testing for a potential future septic system within the project area was being performed at the time the cultural resources field study was conducted thus the archaeologist had access to open trenches where soil visibility was fair to very good. As stated in the report, all open areas were inspected for cultural evidence such as historic structures, artifacts, and features; and indicators of prehistoric archaeological deposits like midden soil, flaked lithics, groundstone, and shell. No artifacts or features over 45 years of age were noted during the trench inspection or the survey nor were any indicators of archaeological deposits observed in the seven test trenches, which were all excavated at the western edge of the project area. No archaeological resources appear to be present in the project area, which is of low sensitivity for buried prehistoric resources. In the unlikely instance that cultural materials are encountered during well construction, conditions of approval require work to stop in the area until a qualified archaeologist can evaluate the nature and significance of the find.

Agriculture Component

Policy 5.1 (*Definition of Prime Agricultural Lands*) outlines five criteria that define prime agricultural lands, including certain classes of Land Capability Classification and Storie Index. Policy 5.5 (*Permitted Uses on Prime Agricultural Lands Designated as Agriculture*) conditionally allows certain uses including single-family residences, public recreation, uses ancillary to agriculture, among others. Policy 5.8 (*Conversion of Prime Agricultural Land Designated as Agriculture*) prohibits conversion of prime agricultural land within a parcel to a conditionally permitted use unless certain criteria can be demonstrated (i.e., no alternative site exists, defined agriculture and non-agricultural use buffers, adjacent agricultural land productivity is not diminished, and public service and facility expansions will not impair agricultural viability).

As identified on the Local Coastal Program Land Use map for the Pescadero area, the western portion of the parcel (project area) is designated Agriculture and the eastern portion (school) is Institutional. According to the Natural Resources Conservation Service Web Soil Survey Storie Index, the soil rating for the project area is rated Grade 1, which is one of the Prime Agricultural Lands criteria. Conditionally permitted uses on these prime lands do not explicitly include domestic wells to serve institutional uses but do include other uses, such as single-family residences and public recreation, which may similarly rely on domestic water sources (including wells) for operation.

Conversion of prime agricultural lands must meet four criteria to allow a conditionally permitted use, as follows.

a. That no alternative site exists for the use.

   The location of the three well sites is based on a combination of site conditions, existing uses, well setbacks required by Environmental Health Services, and potential use of the site for a future fire station. The majority of the property is developed with middle/high school buildings, parking lots, and associated sports fields. Additionally, to the west of the school along Cloverdale Road is an actively farmed field. Located along the north and east property lines along Pescadero Creek are multiple FEMA designated flood zones (floodplain and floodway) which restrict development. The remaining areas are the identified project area and the open grass/drainage areas to the east of the project area parallel to Butano Cutoff in front of the school. In considering a potential future fire station, the location of the development would likely occur within the project area in order to locate the development furthest from the school to minimize noise impacts of the station on students and staff. Within the project area, the location of the well is limited to a corner adjacent to the existing parking lot and driveway due to Environmental Health Services well setback requirements from property lines and septic systems (potentially developed in the future).

b. Clearly defined buffer areas are provided between agricultural and non-agricultural uses.

   The well locations are adjacent to the existing parking lot and driveway; the closest well location is 90 feet from the active agricultural field thus providing a distance buffer to the agricultural use.

c. The productivity of any adjacent agricultural land will not be diminished.

   The actively farmed field will not be impacted by well construction due to the distance between the two uses.

d. Public service and facility expansions and permitted uses will not impair agricultural viability, including by increased assessment costs or degraded air and water quality.

   Construction of the well is to determine water quality and quantity and will not be connected to any existing uses). Potential connection to future uses will be evaluated as part of a separate permitting process.

Sensitive Habitats Component

Policy 7.3 (*Protection of Sensitive Habitats*) prohibits any land use or development which would have significant adverse impacts on sensitive habitat areas; and development in areas adjacent to sensitive habitats shall be sited and designed to prevent impacts that could significantly degrade the sensitive habitats. Policy 7.5 (*Permit Conditions*) requires the applicant to demonstrate that there will be no significant impact on sensitive habitats and when it is demonstrated that significant impacts may occur, require the applicant to provide a report prepared by a qualified professional.

As discussed in Section A.1 of this report, a Preliminary Biological Assessment was completed for the project area which resulted in sensitive habitats identified in the drainage ditch along Cloverdale Road. Due to the presence of CRLF and SFGS within the ditch and the potential for these protected species to move overland toward the project site, a condition is recommended to require pre-construction survey(s) performed by a qualified biologist prior to the start of well drilling activities to ensure no significant adverse impacts occur. In the event that these animals are present, no construction may take place until they leave the area.

Visual Resources Component

Policy 8.30 (*Designation of County Scenic Roads and Corridors*) and Policy 8.21 (*Regulation of Scenic Corridors in Rural Areas*) identifies Pescadero Creek Road and Cloverdale Road as County Scenic Corridors and regulates development within scenic corridors to minimize visual impacts.

Well construction will not result in significant topographical alterations given the flat topography of the project area and the well site locations over 350 feet from the right-of-way line of Cloverdale Road (where a minimum of 100 feet is identified in Policy 8.31.e). Given the location of the well sites and the well height just above grade, no significant visual impacts will result from this project.

Hazards Component

Policy 9.3 (*Regulation of Geologic Hazard Areas*) requires a geologic report prepared by a certified engineering geologist for all development in designated geologic hazard areas.

According to the 1982 California Department of Conservation Special Studies Zones (Franklin Point) Map, the project area is located within the Special Studies Zone Boundary (Alquist-Priolo). A 2016 Fault Evaluation Report (Report), prepared by ENGEO, was completed for a potential future

fire station located within the project area and included a review of the Alquist-Priolo boundary and a review of the United States Geological Survey San Gregorio fault zone Quaternary Fault and Fold Database (QFFD) due to the mapped San Gregorio fault located west of Cloverdale Road. Site exploration of the project area was conducted by ENGEO and consisted of two trench excavations, one in the project area and the second trench in the adjacent parking lot. Combined trenching totaled approximately 650 linear feet and to depths ranging from approximately 8.5 to 13.5 feet. Additional depths were not reached due to the high groundwater and unstable soils encountered.

Artificial fill was encountered within 1-2 feet of thickness, including soils disturbed as a result of tilling. No evidence of faulting, folding or warping was observed in the exposed trench soils. The Report concluded that none of the fault traces depicted on the Alquist-Priolo Zone map or the QFFD are shown to pass through the project area.

3. Conformance with Zoning Regulations

The project has been reviewed for consistency with the Resource Management-Coastal Zone regulations as discussed below.

Schools and fire stations are allowed uses, subject to permitting, in the RM-CZ Zoning District. Well water is the primary water source in rural areas since water service is not available; construction of wells are considered accessory to permitted uses. Chapter 20A.2 Development Review Criteria outlines development criteria relating to environmental quality, site design criteria, utilities, water resources, cultural resources, and hazards to public safety. As conditioned, the project is consistent with this chapter in that no significant noxious odors will result from the project, no significant adverse impacts on wildlife will occur, no significant surface water runoff will result, groundwater recharge will not be diminished as a result of impermeable surfacing or compaction due to the small well pad footprint, and the quantity of prime agricultural soils converted is the minimum necessary to carry out the project.

B. ENVIRONMENTAL REVIEW

An Initial Study and Mitigated Negative Declaration were prepared for this project in compliance with the California Environmental Quality Act (CEQA). The public comment period commenced on November 28, 2018 and ended on December 18, 2018. No public comments were received during this period. Mitigation measures have been included as conditions of approval in Attachment A of this staff report.

C. REVIEWING AGENCIES

Building Inspection Section
Environmental Health Services
California Coastal Commission
Sonoma State Northwest Information Center
Native American Heritage Commission

ATTACHMENTS

A. Recommended Findings and Conditions of Approval
B. Vicinity Map
C. Site Plan
D. Site Assessment Report, Ratcliff Architects (2014)
E. Preliminary Biological Assessment (2016)
F. ENGEO Fault Evaluation Report (2016)
G. Initial Study and Mitigated Negative Declaration

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Attachment A

County of San Mateo
Planning and Building Department

RECOMMENDED FINDINGS AND CONDITIONS OF APPROVAL

Permit or Project File Number: PLN 2018-00351 Hearing Date: January 9, 2019

Prepared By: Melissa Ross
Project Planner

For Adoption By: Planning Commission

RECOMMENDED FINDINGS

For the Environmental Review, Find:

1. That the Initial Study and Mitigated Negative Declaration are complete, correct, adequate, and prepared in accordance with the California Environmental Quality Act (CEQA) and the applicable State and County Guidelines. An Initial Study and a Mitigated Negative Declaration were prepared and issued with a public review period from November 28, 2018 to December 18, 2018.

2. That, on the basis of the Initial Study and comments received hereto, there is no substantial evidence that the project, if subject to the mitigation measures contained in the Mitigated Negative Declaration, will have a significant effect on the environment.

3. That the mitigation measures identified in the Mitigated Negative Declaration, agreed to by the applicant, placed as conditions on the project, and identified as part of this public hearing, have been incorporated as conditions of project approval.

4. That the Initial Study and Mitigated Negative Declaration reflect the independent judgment of the County.

For the Coastal Development Permit, Find:

5. That the project, as described in the application and accompanying materials required by Section 6328.7 and as conditioned in accordance with Section 6328.14, conforms with the plans, policies, requirements and standards of the San Mateo County Local Coastal Program. The applicant has provided a site plan, supplementary documents as necessary to evaluate the proposed development, and the project is conditioned to ensure conformance with the Local Coastal Program.

6. That the project conforms to specific findings required by policies of the San Mateo County Local Coastal Program. As conditioned, the project conforms to the Local Coastal Program policies relating to the location of new development, agriculture, sensitive habitats, visual resources, and hazards.

RECOMMENDED CONDITIONS OF APPROVAL

Current Planning Section

1. This approval applies only to the proposal, documents, and plans described in this report and submitted and approved by the Planning Commission on January 9, 2019. Minor modifications to the project may be approved by the Community Development Director if they are consistent with the intent of, and in substantial conformance with, this approval.

2. This permit is valid for one (1) year from the date of final approval, in which time well construction must be completed. Any extension of this permit shall require submittal of an application for permit extension sixty (60) days prior to expiration.

3. Noise sources associated with demolition, construction, repair, remodeling, or grading of any real property shall be limited to the hours from 7:00 a.m. to 6:00 p.m., weekdays, and 9:00 a.m. to 5:00 p.m., Saturdays. Said activities are prohibited on Sundays, Thanksgiving, and Christmas (San Mateo Ordinance Code Section 4.88.360).

4. Connection and/or use of the well shall be subject to a separate permitting process.

5. **Mitigation Measure 1:** The applicant shall require construction contractors to implement all the Bay Area Air Quality Management District's Basic Construction Mitigation Measures, listed below:

    a. Water all active construction areas at least twice daily.

    b. Apply water two times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking, and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.

    c. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.

    d. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour.

e. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

6. **Mitigation Measure 2:** The applicant shall implement the following basic construction measures at all times:

   a. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measures Title 13, Section 2485 of California Code of Regulations [CCR]).

   b. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.

7. **Mitigation Measure 3:** Preconstruction survey(s) shall be performed prior to the start of well drilling activities by a qualified biologist. If California red-legged frog (CRLF) and San Francisco garter snake (SFGS) are found within the project area, all work shall cease until the individual(s) have been allowed to leave the project area on their own. If the CRLF or SFGS individual(s) cannot passively leave the project area, work will cease and the USFWS will be contacted to determine the appropriate course of action.

8. **Mitigation Measure 4:** If buried cultural materials are encountered during construction, work should stop in that area until a qualified archaeologist can evaluate the nature and significant of the find.

9. **Mitigation Measure 5:** Pursuant to San Mateo County Ordinance Code 4.68.050 Mitigation of Disturbance at Well Site, any disturbance at a well site for the purposes of construction shall be limited to the minimum amount of disturbance necessary to gain access to drill the well. Drilling fluids and other drilling materials produced or used in connection with well construction shall not be allowed to discharge onto or into streets, waterways, sensitive habitats, or storm drains. Drilling fluids shall be properly managed and disposed of in accordance with applicable local, regional, and state requirements. Upon completion of the construction, the site shall be restored as near as possible to its original condition, and appropriate erosion control measures shall be implemented. Wells constructed during a period where winterization requirements are in effect,

between October 1 and May 1, shall comply with County stormwater pollution prevention measures.

10. **Mitigation Measure 6:** During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site:

    a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

    b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with storm water.

    c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges, to storm drains and watercourses.

    d. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

    e. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

    f. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

    g. Performing clearing and earth-moving activities only during dry weather.

    h. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.

    i. Limiting construction access routes and stabilizing designated access points.

    j. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

    k. The contractor shall train and provide instruction to all employees and subcontractors regarding the construction best management practices.

11. **Mitigation Measure 7:** Construction equipment for new development shall comply with best management practices from Bay Area Air Quality Management District guidance.

Building Inspection Section

12. The applicant shall comply with Building Code Section 3306.9 *Adjacent to excavations* requiring every excavation on the site located 5 feet or less from the street lot line to be enclosed with a barrier not less than 6 feet in height. Where located more than 5 feet from the street lot line, a barrier shall be erected where required by the building official. Barriers shall be of adequate strength to resist wind pressure as specified in Chapter 16.

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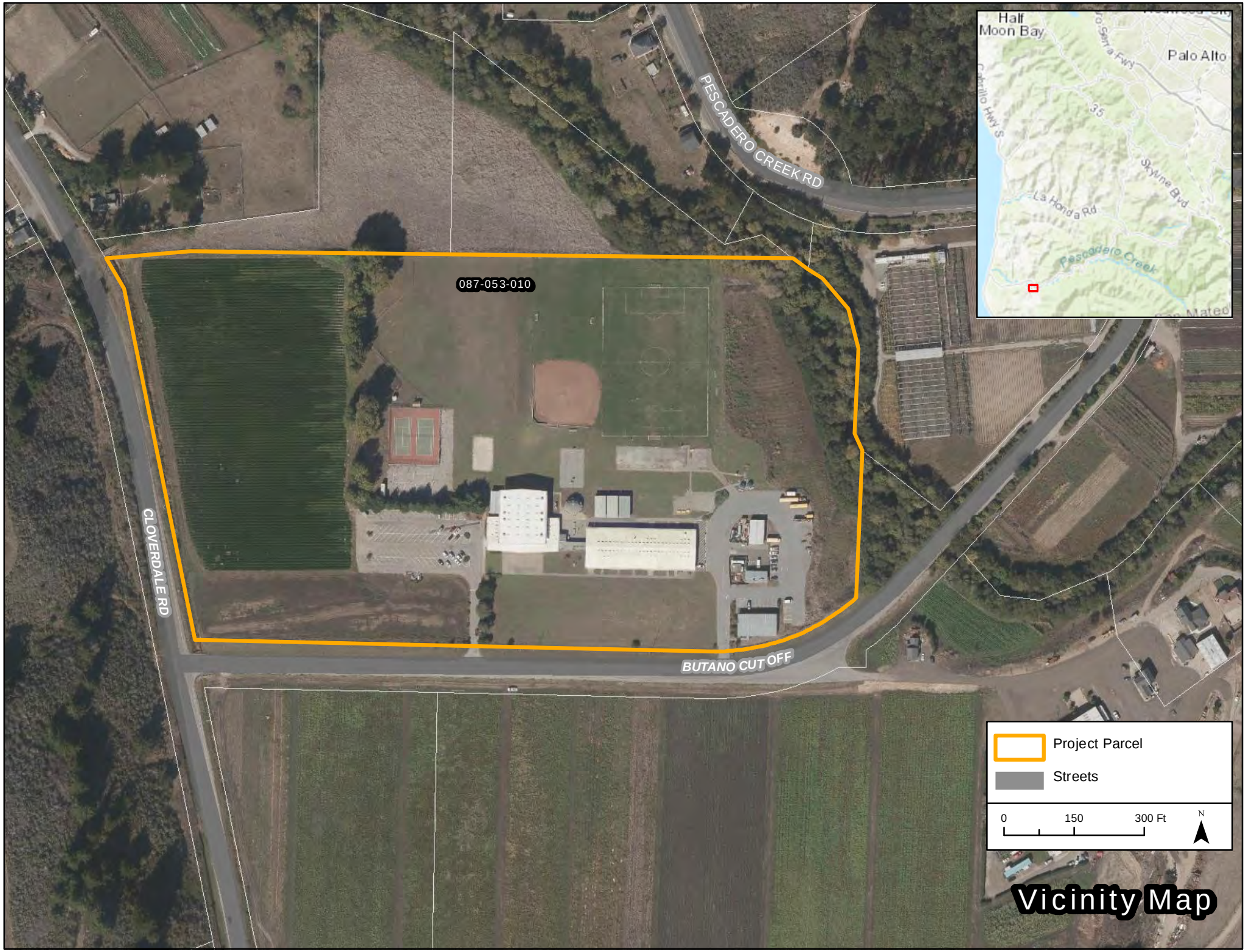
County of San Mateo - Planning and Building Department

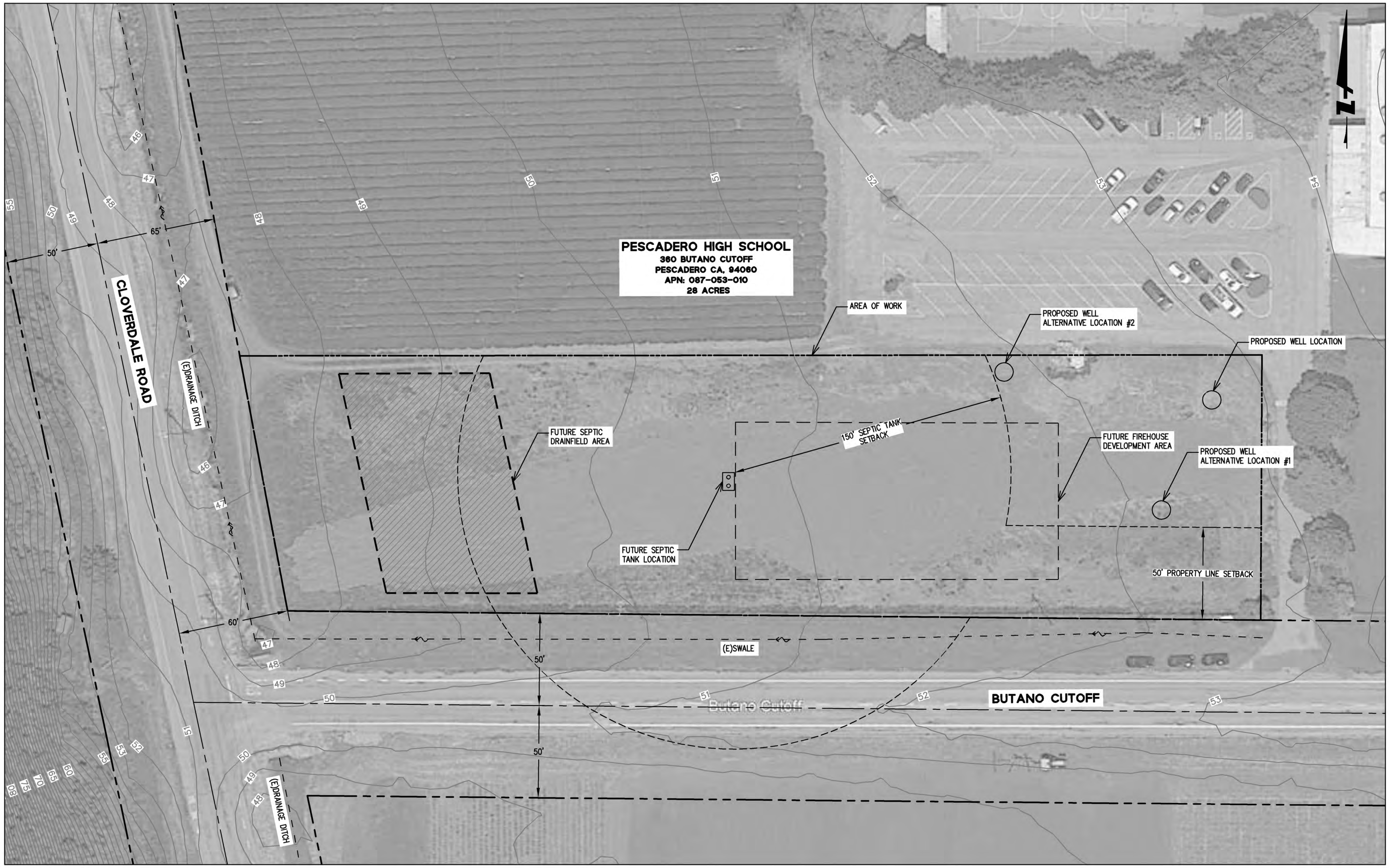
ATTACHMENT B

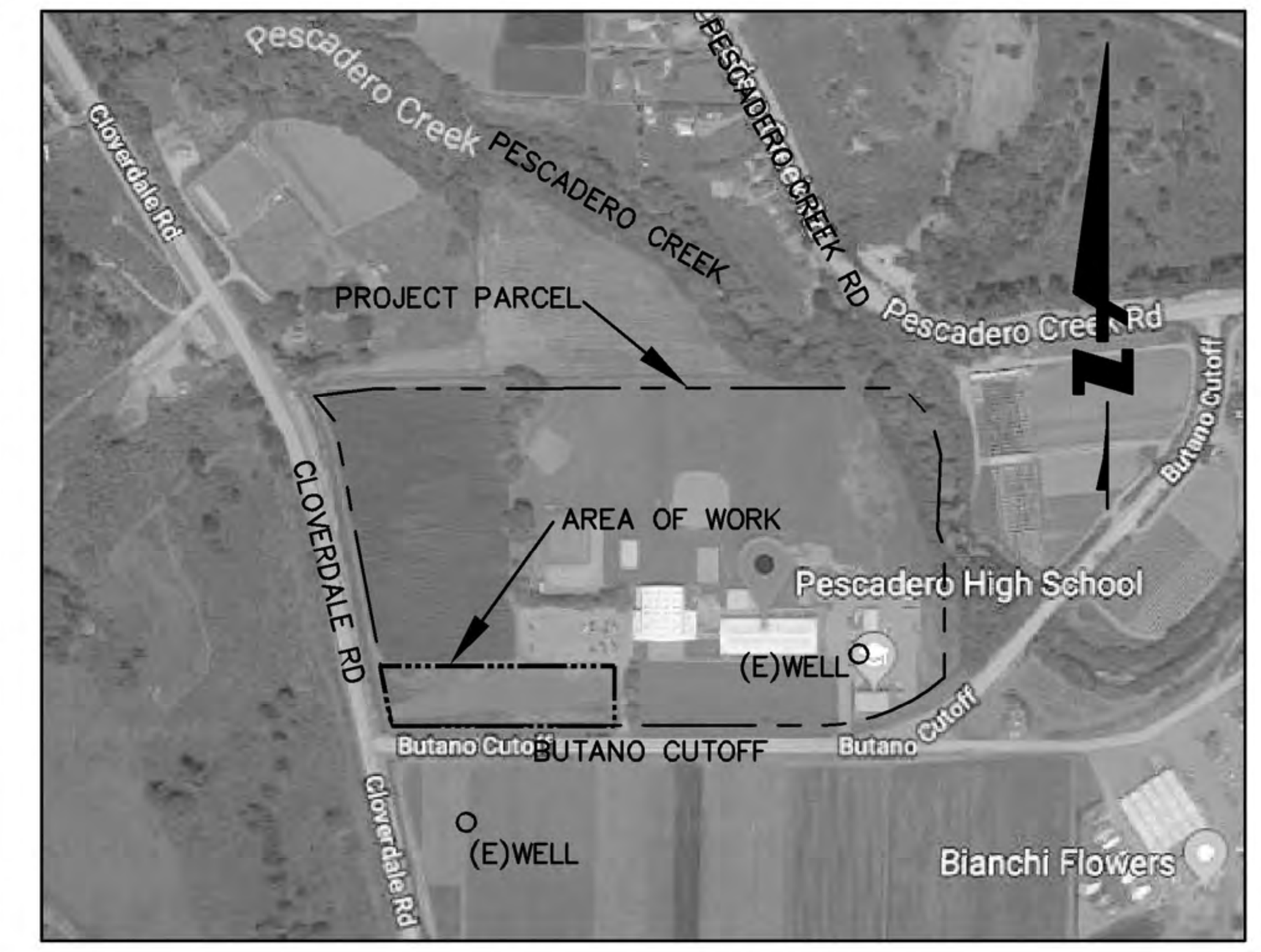

087-053-010
PESCADERO CREEK RD
CLOVERDALE RD
BUTANO CUT OFF
Half Moon Bay
Palo Alto
Project Parcel
Streets
0
150
300 Ft
N
Vicinity Map

County of San Mateo - Planning and Building Department

ATTACHMENT C

© BKF Engineers





LOCATION MAP

N.T.S.

LEGEND:

— - - —	BOUNDARY
—··· —	AREA OF WORK
—— - ——	CENTERLINE
— — — —	FLOWLINE
— — — —	DEVELOPMENT AREA
— — — — —	SETBACK

ABBREVIATIONS:

(E)	EXISTING
RD	ROAD

DOMESTIC WATER WELL NOTES:

DOMESTIC WATER WELL SPECIFICATIONS:
- DEPTH TO BE DRILLED: 120 FEET
- DEPTH OF PROPOSED ANNULAR SEAL: 80 FEET
- SIZE OF OUTER CASING: 5 INCHES
- TYPE OF CASING: CERTA LOCK SDR 17 PVC

0 30 60
GRAPHIC SCALE

811
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DOMESTIC WELL SITE PLAN
PESCADERO HIGH SCHOOL
360 BUTANO CUTOFF

PESCADERO SAN MATEO COUNTY CALIFORNIA

REGISTERED PROFESSIONAL ENGINEER — ALE J. LEDA — C78436 — CIVIL — STATE OF CALIFORNIA
REVIEW ONLY NOT FOR CONSTRUCTION

No.	Revisions	Date

Date 09/13/2018
Scale 1" = 30'
Design DJL
Drawn DJP
Approved RH
Job No 20180894-10

Drawing Number:
C-1
OF

DRAWING NAME: K:\2018\180894_Pescadero_Firehouse\ENG\pfhsheets.dwg
PLOT DATE: 09-13-18 PLOTTED BY: polt

County of San Mateo - Planning and Building Department

ATTACHMENT D

San Mateo County

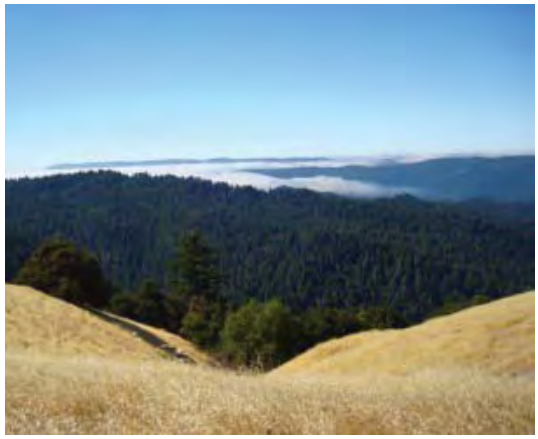
Department of Public Works

Pescadero Fire Station

1200 Pescadero Creek Road
Pescadero, California 94060

Site Assessment

January 13, 2014



RATCLIFF

Table of Contents

Cover image credits: (top) Herb Lingl/aerialarchives.com, (middle) Lake|Flato Architects, (bottom) Trailstompers.com, http://www.trailstompers.com/long-ridge-to-portola-redwoods-trail-run.html

1. Team

San Mateo County Public Works

Cal Fire

Design Team

Architectural

Ratcliff

Structural

Degenkolb Engineers

Civil

CSW/Stuber-Stroeh Engineering Group, Inc.

Mechanical/Electrical/Plumbing

NBA Engineering, Inc.

Cost Analysis

Tbd Consultants

2. Project Description – Service Area

INCIDENT RESPONSE DIRECTION – EXAMINED

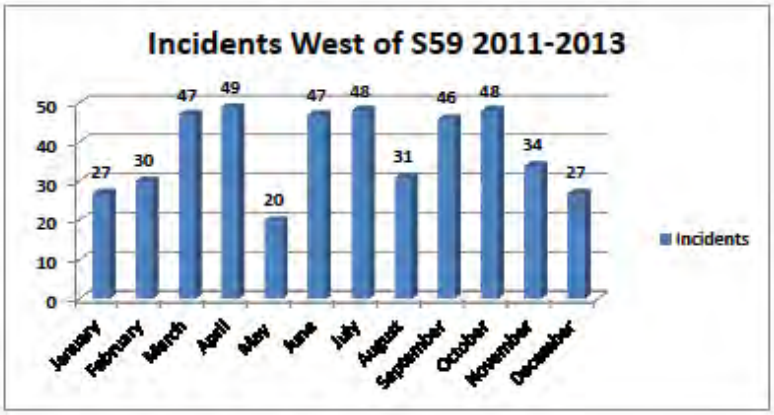
A three-year study investigated the direction to which Station 59 responded most often. The result of the study indicated an essentially equal number of responses in both directions. Consequently, the location of a new station in relationship to either the town or the coast was not informed by this study.

By choosing a position to the east of the flood-prone area, on Pescadero Creek Road, at the creek bridge and closer to Town would allow Community Room access to a greater number of area residents, if such a room were included in the New Fire Station program.

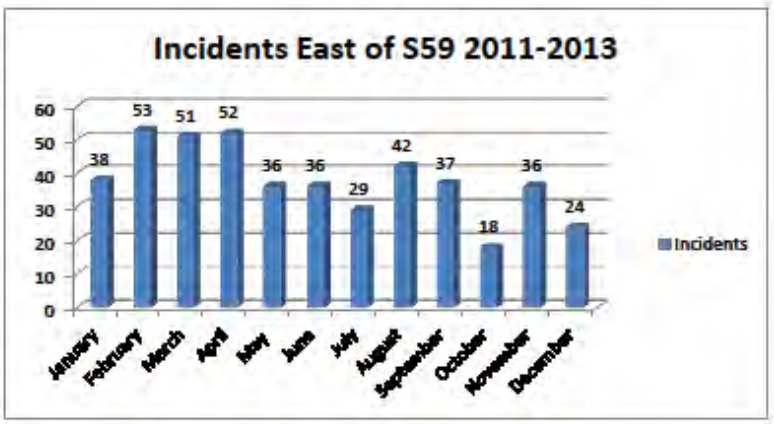
Business and commercial access between the town and the coast makes adopting the flooding resolution as critical to the Town's livelyhood as the other routes out of town.Stage Road to the north and Cloverdale Road to the south—both of which are long and circuitous-- impede tourism and commerce as well as firefighting response time.

one area on Pescadero Creek Rd at the Creek bridge and closer to Town would allow a better use of the Community Room if it were included in the program to develop a New Fire Station.

January	27
February	30
March	47
April	49
May	20
June	47
July	48
August	31
September	46
October	48
November	34
December	27
TOTAL	454



January	38
February	53
March	51
April	52
May	36
June	36
July	29
August	42
September	37
October	18
November	36
December	24
TOTAL	452



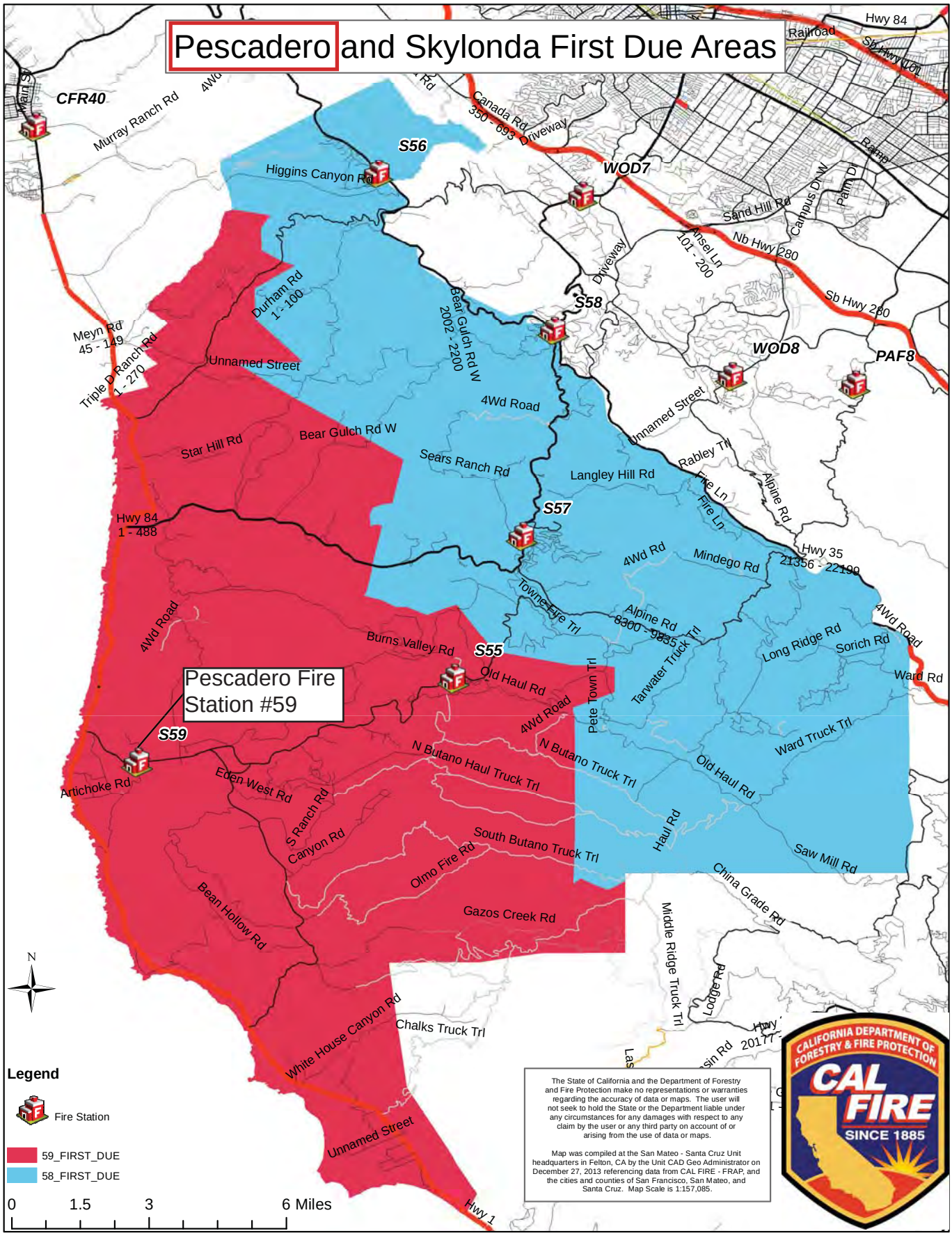


EXHIBIT A. PESCADERO SERVICE AREA

3. Executive Summary and Recommendations

The Team has interviewed the staff at the Fire Station and reviewed the conditions of the existing Pescadero Fire Station to gain an understanding of the current conditions of the facility, its mission and the Service Area.

The service area is indicated in Exhibit A.

There are three full-time firefighters on staff, increasing to 8 or 9 during fire season.

The team has explored several options to mitigate the known water risks at the existing site and bring the facility up to current requirements for its mission.

The options that were considered range from:

Option A: Provides for a new fire station to meet all current criteria by locating an acceptable site near the Town of Pescadero and rebuilding a new, code-compliant, and efficiently operated facility. This site should not be located in the flood plain or in the Tsunami Inundation Zone, as well as outside the limits of 50 year predicted sea level rise (and ideally beyond this limit) in order to protect the investment in the improved facility and properly uphold the public safety mission of the station (see Section 3.1).

Option B: Provides for a new Living Quarter and Command Office area adjacent to a remodeled Apparatus Building, while working within the existing site as it remains open and occupied as a fire station. This appears to provide the most cost effective way to improve the facility's ability to support its mission, but with the understanding that all water risks cannot be mitigated (see Section 3.2).

Option C: Provides for a new Living Quarter and Command Office area adjacent to a remodeled Apparatus Building after temporarily relocating the firefighting services and staff to a location at Pescadero High School Working within the existing site, site provides the most easily constructed improvements project, Again, we emphasize that all water risks cannot be mitigated. This option appears to be more expensive than Option B and was not developed.

Variations of this Option B to save the current site were considered, but it appears that a two phased approach to improvements can be made while allowing staff and equipment to remain on-site. This is the lowest cost approach for this theme. This concept should be verified with a qualified, licensed general contractor to consider all implications of a phased construction sequence that meets all safety requirements for the station, the staff, and the mission should this option be selected to pursue further. It appears that a site access plan for firefighters and the contractor—as well as appropriate construction staging areas—could be developed.

3.1 Option A: New Site.

After completion of Improvements Planning and Cost Analysis for Option B (work with the existing site) and its variations, the team developed the ideas for a new site (location TBD) with the right sized and code compliant station best suited for an efficient operation.

The Team arrived at an optimal space and equipment program after an intensive daylong programming session at the fire station which involved senior firefighter and County Public Works staff. Minor growth in staffing was concluded on, with slow growth in structures predicted for this service area. No apparatus growth was assumed to be necessary at this time, though the placement of the water tender at this site may increase the need for a 4th vehicle bay. This possibility was considered in the conceptual cost estimating and planning by moving the physical training area into a space that had been set aside for a Community Room option that is not present in the current station. This community space was considered a strong asset of consideration if a new station development is to be undertaken. If the water tender is to be kept at this site AND the Community Room option is to be pursued, the programmed area should be increased and reflected in an increased construction budget. This topic needs further discussion.

The station allows for a second floor Living Quarters housed over Command Center, staff offices and the Community Room, both located on the ground level. All spaces are contiguous for an efficient operation. The attached (2) deep apparatus high bays have dual sided access through bi-folding doors and house (3) vehicles and space for physical training and a work shop, convertible to (4) vehicles. The site can park up to (12) staff autos, and (12) public autos. The site can turn around a firefighting vehicle with a 55-foot turning radius, though the maximum radius needed is probably less.

The project consists of a new two-story 8,900 SF fire station with living quarters over offices adjacent to apparatus bays. Sitework includes vehicular and pedestrian paving, landscaping, site lighting and drainage, new emergency generator and fuel storage tanks. Utilities include incoming City water, storm drain and electrical service. Sewer is provided by an onsite septic system, gas is provided by propane tanks.

The projected New Station criteria:
Minimum Site Area: 39,775 SF
Minimum Building Area: 8,100 GSF
Massing: Two-story Living Quarters over Command Center and Offices
Emergency Operations design criteria met.
Programmed area includes room for indoors housing of up to:

- 12 firefighters
- 3 firefighting vehicles
- Community Room (doubles as area needed to meet EOC criteria).
- Design Character (see Zoning requirements in Section 6.1 Architectural)
- Patterned after a Rural Agricultural Structure.
- Clean simple lines
- Steep pitched roof
- Symmetrical opening where possible
- Metal Siding and Roofing or other durable material.

Projected Construction Cost: $5,139,058 (without land cost)

See Section 6. Diagrams:
Site Plan: SK A1
Floor Plans: SK A2

3.2 Option B: Existing Site, with Programmatic Improvements.

The Team arrived at an appropriate space and equipment program after an intensive daylong programming session at the fire station which involved senior firefighter and County Public Works staff. Minor growth in staffing was concluded on, with only slow growth in structures predicted in this service area. Apparatus growth was assumed unnecessary at this time, though the placement of the water tender at this site may increase the need for a 4th vehicle bay. See additional notes in Option A.

The station allows for a second floor Living Quarters to be housed over the command center, staff offices and the community room on the ground level. All spaces are contiguous for an efficient operation.

The original apparatus building steel frame and concrete pad remains. All other aspects of the facility are demolished as they are not code compliant or are at the end of useful life, For details, see Section 5. Site Assessment Reports and Section 8. Appendices.

The existing detached apparatus high bays [would]have single sided access through new bi-folding doors and house (3) vehicles, with space for physical training and a work shop. It is convertible to (4) vehicles. The site can park up to (12) staff autos, and (9) public autos. The site cannot turn around a firefighting vehicle with a 55’ turning radius though the maximum radius needed is probably less.

Project consists of replacing existing living quarters building with a new two-story 5,508 SF Living Quarters building, complete interior/exterior renovation to the existing 2,400 SF apparatus building, including a new 1,100 SF addition. Sitework includes vehicular and pedestrian paving, landscaping, site lighting, drainage, and replacement of the existing emergency generator and fuel storage tanks. Utilities include septic system replacement and connecting existing utilities to new buildings.

The projected Station Programmatic Improvements criteria:
Current Site Area: 56,062 SF
Minimum Building Area: 8,900 GSF
Massing: 2 story Living Quarters over Command Center and Offices,
Adjacent to existing 1 story Apparatus Building with rear addition.
Emergency Operations design criteria met.
Programmed area includes room for indoors housing of up to:

- 12 firefighters
- 3 firefighting vehicles
- Community Room (doubles as area needed to meet EOC criteria).

Design Character (see Zoning requirements in Section 6.1 Architectural)

- Patterned after a Rural Agricultural Structure.
- Clean simple lines

- Steep pitched roof
- Symmetrical openings where possible
- Metal Siding and Roofing or other durable material.

Projected Construction Cost: $5,728,568

Option B - Site Phasing:

Firefighting Operations remain active on site during construction.

Phase 1: build New 2 Story Addition:
- Demo or relocate temporarily storage containers and sheds on west side
- Demo AC driveway and, possibly, (2) Monterey Pine trees
- Relocate utilities as needed
- Build (2) story New Addition, with Living Quarters over the Offices
- Build New Patio 12'x20' with cover roof to west and outdoor BBQ.

Phase 2A: Move staff into New Addition:
- Relocate new command center from Apparatus Building into New Addition offices on first level
- Move into Living Quarters and Offices
- Demo existing Living Quarters.

Phase 2B: Renovate Apparatus Building.
- Relocate vehicles to paved yard, possibly under tent structures
- Relocate turnout gear and supplies to storage mods or into first floor of New Addition
- Demo all interior construction in eastern most bay of Apparatus Building
- Demo rear wood frame addition of Apparatus Building
- Demo Apparatus Building exterior siding and roof
- Build Apparatus Building New Addition: 10' wide, full length of the rear of existing steel prefab bldg. Metal stud on-slab, on-grade construction, same skin and roof as below. 10' min height, 3/12 pitch
- Verify site drainage to hillside cut on south side. Provide additional cut and hillside stabilization, with a keystone wall if required.
- Apply new exterior walls to Apparatus Building (sheet metal siding over sheathing, membrane, new metal studs, interior gyp board)
- Rebuild Apparatus Building roof (sheet metal siding over sheathing, membrane, new plywood, verify existing framing)
- Provide (4) new bi-fold vehicle garage doors on auto operators
- Provide new floor seal for all Apparatus Building. areas, "gym flooring" at west bay, and new, 1-hour rated gyp board on metal stud partition walls to separate new physical training area from new shop and apparatus bays. Include rated doors.
- Provide all new MEP for the Apparatus Building. New Heat/Vent/Vehicle exhaust snorkels/no AC. All new lighting, power, and AV.

3.2 Option B: Existing Site, with Programmatic Improvements – VARIATIONS

The current site could possibly be isolated from Hwy 1 and the coastal areas it serves if a Tsunami

or flooding occurs during an incident requiring emergency response. A separate study for the consideration of a mobile command center of this site should be undertaken.

For the variety of situations that could be faced in this remote fire station, this type of vehicle may be more useful than additional real estate, which would need to be maintained. New real estate would become a fixed asset in a large service area with multiple potential risk types. A custom command vehicle that can house up to 3-4 firefighters, rescue equipment, and wireless communications should be programmed and priced for further consideration before a remote mini-station project is under taken.

4. Process and Participants

San Mateo County

Guido Misculin, Head of Facilities Planning

Theresa Yee, Senior Capital Projects Manager

Cal Fire

Scott Ernest, Cal Fire

Robert Pierson, Cal Fire

Andy Cope, Cal Fire

Scott Jalbert, Cal Fire, Santa Cruz Unit Chief

Ratcliff Architects

Bill Blessing, Principal Architect

Nina Pakanant, Designer

Dan Johnson, Designer

TBD Consultants

Gary Holland, Senior Estimator

CSW/Stuber-Stroeh Engineering Group, Inc.

Kerry Ettinger, PE Civil

NBA Engineering, Inc.

Natalie Alavi, PE

5. Existing Site Analysis

5.0 Water risks Assessment

The Pescadero Fire Station Assessment Study is driven by the known water risks associated with its location on the Pescaedro and Butano Creek drainage plains and its proximity to the Pacific Ocean Coast. These risks include: seasonal flooding caused by proximity to the Creeks, which could be worsened by rising sea levels due to climate change (see Appendix 8.0), and/or a tsunami event (see Appendix 8.0) due to the potential of earthquake events.

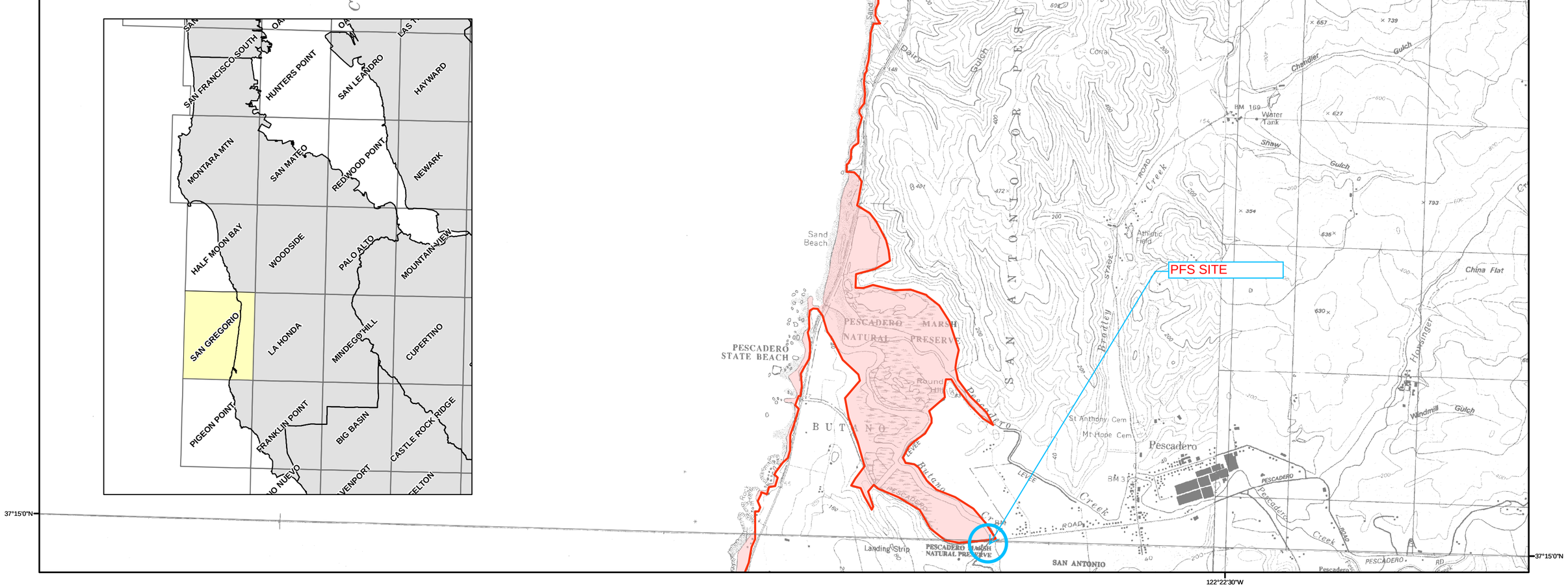
The latter two pose risk categories unto themselves and both have ongoing research with still-indeterminate predictions, but remain as known risks to this site.

The working area of this site (developed for buildings and emergency vehicles) is currently between elevation +13 and +16 ft above mean Sea level. A portion of the site on the SW corner rises up a hill and is not useable for general re-development of the fire station.

After reviewing current studies on the three types of water risks (see Appendices), it appears that the seasonal flooding of the site is most the controllable of the three and yet is mired in determining the final mitigation solution and permitting process (see Appendices). A solution could entail an extensive first Phase of study of the civil engineering within the drainage plain systems and with possible adjacent road work. This study needs to be completed before an additional study as to what affect this first Phase will have on the correct direction for the Fire Station site on Pescadero Creek Road.

In lieu of these studies, the current Assessment Report has taken the approach that the site cannot be easily raised, without a companion work scope that also raises the adjacent roads or other solution in the creek drainage plain. This variable has been set aside and our Team has completed a standalone review of the existing facilities for appropriateness to their firefighting/emergency response mission in terms of operations and their physical condition. The results have then been used to predict what would be needed to bring them into compliance for their intended mission, pending a solution to the seasonal flooding risk which is believed to be achievable. What is missing then is: at what elevation will the new work at the site be set? While this question remains unanswered, within the context of the entire Assessment Report, we still can recommend not continuing to develop this site due to all the water risks associated with this site.

If the seasonal flooding risk is mitigated at this site, it still does not diminish the other two important water risks: rising seal levels and tsunami events, which make vulnerable this site serving its mission.



METHOD OF PREPARATION

Initial tsunami modeling was performed by the University of Southern California (USC) Tsunami Research Center funded through the California Emergency Management Agency (CalEMA) by the National Tsunami Hazard Mitigation Program. The tsunami modeling process utilized the MOST (Method of Splitting Tsunamis) computational program (Version 0), which allows for wave evolution over a variable bathymetry and topography used for the inundation mapping (Titov and Gonzalez, 1997; Titov and Synolakis, 1998).

The bathymetric/topographic data that were used in the tsunami models consist of a series of nested grids. Near-shore grids with a 3 arc-second (75- to 90-meters) resolution or higher, were adjusted to "Mean High Water" sea-level conditions, representing a conservative sea level for the intended use of the tsunami modeling and mapping.

A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near-shore landslides (Table 1). Local tsunami sources that were considered include offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides capable of significant seafloor displacement and tsunami generation. Distant tsunami sources that were considered include great subduction zone events that are known to have occurred historically (1960 Chile and 1964 Alaska earthquakes) and others which can occur around the Pacific Ocean "Ring of Fire."

In order to enhance the result from the 75- to 90-meter inundation grid data, a method was developed utilizing higher-resolution digital topographic data (3- to 10-meters resolution) that better defines the location of the maximum inundation line (U.S. Geological Survey, 1993; Intermap, 2003; NOAA, 2004). The location of the enhanced inundation line was determined by using digital imagery and terrain data on a GIS platform with consideration given to historic inundation information (Lander, et al., 1993). This information was verified, where possible, by field work coordinated with local county personnel.

The accuracy of the inundation line shown on these maps is subject to limitations in the accuracy and completeness of available terrain and tsunami source information, and the current understanding of tsunami generation and propagation phenomena as expressed in the models. Thus, although an attempt has been made to identify a credible upper bound to inundation at any location along the coastline, it remains possible that actual inundation could be greater in a major tsunami event.

This map does not represent inundation from a single scenario event. It was created by combining inundation results for an ensemble of source events affecting a given region (Table 1). For this reason, all of the inundation region in a particular area will not likely be inundated during a single tsunami event.

References:

Intermap Technologies, Inc., 2003, Intermap product handbook and quick start guide: Intermap NEXTmap document on 5-meter resolution data, 112 p.

Lander, J.F., Lockridge, P.A., and Kozuch, M.J., 1993, Tsunamis Affecting the West Coast of the United States 1806-1992: National Geophysical Data Center Key to Geophysical Record Documentation No. 29, NOAA, NESDIS, NGDC, 242 p.

National Atmospheric and Oceanic Administration (NOAA), 2004, Interferometric Synthetic Aperture Radar (IfSAR) Digital Elevation Models from GeoSAR platform (EarthData): 3-meter resolution data.

Titov, V.V., and Gonzalez, F.I., 1997, Implementation and Testing of the Method of Tsunami Splitting (MOST): NOAA Technical Memorandum ERL PMEL – 112, 11 p.

Titov, V.V., and Synolakis, C.E., 1998, Numerical modeling of tidal wave runup: Journal of Waterways, Port, Coastal and Ocean Engineering, ASCE, 124 (4), pp 157-171.

U.S. Geological Survey, 1993, Digital Elevation Models: National Mapping Program, Technical Instructions, Data Users Guide 5, 48 p.

TSUNAMI INUNDATION MAP FOR EMERGENCY PLANNING

State of California ~ County of San Mateo

SAN GREGORIO QUADRANGLE

June 15, 2009

SCALE 1:24,000

0.5 0.25 0 0.5 1 Miles

1,000 500 0 1,000 2,000 3,000 4,000 5,000 Feet

0.5 0.25 0 0.5 1 Kilometers

Table 1: Tsunami sources modeled for the San Mateo County coastline.

Sources (M = moment magnitude used in modeled event)		Areas of Inundation Map Coverage and Sources Used	
		San Francisco Bay	Pescadero
Local Sources	Point Reyes Thrust Fault	X	
	Rodgers Creek-Hayward Faults	X	
	San Gregorio Fault	X	
Distant Sources	Cascadia Subduction Zone-full rupture (M9.0)	X	
	Central Aleutians Subduction Zone #1 (M8.9)	X	X
	Central Aleutians Subduction Zone #2 (M8.9)	X	
	Central Aleutians Subduction Zone #3 (M9.2)	X	X
	Chile North Subduction Zone (M9.4)	X	
	1960 Chile Earthquake (M9.3)	X	
	1964 Alaska Earthquake (M9.2)	X	X
	Japan Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #3 (M8.8)	X	
	Kuril Islands Subduction Zone #4 (M8.8)	X	
	Marianas Subduction Zone (M8.6)	X	X

Cal EMA CALIFORNIA EMERGENCY MANAGEMENT AGENCY

CGS CALIFORNIA GEOLOGICAL SURVEY

USC UNIVERSITY OF SOUTHERN CALIFORNIA

MAP EXPLANATION

Tsunami Inundation Line

Tsunami Inundation Area

PURPOSE OF THIS MAP

This tsunami inundation map was prepared to assist cities and counties in identifying their tsunami hazard. It is intended for local jurisdictional, coastal evacuation planning uses only. This map, and the information presented herein, is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose.

The inundation map has been compiled with best currently available scientific information. The inundation line represents the maximum considered tsunami runup from a number of extreme, yet realistic, tsunami sources. Tsunamis are rare events; due to a lack of known occurrences in the historical record, this map includes no information about the probability of any tsunami affecting any area within a specific period of time.

Please refer to the following websites for additional information on the construction and/or intended use of the tsunami inundation map:

State of California Emergency Management Agency, Earthquake and Tsunami Program: http://www.oes.ca.gov/WebPage/oeswebsite.nsf/Content/B1EC51BA215931768825741F005E8D80?OpenDocument

University of Southern California – Tsunami Research Center: http://www.usc.edu/dept/tsunamis/2005/index.php

State of California Geological Survey Tsunami Information: http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/index.htm

National Oceanic and Atmospheric Agency Center for Tsunami Research (MOST model): http://nctr.pmel.noaa.gov/time/background/models.html

MAP BASE

Topographic base maps prepared by U.S. Geological Survey as part of the 7.5-minute Quadrangle Map Series (originally 1:24,000 scale). Tsunami inundation line boundaries may reflect updated digital orthophotographic and topographic data that can differ significantly from contours shown on the base map.

DISCLAIMER

The California Emergency Management Agency (CalEMA), the University of Southern California (USC), and the California Geological Survey (CGS) make no representation or warranties regarding the accuracy of this inundation map nor the data from which the map was derived. Neither the State of California nor USC shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

5.1 Architectural Assessment

SITE:
CALFIRE / Pescadero Fire Station, San Mateo County Fire Department
1200 Pescadero Creek Road, Pescadero, Ca 94060
(corner of Pescadero Creek Road and Bean Hollow Rd.)

SITE FACTS:

APN: 086160050

SITE AREA: 56,062 sqft.

ASSESSOR LEGAL DESCRIPTION:
1.287 AC MOL ON SLY LN OF PESCADERO RD BEING PTN OF LOT 13 & PTN OF RESERVED PARCEL PENINSULA FARMS CO SUB NO 1 RSM 11/18

GENERAL PLAN (1986)
http://planning.smcgov.org/documents/local-coastal-program-lcp

Local Coastal Program Area (1980), Rural Service Centers
DESIGNATION: Institutional Land Use
Bounded by General Open Space (OS), Public Recreation (marsh), Private lands

Local Coastal Program (LCP)
All development in the Coastal Zone requires either a Coastal Development Permit or an exemption from Coastal Development Permit requirements. For a permit to be issued, the development must comply with the policies of the Local Coastal Program (LCP) and those ordinances adopted to implement the LCP. The project must also comply with other provisions of the County Ordinance Code, such as zoning, building and health regulations.

LOCAL COASTAL PROGRAM POLICIES (verify):
http://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/SMC_Midcoast_LCP_2013.pdf

> *LOCATING AND PLANNING NEW DEVELOPMENT COMPONENT*
> *DEVELOPMENT REVIEW*
> *1.1 Coastal Development Permits*
> *After certification of the Local Coastal Program (LCP), require a Coastal Development Permit for all development in the Coastal Zone subject to certain exemptions.*
>
> *1.2 Definition of Development*
> *As stated in Section 30106 of the Coastal Act, define development to mean:*
> *On land, in or under water, the placement or erection of any solid material or structure; discharge or disposal of any dredged material or any gaseous, liquid, solid, or thermal waste; grading, removing, dredging, mining, or extraction of any materials; change in the density or intensity of use of land, including, but not*

limited to, subdivision pursuant to the Subdivision Map Act (commencing with Section 66410 of the Government Code), and any other division of land, including lot splits, except where the land division is brought about in connection with the purchase of such land by a public agency for public recreational use; change in the intensity of use of water, or of access thereto; construction, reconstruction, demolition, or alteration of the size of any structure, including any facility of any private, public, or municipal utility; and the removal or harvesting of major vegetation other than for agricultural purposes, kelp harvesting, and timber operations which are in accordance with a timber harvesting plan submitted pursuant to the provisions of the Z'berg-Nejedly Forest Practice Act of 1973 (commencing with Section 4511).

As used in this section, "structure" includes, but is not limited to, any buildings, road, pipe, flume, conduit, siphon, aqueduct, telephone line, and electrical power transmission and distribution line.

ITEMS to be verified include:

Appendix 1.A
Minimum Stormwater Pollution Prevention Requirements
Pages 1.27 thru 1.30

Items Apply to PFS: 3.c; 3.e, 3.f, 3.j
Verify that current septic field location would not be allowed by this standard: Items 3.i and 3.j.

3. Developments of Special Concern
j. On-site sewage treatment systems (septic systems) shall be sited away from areas that have poorly or excessively drained soils, shallow water tables or high seasonal water tables that are within floodplains or where effluent cannot be adequately treated before it reaches streams or the ocean. New development with conventional or alternative on-site sewage treatment systems shall include protective setbacks from surface waters, wetlands and floodplains, as well as appropriate separation distances between on-site sewage treatment system components, building components, property lines, and groundwater as required by the Regional Board. Under no conditions shall the bottom of the effluent dispersal system be within five (5) feet of groundwater.

SENSITIVE HABITATS
WETLANDS:
Page 7.5
Site is adjacent to protected Wetland.

7.15 Designation of Wetlands
a. Designate the following as wetlands requiring protection: Pescadero Marsh,…

Page 7.6
Verify if current site and proposed development in Option B are outside of required

Buffer Zone.

7.18 Establishment of Buffer Zones
Buffer zones shall extend a minimum of 100 feet landward from the outermost line of wetland vegetation. This setback may be reduced to no less than 50 feet only where: (1) no alternative development site or design is possible; and (2) adequacy of the alternative setback to protect wetland resources is conclusively demonstrated by a professional biologist to the satisfaction of the County and the State Department of Fish and Game. A larger setback shall be required as necessary to maintain the functional capacity of the wetland ecosystem.)

Page 7.7
7.21 Management of Pescadero Marsh

Other items may apply.

VISUAL RESOURCES:

Verify if these Design Guidelines apply to institutional buildings constructed after April 29, 1998 at this site for proposed development in Option B:

Provisional Appendix - In-Progress Development Proposals Not Affected
by the LCP Amendments Certified by the
Coastal Commission on April 29, 1998 .....PA.1-PA.13

8.13 Special Design Guidelines for Coastal Communities Pages PA.9 thru PA.13
d. Pescadero
Encourage new buildings to incorporate architectural design features found in the historic buildings of the community (see inventory listing), i.e., clean and simple lines, precise detailing, steep roof slopes, symmetrical relationship of windows and doors, wood construction, white paint, etc.
Require remodeling of existing buildings to retain and respect their traditional architectural features, if any.

Note:
Other items may apply if the Option A - New Site approach is determined and defined.

ZONING INFORMATION, Unincorporated Areas
http://planning.smcgov.org/sites/planning.smcgov.org/files/2012_ZoneRegs%5BFINAL%5D_0.pdf

ZONING MAP
https://planning.smcgov.org/sites/planning.smcgov.org/files/documents/files/smc_zoning.pdf

DESIGNATION: PAD/CD (combined districts)
Planned Agricultural Districts/Coastal Development Districts

Items Apply:

CHAPTER 20A.2. DEVELOPMENT REVIEW CRITERIA

(applicable sections, partial list)

- SECTION 6325.2. PRIMARY FISH AND WILDLIFE HABITAT AREAS CRITERIA.
- SECTION 6325.7. PRIMARY NATURAL VEGETATIVE AREAS CRITERIA.
- SECTION 6326. SUPPLEMENTARY REVIEW CRITERIA FOR SPECIAL HAZARD
- SECTION 6326.1. FLOOD PLAIN AREA CRITERIA.

Verify that Option B development is permitted per:

- SECTION 6326.2. TSUNAMI INUNDATION AREA CRITERIA. The following criteria shall apply within all areas defined as Tsunami Inundation Hazard Areas. (a) The following uses, structures, and development shall not be permitted: publicly owned buildings intended for human occupancy other than park and recreational facilities; schools, hospitals, nursing homes, or other buildings or development used primarily by children or physically or mentally infirm persons.
- SECTION 6326.3. SEISMIC FAULT/FRACTURE AREA CRITERIA.

CHAPTER 20B. "CD" DISTRICT

(COASTAL DEVELOPMENT DISTRICT)

SECTION 6328.4. REQUIREMENT FOR COASTAL DEVELOPMENT PERMIT.

Except as provided by Section 6328.5, any person, partnership, corporation or state or local government agency wishing to undertake any project, as defined in Section 6328.3(r), in the "CD" District, shall obtain a Coastal Development Permit in accordance with the provisions of this Chapter, in addition to any other permit required by law. Development undertaken pursuant to a Coastal Development Permit shall conform to the plans, specifications, terms and conditions approved or imposed in granting the permit.

SECTION 6328.5. EXEMPTIONS.

The projects listed below shall be exempt from the requirement for a Coastal Development Permit. Requirements for any other permit are unaffected by this section.

(b) The maintenance, alteration, or addition to existing structures other than single family dwellings and public works facilities; however, the following classes of development shall require a permit because they involve a risk of adverse environmental impact:

(3) The expansion or construction of water wells or septic systems.

(4) On property located between the sea and the first public road paralleling the sea or within 300 feet of the inland intent of any beach or of the mean high tide of the sea where there is no beach, whichever is the greater distance, or in scenic road corridors, an improvement that would result in an increase of 10% or more of external floor area of the existing structure, and/or the construction of an additional story (including lofts) in

an existing structure.

CHAPTER 21A. "PAD" DISTRICT
(PLANNED AGRICULTURAL DISTRICT)
This chapter has sections that may apply to Option A - New Site development location.

SECTION 6353. USES PERMITTED SUBJECT TO THE ISSUANCE OF A PLANNED AGRICULTURAL PERMIT.

The following uses are permitted in the PAD subject to the issuance of a Planned Agricultural Permit, which shall be issued in accordance with the criteria set forth in Section 6355 of this ordinance. Applications for Planned Agricultural Permits shall be made to the County Planning Commission and shall be considered in accordance with the procedures prescribed by the San Mateo County Zoning Ordinance for the issuance of use permits and shall be subject to the same fees prescribed therefore.

B. On Lands Suitable for Agriculture and Other Lands

6. Fire stations.

Site Visit

The Architectural Team worked on October 28, 2012 and the entire A+E Consultant Team worked on November 20, 2013 to complete assessments on the PFS site at 1200 Pescadero Creek Road.

This included a brief tour of potential replacement or remote sites in and around the Town of Pescadero.

Existing site features

- The site is partially surrounded by a 6 foot high wood fence for visual screening.
- No security fence or gates are present.
- The site has a steep hill in the southwest corner.
- Site pavement generally consists of asphalt, depth and section is unknown.
- Concrete pavement is found at the vehicle wash area, fuel station and certain pedestrian building access points; sections are unknown.
- No recent site survey was performed or is currently available through the SM County
- GIS system.

Relative topo information was located here:

- smc-400 Scale Contour-grid-22D.pdf (SM Cty GIS system).

Additional relative topo information was taken from Google Earth Pro:

- Pescadero Cr_els at 1200 & 5631.pdf

The site has Monterey Pine trees – see Google Earth map.

Existing structures

- Living Quarters (barracks), dated: 1/7/1957

    - 2175 GSF
    - 1789 ASF
    - Wood frame, Type 5 construction
    - Composition Shingle roof
    - Interiors are well-maintained but worn in the restrooms, kitchen and dining areas.
    - This building has been flooded more than 3 times in recent memory and has been repaired each time. Standing water and contaminated soil were visible in the crawl space the day of our inspection.
    - An addition was built by the station staff in the early 1980's to enclose the original porch to create additional space in the Dayroom ("recreation room" per original drawings).
    - ADA non-compliant.
    - Operationally, the ideal set up is to have the Living Quarters adjacent to the Command Office and Apparatus Building to improve response time and not across the service yard as is currently.
    - This building has no provision for Community space or interface - and is inadequate for training or as an Emergency Operations Center (EOC) by current standards.
    - Finish Floor elevation is approximately 15'.
- Apparatus Building (barracks), dated: 1/7/1957
    - 3128 GSF
    - 1789 ASF
    - Steel frame superstructure – non protected, wood frame infill, Type 5 construction, and not fire-sprinklered.
    - Sheet metal roof and stained wood siding appear well maintained.
    - Interiors are worn in all areas but Command Offices are well maintained.
    - The interior loft space above the Command Office is used for supplies storage and is only accessible by site built wooden wall ladder. This arrangement is unsafe and not per Code.
    - A rear wood frame addition was built in the early 1980's to create space for a physical training area. It is damp and cramped and not isolated from the apparatus bays and has shared air quality. It is not ideally sized and is without daylight, proper height and MEP systems appropriate to its function.
    - ADA non-compliant
    - Operationally, the ideal set up is to have the Apparatus Building adjacent to the Command Office/ Living Quarters to improve response time and not across the service yard as is currently.
    - This building has no provision for Community space or interface - and is inadequate for training or as an Emergency Operations Center (EOC) by current standards.
    - Finish Floor elevation is approximately 16'.

- Equipment Sheds – to create additional covered and secure storage capacity.
    - 335 GSF
    - 325 ASF
    - Steel shipping container (190 GSF) (age ?)
    - Wood frame, prefab – non protected, Type 5 construction (80 GSF), w/a rear, wood-frame addition – non protected, Type 5 construction (64 G)

        - [appears to have been built in the 1990's (verify date)]
        - Composition Shingle roof (age : 20 yrs + ?)
    - ADA non-compliant
    - These structures are inadequate as part of an Emergency Operations Center (EOC) by current standards.
    - The wood siding and metal enclosure siding is worn and damaged by earth contact in places. These have no permanent foundations, lighting or HVAC systems.
    - Finish Floor elevations is approximately 16'.

- Hazardous Materials Shed
    - 113 GSF
    - 85 ASF
    - CMU walls, wood frame roof – non protected, Type 5 construction
    - Composition Shingle roof (age : 20 yrs + ?)
    - ADA non-compliant
    - Condition appears acceptable but should be re-sealed at exterior wall surfaces.
    - Finish Floor elevations is approximately 16'.

- Emergency Generator Shed
    - 102 GSF
    - 89 ASF
    - Wood frame – non protected, Type 5 construction
    - Appears to have been built in the early 1980's (verify date)
    - Composition Shingle roof (age : 20 yrs + ?)
    - Composition Shingle roof (age : 20 yrs + ?)
    - ADA non-compliant
    - Finish Floor elevations is approximately 14'.

Note:
For all structures, see Engineer Reports below for status of building systems.

5.2 Structural Assessment

Refer to Appendix 8.2 for complete consultant's report.

A building structural assessment per *ASCE 41: Seismic Rehabilitation of Existing Buildings* was conducted. Aspects of building performance that are considered include structural, nonstructural, and foundation/geologic hazard issues. Lifelines such as water, electrical, gas and waste, etc., beyond the perimeter of the building are not considered.

5.2.1 Barracks Building

An ASCE 41-13 Life Safety basic checklist evaluation identifies the structure as being predominately compliant. Unknown factors of liquefaction and surface fault rupture which need to be review by a Geotechnical engineer. The Barracks building is part of an emergency response facility. Therefore an Immediate Occupancy performance level is required. An ASCE 41-13 Immediate Occupancy checklist evaluation for W1 structures identified a number of noncompliant items. These identified issues are all minor in nature and could be retrofitted without significant cost.

The major compliance issue with achieving an Immediate Occupancy building performance level is the structure being located in an area subject to flooding. Flooding will damage the structure and will render the building inoperable during the period of the flood, which would make an Immediate Occupancy performance level difficult to achieve even after a structural retrofit.

5.2.2 Apparatus Building

An ASCE 41-13 Life Safety basic checklist evaluation identifies the structure as being predominately noncompliant or unknown. Some of these identified issues are a mezzanine structure not being independently braced and no confirmation that the original steel system has capacity for the various additions. The Apparatus building is part of an emergency response facility. Therefore an Immediate Occupancy performance level is required. An ASCE 41-13 Immediate Occupancy checklist evaluation for S3 structures identified a number of noncompliant items. It would be anticipated that the identified issues would be major in nature and could be a challenge to retrofit without significant cost.

Two additional compliance issues required to achieve an Immediate Occupancy building performance level are the structure being located in an area subject to flooding and being located adjacent to a slope.

5.3 Mechanical, Electrical, Plumbing, IT Assessment

Refer to Appendix 8.3 for complete consultant's report.

5.3.1 Electrical Systems Existing Conditions

Most of the electrical equipment, including the standby generator (see EE2), and automatic transfer switch (see EE3), has been in use for more than thirty years. The coastal climate, severe weather conditions, and some flooding have caused rusting of the enclosed outdoor service entrance equipment (see EE1). Many broken, inadequate, or unsafe electrical conditions are noted in the report (Appendix 8.3).

5.3.2 Plumbing and Mechanical Systems Existing Conditions

The septic tank floods periodically, requiring station personnel to rent and use portable toilet facilities when the septic system is being repaired and cleaned. Fuel tanks show rust and evidence of leakage. Mechanical ventilation to occupied spaces is missing or inadequate. Some rooms have not heat. The consultant recommends demolishing all existing mechanical, plumbing, fuel, and electrical systems.

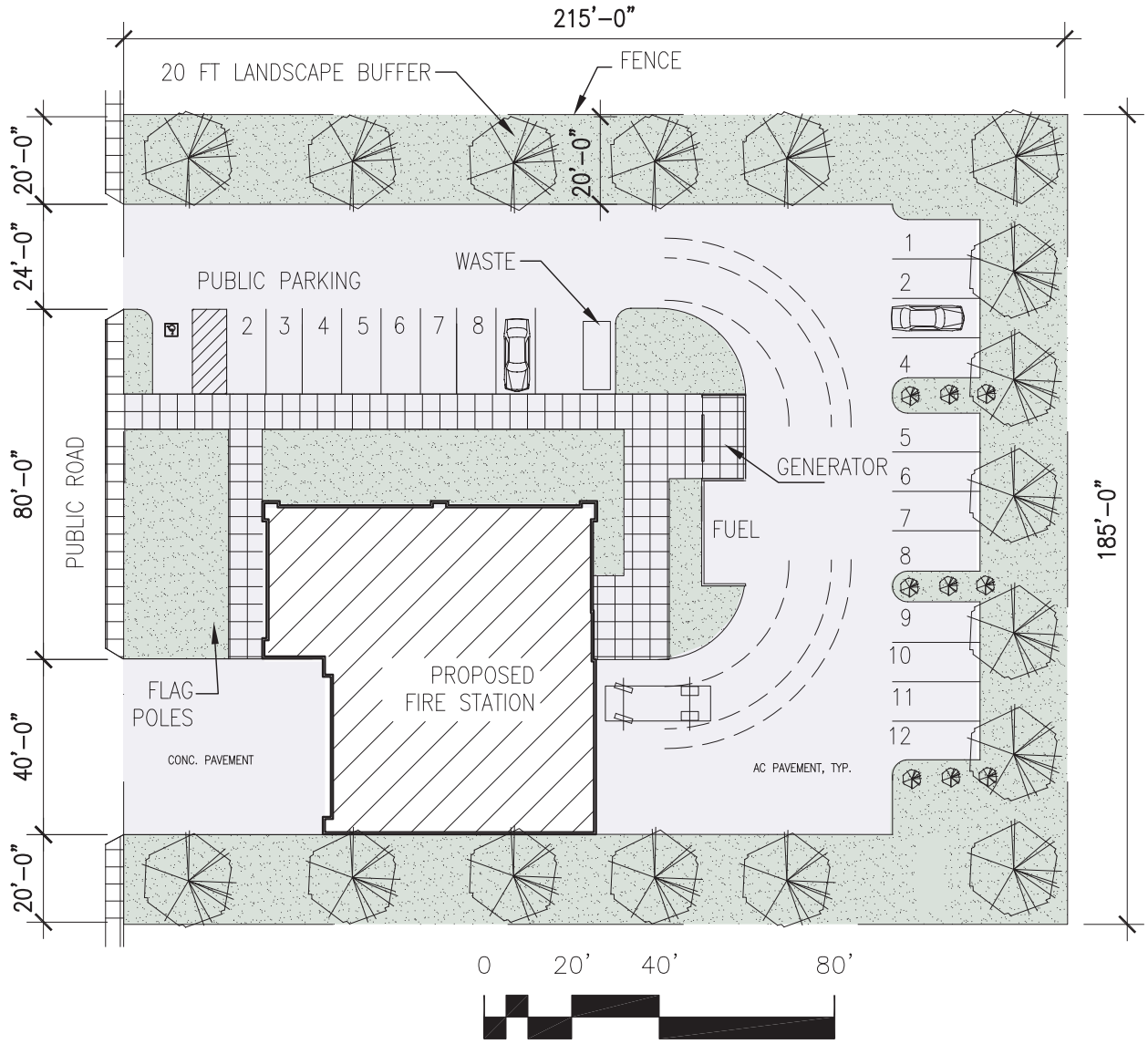
5.4 Civil Assessment

The site and buildings are outdated and in need of improvement, either at the existing site, or at a new site, in order to meet current standards and to adequately serve its community. The Pescadero Fire Sta. is located in the flood plain of the Butano Creek (see “Pescadero Floodway Map” attached, Appendix 8.4) The site is has experienced an increase in the occurrence of flooding since the mid 1980’s due to the accumulation of silt and debris in Butano Creek and Pescadero Marsh as a result of halted dredging operations.

Civil utilities on-site consist of domestic water served by the local water service municipality. The septic system is reported to back-up during flood events, which is to be expected. A new septic system will likely be required. Because the location of the existing system becomes inundated with water during flood events (see Appendix 8.4, Photo 1), it is unlikely that this location will meet code. As such, alternative locations on site should be considered.

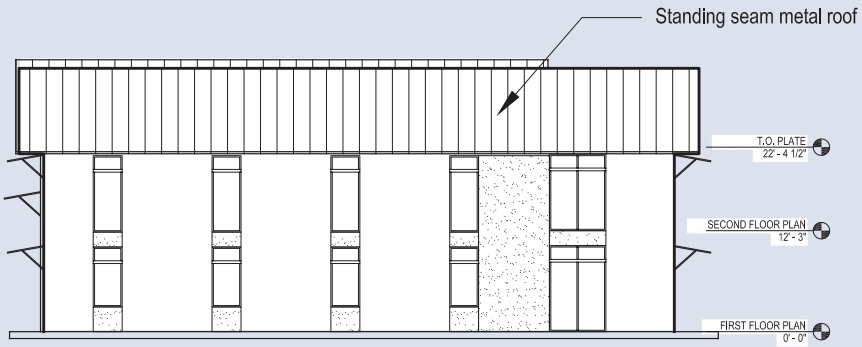
6. Diagrams

SK A1. (New site) Ideal Site Plan

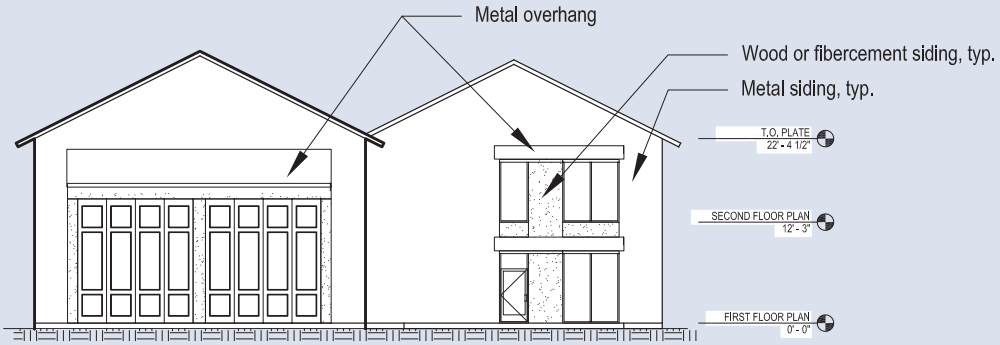


SK A2. (New site) Floor Plans

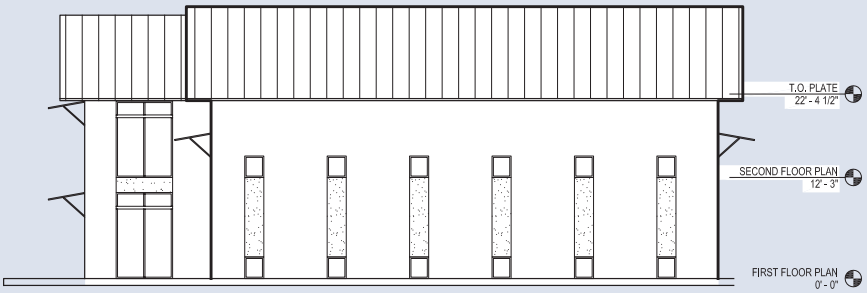
SK A3. (New site) Elevations



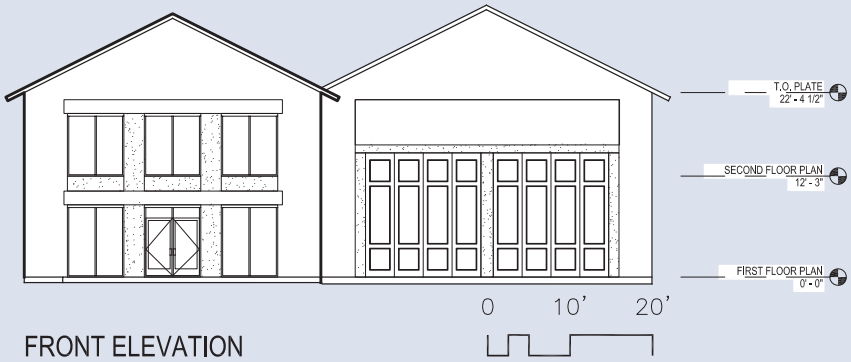
LEFT SIDE ELEVATION



BACK ELEVATION

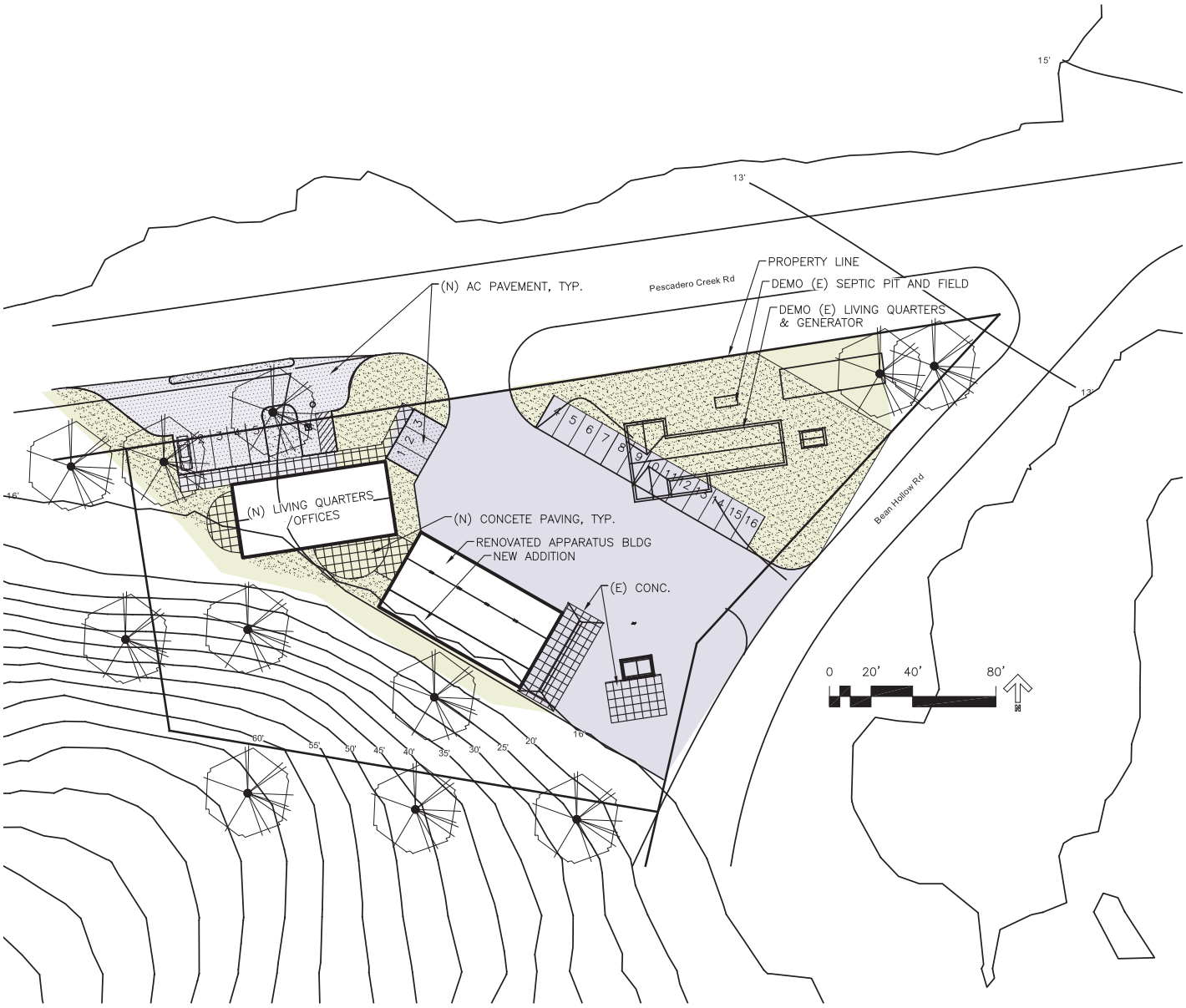


RIGHT SIDE ELEVATION

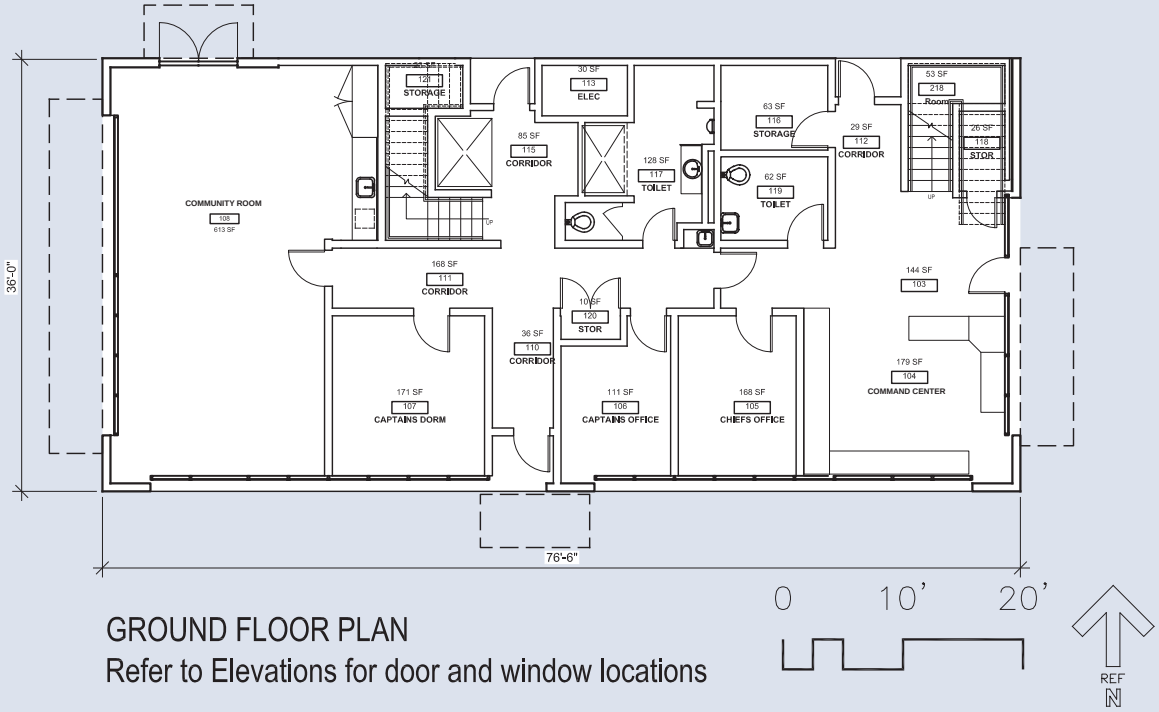


FRONT ELEVATION

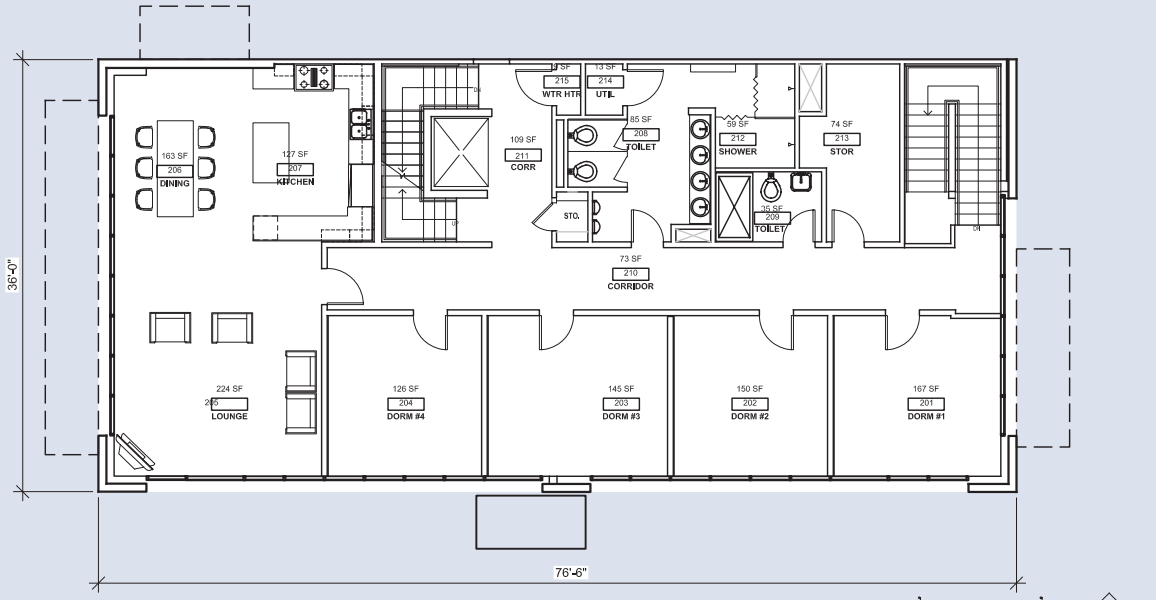
SK B1.0 (Existing site through Phase 2) Site Plan



SK B1.1 (Existing site, Phase 1) new Living Quarters floor plan

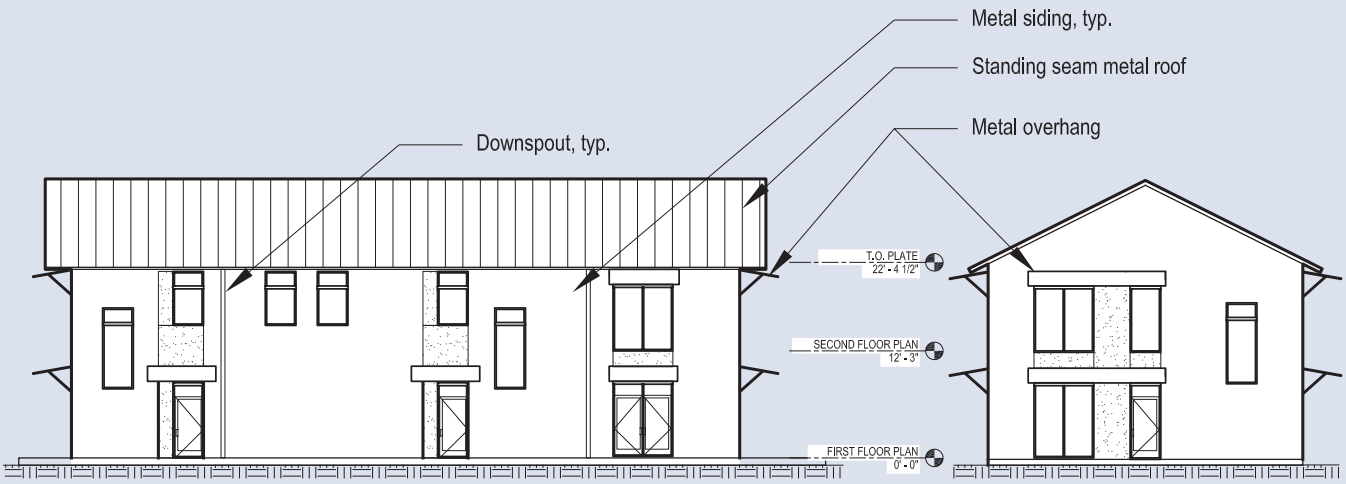


GROUND FLOOR PLAN
Refer to Elevations for door and window locations



UPPER FLOOR PLAN
Refer to Elevations for door and window locations

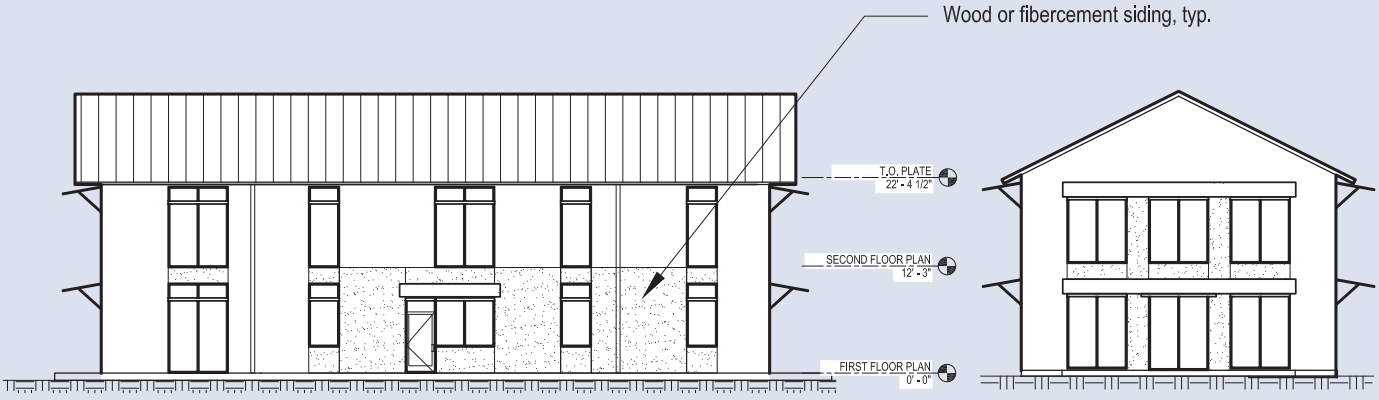
SK B1.2 (Existing site, Phase 1) new Living Quarters elevations



NORTH ELEVATION

0 10' 20'

EAST ELEVATION

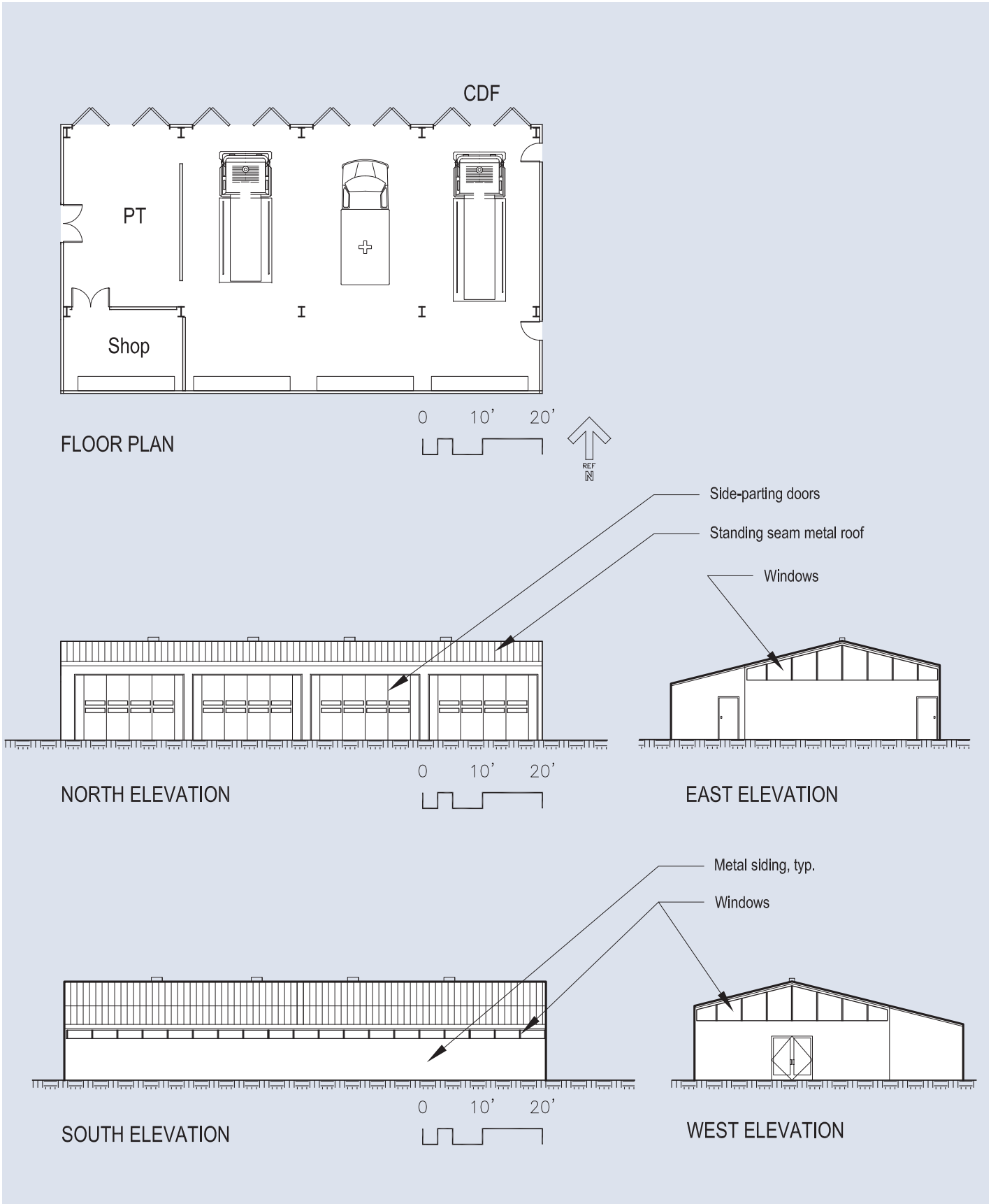


SOUTH ELEVATION

0 10' 20'

WEST ELEVATION

SK B2.1 (Existing site, Phase 2) Apparatus Building drawings



7. Cost Analysis

Options Analyzed

The project consists of Two Options:

Option A (New Site): Project consists of a new two-story 8,904 SF fire station with living quarters and apparatus bays. Sitework includes vehicular and pedestrian paving, landscaping, site lighting and drainage, new emergency generator and fuel storage tanks. Utilities include incoming water, storm drain and electrical service. Sewer is provide by an onsite septic system, gas is provided by propane tanks.

Option B (Existing Site): Project consists of replacing existing living quarters building with a new two-story 5,508 SF living quarters building, complete interior/exterior renovation to the existing 2,400 SF apparatus building, a new 1,100 SF addition to the existing apparatus building. Sitework includes vehicular and pedestrian paving, landscaping, site lighting and drainage, replacement of existing emergency generator and fuel storage tanks. Utilities include septic system replacement, distribution of utilities to buildings.

Cost summaries extracted from the full report are given on the following pages.

Basis for Pricing

Refer to full analysis given in Appendix 8.1. This estimate reflects the fair construction value for this project and should not be construed as a prediction of low bid. Subcontractor's markups have been included in each line item unit price. Subcontractor's markups typically range from 15% to 25% of the unit price depending on market conditions. This cost estimate is based on standard industry practice, professional experience and knowledge of the local construction market costs.

OVERALL SUMMARY OPTION A - NEW FIRESTATION AND SITE

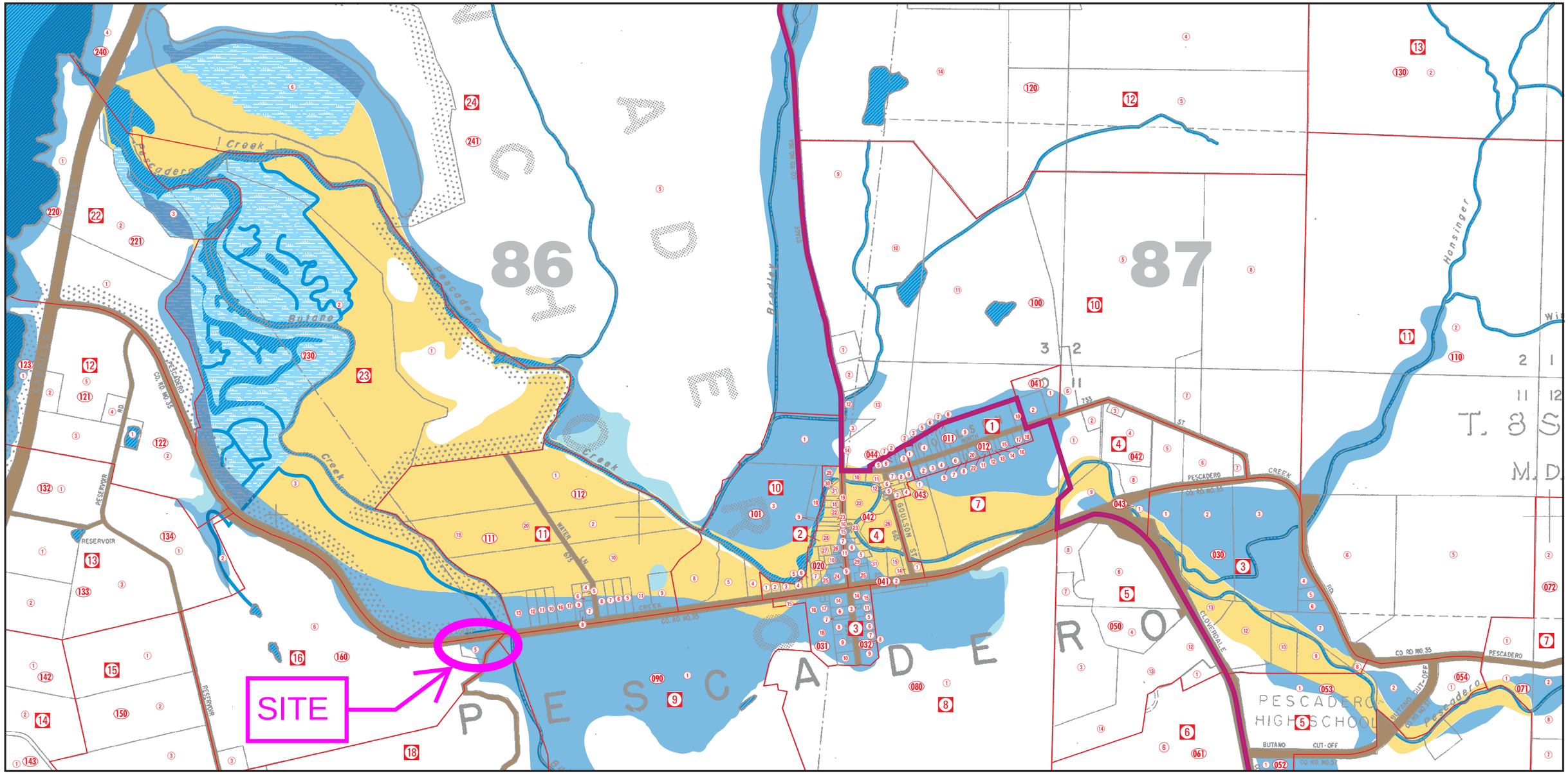
BUILDING			
Fire Station and Apparatus Bays	8,104	SF	2,779,194
Furniture, Fixtures and Equipment (FF&E)			See FF&E Budget
SITEWORK			
Site Preparation, Development and Utilities	1	LS	836,240
DIRECT COSTS SUB-TOTAL			**3,615,434**
SITE REQUIREMENTS AND JOBSITE MANAGEMENT (One Phase over 10 to 12 Months)		11.5%	415,775
ESTIMATE SUB-TOTAL			**4,031,209**
INSURANCE + BONDING		2.5%	100,780
FEE		3.0%	123,960
ESTIMATE SUB-TOTAL			**4,255,949**
DESIGN CONTINGENCY		15.0%	638,392
CONSTRUCTION CONTINGENCY		0.0%	Excluded
ESTIMATE SUB-TOTAL			**4,894,341**
ESCALATION (January 2015 start of Construction)		5.0%	**244,717**
ESTIMATE TOTAL			**5,139,058**

OVERALL SUMMARY OPTION B - EXISTING FIRE STATION AND SITE

BUILDINGS			
New Living Quarters	5,508	SF	1,759,001
Existing Apparatus Building Renovation	2,400	SF	867,100
Apparatus Building Addition	1,100	SF	259,600
Furniture, Fixtures and Equipment (FF&E)			See FF&E Budget
Subtotal - Buildings	9,008	SF	2,885,701
SITEWORK			
Site Preparation, Development and Utilities	1	LS	829,125
DIRECT COSTS SUB-TOTAL			**3,714,826**
SITE REQUIREMENTS AND JOBSITE MANAGEMENT (Two Phases over 18 Months)		17.0%	631,520
ESTIMATE SUB-TOTAL			**4,346,346**
INSURANCE + BONDING		2.5%	108,659
FEE		4.5%	200,475
ESTIMATE SUB-TOTAL			**4,655,480**
DESIGN CONTINGENCY		15.0%	698,322
CONSTRUCTION CONTINGENCY		0.0%	Excluded
ESTIMATE SUB-TOTAL			**5,353,802**
ESCALATION (January 2015 start on Construction)		7.0%	**374,766**
ESTIMATE TOTAL			**5,728,568**

8. Appendices

8.0 Water risks documentation



Pescadero Floodway Map

Disclaimer: The digital flood hazard data used on this map was derived from scanned and composited FEMA Floodway maps. The base cartographic map information was derived from a combination of Assessor and Public Works maps. For this reason and several others, including the scale or resolution that the information is displayed at, these maps should be considered an **advisory tool** for general hazard awareness, education, and flood plain management. This map is **not a legal document** to be used when making a single site flood hazard determination. That determination will have to be made by direct use of the FEMA FIRM or Floodway maps. (This is a non-archival inkjet print and is subject to fading when exposed to direct sunlight. Please store or display accordingly for maximum longevity.)

- Flood plain
- Floodway
- 500-yr Flood
- Lake
- Marshland
- Creeks; perenial
- Major Roads
- 87 Assessors book number
- Assessors book boundary
- Assessors page boundary
- 6 Assessors page number
- 061 Assessors block number
- 6 Assessors parcel number

N

SOURCES: SMC General Plan Map, 1988; FEMA Floodway Map, July 1984 and Geological Survey USGS Map, 1978.
For visual reference only.

pescadero floodway map.cdr rp 11/21/00 disc. rev 2/19/03 rp

The Annual Flooding of Pescadero Creek Road

Issue | Background | Findings | Conclusions | Recommendations | Responses | Attachments

Issue

For over 25 years the main road into Pescadero has been blocked by the annual flooding of Butano Creek, jeopardizing public safety and impeding access by public safety officers and medical responders into and out of the Pescadero community. Why has the County not resolved this problem and how can it finally be fixed?

Summary

The blockage of Pescadero Creek Road, in the unincorporated community of Pescadero, happens one or more times each rainy season, often for days each time. Flooding jeopardizes the safety of local citizens in two primary ways: First, alternative routes into the Pescadero area are along much longer, narrower roadways requiring at least two to three times more driving time from the coastal highway. In the case of emergencies where the San Mateo County Sheriff, CAL FIRE or the California Highway Patrol is required, response time is critical and delays can impact personal safety of citizens and their property. Second, as the road floods, there are always some individuals who deliberately or inadvertently drive through the flooded road areas, sometimes successfully, sometimes not. A flooded road impacts local commerce, tourist traffic, and agribusiness in the area, and often leaves debris and silt to clean up.

The flooding is linked to decades of silt accumulation in the streambed, and excess vegetation growth and debris build-up along Butano Creek and in Pescadero Marsh. The drainage from the Marsh into the sea, and associated flushing of silt into the sea, is compromised by natural and man-made changes. These include logging debris, erosion, run-off, levees and channels built to facilitate agriculture, as well as certain now-abandoned modifications intended to correct watershed problems. The bottom line is that rains cannot be contained within Butano Creek's banks, resulting in predictable and dangerous road flooding.

The San Mateo County Civil Grand Jury recommends the removal of excess silt and clearance of vegetation overgrowth and debris from as much of the Butano Creek as necessary to eliminate the road flooding by October 1, 2012, before the 2012/2013 rainy season, using the regulatory framework of "Emergency" action if necessary.

Background

Since the 1880s, the town of Pescadero, population ~650, has been a farming and ranching community. The town is located at the upstream (eastern) edge of Pescadero Marsh, at the confluence of Pescadero and Butano Creeks, both of which empty into the Pacific.

The flooding of the Pescadero Creek Road at the Butano Creek Bridge closes the main route into and out of Pescadero, while simultaneously inundating privately owned farmlands. The road closure isolates the town and surrounding areas from its CAL FIRE Station, severely impacting emergency services. Alternate roads are small and winding through local hills. An ambulance, fire engine, or police vehicle could require an extra hour or more in transit time. In recent years, flooding has occurred several times during the rainy season, often for 24-48 hours at a time.

Several sources document the history and complexities of the Pescadero watershed. [1] The cause of the annual flooding includes progressive silt accumulation and vegetation overgrowth and debris build-up in Butano Creek up- and down-stream of the Bridge and beyond into the Marsh itself. Additionally, numerous property owners decades ago created levees and channels in the marsh for their land-uses, and several projects for the Coastal Highway have modified the seasonal sand-berm that affects the Butano Creek's flow from the Marsh to the Ocean. State regulations enacted beginning in the 1960s have prevented property owners from dredging and clearing creeks on their property and opening the sand-berm as they had historically done.[2]

Survey profiles demonstrate the silt build up. (*See*, Attachment A.) The streambed was ~12 feet below the bottom of the bridge in 1968.[3] Currently the bridge clears the silted creek bottom by only two feet. The creek has no capacity to handle rainstorm run-off; the water has nowhere to go but up and over the road.

The California Department of State Parks and Recreation began acquiring Marsh properties in the 1960s, and in 1993 started to implement extensive modifications to the Marsh area intended to address and resolve environmental concerns[4]. Modifications included adding and removing dikes, adding water-control gates and culverts, and re-contouring certain flow features. The added features were not maintained, and were subsequently abandoned.[5] The reasons for this abandonment have not been identified. As a result, silt-up and vegetation overgrowth has reduced the capacity and impeded the water flow in the Creek. Fish-kills within the Marsh have also increased; agribusiness has suffered; sport fishing has all but disappeared; and negative effects on endangered wildlife are being documented.[6]

Interviewees from local citizens' groups including the Pescadero Municipal Advisory Group (PMAC), the California Alliance for Species Enhancement (CASE), and the San Mateo County Farm Bureau have stated that State Parks' modifications have exacerbated the flooding. Scientists are mostly in agreement.[7] For many years, citizens' groups have advocated County and State

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[1] IDC, from Sans, Director DPW, to San Mateo County Planning Commission May 8, 1992, "Flooding of Butano Creek at Pescadero Road", and to Pescadero Community Council Nov 10, 1992; Pescadero-Butano Watershed Assessment, Final Report March 5, 2004, Environmental Science Associates.

[2] *See, e.g.*, California Fish and Game Code §§ 1600-1602.

[3] *See*, Attachment A, "Silt-up Profiles."

[4] Website, C.A.S.E., caseforourenvironment.org, August 2011, Example of Jerry Smith's 201995/6 SJSU studies, prepared for State Parks.

[5] Interview, Biologist, NOAA / Fisheries.

[6] Website, C.A.S.E, caseforourenvironment.org, Conditions in Pescadero Marsh, Lennie Roberts report, 2004.

[7] Interview, scientist, California Dept. of Fish and Game.

action to provide relief from the flooding, and have proposed some immediate fixes. These included: dredging the streambed; raising the roadway at the bridge and especially at the low-point of the road; building a causeway and/or; installing a pump to move water from the upstream side of the bridge to a point downstream. None of these proposals have been implemented.

Permitting complexities can be additional barriers to immediate and broader County action. However, the Grand Jury is unaware that the County has actually applied for, or has been denied, any permits to address the road-flooding problem. The entities involved in permitting and advising permit issuance include State Parks, State Fish and Game, U.S. Fish and Wildlife Service, the Coastal Commission, and many others. (See, Attachment B: San Mateo County Public Works Permitting Flowchart.) A November 2010 letter from NOAA's National Marine Fisheries Service (NMFS) to California State Parks and Recreation and San Mateo County Public Works states that dredging may be a feasible solution to local road flooding, as well as alleviating the now encumbered fish passage (salmonids) until more extensive Marsh ecosystem recovery work is completed.[8] It also advises that dredging permits from the State (if necessary) should not be a hindrance and that NOAA stands ready to work with State Parks and the County on such an effort. (*See,* Attachment C: NOAA letter to California State Parks and San Mateo County Dept. of Public Works.)

The responsibility for Pescadero Creek Road and its maintenance belongs to San Mateo County Public Works. Public Works is also responsible for a 30-ft right-of-way on either side of the road. Silt re-deposition, vegetation overgrowth, and debris collection likely would require limited periodic clearing and clean-up efforts in future years. From interviews, the Grand Jury learned that action has not been taken in part because of other priorities, political and jurisdictional disputes with other levels of State and Federal government as well as potential permitting complexities.

County officials and advisors have discussed the concept of "Emergency" public works action with the Grand Jury.[9] The concept of "Emergency" action applies in two distinct circumstances. One is the declaration of a state of emergency by either a local government or the state, such as in 2010 when the San Bruno gas line exploded. The other involves conditions in which a local governmental entity, such as San Mateo County Public Works, can take emergency action to resolve an issue without the need to obtain prior permits to approve such actions. The permits in both circumstances may be resolved after the fact. Typically, Public Works has taken immediate action when necessary to repair roads/access due to slip-outs, rock-falls, flooding, under emergency authority, with permitting/remediation resolved after the fact.

California Government Code §21060.3 defines "Emergency" as a sudden, unexpected occurrence, involving a clear and imminent danger, demanding immediate action to prevent or mitigate loss of, or damage to, life, health, property, or essential public services. "Emergency"

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[8] Attachment B, Letter, NOAA / Fisheries to Public Works, and State Parks, November 24, 2010.
[9] CEQA Cal Government Code §21060.3; Cal. Code of Regulations, §15269 (d).

includes such occurrences as fire, flood, earthquake or other soil or geologic movements, as well as such occurrences as riot, accident or sabotage.

The California Code of Regulations §15269 (Title 14, Ch. 3, Art. 18), Emergency Projects, exempts a series of emergency project types from the requirements of the California Environmental Quality Act (CEQA). Among them are:

> (c) Specific actions necessary to prevent or mitigate an emergency. This does not include long term actions undertaken for the purpose of preventing or mitigating a situation that has a low probability of occurrence in the short-term.

In addition to the California Government Code reference cited above, there are other emergency provisions for waiving permits, allowing immediate actions to address issues of protecting life and public property from imminent danger, including fill and dredging activities under emergency conditions. Applicable references include:

- California Coastal Act: Public Resources Code § 30611 Emergencies; waiver of permit
- Local Coastal Program: SMC Local Coastal Program 9.15 Emergency Provisions
- US Army Corps of Engineers Regional General Permit 5 (emergency defined according to CEQA)[10]
- California Dept. of Fish and Game Code §1610 (a)(b)[11]

Road flooding is one symptom of a deteriorating Marsh watershed. An integrated overall plan is necessary to identify engineering actions needed to address all the interactive elements of the Pescadero Marsh ecosystem. One initiative to develop an overall solution is now underway by the Resource Conservation District (RCD), chartered to advise the County on conservation and environmental issues. The RCD is a Special District of California and is appointed by and advisory to the San Mateo County Board of Supervisors. The RCD obtained funding in 2011 to conduct a study to explore lasting solutions for the Marsh watershed, including resolution of the road-flooding problem. The elapsed time for the RCD research study plus the resulting actual project work will take at least 5 years.

Investigation

To investigate Pescadero Creek flooding, the San Mateo Civil Grand Jury took site tours, reviewed documents and reports, and conducted interviews with Federal, State and County government personnel, and scientific and citizens' groups, including:

- San Mateo County Board of Supervisors
- San Mateo County Public Works
- San Mateo County Resource Conservation District (RCD)
- California State Fish and Game Department

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[10] http://www.spn.usace.army.mil/regulatory/RGP/28218s.pdf and http://ceres.ca.gov/ceqa/stat/Ch_2-5.html .

[11] http://www.dfg.ca.gov/habcon/1600/1600code.html .

- National Oceanic and Atmospheric Administration (NOAA / Fisheries)
- Committee for Green Foothills
- San Mateo County Farm Bureau
- Citizens Against Species Extinction (C.A.S.E.)
- Pescadero Municipal Advisory Council (PMAC)

Note that the Grand Jury attempted to interview two individuals from California State Parks and Recreation, the agency that owns the Marsh and is responsible for its management. The individuals first agreed, then later declined through their lawyers, to provide informational interviews to the Grand Jury on the subject of this Report. After substantial delay, the State's lawyers subsequently claimed that State Park and Recreation has "…very little specific knowledge about the impacts, the causes, or the responsibility for the flooding" and therefore would not allow its clients to be interviewed (even when written questions were tendered in advance). The Grand Jury is disappointed in the lack of cooperation and surprised by the claimed ignorance on the part of the public agency directly responsible for managing the Marsh. For the record, the Grand Jury considers the issuance of this Report to be only part of an open and continuing investigation of matters relating to road flooding, Butano Creek, and the Pescadero Marsh. The Grand Jury expressly reserves its right to request that a subpoena issue from the Superior Court compelling the attendance of and/or production of records before the Grand Jury from any witness. The Grand Jury continues to evaluate whether such steps are required in this matter.

Reference documents reviewed included public records and reports, relevant websites, County engineering and scientific documents and reports, and documents provided by or referenced by the interviewees.

Site tours included several walk-arounds of Butano Creek (at and around the Bridge) and the Marsh and its tributary creeks, as well as the estuary exit sand-berm along the coast.

Findings

The Grand Jury finds:

1. The Butano Creek overflows its banks and floods Pescadero Creek Road and surrounding farmland each year during periods of rains.

2. The flooding of Pescadero Creek Road at Butano Creek Bridge creates a dangerous setting and, when impassable, delays public safety access and virtually isolates a Pescadero community of approximately 650 people.

3. Silt accumulation, vegetation overgrowth, and debris have reduced flow capacity of Butano Creek and increased road flooding risk.

4. Butano Creek has not been thoroughly cleared of accumulated silt, vegetation overgrowth, or debris for decades.

5. California State Parks and Recreation, beginning in 1993, made extensive modifications in the Marsh to re-establish a "natural ecological environment." Some modifications have not been maintained (e.g., flood gates) and, according to several interviewees, are presently ineffective and have made road-flooding conditions worse.

6. Solutions proposed to San Mateo County Public Works to correct the flooding include a raised roadway or a causeway, over-road pumping, dredging, and brush and debris clearance. The County has not adopted any of these suggestions.

7. San Mateo County is responsible for maintaining Pescadero Creek Road and its 30-foot right of way and therefore for correcting the road-flooding situation.

8. Multiple agencies, each with its own specific interests, might normally have to approve or advise on approval of permits to make changes that would resolve the flooding problem. Currently, any one agency could stop the process.

9. Multiple sections of California and federal law, e.g. California Fish and Game Code §1601, CEQA, CA Gov't Code §21060.3, and Cal. Code of Regs. §15269(d), provide for emergency exceptions to the permitting restrictions that normally apply to stream bed changes and road repairs. These may be available to Public Works to expedite actions that would eliminate Pescadero Road flooding.

10. The Grand Jury is unaware that the County has ever applied for, or been denied, any permit(s) for actions that would address the road flooding.

11. A November 24, 2010 letter from the NOAA's National Marine Fisheries Service (NMFS) North Central Coast Office to California State Parks and San Mateo County Public Works expressed the view that the permits required to address the road flooding should not be a hindrance and that "NMFS stands ready to work with State Parks and the County toward the shared goal of resource protections while improving the safety of Pescadero Road."

12. The Resource Conservation District has funding to explore solutions to environmental quality issues in the Pescadero Marsh ecosystem and intends to address Pescadero Creek Road flooding as part of its efforts. Its time frame, however, does not address the immediate need.

Conclusions

The Grand Jury concludes:

1. The status quo of annual road flooding is unsafe and unacceptable. The annual flooding of the main road serving Pescadero seriously jeopardizes citizens' safety, and impedes commercial activity in the area.

2. The diminishing capacity of the Butano Creek due to accumulated silt, vegetation

overgrowth, and debris increases the risk of flooding with lesser rainfall. This annual flooding is predictable and correctable.

3. The Board of Supervisors and responsible County government entities are essentially nonresponsive, hampered by other priorities, jurisdictional disputes with various State and Federal agencies, permitting requirements, and insufficient political will to overcome these.

4. The difficulty of obtaining approval of permits to address road flooding cannot be substantiated because, to the Grand Jury's knowledge, none have ever been applied for, or denied.

5. The Grand Jury believes that the County could invoke the "emergency repair" concept, take remedial action, and immediately end the Pescadero Creek Road flooding.

6. The estimated five years timing for any flood-control relief resulting from RCD's efforts is unacceptable.

7. Immediate solutions to road flooding must be implemented. The most promising include removal of excess silt and clearance of vegetation overgrowth and debris from as much of the Butano Creek as necessary to eliminate the annual road flooding.

Recommendations

The Grand Jury recommends that the Board of Supervisors:

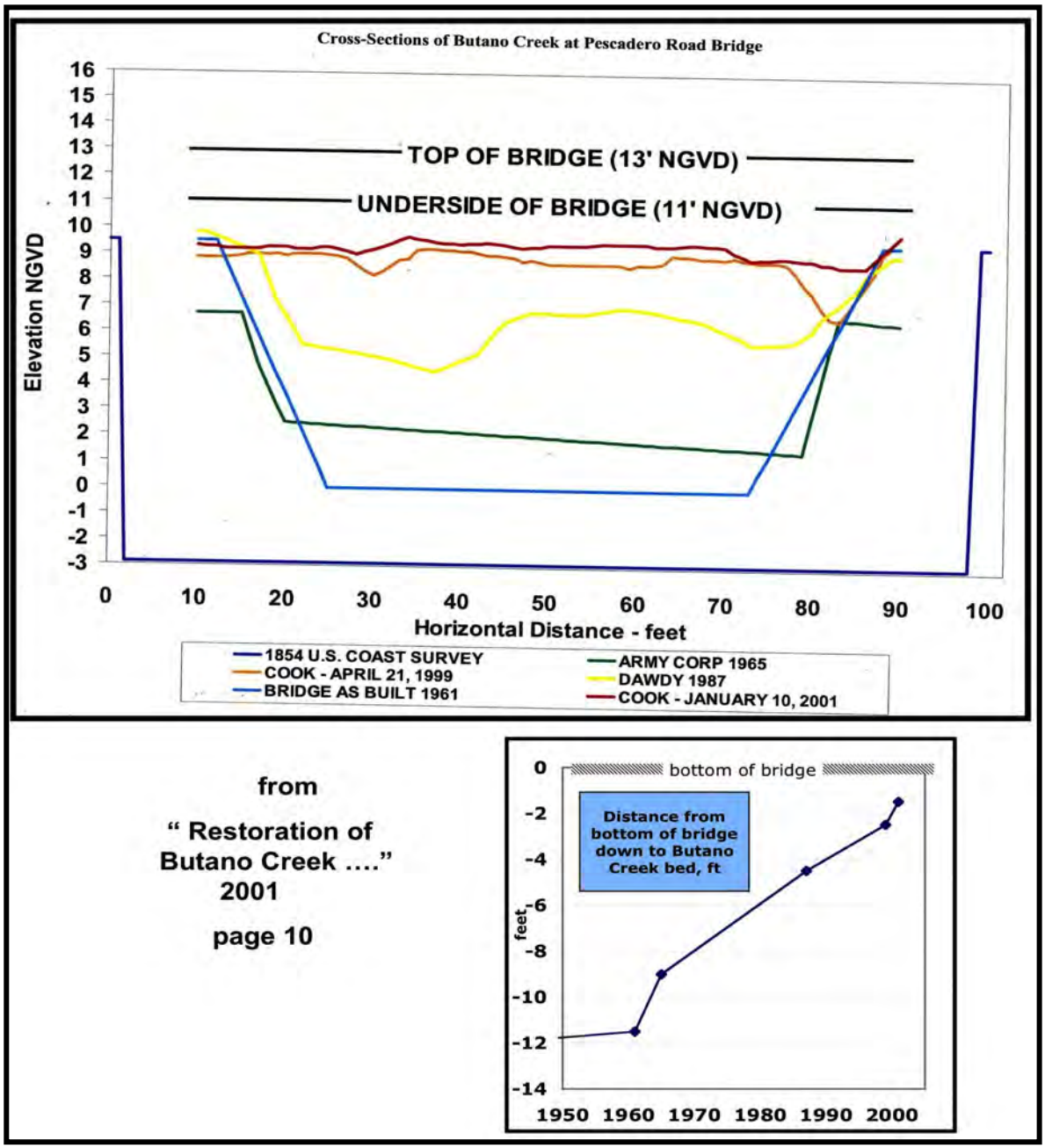
1. Immediately direct the County Department of Public Works to remove excess silt and clear vegetation overgrowth and debris from as much of the Butano Creek as necessary to eliminate the road flooding. The work should be completed as soon as possible, and in all circumstances before October 1, 2012, the start of the 2012-13 rainy season. The intended result of this work is to prevent flooding of Butano Creek onto and around Pescadero Creek Road and farmlands.

2. Review the NOAA (NMFS) Nov 24, 2010 letter (*See,* Attachment B), and consult with NOAA and the San Mateo County RCD on strategies for expediting permit approvals, if any are required, to accomplish the work described in Recommendation 1.

3. If needed to accomplish Recommendation Number 1, use San Mateo County's authority under the various emergency provisions of California and/or federal law to take actions mitigating flooding to protect life or property.

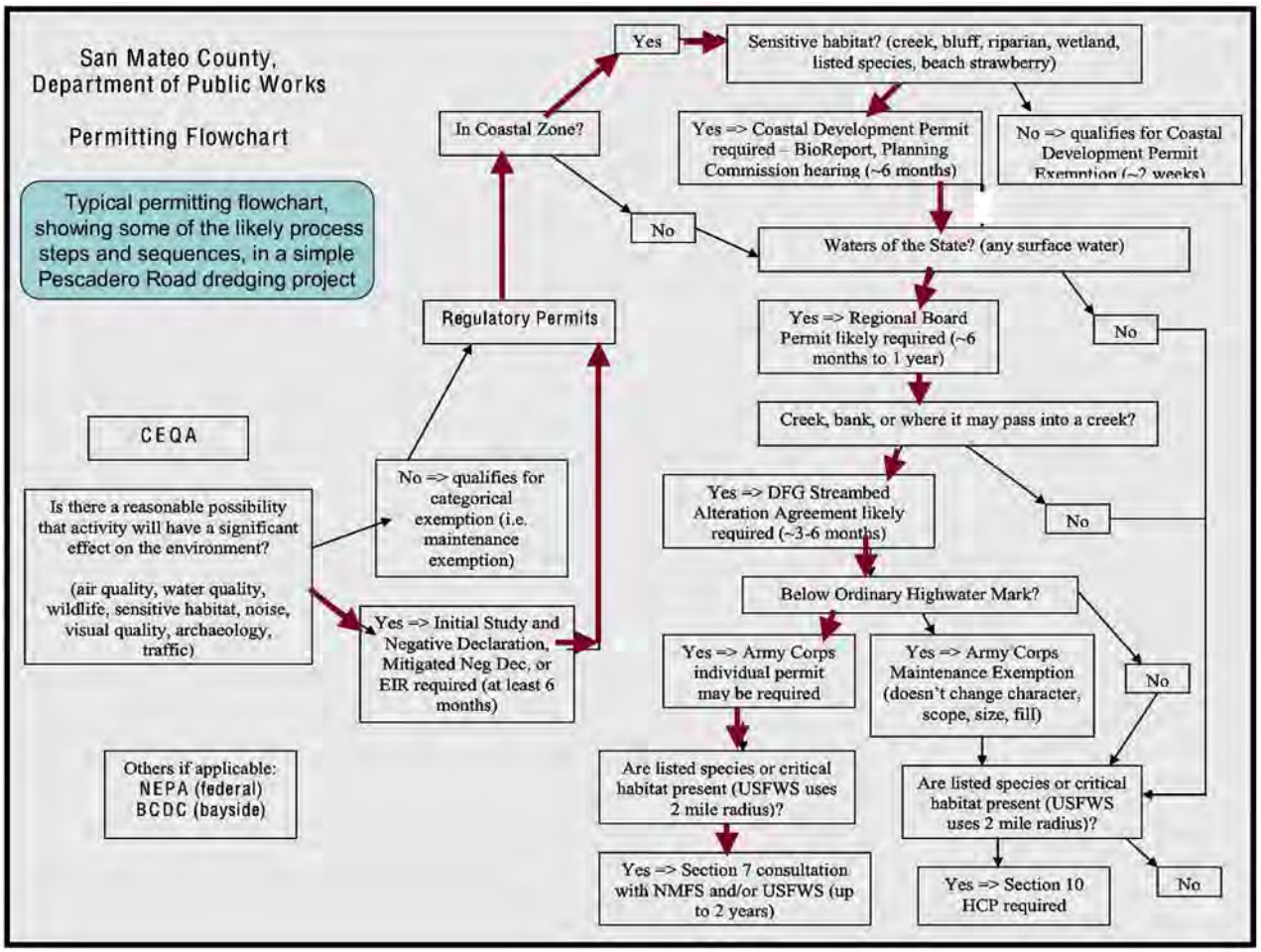
4. Direct the San Mateo County Department of Public Works to periodically clean new silt, vegetation overgrowth, and debris from Butano Creek as needed to maintain flows and eliminate the recurrence of Pescadero Creek Road flooding.

Attachment A: Silt-up Profiles of Butano Creek Bridge



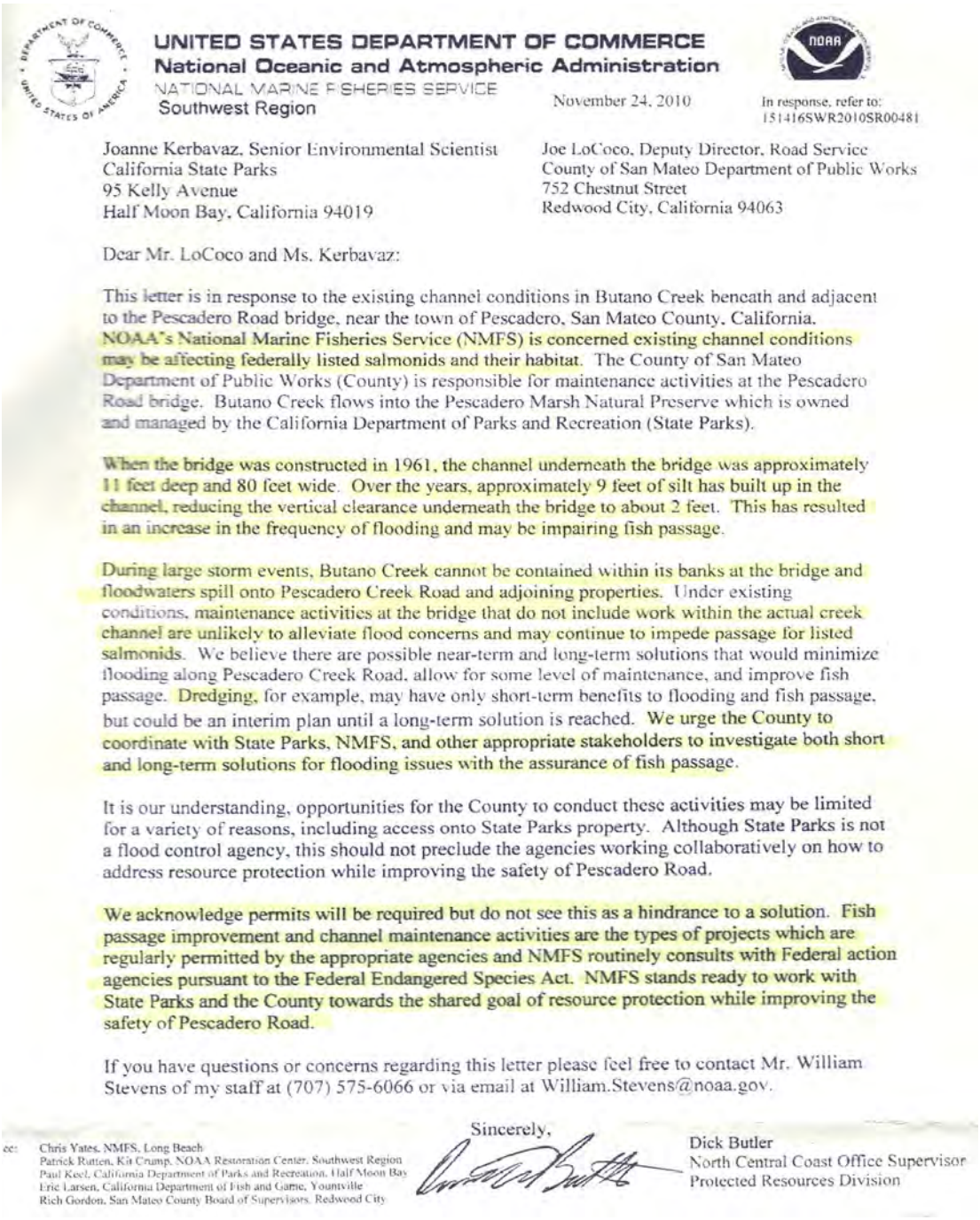
This image shows the profile of the Butano Creek streambed below the Pescadero Creek Road Bridge. Early surveys show the streambed some 12 feet below the bottom of the bridge. Today, the bridge clears the silted and debris-filled creek bottom by only 2 feet.

Attachment B:
San Mateo County Public Works Permitting Flowchart



This flowchart, prepared by the San Mateo County Department of Public Works, illustrates the path and sequence for obtaining permit approval for relatively straightforward projects. It does not show the additional entities that, as a matter of course, provide technical input and guidance to the indicated permitters.

Attachment C: NOAA / Fisheries Letter



UNITED STATES DEPARTMENT OF COMMERCE
National Oceanic and Atmospheric Administration
NATIONAL MARINE FISHERIES SERVICE
Southwest Region

November 24, 2010

In response, refer to:
151416SWR2010SR00481

Joanne Kerbavaz, Senior Environmental Scientist
California State Parks
95 Kelly Avenue
Half Moon Bay, California 94019

Joe LoCoco, Deputy Director, Road Service
County of San Mateo Department of Public Works
752 Chestnut Street
Redwood City, California 94063

Dear Mr. LoCoco and Ms. Kerbavaz:

This letter is in response to the existing channel conditions in Butano Creek beneath and adjacent to the Pescadero Road bridge, near the town of Pescadero, San Mateo County, California. NOAA's National Marine Fisheries Service (NMFS) is concerned existing channel conditions may be affecting federally listed salmonids and their habitat. The County of San Mateo Department of Public Works (County) is responsible for maintenance activities at the Pescadero Road bridge. Butano Creek flows into the Pescadero Marsh Natural Preserve which is owned and managed by the California Department of Parks and Recreation (State Parks).

When the bridge was constructed in 1961, the channel underneath the bridge was approximately 11 feet deep and 80 feet wide. Over the years, approximately 9 feet of silt has built up in the channel, reducing the vertical clearance underneath the bridge to about 2 feet. This has resulted in an increase in the frequency of flooding and may be impairing fish passage.

During large storm events, Butano Creek cannot be contained within its banks at the bridge and floodwaters spill onto Pescadero Creek Road and adjoining properties. Under existing conditions, maintenance activities at the bridge that do not include work within the actual creek channel are unlikely to alleviate flood concerns and may continue to impede passage for listed salmonids. We believe there are possible near-term and long-term solutions that would minimize flooding along Pescadero Creek Road, allow for some level of maintenance, and improve fish passage. Dredging, for example, may have only short-term benefits to flooding and fish passage, but could be an interim plan until a long-term solution is reached. We urge the County to coordinate with State Parks, NMFS, and other appropriate stakeholders to investigate both short and long-term solutions for flooding issues with the assurance of fish passage.

It is our understanding, opportunities for the County to conduct these activities may be limited for a variety of reasons, including access onto State Parks property. Although State Parks is not a flood control agency, this should not preclude the agencies working collaboratively on how to address resource protection while improving the safety of Pescadero Road.

We acknowledge permits will be required but do not see this as a hindrance to a solution. Fish passage improvement and channel maintenance activities are the types of projects which are regularly permitted by the appropriate agencies and NMFS routinely consults with Federal action agencies pursuant to the Federal Endangered Species Act. NMFS stands ready to work with State Parks and the County towards the shared goal of resource protection while improving the safety of Pescadero Road.

If you have questions or concerns regarding this letter please feel free to contact Mr. William Stevens of my staff at (707) 575-6066 or via email at William.Stevens@noaa.gov.

Sincerely,

Dick Butler
North Central Coast Office Supervisor
Protected Resources Division

cc: Chris Yates, NMFS, Long Beach
Patrick Rutten, Kit Crump, NOAA Restoration Center, Southwest Region
Paul Keel, California Department of Parks and Recreation, Half Moon Bay
Eric Larsen, California Department of Fish and Game, Yountville
Rich Gordon, San Mateo County Board of Supervisors, Redwood City

This letter from Mr. Butler of NOAA/Marine Fisheries, dated November 24, 2010, summarizes the silt-up of the Butano Creek streambed and its association with the annual Pescadero Road flooding. It acknowledges the potential interim benefits of dredging. It urges the County to coordinate with stakeholders to investigate solutions and provides guidance and offers support in overcoming permitting issues. (*highlights supplied*).

COUNTY OF SAN MATEO
Inter-Departmental Correspondence
County Manager

Date: July 3, 2012
Board Meeting Date: July 24, 2012
Special Notice / Hearing: None
Vote Required: Majority

To: Honorable Board of Supervisors

From: John L. Maltbie

Subject: 2011-12 Grand Jury Response

RECOMMENDATION:
Approve the Board of Supervisors' response to the 2011-12 Grand Jury report titled: The Annual Flooding of Pescadero Creek Road.

BACKGROUND:
On March 1, 2012, the Grand Jury filed a report titled: The Annual Flooding of Pescadero Creek Road. A copy of the Grand Jury report is attached hereto and identified herein as Exhibit A. The Board of Supervisors is required to submit comments on the findings and recommendations pertaining to the matters under control of the County of San Mateo within ninety days. The County's response to the report is due to the Hon. Gerald J. Buchwald no later than July 30, 2012.

Acceptance of this report contributes to the Shared Vision 2025 outcome of a Collaborative Community by ensuring that all Grand Jury findings and recommendations are thoroughly reviewed by the appropriate County departments and that, when appropriate, process improvements are made to improve the quality and efficiency of services provided to the public and other agencies.

DISCUSSION:
The Annual Flooding of Pescadero Creek Road

Findings:

Grand Jury Finding Number 1. The Butano Creek overflows its banks and floods Pescadero Creek Road and surrounding farmland each year during periods of rains.

Response: Agree. Butano Creek (Creek) overflows its banks and floods Pescadero Creek Road in most years.

Grand Jury Finding Number 2. The flooding of Pescadero Creek Road at Butano Creek Bridge creates a dangerous setting and, when impassable, delays public safety access and virtually isolates a Pescadero community of approximately 650 people.

Response: Disagree in part. Depending on the severity of flooding, access to the community can be impacted. However, the community of Pescadero does not become isolated, as there are two additional, though more circuitous routes into and out of Pescadero that can be taken when Pescadero Creek Road is impacted. These routes include Stage Road, which provides access from the north, and Pescadero Creek Road which provides access from the east. In addition, prior to expected flood events, the County Fire engine at Pescadero moves from the station on the west side of the bridge to the east side, closer to town. Fire response and emergency response are therefore available to the community during flooding events.

Grand Jury Finding Number 3. Silt accumulation, vegetation overgrowth, and debris have reduced flow capacity of Butano Creek and increased road flooding risk.

Response: Disagree in part. It is not clear to what the "debris" reference refers to. Among other contributory flooding factors, silt accumulation and vegetation overgrowth within and adjacent to the Creek, have contributed to flow capacity restrictions within the channel. However, because the area downstream of the bridge and extending as far as the ocean is relatively flat, sediment will naturally accumulate along this section of Creek as long as a sediment source, such as the naturally occurring sandstone formations in the upper watershed, exists.

It is ultimately not clear to what extent these may be naturally occurring processes and to what extent they "have increased road flooding risk." It is also not clear whether downstream restoration efforts or modifications to the Creek system have contributed to any issues associated with flooding..

Grand Jury Finding Number 4. Butano Creek has not been thoroughly cleared of accumulated silt, vegetation overgrowth, or debris for decades.

Response: Disagree in part. The Creek is lengthy and the Finding is not specific to a specific section of Creek. The County performed silt removal work within the Creek and Pescadero Creek Road right-of-way during the 1980's and early 1990's. Additionally, we understand that members of the Pescadero community removed woody debris, including beaver dams, in early 2000's. The County of San Mateo has a limited road right of way along Pescadero Creek Road at the Creek, which is 100 feet wide, and is offset 40 feet approximately 40 feet at the middle of the bridge. With the right of way offset, the County actually has only approximately 60 feet of right of way that is uniformly under our control. Accounting for the width of the bridge (approx. 24 feet), we have full control of approximately 18 feet of channel on either side of the bridge. Silt removal performed by the County is generally limited to the section of Creek within the County's right of way.

Grand Jury Finding Number 5. California State Parks and Recreation, beginning in 1993, made extensive modifications in the Marsh to re-establish a "natural ecological environment." Some modifications have not been maintained (e.g., flood gates) and, according to several interviewees, are presently ineffective and have made road-flooding conditions worse.

Response: Disagree in part. California State Parks and Recreation has performed work within the Marsh. This includes installation of tidegates which we understand are not presently functioning. The specific interaction and effect of the Marsh on the Creek and flooding is not conclusive. Additionally, it has not been determined whether or not the tide gates have a direct effect on the flooding of Pescadero Creek Road.

Grand Jury Finding Number 6. Solutions proposed to San Mateo County Public Works to correct the flooding include a raised roadway or a causeway, over-road pumping, dredging, and brush and debris clearance. The County has not adopted any of these suggestions.

Response: Disagree in part. These have been "suggested solutions" communicated by the community. However, it has not been determined whether any of these "suggested solutions" would in fact eliminate the flooding of Pescadero Creek Road. A significant section of Pescadero Creek Road within the vicinity of the Creek is designated on the Federal Emergency Management Agency (FEMA) Flood Insurance Rate Maps as being subject to flooding. Flooding within the areas designated on the FEMA maps will always be a possibility.

Grand Jury Finding Number 7. San Mateo County is responsible for maintaining Pescadero Creek Road and its 30-foot right of way and therefore for correcting the road-flooding situation.

Response: Disagree. The County of San Mateo is responsible for maintaining constructed road infrastructure within the limits of its road right-of-way. The road right-of-way for Pescadero Creek Road is 100 feet wide at the bridge over the Creek and is offset by forty feet (40') creating right of way limits that vary on each side of the bridge and Creek. The County of San Mateo does not have responsibility for areas outside of its road right of way (upstream or downstream of the bridge over the Creek), nor does it have responsibility for private property drainage. This Finding infers that the County has the responsibility to clear sediment or debris from the Creek upstream and downstream of the bridge to ensure that Pescadero Creek Road will not flood, which is not the case.

Grand Jury Finding Number 8. Multiple agencies, each with its own specific interests, might normally have to approve or advise on approval of permits to make changes that would resolve the flooding problem. Currently, any one agency could stop the process.

Response: Agree. The flooding that occurs on Pescadero Creek Road is a complex, multi-agency, and jurisdictional issue, which may potentially involve State and Federal agencies, the County, and private land owners. Not only are downstream solutions to be evaluated, but upstream property owners and land use must also be considered because the upstream properties are the source of sediment.

Grand Jury Finding Number 9. Multiple sections of California and federal law, e.g. California Fish and Game Code §1601, CEQA, CA Gov't Code §21060.3, and Cal. Code of Regs. §15269(d), provide for emergency exceptions to the permitting restrictions that normally apply to stream bed changes and road repairs. These may be available to Public Works to expedite actions that would eliminate Pescadero Road flooding.

Response: Disagree in part. There are in fact emergency exemptions which allow for after the fact permitting and would allow for expedited work. However, these exemptions generally pertain to situations where there is an immediate threat to public safety as a result of extreme natural events. On-going drainage issues within a designated area of flooding are generally not considered to be eligible for emergency permitting exemptions and would not be applicable to the flooding of Pescadero Creek Road.

Grand Jury Finding Number 10. The Grand Jury is unaware that the County has ever applied for, or been denied, any permit(s) for actions that would address the road flooding.

Response: Disagree. While a solution to the flooding issue has not been determined, the County of San Mateo has in the past applied for permits that would improve or restore localized drainage. Within the past year, the County received a permit to clear a culvert (pipe) along the south side of Pescadero Creek Road that flows to the south side of the bridge over the Creek. In addition, the County currently has a permit application pending for restoring the culvert capacity leading to the north side of the bridge.

Grand Jury Finding Number 11. A November 24, 2010 letter from the NOAA's National Marine Fisheries Service (NMFS) North Central Coast Office to California State Parks and San Mateo County Public Works expressed the view that the permits required to address the road flooding should not be a hindrance and that "NMFS stands ready to work with State Parks and the County toward the shared goal of resource protections while improving the safety of Pescadero Road."

Response: Disagree in part. NMFS is one regulatory agency among several that would be required to approve work in the Creek. NMFS regulates impacts to marine and anadromous wildlife, such as steelhead and Coho. Other agencies that would need to permit sediment removal from the Creek include: California Dept. of Fish and Game (regulates streambed alteration and species protection), California Regional Water Quality Control Board (regulates impacts to "Waters of the State" under Section 401 of the Clean Water Act), U.S. Army Corps of Engineers (regulates dredge and fill work

under Section 404 of the Clean Water Act and Section 10 of the Rivers and Harbors Act), and U.S. Fish and Wildlife Service (regulates terrestrial and freshwater species protection such as California red-legged frog and San Francisco garter snake). All agencies have agreed to work with the County and State Parks towards expediting permits once a project has been proposed. However, this does not mean that the regulatory agencies would allow the County or State Parks to do whatever is necessary to dredge the Creek. Any dredging of the Creek beyond the County road right-of-way would have potentially high impacts to existing dense riparian and wetland habitats, water quality, and endangered species. Any proposed dredging would require working closely with regulatory agencies to develop a plan to minimize those impacts to the maximum extent possible and mitigation for any impacts would likely be required.

Grand Jury Finding Number 12. The Resource Conservation District has funding to explore solutions to environmental quality issues in the Pescadero Marsh ecosystem and intends to address Pescadero Creek Road flooding as part of its efforts. Its time frame, however, does not address the immediate need.

Response: Disagree. The San Mateo County Resource Conservation District (SMCRCD) does not have funding to explore solutions to environmental quality issues in the Pescadero Marsh ecosystem. The SMCRCD provided the Pescadero Municipal Advisory Council, at their April 10, 2012 meeting, with a written description of the SMCRCD work as funded by a $75,000 grant from the Bay Area Integrated Regional Water Management Plan through Proposition 84. The following includes excerpts from the written description as shown below in quotation marks.

"This project is to do the required analysis (most likely hydrology, hydraulics, refined sediment budget - not anything that has already been done but in some cases refining what has been done to a resolution required for permits) and develop consensus around an option or suite of options so that it is permit-ready and implementation-ready."

"What it can do: Develop conceptual designs that are broadly supported by community members, landowners, and resource agencies, do the preliminary work for permit-readiness, include climate change considerations."

"What it will not do: address flooding from mainstem Pescadero, complete designs, complete permits, construct solutions, presuppose a solution before the analysis has been completed."

Recommendations:

1. Immediately direct the County Department of Public Works to remove excess silt and clear vegetation overgrowth and debris from as much of the Butano Creek as necessary to eliminate the road flooding. The work should be completed as soon as possible, and in all circumstances before October 1, 2012, the start of the 2012-13 rainy season. The

intended result of this work is to prevent flooding of Butano Creek onto and around Pescadero Creek Road and farmlands.

Response:
This recommendation requires further analysis, as it has not been determined how dredging would affect riparian and wetland habitat, sensitive species, or adjacent properties. Furthermore, the County of San Mateo has no authority to enter onto private property to perform work of any kind absent a mutual agreement to do so with landowners, and we do not believe that dredging within the 100 feet of County right of way will relieve flooding.

It has also not been determined that dredging is the optimal solution to preventing flooding of Pescadero Creek Road from the Creek. While dredging the Creek has been suggested, there has been no analysis of the impacts of dredging on surrounding lands. It has been reported that the Creek does not have a defined channel approximately 1,000 feet downstream of the Pescadero Creek Road Bridge. Thus, it is not clear whether it is possible to dredge "as much of the Butano Creek as necessary to eliminate the road flooding." The fact that the area is in a defined flood plain suggests that dredging of the creek to eliminate flooding is not in fact achievable. We also do not believe an October 1, 2012 timeframe is plausible for any work involving the Creek. Our experience has been that permit approvals can be expected to take more than one year to obtain in instances such as these where many permit approvals are required to assure that the water quality, sensitive habitats, and protected species are not adversely impacted.

As mentioned above in the Response to Finding 12, the SMCRCD is currently working on a grant funded project which would provide additional site analysis. It is believed that such an analysis will help establish potential solutions to the localized flooding. The County has been in contact with the SMCRCD regarding the possibility of supporting an expanded study by the SMCRCD that would include an analysis of the impacts associated with Creek dredging efforts.

In addition, County staff are working on ways to reduce the danger to the community during flooding by posting electronic message signs on either side of the flood prone area near the bridge. This will not solve the long term flooding problem, but will clearly inform the drivers that the bridge is flooded and hopefully reduce the danger to drivers in the near term. (Are these the measures being considered?)

2. Review the NOAA (NMFS) Nov 24, 2010 letter (See, Attachment B), and consult with NOAA and the San Mateo County RCD on strategies for expediting permit approvals, if any are required, to accomplish the work described in Recommendation 1.

Response:
This recommendation requires further analysis; however, the County has been in contact with NMFS, the SMCRCD, other pertinent regulatory agencies, and State representatives regarding the issues surrounding the Creek, Pescadero Creek Road,

and the Marsh. As stated in the Response to Finding 11, multiple permits or approvals would be required to perform dredging or any work in or near the Creek. The additional site analysis which is to be performed by the SMCRCD through the grant funding is generally considered the next key step in identifying potential flood mitigation solutions. To the extent that the SMCRCD study could be expanded to include levels of detail that would allow for a complete site analysis, the County intends to prepare a comprehensive report during FY 2012/13 which can be utilized as a baseline for the development of solutions to reduce the flooding of Pescadero Creek Road from the Creek. Through discussions with the various permitting agencies, there has been general agreement among the agencies to expedite their reviews.

3. If needed to accomplish Recommendation Number 1, use San Mateo County's authority under the various emergency provisions of California and/or federal law to take actions mitigating flooding to protect life or property.

Response:
This recommendation will not be implemented because it is not feasible. The County's Department of Public Works, works closely with regulatory agencies on numerous projects every year and has had discussions with the various agencies with respect to this and other projects. We have confirmed at several levels that work within the Creek channel would not be considered by the regulatory agencies as emergency work and would therefore require standard reviews and permit approvals. We are, however, continuing to investigate whether there may be FEMA funding opportunities through CalEMA and whether these programs offer opportunities for expedited work approvals.

4. Direct the San Mateo County Department of Public Works to periodically clean new silt, vegetation overgrowth, and debris from Butano Creek as needed to maintain flows and eliminate the recurrence of Pescadero Creek Road flooding.

Response:
This recommendation requires further analysis. As noted in the Response to Recommendation 1, it has not been determined that dredging the Creek is a feasible short term or long term solution to flooding. The County currently has plans to perform an engineering analysis that would consider the effectiveness of potential alternatives, including dredging within the Pescadero Creek Road right-of-way and beyond. We are planning on prioritizing such studies and anticipate that they will be completed within the next fiscal year. Regular and periodic removal of silt, vegetation, and debris from the Creek would require permits from the regulatory agencies.

FISCAL IMPACT:
There is no Net County Cost associated with accepting this report.

8.1 Cost Analysis

Pescadero Fire Station
Pescadero, California

January 14, 2014

tbd consultants

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Roseville, CA 95661
(916) 742-1770
www.tbdconsultants.com

Prepared for:
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5856 Doyle Drive
Emeryville, CA 94608
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TABLE OF CONTENTS

BASIS OF ESTIMATE

PROJECT DESCRIPTION

The project consists of Two Options:

Option A (New Site): Project consists of a new two-story 8,104 SF fire station with living quarters and apparatus bays. Sitework includes vehicular and pedestrian paving, landscaping, site lighting and drainage, new emergency generator and fuel storage tanks. Utilities include incoming water, storm drain and electrical service. Sewer is provide by an onsite septic system, gas is provided by propane tanks.

Option B (Existing Site): Project consists of replacing existing living quarters building with a new two-story 5,508 SF living quarters building, complete interior/exterior renovation to the existing 2,400 SF apparatus building, a new 1,100 SF addition to the existing apparatus building. Sitework includes vehicular and pedestrian paving, landscaping, site lighting and drainage, replacement of existing emergency generator and fuel storage tanks. Utilities include septic system replacement, distribution of utilities to buildings.

REFERENCE DOCUMENTATION

Documents provided by Ratcliff Architects and their Design Team.

SITE VISIT

Meeting and site visit November 20, 2013.

BASIS FOR PRICING

This estimate reflects the fair construction value for this project and should not be construed as a prediction of low bid. Prices are based on local prevailing wage construction costs at the time the estimate was prepared. Pricing assumes a procurement process with competitive bidding for all sub-trades of the construction work, which is to mean a minimum of 3 bids for all subcontractors and materials/equipment suppliers. If fewer bids are solicited or received, prices can be expected to be higher.

Subcontractor's markups have been included in each line item unit price. Markups cover the cost of field overhead, home office overhead and subcontractor’s profit. Subcontractor's markups typically range from 15% to 25% of the unit price depending on market conditions.

General Contractor’s/Construction Manager's Site Requirement costs are calculated on a percentage basis. General Contractor’s/Construction Manager's Jobsite Management costs are also calculated on a percentage basis.

General Contractor’s/Construction Manager's overhead and fees are based on a percentage of the total direct costs plus general conditions, and covers the contractor’s bond, insurance, site office overheads and profit.

Unless identified otherwise, the cost of such items as overtime, shift premiums and construction phasing are not included in the line item unit price.

BASIS OF ESTIMATE

This cost estimate is based on standard industry practice, professional experience and knowledge of the local construction market costs. TBD Consultants have no control over the material and labor costs, contractors methods of establishing prices or the market and bidding conditions at the time of bid. Therefore TBD Consultants do not guarantee that the bids received will not vary from this cost estimate.

CONTINGENCY

Design Contingency ***15%***

The Design Contingency is carried to cover scope that lacks definition and scope that is *anticipated* to be added to the Design. As the Design becomes more complete the Design Contingency will reduce.

Construction Contingency ***0%*** ***to be carried elsewhere in Owner's Budget***

The Construction Contingency is carried to cover the unforeseen during construction execution and Risks that do not currently have mitigation plans. As Risks are mitigated, Construction Contingency can be reduce, but should not be eliminated.

ESCALATION

Escalation has been included based on a January 2015 start of construction.

EXCLUSIONS

- Land acquisition, feasibility, and financing costs
- All Owner soft costs
- All professional fees and insurance
- Construction Manager or Agency Costs
- Site or existing condition survey investigation costs, including determination of subsoil conditions
- Hazardous materials inspection costs, or accommodations in construction for hazardous materials.
- Owners Construction Contingency for scope changes and market conditions at time of bid
- Permits

ITEMS THAT MAY AFFECT THIS ESTIMATE

Such items include, but are not limited to the following:

Modifications to the scope of work subsequent to the preparation of this estimate
Unforeseen existing conditions
Compression of planned construction schedule
Special requirements for site access or off-hours work
Restrictive technical specifications, excessive contract or non-competitive bid conditions
Sole source specifications for materials, products or equipment
Bid approvals delayed beyond the anticipated project schedule

OVERALL SUMMARY OPTION A - NEW FIRESTATION AND SITE

BUILDING			
Fire Station and Apparatus Bays	8,104	SF	2,779,194
Furniture, Fixtures and Equipment (FF&E)			See FF&E Budget
SITEWORK			
Site Preparation, Development and Utilities	1	LS	836,240
DIRECT COSTS SUB-TOTAL			**3,615,434**
SITE REQUIREMENTS AND JOBSITE MANAGEMENT (One Phase over 10 to 12 Months)		11.5%	415,775
ESTIMATE SUB-TOTAL			**4,031,209**
INSURANCE + BONDING		2.5%	100,780
FEE		3.0%	123,960
ESTIMATE SUB-TOTAL			**4,255,949**
DESIGN CONTINGENCY		15.0%	638,392
CONSTRUCTION CONTINGENCY		0.0%	Excluded
ESTIMATE SUB-TOTAL			**4,894,341**
ESCALATION (January 2015 start of Construction)		5.0%	**244,717**
ESTIMATE TOTAL			**5,139,058**

OVERALL SUMMARY OPTION B - EXISTING FIRE STATION AND SITE

BUILDINGS			
New Living Quarters	5,508	SF	1,759,001
Existing Apparatus Building Renovation	2,400	SF	867,100
Apparatus Building Addition	1,100	SF	259,600
Furniture, Fixtures and Equipment (FF&E)			See FF&E Budget
Subtotal - Buildings	9,008	SF	2,885,701
SITEWORK			
Site Preparation, Development and Utilities	1	LS	829,125
DIRECT COSTS SUB-TOTAL			**3,714,826**
SITE REQUIREMENTS AND JOBSITE MANAGEMENT (Two Phases over 18 Months)		17.0%	631,520
ESTIMATE SUB-TOTAL			**4,346,346**
INSURANCE + BONDING		2.5%	108,659
FEE		4.5%	200,475
ESTIMATE SUB-TOTAL			**4,655,480**
DESIGN CONTINGENCY		15.0%	698,322
CONSTRUCTION CONTINGENCY		0.0%	Excluded
ESTIMATE SUB-TOTAL			**5,353,802**
ESCALATION (January 2015 start on Construction)		7.0%	**374,766**
ESTIMATE TOTAL			**5,728,568**

New Fire Station (8,904 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	STRUCTURE					
	Building Pad					
	Built-up building pad - allow	7,200	SF	2.50	18,000	
	Foundations					
	Perimeter wall footing	340	LF	100.00	34,000	
	Column footings	30	EA	650.00	19,500	
	Interior grade beams - allow	1	LS	10,000.00	10,000	
	Elevator pit - single	1	EA	10,000.00	10,000	
	Vertical Structure					
	Steel columns and moment frames - allow					
	6.00#/SF	25	TN	4,500.00	112,500	
	Floor and Roof Structure					
	Slab on grade including base					
	Living quarters	2,754	SF	10.00	27,540	
	Apparatus	2,596	SF	14.00	36,344	
	Steel framed floor structure including metal					
	decking and concrete topping - allow 8.00#/SF	2,754	SF	30.00	82,620	
	Steel framed pitched roof structure and roof					
	overhangs including metal decking - allow					
	Living quarters	3,360	SF	25.00	84,000	
	Apparatus - long span	3,100	SF	30.00	93,000	
	Wall curbs, equipment pads and curbs	1	LS	10,000.00	10,000	
	Miscellaneous metals and rough carpentry	8,104	SF	3.00	24,312	
	Seismic joints between living quarters and					
	apparatus building	1	LS	10,000.00	10,000	
	Fireproofing steelwork - not required				NIC	
	STRUCTURE				**571,816**	
	EXTERIOR WALLS AND ROOFING					
	Exterior Walls					
	Steel stud framed exterior walls with plywood					
	sheathing	6,900	SF	16.00	110,400	
	Metal/wood siding, batt insulation, gypsum board					
	and paint to interior face of exterior wall	6,900	SF	25.00	172,500	
	Operable windows (allow 25% of exterior walls)	1,700	SF	80.00	136,000	
	Shade structures at windows - allow	1	LS	10,000.00	10,000	
	Soffits/roof overhangs	1,200	SF	25.00	30,000	
	Entrance doors and service doors	1	LS	20,000.00	20,000	
	Apparatus bi-fold doors - motorized	4	EA	30,000.00	120,000	
	Fascia's, trim and ornamentation	1	LS	20,000.00	20,000	
	Entrance canopy or covered porch	1	LS	10,000.00	10,000	
	Louvers and vents	1	LS	3,000.00	3,000	
	Outdoor Patio					
	Concrete paving	240	SF	15.00	3,600	
	Roof structure including structure and metal					
	roofing	240	SF	75.00	18,000	
	Roofing					
	Metal roofing including insulation and flashing	6,460	SF	25.00	161,500	
	Gutters and downspouts	1	LS	10,000.00	10,000	
	Miscellaneous flashing, caulking and sealants	1	LS	8,000.00	8,000	
	Skylights - not required				NIC	
	EXTERIOR WALLS AND ROOFING				**833,000**	

New Fire Station (8,904 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	INTERIOR CONSTRUCTION					
	Interior Partitions					
	Metal stud partitions including sound insulation,					
	gypsum board and paint finish	4,200	SF	15.00	63,000	
	Interior doors -allow	26	EA	2,000.00	52,000	
	Interior Finishes					
	Flooring including base					
	Carpet and vinyl	5,108	SF	8.00	40,864	
	Ceramic tile	400	SF	22.00	8,800	
	Sealer	2,596	SF	2.50	6,490	
	Walls					
	Ceramic tile	1,200	SF	20.00	24,000	
	Painted plywood panels at apparatus room	1,500	SF	8.00	12,000	
	Miscellaneous wall finishes - allow	1	LS	15,000.00	15,000	
	Ceilings					
	Suspended acoustical tile and gypsum board					
	ceilings	8,104	SF	10.00	81,040	
	Equipment					
	Kitchen					
	Base cabinet including countertop	30	LF	450.00	13,500	
	Upper wall cabinet	20	LF	200.00	4,000	
	Island	1	EA	3,000.00	3,000	
	Appliances	1	LS	20,000.00	20,000	
	Restrooms					
	Vanities	10	LF	300.00	3,000	
	Shower stalls	3	EA	1,500.00	4,500	
	Partitions and accessories	1	LS	6,000.00	6,000	
	Offices, meeting room and training room					
	Built-in casework - allow	1	LS	10,000.00	10,000	
	Equipment and accessories	1	LS	10,000.00	10,000	
	Wardrobe lockers - allow	13	EA	1,200.00	15,600	
	Restroom lockers - allow	13	EA	600.00	7,800	
	Turn-out lockers - allow	24	EA	800.00	19,200	
	Casework and workbench at apparatus room	1	LS	10,000.00	10,000	
	Laundry room casework, washer and dryer	1	LS	6,000.00	6,000	
	Shelving, wall guards and corner guards	1	LS	5,000.00	5,000	
	Window blinds or shades	1,700	SF	7.00	11,900	
	Signage and graphics (interior and exterior)	1	LS	10,000.00	10,000	
	Miscellaneous equipment and accessories	1	LS	15,000.00	15,000	
	Furniture, beds and moveable furnishings -					
	FF&E Budget				FF&E Budget	
	Vertical Transportation					
	Elevator- two stop hydraulic including shaft walls					
	and associated mechanical and electrical					
	requirements	1	EA	100,000.00	100,000	
	Stair including railings	2	EA	15,000.00	30,000	
	INTERIOR CONSTRUCTION				**607,694**	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION					
	Plumbing					
	Plumbing system	8,104	SF	18.50	149,924	
	Heating and Ventilation					
	Heating and ventilation system (no air conditioning)	8,104	SF	16.00	129,664	
	Vehicle exhaust system (2 bays)	1	LS	90,000.00	90,000	
	Electrical					
	Electrical system including power, lighting, alarm					
	systems and communications	8,104	SF	44.00	356,576	

New Fire Station (8,904 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	Fire Protection					
	Fire sprinkler system	8,104	SF	5.00	40,520	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION				**766,684**	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK					
	No work anticipated					
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK					
	SITE WORK					
	See Site Work Estimate				Site Work	
	SITE WORK					
DIRECT COSTS SUB-TOTAL					**2,779,194**	

Two-Story Living Quarters Building (5,508 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	STRUCTURE					
	Building Pad					
	Built-up building pad - allow	4,000	SF	3.00	12,000	
	Foundations					
	Perimeter wall footing	220	LF	100.00	22,000	
	Column footings	15	EA	650.00	9,750	
	Interior grade beams - allow	1	LS	5,000.00	5,000	
	Elevator pit - single	1	EA	10,000.00	10,000	
	Vertical Structure					
	Steel columns and moment frames - allow					
	6.00#/SF	17	EA	4,500.00	76,500	
	Floor and Roof Structure					
	Slab on grade including base	2,754	SF	10.00	27,540	
	Steel framed floor structure including metal					
	decking and concrete topping - allow 8.00#/SF	2,754	SF	30.00	82,620	
	Steel framed pitched roof structure and roof					
	overhangs including metal decking - allow 8.00#/SF	3,360	SF	25.00	84,000	
	Miscellaneous metals and rough carpentry	5,508	SF	3.00	16,524	
	Wall curbs, equipment pads and curbs	1	LS	5,000.00	5,000	
	Fireproofing steelwork - not required				NIC	
	STRUCTURE				**350,934**	
	EXTERIOR WALLS AND ROOFING					
	Exterior Walls					
	Steel stud framed exterior walls with plywood					
	sheathing	4,500	SF	16.00	72,000	
	Metal/wood siding, batt insulation, gypsum board					
	and paint to interior face of exterior wall	4,500	SF	25.00	112,500	
	Operable windows (allow 25% of exterior walls)	1,125	SF	80.00	90,000	
	Shade structures at windows - allow	1	LS	10,000.00	10,000	
	Soffits/roof overhangs	600	SF	25.00	15,000	
	Entrance doors and service doors	1	LS	15,000.00	15,000	
	Fascia's, trim and ornamentation	1	LS	10,000.00	10,000	
	Entrance canopy or covered porch	1	LS	10,000.00	10,000	
	Outdoor Patio					
	Concrete paving	240	SF	15.00	3,600	
	Roof structure including structure and metal					
	roofing	240	SF	75.00	18,000	
	Roofing					
	Metal roofing including insulation and flashing	3,360	SF	25.00	84,000	
	Gutters and downspouts	1	LS	8,000.00	8,000	
	Miscellaneous flashing, caulking and sealants	1	LS	5,000.00	5,000	
	Skylights - not required				NIC	
	EXTERIOR WALLS AND ROOFING				**453,100**	

Two-Story Living Quarters Building (5,508 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	INTERIOR CONSTRUCTION					
	Interior Partitions					
	Metal stud partitions including sound insulation,					
	gypsum board and paint finish	3,200	SF	15.00	48,000	
	Interior doors -allow	22	EA	2,000.00	44,000	
	Interior Finishes					
	Flooring including base					
	Carpet and vinyl	5,108	SF	8.00	40,864	
	Ceramic tile	400	SF	22.00	8,800	
	Walls					
	Ceramic tile	1,200	SF	20.00	24,000	
	Miscellaneous wall finishes - allow	1	LS	15,000.00	15,000	
	Ceilings					
	Suspended acoustical tile and gypsum board					
	ceilings	5,508	SF	10.00	55,080	
	Equipment					
	Kitchen					
	Base cabinet including countertop	30	LF	450.00	13,500	
	Upper wall cabinet	20	LF	200.00	4,000	
	Island	1	EA	3,000.00	3,000	
	Appliances	1	LS	20,000.00	20,000	
	Restrooms					
	Vanities	10	LF	300.00	3,000	
	Shower stalls	3	EA	1,500.00	4,500	
	Partitions and accessories	1	LS	6,000.00	6,000	
	Offices, meeting room and training room					
	Built-in casework - allow	1	LS	10,000.00	10,000	
	Equipment and accessories	1	LS	10,000.00	10,000	
	Wardrobe lockers - allow	13	EA	1,200.00	15,600	
	Restroom lockers - allow	16	EA	600.00	9,600	
	Laundry room casework, washer and dryer	1	LS	6,000.00	6,000	
	Window blinds or shades	1,125	SF	7.00	7,875	
	Shelving, wall guards and corner guards	1	LS	5,000.00	5,000	
	Signage and graphics (interior and exterior)	1	LS	5,000.00	5,000	
	Miscellaneous equipment and accessories	1	LS	10,000.00	10,000	
	Furniture, beds and moveable furnishings -					
	FF&E Budget				FF&E Budget	
	Vertical Transportation					
	Elevator- two stop hydraulic including shaft walls					
	and associated mechanical and electrical					
	requirements	1	EA	100,000.00	100,000	
	Stair including railings	2	EA	15,000.00	30,000	
	INTERIOR CONSTRUCTION				**498,819**	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION					
	Plumbing					
	Plumbing system	5,508	SF	23.00	126,684	
	Heating and Ventilation					
	Heating and ventilation system (no air conditioning)	5,508	SF	20.00	110,160	
	Electrical					
	Electrical system including power, lighting, alarm					
	systems and communications	5,508	SF	32.00	176,256	
	Fire Protection					
	Fire sprinkler system	5,508	SF	6.00	33,048	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION				**446,148**	

Two-Story Living Quarters Building (5,508 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK					
	Clear site for building pad	5,000	SF	2.00	10,000	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK				**10,000**	
	SITE WORK					
	See Site Work Estimate				Site Work	
	SITE WORK					
DIRECT COSTS SUB-TOTAL					**1,759,001**	

Existing Apparatus Building (2,400 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	STRUCTURE					
	Existing Foundations					
	Foundation work at new moment frames - allow	110	LF	150.00	16,500	
	Existing Bent Frame Structure					
	Allowance for miscellaneous structural modifications to bring existing structure up to current codes - allow	2,400	SF	5.00	12,000	
	Moment frames at overhead doors	3	EA	12,000.00	36,000	
	Moment frames at exterior walls	2	EA	12,000.00	24,000	
	Floor and Roof Structure					
	Patch and repair existing concrete slab on grade	2,400	SF	4.00	9,600	
	Steel joist roof structure including plywood decking	2,600	SF	13.00	33,800	
	Wall curbs, equipment pads and curbs	1	LS	5,000.00	5,000	
	Miscellaneous metals and rough carpentry	2,400	SF	5.00	12,000	
	STRUCTURE				**148,900**	
	EXTERIOR WALLS AND ROOFING					
	Exterior Walls					
	steel stud wall framed exterior walls including plywood sheathing	2,400	SF	16.00	38,400	
	Metal/wood siding, batt insulation, gypsum board and paint to interior face of exterior wall	2,400	SF	25.00	60,000	
	Operable windows - allow	200	SF	80.00	16,000	
	Soffits/roof overhangs	200	SF	25.00	5,000	
	Louvers and vents	1	LS	3,000.00	3,000	
	Entrance doors and service doors	1	LS	10,000.00	10,000	
	Overhead doors - motorized	3	EA	12,000.00	36,000	
	Fascia's, trim and ornamentation	1	LS	5,000.00	5,000	
	Entrance canopy or covered porch	1	LS	5,000.00	5,000	
	Roofing					
	Metal roofing including insulation and flashing	2,600	SF	25.00	65,000	
	Gutters and downspouts	1	LS	6,000.00	6,000	
	Miscellaneous flashing, caulking and sealants	1	LS	5,000.00	5,000	
	Skylights - not required				NIC	
	EXTERIOR WALLS AND ROOFING				**254,400**	
	INTERIOR CONSTRUCTION					
	Interior Partitions					
	Interior partition and door allowance	1	LS	10,000.00	10,000	
	Interior Finishes					
	Flooring					
	Gym flooring	600	SF	15.00	9,000	
	Concrete sealer	1,800	SF	2.00	3,600	
	Steel structure - paint	2,400	SF	2.00	4,800	
	Walls					
	Painted plywood panels	1,500	SF	8.00	12,000	
	Ceiling - paint exposed structure and services	2,400	SF	2.00	4,800	

Existing Apparatus Building (2,400 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	Equipment					
	Special equipment - allow	1	LS	10,000.00	10,000	
	Bollards at overhead doors	6	EA	1,000.00	6,000	
	Turn-out lockers - allow	24	EA	800.00	19,200	
	Casework and workbench at apparatus room	1	LS	10,000.00	10,000	
	Window blinds or shades	200	SF	7.00	1,400	
	Signage and graphics (interior and exterior)	1	LS	5,000.00	5,000	
	Miscellaneous equipment and accessories	1	LS	10,000.00	10,000	
	Furniture and moveable furnishings - FF&E Budget				FF&E Budget	
	INTERIOR CONSTRUCTION				**105,800**	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION					
	Plumbing					
	Plumbing system	2,400	SF	3.50	8,400	
	Heating and Ventilation					
	Heating and ventilation system (no air conditioning)	2,400	SF	8.00	19,200	
	Vehicle exhaust system (3 bays)	1	LS	120,000.00	120,000	
	Electrical					
	Electrical system including power, lighting, alarm systems and communications	2,400	SF	50.00	120,000	
	Fire Protection					
	Fire sprinkler system	2,400	SF	4.00	9,600	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION				**277,200**	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK					
	Selective Building Demolition					
	Remove interior construction, exterior walls, mezzanine, roofing, mechanical and electrical systems	2,400	SF	12.00	28,800	
	Hazardous material abatement or removal - excluded				NIC	
	Temporary Construction					
	Temporary enclosure/shelter to house vehicles, lockers and equipment during renovation of the apparatus building - allow	8	MO	5,000.00	40,000	
	Shoring and bracing of existing structure during construction	2,400	SF	5.00	12,000	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK				**80,800**	
	SITE WORK					
	See Site Work Estimate				Site Work	
	SITE WORK					
	DIRECT COSTS SUB-TOTAL				**867,100**	

Apparatus Building Addition (1,100 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	STRUCTURE					
	Building Pad					
	Built-up building pad - allow	1,500	SF	3.00	4,500	
	Foundations					
	Perimeter wall footing	120	LF	100.00	12,000	
	Vertical Structure					
	Steel stud framed exterior walls with plywood sheathing (load bearing and shearwalls)	1,000	SF	16.00	16,000	
	Floor and Roof Structure					
	Slab on grade including base and dowels to existing slab	1,100	SF	12.00	13,200	
	Steel joist roof structure including plywood decking	1,200	SF	15.00	18,000	
	Steel ledger at existing building for roof framing	80	LF	75.00	6,000	
	Wall curbs, equipment pads and curbs	1	LS	3,000.00	3,000	
	Miscellaneous metals and rough carpentry	1,100	SF	3.00	3,300	
	STRUCTURE				**76,000**	
	EXTERIOR WALLS AND ROOFING					
	Exterior Walls					
	Metal/wood siding, batt insulation, gypsum board and paint to interior face of exterior wall	1,000	SF	25.00	25,000	
	Operable windows - allow	100	SF	80.00	8,000	
	Soffits/roof overhangs	100	SF	25.00	2,500	
	Entrance doors and service doors	1	LS	5,000.00	5,000	
	Roofing					
	Metal roofing including insulation and flashing	1,200	SF	25.00	30,000	
	Gutters and downspouts	1	LS	3,000.00	3,000	
	Miscellaneous flashing, caulking and sealants	1	LS	2,000.00	2,000	
	Expansion joint covers (walls and roof)	1	LS	5,000.00	5,000	
	Skylights - not required				NIC	
	EXTERIOR WALLS AND ROOFING				**80,500**	
	INTERIOR CONSTRUCTION					
	Interior Partitions					
	Interior partition and door allowance	1	LS	5,000.00	5,000	
	Interior Finishes					
	Flooring including base					
	Concrete sealer	1,100	SF	3.00	3,300	
	Ceilings					
	Gypsum board and paint to underside of roof framing	1,100	SF	12.00	13,200	
	Equipment					
	Restroom accessories	1	LS	1,000.00	1,000	
	Window blinds or shades	100	SF	7.00	700	
	Miscellaneous equipment and accessories	1	LS	5,000.00	5,000	
	Furniture and moveable furnishings - FF&E Budget				FF&E Budget	
	INTERIOR CONSTRUCTION				**28,200**	

Apparatus Building Addition (1,100 SF)

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION					
	Plumbing					
	Plumbing system	1,100	SF	9.00	9,900	
	Heating and Ventilation					
	Heating and ventilation system (no air conditioning)	1,100	SF	15.00	16,500	
	Electrical					
	Electrical system including power, lighting, alarm systems and communications	1,100	SF	35.00	38,500	
	Fire Protection					
	Fire sprinkler system	1,100	SF	5.00	5,500	
	MECHANICAL, ELECTRICAL, PLUMBING, FIRE PROTECTION				**70,400**	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK					
	Clear site for building pad	1,500	SF	3.00	4,500	
	SELECTIVE BUILDING DEMOLITION / TEMPORARY WORK				**4,500**	
	SITE WORK					
	See Site Work Estimate				Site Work	
	SITE WORK					
DIRECT COSTS SUB-TOTAL					**259,600**	

New Site

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	SITE PREPARATION					
	Building Demolition					
	No work required				NIC	
	Site Demolition					
	Miscellaneous site demolition - allow	1	LS	5,000.00	5,000	
	Site Clearing and Grading					
	General clearing, grading and compaction	40,000	SF	1.00	40,000	
	Building pad - see building estimate				Building	
	Erosion control and site drainage during construction	1	LS	20,000.00	20,000	
	SITE PREPARATION				**65,000**	
	SITE DEVELOPMENT					
	Vehicular Paving					
	Concrete driveway including curbs and gutters	1,760	SF	15.00	26,400	
	Asphalt paving including curbs and gutters	13,880	SF	10.00	138,800	
	Striping, signage and graphics	1	LS	5,000.00	5,000	
	Pedestrian Paving					
	Concrete paving and walkways	2,680	SF	10.00	26,800	
	Patio - see building estimate				Building	
	Site Structures and Features					
	Trash enclosure	1	LS	10,000.00	10,000	
	Fuel storage system including containment - allow	1	LS	35,000.00	35,000	
	Monument sign, site signage and flagpoles	1	LS	15,000.00	15,000	
	Benches, planters, screen walls and bollards	1	LS	25,000.00	25,000	
	Perimeter fencing and gates					
	Wood fencing - allow	600	LF	35.00	21,000	
	Vehicle gate - motorized	1	EA	20,000.00	20,000	
	Site Lighting and Power					
	Generator enclosure - allow	1	LS	25,000.00	25,000	
	Emergency generator - see electrical utilities				Electrical Utilities	
	Site lighting and miscellaneous power					
	Paved areas	18,320	SF	1.50	27,480	
	Landscape areas	16,240	SF	0.50	8,120	
	Site Drainage					
	Site drainage					
	Paved areas	18,320	SF	1.00	18,320	
	Landscape areas	16,240	SF	0.50	8,120	
	Vehicle wash area containment and filters - allow	1	LS	15,000.00	15,000	
	Landscaping and Irrigation					
	Soil preparation, planting and irrigation system	16,240	SF	5.00	81,200	
	Trees - allow	1	LS	10,000.00	10,000	
	SITE DEVELOPMENT				**516,240**	

New Site

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	UTILITIES ON SITE					
	Mechanical Utilities (allow 100 LF)					
	Water					
	Water service to building	1	LS	10,000.00	10,000	
	Fire water					
	Water service to building including riser assembly	1	LS	20,000.00	20,000	
	Sanitary sewer					
	Septic system including distribution piping to building	1	LS	50,000.00	50,000	
	Storm drainage					
	Included with site drainage				Site Drainage	
	Natural gas					
	Propane tanks - by Propane Company				Propane Company	
	Piping to building	1	LS	5,000.00	5,000	
	Electrical Utilities (allow 100 LF)					
	Power and communications					
	Incoming service to building	1	LS	20,000.00	20,000	
	Emergency generator, switchboard, automatic transfer switch and day tank (allow 150 KVA)	1	LS	150,000.00	150,000	
	Radio system - by Owner				Owner	
	UTILITIES ON SITE				**255,000**	
	DIRECT COSTS SUB-TOTAL				**836,240**	

Existing Site

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	SITE PREPARATION					
	Building Demolition					
	Living quarters building	2,175	SF	7.00	15,225	
	Apparatus building addition and slab	200	SF	20.00	4,000	
	Emergency generator building and generator	1	LS	10,000.00	10,000	
	Site Demolition					
	Fuel storage system	1	LS	10,000.00	10,000	
	Septic system	1	LS	5,000.00	5,000	
	Miscellaneous site demolition	1	LS	5,000.00	5,000	
	Site Clearing and Grading					
	General clearing, grading and compaction	22,000	SF	1.00	22,000	
	Building pad - see building estimate				Building	
	Erosion control and site drainage during construction	1	LS	15,000.00	15,000	
	SITE PREPARATION				**86,225**	
	SITE DEVELOPMENT					
	Vehicular Paving					
	Concrete driveways including curbs and gutters	1,100	SF	15.00	16,500	
	Asphalt paving including curbs and gutters	6,800	SF	10.00	68,000	
	Patch and repair existing asphalt paving - allow	13,000	SF	1.00	13,000	
	Striping, signage and graphics	1	LS	5,000.00	5,000	
	Pedestrian Paving					
	Concrete paving and walkways	1,800	SF	10.00	18,000	
	Patio - see building estimate				Building	
	Site Structures and Features					
	Retaining walls at hillside behind new living quarters and apparatus building additions - allow	100	LF	200.00	20,000	
	Trash enclosure	1	LS	10,000.00	10,000	
	Fuel storage system including containment - allow	1	LS	35,000.00	35,000	
	Monument sign, site signage and flagpoles	1	LS	15,000.00	15,000	
	Benches, planters, screen walls and bollards	1	LS	15,000.00	15,000	
	Perimeter fencing and gates					
	Wood fencing - allow	850	LF	35.00	29,750	
	Vehicle gates - motorized	2	EA	20,000.00	40,000	
	Site Lighting and Power					
	Generator enclosure - allow	1	LS	25,000.00	25,000	
	Emergency generator - see electrical utilities				Electrical Utilities	
	Site lighting and miscellaneous power					
	Paved areas - new and existing	22,700	SF	1.50	34,050	
	Landscape areas - new and existing	11,900	SF	0.50	5,950	
	Site Drainage					
	Site drainage					
	Paved areas - new and existing	22,700	SF	1.00	22,700	
	Landscape areas - new and existing	11,900	SF	0.50	5,950	
	Culvert at new driveway	1	LS	10,000.00	10,000	
	Vehicle wash area containment and filters - allow	1	LS	15,000.00	15,000	
	Landscaping and Irrigation					
	Soil preparation, planting and irrigation system	9,200	SF	5.00	46,000	
	Patch and repair existing planting areas	1	LS	5,000.00	5,000	
	Trees - allow	1	LS	5,000.00	5,000	
	SITE DEVELOPMENT				**459,900**	

Existing Site

REF	DESCRIPTION	QUANTITY	UoM	UNIT RATE	TOTAL	COMMENTS
	UTILITIES ON SITE					
	Mechanical Utilities					
	Water					
	Water service to site - existing				Existing	
	Distribution to buildings (allow 300 LF)	1	LS	10,000.00	10,000	
	Fire Protection					
	Water service to site - existing				Existing	
	Distribution to buildings (allow 250 LF plus					
	riser assemblies)	1	LS	25,000.00	25,000	
	Sanitary sewer					
	Septic system including 300 LF of distribution					
	piping to buildings	1	LS	60,000.00	60,000	
	Storm drainage					
	Included with site drainage				Site Drainage	
	Natural gas					
	Propane tanks - existing to remain				Existing	
	Relocate propane tanks - by Propane Company				Propane Company	
	Distribution to buildings (allow 200 LF)	1	LS	8,000.00	8,000	
	Electrical Utilities					
	Power and communications					
	Incoming service - existing				Existing	
	Distribution to buildings	1	LS	15,000.00	15,000	
	Emergency generator, switchboard, automatic					
	transfer switch and day tank (allow 150 KVA)	1	LS	150,000.00	150,000	
	Emergency power distribution to buildings	1	LS	15,000.00	15,000	
	Radio system - by Owner				Owner	
	UTILITIES ON SITE				**283,000**	
DIRECT COSTS SUB-TOTAL					**829,125**	

8.2 Structural report

I. Structural Assessment of Existing Site

Introduction

This report presents the findings of building structural assessments per *ASCE 41: Seismic Rehabilitation of Existing Buildings.* Aspects of building performance that are considered include structural, nonstructural, and foundation/geologic hazard issues. Lifelines such as water, electrical, gas and waste, etc., beyond the perimeter of the building are not considered.

The ASCE 41 process has 3 tiers or levels of evaluation. A Tier 1 evaluation is considered a preliminary phase with the purpose of screening out buildings that are compliant and quickly identifying buildings with potential seismic deficiencies. A Tier 2 evaluation is an analysis of the building that addresses the potential seismic deficiencies identified in Tier 1 screening. A Tier 3 evaluation is a detailed and complete analysis of the building. For this evaluation, a Tier 1 screening was performed.

The structural elements including foundations and the nonstructural elements are evaluated with a choice of three main performance objectives: Collapse Prevention, Life-safety or Immediate Occupancy. In evaluating the fire station site, the life-safety and immediate occupancy damage states were considered. However because the fire station is an emergency facility the ultimate performance objective should be immediate occupancy.

Life-safe structural performance is the post-earthquake damage state in which significant damage to the structure has occurred, but some margin against the onset of partial or total collapse remains. Some structural elements and components are severely damaged, but this does not result in large falling debris hazards, either within or outside the building. Injuries may occur during the earthquake; however overall risk of life-threatening injury as a result of structural damage is expected to be low. It should be possible to repair the structure; however, for economic reasons this may not be practical. While the damaged structure is not an imminent collapse risk, it would be prudent to implement structural repairs or install temporary bracing prior to re-occupancy. Immediate Occupancy structural performance is the post-earthquake damage state to both structural and non-structural components such that damage is not life-threatening so as to permit immediate occupancy of the building after a design earthquake. Damage is repairable while the building is occupied.

The scope of work for the structural building assessments included the following tasks:

1. Reviewing available original construction documents.
2. Making a site visit to confirm that the available drawings properly identify the extent of the building, to observe whether significant building modifications have occurred, and to observe the nonstructural systems bracing and anchorage.
3. Performing the required calculations as required by ASCE 31.
4. Preparing a report summarizing our findings.

Barracks Building

The Barracks building is a single-story, light wood framed structure. The structural system matches that of a single family dwelling. The foundation consists of raised wood floor construction with a continuous concrete perimeter footing and isolated interior concrete piers. The floor and roof framing consist of short spanning, wood members not spaced more than 24 inches apart. The exterior walls and roof have plywood sheathing, while interior walls are sheathed with plaster or gypsum board. Multiple undocumented additions and modifications were observed. In general the additions and modifications consisted of wood construction similar to original construction type.

ASCE 41-13 Seismic Rehabilitation of Existing Buildings describes this structure as Building Type W1. In general this type of structure is ductile and tends to perform well in seismic events.

An ASCE 41-13 Life Safety basic checklist evaluation identifies the structure as being predominately compliant. The main exceptions were unknown factors of liquefaction and surface fault rupture which need to be review by a Geotechnical engineer. In addition the structural load path needs to be confirmed since the original documents do not clearly state how various concealed connections are constructed.

The Barracks building is part of an emergency response facility. Therefore an Immediate Occupancy performance level is required. An ASCE 41-13 Immediate Occupancy checklist evaluation for W1 structures identified a number of noncompliant items. These items must be addressed during a retrofit to comply with CBC requirements for Emergency Faculties. Some of these issues are no Hold-down anchors at shear walls, discontinuous chords and collectors, excessive unblocked diaphragms ratios if only exterior walls are considered part of the lateral resisting elements, interior shear walls with no footings or plywood sheathing if interior walls are considered part of the lateral system, as well as the items identified in the Life Safety check list. These identified issues are all minor in nature and could be retrofitted without significant cost.

The major compliance issue with achieving an Immediate Occupancy building performance level is the structure being located in an area subject to flooding. The structure has been subject to flood waters three times in recent years. In one of those events the structure experienced flood water levels three feet above the finished floor line of the building. Flooding will damage the structure and will render the building inoperable during the period of the flood, which would make an Immediate Occupancy performance level difficult to achieve even after a structural retrofit.

Apparatus Building

The original, main portion of the Apparatus building is a single-story, pre-engineered and pre-fabricated steel building. The structure consists of rigid steel frames in the transverse direction and rod bracing in the longitudinal direction on one side of the structure. There is no lateral system in the longitudinal direction where the large equipment doors are located. The foundation is a concrete slab-on-grade system with spread footings around the perimeter and under the steel frame locations. The walls are constructed with wood studs attached to steel frames and horizontal girts. The roof framing consists of steel joists with lightweight metal roofing. The diaphragm consists of rod bracing in alignment with the vertical rod bracing lateral system locations. An addition and modifications were observed during the site visit. In general the addition and modifications consist of wood construction and are not similar to the pre-manufactured steel building they are connected too.

ASCE 41-13 describes this steel building portion of the structure as Building Type S3. In general this type of system is designed for maximum efficiency of material and cost and not for a high performance during seismic events.

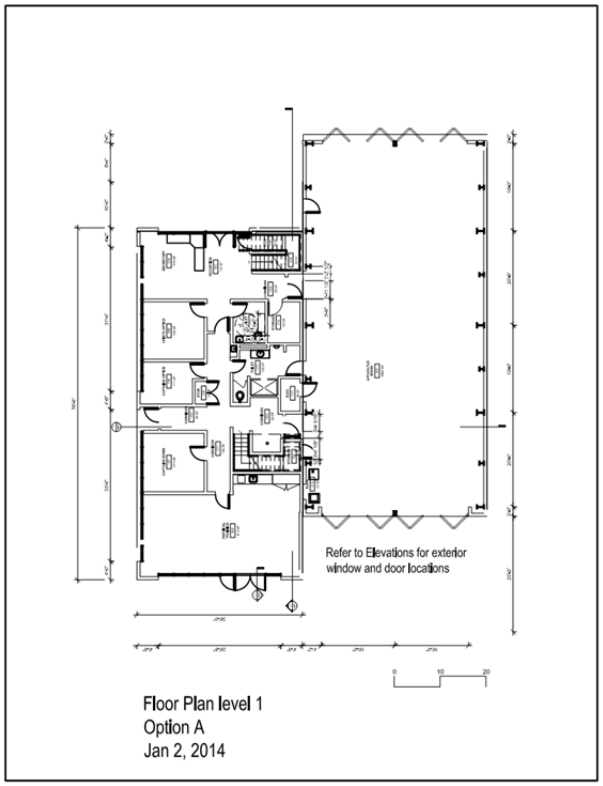
An ASCE 41-13 Life Safety basic checklist evaluation identifies the structure as being predominately noncompliant or unknown. Some of these identified issues are a mezzanine structure not being independently braced from the main building, load path issues related to the various additions, and no confirmation that the original, economically designed steel system has the additional capacity to resist the added demands from the various additions. The unknown factors of liquefaction and surface fault rupture also exist and need to be review by a Geotechnical engineer.

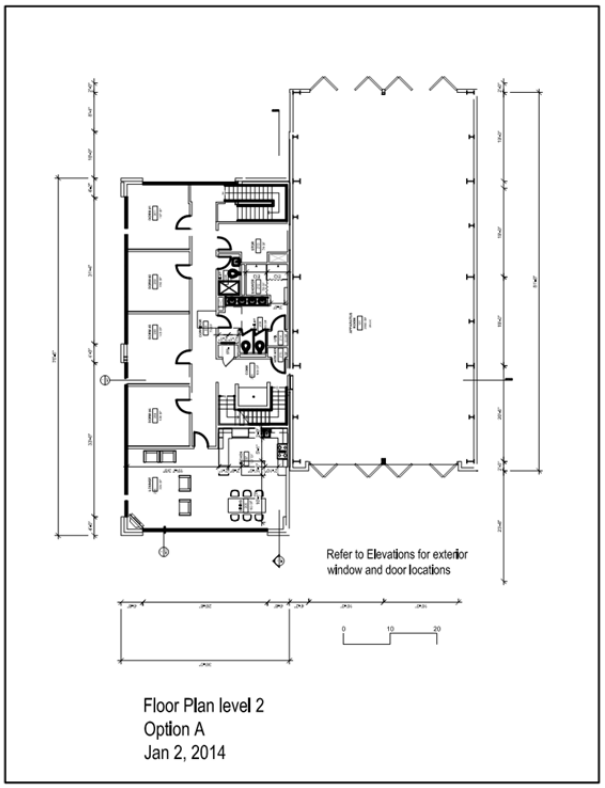
The Apparatus building is part of an emergency response facility. Therefore an Immediate Occupancy performance level is required. An ASCE 41-13 Immediate Occupancy checklist evaluation for S3 structures identified a number of noncompliant items which would need to be addressed during a retrofit to comply with CBC requirements for Emergency Faculties. Most of these noncompliant issues relate to the steel frame ductility checks. Since this type of steel system is typically designed for economy and not performance it would be anticipated that the identified issues would be major in nature and could be a challenge to retrofit without significant cost. The items identified in the Life Safety check list would also need to be addressed by the retrofit.

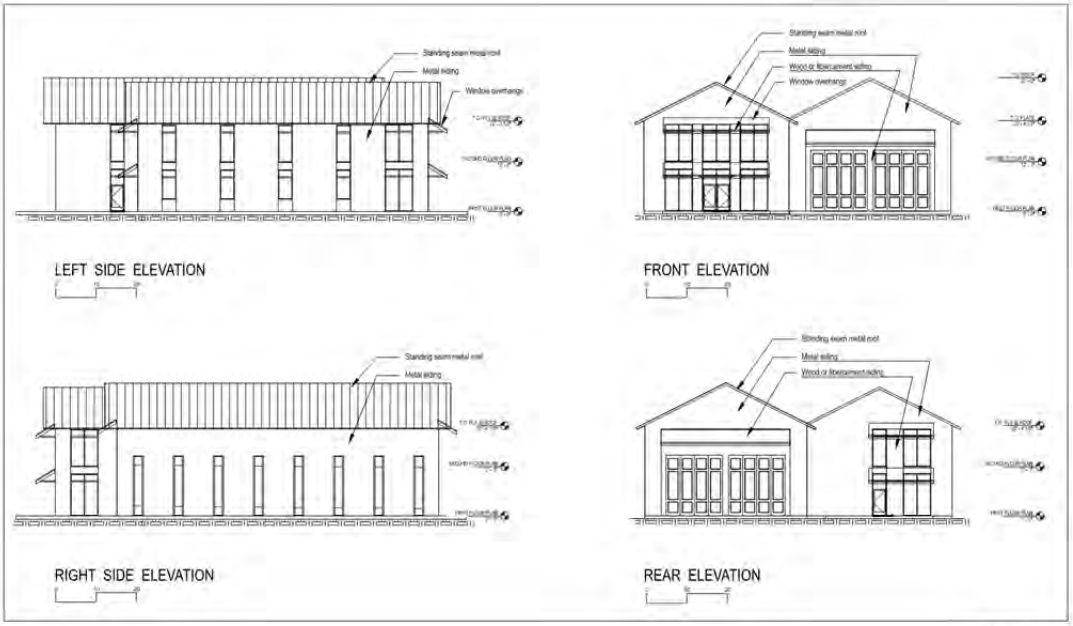
Two additional compliance issues required to achieve an Immediate Occupancy building performance level are the structure being located in an area subject to flooding and being located adjacent to a slope. In recent years the property has flooded numerous times. Although this structure has not been flooded, access into and out of the emergency facility during a flood event was impeded and would need to be evaluated and addressed. Due to the building being located within close proximity to an adjacent slope a Geotechnical engineer must evaluate the risk of slope failure and rock falls.

II. Option A: New Fire Station, Idealized Site

The structural system narrative is based on the concept architectural plans for a new apparatus building adjacent to an office and living quarters building as shown below. The two structures will be separate by a seismic joint.







The structural gravity system for the apparatus structure consists of steel beams in the transverse direction and along the perimeter supported on steel columns. Light gauge or wood roof framing members span between the steel beams to form the roof system. Exterior cladding is composed of either light gauge steel studs or wood studs spanning from the foundation to the roof framing level. The lateral system consists of steel moment frames in the transverse direction and plywood shear walls in the longitudinal direction. Reinforced masonry shear walls is an option to the plywood walls in the longitudinal direction. A plywood roof diaphragm is used to transfer seismic forces to the lateral system.

The structural gravity system for the Office/Living Quarters structure consists of light gauge or wood joists at the roof and floor levels. The joists at both levels are supported by light gauge or wood stud interior and exterior bearing walls. Roof joists span the transverse direction and are supported on interior corridor walls as required. The direction of floor joists framing is dependent on the Level One wall layout. As an alternate to roof and floor joists, trusses can be utilized at both levels. The lateral system in both transverse and longitudinal directions consists of plywood shear walls. Plywood roof and floor diaphragms are used to transfer seismic forces to the lateral system. For both gravity and lateral systems to be implemented efficiently, a series of interior walls in both the longitudinal and transverse direction must be “stacked” between the first and second levels to provide continuous load paths to the foundation. In addition at the front and rear exterior walls one or more of the wall segments must have a height to width ratio no greater than 2:1 between each framing level for plywood shear walls to be utilized.

The ideal site for these types of structures is a relatively flat site with soils suitable for typical continuous shallow reinforced concrete footings with a concrete slab-on-grade. Sites with expansive or liquefiable soils should be avoided if possible. Sites subject to flooding should be avoided.

III. Option B: New Living Quarters/Offices Building and Renovate Apparatus Building at Prescadero Creek Road Site

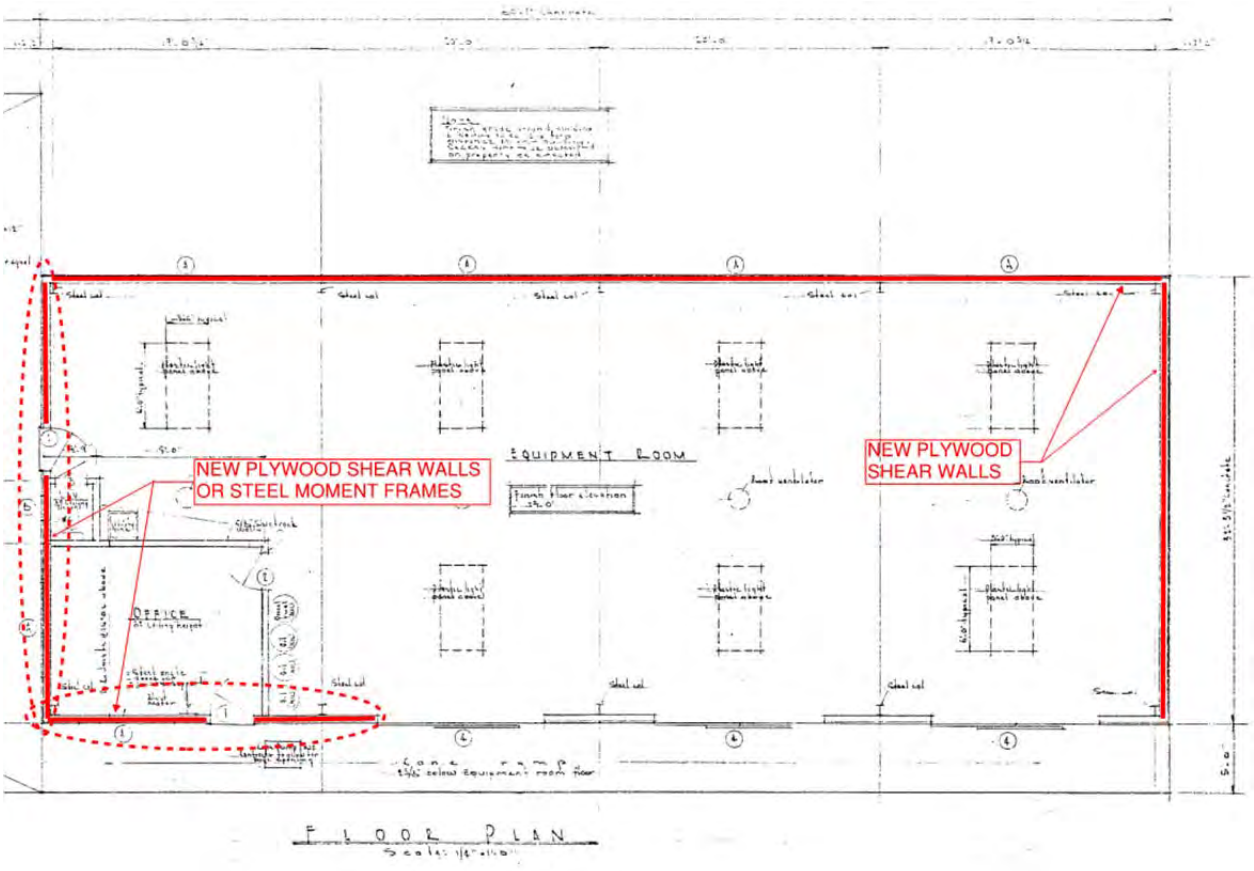
The structural system narrative is based on the concept architectural plans shown on this page. The new Living Quarters/Office portion of the structure is assumed to be the same layout as Option A.

The station would consist of two separate building structures: new Office/Living Quarters and renovated Apparatus.

The structural gravity system for the Office/Living Quarters structure consists of light gauge or wood joists at the roof and floor levels. The joists at both levels are supported by light gauge or wood stud interior and exterior bearing walls. Roof joists span the transverse direction and are supported on interior corridor walls as required. The direction of floor joists framing is dependent on the Level One wall layout. As an alternate to roof and floor joists, trusses can be utilized at both levels. The lateral system in both transverse and longitudinal directions consists of plywood shear walls. Plywood roof and floor diaphragms are used to transfer seismic forces to the lateral system. For both gravity and lateral systems to be implemented efficiently, a series of interior walls in both the longitudinal and transverse direction must be “stacked” between the first and second levels to provide continuous load paths to the foundation. In addition at the front and rear exterior walls one or more of the wall segments must have a height to width ratio no greater than 2:1 between each framing level for plywood shear walls to be utilized.

With minor modifications the existing apparatus building should have a gravity system capability of meeting the requirements for Immediate Occupancy as described previously. However, the existing

structure lacks a lateral system adequate to meet the requirements of Immediate Occupancy for Emergency Response building occupancies. As described in the existing apparatus building evaluation the structure is a single-story, pre-engineered and pre-fabricated steel building. In general this type of system is designed for maximum efficiency of material and cost and not for a high performance during seismic events. Therefore, the existing lateral system will be abandoned in place and allowing the steel frames to remain as the primary gravity system only. A new lateral system will supersede the existing system. The new system will consist of plywood shear walls on as many as four sides of the structure over new light gauge or wood stud exterior walls. Depending on the height to width ratios of the new shear walls, the existing foundation may be determined to be adequate if the ends of the walls terminate at steel column locations. At the front and left side of the structure new steel moment frames may need to be installed to resist lateral forces if the existing window and door openings cannot be modified to allow for plywood shear walls to be utilized. New foundation elements will be required at steel moment frame locations. Plywood roof diaphragm will be used to transfer seismic forces to the new lateral system.



8.3 Mechanical, electrical, and plumbing report

NBA ENGINEERING, INC.

San Francisco * Oakland * Los Angeles

Fire Station at 1200 Pescadero Creek Rd, Pescadero, CA
Investigative Study for Mechanical & Electrical Systems

Bill Blessing
Ratcliff Architects
5856 Doyle Street
Emeryville, CA 94608

I. Existing Conditions:

A. Electrical Systems Existing Conditions

Currently, the fire station consists of four buildings: the Living Quarters, the Apparatus Building, the Pump Room, and the Generator Room. The entire station's power is provided by a pole-mounted, PG&E 15KVA, single-phase transformer. The service to the four buildings is a 120/240V, 1PH, 3-wire system. In addition, there is a 50 KW/62.5 KVA diesel fuel standby generator with an automatic transfer switch to provide power in case of emergency. Most of the electrical equipment, including the standby generator (see EE2), and automatic transfer switch (see EE3), has been in use for more than thirty years. The coastal climate, severe weather conditions, and some flooding have caused rusting of the enclosed outdoor service entrance equipment (see EE1). Some of the equipment covers are missing or broken. The existing storage room panel board is very old and rusted (see EE1). The amperage in the exercise room is not adequate to run the exercise equipment. There is no security camera or intrusion detection system in this facility.

The following lighting installations have been observed in the field:

1. There are smoke detectors missing from the bedrooms.
2. Due to years of operation, the translucent acrylic prismatic fluorescent fixture diffusers have become discolored at the center/edge of the luminaire (see EE5).
3. Most of the fluorescent fixtures are equipped with 40-watt lamps, which are considered obsolete. The current standard for fluorescent lamps with electronic ballast is a rating of 32 watts.
4. Building door lights and fixtures at the Living Quarters are equipped with 60-watt incandescent lamps. One wall mounted light in the Living Quarters is broken (see EE6). Incandescent lamps consume more energy and provide less illumination than compact fluorescent lamps.
5. There are five high-wattage security HID flood lights on the building roof that consume a great deal of electricity when in use.
6. There are three 25-inch diameter HID fixtures, plus eight 2 lamp, 1'x4' industrial-type fluorescent fixtures in the Apparatus Building. All fixtures are ceiling-mounted. There is a time delay due to lamp warm up when the HID lights are turned on. This hampers operation and maintenance of the vehicles.

Miscellaneous Findings:

1. Most of the receptacles inside all three buildings are worn, having been in use for many years. Some are discolored. They need to be replaced.
2. Ceiling-mounted, battery-powered smoke detectors have been found in some rooms. Some rooms lack these smoke detectors, particularly in Living Quarters.
3. Sump pump power and control equipment is located outdoors in a wooden cabinet adjacent to the Headquarters building. The enclosures show rust.

B. Mechanical Systems Existing Conditions

There is no gas or sewer piping to these buildings. There is an underground septic tank for black water. The septic tank floods periodically, requiring station personnel to rent and use portable toilet facilities when the septic system is being repaired and cleaned.

A propane tank provides gas to these buildings. The kitchen oven runs on propane. There is an old propane domestic water heater serving showers and lavatories in the Living Quarters (see ME1). There is rust on the 500 gallon propane tank and the dual fuel tank (1000 gallon diesel and 500 gallon unleaded gasoline), probably due to flooding. The fuel tank appears leak (see ME3 and ME5).

An old, forced-air propane furnace serves the Living Quarters, (see ME2). The ductwork lacks insulation. There are no heating ducts to some of the rooms in the Living Quarters. There is no indication of mechanical ventilation in either the Living Quarters or in the Apparatus Building. There are no fire sprinkler and no fire alarm systems. A large proportion of the equipment is rusted, possibly due to salt water.

The available utilities are Pescadero Community Water System, which provides potable water, and Pacific Gas & Electric providing power. A well on the hill above the site has a holding tank that feeds the stand pipe. It provides non-potable water.

There is a 240-volt air compressor for shop air requirements/Apparatus Building, which is aged. There are three overhead exhaust systems with control boxes on the wall in the Apparatus Building. This building has no fire alarm or fire sprinkler. There is an antiquated bathroom and sink and in the Apparatus Building.

Heat for the Apparatus Building is provided by an old, propane-fired, Reynar unit heater, (see ME6), which has some rusted piping and no insulation on the exhaust flue. There is no heat in the Apparatus Building office areas. The engine area of the Apparatus Building is too small and too proximate to the roll up door. Existing HVAC control systems are localized via thermostat.

II. Option A- New, Single-Building, Fire Station Site

A. Electrical System

A new site will require a 120/240 VAC, single phase, 3 wire power distribution system. A new service transformer shall be provided and installed by the utility company (PG&E) to meet new load requirements. The new utility transformer shall be either the pole mounted or the pad mounted type. Building lighting will be served by a 120 or 208 VAC single phase system. Receptacles shall be served with 120 VAC system. A standby diesel generator and automatic transfer switch shall be provided for emergency power outages.

List of desirable electrical items in an ideal site:

1. New utility company service transformer,
2. Service entrance panel board with utility meter socket,
3. Two power distribution panel boards, one located in Level 1 and the other located in Level 2,
4. New standby diesel generator and associated automatic transfer switch,
5. Addressable fire alarm system for the building
6. CCTV/security systems for the building
7. Telephone system for the building
8. LED type security floodlights for the new building and surrounding areas.
9. An energy management system to control HVAC systems.

B. Mechanical Systems

The building shall be provided with HVAC systems consistent with the design conditions in order to maintain occupants' comfort and functional requirements. Heating and ventilating units and exhaust fans for different zones shall be provided to supply heating and ventilation to the apparatus room , electrical room, dorms, lounge, kitchen, dining, corridors, toilets, shower room, and janitor storage. One split-system heat pump unit per zone will be provided to serve the office area that includes areas for secretary, reception, corridor, and storage. A ductless, split heat pump unit shall be provided to serve the physical training area. Make-up air unit and exhaust fans shall be provided for the engine exhaust in the apparatus room.

The HVAC systems will be equipped with local digital thermostats. Kitchen shall be provided with state-of-the-art exhaust hood and a stove, refrigerator, dish washer, dual-sink, and a garbage disposal.

A. Plumbing Systems

The building plumbing fixtures will include low-flow water closets, urinals, and lavatories; showers, sinks, floor drains, trap primers, hose bibs, roof drains, overflow drains, washing machine hook-up or drains, trench drains, area drains, and filtered water system. One high-efficiency, central, gas-fired, water heater shall be provided to supply domestic hot water for the showers, lavatories, and sinks. A circulating pump will be installed to maintain hot water at the point of use. A compressed-air system with a refrigerated dryer shall be provided to supply compressed air to the apparatus room. A double wall fuel storage tank for diesel and unleaded gasoline fuels will be provided. The fuel storage tanks shall be

equipped with leak detection sensors and monitoring units. All utilities, gas, water, sewer, storm, and fire water to be piped from city/county systems.

III. Option B- Keep Existing Site , New Living Quarters over Offices, Modify Apparatus Building

A. Electrical System

Power distribution system shall be a 120/240VAC, single phase, 3 wire system. It is recommended that a new service transformer shall be provided and installed by PG&E to replace the existing one. Building lighting will be served by a 120 or 208VAC single phase system .Receptacles will be served by a 120VAC system. A standby diesel generator and automatic transfer shall be provided to replace the existing ones.

List of electrical items to be demolished

1. Existing pole-mounted utility transformer,
2. Existing service entrance panel board with utility meter,
3. Existing panel board “ILEC”,
4. Existing diesel standby generator and associated automatic transfer switch,
5. All fluorescent fixtures inside the existing buildings,
6. All building door/outside wall-mounted incandescent light fixtures,
7. All lighting fixtures inside Apparatus Building,
8. All roof-mounted HID floodlights,
9. All conduit, wires, junction boxes associated with demolition items.

B. Mechanical Systems

The buildings shall be provided with HVAC systems consistent with the design conditions in order to maintain occupants’ comfort and functional requirements. Heating and ventilating units and exhaust fans for different zones shall be provided to supply heating and ventilation to the apparatus room , electrical room, dorms, lounge, kitchen, dining, corridors, toilets, shower room, and janitor storage. One split-system heat pump unit per zone will be provided to serve the office area that includes areas for secretary, reception, corridor, and storage. A ductless, split heat pump unit shall be provided to serve the physical training area. Make-up air unit and exhaust fans shall be provided for the engine exhaust in the Apparatus Building.

The HVAC systems will be equipped with local digital thermostats. Kitchen shall be provided with state-of-the-art exhaust hood and a stove, refrigerator, dish washer, dual-sink, and a garbage disposal.

C. Plumbing Systems

The buildings’ plumbing fixtures will include low-flow water closets, urinals, and lavatories; showers, sinks, floor drains, trap primers, hose bibs, roof drains, overflow drains, washing machine hook-up or drains, trench drains, area drains, and filtered water system. One high-efficiency, central, gas-fired, water heater shall be provided to supply domestic hot water for the showers, lavatories, and sinks. A circulating pump will be installed to maintain hot water at the point of use. A compressed-air system with a refrigerated dryer shall be provided to supply compressed air to the Apparatus Building. A double wall

fuel storage tank for diesel and unleaded gasoline fuels will be provided. The fuel storage tanks shall be equipped with leak detection sensors and monitoring units.

List of mechanical and plumbing items to be demolished

1. All the HVAC equipment: furnace, toilet exhaust fans, kitchen hood exhaust fan, and distribution systems (ductwork, diffusers, exhaust grills, etc.) and controls (thermostat) for the Living Quarters shall be demolished and discarded;
2. The existing unit heater and associated piping and exhaust flue in the Apparatus Building shall be demolished and discarded;
3. All existing lavatories and water closets and kitchen sink in the Living Quarters and lavatory and water closet area shall be demolished and discarded;
4. Demolish and discard existing dual fuel tank,
5. Remove and discard existing propane tank,
6. Remove and discard existing air compressor.

ME1 – Water heater and furnace

ME2 – Gas furnace

ME3 – Liquid fuel tank

ME4 – Non-potable water connection

ME5 – Propane fuel tank

ME6 – Gas unit heater

EE1 – Fire Station entrance equipment cabinet

EE2 – Single phase diesel fuel standby generator

EE3 – Automatic transfer switch

EE4 – Storage Room panel

EE5 – Living quarters corridor lights

EE6 – Damaged light, Living Quarters

8.4 Civil engineering report

DRAFT

CIVIL ASSESSMENT

FOR

PESCADERO FIRE STATION

Pescadero, California

Prepared For:
Ratcliff
5856 Doyle Street
Emeryville, CA 94608

Prepared By:
CSW/Stuber-Stroeh Engineering Group, Inc.
45 Leveroni Court
Novato, California 94949
(415)-883-9850

Prepared:
January 3, 2014

CSW|ST2 File No.:
4.1174.00

CSW | ST2

Introduction

The San Mateo County Fire Station located at 1200 Pescadero Creek Road in Pescadero, CA (Pescadero Fire Sta.) consists of four buildings on a 1.3 acre site. According to the contract drawings and as-builts, the station was originally constructed in 1957 with various improvements made since that time. The site is located within the flood plain which creates a number of issues which will be discussed below. The site and buildings are outdated and in need of improvement, either at the existing site, or at a new site, in order to meet current standards and to adequately serve its community.

Existing Conditions

As mentioned above, the Pescadero Fire Sta. is located in the flood plain of the Butano Creek (see "Pescadero Floodway Map" attached. The site is has experienced an increase in the occurrence of flooding since the mid 1980's due to the accumulation of silt and debris in Butano Creek and Pescadero Marsh as a result of halted dredging operations. It is reported that the site floods at least once a year with as much as three feet of water reported in 1998. Pescadero Creek Road also floods during these events. As such, the Pescadero Fire Sta. staff relocates to alternative sites during heavy rains so that they can maintain their ability to respond to emergency events.

Civil utilities on-site consist of domestic water served by the local water service municipality. Additionally, there is an on-site well used for non-potable water needs (i.e. to supply the existing wharf hydrant), and a septic system for the disposal of site generated sewage waste. The septic system is reported to back-up during flood events, which is to be expected considering the ground would be saturated during these events and would have no additional hydraulic capacity. The system was constructed along with the rest of the site in 1957. Considering the age of the system, it is unlikely that it meets current code. Additionally, septic systems have an average lifespan of 25 years. As such, it is likely that the system at the Pescadero Fire Sta. has reached the end of its useful life, though it would have to be tested to confirm this.

Option A. New Fire Station / Idealized Site

The selected site should be one that is located at an elevation that is above the flood plain with additional vertical elevation to allow for sea level rise. Additionally, the road(s) leading to and from the fire station should be similarly above flood elevations to maximize, as much as possible, access to the community during flood events. There shall also be adequate space on-site to provide for State and local storm water treatment requirements.

Domestic water shall be provided by the local water service municipality if available at the selected location. If municipal water is unavailable at the selected location, there must be adequate potable well water available to serve the new fire station's needs.

In absence of any municipal sewer system, the sewage disposal needs will need to be met with an on-site septic system that meets current code. As such, there must be adequate space and soil conditions to accommodate this.

Option B. Keep Pescadero Creek Rd Site: New Living Quarters over Offices, Renovate Apparatus Bldg.

In this scenario, the existing residence building will be demolished and relocated to a new two story addition adjacent to the existing apparatus building. The new addition must be constructed such that the finished floor elevation of the first level is above the flood elevation with additional vertical elevation clearance to allow for sea level rise. The existing apparatus building, however, may be at an elevation that is below future flood elevations as sea level rise continues. As such, this building may experience flooding in the future. A new driveway access will be constructed to Bean Hollow Road at the south-east side of the site which is at a higher elevation than the existing access from Pescadero Creek Road. This will improve access during flood events, though access to Pescadero Creek Road will still be limited due to flooding. Space will also have to be dedicated on-site to meet State and local storm water treatment requirements. The location of the existing residence would be a likely alternative for this.

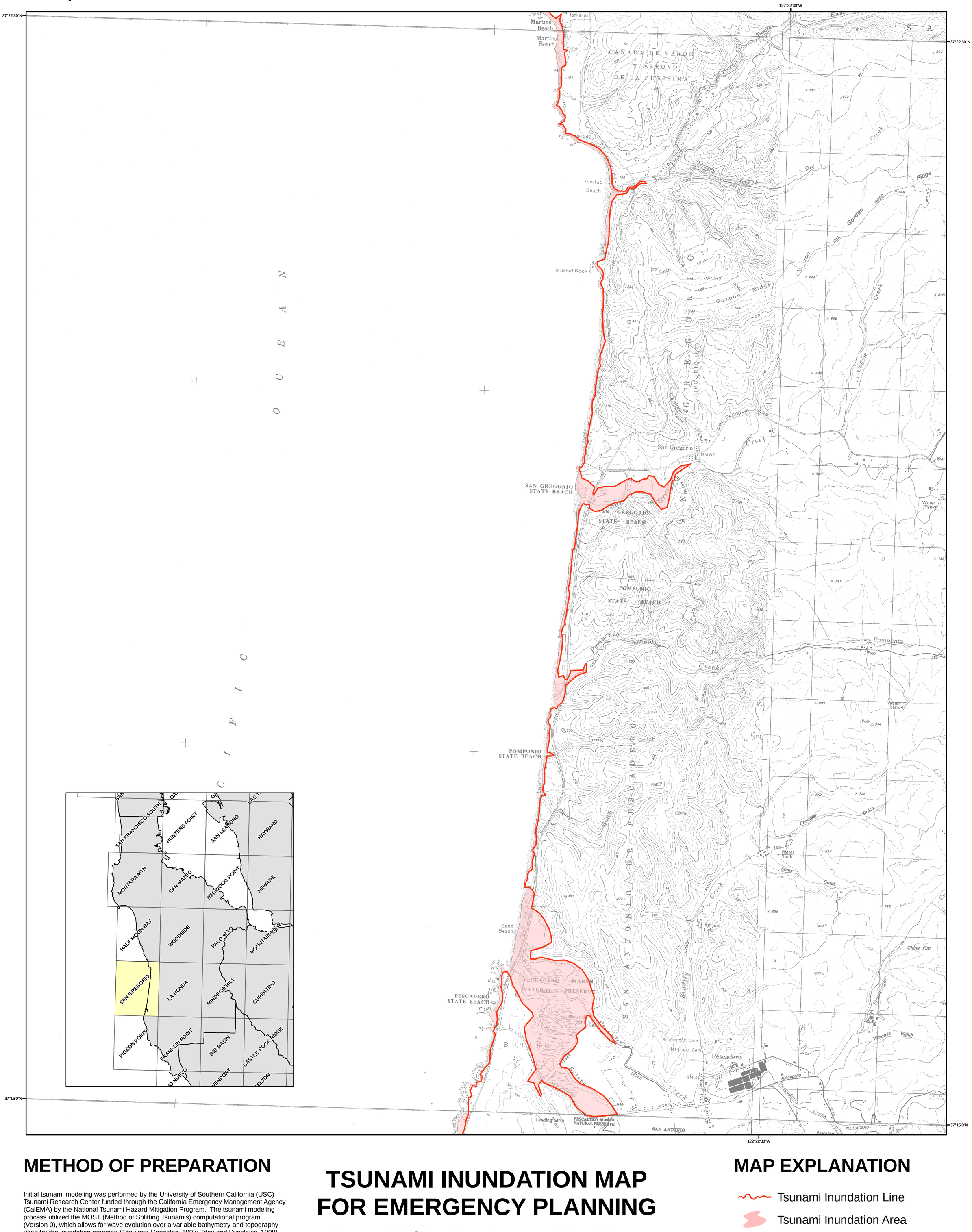
The new addition is likely to be situated such that a portion of the existing hillside will have to be excavated to accommodate the structure. As such, a new retaining wall will need to be constructed along with adequate drainage facilities to capture hillside runoff.

Domestic water will continue to be served by the local water service municipality.

A new septic system will likely be required. The location of the existing system would be the ideal location if it has adequate space and soil conditions to accommodate a system that meets current code. Due to the likelihood of high groundwater at the location of the existing system, a shallow pressure dosing system would likely be required. However, because this location becomes inundated with water during flood events (see Photo 1), it is unlikely that this location will meet code. As such, alternative locations on site should be considered such as the western side of the site or on the hillside along the southern end of the site. It is unlikely, however, that the southern end will be feasible due to the steep slope and the confined area.

Septic field with flood elevation marker (white post with red marks) shown in the background

8.5 Reference documents



California Emergency Management Agency
California Geological Survey
University of Southern California

Tsunami Inundation Map for Emergency Planning
San Gregorio Quadrangle

State of California
County of San Mateo

METHOD OF PREPARATION

Initial tsunami modeling was performed by the University of Southern California (USC) Tsunami Research Center funded through the California Emergency Management Agency (CalEMA) by the National Tsunami Hazard Mitigation Program. The tsunami modeling process utilized the MOST (Method of Splitting Tsunamis) computational program (Version 0), which allows for wave evolution over a variable bathymetry and topography used for the inundation mapping (Titov and Gonzalez, 1997; Titov and Synolakis, 1998).

The bathymetric/topographic data that were used in the tsunami models consist of a series of nested grids. Near-shore grids with a 3 arc-second (75- to 90-meters) resolution or higher, were adjusted to "Mean High Water" sea-level conditions, representing a conservative sea level for the intended use of the tsunami modeling and mapping.

A suite of tsunami source events was selected for modeling, representing realistic local and distant earthquakes and hypothetical extreme undersea, near-shore landslides (Table 1). Local tsunami sources that were considered include offshore reverse-thrust faults, restraining bends on strike-slip fault zones and large submarine landslides capable of significant seafloor displacement and tsunami generation. Distant tsunami sources that were considered include great subduction zone events that are known to have occurred historically (1960 Chile and 1964 Alaska earthquakes) and others which can occur around the Pacific Ocean "Ring of Fire."

In order to enhance the result from the 75- to 90-meter inundation grid data, a method was developed utilizing higher-resolution digital topographic data (3- to 10-meters resolution) that better defines the location of the maximum inundation line (U.S. Geological Survey, 1993; Intermap, 2003; NOAA, 2004). The location of the enhanced inundation line was determined by using digital imagery and terrain data on a GIS platform with consideration given to historic inundation information (Lander, et al., 1993). This information was verified, where possible, by field work coordinated with local county personnel.

The accuracy of the inundation line shown on these maps is subject to limitations in the accuracy and completeness of available terrain and tsunami source information, and the current understanding of tsunami generation and propagation phenomena as expressed in the models. Thus, although an attempt has been made to identify a credible upper bound to inundation at any location along the coastline, it remains possible that actual inundation could be greater in a major tsunami event.

This map does not represent inundation from a single scenario event. It was created by combining inundation results for an ensemble of source events affecting a given region (Table 1). For this reason, all of the inundation region in a particular area will not likely be inundated during a single tsunami event.

References:

Intermap Technologies, Inc., 2003, Intermap product handbook and quick start guide: Intermap NEXTmap document on 5-meter resolution data, 112 p.

Lander, J.F., Lockridge, P.A., and Kozuch, M.J., 1993, Tsunamis Affecting the West Coast of the United States 1806-1992: National Geophysical Data Center Key to Geophysical Record Documentation No. 29, NOAA, NESDIS, NGDC, 242 p.

National Atmospheric and Oceanic Administration (NOAA), 2004, Interferometric Synthetic Aperture Radar (IfSAR) Digital Elevation Models from GeoSAR platform (EarthData): 3-meter resolution data.

Titov, V.V., and Gonzalez, F.I., 1997, Implementation and Testing of the Method of Tsunami Splitting (MOST): NOAA Technical Memorandum ERL PMEL – 112, 11 p.

Titov, V.V., and Synolakis, C.E., 1998, Numerical modeling of tidal wave runup: Journal of Waterways, Port, Coastal and Ocean Engineering, ASCE, 124 (4), pp 157-171.

U.S. Geological Survey, 1993, Digital Elevation Models: National Mapping Program, Technical Instructions, Data Users Guide 5, 48 p.

TSUNAMI INUNDATION MAP FOR EMERGENCY PLANNING

State of California ~ County of San Mateo

SAN GREGORIO QUADRANGLE

June 15, 2009

SCALE 1:24,000

Table 1: Tsunami sources modeled for the San Mateo County coastline.

Sources (M = moment magnitude used in modeled event)		Areas of Inundation Map Coverage and Sources Used	
		San Francisco Bay	Pescadero
Local Sources	Point Reyes Thrust Fault	X	
	Rodgers Creek-Hayward Faults	X	
	San Gregorio Fault	X	
Distant Sources	Cascadia Subduction Zone-full rupture (M9.0)	X	
	Central Aleutians Subduction Zone #1 (M8.9)	X	X
	Central Aleutians Subduction Zone #2 (M8.9)	X	
	Central Aleutians Subduction Zone #3 (M9.2)	X	X
	Chile North Subduction Zone (M9.4)	X	
	1960 Chile Earthquake (M9.3)	X	
	1964 Alaska Earthquake (M9.2)	X	X
	Japan Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #2 (M8.8)	X	
	Kuril Islands Subduction Zone #3 (M8.8)	X	
	Kuril Islands Subduction Zone #4 (M8.8)	X	
	Marianas Subduction Zone (M8.6)	X	X

MAP EXPLANATION

〰	Tsunami Inundation Line
▨	Tsunami Inundation Area

PURPOSE OF THIS MAP

This tsunami inundation map was prepared to assist cities and counties in identifying their tsunami hazard. It is intended for local jurisdictional, coastal evacuation planning uses only. This map, and the information presented herein, is not a legal document and does not meet disclosure requirements for real estate transactions nor for any other regulatory purpose.

The inundation map has been compiled with best currently available scientific information. The inundation line represents the maximum considered tsunami runup from a number of extreme, yet realistic, tsunami sources. Tsunamis are rare events; due to a lack of known occurrences in the historical record, this map includes no information about the probability of any tsunami affecting any area within a specific period of time.

Please refer to the following websites for additional information on the construction and/or intended use of the tsunami inundation map:

State of California Emergency Management Agency, Earthquake and Tsunami Program:
http://www.oes.ca.gov/WebPage/oeswebsite.nsf/Content/B1EC
51BA215931768825741F005E8D80?OpenDocument

University of Southern California – Tsunami Research Center:
http://www.usc.edu/dept/tsunamis/2005/index.php

State of California Geological Survey Tsunami Information:
http://www.conservation.ca.gov/cgs/geologic_hazards/Tsunami/index.htm

National Oceanic and Atmospheric Agency Center for Tsunami Research (MOST model):
http://nctr.pmel.noaa.gov/time/background/models.html

MAP BASE

Topographic base maps prepared by U.S. Geological Survey as part of the 7.5-minute Quadrangle Map Series (originally 1:24,000 scale). Tsunami inundation line boundaries may reflect updated digital orthophotographic and topographic data that can differ significantly from contours shown on the base map.

DISCLAIMER

The California Emergency Management Agency (CalEMA), the University of Southern California (USC), and the California Geological Survey (CGS) make no representation or warranties regarding the accuracy of this inundation map nor the data from which the map was derived. Neither the State of California nor USC shall be liable under any circumstances for any direct, indirect, special, incidental or consequential damages with respect to any claim by any user or any third party on account of or arising from the use of this map.

RATCLIFF
5856 Doyle Street
Emeryville CA 94608
Tel 510 899 6400
www.ratcliffarch.com

Meeting Minutes

Meeting Date: November 20, 2013
Meeting time: 9:30 am

Meeting No.: 2

Project: Pescadero Fire Station (PFS) Assessment Study
Pescadero, CA
Ratcliff Project No: 32053.00

Place: Pescadero Fire Station

Attendees:

Name

Bill Blessing, Ratcliff
Nina Pakanant, Ratcliff
Scott Ernest, PFS
Robert Pierson, PFS
Andy Cope, PFS
Guido Misculin, San Mateo County
Theresa Yee, San Mateo County

Meeting Minutes:

Item		Agenda topic	Action	Due Date

1		**Existing Drawings**
		- Ratcliff received existing drawings of the Apparatus Building.
		- Current fire station service coverage:
		  ○ North boundary – Tunitas Creek Rd.
		  ○ East boundary – Hwy 84
		  ○ South boundary – Cloverdale Rd.
		- Ratcliff needs a Service Area map.		

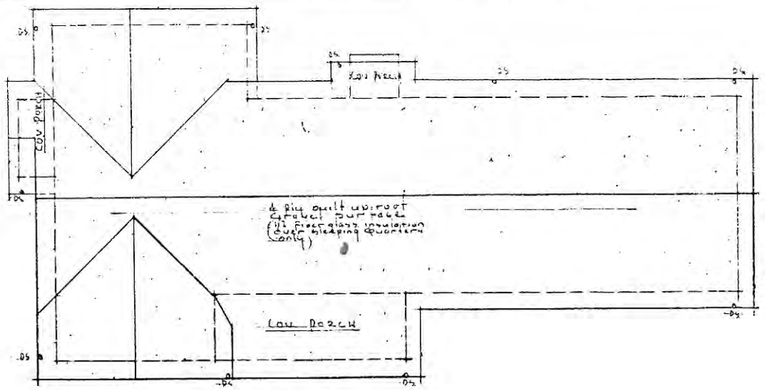
2		**Ratcliff Presentation** - Presented example of stations from Chico Airport Fire Station, Yuba City Fire Station, and Emeryville Fire Station. - Proposed new site in Town of Pescadero is also in the flood zone. - San Mateo OES can provide Tsunami plan.		
3		**Issues with current fire station location** - During seasonal flood, an engine from Station 17 is sent to a site nearby high school. A temporary modular trailer is set up at the fire station. - Chemical run off contaminates rain water. - Response plan includes Engine 40 from Half Moon Bay and Station 55 (volunteer).	.	
4		**Staffing** - Under normal budget, the station has 4 staff (2 rescuers, 2 engine staff). Under the budget cut, the station has 3 engine staff and 1 supplemental rescuer. - Maximum staff is 9. This occurs approximately 8 times per		

		year. - Fire season is between: May 15 – Nov. 1. When maximum staffing typically occurs. - During off-season: 3-4 staff - Typical shift: 3 work days. 4 off days.		
5		**Site** - Currently the overall storage space is insufficient. The shed and shipping container houses landscaping tools and emergency supplies. - Current above grade dual fuel tank is rusting and has some leaks. - Original underground tank had been dug out. (soil contamination ?) - Well water is used for the Apparatus and hydrants. The Living Quarters uses potable city water. - Current emergency power generator is pre 1983. - PFS is ok with 72 hr generator. Ratcliff to confirm size needed. - Need a wharf hydrant. - Hose rack is antiquated. Prefer modern hose dryer.		
6		**Apparatus Bay** - Current engines: (1) Type 1 engine, (1) rescue 59, (1) seasonal Type 3, (1) utility pick-up truck, (1) water tender - Prefer solution for adjacency among decontamination, turn-out room, and extractor equipment spaces. - Currently turnout gear is on sides and rear of Apparatus bays, and is circulation around vehicles is reduced. - Need sizable medical storage due to the variety of incident types required: coastal waters, coastal cliffs, highway, forest, town. - Ratcliff needs make and model of the engines for planning. - Staff performs minor station repairs on site, others by County mechanics. - Need washing apparatus pad. Prefer indoor. Underside spray needed due to salt vapor within coastal areas. - Currently no oil disposal set up. - Need to accommodate 11'-3" high truck at this time. - Rear addition (date:?) includes area for physical training. - Area is insufficient and not efficiently laid out. At present – no daylight and area is mixed with vehicle bay air systems.		
7		**Public/ Office** - PFS prefers having a lobby/office area to receive visitors. - Office space requirements: (2) workstations, (1) EMS workstation, (1) captain's office - Guido requested Ratcliff to present an option of having Emergency Operation Center function. - Prefers having spaces to accommodate public meetings and training (e.g. PMAC Meeting and voting) - Current EMS training takes place at Station 40. - Outdoor training takes place at PFS. - Deliveries: occasional big deliveries. - Need public restroom.		

8		**Living Quarters** - Existing beds: 7. - During training, living facility is insufficient. Would prefer to provide separate gender bathrooms and bedrooms. - Prefer Day Room to have separation from Dining and Kitchen - Kitchen size is currently sufficient. Would like to have commercial-grade dish washer. - Current pantry storage space insufficient. - Dining table some time is used for meetings. During having maximum staffing, some people dine in the Day Room. - Outdoor patio needs wind and insect screen protection in the coastal area. - Prefer commercial-grade washer and dryer.		
9		**Programming Report** - Ratcliff to explore possibly 4 options: o Option A: Renovating existing fire station – occupied site (need phased planning) o Option B: Renovation existing fire station – unoccupied site (need temp site) o Option C: : Renovation existing fire station – with a remote mini station concept. (need remote site) o Option D: New fire station at a new location (need new site TBD). - Ratcliff to incorporate sustainable features.		
10		**Aesthetic** - Not deeply discussed, but some preference for association with local rural structures was mentioned.		

These minutes summarize the conclusions of the subject meeting. If there are substantial errors or omissions, please contact Ratcliff within three working days of receipt of this memorandum

Nina Pakanant
Ratcliff



ROOF PLAN

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

PLOT PLAN

Scale: 1" = 30'-0"

SECTION

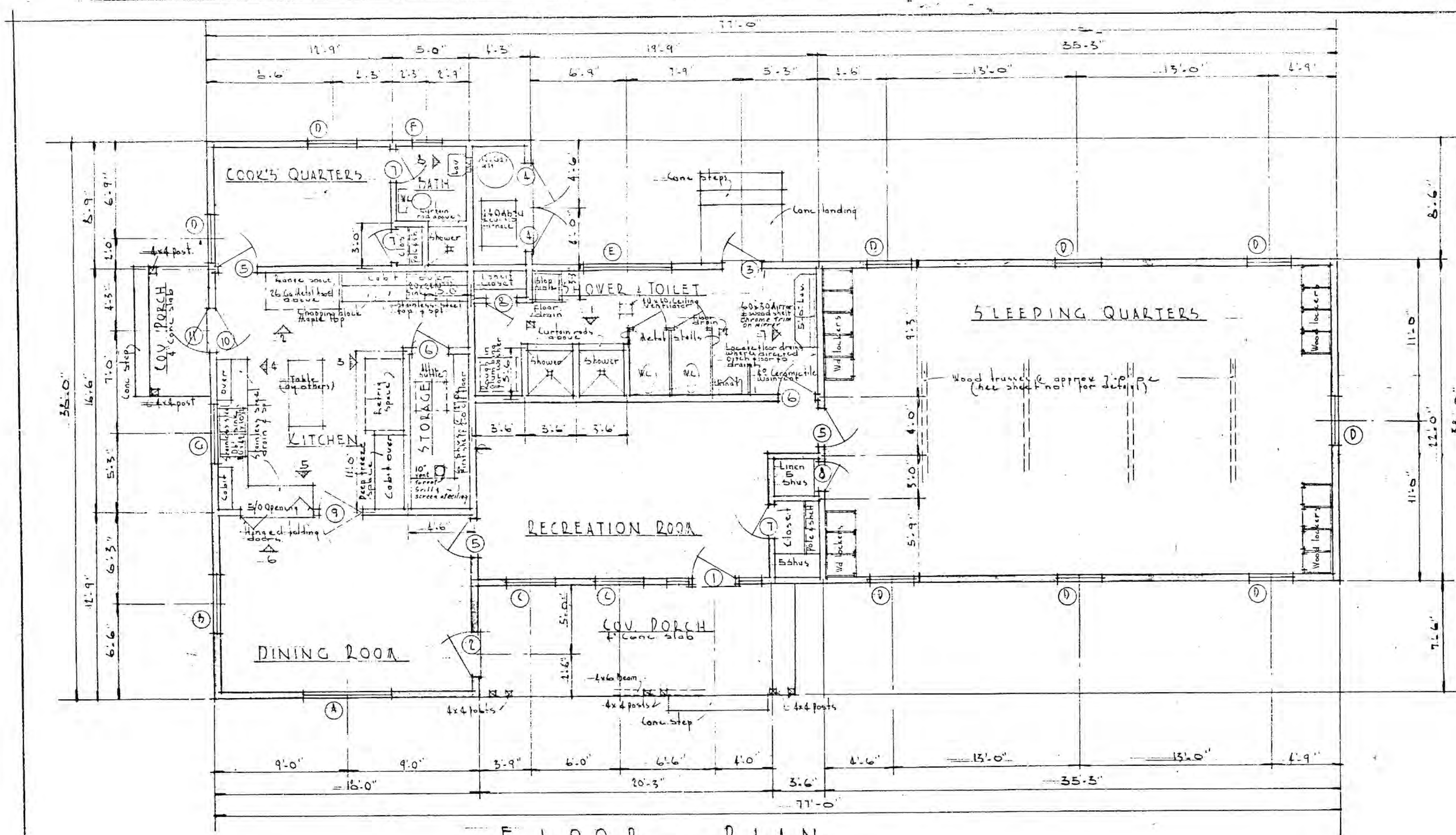
PLAN

SEPTIC TANK DETAILS

TYPICAL TRENCH DETAILS

Approved By		
Fire Warden	LIVING QUARTERS FOR PESCADERO FIRE STATION	Date
Chan. Bd. of Supervisors		Scale
County Manager	SAN MATEO COUNTY DEPARTMENT OF CONSTRUCTION & MAINTENANCE	Drawn By
Director of Constr.		Sheets
		File No.

P-2-1



FLOOR PLAN

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

see sheet no. 3 for truss detail

SCHEDULE OF ROOM FINISHES						
ROOM	FLOOR	BASE	WALLS	TRIM	CEILING	PAINTING SPECIFICATIONS
SLEEPING QUARTERS	Asphalt tile	Rubber base	Sheetrock painted	Wood	Painted at ceiling Exposed trusses painted	Spec #1 & 2
DINING	" " (Grease proof)	" "	" "	"	Sheetrock painted	" #1 & 2
COOK'S QUARTERS	" "	" "	" "	"	" "	" #1 & 2
KITCHEN	(Grease proof)	" "	" "	"	" "	" #2 & 3
BATH	" "	" "	" "	"	" "	" #2 & 3
SHOWERS TOILET	Ceramic tile & faucets	Ceramic tile Ceramic tile	Ceramic tile Sheetrock painted	"	" "	" #2 & 3
STORAGE	Asphalt tile	Rubber base	Sheetrock painted	"	" "	" #1 & 2
CLOSET	" "	" "	" "	"	" "	" #1 & 2
RECREATION	" "	" "	" "	"	" "	" #1 & 2
FURNACE	4" Conc slab	None	5/8 sheetrock no paint	..	5/8 sheetrock no paint	" #2

PAINTING NOTES: Interior woodwork shall be specification #2 except ceiling of Sleeping Room which shall be #1
Interior walls & ceilings shall be specification #1 except in Kitchen, Bath & Toilets which shall be #3
Exterior woodwork shall be specification #4
Exterior metal shall be specification #4

WINDOW SCHEDULE			
NO	SIZE	TYPE	NOTES
A	6'-0" x 4'-2 5/8"	Alum Casement	All glass shall be "B" Quality type Double Strength
B	4'-0" x 4'-2 5/8"	" "	
C	3'-2" x 4'-2 5/8"	" "	
D	3'-2" x 3'-2 3/8	" "	
E	6'-0" x 3'-2 3/8	" "	1 Horiz muntin 18" obscure glass 18 1/2" clear glass see exterior elevation
F	1'-0 1/2" x 2'-2"	" "	Obscure glass
G	4'-0" x 3'-2 3/8	" "	
Furnish one screen for each vented window			

DOOR SCHEDULE			
No	SIZE	TYPE	NOTES
1	3'-0" x 6'-8" 1 3/4"	D.F. 9 lites	[illegible] lites 1'-6" x 6'-8" 3/4"
2	3'-0" x 6'-8" 1 3/4"	DF	Flush solid core
3	2'-8" x 6'-8" 1 3/4"	DF Hollywood	Obscure glass
4	3'-0" x 6'-8" 1 3/4	DF	Flush solid core
5	2'-8" x 6'-8" 1 3/8	DF	" Hollow core
6	2'-6" x 6'-8" 1 3/8	DF	" " "
7	2'-4" x 6'-8" 1 3/8	DF	" " "
8	2'-0" x 6'-8 1 3/8	DF	" " "
9	3'-0" x 6'-8" 1 3/8	DF Double acting	[illegible]
10	3'-0" x 6'-8 1 3/4"	DF Lite	" solid core
11	3'-0 x 6'-8 1 3/8	[illegible]	

Approved by

Fire Warden

County Manager

LIVING QUARTERS FOR PESCADERO FIRE STATION

SAN MATEO COUNTY DEPARTMENT OF CONSTRUCTION & MAINTENANCE

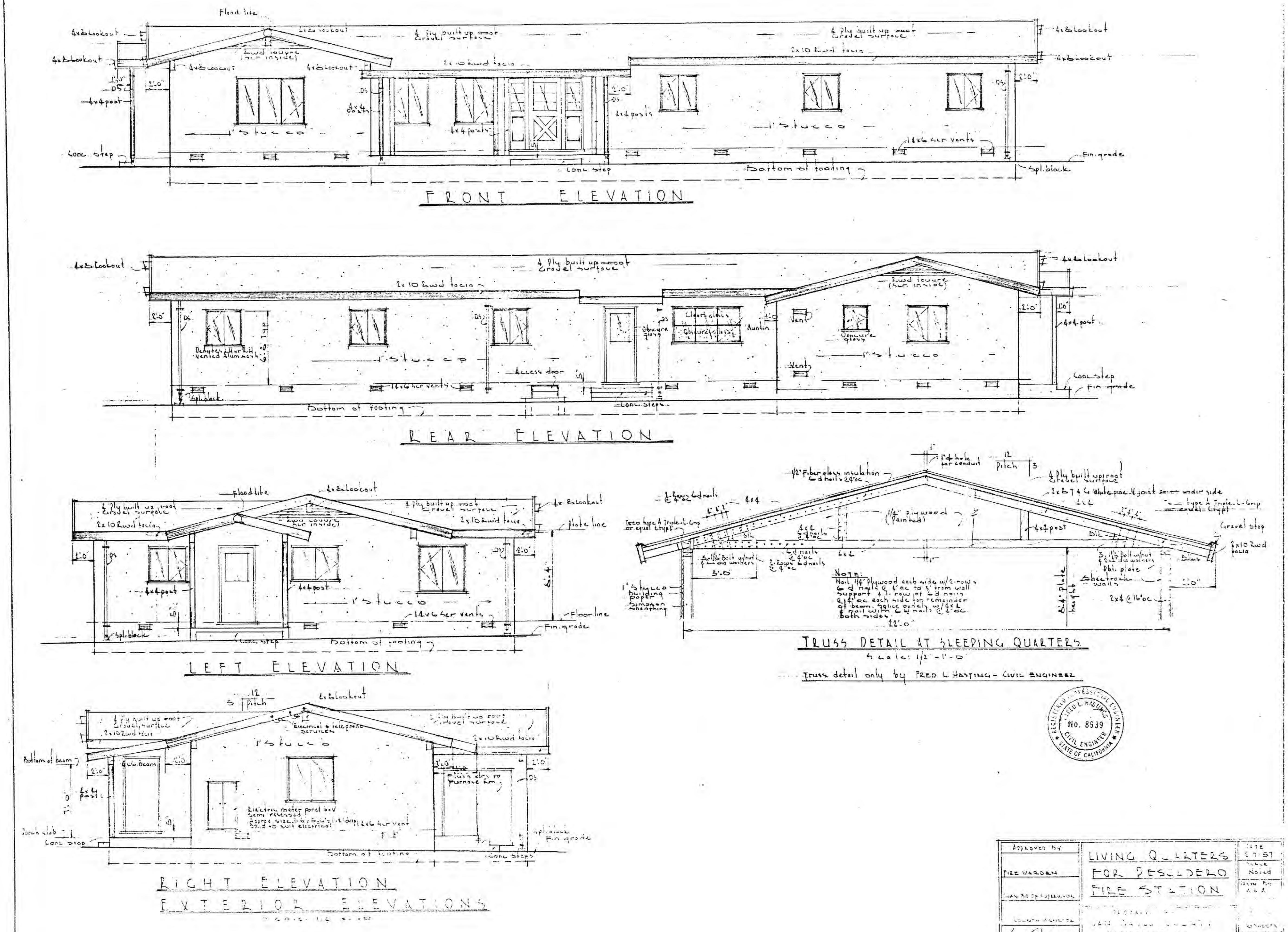
Date 3-7-51

Scale Noted

Drawn by

File No

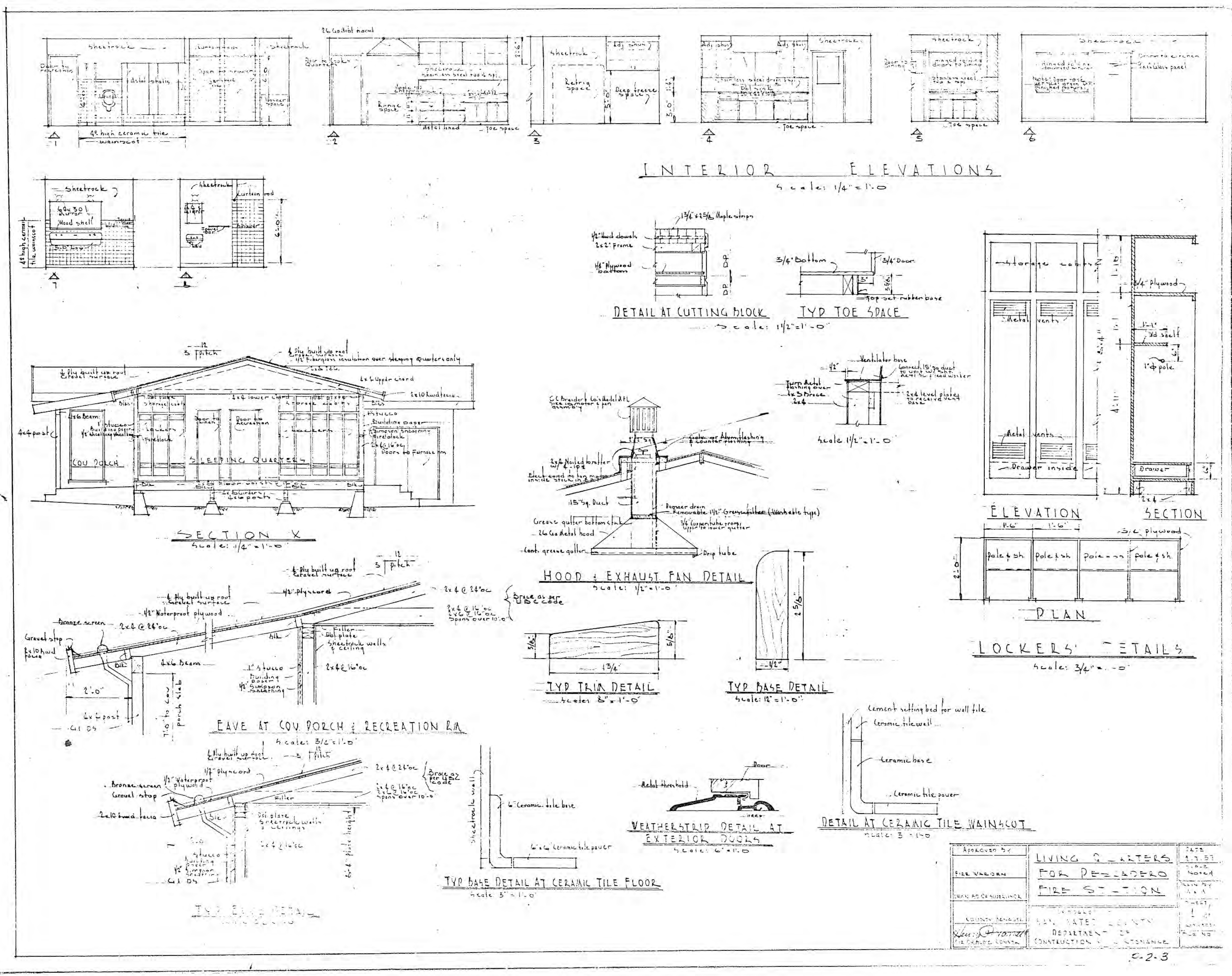
P-2-6

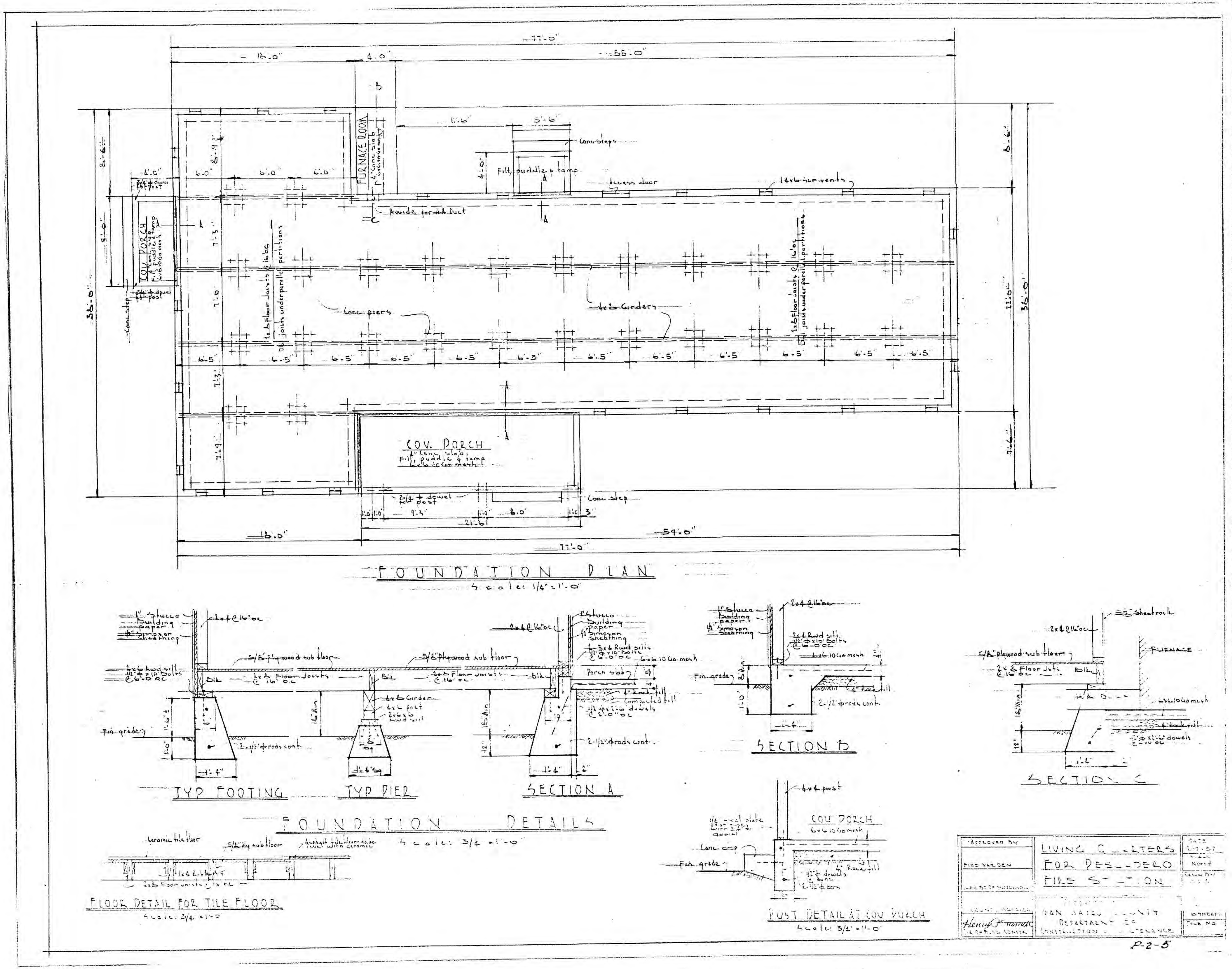


Flood lite
4x6 lookout
4 ply built up roof
Gravel surface
Rwd louvre (scr inside)
2x10 Rwd facia
4x4 post
4x4 posts
1" stucco
1x6 scr vents
Conc. step
Bottom of footing
Fin. grade
Spl. block
FRONT ELEVATION
Access door
Obscure glass
Vent
Conc. steps
REAR ELEVATION
Plate line
Floor line
LEFT ELEVATION
1/4" plywood (painted)
Gravel stop
Sheetrock walls
2x4 @ 16" oc
22'-0"
TRUSS DETAIL AT SLEEPING QUARTERS
Scale: 1/2"=1'-0"
Truss detail only by FRED L. HASTING - CIVIL ENGINEER
FRED L. HASTINGS
No. 8939
CIVIL ENGINEER
STATE OF CALIFORNIA
12
Pitch
3
Bottom of beam
4x6 beam
Porch slab
Electric meter panel box
Flush drs to furnace rm.
RIGHT ELEVATION
EXTERIOR ELEVATIONS

Approved by	LIVING QUARTERS FOR PESCADERO FIRE STATION	Date 2-7-57
Fire Warden		Scale Noted
Chan. Bd. of Supervisors		Drawn by A & A
County Architect	San Mateo County Department of Construction & Maintenance	Sheets
Dir. of Bldg. Constr.		File No

5-2-4

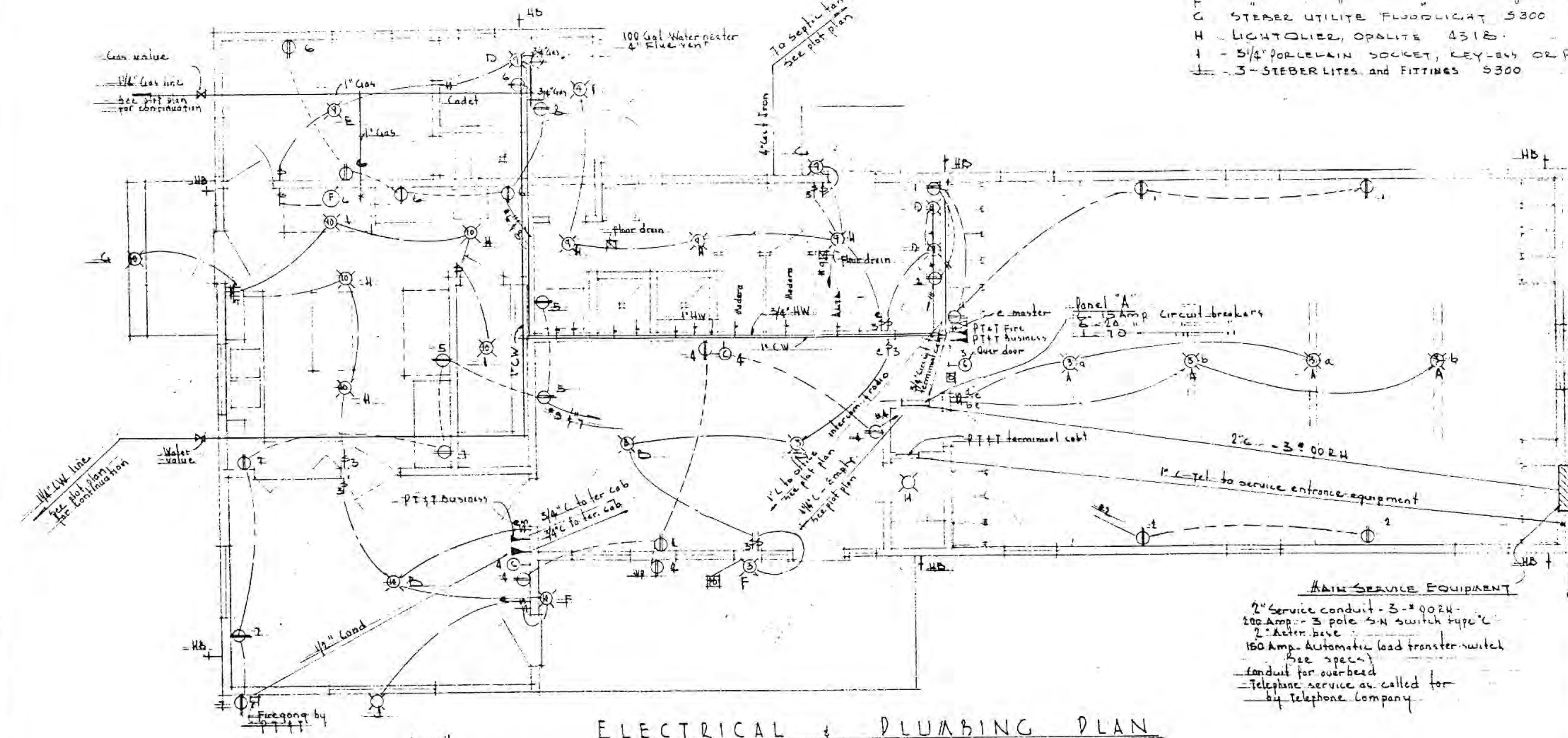

INTERIOR ELEVATIONS
Scale: 1/4" = 1'-0"
Sheetrock
Metal stalls
Open shower
42" high ceramic tile wainscot
Range space
Metal lined
Toe space
Refrig space
Deep freeze space
Storage cabinet
Metal vents
Drawer inside
Drawer
ELEVATION
SECTION
3/4" plywood
Wd shelf
1" Φ pole
Pole & sh.
PLAN
LOCKERS' DETAILS
Scale: 3/4" = 1'-0"
DETAIL AT CUTTING BLOCK
TYP TOE SPACE
Scale: 1 1/2" = 1'-0"
3/4" Bottom
3/4" Door
Top set rubber base
Ventilator base
Scale 1 1/2" = 1'-0"
SECTION X
Scale: 1/4" = 1'-0"
SLEEPING QUARTERS
COV. PORCH
4x4 post
2x6 Beam
Lockers
HOOD & EXHAUST FAN DETAIL
Scale: 1/2" = 1'-0"
Cont. grease gutter
Drip tube
15"Sq. Duct
26 Ga. Metal hood
TYP TRIM DETAIL
Scale: 8" = 1'-0"
TYP BASE DETAIL
Scale: 12" = 1'-0"
EAVE AT COV. PORCH & RECREATION RM
Scale: 3/4" = 1'-0"
Bronze screen
Gravel stop
2x10 Rwd. facia
1/2" Waterproof plywood
2x4 @ 24" oc
4 Ply built up roof Gravel surface
Sheetrock walls & ceiling
Stucco
Building paper
TYP BASE DETAIL AT CERAMIC TILE FLOOR
Scale 3" = 1'-0"
6" Ceramic tile base
Sheetrock wall
WEATHERSTRIP DETAIL AT EXTERIOR DOORS
Metal threshold
Door
DETAIL AT CERAMIC TILE WAINSCOT
Cement setting bed for wall tile
Ceramic tile wall
Ceramic base
Ceramic tile paver
APPROVED BY
FIRE WARDEN
COUNTY MANAGER
LIVING QUARTERS
FOR PESCADERO
FIRE STATION
SAN MATEO COUNTY
DEPARTMENT OF
CONSTRUCTION & MAINTENANCE
NOTED
C-2-3



FOUNDATION PLAN
Scale: 1/4" = 1'-0"
77'-0"
16'-0"
4'-0"
55'-0"
FURNACE ROOM
Conc steps
Fill, puddle & tamp
Access door
14x6 scr vents
Provide for H.A. Duct
COV. PORCH
Conc. piers
4x6 Girders
2x6 Floor Joists @ 16" oc
Dbl joists under parallel partitions
Conc step
COV. PORCH
4" Conc. slab
Fill, puddle & tamp
6x6 10 Ga mesh
5/8" ϕ dowel for post
54'-0"
18'-0"
36'-0"
22'-0"
TYP FOOTING
TYP PIER
SECTION A
SECTION B
SECTION C
FOUNDATION DETAILS
Scale: 3/4" = 1'-0"
1" Stucco
Building paper
1/2" Simpson Sheathing
2x4 @ 16" oc
5/8" plywood sub floor
2x6 Floor Joists @ 16" oc
4x6 Girder
4x4 post
Porch slab
Compacted fill
2-1/2" ϕ rods cont.
Fin. grade
Sheetrock
FURNACE
FLOOR DETAIL FOR TILE FLOOR
Scale: 3/4" = 1'-0"
Ceramic tile floor
POST DETAIL AT COV PORCH
Scale: 3/4" = 1'-0"
4x4 post
APPROVED BY
FIRE WARDEN
LIVING QUARTERS
FOR DES__DERO
FIRE STATION
SAN MATEO COUNTY
DEPARTMENT OF
CONSTRUCTION & MAINTENANCE
DATE
2-7-57
SCALE
Noted
Henry F. Prarrott
P-2-5

ELECTRICAL FIXTURE SCHEDULE

A	THOMAS INDUSTRIES INC., STARLIGHT #TI-229	4-40 WATT LAMPS
B	GRAYBAR HOMES AREA LITES 24×24 x2 PLASTIC	2 G.E. CIRCLINE LAMPS
C	LIGHTOLIER, OPALITE 4317	2-75 WATT LAMPS
D	THOMAS INDUSTRIES INC., STARLIGHT #TI-235	2-60 " "
E	" " " " #SL-143	2-60 " "
F	" " " " #TI-751	1-40 " "
G	STEBER UTILITE FLOODLIGHT S300	1-200 LAMP
H	LIGHTOLIER, OPALITE 4318	3-60 WATT LAMP
I	5¼" PORCELAIN SOCKET, KEYLESS OR PULL AS REQUIRED	1-75 W LAMP
J	3-STEBER LITES and FITTINGS S300	3-R40 LAMPS



ELECTRICAL & PLUMBING PLAN

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

NOTE

Telephone: Electrical contractor shall furnish and install all cabinets, boxes and conduits necessary for the telephone system.

SYMBOLS

- Outlet wall or ceiling
- Duplex convenience outlet
- WP Weatherproof convenience outlet
- Clock outlet (110 volts)
- PT&T Telephone
- Intercom & radio
- Push button
- Buzzer or bell as selected
- e Switches on emergency light circuit (see specs)

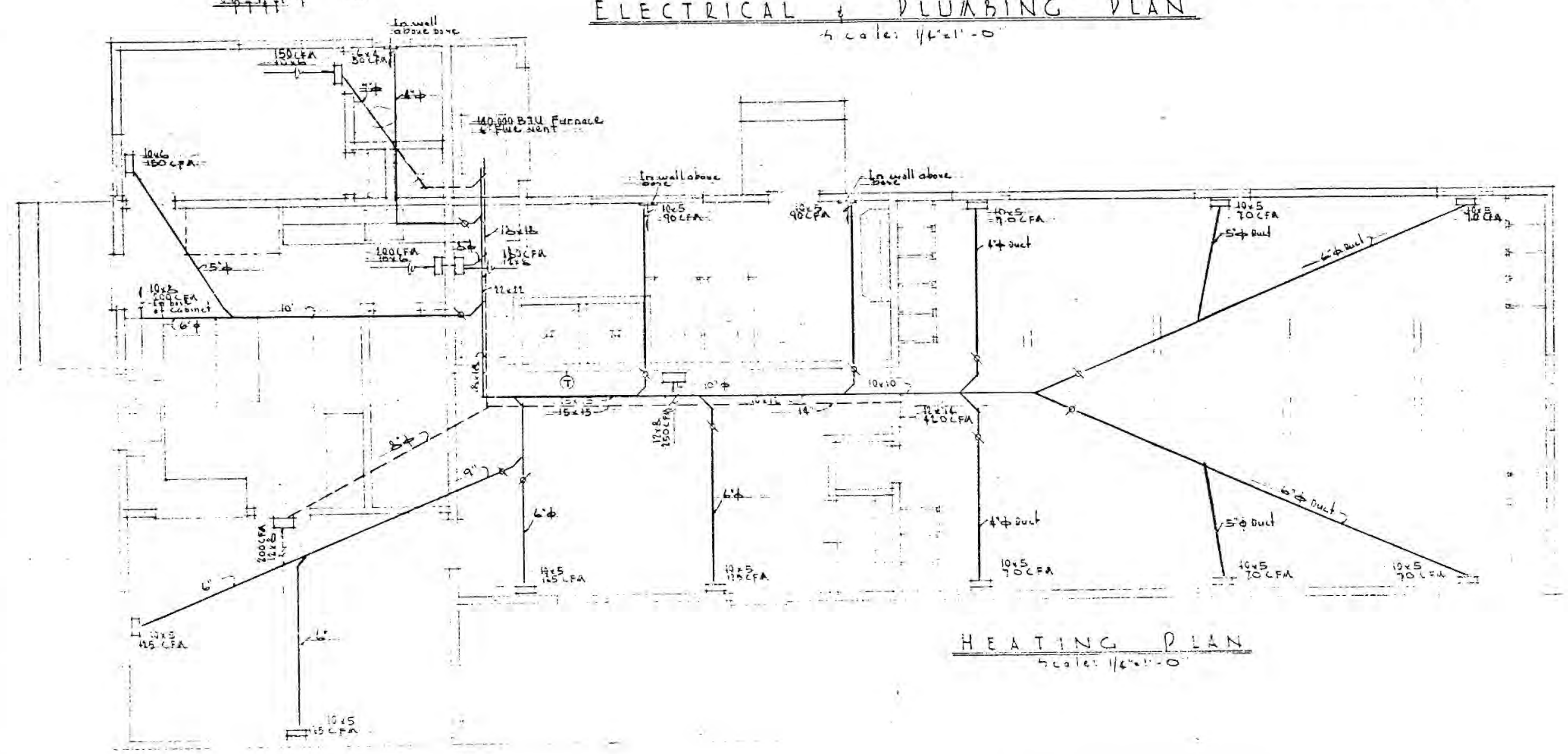
2"C Empty stub out from transfer sw & cap 5'-0" from building

PLUMBING NOTES:

Hot & cold water supply to water heater shall be 1"
Hot & cold feeder lines shall be of size shown on plans.
Taps for fixtures & hose bibbs shall be sized in accordance with San Mateo County Plumbing Code.
Pressure on system shall be 30 lbs
Rough in only for washing machine
Gas line shall be as shown on plans
Waste and venting shall be in accordance with San Mateo County County Code and shall be complete with septic tank and drain field as shown on plans.
See plot plan for extensions of lines.

MAIN SERVICE EQUIPMENT

2" Service conduit - 3-#00 RH
200 Amp - 3 pole S.N switch type "C"
2" Acorn base
150 Amp. Automatic load transfer switch See specs
Conduit for overhead
Telephone service as called for by Telephone Company



HEATING PLAN

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

HEATING NOTES:

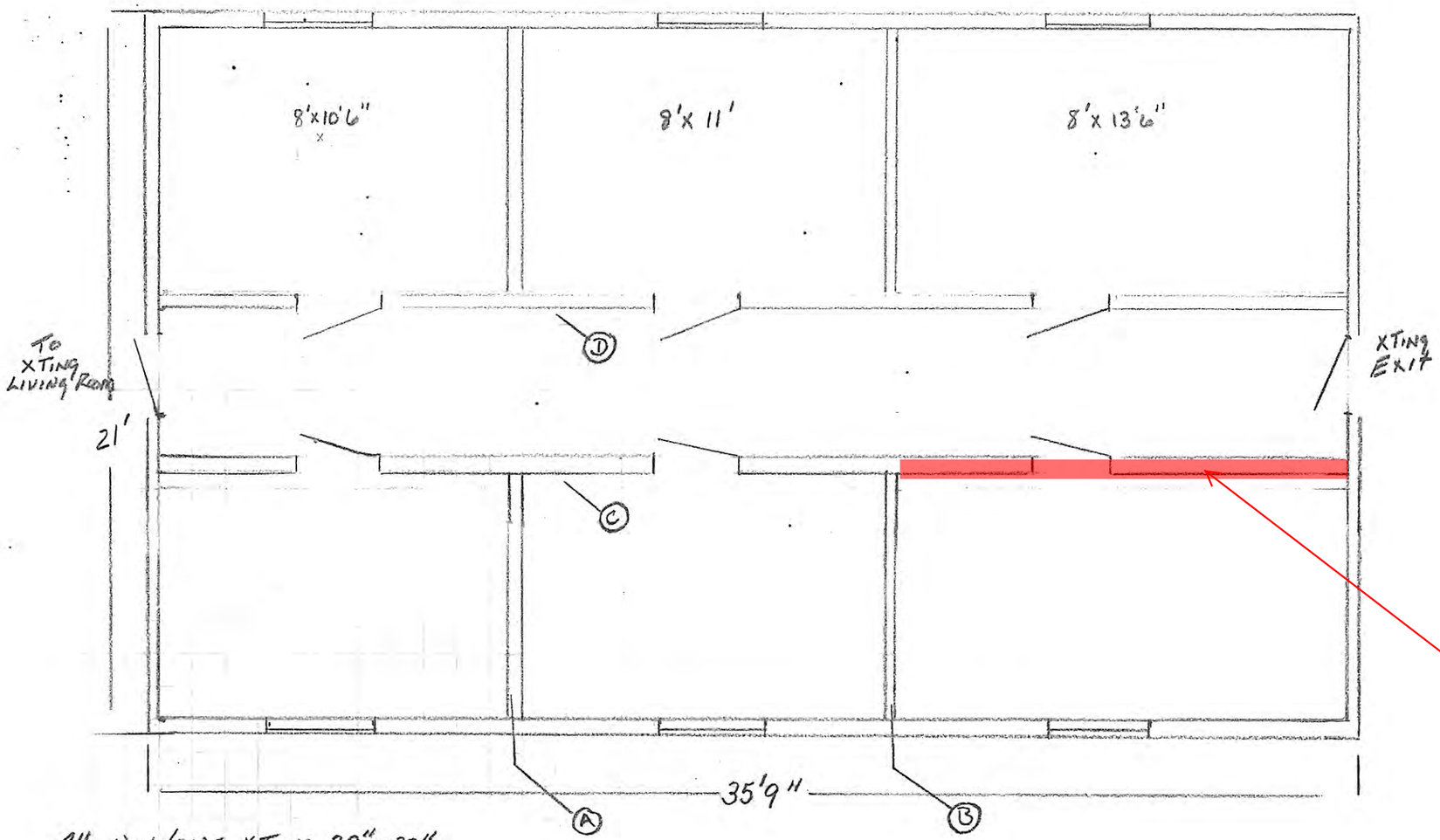
1. Floor supply diffusers shall be Tuttle & Bailey T-60 with adjustable dampers
2. Return air registers shall be Tuttle & Bailey Aerovane Model T 78" or equal with opposed blade dampers
3. Return air ducts shall be in attic space, supply ducts under floor

LEGEND

- Supply Air
- Return Air
- Volume damper
- Room Thermostat

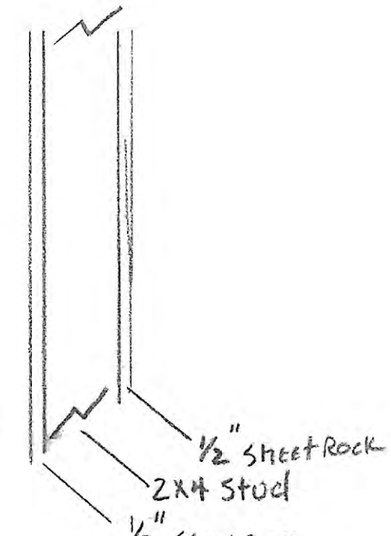
Approved by	LIVING QUARTERS FOR PESCADERO FIRE STATION	Date 2-7-57
FIREWARDEN		Scale Noted
CHAIRMAN BD OF SUPERVISORS		Drawn by A.E.K.
COUNTY MANAGER	DESIGNED BY SAN MATEO COUNTY DEPARTMENT OF CONSTRUCTION & MAINTENANCE	Sheet of sheets
[signature] ENGINEER COUNTY		File No

F-2-2



All windows XTing 38"x38"
All doors 3° Hollow core
All walls insolated for sound Resistance

Walls A, C, D New Partitians
Wall B XTing Partitian



Typical wall detail

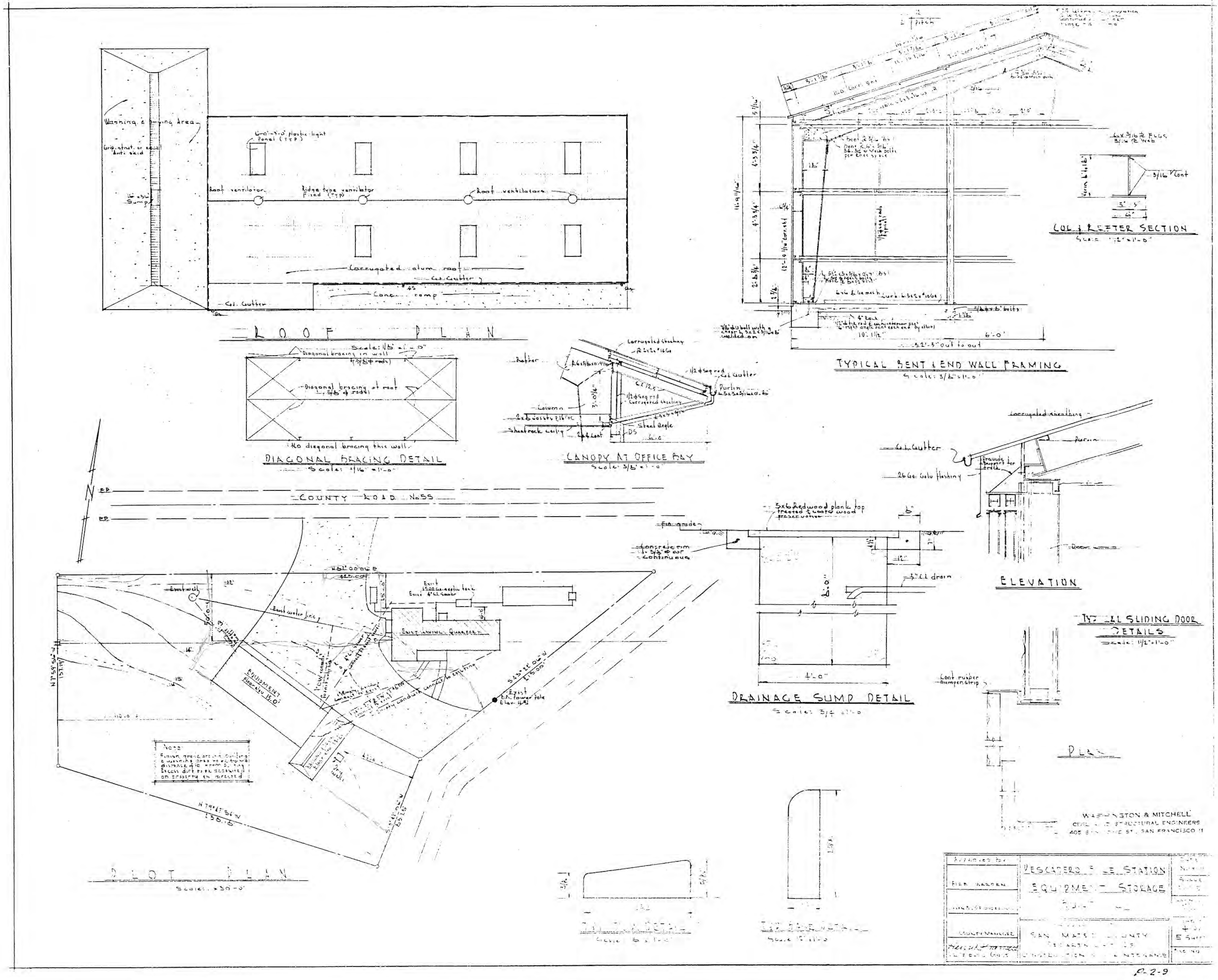
This wall was not built.
Confirmed on 11/20/13.
Note:
"xting" means "Existing Condition"

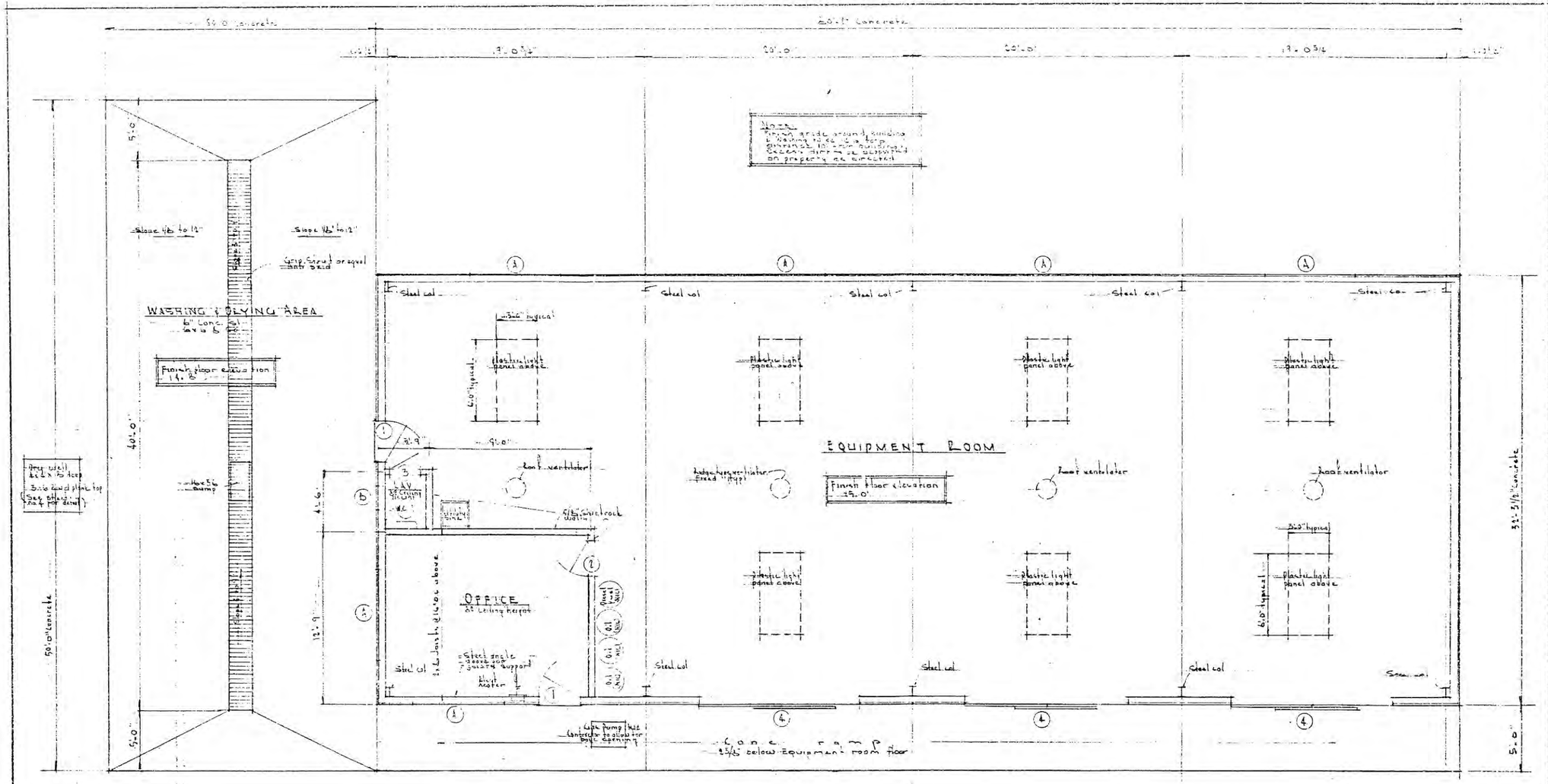
Date of Drawing:
Unknown

1/4" Scale

D. Risney

Pescadero Fire Station
Barracks


ROOF PLAN
Scale: 1/8" = 1'-0"
Washing & drying Area
Corrugated alum. roof
Roof ventilator
Ridge type ventilator Fixed (typ)
Roof ventilators
Conc. ramp
G.I. Gutter
DIAGONAL BRACING DETAIL
Scale: 1/16" = 1'-0"
Diagonal bracing in wall
Diagonal bracing at roof
No diagonal bracing this wall
CANOPY AT OFFICE BAY
Scale: 3/8" = 1'-0"
Corrugated sheathing
Rafter
Column
Purlin
G.I. Gutter
Steel angle
Sheetrock ceiling
TYPICAL BENT & END WALL FRAMING
Scale: 3/8" = 1'-0"
52'-3" out to out
COL. & RAFTER SECTION
Scale: 1/2" = 1'-0"
3/16 Cont
COUNTY ROAD No.55
PLOT PLAN
Scale: 1" = 30'-0"
Exist. well
Exist. water line
Exist. living quarters
Exist. septic tank
Exist. power pole
N 74°47'56" W 138.6
Note:
Finish grade around building & washing area to obtain drainage. Excess dirt to be deposited on property as directed
DRAINAGE SUMP DETAIL
Scale: 3/4" = 1'-0"
3x6 Redwood plank top treated & coated wood preservative
Concrete rim
3" C.I. drain
4'-0"
6'-0"
ELEVATION
Corrugated sheathing
Purlin
G.I. Gutter
26 Ga. Galv. flashing
Door
TYPICAL SLIDING DOOR DETAILS
Scale: 1 1/2" = 1'-0"
Cont. rubber bumper strip
PLAN
WASHINGTON & MITCHELL
CIVIL AND STRUCTURAL ENGINEERS
405 SAN FRANCISCO 11
PESCADERO FIRE STATION
EQUIPMENT STORAGE
FIRE WARDEN
COUNTY MANAGER
SAN MATEO COUNTY
E SHT
P-2-9



FLOOR PLAN

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

SCHEDULE OF ROOM FINISHES						
ROOM	FLOOR	BASE	WALLS	TRIM	CEILING	PAINTING SPECIFICATIONS
EQUIPMENT	[illegible]	None	[illegible]	None	[illegible]	[illegible]
OFFICE	[illegible] 6x6 [illegible] mesh	[illegible]	[illegible]	Wood	Sheetrock	Spec #1 & 2
LAV	[illegible] 6x6 [illegible] mesh	Wood base [illegible]	Exposed [illegible] & Sheetrock	Wood	Sheetrock	Spec #1 & 2

PAINTING NOTES:

Exterior & interior alum. sheathing no paint
Structural steel shop coat only by building supplier
Exterior sides of doors & metal sash Spec #3
Interior sides of doors & metal sash see schedule of room finishes above

WINDOW SCHEDULE			
No	SIZE	TYPE	NOTES
A	[illegible]	[illegible]	[illegible]
B	[illegible]	Steel projected out	Obscure glass

FROM SOULE' STEELING WINDOW CATALOG

DOOR SCHEDULE			
No	SIZE	TYPE	NOTE
1	[illegible] 1 3/4"	[illegible]	[illegible]
2	2'-6"x6'-8" 1 3/8"	SF	Flush [illegible]
3	[illegible] 1 3/8"	SF	Flush [illegible]
4	[illegible]	Sliding	[illegible]

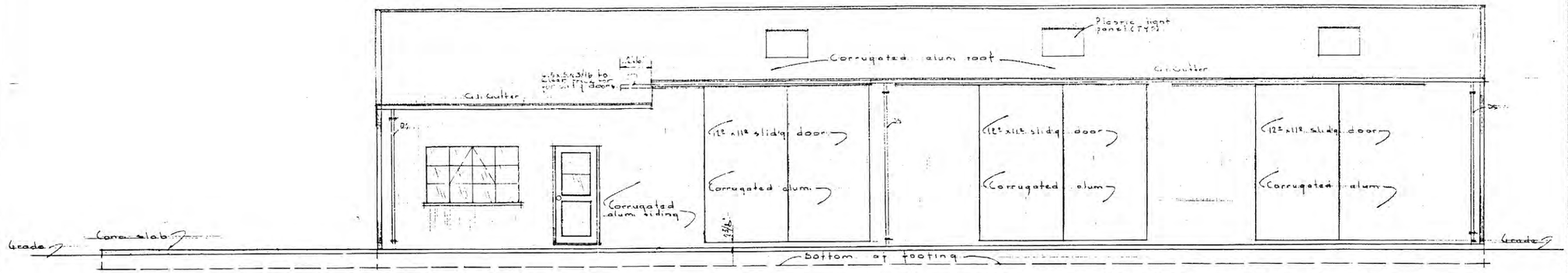
WASHINGTON & MITCHELL
CIVIL AND STRUCTURAL ENGINEERS
405 SANSOME ST. SAN FRANCISCO 11

APPROVED BY
FIRE WARDEN
[illegible]
COUNTY MANAGER

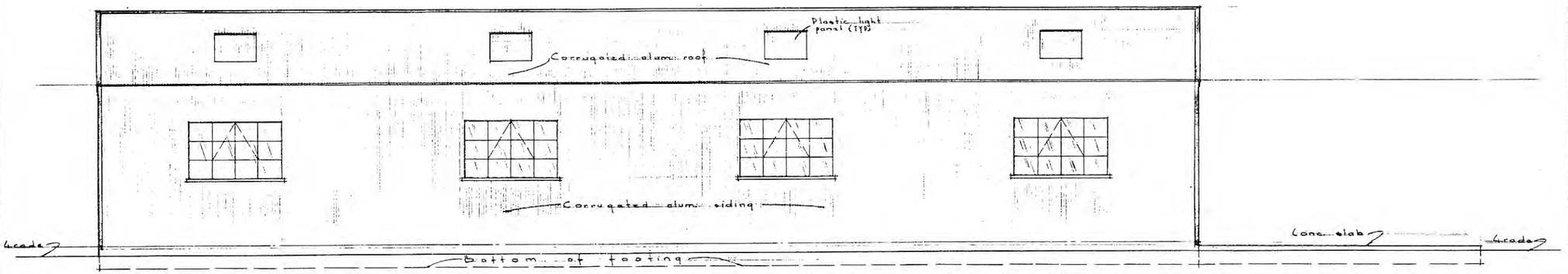
PESCADERO FIRE STATION
EQUIPMENT STORAGE
BUILDING

SAN MATEO COUNTY
DEPARTMENT OF
CONSTRUCTION & MAINTENANCE

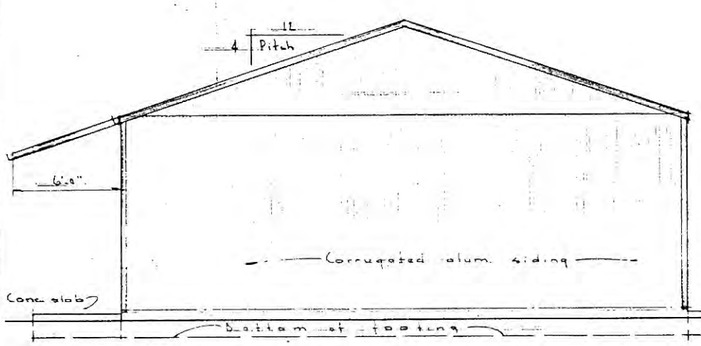
F-2-12



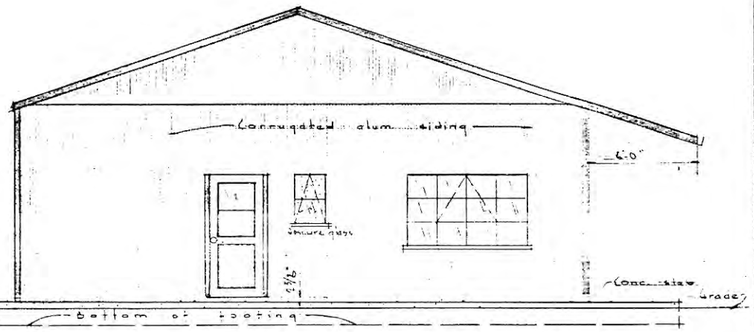
FRONT ELEVATION



REAR ELEVATION



RIGHT ELEVATION



LEFT ELEVATION

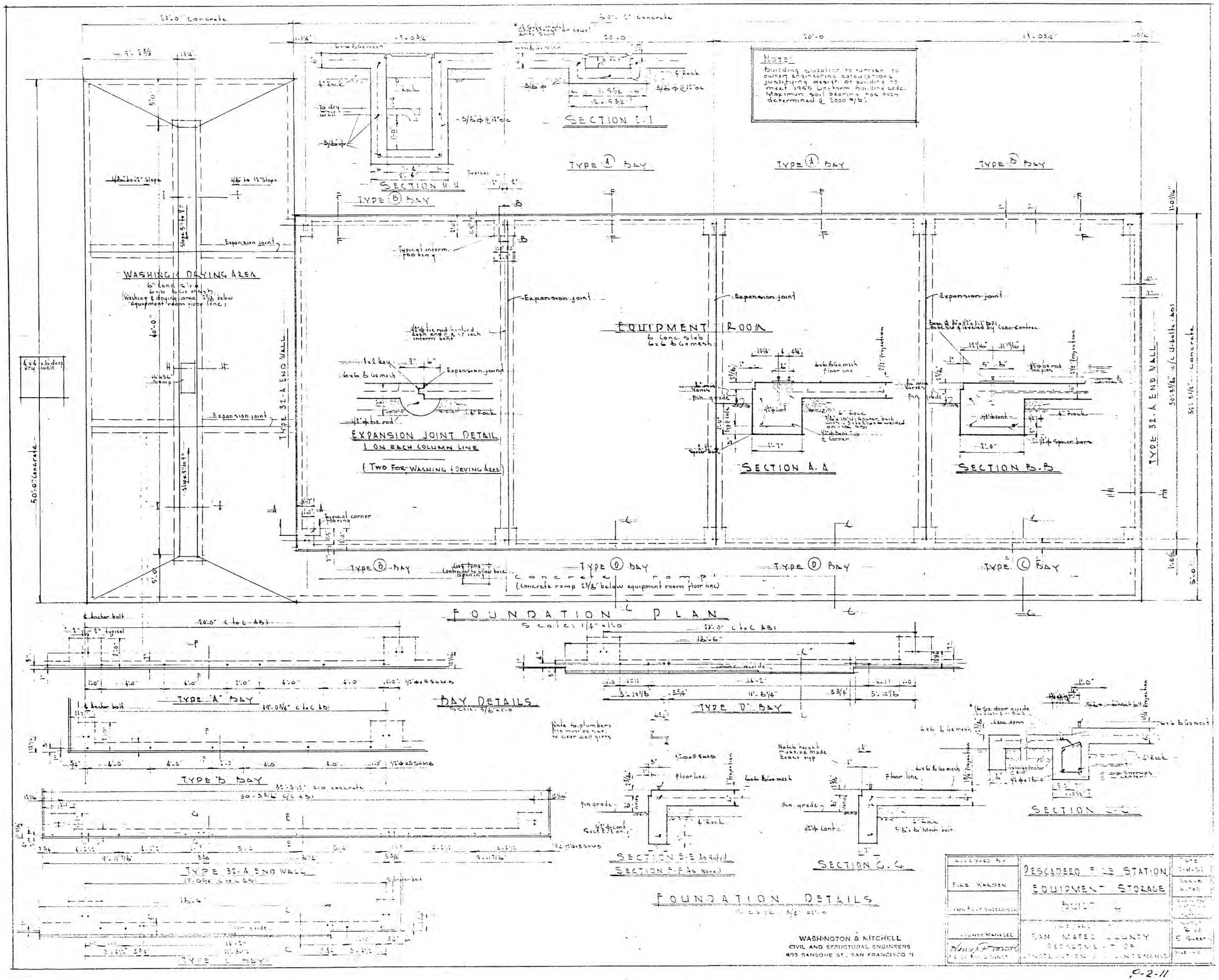
EXTERIOR ELEVATIONS

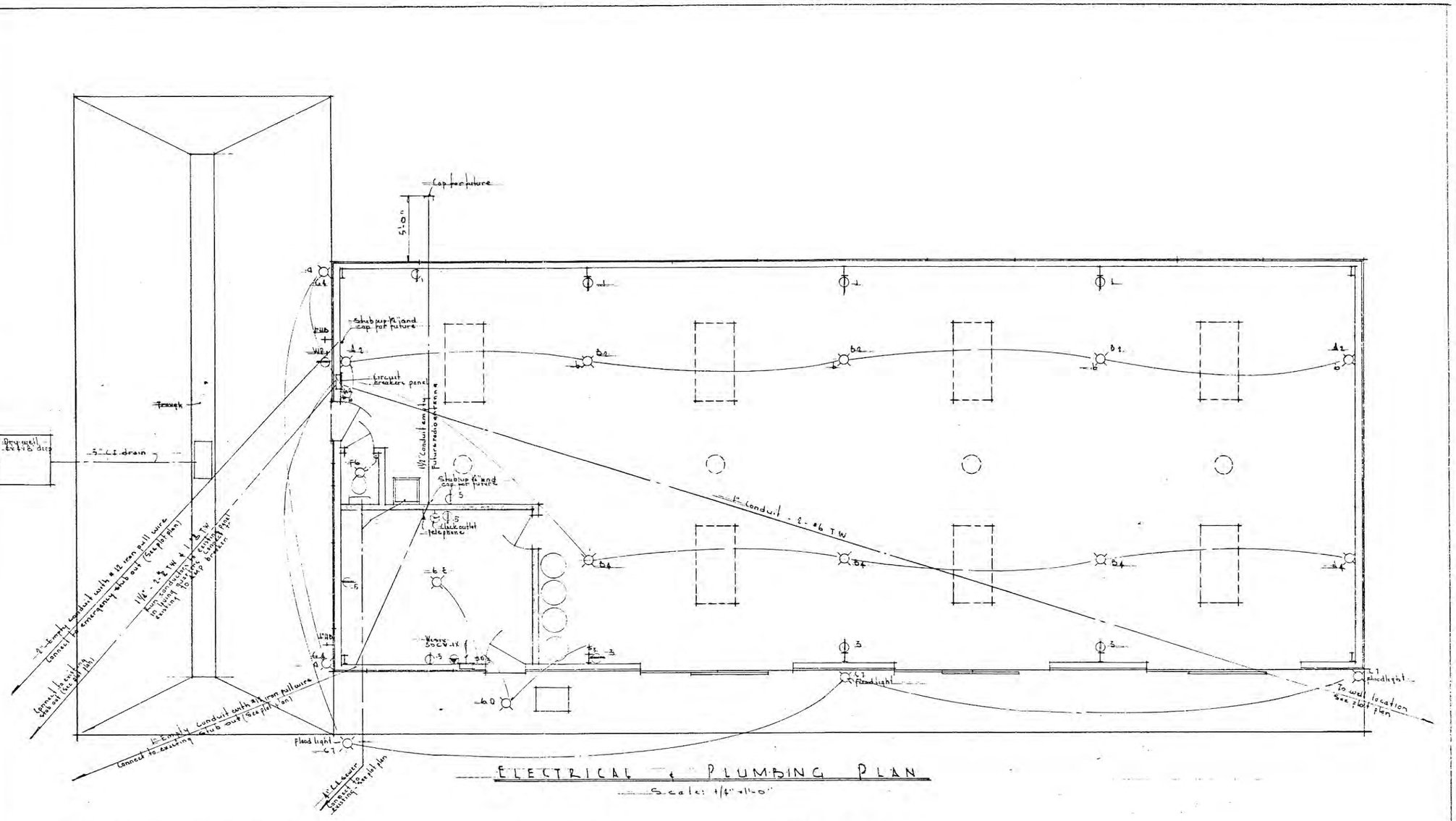
Scale: 1/4" = 1'-0"

WASHINGTON & MITCHELL
CIVIL AND STRUCTURAL ENGINEERS
405 SANSOME ST. SAN FRANCISCO 11

Approved by	Pescadero Fire Station
Fire Warden	Equipment Storage
Commissioner Supervisor	Building
County Manager	San Mateo County
Dir. of Bldg. Const.	Department of Construction & Maintenance
Date	
Scale	1/4" = 1'-0"
Drawn by	
Sheet	5 of 5 Sheets
Job No.	

P-2-10


NOTE:
Building contractor to furnish to owner engineering calculations justifying design of building to meet 1955 Uniform Building Code. Maximum soil bearing has been determined @ 2000 #/□'.
SECTION H-H
SECTION 1-1
TYPE (A) BAY
TYPE (B) BAY
TYPE (C) BAY
TYPE (D) BAY
WASHING & DRYING AREA
6" Conc. slab 6x6 6/6 mesh
(Washing & drying area 2 3/8" below equipment room floor line)
EQUIPMENT ROOM
6" Conc. slab 6x6 6/6 mesh
EXPANSION JOINT DETAIL
1 ON EACH COLUMN LINE
(TWO FOR WASHING & DRYING AREA)
Expansion joint
Typical interm. footing
Typical corner footing
TYPE 32-A END WALL
50'-0" Concrete
SECTION A-A
SECTION B-B
concrete ramp
(Concrete ramp 2 3/8" below equipment room floor line)
FOUNDATION PLAN
Scale: 1/4" = 1'-0"
TYPE "A" BAY
TYPE "B" BAY
TYPE "D" BAY
TYPE 32-A END WALL
TYPE "C" BAY
BAY DETAILS
SECTION E-E As Noted
SECTION F-F As Noted
SECTION G-G
SECTION C-C
FOUNDATION DETAILS
WASHINGTON & MITCHELL
CIVIL AND STRUCTURAL ENGINEERS
405 SANSOME ST., SAN FRANCISCO 11
APPROVED BY
FIRE WARDEN
COUNTY MANAGER
PESCADERO FIRE STATION
EQUIPMENT STORAGE
BUILDING
SAN MATEO COUNTY
SCALE NOTED
2 OF 5 SHEETS
C-2-11



ELECTRICAL & PLUMBING PLAN

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

ELECTRIC FIXTURE SCHEDULE

A Benjamin #5526 with 200 watt lamp
B Benjamin #5826 with #N-3585 Aligner and 200 watt lamp
C 3. Steberlites & fittings each fixture S-300 with 3-R 40 Lamps
D R & S. #6362 Shallow dome vaportight with 100 watt lamp
E All-Brite #86296 with 2-96-T 12-430 MA lamps
F 5/8" Pare Keyless Socket
G 1. Steberlite & fittings each fixture S-300 with 2-R 40 Lamps

PANEL SCHEDULE

Cir.			
"	1	South wall receptacles	20 A
"	2	Overhead lights	15 A
"	3	North wall receptacles	20 A
"	4	Overhead lights & Exit lights	15 A
"	5	Office receptacles	20 A
"	6	Office & Isu lights	15 A
"	7	North floods	15 A
"	8	Spare	20 A
"	9	4. Pole - 230 volt well pumps	35 A
"	10	2. Pole - 230 volt Air comp.	15 A
"	11	220 Volt 3 KW Elect heater	20 A

SYMBOLS

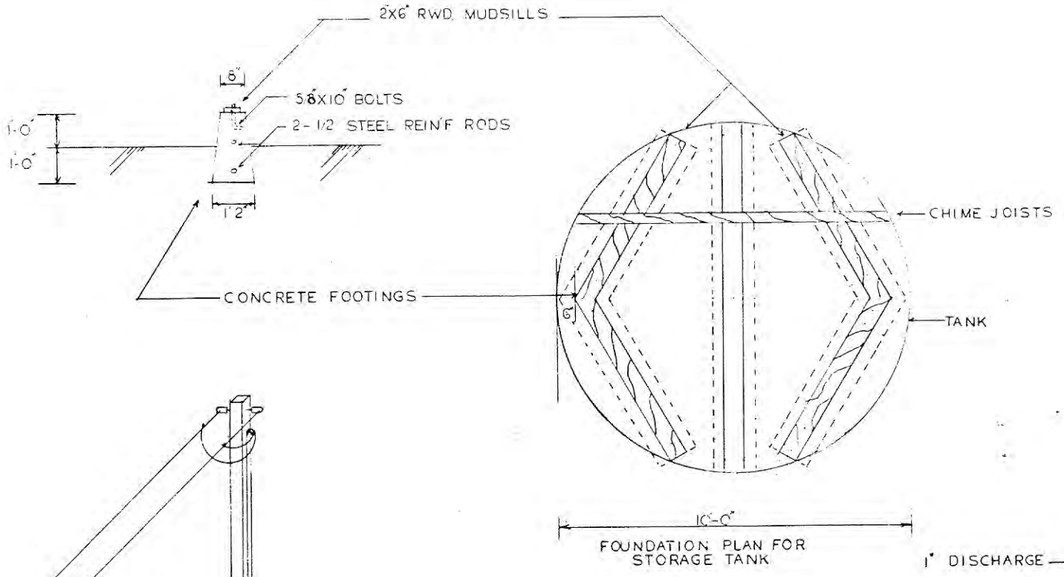
- Outlet wall or ceiling
- Duplex convenience outlet
- 220 V
- Clock outlet to point
- Telephone
- Under slab

APPROVED BY: FIRE WARDEN	PESCADERO F. P. STATION EQUIPMENT STORAGE	DATE: SCALE: NOTED
COUNTY MANAGER	SAN MATEO COUNTY DEPARTMENT OF PUBLIC WORKS	SHEET 5 OF 5 SHEETS FILE NO.

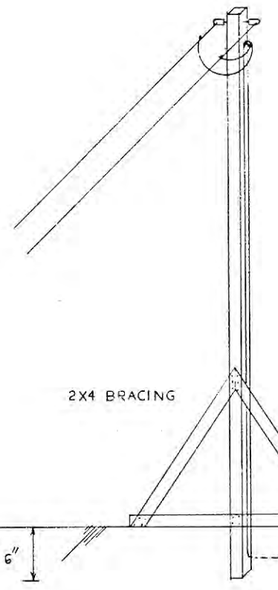
P-2-8

PIPING ABOVE GRADE
PIPING BELOW GRADE
CONDUIT BELOW GRADE
EXISTING CONDUIT

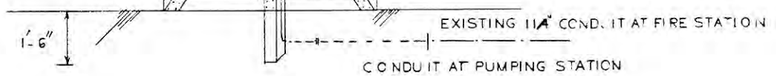
1- CONCRETE FOUNDATION FOR STORAGE TANK BY OTHERS
2- PUMPING STRUCTURE AND CONCRETE FLOOR BY OTHERS
3- ALL PIPING BELOW GRADE SHALL BE INSTALLED AT A DEPTH OF 1'-0" MIN.

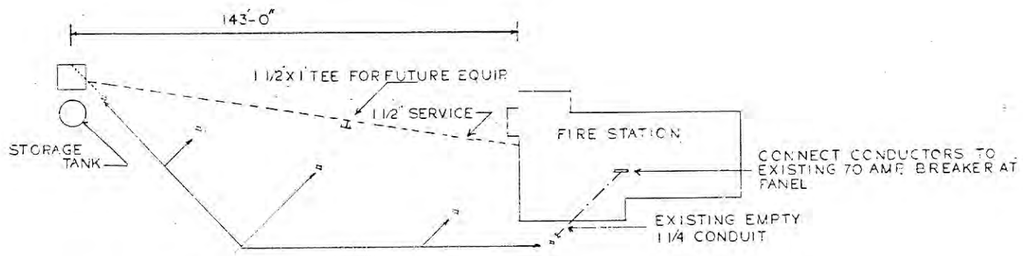


FOUNDATION PLAN FOR STORAGE TANK



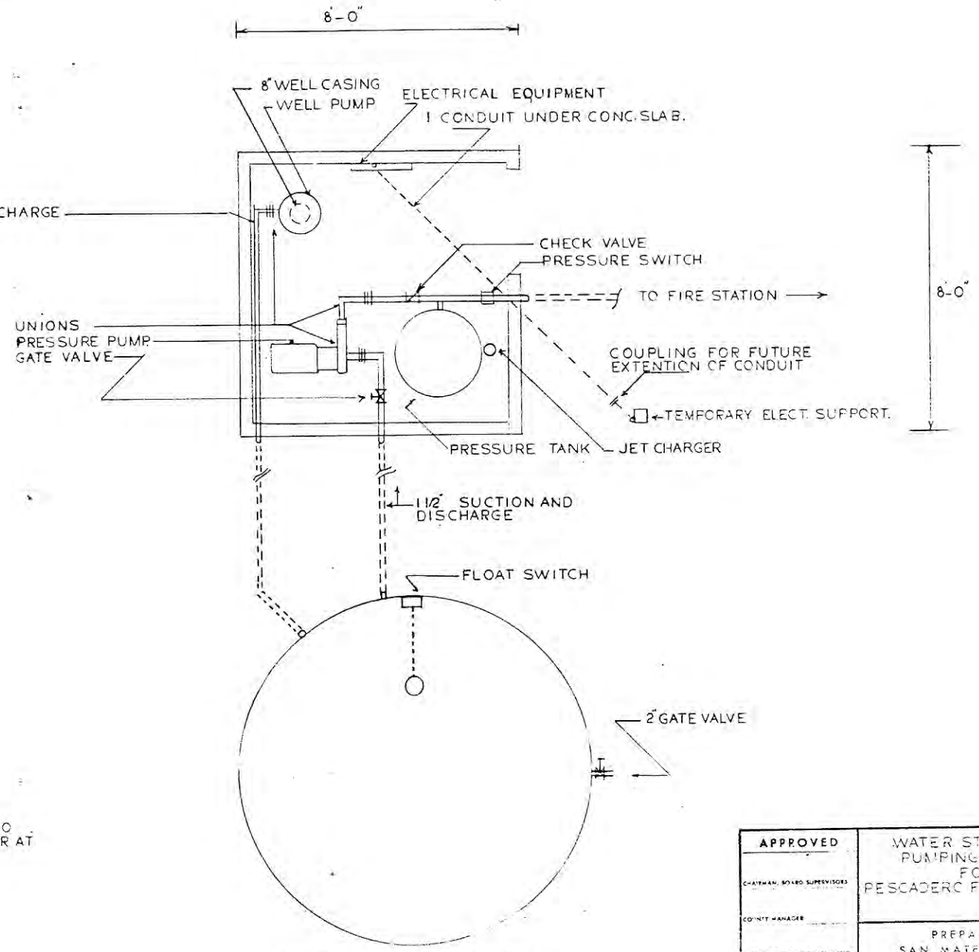
TYPICAL TEMPORARY ELECTRICAL SUPPORTS





TEMPORARY ELECTRICAL SUPPORTS

PLOT PLAN
NO SCALE



STORAGE TANK AND PRESSURE EQUIPMENT

APPROVED	WATER STORAGE AND PUMPING SYSTEM FOR PESCADERO FIRE STATION	DATE 6-28-57
CHAIRMAN, BOARD SUPERVISORS		SCALE 1/2"=1'-0"
COUNTY MANAGER		DRAWN BY JCP
DIRECTOR OF BUILDING CONSTRUCTION	PREPARED BY SAN MATEO COUNTY DEPARTMENT OF BUILDING CONSTRUCTION	SHEET
		FILE NO.

P-2-7

105.6
loft

6.0
Mech

(18) 25"x40"
[9 x 2 high]

380.0

40"x60"

6.0
tool
shed

138.0

60"x72"

60"x72"
[5 tubs above]

40"x86"

18.2

60"x86"

12.1

12.4

EQUIPMENT ROOM

555.0

555.0

555.0

176
HazMat
Stor

OFFICE
295.0

(12) 25"x40"
[6 x 2 high]

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

3023 Main level
105 Loft
3128 GSF

160
storage container

80
storage shed

SCHEDULE OF ROOM FINISHES

ROOM	FLOOR	BASE	WALLS	TRIM	CEILING	REMARKS
EQUIPMENT						
OFFICE						
LAN —						

PAINTING NOTES:

WINDOW SCHEDULE

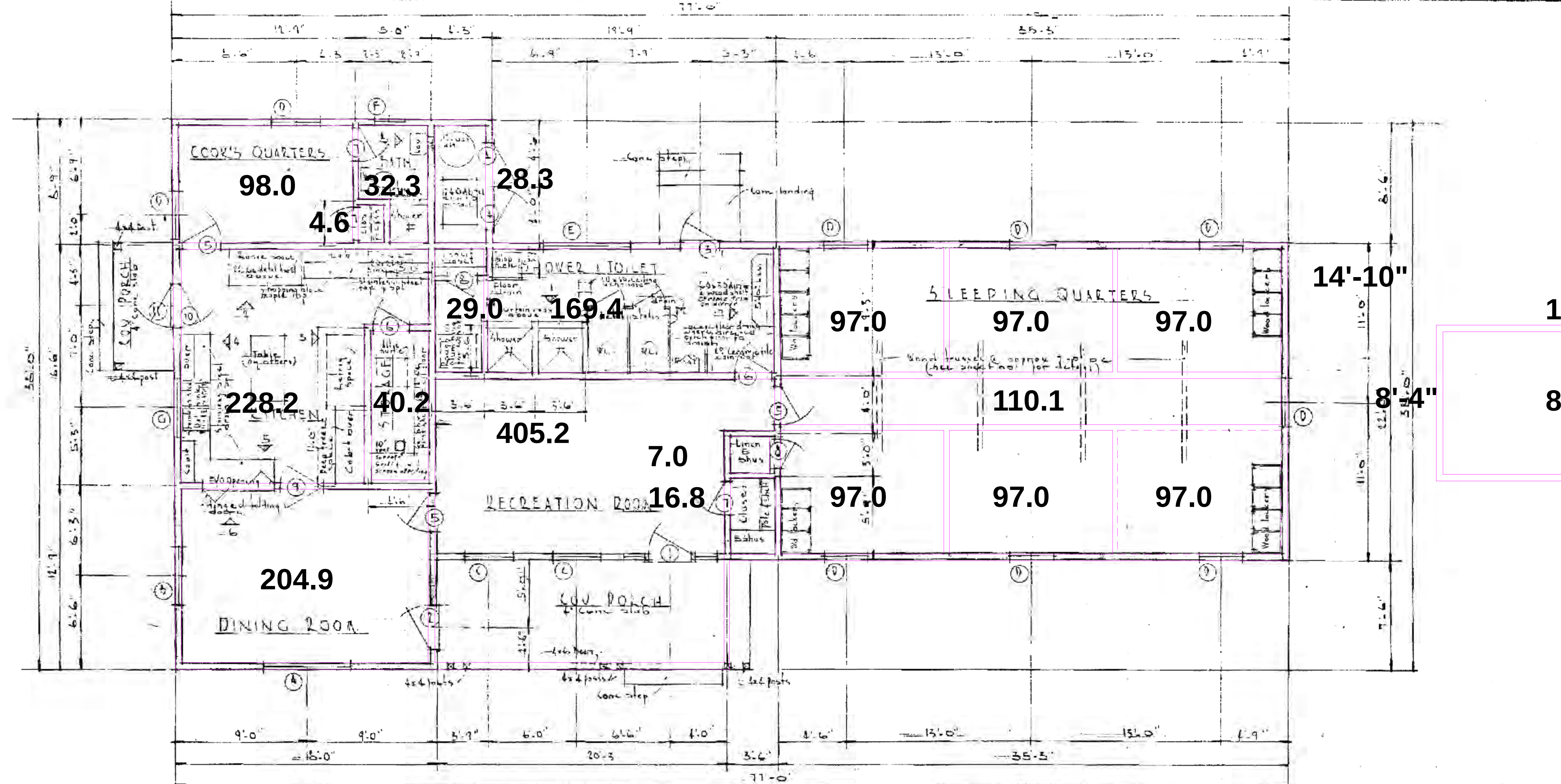
NO	SIZE	TYPE	NOTES
A			
B			

FROM GOULD STEELINE WINDOW CATALOG

DOOR SCHEDULE

NO	SIZE	TYPE	NOTE
1			
2			
3			
4			

PESCADERO FIRE STATION
EQUIPMENT STORAGE



FLOOR PLAN 2175 GSF

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

See sheet no 3 for truss detail

SCHEDULE OF ROOM FINISHES						
ROOM	FLOOR	BASE	WALLS	TRIM	CEILING	PAINTING SPECIFICATIONS
SLEEPING QUARTERS	Asphalt tile	Rubber base	Sheetrock painted	Wood	Painted 1/2 ceiling, Exposed trusses painted	Spec #1 & 2
DINING	(Grease proof)	" "	" "	"	Sheetrock painted	" #1 & 2
COOK'S QUARTERS	"	" "	" "	"	" "	" #1 & 2
KITCHEN	(Grease proof)	" "	" "	"	" "	" #2 & 3
BATH	"	" "	" "	"	" "	" #2 & 3
SHOWERS TOILET	Ceramic tile [illegible]	Ceramic tile [illegible]	Ceramic tile Sheetrock painted	"	" "	" #2 & 3
STORAGE	Asphalt tile	Rubber base	Sheetrock painted	"	" "	" #1 & 2
CLOSET	"	" "	" "	"	" "	" #1 & 2
RECREATION	" "	" "	" "	"	" "	" #1 & 2
FURNACE	[illegible] slab	None	5/8 Sheetrock (no paint)	"	5/8 Sheetrock (no paint)	" #2

PAINTING NOTES: Interior woodwork shall be specification #2 except ceiling of Sleeping Room which shall be #1
Interior walls & ceilings shall be specification #1 except in Kitchen, Bath & Toilets which shall be #3
Exterior woodwork shall be specification #4
Exterior metal shall be specification #4

WINDOW SCHEDULE			
NO	SIZE	TYPE	NOTES
A	6'-0" x 4'-2 5/8"	Alum. Casement	All glass shall be "B" Quality type Double Strength
B	4'-0" x 4'-2 5/8"	" "	
C	5'-2" x 4'-2 5/8"	" "	
D	3'-4" x 2'-1 5/8	" "	
E	6'-0" x 2'-2 5/8	" "	[illegible]
F	2'-0 1/2" x 2'-2"	" "	Obscure glass
G	4'-0" x 3'-2 5/8	" "	
Furnish one screen for each vented window			

DOOR SCHEDULE			NOT
NO	SIZE	TYPE	
1	3'-0" x 6'-8" 1 3/4"	DF 9 lites	
2	3'-0" x 6'-8" 1 3/4"	DF	
3	2'-8" x 6'-8" 1 3/4"	DF [illegible]	
4	3'-0" x 6'-8" 1 3/4	DF	
5	2'-8" x 6'-8" 1 3/8	DF	
6	2'-6" x 6'-8" 1 3/8	DF	
7	2'-4" x 6'-8" 1 3/8	DF	
8	2'-0" x 6'-8" 1 3/8	DF	
9	3'-0" x 6'-8" 1 3/8	DF Double acting	
10	3'-0" x 6'-8" 1 3/4"	DF [illegible]	
11	[illegible]	DF [illegible]	

Approved by

File Warden

LIVING QUARTE[RS]

FOR RE[illegible]

The 2010 Forest and Range Assessment: Final Document

http://frap.fire.ca.gov/data/assessment2010/pdfs/california_forest_assessment_nov22.pdf

This assessment highlights key issues, resource status and trends and priority landscapes for the subsequent strategy document, which will provide a framework for state and federal programs to support good forest and rangeland stewardship in California.

Chapter 3.7 Climate Change: Threats and Opportunities. A variable pattern of annual precipitation is expected; increasing through 2069, then followed by a large decrease by 2099.

California Coastal Commission Draft Sea-Level Rise Policy Guidance. Public Review Draft.

http://www.coastal.ca.gov/climate/slr/guidance/CCC_Draft_SLR_Guidance_PR_10142013.pdf

Page 5 of the document, showing projected sea level rise, is included below.

Table 1. NRC Sea-Level Rise Projections for California (NRC, 2012)

TIME PERIOD	NORTH OF CAPE MENDOCINO	SOUTH OF CAPE MENDOCINO
2000 – 2030	-4 – +23 cm (-1.56 – 9 inches)	4 – 30 cm (1.56 – 11.76 inches)
2000 – 2050	-3 – + 48 cm (-1.2 – 18.84 inches)	12 – 61 cm (4.68 – 24 inches)
2000 – 2100	10 – 143 cm (3.6 – 56.28 inches)	42 – 167 cm (16.56 – 65.76 inches)

Could be 24" rise within 50-year lifespan of New Fire Station

In addition to these sea-level rise projections, the 2012 NRC report provides information on the impacts of sea-level rise in California. According to the report, sea-level rise will cause flooding and inundation, an increase in coastal erosion, changes in sediment supply and movement, and saltwater intrusion to varying degrees along the California coast. These effects in turn could have a significant impact on the coastal economy and could put important coastal resources and coastal development at risk, including ports, marine terminals, commercial fishing infrastructure, public access, recreation, wetlands and other coastal habitats, water quality, biological productivity in coastal waters, coastal agriculture, and archeological and paleontological resources.

PRINCIPLES FOR ADDRESSING SEA-LEVEL RISE IN THE COASTAL ZONE

This guidance is rooted in certain fundamental guiding principles, many of which derive directly from the requirements of the Coastal Act. In this respect, the principles are not new, but rather generally reflect the policies and practices of the Commission since its inception in addressing coastal hazards and the other resource and development policies of the Act. Each of the four groups of principles below embodies important concepts that are specifically and increasingly raised by the challenges of rising sea levels. This guidance builds on the cumulative knowledge and experience of the agency to help identify practical guidance for addressing sea-level rise in the California coastal zone, consistent with these principles and the statewide policies of the California Coastal Act.

A. Use Science to Guide Decisions [Coastal Act Sections 30006.5; 30335.5]

1. Acknowledge and address sea-level rise as necessary in planning and permitting decisions.
2. Use the best available science to determine locally relevant (context-specific) sea-level rise projections for all stages of planning, project design, and permitting reviews.
3. Recognize scientific uncertainty by using scenario planning and adaptive management techniques.

B. Minimize Coastal Hazards through Planning and Development Standards [Coastal Act Sections 30253, 30235; 30001, 30001.5]

4. Avoid significant coastal hazard risks where feasible.
5. Minimize hazard risks to new development over the life of authorized structures.

DRAFT

County of San Mateo - Planning and Building Department

ATTACHMENT E

March 16, 2017

Pescadero Fire Station Siting Analysis- Biological Assessment

Introduction

The purpose of this report is to present the results of the biological assessment of a proposed location in Pescadero, California that is being considered for the construction of a new County Fire Station (Figure 1). The site is located at the corner of Cloverdale Road and Butano Cut-off at the existing Pescadero High School, approximately 1.25 miles southeast of the town of Pescadero and 3.0 miles east of Highway 1, in unincorporated San Mateo County (Figure 2).

The proposed fire station site will be approximately 40,000 square feet and is intended to replace the existing fire station located at the intersection of Pescadero Creek Road and Bean Hollow Road in Pescadero. In preparation for field assessment of the proposed location, a background literature review of past studies such as special-status species recovery plans and previously prepared biological assessments for County of San Mateo (County) projects in the vicinity was conducted. On June 10, 2016, County Department of Public Works (DPW) biologist Theresa Engle conducted a biological survey at proposed site to determine existing habitat types and the potential for presence of special-status species, including California red-legged frog (CRLF; *Rana draytonii*), San Francisco garter snake (SFGS; *Thamnophis sirtalis tetrataenia*), San Francisco dusky-footed woodrat (SFDW; *Neotoma fuscipes annectens)*, western pond turtle (WPT*; Actinemys marmorata*), San Francisco common yellowthroat (*Geothlypis trichas sinuosa*), white-tailed kite (*Elanus leucurus)*, yellow warbler (*Dendroica petechial)*, choris' popcorn flower (*Plagiobothrys chorisianus var. chorisianus)* and coastal marsh milk vetch (*Astragalus pycnostachyus* var. *pycnostachyus*). The survey area included the proposed 40,000 square foot project footprint and an approximate 250-foot buffer (Figures 3 and 4).

Description of the Project Location

The surrounding land use at the site consists of Pescadero High school to the north and east and disturbed soils to the west and south (Photos 1-6). The proposed site is developed and contains a paved parking lot bordered by ornamental trees. At the time of the site visit, disturbed soils lay between the paved parking lot and Butano Cut-off to the south; to the west of the site, active agricultural crop rows of rosemary were observed (Figure 5). A drainage ditch is present approximately 50 feet west of the proposed site along the east side of Cloverdale Road, and is predominately vegetated with cattails, horsetail, blackberry, and wild radish. Pescadero Creek and associated riparian habitat lies approximately 1,000 feet to the northeast of the site (Figure 3). A portion of the site falls within the FEMA 100-year flood zone (Figure 6). The adjacent Colverdale ditch has been known to flood in the past, further hydrological studies are recommended to better understand the potential impacts on the project site. (i.e. flooding)

Methodology

The results of the site survey were analyzed for potential impacts to biological resources including special-status plant and animal species from the construction of the new station. Special-status species are those that have been designated as endangered, threatened, or species of concern by Federal or State regulatory agencies. The analysis consisted of a review of Federal and State species-specific data and available documents, conducting a field survey of the site, and evaluating the likelihood of special-status species occurrences in the study area. A review of special-status species with the potential to occur in the vicinity of the site was conducted using a combination of Federal and State Agency databases. A list of federally listed plant and animal species known to, or with the potential to occur within the Project vicinity (San Gregorio quadrangle) was generated using the Sacramento United States Fish and Wildlife Service (USFWS) website (USFWS, 2016). The California Native Plant Society (CNPS) was queried to generate a list of plants listed as rare or endangered (CNPS, 2016). In addition, the California Natural Diversity Database (CNDDB, 2017), administered by the California Department of Fish and Wildlife (CDFW), was queried to determine if there were any documented occurrences of the special-status plant or animal species from the USFWS and CNPS lists within the Project vicinity (CDFW, 2016). These lists are included as attachments. Marine species and species that do not typically occur within the plant communities and habitats that currently exist in the study areas were excluded. The query results were further analyzed and mapped to determine if any special-status species occurrences have been documented within ½ mile of the site (Figure 4).

Based on the analysis described above, it was determined the following species have the potential to occur in the vicinity of the proposed site: CRLF, SFGS, SFDW, WPT, San Francisco common yellowthroat, white-tailed kite, yellow warbler, choris' popcorn flower, and coastal marsh milk vetch. During the June 10, 2016 site survey, the study areas were traversed by foot to identify if suitable habitat for any of these species was present in the study area.

Results

California red-legged frog (CRLF)

CRLF is listed as threatened under the Federal Endangered Species Act and is a State species of special concern (SSC). CRLF typically inhabit marshes, ponds, and slow moving streams with a well-developed riparian canopy (USFWS, 2002). They require aquatic breeding areas often embedded within a matrix of riparian and upland dispersal habitats. Breeding sites for CRLF occur in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, springs, sag ponds, dune ponds and lagoons. Additionally, CRLF frequently breed in artificial impoundments such as stock ponds (USFWS, 2002). CRLF typically breed during winter and spring in marshes and ponds with emergent vegetation for egg attachment. The aquatic features used for breeding must retain water for a long enough period for larval development which typically ranges between 2.5 to 5 months, depending on temperature (CDFW, 2009). Aquatic non-breeding habitat includes riparian corridors with slow moving creeks or streams. Upland habitat includes natural areas surrounding aquatic habitats that can be used by CRLF for foraging, dispersal, and predator avoidance. Dispersal habitat includes upland and riparian habitat

typically within one mile of occupied breeding sites. Based on suitable aquatic breeding, aquatic non-breeding, upland and dispersal habitat and CRLF documented occurrences within the study area; it is likely that CRLF could occur at the proposed project site.

There is a documented CRLF road mortality in CNDDB within a ½ mile of the proposed project location (CNDDB, 2017, Figure 4). Additionally, multiple CRLF have been observed by County staff in the drainage ditch adjacent to Cloverdale Road, located 50 feet from the proposed project site. Three CRLF were also observed approximately 1.5 miles south of the proposed project along Cloverdale Road (County staff observation). It is anticipated that CRLF use the drainage ditch adjacent to Cloverdale Road as foraging, dispersal, and possibly breeding habitat during the wet season. Numerous small mammal burrows were observed within the study area that could be used by CRLF as upland habitat during summer months. As a result, CRLF are expected to occur within the study area and in the absence of appropriate avoidance and minimization measures could be impacted by construction and operation of a new fire station. The site does not occur within critical habitat for CRLF (USFWS, 2010).

San Francisco Garter Snake (SFGS)

The SFGS is listed as endangered species under the Federal and California endangered species acts. CDFW lists the species as fully protected. This semi-aquatic species is often found hunting in ponds, slow moving streams, and ephemeral wetlands occupied by their primary prey, Pacific chorus frogs and CRLF. SFGS primarily breed in spring, but can also breed during fall. Peak mating and foraging activity takes place from spring through late summer/early fall. SFGS utilize upland areas such as grassland/shrub habitat, particularly abandoned rodent burrows, for overwintering (USFWS, 1985). SFGS require seasonal or permanent water bodies and upland habitat for survival. SFGS preferred habitat is densely vegetated aquatic habitat near an open hillside where they can bask in the sun, forage, and find cover in small mammal burrows. Based on suitable aquatic and upland habitat for SFGS, documented occurrences of SFGS within ½ mile of the study area, and documented breeding sites for CRLF, a preferred prey of SFGS, located within one mile of the study area, it is likely that this species could occur within the proposed project site.

SFGS occurrences are considered sensitive information, but there is a known population in Pescadero Marsh from which dispersal to aquatic habitat in the vicinity can occur. Previous biological surveys by McGinnis and more recent limited trapping by Swaim Biological, Inc. have documented the presence of SFGS in numerous locations within one mile of the sites (McGinnis 1984, SBI, 2014). There is a documented SFGS occurrence in ponds on private land within a ½ mile of the proposed site (CNDDB, 2017; Figure 4). In addition, a deceased SFGS that had been run over was recently observed on Cloverdale Road approximately 2 miles south of the proposed project site (County staff observation). SFGS are likely to use the drainage ditch adjacent to Cloverdale Road, approximately 50 feet from the proposed project site, for foraging and dispersal habitat. In addition, SFGS are likely to utilize small mammal burrows in the surrounding agricultural lands and upland coastal scrub area as foraging and hibernating habitat. As a result, SFGS are expected to occur within the study area and in the absence of appropriate avoidance and minimization measures could be impacted by the construction and operation of a new fire station.

San Francisco Dusky-footed Woodrat (SFDW)

The SFDW, a subspecies of the dusky-footed woodrat, is a medium-sized rodent listed as a California Species of Special Concern (SSC) by the CDFW. Woodrats are mostly nocturnal and occupy stick houses up to eight feet tall. Their nests occur within the stick houses, and their breeding season extends from December to September (Zeiner, D.C. et. al., 1988-1990). SFDW is widely distributed in San Mateo County and is expected to occur in the coastal scrub and riparian habitats within the vicinity of the proposed site.

There are no CNDDB records for SFDW within a ½ mile radius of the proposed site (CNDDB, 2017; Figure 4). However, there is suitable habitat for SFDW and an SFDW nest was observed approximately 800 feet west of the site in the riparian habitat adjacent to the drainage ditch along Cloverdale Road. Suitable riparian habitat also occurs approximately 1,000 feet to the northeast along Pescadero Creek. As a result, SFDW are expected to occur in the vicinity. However, impacts to this species from the construction and operation of a new fire station are not anticipated.

Western Pond Turtle (WPT)

WPT is listed as a California SSC by the CDFW. WPT occur in a variety of habitats near permanent or semi-permanent water sources including ponds, lakes, streams, irrigation ditches and permanent pools along intermittent streams. WPT require basking sites such as partially submerged logs, rocks, or mats of floating vegetation. WPT dive underwater from basking sites to avoid humans and predators. WPT breeding season extends from March through August. Females tend to seek out open areas with sparse, low vegetation (annual grasses and herbs), low slope angle, and dry hard soil for nest sites (Zeiner, et. al., 1990). WPT could utilize the aquatic habitats in the vicinity of the sites for foraging, basking, and mating. There are no CNDDB records for WPT in the San Gregorio USGS quadrangle (CNDDB, 2017).

There are no CNDDB records for WPT within two miles of the proposed site (CNDDB, 2017; Figure 4). WPT could potentially utilize ponds on private property approximately ½ mile southwest of the site as foraging, breeding, and basking habitat. WPT were not observed during a site survey on June 10, 2016. Consequently, impacts to WPT from construction and operation of a new fire station are not anticipated.

Saltmarsh Common Yellowthroat

The saltmarsh common yellowthroat is listed as a California SSC by the CDFW. Saltmarsh common yellowthroats typically breed in freshwater marsh, brackish marsh, and wooded swamp habitat and winter in salt marsh habitat (Cornell, 2016). The CNDDB does not contain any known occurrences of saltmarsh common yellowthroat within a ½ mile radius of the proposed site (CNDDB, 2017; Figure 4). There is no suitable habitat present within the study area, and saltmarsh common yellowthroats were

not observed during the June 10, 2016 site assessment. Consequently, impacts to saltmarsh common yellowthroats from the construction and operation of a new fire station are not anticipated.

White-Tailed Kite

The white-tailed kite is listed as a Fully Protected Species by the CDFW. The white-tailed kite ranges over large areas and forages on small rodents within annual grasslands, open woodlands, and cultivated fields (Cornell, 2016).

The CNDDB does not contain any known occurrences of white-tailed kites within a ½ mile radius of the proposed site (CNDDB, 2017; Figure 4). However, white-tailed kites have been previously observed in the Pescadero vicinity by County staff. White-tailed kites could forage in the agricultural land immediately adjacent to the study area and potential nesting habitat occurs in the riparian habitat along Pescadero Creek approximately 1,000 feet northeast of the site. However, impacts to white-tailed kite from the construction and operation of a new fire station are not anticipated.

Yellow Warbler

The yellow warbler is listed as a California SSC by the CDFW. The yellow warbler is a seasonal resident of California, typically April through October, and breeds in coastal riparian woodlands and wetlands (Cornell, 2016).

The CNDDB does not report any occurrences of yellow warblers within a ½ mile radius of the proposed site (CNDDB, 2017; Figure 4). Suitable habitat for yellow warblers may be present approximately 1,000 feet northeast of the site in riparian habitat along Pescadero Creek. However, yellow warblers were not observed during the site survey on June 10, 2016, and impacts to yellow warblers from the construction and operation of a new fire station are not anticipated.

Choris' Popcorn-Flower

The CNPS lists Choris's popcorn-flower as a 1B species, meaning that it is rare, threatened, or endangered in California and elsewhere. Choris's popcorn-flower is typically found in chaparral, coastal scrub, and coastal prairie habitat (CNPS, 2016).

Suitable habitat for Choris' popcorn-flower may exist approximately 50 feet from the proposed site along the banks of the drainage ditch adjacent to Cloverdale Road, and outside of the study area within adjacent coastal scrub habitat. The site was surveyed on June 10, 2016, during the appropriate blooming period for this species and Choris's popcorn-flower was not detected. It is unlikely that this species will be impacted by the construction and operation of a new fire station.

Coastal Marsh Milk Vetch

The CNPS lists coastal marsh milk-vetch as a 1B species, meaning that it is rare, threatened, or endangered in California and elsewhere. Coastal marsh milk-vetch is typically found within coastal salt

marshes, swamps, streamsides, coastal dunes, and coastal scrub habitat (CNPS, 2008). Coastal marsh milk vetch is commonly found in wetland and marsh areas, or in coastal scrub habitats adjacent to those areas (Calflora, 2016).

Coastal marsh milk-vetch has not been documented within a ½ mile radius of the proposed site (CNDDB, 2017; Figure 4). There is potential suitable habitat for coastal marsh milk vetch in the drainage ditch adjacent to Cloverdale Road approximately 50 feet from the proposed site. However, this species was not observed during the June 2016 site assessment, which was within the appropriate blooming period. It is unlikely that this species will be impacted by construction or operation of a new fire station.

Conclusions and Recommendations

Based on the results of the June 10, 2016 site assessment, the proposed site contains low quality habitat for special-status species based on the level of development and human disturbance. There is high quality habitat for special-status species within the 250-foot buffer that was assessed as part of the study area. The site is bound by a school to the east, cultivated fields to the north and south, and privately owned agricultural land to the west (Figure 5).Theses recommendations are based on past experience working with the various regulatory agencies (i.e. USFWS, US Army Corps Engineers (USACE), CDFW) and include general avoidance and minimization measures to protect biological resources.

Aquatic and Semi-Aquatic Species

CRLF, SFGS and WPT could occur in aquatic and coastal scrub habitats adjacent to the locations. The site provides low quality dispersal habitat for these species because of the lack of vegetative cover and human activity. However, high quality habitat for all three species exists in close proximity to the site. CRLF and SFGS could utilize small mammal burrows occurring on the sites to locate prey or find cover. SFGS may bask in open areas within the adjacent coastal scrub habitat. Consequently, all three species could potentially move through the site while foraging or dispersing from breeding sites. Expansion of the project footprint into adjacent wetland or coastal scrub habitats could directly impact these species. In addition, the proposed location falls within the Coastal Zone, and as such, is subject to the requirements of the San Mateo County Local Coastal Program (LCP), which prohibits impacts to wetlands. Wetlands that may provide habitat for all three species occurs within the drainage ditch adjacent to Cloverdale Road. Due to the close proximity, there is potential for impacts to wetland habitat, and expansion into these areas would likely be prohibited.

The LCP policies specify that all outdoor lighting be kept at a distance away from a wetland sufficient not to affect the wildlife. The LCP defines wetlands as an area where the water table is at, near, or above the land surface long enough to bring about the formation of hydric soils or to support the growth of plants which normally are found to grow in water or wet ground. Such wetlands can include mudflats, marshes, and swamps, and may include wetlands found along streams (riparian). The sensitive habitats occurring within the study area include the drainage ditch adjacent to Cloverdale Road, characterized as wetland habitat, and Pescadero Creek, characterized as riparian habitat (Figure 3).

There is nothing in the CRLF Recovery plan concerning impacts to frogs from artificial lighting. However, impacts to individuals could include affects to the physiology and behavior of animals, leading to ecological consequences at the population, community, and ecosystem levels. Aquatic ecosystems may be particularly vulnerable to such effects, and nocturnally breeding animals such as frogs may be especially affected (Baker, 2006). An increase in artificial lighting on the sensitive habitats near the proposed site could potentially have an adverse effect on CRLF behavior. However, with the implementation of the lighting modifications described below in the Avoidance and Minimization section, these potential adverse effects would be reduced or eliminated to the extent that the additional artificial lighting would have a negligible impact on CRLF.

The operation of a new fire station at this location would result in increased noise levels in the vicinity. Increased noise levels can adversely affect the physiology and behavior of animals, potentially leading to ecological consequences at the population, community, and ecosystem levels. The existing County fire station is located on Pescadero Creek Road adjacent to Butano Creek. The County recently conducted a sediment removal project in Butano Creek and observed a thriving CRLF population, serving as evidence that the fire station operation has not negatively affected the CRLF population in Butano Creek. Furthermore, the existing high school produces elevated noise levels when students are present. Based on this anecdotal evidence, the County does not anticipate the operation of a new fire station at the proposed site to result in adverse effects to the CRLF population in the vicinity.

Rare Plant Species

Suitable habitat (coastal scrub) for coastal marsh milk vetch and Choris' popcorn-flower does not exist at the proposed site, and these species were not observed during the June 2016 site assessment, which was within the appropriate blooming period. Coastal marsh milk vetch and Choris' popcorn-flower are not likely to be affected by construction of the fire station at this location. However, suitable habitat for these species does occur adjacent to the site. If the project footprint extends into coastal scrub or wetland habitat, there is potential for impacts to these species.

Listed Bird Species

Suitable nesting and foraging habitat for San Francisco common yellowthroats, white-tailed kites, yellow warblers exist in close proximity to the proposed site, but outside of the study area. If the project footprint extends into riparian, coastal scrub, and wetland/marsh habitats there is potential for impacts to these species.

SFDW

Suitable habitat (riparian) for SFDW occurs outside of the study area, in close proximity the proposed site. If the project footprint were to be extended into riparian habitat there is potential for impacts to this species.

Avoidance, Minimization and Conservation Measures

A majority of the site is currently disturbed and does not contain wetlands or high quality special-status species habitat. While construction of the new fire station would not result in direct impacts to sensitive habitats, in the absence of avoidance and minimization measures, there is a potential for impacts to CRLF and SFGS given the presence of existing wetland habitat within 50 feet and riparian habitat within 1,000 feet of the site.

Example avoidance and minimization measures that are likely to be required include: buffers around existing coastal scrub and wetland habitat; exclusionary fencing with one way exit funnels; pre-construction surveys and biological monitoring during construction; environmental training for construction personnel; and project construction scheduled during the dry season.

Recommended Avoidance and Minimization Measure to Protect Biological Resources:

1. Staging, access, and parking areas will be located outside of sensitive habitats to the extent feasible.

2. Areas of disturbance will be limited to the smallest footprint necessary.

3. Following the completion of all Project activities in a given year, temporary access and staging areas will be restored to pre-Project contours, and will be seeded with a native seed mix appropriate for the site.

4. All equipment will be maintained free of petroleum leaks. All vehicles will be inspected daily for leaks and, if necessary, repaired before leaving the staging area. Inspections will be documented in a record that is available for review on request.

5. No fueling will be performed within 50 ft of wetland or aquatic habitats unless equipment stationed in these locations is not readily relocated. For stationary equipment that must be fueled on site, such as sump pumps, containment will be provided in such a manner that any accidental spill of fuel will not be able to enter wetland or aquatic habitats or contaminate sediments that may come in contact with water.

6. A hazardous materials management/fuel spill containment plan will be developed and implemented by the Project contractor and given to all contractors and biological monitors working on the Project, with at least one copy of the plan located onsite at all times. The purpose of the plan is to provide onsite Project managers, environmental compliance monitors, and regulatory agencies with a detailed description of hazardous materials management, spill prevention, and spill response/cleanup measures associated with the implementation of the Project elements. Elements of the plan may include, but are not limited to the following:

    a. A discussion of hazardous materials and fuels management, including delineation of refueling areas, access and egress routes, waterways, and temporary storage areas,

    b. Materials Safety Data Sheets for all chemicals used and stored on site,

c. An inventory list of emergency equipment,

d. Spill control and countermeasures including employee spill prevention/response training, and

e. Notification and documentation procedures.

7. Vehicles will be washed off-site. No washing of vehicles will occur at Project sites.

8. A sediment fence or other sediment-control device will be installed around stockpiled soil material to prevent runoff from transporting sediment into sensitive habitats.

9. The work site, areas adjacent to the work site, and access areas will be maintained in an orderly condition, free and clear from debris and discarded materials. Personnel will not sweep, grade, or flush surplus materials, rubbish, debris, or dust onto adjacent areas or waterways. Upon completion of work, all materials and equipment involved in sediment removal will be removed from the Project site.

10. Suitable erosion control, sediment control, source control, treatment control, material management, and non-stormwater management best management practices will be implemented consistent with the latest edition of the California Stormwater Quality Association "Stormwater Best Management Practices Handbook," available at www.capmphandbooks.com.

11. For each activity, all Project personnel will participate in a worker environmental awareness program. Under this program, Project personnel will be informed about the presence of listed species and habitats associated with the species and that unlawful take of the animal or destruction of its habitat is a violation of Federal Endangered Species Act (FESA). Prior to Project activities, a qualified biologist approved by USFWS will instruct all Project personnel about (1) the description and status of the species; (2) the importance of their associated habitats; and (3) a list of measures being taken to reduce impacts on these species during Project implementation. A fact sheet conveying this information will be prepared for distribution to the Project crew and anyone else who enters the Project site. A member of the Project crew will be appointed and identified during the environmental awareness program who will be the point of contact for any employee or contractor who might encounter a listed species. The representative's name and telephone number will be provided to USFWS and NMFS prior to the initiation of any activities.

12. No firearms (except for federal, State, or local law enforcement officers and security personnel) will be permitted at the Project site to avoid harassment, killing or injuring of wildlife.

13. No animals (e.g., dogs or cats) can be brought to the Project site to avoid harassment, killing or injuring of wildlife.

14. A designated work areas will be clearly identified in the field, such as with stakes, flagging, or fencing, and work will not be conducted outside this area.

15. In order to minimize the spread of invasive or undesirable plants, animals, or pathogens, all equipment (including personal gear) will be cleaned and adequately decontaminated prior to arriving on the Project site.

16. The Project site will be maintained trash-free, and food refuse will be contained in secure bins and removed daily during Project implementation.

17. A USFWS approved biological monitor will be present during all work activities in or immediately adjacent to habitat that could be occupied by federally listed species to look for individuals that may be impacted by Project implementation; activities are considered "immediately adjacent" to sensitive habitat if those activities could result in the physical disturbance of the habitat (e.g., as a result of mobilization of sediment into the habitat) or if individual listed species could move from that habitat into the Project site (e.g., seeking refuge under Project equipment). The biologist will have stop-work authority if any individual of a federally listed species is detected in an area where it may be injured or killed by Project activities.

18. Prior to pre-activity surveys, the Project shall enclose the project area with a 3-foot-high silt fence or similar material, of which approximately 6 inches is buried underground, that will remain in place during work in order to prevent CRLF and SFGS from entering the impact area. Escape ramps, funnels, or other features that allow animals to exit the work area, but which will prohibit the entry of such animals, shall be provided in the exclusion fencing. A qualified biologist shall conduct a pre-activity survey of the fence installation area immediately prior to (i.e., the day of) the commencement of installation and shall be on-hand to monitor fence installation. The exclusion fencing shall be inspected daily by Project personnel and maintained for the duration of Project implementation. Such fencing may not be feasible for all work areas. In such situations, the biologist shall conduct a pre-activity survey as described below and determine, in consultation with the USFWS, whether monitoring or other measures are preferable in lieu of exclusion fencing.

19. No more than twenty-four (24) hours prior to the date of initial ground disturbance, a pre-activity survey for the CRLF and SFGS will be conducted by a USFWS-approved biologist at the Project site. The survey will consist of walking the Project limits and within the Project site to ascertain the possible presence of the species. The USFWS-approved biologist will investigate all potential areas that could be used by the CRLF for feeding, breeding, sheltering, movement, and other essential behaviors. This includes an adequate examination of mammal burrows, such as those of California ground squirrels (*Spermophilus beecheyi*) or gophers (*Thomomys bottae*). If any adults, subadults, juveniles, tadpoles, or eggs are found, the USFWS-approved biologist will contact the USFWS to determine if moving any of the individuals is appropriate. If the USFWS approves moving CRLF, the biologist and USFWS will identify a suitable relocation site, and the USFWS-approved biologist must be given sufficient time to move the animals from the work site before ground disturbance is initiated. Only USFWS-approved biologists will capture, handle, and monitor the CRLF.

22. If a SFGS is observed within the Project work area, either during this survey or at any time, Project activities that could potentially harm the individual shall be stopped immediately. The biologist (or a member of the Project crew, if the biologist is not on-site) will watch the individual until it has moved out of the work area. No individuals of this species will be relocated without explicit USFWS approval; however, if the snake will not leave the area on its own, the biologist will contact the USFWS to determine if moving any of the individuals is appropriate. If the USFWS approves moving animals, the biologist and USFWS will identify a suitable relocation site, and the USFWS-approved biologist must be given sufficient time to move the animals from the work site before ground disturbance is initiated.

23. Pipes, conduits and other Project materials could provide shelter for CRLF and SFGS. Therefore, all pipes, conduits, or similar structures that are stored at the site for one or more overnight periods will be either stored on an open-top trailer to elevate the materials above ground, securely capped prior to storage, or thoroughly inspected by the USFWS-approved biologist before the pipe is buried, capped, or otherwise used or moved.

24. To the maximum extent practicable, no Project activities will occur during wet weather or within 24-hours following a rain event. Wet weather for this purpose is defined as when there is more than 30% chance of rain (¼ inch of rain in a 24-hour period) in the 72-hour forecast. Prior to Project activities resuming, a USFWS-approved biologist will inspect the action area and all equipment/materials for the presence of CRLF. The animals will be allowed to move away from the Project site of their own volition or moved by the USFWS-approved biologist.

25. To the maximum extent practicable, night-time Project activities will be minimized or avoided by the applicant. Because dusk and dawn are often the times when the CRLF is most actively moving and foraging, to the maximum extent practicable, earthmoving and other Project activities will cease no less than 30 minutes before sunset and will not begin again prior to no less than 30 minutes after sunrise. Except when necessary for driver or pedestrian safety, to the maximum extent practicable, artificial lighting at a Project site will be prohibited during the hours of darkness.

26. Plastic monofilament netting (erosion control matting), loosely woven netting, or similar material in any form will not be used at the Project site because CRLF and SFGS can become entangled and trapped in them. Any such material found on site will be immediately removed by the USFWS-approved biologist, Project personnel, or the applicant. Materials utilizing fixed weaves (strands cannot move), polypropylene, polymer or other synthetic materials will not be used.

27. Pits one (1) foot or deeper that are going to be left unfilled for more than forty-eight (48) hours will be securely covered with boards or other material to prevent the CRLF and SFGS from falling into them. If this is not possible, the applicant will ensure wooden ramps or other structures of suitable surface that provide adequate footing for the CRLF are placed in the pit to allow for their unaided escape. The USFWS-approved biologist will inspect the pits prior to their being

filled to ensure there are no CRLF in them. The pit also will be examined by the USFWS-approved biologist each workday morning at least one hour prior to initiation of work and in the late afternoon no more than one hour after work has ceased to ascertain whether any individuals have become trapped. If the escape ramps fail to allow the animal to escape, the USFWS-approved biologist will remove and transport it to a safe location, or contact the USFWS for guidance.

Standard approach for minimizing lighting impacts on sensitive habitats:

The most critical element of light management is the selection of the lighting alternative that most effectively reduces the potential for impacts to sensitive species while accommodating lighting needs for public safety.

1) Keep lights out of wetland and riparian habitat:

    a. Design or modify lights in such a manner that the light is confined to the fire station footprint and is prevented from straying into wetland or riparian habitat. This can be achieved by modifying the light broadcast properties of a fixture and/or realigning, repositioning, shielding, and/or screening light sources from habitat view.

        i. Realign the fixture – change the angle of mounting arm or rotate fixture head so the source of light is not directly visible from the sensitive habitat. This can be accomplished by altering the mounting angle of the fixture on the mounting arm so light is directed down or away from sensitive habitat. If the fixture is parallel to the roadway surface or bent at a slight angle toward the road, the potential for light reaching sensitive habitat is less than if the fixture were at an obtuse angle.

        ii. Apply a shield to a drop globe fixture.

        iii. Change an open bottom or drop globe fixture to a cutoff fixture.

        iv. Apply a shield to a cutoff fixture.

        v. Reduce the mounting height of the fixture (when practical).

        vi. Change the lamp socket position in the fixture to compress the lighting footprint.

        vii. Change to a fixture with a different type of reflector providing a more favorable lighting footprint.

        viii. Install a flat 2422 acrylic amber lens in a cutoff fixture with an High Pressure Sodium (HPS) lamp of 70-watts or less (e.g. GELS 70W M250).

        ix. Turn the light off seasonally (requires that the lighting custodian is available and can be responsive to user requests for assistance).

    b. Different species respond differently to the various properties of light (brightness, color, etc.)

c. Confine light to the area of its intended use

i. Redirect the light fixture

ii. Change a drop globe fixture to a cutoff style fixture

iii. Install a light shield (if the shield can meet the wind loading criteria for the area)

2) Reduce luminance/brightness

a. A reduction in the total luminance (combination of lamp wattage and number of fixtures) of outside lights to the minimum required for pedestrian and motorist safety and fire station personnel. This may require selectively turning off certain lights, decreasing the total number of fixtures, and/or reducing the wattage of lights closest to the riparian area.

b. Reduce the amount of light emitted to the minimum required to effectively achieve its intended purpose.

i. Reduce wattage

ii. Lower mounting height (would not meet street lighting standards for height).

3) Change spectral qualities

a. Utilization or modification of lights such that the quality (color) of light emitted is less attractive or disruptive to special status species than light from traditional sources. This method should only be used in combination with options 1 and 2, above.

i. Selectively install amber-colored filtering lenses on cutoff fixtures of 70-watts or less.

1. Amber colored lenses filter out much of the short-wavelength light emitted by HPS lamps. Unlike other types of long-pass filters (e.g. dichroic filters), the angle at which the light strikes the lens has relatively little effect on its filtering properties. Filtering lenses are appealing because they are relatively inexpensive, are easy to install and maintain, and can be applied to existing HPS fixtures.

ii. Fixtures emitting only long-wavelength (550-700 nanometers) light are particularly useful in situations where lighting is needed very close to sensitive habitats. Long-wavelength light sources require less broadcast precision than conventional light sources, because they are less likely to cause problems for sensitive species.

iii. Employ Best Available Technology (BAT) – light managers should use the best available means to minimize the potential for lighting impacts to sensitive species.

Table 1. Special-Status Species with Potential to Occur Within One-Half Mile of the Proposed Pescadero Fire Station Location

Common Name	Scientific Name	Status	General Habitat Description	Habitat Present/ Absent	Rationale
Amphibians					
California red-legged frog (CRLF)	*Rana draytonii*	T, CH	Inhabits streams, freshwater pools, and ponds with overhanging vegetation. Deep pools with emergent vegetation are required for breeding.	P	Known to occur in the vicinity (within ½ mile) of the sites (CNDDB 2016).
Western Pond Turtle (WPT)	*Actinemys marmorata*	SSC	Permanent or nearly permanent water in ponds, marshes, rivers, streams, and irrigation ditches, usually with aquatic vegetation.	P	No known occurrences within a half mile of the study area (CNDDB, 2017). The vegetated drainage ditch on Cloverdale Road approximately 50 feet west of the proposed site provides suitable foraging and dispersal habitat for this species and the adjacent coastal scrub habitat provides suitable nesting habitat.
Reptiles					
San Francisco Garter snake (SFGS)	*Thamnophis sirtalis tetrataenia*	E, FP	Occurs in freshwater marshes, ponds, and slow-moving streams where its primary prey species, CRLF, is present. Prefers dense cover and access to upland grassland habitat.	P	Known to occur in the vicinity (within ½ mile) of the site (CNDDB, 2017).
Birds					
California Least tern	*Sterna antillarum browni*	E	Nests along the coast on bare or sparsely vegetated flat substrates. Forages for fish in open waters.	A	No suitable nesting, roosting, or foraging habitat is present in any of the sites.
Marbled murrelet	*Brachyramphus marmoratus*	T	Nests in old-growth forests and forages in coastal waters.	A	No suitable nesting, roosting, or foraging habitat is present at the site.
San Francisco common yellowthroat	*Geothlypis trichas sinuosa*	E	Nests primarily in fresh and brackish marshes in tall grass, tules and willows, uses salt	P	No documented occurrences within a ½ mile of the study area (CNDDB, 2017). Suitable breeding/winter habitat occurs in the vicinity of the site, along

			marshes primarily in winter.		Pescadero Creek and in agricultural fields.
White-tailed kite	*Elanus leucurus*	FP	Coastal and valley lowlands and woodland margins, grasslands, meadows, and marshes.	P	No documented CNDDB occurrences within a ½ of the study area (CNDDB, 2017). However, white-tailed kites have been regularly observed foraging in the annual grassland and seasonal wetlands within the vicinity (H.T.Harvey, 2015; County staff observations).
Yellow warbler	*Dendroica petechia*	SSC	Typical breeding habitat is riparian. Winter in a variety of habitats including scrub, woodlands, riparian, agricultural fields, and pastures.	P	No documented occurrences within a ½ mile of the study area (CNDDB, 2017). Suitable breeding/winter habitat occurs in the vicinity of the site, along Pescadero Creek and in agricultural fields.
Mammals					
San Francisco dusky-footed woodrat (SFDW)	*Neotoma fuscipes annectens*	SSC	Nests in a variety of habitats including riparian areas, oaks, woodlands, and scrub.	P	Known to occur in the vicinity of the study areas. Suitable nesting habitat occurs north of the site along the vegetated drainage ditch on Cloverdale Road.
Pallid bat	*Antrozous pallidus*	SSC	Roosts in crevices of rocky outcrops, cliffs, caves, mines, trees, and human structures. Forages over grasslands, open pine forests, gravel roads, and orchards.	A	The closest occurrence reported in the CNDDB is from 1945 within forested habitat approximately 3 miles from the project sites (CNDDB, 2017). Suitable roosting habitat occurs north of the proposed site along Pescadero Creek, but these areas are not likely to be affected by the project.
Plants					
Coastal marsh milk-vetch	*Astragalus pycnostachyus var. pycnostachyus*	1B.2	Coastal dunes (mesic), coastal scrub, marshes and swamps, (coastal, saltmarsh edges).	A	Habitat (coastal marsh) is absent. Coastal scrub habitat occurs adjacent to the site, but is not likely to be affected by the project.
Round-leaved filaree	*California macrophylla*	1B.2	Cismontane woodland valley and foothill grasses with clay soils.	A	Habitat (heavy clay soils) absent.
Fragrant fritillary	*Fritillaria liliacea*	1B.2	Cismontane woodland, coastal prairie, coastal scrub, valley and foothill grassland/ commonly serpentine soils.	A	Habitat (serpentine soils) absent.
Perennial goldfields	*Lasthenia californica ssp. macrantha*	1B.2	Coastal bluff scrub, coastal dunes, coastal scrub.	A	Habitat absent. Coastal scrub habitat occurs adjacent to the site, but is not likely to be affected by the project.

Rose leptosiphon	*Leptosiphon rosaceus*	1B.1	Coastal bluff scrub.	A	Habitat absent.
Marsh microseris	*Microseris paludosa*	1B.2	Closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill annual and perennial grasses.		Habitat absent. Coastal scrub habitat occurs adjacent to the site, but is not likely to be affected by the project.
Choris' popcornflower	*Plagiobothrys chorisianus var. chorisianus*	1B.2	Chaparral, coastal prairie, coastal scrub/mesic.	A/P	Habitat absent. Coastal scrub habitat occurs within the study area adjacent to the site, but is not likely to be affected by the project.

Key to Table 1 Abbreviations:
Absent (A) - no habitat present or site is outside of species' range. No further discussion warranted.
Present (P)- habitat present and species may be present
Federally Endangered (FE), Federally Threatened (FT) , State Endangered (SE), State Threatened (ST), Fully Protected (FP),
Species of Special Concern (SSC), Critical Habitat (CH)
CNPS Rare Plant Rank- 1B.2- Plants endangered in California and elsewhere

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Photos

Photo 1. Paved parking lot of Pescadero High School at Site D, facing west.

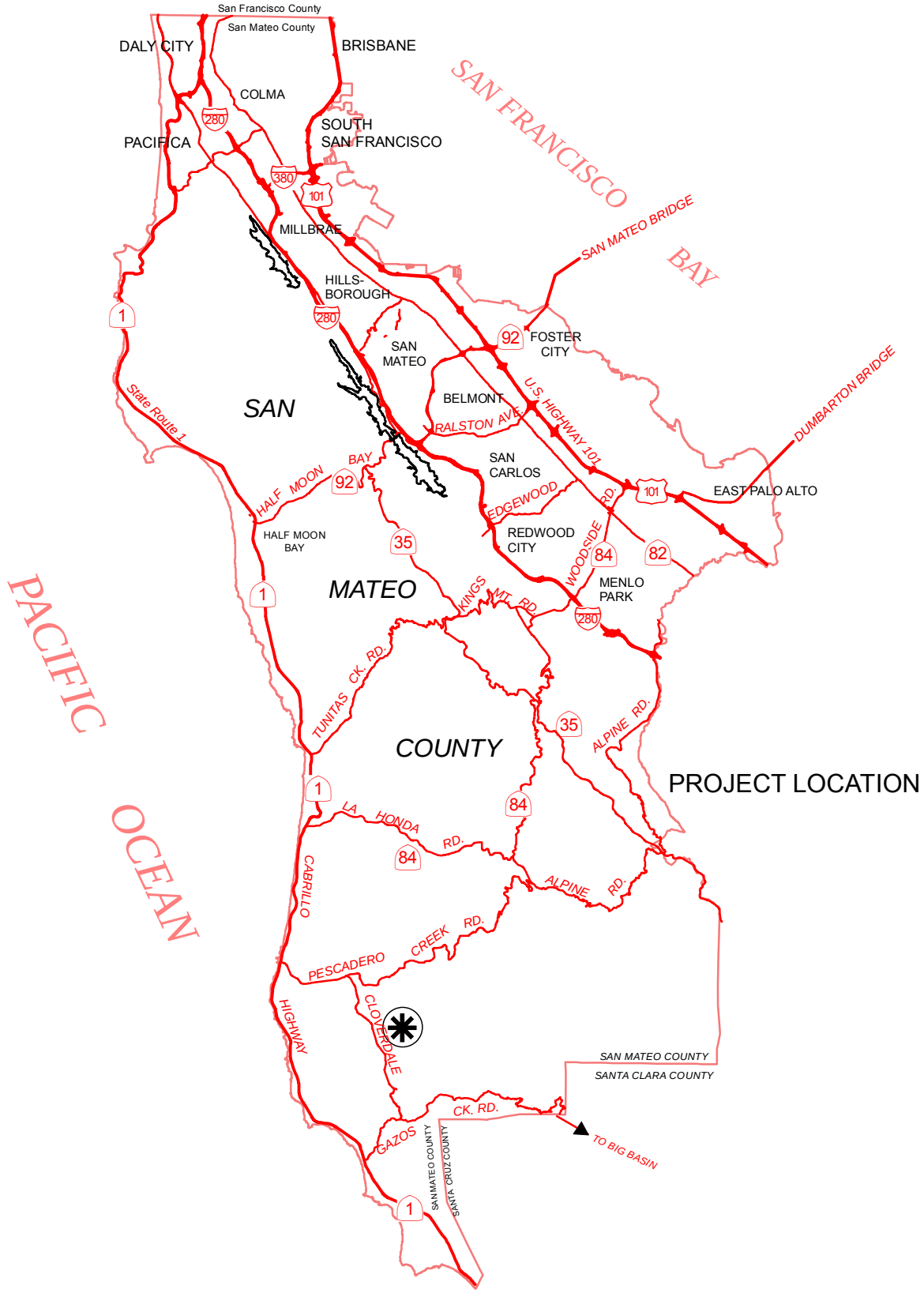
Photo 2. Pescadero High School and parking lot at Site D pictured, looking north at from Butano Cutoff.

Photo 3. Site D, looking west at fallow agricultural field adjacent to Pescadero High School parking lot.

Photo 4. Existing conditions at Site D, looking south from the corner of Butano cutoff and Cloverdale Road.

Photo 5. Vegetated drainage ditch and adjacent coastal scrub habitat pictured, facing west at the corner of Butano Cutoff and Cloverdale Road.

Photo 6. Vegetated drainage ditch located approximately 50 feet west of Site D, facing north from the corner of Cloverdale Road and Butano Cutoff.

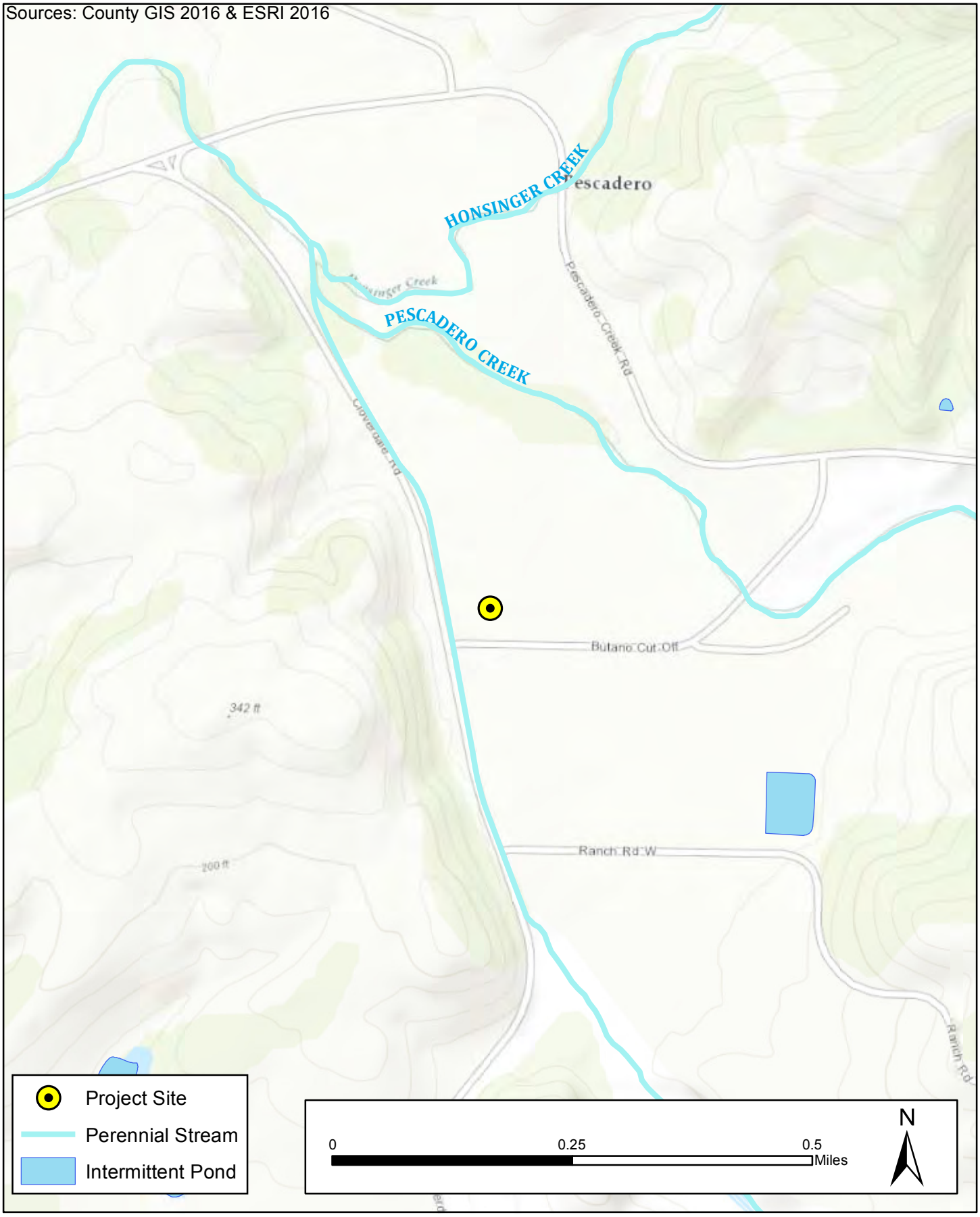


Document Path: G:\Users\utility\watershed_protection\PERMITS\WPS2016-013 Pescadero Fire Station

DESIGNED BY:	PESCADERO FIRE STATION SITING ANALYSIS UNINCORPORATED SAN MATEO COUNTY VICINITY MAP	SCALE: NONE
CHECKED BY: JC		DATE: MARCH 2017
DRAWN BY: TE		FILE NO: 1/XXXX

JAMES C. PORTER, DIRECTOR OF PUBLIC WORKS
SAN MATEO COUNTY

555 COUNTY CENTER, 5TH FLOOR
REDWOOD CITY, CALIFORNIA 94063-1665



COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

Figure 2. Location Map
Pescadero Fire Station Siting Analysis

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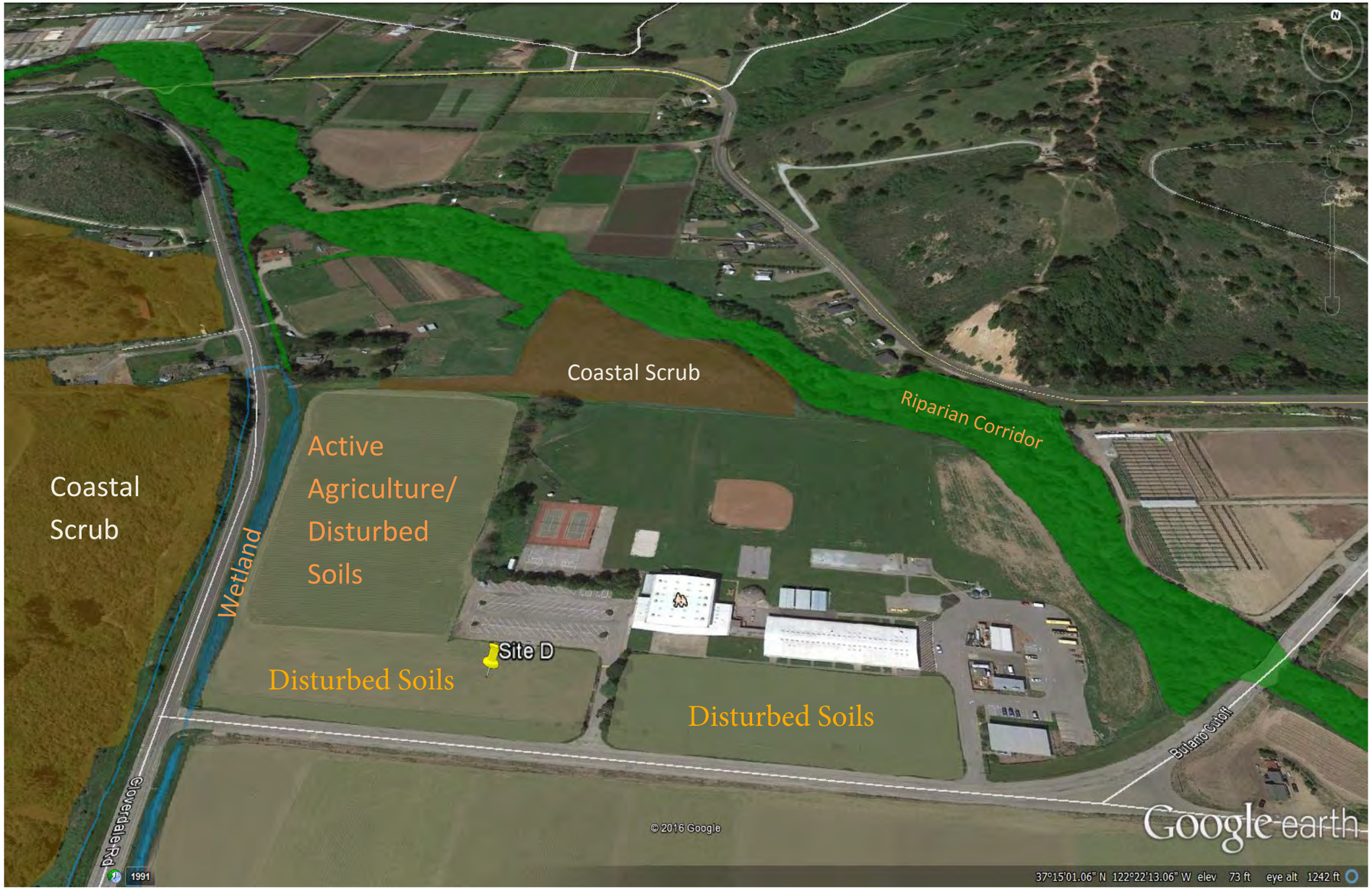


Generalized Habitat Types

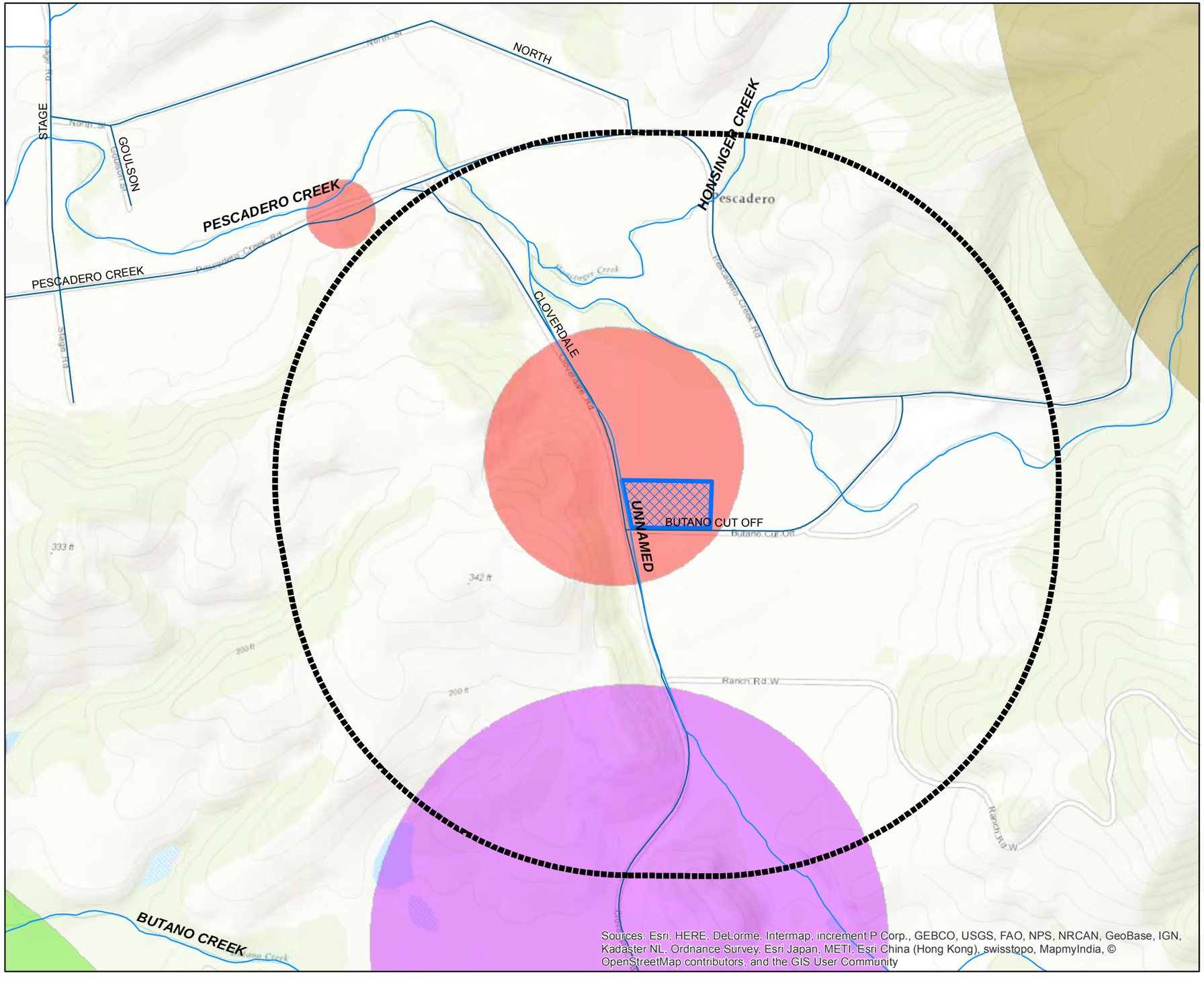
- Riparian Habitat
- Wetland Habitat
- Coastal Scrub Habitat
- Active Agriculture/ Disturbed Soils

N

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

Figure 3. General Habitat Types in the vicinity of Pescadero High School.

Figure 4. California Diversity Database Map - Pescadero Fire Station Siting Analysis



Legend

- Site D
- 1/2 Mile Buffer
- California red-legged frog
- San Francisco garter snake
- Townsend's big-eared bat
- coastal marsh milk-vetch

N
W E
S

0 0.125 0.25 0.5 Miles

Figure 5c. California Natural Diversity Database Map- Site D

COUNTY OF SAN MATEO
DEPARTMENT OF PUBLIC WORKS

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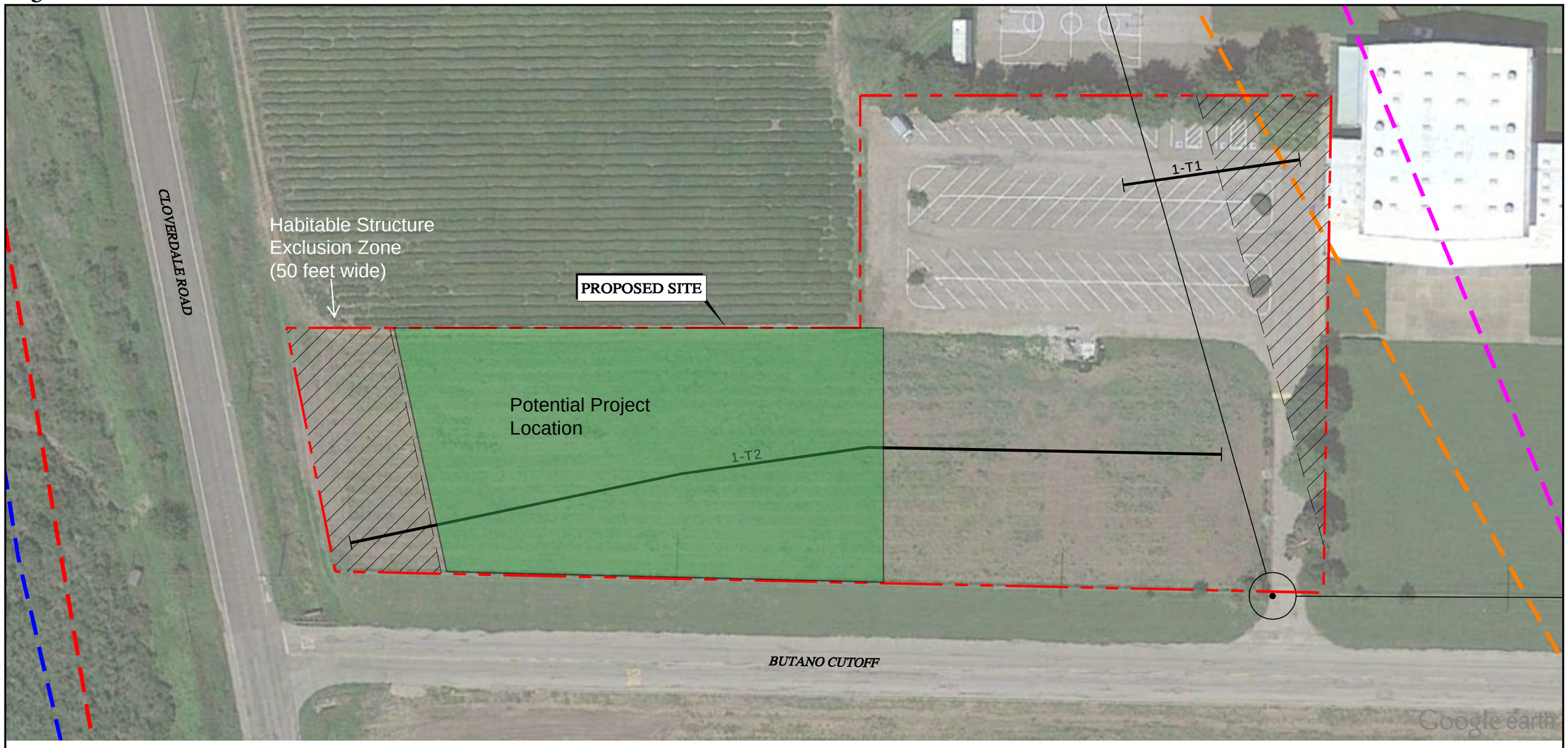
Figure 5. Site Plan



EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- U.S.G.S QFFD
- FAULT (BRABB, GRAYMER, & JONES, 2000)
- FAULT (STATE OF CALIFORNIA SPECIAL STUDIES ZONES, 1982)
- FAULT (BRABB, GRAYMER, & JONES, 1998)
- EARTHQUAKE FAULT ZONE LIMIT
- 1-T2 FAULT TRENCH (ENGEO, 2016)
- PROPOSED HABITABLE STRUCTURE EXCLUSION ZONE

N

0 FEET 60
0 METERS 30

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE

ENGEO Expect Excellence

SITE PLAN
PESCADERO FIRE STATION
PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001
SCALE: AS SHOWN
DRAWN BY: DLB CHECKED BY: RHB

FIGURE NO. 2

ORIGINAL FIGURE PRINTED IN COLOR

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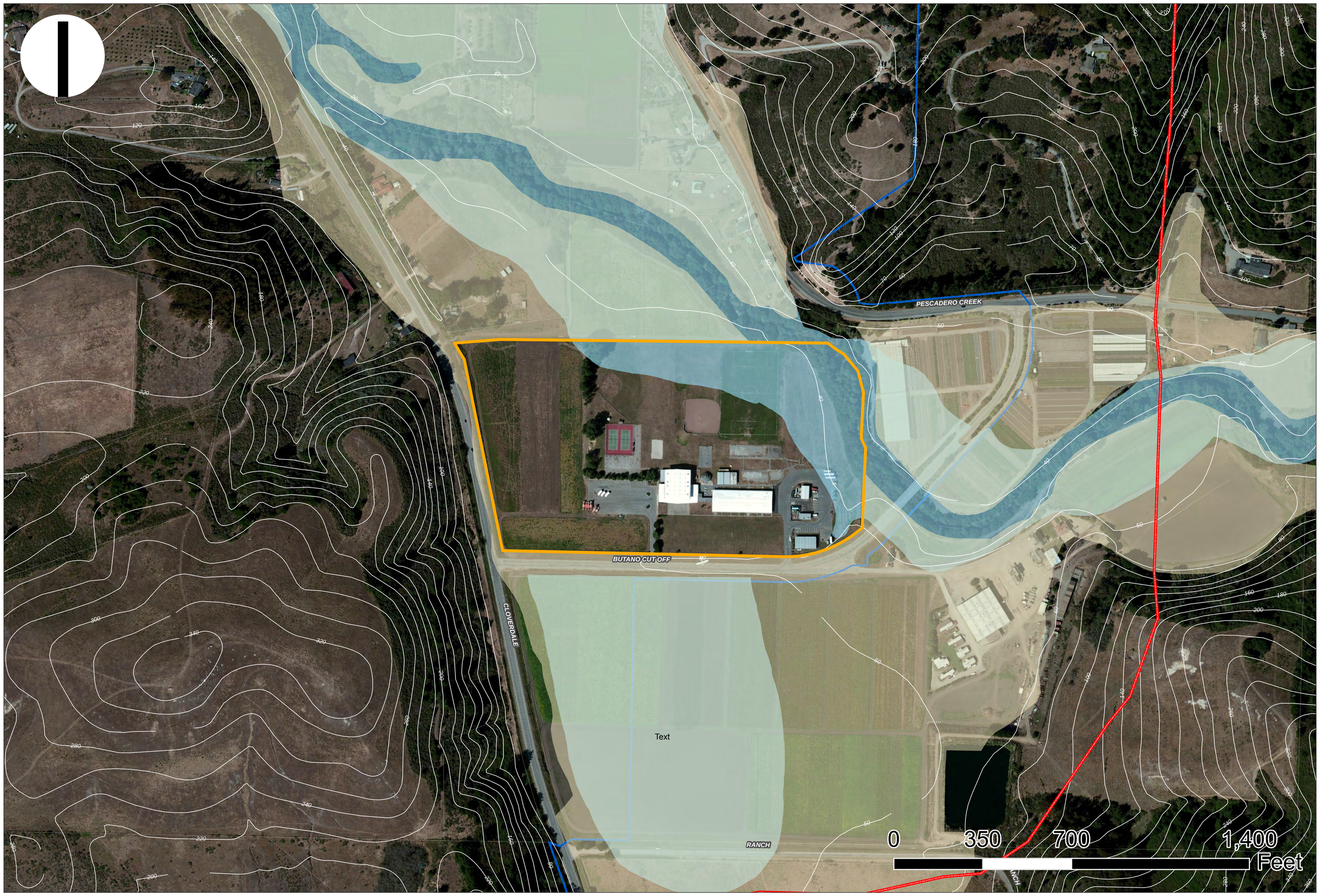
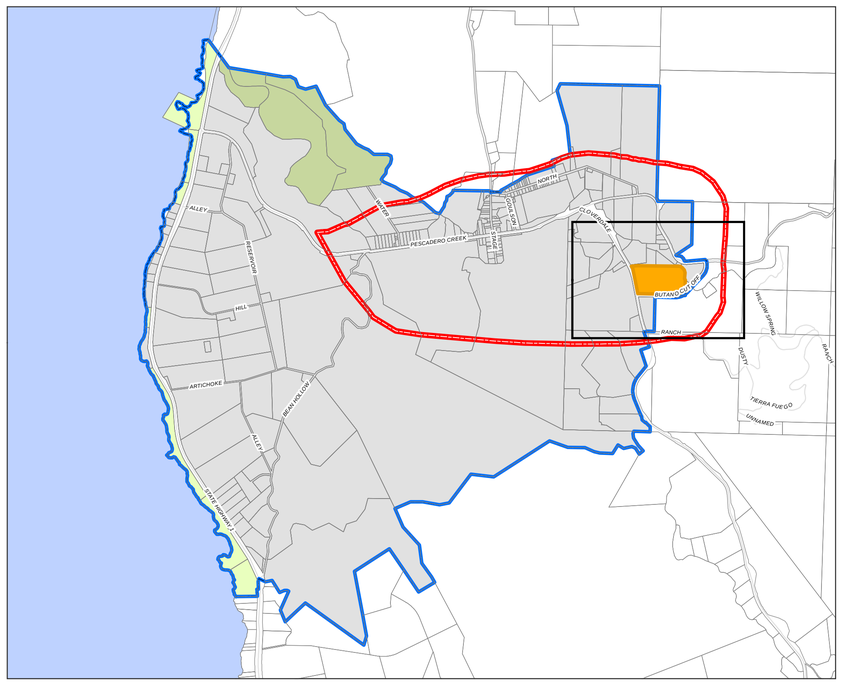
FIGURE 6. FEMA 100 -YEAR FLOOD ZONE





PESCADERO COMMUNITY MAP

Note: Matrix data based on fire station minimum site criteria, San Mateo County Planning Department Geographic Information System data, Local Coastal Program Policy, and site inspections conducted by the Steering Committee.

This product is for informational purposes and may not have been prepared for, or be suitable for legal, enginnering, or surveying purposes. Users of this information should review or consult the primary data and information sources to ascertain the usability of the information.

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LEGEND

- SUBJECT PARCEL
- CALFIRE RESPONSE AREA
- TSUNAMI INUNDATION ZONE
- PRIME SOILS (CLASS I, II, III)
- FEMA FLOOD ZONES (A, AE, AE w/ FLOODWAY)
- PESCADERO
- COUNTY PARCELS

Indicates criteria is not met, has a high probabilty of occurring on the parcel, or may have significant/unavoidable impacts

Indicats criteria may be met however impacts are likely to occur

Indicates criteria may be met or where impacts may be minimized through siting of development

Indicates criteria is met, has a low probability of occurring on the parcel, or may result in minimal impacts

[1] ***Federal Emergency Management Agency (FEMA) Flood Insurance Rate Map (FIRM) Definitions:***

Zone X:

Area of minimal flood hazard; area determinted to be outside the 500-year flood. Flood insurance is not required.

Zone A:

Areas with a 1% annual chance of flooding and a 26% chance of flooding over the life of a 30-year mortgage. Because detailed analysis are not performed for such area; no depths or base flood elevations are shown. Mandatory flood insurance is required.

Zone AE:

The base floodplain where base flood elevations are provided. Mandatory flood insurance is required.

[2] ***CEQA = California Environmental Quality Act.***

PROPERTY DETAILS	
Site #	D
Property	350 Butano Cut Off
Site Identifying Name	**High School**
APN	087-053-010
Gross Parcel Acreage (Assessor's Data)	28.61
Acreage	28.61, A portion located on the northwest corner
Owner	La Honda- Pescadero Union High School District
Zoning	RM-CZ/CD
Local Coastal Program Land Use Designation	Agriculture and Institutional
Existing Water Source	Small well for school.

AGENCY CRITERIA / DEVELOPMENT AND LAND USE POLICY ISSUES		
County Fire Minimum 1-3 Acre Site Available		Yes
Safe Access for Engines		Yes
Within County Fire Response Circle		Yes
Slopes in excess of 20% (County mapped contours)		Less than 20%
Mapped Flood Zones[1]		Partial Majority within Zone X; Rear Ag. and play fields within Zone X (0.2%), Zone AE and Zone AE with Floodway
Tsunami Zone		No
Sensitive Habitat/ Riparian Corridor		Yes (drainage along Cloverdale Road, Pescadero Creek)
Mapped Prime Soils		None mapped However, Ag. field likely meets LCP Prime Soils definition; Class I Prime Soils are mapped along Cloverdale Rd. and
Septic		Potential shallow groundwater, setbacks from drainages

PROCESS	
Land Use Requirements[2]	Local Coastal Program amendment (voter approval required); CSA 11 water service extension (LAFCo approval required); Rezoning; Coastal Development Permit, CEQA

County of San Mateo - Planning and Building Department

ATTACHMENT F

FAULT EVALUATION REPORT

PROPOSED FIRE STATION (APN 087-053-010)
360 BUTANO CUTOFF
PESCADERO, CALIFORNIA

Submitted to:
Ms. Theresa Yee
County of San Mateo
555 County Center, 5th Floor
Redwood City, CA 94063

Prepared by:
ENGEO Incorporated

July 21, 2016

Project No:
11780.000.001

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Project No.
11780.000.001

July 21, 2016

Ms. Theresa Yee
County of San Mateo
555 County Center, 5th Floor
Redwood City, CA 94063

Subject: Proposed Fire Station (APN 087-053-010)
360 Butano Cutoff
Pescadero, California

FAULT EVALUATION REPORT

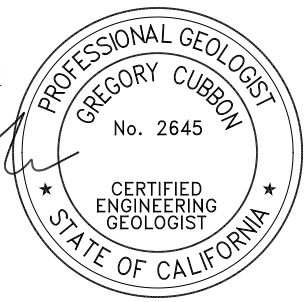
Dear Ms. Yee:

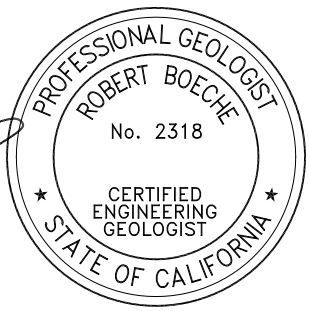
With your authorization, we prepared this report describing the results of our fault exploration for a proposed fire station to be potentially located at a portion of the existing Pescadero High School (APN 087-053-010) located at 360 Butano Cutoff in Pescadero, California. The accompanying report presents the findings of our exploration and our conclusions and recommendations regarding potential fault hazards at the site.

Evidence of faulting was not encountered in the fault trenches excavated at the site. In our opinion, hazards associated with fault rupture at the site can be mitigated by implementation of the fault setback recommendations provided in this report. Additional design-level exploration services will be required in the future in order to present grading, drainage, and foundation design recommendations. We are pleased to have been of service to you on this project and are prepared to consult further with you and your design team as the project progresses.

Sincerely,

ENGEO Incorporated





Greg Cubbon, CEG
gc/rhb/bvv

Robert H. Boeche, CEG

TABLE OF CONTENTS

1.0 INTRODUCTION

1.1 PURPOSE AND SCOPE

The purpose of this study was to evaluate the potential for surface fault rupture along a portion of the Coastways section of the San Gregorio fault at the subject site as identified on the Alquist-Priolo Earthquake Fault Zone map for the Franklin Point Quadrangle (1982). Our scope of work included the following:

- Review of publicly available regional geologic maps.
- Review of the California Geological Survey (CGS) Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle and supporting documentation provided in the California Geological Survey (CGS) Fault Evaluation Report and United States Geological Survey (USGS) Quaternary Fault and Fold Database (QFFD) for the San Gregorio Fault.
- Review of single and stereo-paired historic aerial images flown between 1958 and 2002, and available historic topographic maps.
- Excavation and logging of two trenches at the site.
- Soil profile dating by Soil Tectonics, Inc.
- Preparation of this report.

The documents and maps reviewed for this study are described in the References. The results of the Soil Tectonics soil profile analysis are summarized in Appendix A.

This report was prepared for the exclusive use of our client and their consultants. In the event that any changes are made in the character, design or layout of the development, we must be contacted to review the conclusions and recommendations contained in this report to determine whether modifications are necessary.

1.2 ALQUIST-PRIOLO EARTHQUAKE FAULT ZONE ACT

The Alquist-Priolo program requires the State Geologist, via the CGS to establish regulatory zones around fault traces that are considered active and sufficiently well defined to create the potential for surface fault rupture hazards to structures. A fault trace is considered “active” if it is judged to have had identifiable surface rupture during the Holocene (defined by the CGS as the last 11,000 years). The State requires geological investigations prior to construction of new structures within Earthquake Fault hazard zones as described in CGS Special Publication 42 and Note 49. The policies and criteria of the State Mining and Geology Board with reference to the Alquist-Priolo Earthquake Fault Zoning Act are described in CGS Special Publication 42, Specific Criteria that include:

Appendix B Section 3603 (a): No structure for human occupancy, identified as a project under Section 2621.6 of the Act, shall be permitted to be placed across the trace of an active fault. Furthermore, as the area within fifty (50) feet of such active faults shall be presumed to be underlain by active branches of that fault unless proven otherwise by an appropriate geologic investigation and report prepared as specified in Section 3603(d) of this subchapter, no such structures shall be permitted in this area.

Appendix C Guidelines for Evaluating the Hazards of Surface Rupture: Setback distances of proposed structures from hazardous faults. The setback distance generally will depend on the quality of data and type and complexity of fault(s) encountered at the site.

1.3 PROJECT LOCATION

Based on conversations with you, it is our understanding that the proposed San Mateo County fire station may be constructed within the southwestern portion of APN 087-053-010 in Pescadero, California (Figure 1). Based on recent site visits, the northeastern portion of the proposed development area is located within a paved parking area, while the remainder of the site is located within a fallow field with low height seasonal vegetation. At the time of our site visits, it appeared as though the fallow field had been tilled recently to control weeds. The remainder of the parcel located outside of the proposed development area is occupied by both agriculture and buildings/athletic fields associated with Pescadero High School.

The current topography of the site can generally be characterized as relatively flat with a gentle slope towards the west.

1.4 PROJECT DESCRIPTION

Although no formal plans are available at this time, it is our understanding that a new fire station may be constructed at the subject site. We anticipate project development will include the construction of one to two structures, paved parking areas, and landscaping.

1.5 REGIONAL GEOLOGY

The site is located within the Coast Ranges geomorphic province of California. The Coast Ranges province is typified by a system of northwest-trending, fault-bounded mountain ranges and intervening alluviated valleys. Bedrock in the Coast Ranges consists of igneous, metamorphic, and sedimentary rocks that range in age from Jurassic to Pleistocene. The present geology of the Coast Ranges is the result of deformation and deposition along the tectonic boundary between the North American plate and the Pacific plate. Plate boundary fault movements are largely concentrated along the well-known fault zones, which in the area include the San Andreas, Calaveras, and Hayward faults, as well as other lesser-order faults.

1.6 LOCAL GEOLOGY

The site geology has been mapped by Brabb et al. (2000 and 1998, Figure 3) as underlain by Holocene age, younger (outer) alluvial fan deposits (Qyfo) consisting of unconsolidated fine sand, silt, and clayey silt.

1.7 SAN GREGORIO FAULT

The history of mapping and identification of the San Gregorio fault zone in the vicinity of the site as identified on the Franklin Point 7.5 minute Quadrangle is described in the Fault Evaluation Report (FER-116) by Smith (1981). In 1976, the CDMG established Special Studies Zones (SSZ) around the San Gregorio fault zone based on the mapping of Weber (1975), Hall et al. (1974), Brown (1972), and Clark (1970). However, the limits of the SSZ and location of segments of the San Gregorio fault zone were revised in 1982 based on additional data by Weber and Lajoie (1980), Weber and Cotton (1980), and interpretation of aerial photographs by Smith (FER-116, 1981). Revisions to the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle have not been made since publication of the revised map in 1982. Fault segments as shown on the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982) in the vicinity of the project (Figures 2 and 6) appear to be based on interpretation of aerial photographs and geomorphology. Specifically, FER-116 indicates the segment mapped just west and roughly parallel with Cloverdale Road is based on an apparent broad, topographic scarp with deflected drainage channels. This segment is located west of the project area. Three discontinuous segments mapped just south but not entering the site appear to be based on tonal lineaments and closed depressions observed in aerial photographs. Although removed from the current Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982) and QFFD, the prior Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1976) depicted a segment of the San Gregorio fault passing through the current school site, just east of the project area. A similar segment is still depicted on regional geologic maps prepared by Brabb et al. (2000 and 1998, Figures 2 and 6), and is shown to pass through or in close proximity to the northeastern corner of the site.

As described in FER-116 and the USGS QFFD, the San Gregorio fault zone is part of a larger fault zone, known as the San Gregorio-Hosgri fault zone,that extends over a distance of approximately 400 kilometers from roughly Bolinas in the north to Lompoc in the south. Near the project, the San Gregorio fault zone consists of a complex system of numerous fault strands that include but are not limited to the Frijoles segment, Seal Cove segment, Ano Nuevo segment, Greyhound Rock segment, and Coastways segment, which is the focus of this study. According to the QFFD, the Coastways segment mapped in the vicinity of the site is considered to be a Holocene age fault (i.e. defined as active within the last 11,000 years).

The QFFD indicates that estimated slip rates along the San Gregorio fault zone vary, with some estimates as low as 0.4 mm/year and others as high as 10 mm/yr. Movement along the San Gregorio fault zone is predominantly right lateral strike slip, although some segments may include a component of reverse movement. Recurrence intervals are estimated to be on the order of 400 to 1,000 years, with the last major earthquake on the fault occurring after 1200 to 1470 AD but before the arrival of Spanish missionaries in 1775 AD. As described in FER-116,

few seismic events have been recorded in the project area, with most nearby seismic activity associated with the San Andreas fault.

1.8 REGIONAL SEISMICITY

Because of the presence of nearby active faults, the Central Coast Region of California is considered seismically active. Numerous small earthquakes occur every year in the region, and large (>M7) earthquakes have been recorded and can be expected to occur in the future. The site is located within the Earthquake Fault Hazard Zone for the San Gregorio fault (Figure 4). Figure 5 shows the approximate location of active and potentially active faults and significant historic earthquakes mapped within the project area. Based on the 2008 USGS National Seismic Hazard Maps database, the nearest active fault is the San Gregorio fault, located immediately west of the subject site. Other active or potentially active faults located near the site include the San Andreas fault, located approximately 11.9 miles to the northeast, the Monte Vista Shannon fault, located approximately 14 miles to the northeast; and the Zayante Vergeles fault, located approximately 24.3 miles to the southeast.

1.9 AERIAL PHOTOGRAPH REVIEW

We reviewed the following individual and stereo-paired images of the site:

TABLE 1.9-1
Aerial Photographs

Date	Film ID	Line Number	Photograph Numbers	Scale
10/13/2005	KAV 9200	8	28/29	1:15,000
8/15/2000	AV 6600	8	59/60	1:12,000
8/5/1997	AV 5434	8	54/55	1:12,000
8/8/1995	KAV 4905	4	19	1:24,000
8/27/1993	AV 4515	8	58/59/60	1:12,000
9/24/1991	KAV 4122	4	15/16	1:36,000
7/2/1991	AV 4075	8	66	1:12,000
6/21/1989	AV 3593	4	16/17	1:36,000
7/3/1985	AV 2664	4	16/17	1:36,000
11/2/1981	AV 2050	07	41	1:54,000
5/11/1979	AV 1700	06/07	37/38 & 34/35	1:54,000
9/4/1975	AV1215	07	35/36	1:54,000
9/8/1970	AV 965	965	35/36 & 40	1:48,000
2/20/1967	AV 784	22	05/06	1:36,000
4/21/1966	AV 710	07	47	1:36,000
7/9/1963	AV 550	06	39/40	1:36,000
8/22/1960	AV 385	09	22/23	1:30,000
3/1/1958	SF Area	01	126/127	1:36,000

Review of the above photographs indicates that the site was used as agricultural land since at least 1958. In the 1958 photographs, a small barn structure is visible in the southwest corner of the project area, roughly at the intersection of Cloverdale Road and Butano Cutoff. By the time of the photographs dated 1960, the barn had been demolished and the current school had been built. No significant changes to the project area are visible in the remaining photographs reviewed.

The project area appears to be located in a broad, linear alluvial valley that trends in a roughly northwest/southeast direction. A relatively linear, north/south trending prominent break in slope is visible to the west of Cloverdale Road. Additionally, tonal lineaments trending in a northwest/southeast direction are periodically visible in the open fields located south of the site. The features mentioned above are roughly coincident with the fault traces depicted by USGS QFFD mapping and the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982). It should be noted that none of the features described above appear to traverse the project area.

2.0 SITE EXPLORATION

2.1 TRENCH EXCAVATIONS

We excavated and logged a total of approximately 650 feet of trench as depicted on Figure 2. The trenches were excavated with a tracked excavator to depths ranging from approximately 8.5 to 13.5 feet. The trenches could not be excavated past a depth of approximately 13.5 feet due to high groundwater and unstable soils. The excavations were benched or shored for safety and the south walls of the trenches were cleaned of smeared materials and logged by ENGEO geologists as noted on the logs. The trench locations and significant features were located by measuring from existing landmarks.

The purpose of the trench excavations was to expose the alluvial deposits so that they could be closely examined for evidence of recent fault displacement. The geologic logging process included description of soil color, estimated grain size, structure and interpretation of geologic features such as development of soil weathering profiles, depositional layering and contacts between differing soil layers.

We retained Dr. Glenn Borchardt to provide a detailed pedochronologic description of represented weathering profiles developed in Trench 1-T1 at Station 48. The purpose of the pedochronologic description was to correlate the soils observed onsite with nearby dated profiles and to estimate the age of weathering profiles. The results of Dr. Borchardt's study are presented in Appendix A.

The trenches were excavated in a roughly southwest/northeast direction and were oriented roughly perpendicular to the trend of mapped fault traces in the project area. Trench 1-T1 was excavated on the eastern side of the project area in the existing parking lot to the limit of the eastern edge of the AP Earthquake Fault Hazard Zone (Figure 2). Trench 1-T2 was excavated

from the western side to the eastern side of the project area in an open field and is entirely located within the AP Earthquake Fault Hazard Zone (Figure 2).

2.2 SUBSURFACE CONDITIONS

The following sections described the geologic units encountered in Trenches 1-T1 and 1-T2. The trench logs are included as Figure 7. Groundwater was encountered in both trenches at depths of roughly 10½ to 13 feet below the ground surface.

2.2.1 Artificial Fill (Unit 1 in 1-T1, Unit 1A and 1B in 1-T2)

Artificial fill was encountered across the extent of both trenches and ranged in thickness from approximately 1 to 2 feet, including soils disturbed as a result of tilling. The fill encountered was generally black to light brown lean clay with minor debris items (rusted metal, porcelain). Additionally, a leach line and remnants of a wooden septic tank was encountered between Stations 420 and 425 in 1-T2, in the vicinity of the former barn. In Trench 1-T1, the artificial fill is overlain by a pavement section consisting of approximately 2 inches of asphaltic concrete over 4 inches of aggregate base. Based on conversations with representatives of Pescadero High School, we understand that the school site may have been raised in the past to help reduce the potential for flooding. Additionally, we observed that the site is roughly 1 to 2 feet higher in elevation than agricultural fields to the south of the site.

2.2.2 Holocene Alluvium, A Horizon (Unit 2, Both Trenches)

An A Horizon, consisting of black silty lean clay, was observed underlying artificial fill across both trenches. Where encountered, this soil was generally porous and contained abundant rootlets and worm burrows. This unit is described as containing three separate A Horizons (A1, A2, and A3) in the report prepared by Dr. Borchardt (Appendix A).

2.2.3 Holocene Alluvium, Bt Horizon (Unit 3 in 1-T1, Unit 3A and Upper Unit 3 in 1-T2)

A Bt Horizon, consisting of brown and light brown silty lean clay was observed underlying the A Horizon across both trenches. Where encountered, this soil was observed to contain numerous root traces and worm burrows, with black clay coating the root trace and burrow surfaces. The upper portion of Unit 3 in 1-T2 is interpreted to include the Bt Horizon, although the moisture content and increased clay content of this soil between Station 450 and 540 made identifying the geologic contact with underlying soils difficult to discern. As such, a facies change is shown on the log for Trench 1-T2 at Station 450.

2.2.4 Holocene Alluvium, BC Horizon (Unit 4 in 1-T1, Unit 3B and Lower Unit 3 in 1-T2)

A BC Horizon, consisting of light yellowish brown silty lean clay was observed underlying the Bt Horizon across both trenches. Where encountered, this soil was observed to contain some root traces and worm burrows, with black clay coating the root trace and burrow surfaces. Additionally, the BC horizon contained noticeably more silt than the overlying Bt Horizon. The

lower portion of Unit 3 in 1-T2 is interpreted to include the BC Horizon, although the moisture content and increased clay content of this soil between Station 450 and 540 made identifying the geologic contact with underlying soils difficult to discern. As such, a facies change is shown on the log for trench 1-T2 at Station 450. As discussed in the report prepared by Dr. Borchardt, the age of this soil is interpreted to be approximately 4,700 years.

2.2.5 Holocene Alluvium, Ab1/Btb1 Horizon (Unit 5 in 1-T1, Unit 4 in 1-T2)

An Ab1/Btb1 Horizon, consisting of dark brown and gray lean clay was observed underlying the BC Horizon across both trenches. Where encountered, this soil was observed to contain abundant root traces and worm burrows, with black clay coating the root trace and burrow surfaces. This soil appeared to have a moderate blocky structure. As discussed in the report prepared by Dr. Borchardt, the age of the lower portion (i.e. Btb1) of this soil is interpreted to be approximately 5,300 years.

2.2.6 Holocene Alluvium, Ab2 Horizon (Unit 6 in 1-T1, Unit 5 in 1-T2)

An Ab2 Horizon, consisting of brown silty lean clay was observed underlying the Ab2 Horizon across both trenches. Where encountered, this soil was observed to exhibit a moderate blocky structure with clay films on blocky surfaces. As discussed in the report prepared by Dr. Borchardt, the soil age is interpreted to be approximately 6,300 years.

2.3 FAULTING

No evidence of faulting, folding or warping was observed in the soils exposed in Trenches 1-T1 or 1-T2.

3.0 DISCUSSION AND RECOMMENDATIONS

Review of FER-116 indicates that the mapped traces of the San Gregorio fault (depicted on Figure 6) immediately west and south of the site are based on geomorphic expression and tonal lineaments observed through review of aerial photographs. The fault traces immediately south of the site are shown to be queried and discontinuous, while the fault trace to the west of the site (roughly coincident with Cloverdale Road) is located along a prominent break in slope. The locations of potential fault traces that are mapped on the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982) due to tonal lineaments to the south of the site and the linear break in slope to the west of the site and are in general agreement with similar features observed during our review of aerial photographs. None of the fault traces depicted on the Alquist-Priolo Zone map or QFFD are shown to pass through the site.

The trace of the San Gregorio fault shown in close proximity to or through the northeastern corner to the east of the site as mapped by Brabb et al. (1998, 2000) appears to be based on prior geologic data and is not included on the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982) or mapping by the QFFD. Additionally, the referenced maps

prepared by Brabb et al. are small-scale regional geologic maps; therefore, fault traces as shown in a smaller, site-specific location may not be entirely accurate.

The base of the soil profile exposed in our trenches was estimated to be approximately 6,300 years in age (Appendix A), and no warping or offset of soils within the trenches was observed. The guidelines for implementation of the Alquist-Priolo act indicate that structures may not be constructed across the trace of an active fault, which CGS defines as a fault that has experienced movement in the last 11,000 years. As discussed in a previous section, recurrence intervals along the San Gregorio fault are estimated to be in the range of 400 to 10,000 years. Considering soils encountered in our trenches are up to 6,300 years in age, it is our opinion that offset or warping of soils should have been observed if active splays of the San Gregorio fault were present across the subject site. Dr. Borchardt, who concluded that the modern soil and underlying mid-Holocene paleosols observed in our trenches could be used to evaluate the potential for surface fault rupture at the site, drew a similar conclusion (Appendix A).

Considering the general absence of fault traces mapped through the site, lack of geomorphic evidence for an active fault traversing the site, and the age of un-faulted soils exposed in our trenches in conjunction with the recurrence interval of the San Gregorio fault, it is our opinion that the results of this study sufficiently satisfy the intent of the Alquist-Priolo act.

Based on the results of this study we have the following recommendations:

- Structures intended for human occupancy should be set back from the eastern edge of Trench 1-T1 and western edge of Trench 1-T2 a minimum of 50 feet as depicted on Figure 2.

- It will be acceptable to construct other improvements such as roads, parking lots, landscaping, and underground utilities within the recommended fault setback zones. However, these improvements may be susceptible to damage in the event of fault rupture.

4.0 LIMITATIONS AND UNIFORMITY OF CONDITIONS

If changes occur in the nature or design of the project, we should be allowed to review this report and provide additional recommendations, if any. It is the responsibility of the owner to transmit the information and recommendations of this report to the appropriate organizations or people involved in design of the project, including, but not limited to, developers, owners, buyers, architects, engineers, and designers. The conclusions and recommendations contained in this report are solely professional opinions and are valid for a period of no more than 2 years from the date of report issuance.

We strived to perform our professional services in accordance with generally accepted geotechnical engineering principles and practices currently employed in the area; no warranty is expressed or implied. There are risks of earth movement and property damages inherent in building on or with earth materials. We are unable to eliminate all risks or provide insurance; therefore, we are unable to guarantee or warrant the results of our services.

This report is based upon field and other conditions discovered at the time of report preparation. We developed this report with limited subsurface exploration data. We assumed that our subsurface exploration data is representative of the actual subsurface conditions across the site. If unexpected conditions are encountered, notify ENGEO immediately to review these conditions and provide additional and/or modified recommendations, as necessary.

Actual field or other conditions will necessitate clarifications, adjustments, modifications or other changes to ENGEO's documents. Therefore, ENGEO must be engaged to prepare the necessary clarifications, adjustments, modifications or other changes before construction activities commence or further activity proceeds. If ENGEO's scope of services does not include onsite construction observation, or if other persons or entities are retained to provide such services, ENGEO cannot be held responsible for any or all claims arising from or resulting from the performance of such services by other persons or entities, and from any or all claims arising from or resulting from clarifications, adjustments, modifications, discrepancies or other changes necessary to reflect changed field or other conditions.

SELECTED REFERENCES

Bryant, W.A., and Cluett, S.E., compilers, 1999, Fault number 60a, San Gregorio fault zone, San Gregorio section, in Quaternary fault and fold database of the United States: U.S. Geological Survey website, http://earthquakes.usgs.gov/hazards/qfaults, accessed 07/15/2016.

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California Geological Survey, Note 49, Guidelines for Evaluating the Hazard of Surface Fault Rupture.

California Geological Survey Special Publication 117A (2008). Guidelines for Evaluation and Mitigating Seismic Hazards in California.

Hart, E.W. and Bryant, W.A. (2007), Fault-Rupture Hazard Zones in California: California Division of Mines and Geology, Special Publication 42.

United States Geological Survey and the California Geological Survey; Quaternary fault and fold database for the United States, Google Earth KMZ.

FIGURES

FIGURES

N

0 FEET 2000

0 METERS 1000

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE

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VICINITY MAP

PESCADERO FIRE STATION

PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001		FIGURE NO. 1
SCALE: AS SHOWN		
DRAWN BY: DLB	CHECKED BY: RHB	

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ORIGINAL FIGURE PRINTED IN COLOR

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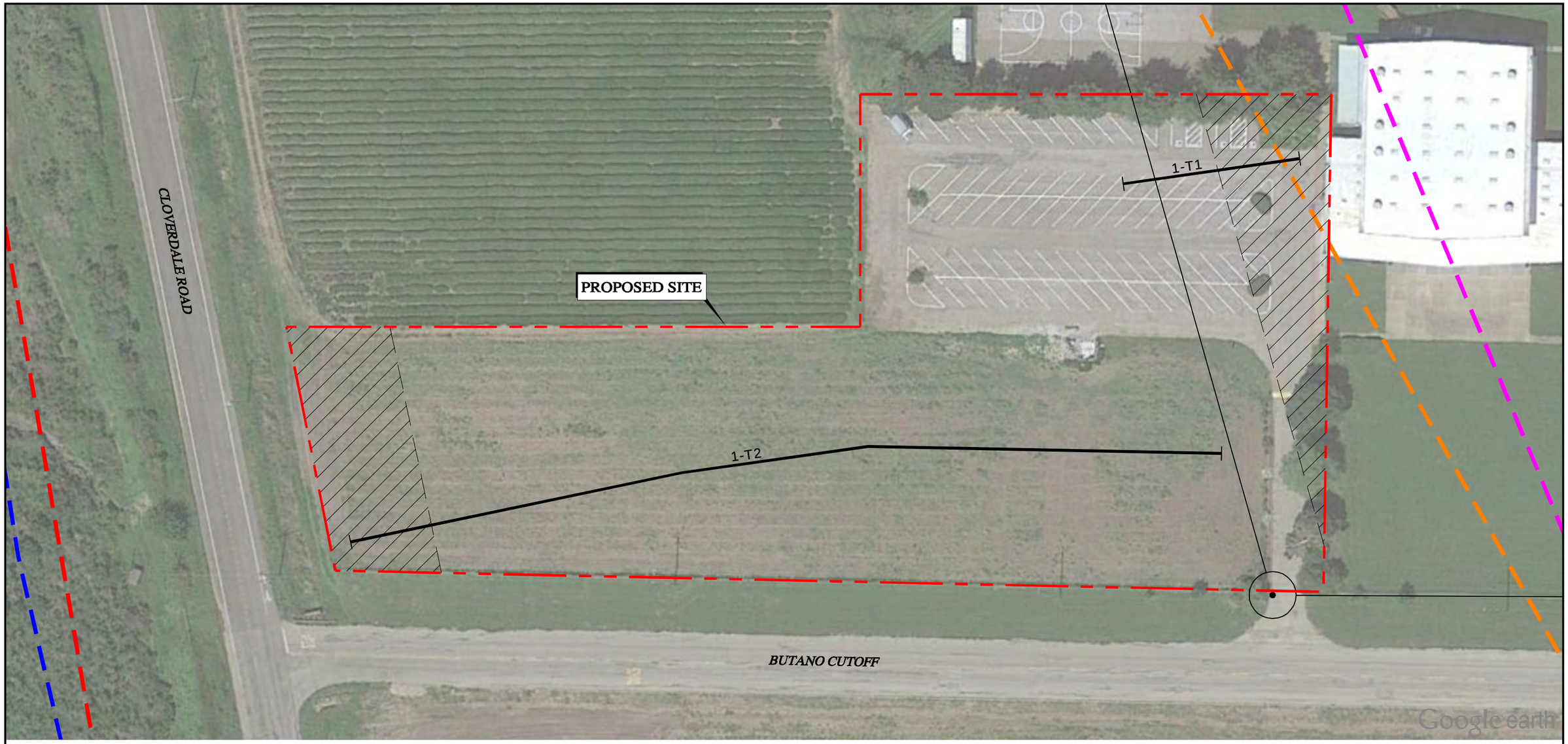

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- U.S.G.S QFFD
- FAULT (BRABB, GRAYMER, & JONES, 2000)
- FAULT (STATE OF CALIFORNIA SPECIAL STUDIES ZONES, 1982)
- FAULT (BRABB, GRAYMER, & JONES, 1998)
- EARTHQUAKE FAULT ZONE LIMIT
- 1-T2 FAULT TRENCH (ENGEO, 2016)
- PROPOSED HABITABLE STRUCTURE EXCLUSION ZONE

N

0 FEET 60

0 METERS 30

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE

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SITE PLAN
PESCADERO FIRE STATION
PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001	FIGURE NO. 2
SCALE: AS SHOWN	
DRAWN BY: DLB	CHECKED BY: RHB

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ORIGINAL FIGURE PRINTED IN COLOR

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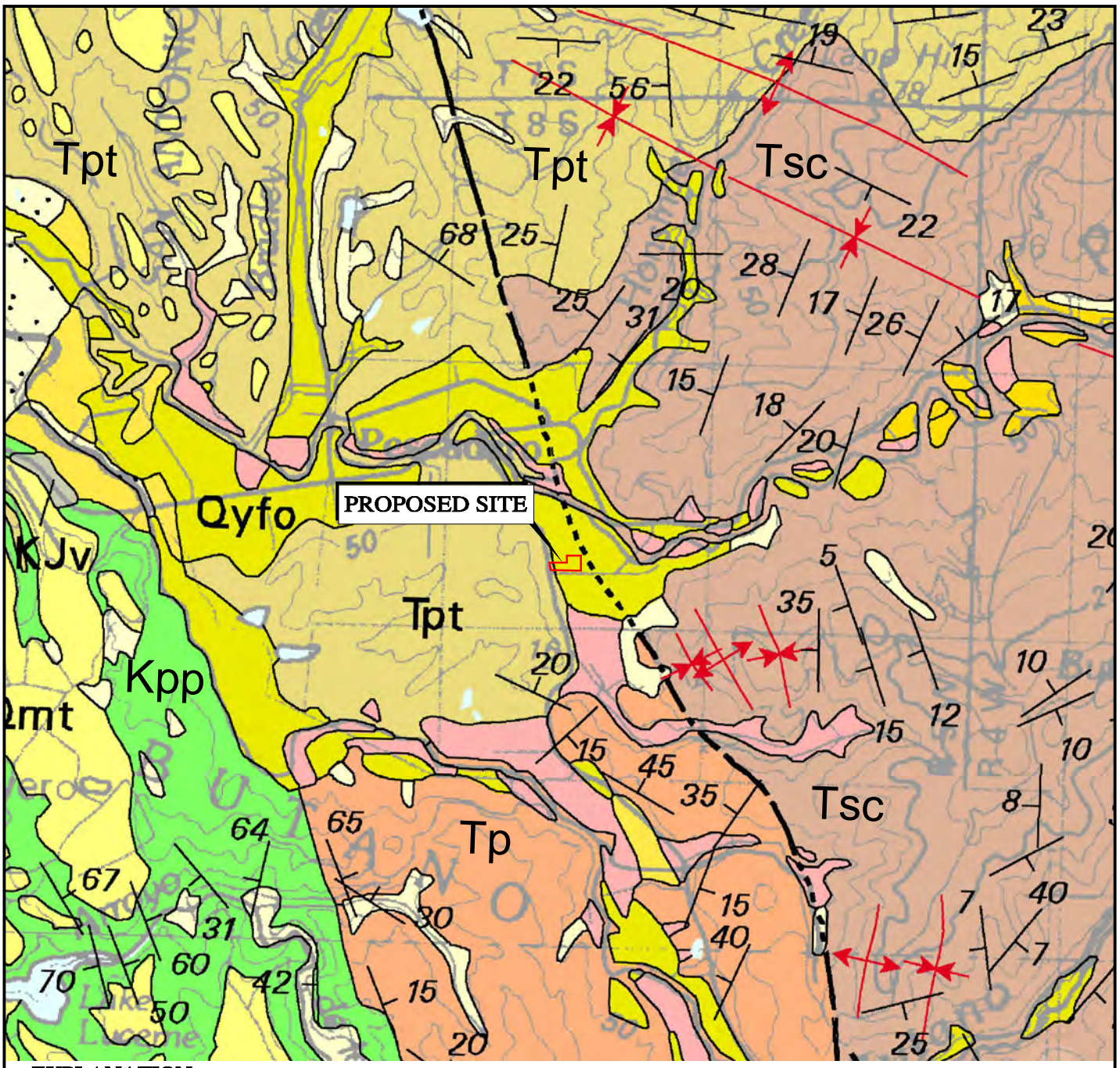

EXPLANATION

FAULT-DASHED WHERE APPROXIMATELY LOCATED, SHORT DASHED WHERE INFERRED, DOTTED WHERE CONCEALED, QUERIED WHERE LOCATION IS UNCERTAIN STRIKE-SLIP MOVEMENT

AXIS OF FOLD

ANTICLINE — SYNCLINE

STRIKE AND DIP OF STRATA

INCLINED — VERTICAL — OVERTURNED

Qyfo	YOUNGER ALLUVIAL FAN DEPOSIT
Tp	PURISIMA FORMATION
Tpt	TAHANA MEMBER
Tsc	SANTA CRUZ MUDSTONE
Kpp	PIGEON POINT FORMATION

BASE MAP SOURCE: BRABB, GRAYMER, JONES, 2000

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REGIONAL GEOLOGIC MAP

PESCADERO FIRE STATION

PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001		FIGURE NO. 3
SCALE: AS SHOWN		
DRAWN BY: DLB	CHECKED BY: RHB	

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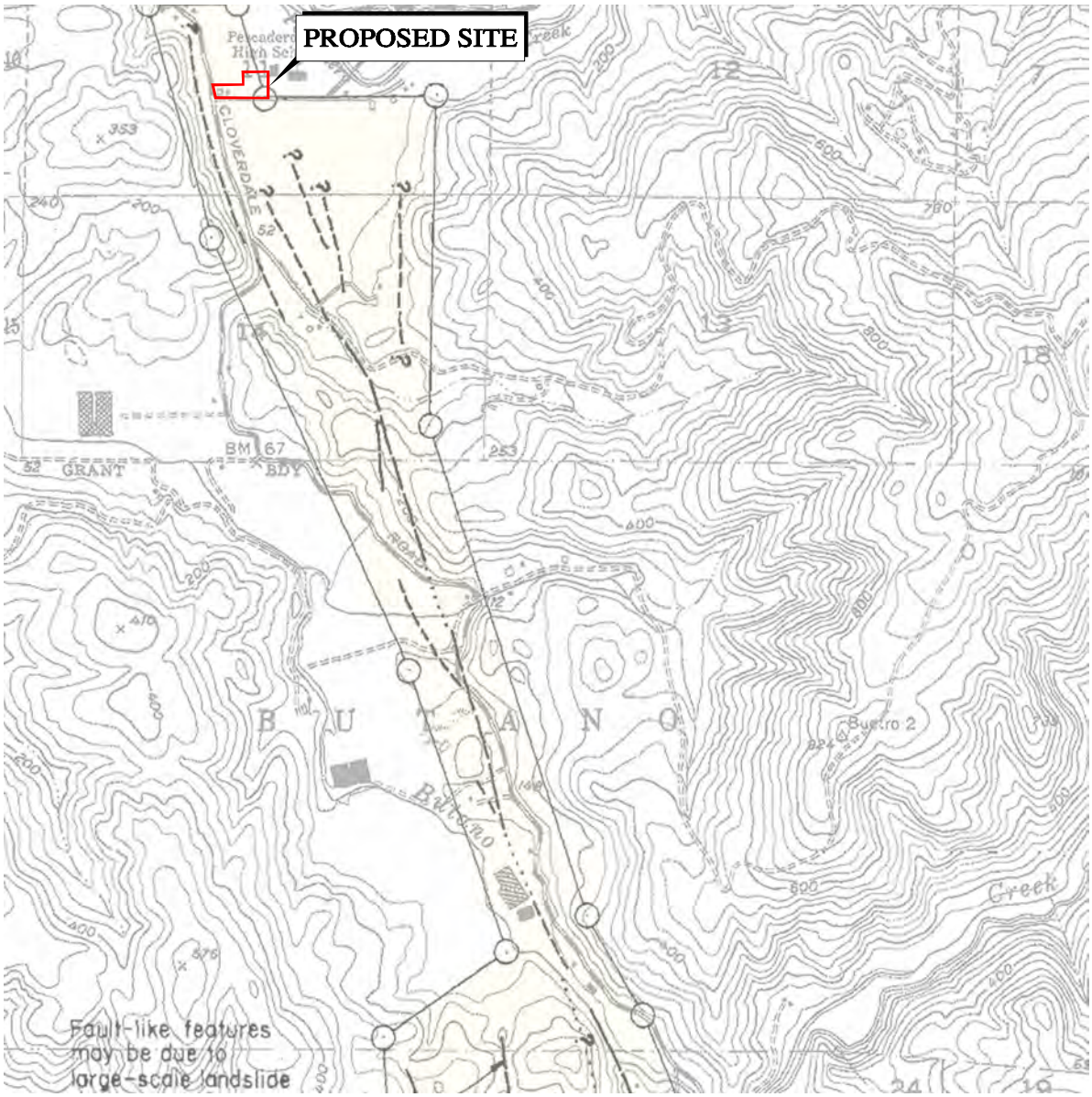

EXPLANATION

1906 C
?

FAULTS CONSIDERED TO HAVE BEEN ACTIVE DURING HOLOCENE TIME AND TO HAVE A RELATIVELY HIGH POTENTIAL FOR SURFACE RUPTURE; SOLID LINE WHERE ACCURATELY LOCATED, LONG DASH WHERE APPROXIMATELY LOCATED, SHORT DASH WHERE INFERRED, DOTTED WHERE CONCEALED; QUERY (?) INDICATES ADDITIONAL UNCERTAINTY. EVIDENCE OF HISTORIC OFFSET INDICATED BY YEAR OF EARTHQUAKE-ASSOCIATED EVENT OR C FOR DISPLACEMENT CAUSED BY CREEP OR POSSIBLE CREEP

EARTHQUAKE FAULT ZONE BOUNDARIES; DELINEATED AS STRAIGHT-LINE SEGMENTS THAT CONNECT ENCIRCLED TURNING POINTS SO AS TO DEFINE EARTHQUAKE FAULT ZONE SEGMENTS

N

0 FEET 2000
0 METERS 1000

BASE MAP SOURCE: CDMG, 1982

ENGEO Expect Excellence

EARTHQUAKE FAULT ZONE MAP

PESCADERO FIRE STATION

PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001		FIGURE NO. 4
SCALE: AS SHOWN		
DRAWN BY: DLB	CHECKED BY: RHB	

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\11780\000\GEX\11780000001-GEX-4-EQ-Faultzone-0716.dwg Plot Date: 7-25-16 llee

ORIGINAL FIGURE PRINTED IN COLOR

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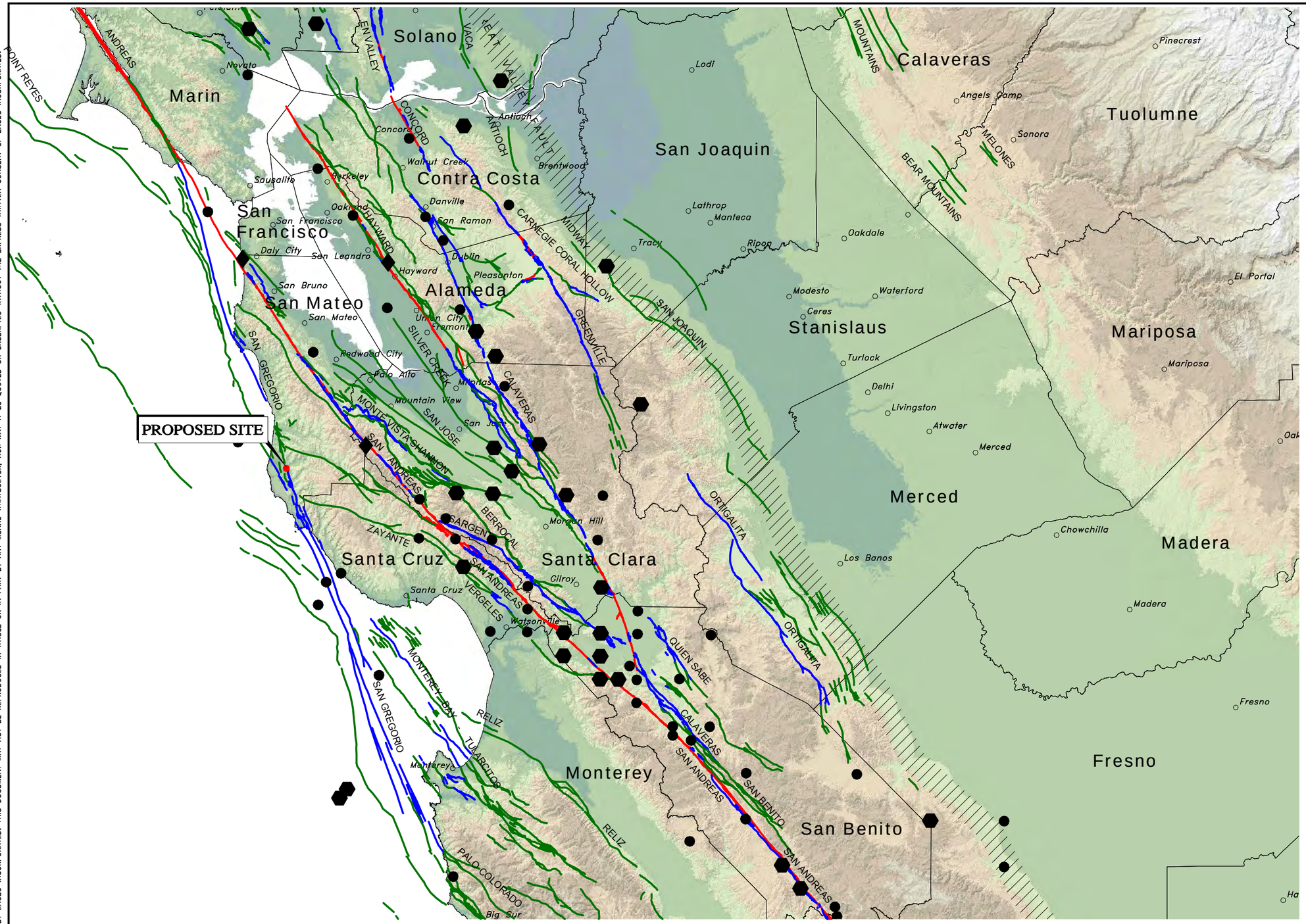

BASE MAP SOURCE:
COLOR HILLSHADE IMAGE BASED ON THE NATIONAL ELEVATION DATASET (NED) AT 30 METER RESOLUTION
U.S.G.S. QUATERNARY FAULT DATABASE, NOVEMBER, 2010
U.S.G.S. HISTORIC EARTHQUAKE DATABASE (1800–2000)

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REGIONAL FAULTING AND SEISMICITY

PESCADERO FIRE STATION
PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001	FIGURE NO 5
SCALE: AS SHOWN	
DRAWN BY: DLB	CHECKED BY: RHB

ORIGINAL FIGURE PRINTED IN COLOR

G:\Drafting\DRAFTING2_Dwg_10000 to 12999\11780\000\GEX\11780000001-GEX-5-RegFTSS-0716.dwg Plot Date: 7-25-16 llee

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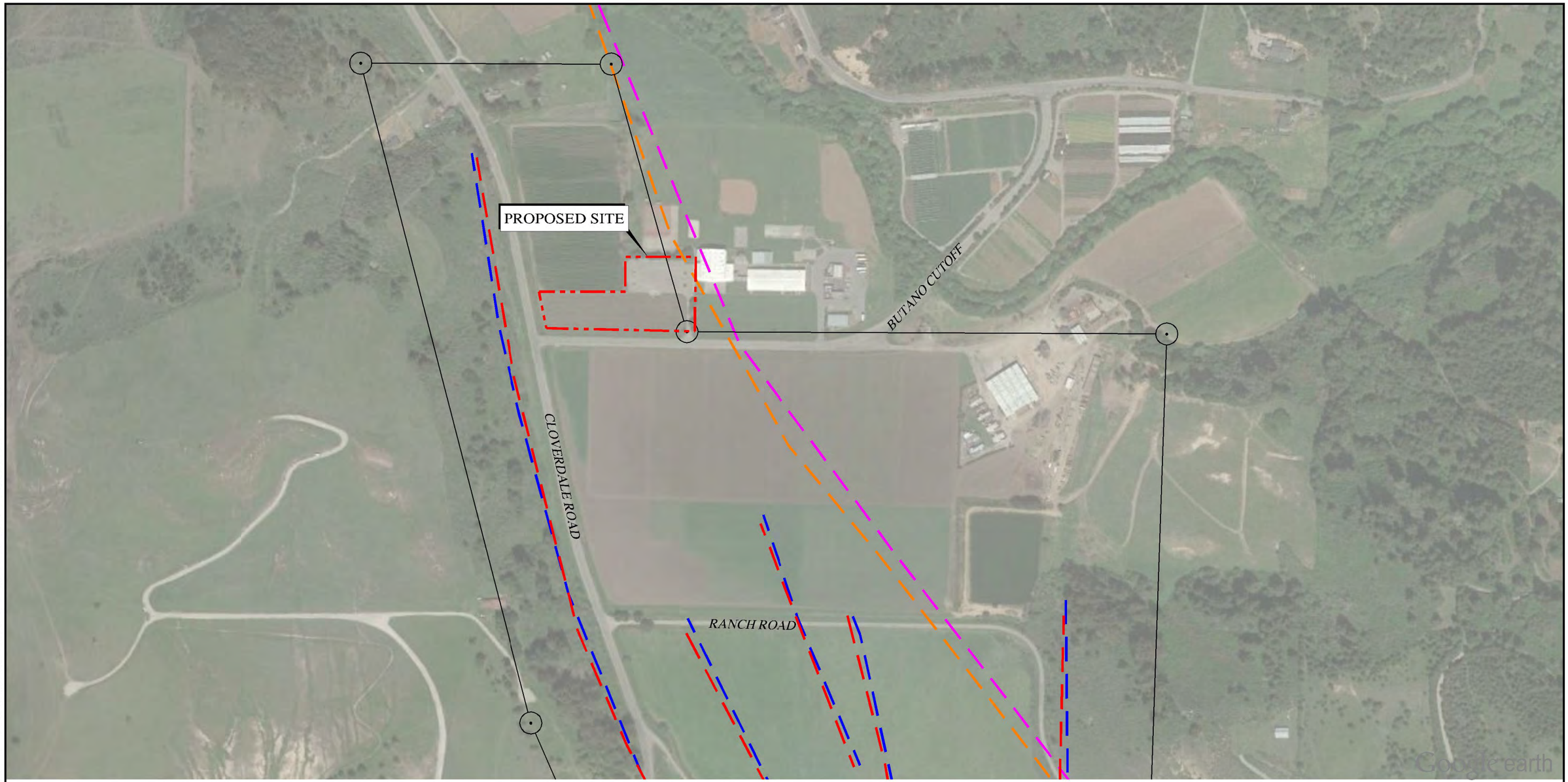

EXPLANATION

ALL LOCATIONS ARE APPROXIMATE

- U.S.G.S. QFFD
- FAULT (BRABB, GRAYMER, & JONES, 2000)
- FAULT (STATE OF CALIFORNIA SPECIAL STUDIES ZONES, 1982)
- FAULT (BRABB, GRAYMER, & JONES, 1998)
- EARTHQUAKE FAULT ZONE LIMIT

N

0 FEET 400

0 METERS 200

BASE MAP SOURCE: GOOGLE EARTH MAPPING SERVICE

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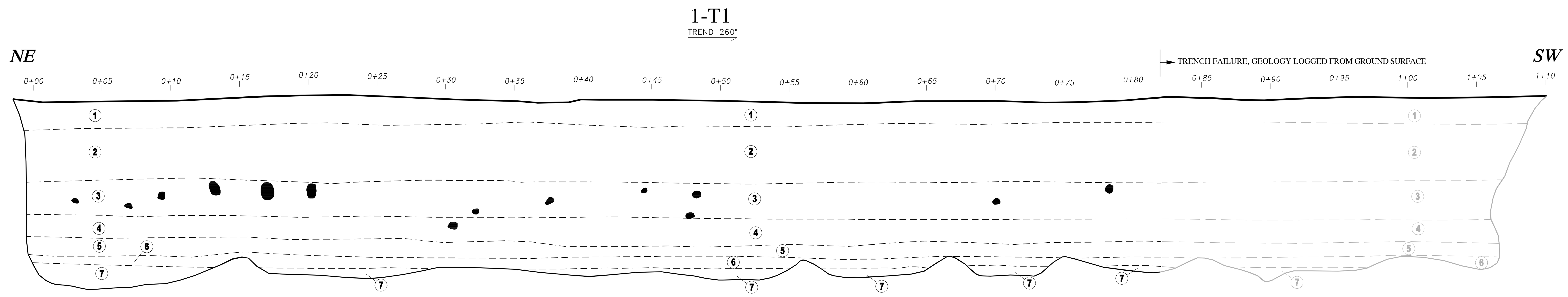
FAULT COMPILATION MAP

PESCADERO FIRE STATION

PESCADERO, CALIFORNIA

PROJECT NO.: 11780.000.001	FIGURE NO. 6
SCALE: AS SHOWN	
DRAWN BY: DLB	CHECKED BY: RHB

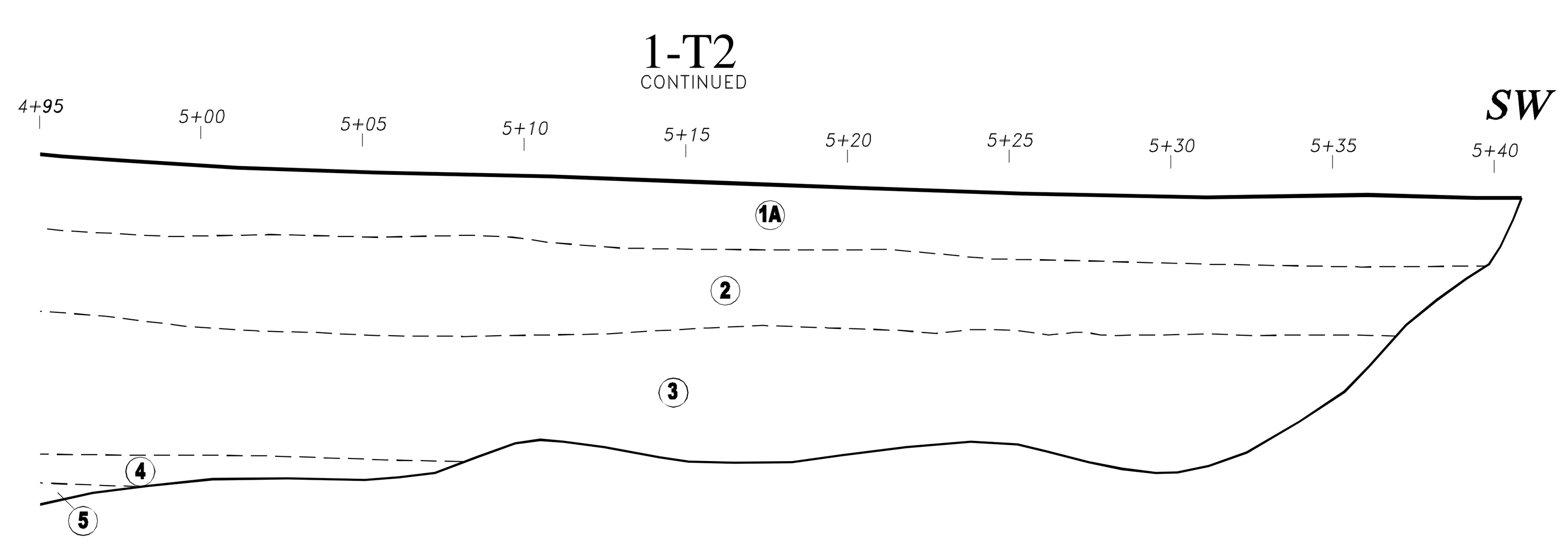
ORIGINAL FIGURE PRINTED IN COLOR



TRENCH 1-T1 EXPLANATION

1. Artificial Fill. Black and light brown silty lean CLAY. Covered by approximately 2 inches of asphaltic concrete over 4 inches of light yellowish brown aggregate base.
2. Holocene Alluvium. Black silty lean CLAY, porous, abundant rootlets and worm burrows. 'A' Horizon.
3. Holocene Alluvium. Mottled brown and light brown silty lean CLAY, contains worm burrows and root traces. Burrows and root trace surfaces covered with black clay coating. 'Bt' Horizon.
4. Holocene Alluvium. Light yellowish brown silty lean CLAY, contains some worm burrows and root traces. Contains more silt than Unit 3. Black clay coating on burrow and root trace surfaces. 'BC' Horizon.
5. Holocene Alluvium. Dark brown and gray lean CLAY, abundant root traces and worm burrows, clay coating on root trace and worm burrow surfaces. Moderate blocky structure. 'Ab1/Btb1' Horizon.
6. Holocene Alluvium. Dark brown and black lean CLAY. Moderately well developed blocky structure, abundant worm burrows and root traces with clay coating on surfaces. 'Ab2' Horizon.
7. Holocene Alluvium. Brown silty lean CLAY, moderate blocky structure, clay films on blocky surfaces. 'Btb2/Bctb2' Horizon.

KROTOVINA



TRENCH 1-T2 EXPLANATION

1A. Artificial Fill/Disturbed native soil from tilling. Black silty lean CLAY with orange mottling at base of unit. Contains abundant rootlets and worm burrows and occasional trash items (rusted metal bolts, porcelain).

1B. Artificial Fill. Black silty lean CLAY with trash items (rusted metal, glass, some wood). Leach line and remnants of wooden septic box. Leach line consists of approximately 5 inch diameter clay pipe segments with gaps between segments, pipe surrounded with 1 inch diameter gravels.

2. Holocene Alluvium. Black silty lean CLAY, porous, abundant rootlets and worm burrows. 'A' Horizon.

3. Holocene Alluvium. Dark grey with orange mottling lean to fat CLAY, contains worm burrows and root traces. More abundant burrows and root traces visible in upper portion of unit. Burrows and root trace surfaces covered with black clay coating. Facies change at roughly Station 450 to Units 3A and 3B. Lower portion of unit much more clayey than Unit 3B. 'Bt/BC' Horizon. Analagous to Units 3 & 4 in trench 1-T1.

3A. Holocene Alluvium. Brown and light brown silty lean CLAY, contains worm burrows and root traces. contains worm burrows and root traces. Burrows and root trace surfaces covered with black clay coating. Facies change at roughly Station 450 to Unit 3. 'Bt' Horizon. Analagous to Unit 3 in trench 1-T1.

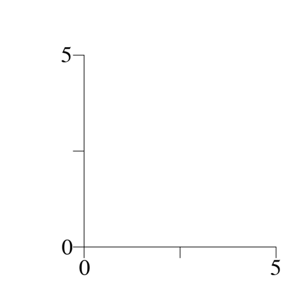
3B. Holocene Alluvium. Light yellowish brown silty lean CLAY, contains some worm burrows and root traces. Burrows and root trace surfaces covered with black clay coating. Contains more silt than Unit 3A. Facies change at roughly Station 450 to Unit 3. 'BC' Horizon. Analagous to Unit 4 in trench 1-T1.

4. Holocene Alluvium. Dark brown and gray lean CLAY, abundant root traces and worm burrows, clay coating on root trace and worm burrow surfaces. Moderate blocky structure. 'Ab1/Btb1' Horizon.

5. Holocene Alluvium. Dark brown and black lean CLAY. Moderately well developed blocky structure, abundant worm burrows and root traces with clay coating on surfaces. 'Ab2' Horizon.

6. Holocene Alluvium. Brown silty lean CLAY, moderate blocky structure, clay films on blocky surfaces. 'Btb2/Bctb2' Horizon.

KROTOVINA



ENGEO Expect Excellence

TRENCH LOGS PESCADERO FIRE STATION PESCADERO, CALIFORNIA	PROJECT NO.: 11780.000.001		FIGURE NO. 7
	SCALE: 1"=5'		
	DRAWN BY: DLB	CHECKED BY: RHB	

ORIGINAL FIGURE PRINTED IN COLOR

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APPENDIX A

Soil Tectonics Report

APPENDIX A

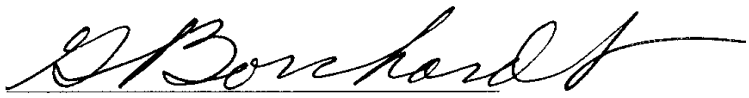
APPENDIX A

PEDOCHRONOLOGICAL REPORT FOR PESCADERO FIRE STATION, PESCADERO, CALIFORNIA

Prepared for ENGEO, Inc., San Jose, California, Project No. 11780.000.001

July 12, 2016

Soil Tectonics
P.O. Box 5335
Berkeley, CA 94705



Glenn Borchardt

Principal Soil Scientist
Certified Professional Soil Scientist No. 24836

PEDOCHRONOLOGICAL REPORT FOR PESCADERO FIRE STATION, PESCADERO, CALIFORNIA

Prepared for ENGEO, Inc., San Jose, California, Project No. 11780.000.001

July 12, 2016

Glenn Borchardt

INTRODUCTION

An assessment of seismic and landslide risk due to ground movement can be aided greatly by the techniques of pedochronology (Borchardt, 1992, 1998), soil dating. This is because the youngest geological unit overlying fault traces is generally a soil horizon. The age and relative activity of ground movement often can be estimated by evaluating the age and relative disturbance of overlying soil units, as well as buried soils called paleosols. Terms, prefixes, and suffixes are defined in the Soils Glossary at the end of this report.

Soil horizons exhibit a wide range of physical, chemical, and mineralogical properties that evolve at varying rates. Soil scientists use various terms to describe these properties. A black, highly organic "A" horizon, for example, may form within a few centuries, while a dark brown, clayey "Bt" horizon may take up to 40,000 years to form. Certain soil properties are invariably absent in young soils. For instance, soils developed in granitic alluvium of the San Joaquin Valley do not have Munsell hues redder than 10YR until they are at least 100,000 years old (Birkeland, 1999; Harden, 1982). Still other properties, such as the movement and deposition of clay-size particles and the precipitation of calcium carbonate at extraordinary depths, indicate soil formation during a climate much wetter than at present. In the absence of a radiometric age date for the material from which a particular soil formed, an estimate of its age must take into account all the known properties of the soil and the landscape and climate in which it evolved.

METHOD

The first step in studying a soil is the compilation of the data necessary for describing it (Birkeland, 1999; Borchardt, 2010). At minimum, this requires a Munsell color chart, hand lens, acid bottle, and instruments for 1:1 soil:water pH and electrical conductivity (EC) measurements. The second step may involve collecting samples of each horizon of the soil profile column for laboratory analysis of particle size. This is done to check the textural classifications made in the field and to evaluate the genetic relationships between horizons and between different soils in the

landscape. When warranted, the clay mineralogy and chemistry of the soil also is analyzed to provide additional information on the changes undergone by the initial material from which the soil weathered. The last step is the comparison of this accumulated soil data with that for soils having developed under similar conditions, preferably in the same region. Such information is scattered in soil survey reports (e.g., Welch, 1981), soil science journals, and consulting reports. In a particular locality, there is seldom enough comparative data available for this purpose. That is why, at the very least, the study of one soil profile always makes the evaluation of the next that much easier.

RESULTS OF THIS EVALUATION

Soil Profile No. 1 was studied to assess the age of the soil in Trench 1-T1 excavated 192 m east of the mapped trace of the San Gregorio fault at Pescadero High School, Pescadero, California (Table 1). I did some previous pedochronology along the San Gregorio fault on the Sangamon terrace (122 ka) at Pillar Point near Half Moon Bay (Borchardt, 2001) and at Moss Beach (Borchardt, 2007).

Soil Profile No. 1

This profile was developed in clay to clayey very fine sand overbank deposits 192 m east of the mapped trace of the San Gregorio fault. It is essentially a three-part soil, with a moderately developed modern soil (Figures 1 to 3) underlain by two weakly developed paleosols (Figures 4 and 5). This sequence has been observed elsewhere in the Bay Area where sedimentation rates also are relatively high due to rapid sea level rise since 11 ka (WLA, 2003; Borchardt, 2008; Baldwin and others, 2009; Borchardt, 2012; 2016).

Late Holocene Soil

Buried beneath 65-cm of fill, the modern soil consists of a tri-part cumulic A horizon that is a 133-cm thick very dark brown to very dark grayish brown silty clay with medium moderate angular blocky structure and many fine to medium continuous random tubular pores (Table 1; Figures 1 and 2). These three A horizons overly a 76-cm thick dark brown silty clay Bt horizon with medium moderate to strong angular blocky to prismatic structure with many fine to medium continuous vertical to random tubular pores (Figure 3). It has many thin to medium thick black clay films lining pores. This overlies a 39-cm thick brown silty clay loam to clayey very fine sand 2BC horizon with medium moderate subangular blocky structure with a few fine continuous random tubular pores.

Mid-Holocene Paleosol b1

The second part of this profile is an extremely weak paleosol consisting of a 14-cm thick grayish brown silty clay 3Ab1 horizon with a few fine faint yellowish brown mottles, medium strong subangular blocky structure, a few fine continuous random tubular pores, and a few thin clay films lining pores (Table 1; Figure 4). This overlies an 18-cm thick brown silty clay 3Btb1 horizon with few to many fine faint yellowish brown mottles, medium moderate subangular to

angular blocky structure, and many thin clay films lining a few fine continuous random tubular pores.

Mid-Holocene Paleosol b2

The third part of this profile is a weak paleosol consisting of a 20-cm thick very dark brown clay 4Ab2 horizon with medium to coarse strong subangular blocky structure and a few thin to medium thick clay films lining many fine to coarse continuous random tubular pores (Table 1; Figure 4). This overlies a 13-cm thick very dark grayish brown clay 4Btb2 horizon with common medium distinct yellow mottles, medium to coarse strong subangular blocky structure, and a few thin clay films lining many fine to coarse continuous random tubular pores (Figure 5). This overlies a >22-cm thick brown clay 4BCtb2 horizon with common medium distinct yellow mottles, medium to coarse strong subangular to angular blocky structure, and common thin to medium thick clay films lining many fine to coarse continuous random tubular pores.

Soil pH and Electrical Conductivity

The properties of young sediments of consistent texture generally are not expected to show much change with depth. That is why changes in chemical properties, such as soil pH and electrical conductivity (EC), supply information on the degree soil weathering. Such "depth functions" prove that pedogenesis indeed did occur, and help to support the judgements involved in preparing soil descriptions (Borchardt, 2016). Unweathered rocks and sediments usually have no changes in pH and EC with depth.

The pH in Soil Profile No. 1, for instance, is 5.75 in the surface of the modern soil, decreases in the A2 horizon, and then increases to 5.9 in the 2BC horizon (Figure 6). The slight increase in the A1 probably was produced by Ca-laden vegetative material deposited on the soil. The subsequent increase with depth probably reflects the young age of this soil. As mentioned, the pH of unweathered sediments generally is about 7.0.

The EC in Soil Profile No. 1 also increases with depth in the modern soil, reaching a maximum in the Bt horizon (Figure 7). This is 171 cm from the buried surface of the modern soil—a wetting front about 71 cm deeper than what would be expected under the current climate. I attribute this to the cumulic nature of the profile: Recent flooding appears to have contributed silts and clays to the surface, thickening the modern soil.

Soil Ages

Soil profiles estimated to be mid- to late-Holocene at Contra Costa Community College (CCCC) (WLA, 2003, Borchardt, 2008, Baldwin, 2009, Borchardt, 2012; 2016) are remarkably similar to the profile at our present site. In that study, we obtained bulk samples of the two Ab horizons to get the MRT (mean residence time) for C-14 in each (Borchardt, 2016). The Ab1 and Ab2 horizons had calibrated MRT ages of 3.375 ka and 4.040 ka. The difference between the two was 0.865 ky, which was slightly less than the 1 ky estimated in the field. Because MRT

ages represent carbon from the beginning of soil development (t_o) to the end of soil development (t_b), I used the difference (0.865 ky) to estimate that the beginning of soil development in the Ab2 began at 4.47 ka and ended 865 years later at 3.61 ka. Similar calculations were performed for the Ab1 horizon. The 286-cm thick profile was deposited since 4.47 ka.

The present site affords almost the same situation. In this instance, we dated the top 1 cm of the 4Ab2 horizon at 5.3 ka (Table 2). The paleosols had Bt and solum horizon thicknesses of 8 and 32 cm for the b1 and 13 and 65 cm for the b2. When compared to the 76-cm Bt and 209-cm solum thicknesses of the modern soil, this yielded average t_d values of 0.6 ky for the b1 and 1.0 ky for the b2 (Table 1). The upshot is that pedogenesis in paleosol b2 adds 1.0 ky to the C14 age, yielding a 6.3-ka age for the base of the profile.

The sedimentation rate for the profile was 0.54 mm/yr for the last 6.3 ka (3.39 m in 6.3 ky). This was similar to the soil profile studied at CCCC, which had a sedimentation rate of 0.64 mm/yr for the last 4.5 ka (2.86 m in 4.5 ky). That is why the paleosols were so weak. They had less than a thousand years of exposure to the elements before the next series of floods buried them. Coincidentally, the modern soil at CCCC had a sedimentation rate of 0.53 mm/yr, which also was similar to the rate found for the bay marsh along the Hayward fault at Point Pinole (0.44 mm/yr) since 1.3 ka (Borchardt, 1988). These rates are commensurate with the worldwide rise in sea level that has occurred in geologically stable areas (Bloom, 1970). This suggests that rising sea level controls the base level and rate of overbank deposition in the Pescadero Creek drainage.

Seismic Hazard

The relatively high sedimentation rate in the area makes it impossible to safely excavate deep enough to uncover additional, still older paleosols. Nevertheless, the 6.3-ka age of the soil profile we examined should be sufficient for detecting any hazardous traces of the San Gregorio fault. A study of the fault at Moss Beach about 33 km to the north estimated that the Holocene slip rate was about 4 mm/yr (Simpson, Lettis, and Randolph, 1998). That site had a 1.5- to 6-m high east-facing scarp, with evidence for the most recent event having occurred 220 to 730 years ago (average 475 years ago). The penultimate event occurred between 620 and 1400 A.D. (average 1010 A.D.). These earthquakes are estimated to have been about M7 with offsets between 3 and 5 m. With the implied recurrence interval of about 500 years, the 6.3-ka soil at our site would have experienced about a dozen events had it been exposed to the San Gregorio fault. That level of activity would be obvious in seismic excavations despite the soil age being younger than desired.

CONCLUSIONS

1. Both the modern soil and the underlying mid-Holocene paleosols can be used to evaluate surface fault rupture (SFR) at this site.
2. Offsets or warping of the paleosols should be considered potential for SFR.

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Table 1. Soil profile described on the alluvial plain about 192 m east of the mapped trace of the San Gregorio fault near intersection of Cloverdale Road and Butano Cutoff, west of Pescadero High School at Pescadero, California. Abbreviations and definitions are given in Schoeneberger and others (2012) and Soil Survey Staff (1993, 1999, 2010).

Description of soil developed in overbank deposits by Glenn Borchardt, who measured and sampled the soil on June 22, 2016 at latitude N37.24768^{o} and longitude W122.36591^{o} at station 48' in the south wall of Trench 1-T1 at an elevation of 54'(54' Google Earth and 51' GPS). Mediterranean climate with mean annual precipitation of 26.62"/yr at Half Moon Bay (1948-2010). Slope 0% along trench (natural slope is 2.6% for a distance of 192 m west). Moderate drainage. Water at 396 cm. The parent material is silty clay overbank deposits. Soil pH is medium acid throughout. Soil in the area is mapped as: *Soquel loam, Cumulic Haploxerolls, 0-1% slope, with a solum thickness of 94 cm overlying a paleosol.*

Horizon	Depth, cm	Description
Fill	0-65	10-cm asphalt over 55 cm fill
A1	65-117	Very dark brown (10YR2/2m; 4/2d) silty clay; medium moderate angular blocky structure; sticky and plastic when wet, very friable when moist, and extremely hard when dry; many fine to medium continuous random tubular pores; few thin very dark brown clay films lining pores; diffuse smooth boundary; pH 5.75; conductivity 267 uS; Sample No. 16B031.
A2	117-160	Very dark brown (10YR2/2m; 5/2d) silty clay; medium moderate angular to subangular blocky structure; sticky and plastic when wet, very friable when moist, and very hard when dry; many fine to medium continuous random tubular pores; diffuse smooth boundary; pH 5.63; conductivity 277 uS; Sample No. 16B032.
A3	160-198	Very dark grayish brown (10YR3/2m; 5/2d) silty clay; medium moderate angular to subangular blocky structure; sticky and plastic when wet, very friable when moist, and very hard when dry; many fine to medium continuous random tubular pores; gradual wavy boundary; pH 5.70; conductivity 362 uS; Sample No. 16B033.
Bt	198-274	Dark brown (10YR3/3m; 6/4d) silty clay; medium moderate to strong angular blocky to prismatic structure; sticky and plastic when wet, very friable when moist, and very hard when dry; many fine to medium continuous vertical to random tubular pores; diffuse smooth boundary; many thin to medium thick black clay films lining pores; pH 5.80; conductivity 448 uS; Sample No. 16B034.

2BC 274-313 Brown (10YR5/3m; 7/4d) silty clay loam to clayey very fine sand; medium moderate subangular blocky structure; slightly sticky and slightly plastic when wet, very friable when moist, and very hard when dry; few fine continuous random tubular pores; clear wavy boundary; pH 5.92; conductivity 298 uS; Sample No. 16B035.

*ESTIMATED AGE:	t_o	=	4.7	ka
	t_b	=	0	ka
	t_d	=	4.7	ky

3Ab1 313-327 Grayish brown (10YR5/2m; 6/4d) silty clay with few fine faint yellowish brown (10YR5/6md) mottles; medium strong subangular blocky structure; slightly sticky and slightly plastic when wet, very friable when moist, and very hard when dry; few fine continuous random tubular pores; few thin clay films lining pores; clear wavy boundary; pH 5.89; conductivity 320 uS; Sample No. 16B036.

3Btb1 327-345 Brown (10YR4/3m; 7/4d) silty clay with few to many fine faint yellowish brown (10YR5/6md) mottles; medium moderate subangular to angular blocky structure; sticky and plastic when wet, very friable when moist, and very hard when dry; few fine continuous random tubular pores; many thin clay films lining pores; clear smooth boundary; pH 5.87; conductivity 309 uS; Sample No. 16B037.

*ESTIMATED AGE:	t_o	=	5.3	ka
	t_b	=	4.7	ka
	t_d	=	0.6	ky

4Ab2 345-365 Very dark brown (10YR2/2m; 5/2d) clay with very few fine faint yellow (10YR7/6md) mottles; medium to coarse strong subangular blocky structure; sticky and plastic when wet, very friable when moist, and very hard when dry; many fine to coarse continuous random tubular pores; few thin to medium thick clay films lining pores; clear smooth boundary; pH 5.91; conductivity 267 uS; Sample No. 16B038. [Upper 1-cm in sample 16B041 had a C-14 age of 5,295 calendar years.]

4Btb2 365-378 Very dark grayish brown (10YR3/2m; 5/2d) clay with common medium distinct yellow (10YR7/6md) mottles; medium to coarse strong subangular blocky structure; sticky and plastic when wet, very friable when moist, and extremely hard when dry; many fine to coarse continuous random tubular pores; few thin clay films lining pores; clear smooth boundary; pH 5.92; conductivity 235 uS; Sample No. 16B039.

4BCtb2 378-400+ Brown (10YR4/3m; 6/4d) clay with common medium distinct yellow (10YR7/6md) mottles; medium to coarse strong subangular to angular blocky structure; sticky and plastic when wet, very friable when moist, and very hard when dry; many fine to coarse continuous random tubular pores; common thin to medium thick clay films lining pores; pH 5.93; conductivity 330 uS; Sample No. 16B040.

*ESTIMATED AGE:	t_o	=	6.3	ka
	t_b	=	5.3	ka
	t_d	=	1.0	ky

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*Pedochronological estimates based on available information. All ages should be considered subject to ±50% variation unless otherwise indicated (Borchardt, 1992). Bold dates are absolute.

t_o = date when soil formation or aggradation began, ka

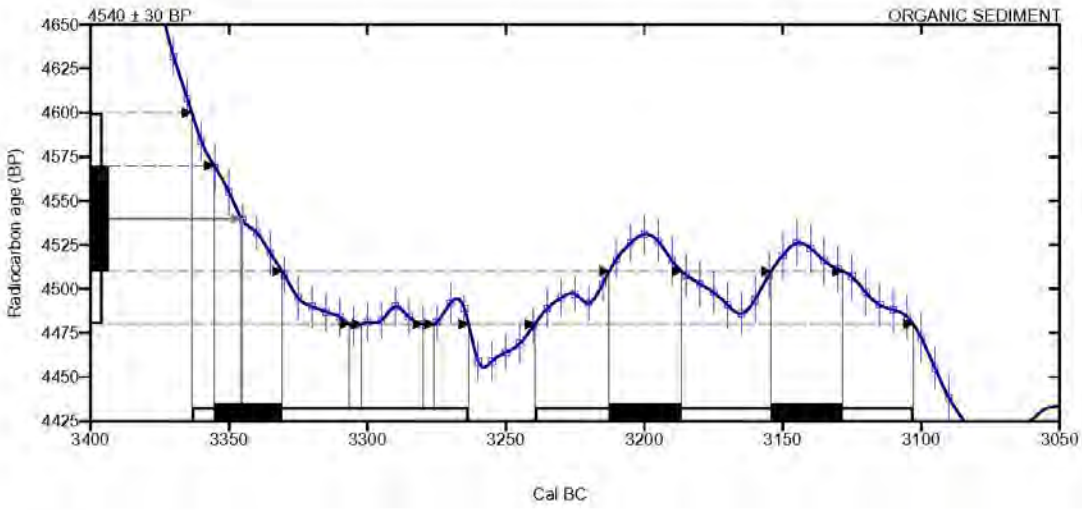
t_b = date when soil or strata was buried, ka

t_d = duration of soil development or aggradation, ky

CALIBRATION OF RADIOCARBON AGE TO CALENDAR YEARS

(Variables: C13/C12 = -25.3 o/oo : lab. mult = 1)

Laboratory number	**Beta-440519 : 16B041**
Conventional radiocarbon age	**4540 ± 30 BP**
Calibrated Result (95% Probability)	**Cal BC 3365 to 3265 (Cal BP 5315 to 5215)** **Cal BC 3240 to 3105 (Cal BP 5190 to 5055)**
Intercept of radiocarbon age with calibration curve	Cal BC 3345 (Cal BP 5295)
Calibrated Result (68% Probability)	Cal BC 3355 to 3330 (Cal BP 5305 to 5280) Cal BC 3215 to 3185 (Cal BP 5165 to 5135) Cal BC 3155 to 3130 (Cal BP 5105 to 5080)



Database used
INTCAL13

References

Mathematics used for calibration scenario
A Simplified Approach to Calibrating C14 Dates, Talma, A. S., Vogel, J. C., 1993, Radiocarbon 35(2):317-322

References to INTCAL13 database
Reimer P J et al. IntCal13 and Marine13 radiocarbon age calibration curves 0–50,000 years cal BP. Radiocarbon 55(4):1869–1887., 2013.

Beta Analytic Radiocarbon Dating Laboratory
4985 S.W. 74th Court, Miami, Florida 33155 • Tel: (305)667-5167 • Fax: (305)663-0964 • Email: beta@radiocarbon.com

1

Table 2. Analysis of the soil carbon in the upper 1-cm of the 4Ab2 horizon showing a calibrated age of 5,295 calendar years (5.295 ka).

Figure 1. Soil Profile No. 1 192 m east of the San Gregorio fault at Pescadero High School, Pescadero, California, showing the very dark brown A1 horizon. View S.

Figure 2. Base of the 133-cm thick A horizon showing krotovinas and/or remnants of the Bt horizon left behind by soil tongue development. View S.

Figure 3. Bt and 2BC horizons. Note the black krotovina in the middle of the Bt and the vertical root traces. View S.

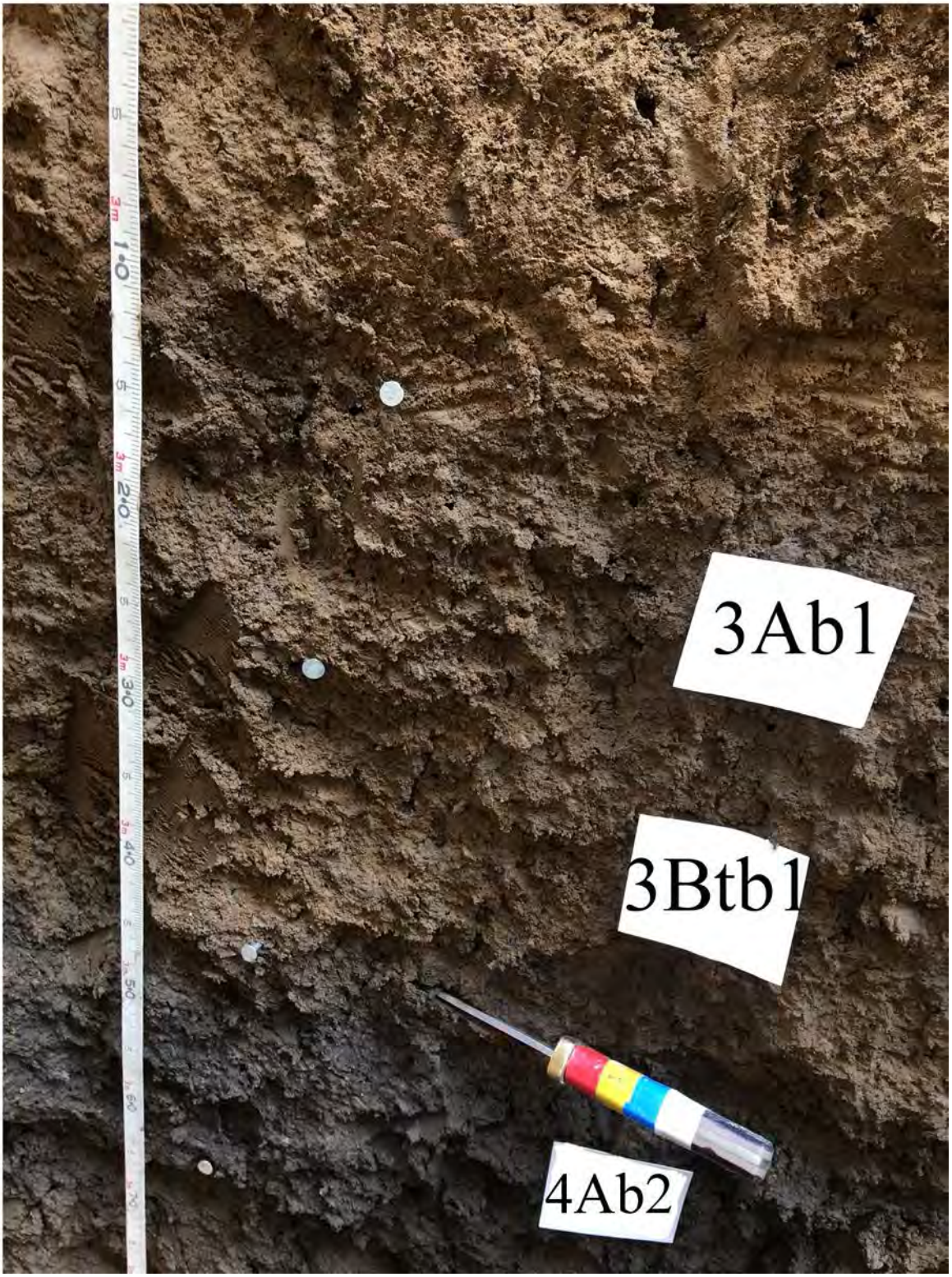


Figure 4. The short-duration b1 and b2 paleosols. The top 1cm of the Ab2 horizon had a C-14 age of 5.3 ka (Table 2). The b2 paleosol was estimated to have a t_d of 1 ka, yielding a t_o age for the profile of 6.3 ka.

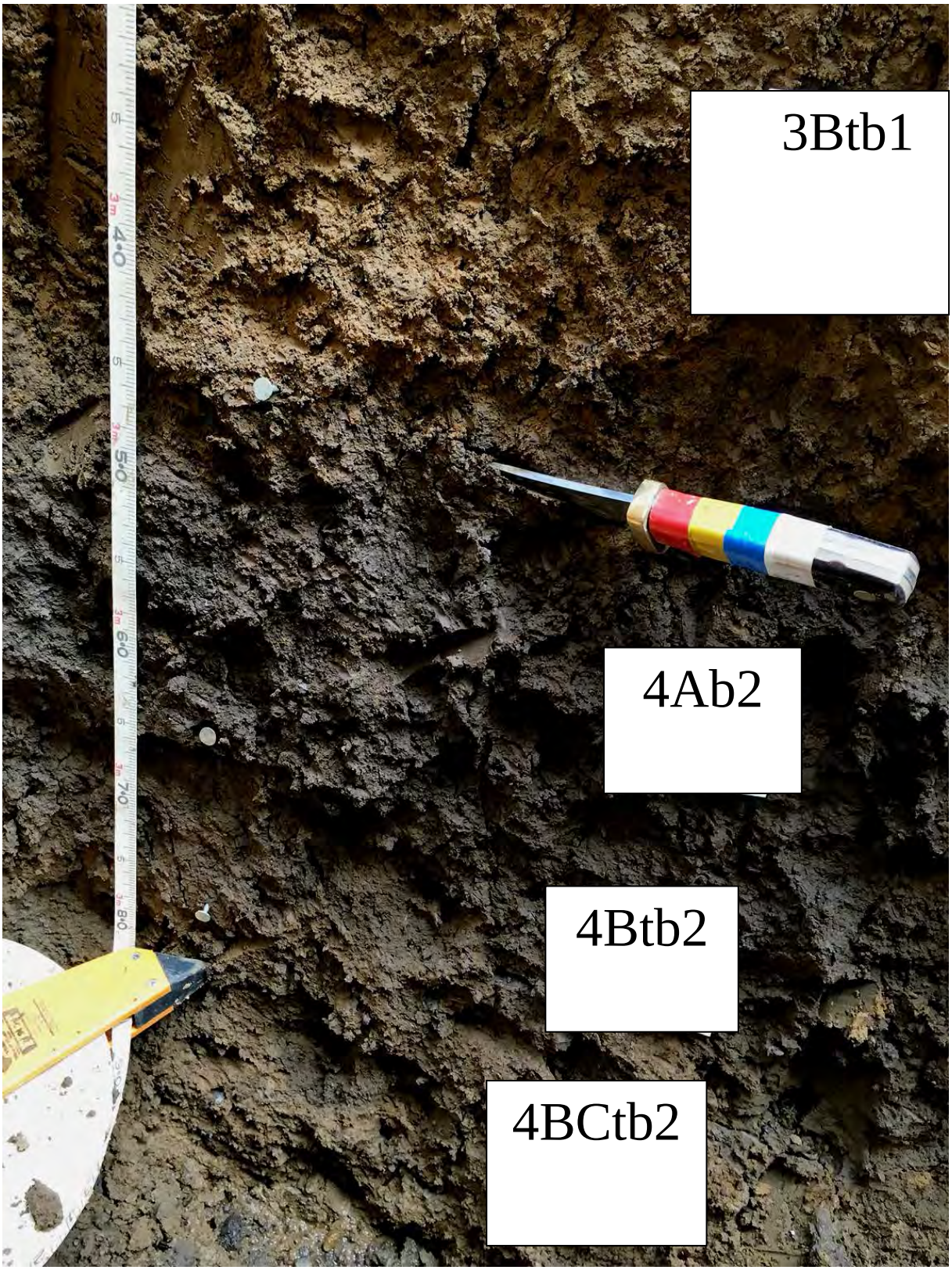


Figure 5. Paleosol b2 showing the location of the C-14 sample taken from the top 1 cm of the 4Ab2 horizon (at the tip of the knife). View S.

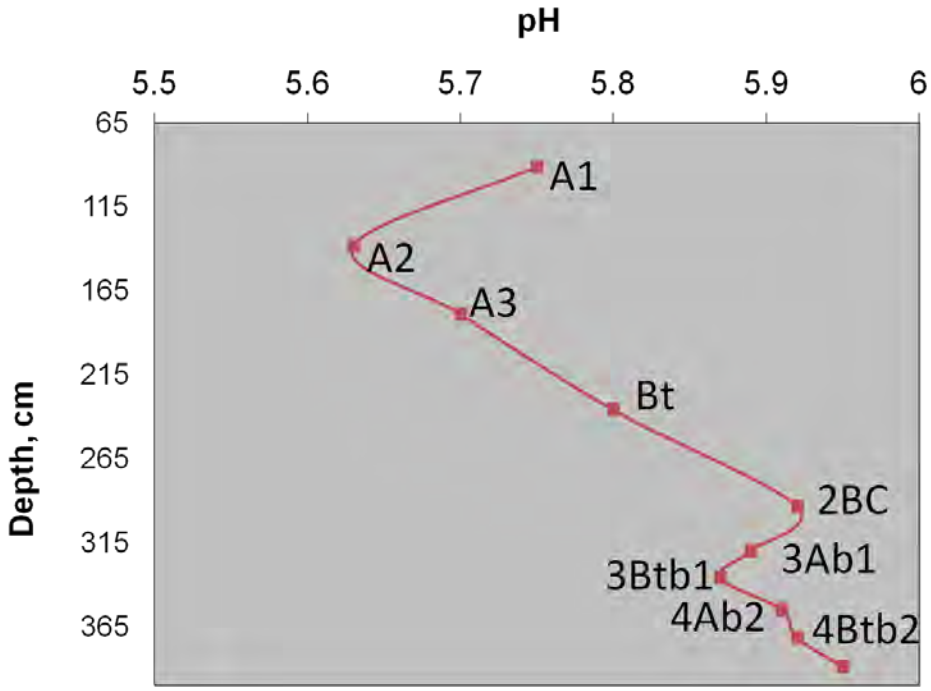


Figure 6. Depth function for pH in Soil Profile No. 1 192 m east of the San Gregorio fault at Pescadero High School, Pescadero, California.

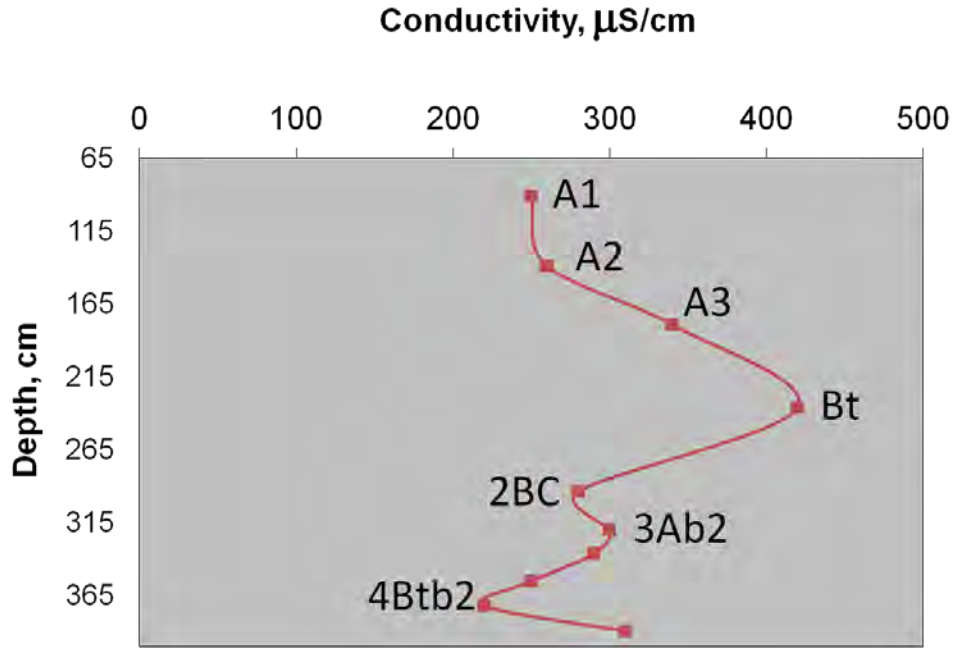


Figure 7. Depth function for electrical conductivity in Soil Profile No. 1 192 m east of the San Gregorio fault at Pescadero High School, Pescadero, California. The maximum indicates an area of salt entrapment. These often exist at the base of fine-textured paleosols (Borchardt, 2016).

July 1, 2015

SOILS GLOSSARY

AGE. Elapsed time in calendar years. Because the cosmic production of C-14 has varied during the Quaternary, radiocarbon years (expressed as ky B.P.) must be corrected by using tree-ring and other data. Abbreviations used for corrected ages are: ka (kilo anno or years in thousands) or Ma (millions of years). Abbreviations used for intervals are: yr (years), ky (thousands of years). radiocarbon ages = yr B.P. Calibrated ages are calculated from process assumptions, relative ages fit in a sequence, and correlated ages refer to a matching unit. (See also yr B.P., HOLOCENE, PLEISTOCENE, QUATERNARY, PEDOCHRONOLOGY).

AGGRADATION. Deposition on the earth's surface in the direction of uniformity of grade.

ALKALI (SODIC) SOIL. A soil having so high a degree of alkalinity (pH 8.5 or higher) or so high a percentage of exchangeable sodium (15 % or more of the total exchangeable bases) that plant growth is restricted.

ALKALINE SOIL. Any soil that has a pH greater than 7.3. (See Reaction, Soil.)

ANGULAR ORPHANS. Angular fragments separated from weathered, well-rounded cobbles in colluvium derived from conglomerate.

ARGILLAN. (See Clay Film.)

ARGILLIC horizon. A horizon containing clay either translocated from above or formed in place through pedogenesis.

ALLUVIATION. The process of building up of sediments by a stream at places where stream velocity is decreased. The coarsest particles settle first and the finest particles settle last.

ANOXIC. (See also GLEYED SOIL). A soil having a low redox potential.

AQUICLUDE. A saturated body of sediment or rock that is incapable of transmitting significant quantities of water under ordinary hydraulic gradients.

AQUITARD. A body of rock or sediment that retards but does not prevent the flow of water to or from an adjacent aquifer. It does not readily yield water to wells or springs but may serve as a storage unit for groundwater.

ATTERBERG LIMITS. The moisture content at which a soil passes from a semi-solid to a plastic state (plastic limit, PL) and from a plastic to a liquid state (liquid limit, LL). The plasticity index (PI) is the numerical difference between the LL and the PL.

BEDROCK. The solid rock that underlies the soil and other unconsolidated material or that is exposed at the surface.

BISEQUUM. Two soils in vertical sequence, each soil containing an eluvial horizon and its underlying B horizon.

BOUDIN, BOUDINAGE. From a French word for sausage, describes the way that layers of rock break up under extension. Imagine the hand, fingers together, flat on the table, encased in soft clay and being squeezed from above, as being like a layer of rock. As the spreading clay moves

the fingers (sausages) apart, the most mobile rock fractions are drawn or squeezed into the developing gaps.

BURIED SOIL. A developed soil that was once exposed but is now overlain by a more recently formed soil.

CALCAREOUS SOIL. A soil containing enough calcium carbonate (commonly with magnesium carbonate) to effervesce (fizz) visibly when treated with cold, dilute hydrochloric acid. A soil having measurable amounts of calcium carbonate or magnesium carbonate.

CARBONATE MORPHOLOGY STAGES. Descriptive classes of calcite precipitation indicating increasing pedogenesis over time:

Stage	Description	Percent Carbonate
I	Bk horizon with few filaments and coatings	<10
I+	Bk with common filaments and continuous clast coatings	<10
II	Bk with continuous clast coatings, white masses, few nodules	>10
II+	Bk as above, but matrix is completely whitened, common nodules	>15
>II	K horizon that is 90% white, many nodules	>20
III+	K that is completely plugged	>40
IV	K as above, but upper part cemented and has weak platy structure	>50
V	K same as above, but laminar layer is strong with incipient brecciation	>50
VI	K brecciation and recementation, as well as pisoliths, are common	>50

CATENA. A sequence of soils of about the same age, derived from similar parent material and forming under similar climatic conditions, but having different characteristics due to variation in relief and drainage. (See also TOPOSEQUENCE.)

CEC. Cation exchange capacity. The amount of negative charge balanced by positively charged ions (cations) that are exchangeable by other cations in solution (meq/100 g soil = cmol(+)/kg soil).

CLAY. As a soil separate, the mineral soil particles are less than 0.002 mm in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

CLAY FILM. A coating of oriented clay on the surface of a sand grain, pebble, soil aggregate, or ped. Clay films also line pores or root channels and bridge sand grains. Frequency classification is based on the percent of the ped faces and/or pores that contain films: very few--<5%; few--5-25%; common--25-50%; many--50-90%; and continuous--90-100%. Thickness classification is based on visibility of sand grains: thin--very fine sand grains standout; moderately thick--very fine sand grains impart microrelief to film; thick--fine sand grains enveloped by clay and films visible without magnification. Synonyms: clay skin, clay coat, argillan, illuviation cutan.

CLAY LAMELLAE. Thin, generally wavy bands that appear as multiple micro-Bt horizons at the base of the solum in sandy Holocene deposits. The lamellae generally are 1-3 cm in thickness and 5 to 30 cm apart. There may be two to six or more clay lamellae comprising the Bt horizon of such a soil.

COBBLE. Rounded or partially rounded fragments of rock ranging from 7.5 to 25 cm in diameter.

COLLUVIUM. Any loose mass of soil or rock fragments that moves downslope largely by the force of gravity. Usually it is thicker at the base of the slope.

COLLUVIUM-FILLED SWALE. The prefailure topography of the source area of a debris flow.

COMPARATIVE PEDOLOGY. The comparison of soils, particularly through examination of features known to evolve through time.

CONCRETIONS. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrated compounds or cemented soil grains. The composition of most concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are common compounds in concretions.

CONDUCTIVITY. The ability of a soil solution to conduct electricity, generally expressed as the reciprocal of the electrical resistivity. Electrical conductance is the reciprocal of the resistance ($1/R = 1/ohm = ohm^{-1}$ = mho [reverse of ohm] = siemens = S), while electrical conductivity is the reciprocal of the electrical resistivity (EC = 1/r = 1/ohm-cm = mho/cm = S/cm or mmho/cm = dS/m). EC, expressed as uS/cm, is equivalent to the ppm of salt in solution when multiplied by 0.640. Pure rain water has an EC of 0, standard 0.01 N KCl is 1411.8 uS at 25C, and the growth of salt-sensitive crops is restricted in soils having saturation extracts with an EC greater than 2,000 uS/cm. Measurements in soils are usually performed on 1:1 suspensions containing one part by weight of soil and one part by weight of distilled water.

CONSISTENCE, SOIL. The feel of the soil and the ease with which a lump can be crushed by the fingers. Terms commonly used to describe consistence are --

Loose.--Noncoherent when dry or moist; does not hold together in a mass.

Friable.--When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.--When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.--When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky.--When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.--When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.--When dry, breaks into powder or individual grains under very slight pressure.

Cemented.--Hard and brittle; little affected by moistening.

CTPOT. Easily remembered acronym for climate, topography, parent material, organisms, and time; the five factors of soil formation.

CUMULIC. A soil horizon that has undergone aggradation coincident with its active development.

CUTAN. (See Clay Film.)

DEBRIS FLOW. Incoherent or broken masses of rock, soil, and other debris that move downslope in a manner similar to a viscous fluid.

DEBRIS SLOPE. A constant slope with debris on it from the free face above.

DEGRADATION. A modification of the earth's surface by erosion.

DURIPAN. A subsurface soil horizon that is cemented by illuvial silica, generally deposited as opal or microcrystalline silica, to the degree that less than 50 percent of the volume of air-dry fragments will slake in water or HCl.

ELUVIATION. The removal of soluble material and solid particles, mostly clay and humus, from a soil horizon by percolating water.

EOLIAN. Deposits laid down by the wind, landforms eroded by the wind, or structures such as ripple marks made by the wind.

FAULT-LINE SCARP. A scarp that has been produced by differential erosion along an old fault line.

FAULTSLIDE. A landslide that shows physical evidence of its interaction with a fault.

FIRST-ORDER DRAINAGE. The most upstream, field-discernible concavity that conducts water and sediments to lower parts of a watershed.

FLOOD PLAIN. A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artificially.

FOSSIL FISSURE. A buried rectilinear chamber associated with extension due to ground movement. The chamber must be oriented along the strike of the shear and must have vertical and horizontal dimensions greater than its width. It must show no evidence of faunal activity and its walls may have silt or clay coatings indicative of frequent temporary saturation with ground water. May be mistaken for an animal burrow. Also known as a paleofissure.

FRIABILITY. Term for the ease with which soil crumbles. A friable soil is one that crumbles easily.

GENESIS, SOIL. The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum (A and B horizons) from the unconsolidated parent material.

GEOMORPHIC. Pertaining to the form of the surface features of the earth. Specifically, geomorphology is the analysis of landforms and their mode of origin.

GLEYED SOIL. A soil having one or more neutral gray horizons as a result of water logging and lack of oxygen. The term "gleyed" also designates gray horizons and horizons having yellow and gray mottles as a result of intermittent water logging.

GRAVEL. Rounded or angular fragments of rock 2 to 75 mm in diameter. Soil textures with >15% gravel have the prefix "gravelly" and those with >90% gravel have the suffix "gravel."

HIGHSTAND. The highest elevation reached by the ocean during an interglacial period.

HOLOCENE. The most recent epoch of geologic time, extending from 10 ka to the present.

HORIZON, SOIL. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major soil horizons:

O horizon.--The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon.--The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

E horizon -- This eluvial horizon is light in color, lying beneath the A horizon and above the B horizon. It is made up mostly of sand and silt, having lost most of its clay and iron oxides through reduction, chelation, and translocation.

B horizon.--The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these.

C horizon.--The relatively unweathered material immediately beneath the solum. Included are sediment, saprolite, organic matter, and bedrock excavatable with a spade. In most soils this material is presumed to be like that from which the overlying horizons were formed. If the material is known to be different from that in the solum, a number precedes the letter C.

R horizon.--Consolidated rock not excavatable with a spade. It may contain a few cracks filled with roots or clay or oxides. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Major horizons may be further distinguished by applying prefix Arabic numbers to designate differences in parent materials as they are encountered (e.g., 2B, 2BC, 3C) or by applying suffix numerals to designate minor changes (e.g., B1, B2).

The following is from the Natural Resources Conservation Service, except for the proposed addition of mn:

“Suffix Symbols

Lowercase letters are used as suffixes to designate specific kinds of master horizons and layers. The term “accumulation” is used in many of the definitions of such horizons to indicate that these horizons must contain more of the material in question than is presumed to have been present in the parent material. The suffix symbols and their meanings are as follows:

a Highly decomposed organic material

This symbol is used with O to indicate the most highly decomposed organic materials, which have a fiber content of less than 17 percent (by volume) after rubbing.

b Buried genetic horizon

This symbol is used in mineral soils to indicate identifiable buried horizons with major genetic features that were developed before burial. Genetic horizons may or may not have formed in the overlying material, which may be either like or unlike the assumed parent material of the buried soil. This symbol is not used in organic soils, nor is it used to separate an organic layer from a mineral layer.

c *Concretions or nodules*

This symbol indicates a significant accumulation of concretions or nodules. Cementation is required. The cementing agent commonly is iron, aluminum, manganese, or titanium. It cannot be silica, dolomite, calcite, or more soluble salts.

co *Coprogenous earth*

This symbol, used only with L, indicates a limnic layer of coprogenous earth (or sedimentary peat).

d *Physical root restriction*

This symbol indicates noncemented, root-restricting layers in natural or human-made sediments or materials. Examples are dense basal till, plowpans, and other mechanically compacted zones.

di *Diatomaceous earth*

This symbol, used only with L, indicates a limnic layer of diatomaceous earth.

e *Organic material of intermediate decomposition*

This symbol is used with O to indicate organic materials of intermediate decomposition. The fiber content of these materials is 17 to 40 percent (by volume) after rubbing.

f *Frozen soil or water*

This symbol indicates that a horizon or layer contains permanent ice. The symbol is not used for seasonally frozen layers or for dry permafrost.

ff *Dry permafrost*

This symbol indicates a horizon or layer that is continually colder than 0^{o} C and does not contain enough ice to be cemented by ice. This suffix is not used for horizons or layers that have a temperature warmer than 0^{o} C at some time of the year.

g *Strong gleying*

This symbol indicates either that iron has been reduced and removed during soil formation or that saturation with stagnant water has preserved it in a reduced state. Most of the affected layers have chroma of 2 or less, and many have redox concentrations. The low chroma can represent either the color of reduced iron or the color of uncoated sand and silt particles from which iron has been removed. The symbol g is not used for materials of low chroma that have no history of wetness, such as some slates or E horizons. If g is used with B, pedogenic change in addition to gleying is implied. If no other pedogenic change besides gleying has taken place, the horizon is designated Cg.

h *Illuvial accumulation of organic matter*

This symbol is used with B to indicate the accumulation of illuvial, amorphous, dispersible complexes of organic matter and sesquioxides if the sesquioxide component is dominated by aluminum but is present only in very small quantities. The organo-sesquioxide material coats sand and silt particles. In some horizons these coatings have coalesced, filled pores, and cemented the horizon. The symbol h is also used in combination with s as "Bhs" if the amount of the sesquioxide component is significant but the color value and chroma, moist, of the horizon are 3 or less.

i *Slightly decomposed organic material*

This symbol is used with O to indicate the least decomposed of the organic materials. The fiber content of these materials is 40 percent or more (by volume) after rubbing.

j *Accumulation of jarosite*

Jarosite is a potassium or iron sulfate mineral that is commonly an alteration product of pyrite that has been exposed to an oxidizing environment. Jarosite has hue of 2.5Y or yellower and normally has chroma of 6 or more, although chromas as low as 3 or 4 have been reported. [Note: No longer used to indicate "juvenile."]

jj *Evidence of cryoturbation*

Evidence of cryoturbation includes irregular and broken horizon boundaries, sorted rock fragments, and organic soil materials existing as bodies and broken layers within and/or between mineral soil layers. The organic bodies and layers are most commonly at the contact between the active layer and the permafrost.

k *Accumulation of secondary carbonates*

This symbol indicates an accumulation of visible pedogenic calcium carbonate (less than 50 percent, by volume). Carbonate accumulations exist as carbonate filaments, coatings, masses, nodules, disseminated carbonate, or other forms.

kk *Engulfment of horizon by secondary carbonates*

This symbol indicates major accumulations of pedogenic calcium carbonate. The suffix kk is used when the soil fabric is plugged with fine grained pedogenic carbonate (50 percent or more, by volume) that exists as an essentially continuous medium. The suffix corresponds to the stage III plugged horizon or higher of the carbonate morphogenetic stages (Gile et al., 1966).

m *Cementation or induration*

This symbol indicates continuous or nearly continuous cementation. It is used only for horizons that are more than 90 percent cemented, although they may be fractured. The cemented layer is physically root-restrictive. The dominant cementing agent (or the two dominant ones) may be indicated by adding defined letter suffixes, singly or in pairs. The horizon suffix km or kkm indicates cementation by carbonates; qm, cementation by silica; sm, cementation by iron; yym, cementation by gypsum; kqm, cementation by lime and silica; and zm, cementation by salts more soluble than gypsum.

ma *Marl*

This symbol, used only with L, indicates a limnic layer of marl.

mn *Mangans*

This symbol indicates an accumulation of manganese oxide, generally as ped coatings called mangans (First used by Borchardt on 20130418.)

n *Accumulation of sodium*

This symbol indicates an accumulation of exchangeable sodium.

o *Residual accumulation of sesquioxides*

This symbol indicates a residual accumulation of sesquioxides.

p *Tillage or other disturbance*

This symbol indicates a disturbance of the surface layer by mechanical means, pasturing, or similar uses. A disturbed organic horizon is designated Op. A disturbed mineral horizon is designated Ap even though it is clearly a former E, B, or C horizon.

q *Accumulation of silica*

This symbol indicates an accumulation of secondary silica.

r *Weathered or soft bedrock*

This symbol is used with C to indicate cemented layers (moderately cemented or less cemented). Examples are weathered igneous rock and partly consolidated sandstone, siltstone, or slate. The excavation difficulty is low to high.

s *Illuvial accumulation of sesquioxides and organic matter*

This symbol is used with B to indicate an accumulation of illuvial, amorphous, dispersible complexes of organic matter and sesquioxides if both the organic-matter and sesquioxide components are significant and if either the color value or chroma, moist, of the horizon is 4 or more. The symbol is also used in combination with h as “Bhs” if both the organic-matter and sesquioxide components are significant and if the color value and chroma, moist, are 3 or less.

se *Presence of sulfides*

Typically dark colors (e.g., value <4, chroma <2); may have a sulphurous odor.

ss *Presence of slickensides*

This symbol indicates the presence of slickensides. Slickensides result directly from the swelling of clay minerals and shear failure, commonly at angles of 20 to 60 degrees above horizontal.

They are indicators that other vertic characteristics, such as wedge-shaped peds and surface cracks, may be present.

t *Accumulation of silicate clay*

This symbol indicates an accumulation of silicate clay that either has formed *in situ* within a horizon or has been moved into the horizon by illuviation, or both. At least some part of the horizon should show evidence of clay accumulation either as coatings on surfaces of peds or in pores, as lamellae, or as bridges between mineral grains.

u *Presence of human-manufactured materials (artifacts)*

This symbol indicates the presence of manufactured artifacts that have been created or modified by humans, usually for a practical purpose in habitation, manufacturing, excavation, or construction activities. Examples of artifacts are processed wood products, liquid petroleum products, coal, combustion by-products, asphalt, fibers and fabrics, bricks, cinder blocks, concrete, plastic, glass, rubber, paper, cardboard, iron and steel, altered metals and minerals, sanitary and medical waste, garbage, and landfill waste.

v *Plinthite*

This symbol indicates the presence of iron-rich, humus-poor, reddish material that is firm or very firm when moist and hardens irreversibly when exposed to the atmosphere and to repeated wetting and drying.

w *Development of color or structure*

This symbol is used with B to indicate the development of color or structure, or both, with little or no apparent illuvial accumulation of material. It should not be used to indicate a transitional horizon.

x *Fragipan character*

This symbol indicates a genetically developed layer that has a combination of firmness and brittleness and commonly a higher bulk density than the adjacent layers. Some part of the layer is physically root-restrictive.

y *Accumulation of gypsum*

This symbol indicates an accumulation of gypsum (<50% by volume).

yy *Dominance of gypsum*

This symbol indicates an accumulation of gypsum (>50% by volume); light colored (e.g., value >7, chroma <4); may be pedogenically derived or inherited transformation of primary gypsum from parent material.

z *Accumulation of salts more soluble than gypsum*

This symbol indicates an accumulation of salts that are more soluble than gypsum; e.g., NaCl.

HUMUS. The well-decomposed, more or less stable part of the organic matter in mineral soils.

ILLUVIATION. The deposition by percolating water of solid particles, mostly clay or humus, within a soil horizon.

INTERFLUVE. The land lying between streams.

ISOCHRONOUS BOUNDARY. A gradational boundary between two sedimentary units indicating that they are approximately the same age. Opposed to a nonisochronous boundary, which by its abruptness indicates that it delineates units having significant age differences.

KROTOVINA. An animal burrow filled with soil.

LEACHING. The removal of soluble material from soil or other material by percolating water.

LOWSTAND. The lowest elevation reached by the ocean during a glacial period.

MANGAN. A thin coating of manganese oxide (cutan) on the surface of a sand grain, pebble, soil aggregate, or ped. Mangans also line pores or root channels and bridge sand grains.

MAP. Mean annual precipitation.

MODERN SOIL. The portion of a soil section that is under the influence of current pedogenetic conditions. It generally refers to the uppermost soil regardless of age.

MODERN SOLUM. The combination of the A and B horizons in the modern soil.

MORPHOLOGY, SOIL. The physical make-up of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

MOTTLING, SOIL. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: abundance--few, common, and many; size--fine, medium, and coarse; and contrast--faint, distinct and prominent. The size measurements are these: fine, less than 5 mm in diameter along the greatest dimension; medium, from 5 to 15 mm, and coarse, more than 15 mm.

MRT (MEAN RESIDENCE TIME.) The average age of the carbon atoms within a soil horizon. Under ideal reducing conditions, the humus in a soil will have a C-14 age that is half the true age of the soil. In oxic soils humus is typically destroyed as fast as it is produced, generally yielding MRT ages no older than 300-1000 years, regardless of the true age of the soil.

MUNSELL COLOR NOTATION. Scientific description of color determined by comparing soil to a Munsell Soil Color Chart (Available from Macbeth Division of Kollmorgen Corp., 2441 N. Calvert St., Baltimore, MD 21218). For example, dark yellowish brown is denoted as 10YR3/4m in which the 10YR refers to the hue or proportions of yellow and red, 3 refers to value or lightness (0 is black and 10 is white), 4 refers to chroma (0 is pure black and white and 20 is the pure color), and m refers to the moist condition rather than the dry (d) condition.

OVERBANK DEPOSIT. Fine-grained alluvial sediments deposited from floodwaters outside of the fluvial channel.

OXIC. A soil having a high redox potential. Such soils typically are well drained, seldom being waterlogged or lacking in oxygen. Rubification in such soils tends to increase with age.

PALEO SOIL TONGUE. A soil tongue that formed during a previous soil-forming interval.

PALEOSEISMOLOGY. The study of prehistoric earthquakes through the examination of soils, sediments, and rocks.

PALEOSOL. A soil that formed on a landscape in the past with distinctive morphological features resulting from a soil-forming environment that no longer exists at the site. The former

pedogenic process was either altered because of external environmental change or interrupted by burial.

PALINSPASTIC RECONSTRUCTION. Diagrammatic reconstruction used to obtain a picture of what geologic and/or soil units looked like before their tectonic deformation.

PARENT MATERIAL. The great variety of unconsolidated organic and mineral material in which soil forms. Consolidated bedrock is not yet parent material by this concept.

PED. An individual natural soil aggregate, such as a granule, a prism, or a block.

PEDOCHRONOLOGY. The study of pedogenesis with regard to the determination of when soil formation began, how long it occurred, and when it stopped. Also known as soil dating. Two ages and the calculated duration are important:

t_o = age when soil formation or aggradation began, ka

t_b = age when the soil or stratum was buried, ka

t_d = duration of soil development or aggradation, ky

Pedochronological estimates are based on available information. All ages should be considered subject to $\pm$50% variation unless otherwise indicated.

PEDOCHRONOPALEOSEISMOLOGY. The study of prehistoric earthquakes by using pedochronology.

PEDOLOGY. The study of the process through which rocks, sediments, and their constituent minerals are transformed into soils and their constituent minerals at or near the surface of the earth.

PEDOGENESIS. The process through which rocks, sediments, and their constituent minerals are transformed into soils and their constituent minerals at or near the surface of the earth.

PERCOLATION. The downward movement of water through the soil.

pH VALUE. The negative log of the hydrogen ion concentration. Measurements in soils are usually performed on 1:1 suspensions containing one part by weight of soil and one part by weight of distilled water. A soil with a pH of 7.0 is precisely neutral in reaction because it is neither acid nor alkaline. An acid or "sour" soil is one that gives an acid reaction; an alkaline soil is one that gives an alkaline reaction. In words, the degrees of acidity or alkalinity are expressed as:

Extremely acid	<4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4

Strongly alkaline	8.5 to 9.0
Very strongly alkaline	>9.0
Used if significant:	
Very slightly acid	6.6 to 6.9
Very mildly alkaline	7.1 to 7.3

PHREATIC SURFACE. (See Water Table.)

PLANATION. The process of erosion whereby a portion of the surface of the Earth is reduced to a fundamentally even, flat, or level surface by a meandering stream, waves, currents, glaciers, or wind.

PLEISTOCENE. An epoch of geologic time extending from 10 ka to 1.8 Ma; it includes the last Ice Age.

PROFILE, SOIL. A vertical section of the soil through all its horizons and extending into the parent material.

QUATERNARY. A period of geologic time that includes the past 1.8 Ma. It consists of two epochs--the Pleistocene and Holocene.

PROGRADATION. The building outward toward the sea of a shoreline or coastline by nearshore deposition.

REFUGIUM. A place of refuge. Plants, animals, and soil minerals tend to accumulate only in the most ideal areas when surrounded by a hostile environment.

RELICT SOIL. A surface soil that was partly formed under climatic conditions significantly different from the present.

RUBIFICATION. The reddening of soils through the release and precipitation of iron as an oxide during weathering. Munsell hues and chromas of well-drained soils generally increase with soil age.

SALINE SOIL. A soil that contains soluble salts in amounts that impair the growth of crop plants but that does not contain excess exchangeable sodium.

SAND. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 mm. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

SECONDARY FAULT. A minor fault that bifurcates from or is associated with a primary fault. Movement on a secondary fault never occurs independently of movement on the primary, seismogenic fault.

SHORELINE ANGLE. The line formed by the intersection of the wave-cut platform and the sea cliff. It approximates the position of sea level at the time the platform was formed.

SILT. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 mm) to the lower limit of very find sand (0.05 mm.) Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

SLICKENSIDES. Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may form along a fault plane; at the bases of slip surfaces on steep slopes; on faces of blocks, prisms, and columns undergoing shrink-swell. In tectonic slickensides the striations are strictly parallel.

SLIP RATE. The rate at which the geologic materials on the two sides of a fault move past each other over geologic time. The slip rate is expressed in mm/yr, and the applicable duration is stated. Faults having slip rates less than 0.01 mm/yr are generally considered inactive, while faults with Holocene slip rates greater than 0.1 mm/yr generally display tectonic geomorphology.

SMECTITE. A fine, platy, aluminosilicate clay mineral that expands and contracts with the absorption and loss of water. It has a high cation-exchange capacity and is plastic and sticky when moist.

SOIL. A natural, three-dimensional body at the earth's surface that is capable of supporting plants and has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

SOIL SEISMOLOGIST. Soil scientist who studies the effects of earthquakes on soils.

SOIL SLICKS. Curvilinear striations that form in swelling clayey soils, where there is marked change in moisture content. Clayey slopes buttressed by rigid materials may allow minor amounts of gravitationally driven plastic flow, forming soil slicks sometimes mistaken for evidence of tectonism. Soil slicks disappear with depth and the striations are seldom strictly parallel as they are when movement is major. (See also SLICKENSIDES.)

SOIL TECTONICS. The study of the interactions between soil formation and tectonism.

SOIL TONGUE. That portion of a soil horizon extending into a lower horizon.

SOLUM. Combined A and B horizons. Also called the true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

STONELINE. A thin, buried, planar layer of stones, cobbles, or bedrock fragments. Stonelines of geological origin may have been deposited upon a former land surface. The fragments are more often pebbles or cobbles than stones. A stoneline generally overlies material that was subject to weathering, soil formation, and erosion before deposition of the overlying material. Many stonelines seem to be buried erosion pavements, originally formed by running water on the land surface and concurrently covered by surficial sediment.

STRATH TERRACE. A gently sloping terrace surface bearing little evidence of aggradation.

STRUCTURE, SOIL. The arrangement of primary soil particles into compound particles or aggregates that are separated from adjoining aggregates. The principal forms of soil structure are--platy (laminated), prismatic (vertical axis of aggregates longer than horizontal), columnar (prisms with rounded tops), blocky (angular or subangular), and granular. Structureless soils are either single grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

SUBSIDIARY FAULT. A branch fault that extends a substantial distance from the main fault zone.

SURFACE FAULT RUPTURE (SFR). Permanent disturbance of soil surface occurring as a result of tectonic offset. This may produce ground cracks, offsets, and warping of soil horizons.

TECTOTURBATION. Soil disturbance resulting from tectonic movement.

TEXTURE, SOIL. Particle size classification of a soil, generally given in terms of the USDA system which uses the term "loam" for a soil having equal properties of sand, silt, and clay. The basic textural classes, in order of their increasing proportions of fine particles are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sand clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

TOPOSEQUENCE. A sequence of kinds of soil in relation to position on a slope. (See also CATENA.)

TRANSLOCATION. The physical movement of soil particles, particularly fine clay, from one soil horizon to another under the influence of gravity.

UNIFIED SOIL CLASSIFICATION SYSTEM. The particle size classification system used by the U.S. Army Corps of Engineers and the Bureau of Reclamation. Like the ASTM and AASHO systems, the sand/silt boundary is at 80 um instead of 50 um used by the USDA. Unlike all other systems, the gravel/sand boundary is at 4 mm instead of 2 mm and the silt/clay boundary is determined by using Atterberg limits.

VERTISOL. A soil with at least 30% clay, usually smectite, that fosters pronounced changes in volume with change in moisture. Cracks greater than 1 cm wide appear at a depth of 50 cm during the dry season each year. One of the ten USDA soil orders.

WATER TABLE. The upper limit of the soil or underlying rock material that is wholly saturated with water. Also called the phreatic surface.

WAVE-CUT PLATFORM. The relatively smooth, slightly seaward-dipping surface formed along the coast by the action of waves generally accompanied by abrasive materials.

WEATHERING. All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

WETTING FRONT. The greatest depth affected by moisture due to precipitation.

yr B.P. Uncorrected radiocarbon age expressed in years before present, calculated from 1950. Calendar-corrected ages are expressed in ka, or, if warranted, as A.D. or B.C.

County of San Mateo - Planning and Building Department

ATTACHMENT G

COUNTY OF SAN MATEO, PLANNING AND BUILDING DEPARTMENT

NOTICE OF INTENT TO ADOPT
MITIGATED NEGATIVE DECLARATION

A notice, pursuant to the California Environmental Quality Act of 1970, as amended (Public Resources Code 21,000, et seq.), that the following project: *Domestic Well*, when adopted and implemented, will not have a significant impact on the environment.

FILE NO.: PLN 2018-00351

OWNER: La Honda Pescadero Unified School District

APPLICANT: County of San Mateo

ASSESSOR'S PARCEL NO.: 087-053-010

LOCATION: 350-360 Butano Cut Off, Pescadero

PROJECT DESCRIPTION

Drilling of a domestic well to determine the viability of a new well to serve the existing school and potential future fire station on the La Honda-Pescadero Unified School District property. Three well locations are identified as potential well sites but only one well will be constructed and certified. The parcel size is 28.61 acres, the project area (potential fire station area) is 76,000 sq. ft., and the project site is approximately 4 sq. ft. (construction area of each well). Wells are located in the southwest portion of the property between the existing parking lot and Butano Cut-Off within the project area.

FINDINGS AND BASIS FOR A NEGATIVE DECLARATION

The Current Planning Section has reviewed the initial study for the project and, based upon substantial evidence in the record, finds that:

1. The project will not adversely affect water or air quality or increase noise levels substantially.

2. The project will not have adverse impacts on the flora or fauna of the area.

3. The project will not degrade the aesthetic quality of the area.

4. The project will not have adverse impacts on traffic or land use.

5. In addition, the project will not:

    a. Create impacts which have the potential to degrade the quality of the environment.

    b. Create impacts which achieve short-term to the disadvantage of long-term environmental goals.

c. Create impacts for a project which are individually limited, but cumulatively considerable.

d. Create environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly.

The County of San Mateo has, therefore, determined that the environmental impact of the project is insignificant.

MITIGATION MEASURES included in the project to avoid potentially significant effects:

Mitigation Measure 1: The applicant shall require construction contractors to implement all the Bay Area Air Quality Management District's Basic Construction Mitigation Measures, listed below:

a. Water all active construction areas at least twice daily.

b. Apply water two times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking, and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.

c. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.

d. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour.

e. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

Mitigation Measure 2: The applicant shall implement the following basic construction measures at all times:

a. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measures Title 13, Section 2485 of California Code of Regulations [CCR]).

b. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.

Mitigation Measure 3: Preconstruction survey(s) shall be performed prior to the start of well drilling activities by a qualified biologist. If CRLF and SFGS are found within the project area, all work shall cease until the individual(s) have been allowed to leave the project area on their own. If the CRLF or SFGS individual(s) cannot passively leave the project area, work will cease and the U.S. Fish and Wildlife Service (USFWS) will be contacted to determine the appropriate course of action.

Mitigation Measure 4: If buried cultural materials are encountered during construction, work should stop in that area until a qualified archaeologist can evaluate the nature and significance of the find.

Mitigation Measure 5: Pursuant to San Mateo County Ordinance Code 4.68.050 *Mitigation of Disturbance at Well Site*, disturbance at a well site for the purposes of construction shall be limited to the minimum amount of disturbance necessary to gain access to drill the well. Drilling fluids and other drilling materials produced or used in connection with well construction shall not be allowed to discharge onto or into streets, waterways, sensitive habitats, or storm drains. Drilling fluids shall be properly managed and disposed of in accordance with applicable local, regional, and state requirements. Upon completion of the construction, the site shall be restored as near as possible to its original condition, and appropriate erosion control measures shall be implemented. Wells constructed during a period where winterization requirements are in effect, between October 1 and May 1, shall comply with County stormwater pollution prevention measures.

Mitigation Measure 6: During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site:

a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with stormwater.

c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges, to storm drains and watercourses.

d. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

e. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

f. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

g. Performing clearing and earth-moving activities only during dry weather.

h. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.

i. Limiting construction access routes and stabilizing designated access points.

j. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

k. The contractor shall train and provide instruction to all employees and subcontractors regarding the construction Best Management Practices.

Mitigation Measure 7: Construction equipment for new development shall comply with best management practices from Bay Area Air Quality Management District guidance.

RESPONSIBLE AGENCY CONSULTATION

None

INITIAL STUDY

The San Mateo County Current Planning Section has reviewed the Environmental Evaluation of this project and has found that the probable environmental impacts are insignificant. A copy of the initial study is attached.

REVIEW PERIOD: November 28, 2018 to December 18, 2018

All comments regarding the correctness, completeness, or adequacy of this Negative Declaration must be received by the County Planning and Building Department, 455 County Center, Second Floor, Redwood City, no later than **5:00 p.m., December 18, 2018**.

CONTACT PERSON

Melissa Ross
Project Planner, 650/599-1559
mross@smcgov.org

Melissa Ross, Project Planner

MR:pac - MARCC0559_WPH.DOCX

County of San Mateo
Planning and Building Department

INITIAL STUDY
ENVIRONMENTAL EVALUATION CHECKLIST
(To Be Completed by Planning Department)

1. **Project Title:** Domestic Well

2. **County File Number:** PLN 2018-00351

3. **Lead Agency Name and Address:**
   County of San Mateo
   Planning and Building Department
   455 County Center, 2nd Floor
   Redwood City, CA 94063

4. **Contact Person and Phone Number:** Melissa Ross, Senior Planner, 650/599-1559

5. **Project Location:** 350-360 Butano Cut-Off, Pescadero

6. **Assessor's Parcel Number and Size of Parcel:** 087-053-010; 28.61 acres

7. **Project Sponsor's Name and Address:**
   County of San Mateo
   Project Development Unit
   1402 Maple Street
   Redwood City, CA 94063

8. **General Plan Designation:** General Plan: Institutional; Local Coastal Plan Designation Agriculture and Institutional

9. **Zoning:** Resource Management-Coastal Zone/Coastal Development (RM-CZ/CD)

10. **Description of the Project:** Drilling of a domestic well to determine the viability of a new well to serve the existing school and potential future fire station on the La Honda-Pescadero Unified School District property. Three well locations are identified as potential well sites but only one well will be constructed and certified. The parcel size is 28.61 acres, the project area (potential fire station) is 76,000 sq. ft., and the project site is approximately 4 sq. ft. (construction area of each well). Wells are located in the southwest portion of the property between the existing parking lot and Butano Cut-Off within the project area.

11. **Surrounding Land Uses and Setting:** The 28.61-acre parcel is located approximately 0.16-mile south of Pescadero Creek Road at the intersection of Cloverdale and Butano Cut-Off Roads. The parcel is relatively flat and is bounded on the east side by Pescadero Creek. Development on the site includes the existing Pescadero Middle and High School. An agricultural field is located along Cloverdale Road. The parcel is located in a rural area surrounded by agricultural fields, agriculturally related development, single-family residences, and located approximately 0.98-mile from the Town of Pescadero.

12. **Other Public Agencies Whose Approval is Required:** None

13. **Have California Native American tribes traditionally and culturally affiliated with the project area requested consultation pursuant to Public Resources Code Section 21080.3.1? If so, has consultation begun?:** This project is not subject to Assembly Bill 52, as the County of San Mateo has no records of requests for formal notification of proposed projects within the County from any traditionally or culturally affiliated California Native American Tribes. However, the County seeks to satisfy the Native American Heritage Commission's best practices and has referred this project to all tribes within San Mateo County. As of the date of this report, no tribes have contacted the County requesting formal consultation on this project.

ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED

The environmental factors checked below would be potentially affected by this project, involving at least one impact that is a "Potentially Significant Impact" or "Significant Unless Mitigated" as indicated by the checklist on the following pages.

	Aesthetics		Hazards and Hazardous Materials		Recreation
	Agricultural and Forest Resources		Hydrology/Water Quality		Transportation/Traffic
X	Air Quality		Land Use/Planning		Tribal Cultural Resources
X	Biological Resources		Mineral Resources		Utilities/Service Systems
X	Cultural Resources		Noise	X	Mandatory Findings of Significance
	Geology/Soils		Population/Housing		
X	Climate Change		Public Services		

EVALUATION OF ENVIRONMENTAL IMPACTS

1. A brief explanation is required for all answers except "No Impact" answers that are adequately supported by the information sources a lead agency cites. A "No Impact" answer is adequately supported if the referenced information sources show that the impact simply does not apply to projects like the one involved (e.g., the project falls outside a fault rupture zone). A "No Impact" answer should be explained where it is based on project-specific factors as well as general standards (e.g., the project will not expose sensitive receptors to pollutants, based on a project-specific screening analysis).

2. All answers must take account of the whole action involved, including off-site as well as on-site, cumulative as well as project-level, indirect as well as direct, and construction as well as operational impacts.

3. Once the lead agency has determined that a particular physical impact may occur, then the checklist answers must indicate whether the impact is potentially significant, less than significant with mitigation, or less than significant. "Potentially Significant Impact" is appropriate if there is substantial evidence that an effect may be significant. If there are one or more "Potentially Significant Impact" entries when the determination is made, an EIR is required.

4. "Negative Declaration: Less Than Significant with Mitigation Incorporated" applies where the incorporation of mitigation measures has reduced an effect from "Potentially Significant Impact" to a "Less Than Significant Impact." The lead agency must describe the mitigation measures, and briefly explain how they reduce the effect to a less than significant level (mitigation measures from "Earlier Analyses," as described in 5. below, may be cross-referenced).

5. Earlier analyses may be used where, pursuant to the tiering, program EIR, or other CEQA process, an effect has been adequately analyzed in an earlier EIR or negative declaration (Section 15063(c)(3)(D)). In this case, a brief discussion should identify the following:

   a. Earlier Analysis Used. Identify and state where they are available for review.

   b. Impacts Adequately Addressed. Identify which effects from the above checklist were within the scope of and adequately analyzed in an earlier document pursuant to applicable legal standards, and state whether such effects were addressed by mitigation measures based on the earlier analysis.

   c. Mitigation Measures. For effects that are "Less Than Significant with Mitigation Measures Incorporated," describe the mitigation measures which were incorporated or refined from the earlier document and the extent to which they address site-specific conditions for the project.

6. Lead agencies are encouraged to incorporate into the checklist references to information sources for potential impacts (e.g., general plans, zoning ordinances). Reference to a previously prepared or outside document should, where appropriate, include a reference to the page or pages where the statement is substantiated.

7. Supporting Information Sources. Sources used or individuals contacted should be cited in the discussion.

1. AESTHETICS. Would the project:					
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
1.a.	Have a significant adverse effect on a scenic vista, views from existing residential areas, public lands, water bodies, or roads?				X
Discussion: Construction of the domestic well will be located at grade level on a relatively flat parcel. Scenic views from the public roadway will not be adversely impacted. **Source:** Project Plans, Google Earth					

1.b.	Significantly damage or destroy scenic resources, including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway?				X
Discussion: The parcel is not located within a state scenic highway. The location of the well will not impact existing trees within the property. No rock outcroppings are present within the parcel nor are any designated historic buildings. **Source:** Project Plans, Planning GIS Planning Map Viewer Scenic Corridors Layer, National Park Service National Register of Historic Places, Google Earth					
1.c.	Significantly degrade the existing visual character or quality of the site and its surroundings, including significant change in topography or ground surface relief features, and/or development on a ridgeline?				X
Discussion: Access and construction of the well does not require significant modifications to the topography and will not be located on a ridgeline. Access to the project site is via the existing driveway and adjacent parking lot. **Source:** Project Plans, Google Earth					
1.d.	Create a new source of significant light or glare that would adversely affect day or nighttime views in the area?				X
Discussion: No lighting is proposed. **Source:** Project Scope					
1.e.	Be adjacent to a designated Scenic Highway or within a State or County Scenic Corridor?				X
Discussion: The project site is located within the Pescadero Creek Road and Cloverdale Road County Scenic Corridors. Given the ground level height of the well and existing access, no impact is expected to the scenic corridors. **Source:** Project Plans, Planning GIS Planning Map Viewer Scenic Corridors Layer, Google Earth					
1.f.	If within a Design Review District, conflict with applicable General Plan or Zoning Ordinance provisions?				X
Discussion: Not located within a Design Review district. **Source:** Project Location					
1.g.	Visually intrude into an area having natural scenic qualities?				X

Discussion: The parcel is located within the rural surroundings of the Pescadero area. Typically found within the vicinity of the project are agricultural fields and related development, vegetated watercourses, a mix of steep hillsides and flatlands, and low-density residential development. Construction of the well will not impact the rural scenic qualities found in the vicinity of the project due to its ground level construction and minimal vegetation removal associated with construction.

Source: Project Plans, Google Earth

2. AGRICULTURAL AND FOREST RESOURCES. In determining whether impacts to agricultural resources are significant environmental effects, lead agencies may refer to the California Agricultural Land Evaluation and Site Assessment Model (1997) prepared by the California Department of Conservation as an optional model to use in assessing impacts on agriculture and farmland. In determining whether impacts to forest resources, including timberland, are significant environmental effects, lead agencies may refer to information compiled by the California Department of Forestry and Fire Protection regarding the State's inventory of forestland, including the Forest and Range Assessment Project and the Forest Legacy Assessment Project; and forest carbon measurement methodology provided in Forest Protocols adopted by the California Air Resources Board. Would the project:

		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
2.a.	For lands outside the Coastal Zone, convert Prime Farmland, Unique Farmland, or Farmland of Statewide Importance (Farmland) as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency, to non-agricultural use?				X

Discussion: Project is not located outside the Coastal Zone.

Source: Project Location

2.b.	Conflict with existing zoning for agricultural use, an existing Open Space Easement, or a Williamson Act contract?			X	

Discussion: The parcel is not encumbered by a Williamson Act contract or Open Space Easement. The parcel is zoned Resource Management-Coastal Zone, and though not zoned "agriculture," agricultural uses are permitted in this zoning district. The northwest portion of the property, just north of the "area of work" identified on the site plan, is farmed and will continue to be farmed. The location of the well sites are not located within the active agricultural field and are allowed uses in the RM-CZ Zoning District subject to permit approval.

Source: Planning Department GIS

2.c.	Involve other changes in the existing environment which, due to their location or nature, could result in conversion of Farmland to non-agricultural use or conversion of forestland to non-forest use?			X	

Discussion: According to the Department of Conservation Farmland Mapping and Monitoring Program California Important Farmland Finder (2016 Interactive GIS), the parcel is classified into three categories: Prime Farmland, Urban and Built-Up Land, and Grazing Land.

If the project area were to be irrigated, the land would be designated as Prime Farmland, which is defined as: *Irrigated land with the best combination of physical and chemical features able to sustain long term production of agricultural crops. This land has the soil quality, growing season, and moisture supply needed to produce sustained high yields. Land must have been used for production of irrigated crops at some time during the four years prior to the mapping date.*

According to aerial photos, the area of the proposed well site was farmed in the previous 4 years (May 2012) of the Department of Conservation map dated 2016. Since 2013, the land has been left fallow.

Construction of the well will convert approximately 4 sq. ft. of the 76,000 sq. ft. project area and will be located outside of the active agricultural field to the northwest.

Given the small footprint of the domestic well, the Prime Farmland conversion is less than significant.

Source: Department of Conservation Farmland Mapping and Monitoring Program California Important Farmland Finder (2016 Interactive GIS), Google Earth

2.d.	For lands within the Coastal Zone, convert or divide lands identified as Class I or Class II Agriculture Soils and Class III Soils rated good or very good for artichokes or Brussels sprouts?			X	

Discussion: Soils in the proposed well site areas have an Irrigated Land Capability Classification rating of Class I as identified on the Natural Resources Conservation Service Web Soil Survey. Land capability classification takes into consideration landscape location, slope of the field, depth, texture, and reaction of the soil. Classes I through IV are rated by NRCS as arable land with Class I soils as having few limitations that restrict their use. The project area is identified on the San Mateo County General Plan Productive Soil Resources Soils with Agricultural Capability for Irrigated Rowcrops and Soil Dependent Floriculture, which includes artichokes or Brussels sprouts. Conversion of these soils will occur as result of this project; however, construction of a well is limited to 4 sq. ft. which is the minimum necessary to establish the domestic water source.

Source: Natural Resources Conservation Service Web Soil Survey, General Plan Productive Soils Resources Soils with Agricultural Capability Map

2.e.	Result in damage to soil capability or loss of agricultural land?			X	

Discussion: Approximately 4 sq. ft. of agricultural land will be converted for construction of the well and concrete pad. This area is minimal compared to the approximate 7.48 acres of land designated

Agriculture (project area and active agricultural field).

Source: Project Plans

2.f.	Conflict with existing zoning for, or cause rezoning of, forestland (as defined in Public Resources Code Section 12220(g)), timberland (as defined by Public Resources Code Section 4526), or timberland zoned Timberland Production (as defined by Government Code Section 51104(g))? *Note to reader: This question seeks to address the economic impact of converting forestland to a non-timber harvesting use.*				X

Discussion: Construction of the well does not conflict with the current Resource Management-Coastal Zone/Coastal Development zoning district nor are trees present on the parcel meeting the definition of forest land (land that supports 10% native tree cover of any species and that allows for management of one or more forest resources) or timberland (land capable of growing a crop of trees of a commercial species used to produce lumber and other forest products). The current land use is such that these forest uses would not be compatible with the existing school and agricultural field.

Source: Project Site

3. AIR QUALITY. Where available, the significance criteria established by the applicable air quality management or air pollution control district may be relied upon to make the following determinations. Would the project:

		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
3.a.	Conflict with or obstruct implementation of the applicable air quality plan?		X		

Discussion: The Bay Area Air Quality Management District (District) 2017 Clean Air Plan (CAP) is the applicable plan for San Mateo County. The District outlines Criteria Air Pollutants and Precursors for Construction-Related Impacts in its CEQA Guidelines for use by Lead Agencies in preliminarily identifying whether such pollutants and/or precursors will exceed the District's Thresholds of Significance (Screening Criteria). The Screening Criteria references Table 3-1 of the District's CEQA Guidelines which identifies land use types of a large scale (e.g., office parks, hospitals, warehouses, manufacturing). These uses are beyond the current project scope. The Screening Criteria also provides for the inclusion of basic construction mitigation measures to reduce potential impacts to less than significant levels. As mitigated, the project will not conflict or obstruct implementation of the 2017 CAP.

Mitigation Measure 1: The applicant shall require construction contractors to implement all the Bay Area Air Quality Management District's Basic Construction Mitigation Measures, listed below:

a. Water all active construction areas at least twice daily.

b. Apply water two times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads,

parking, and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.

c. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.

d. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour.

e. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

Source: Bay Area Air Quality Management District 2017 Clean Air Plan, Bay Area Air Quality Management District CEQA Guidelines May 2017

3.b.	Violate any air quality standard or contribute significantly to an existing or projected air quality violation?		X		

Discussion: The Bay Area Air Quality Management District (District) monitors and regulates air pollution within the nine counties surrounding the San Francisco Bay. According to the District Facility Data Map, no regulated facilities are present within the project vicinity nor is the Pescadero area identified as an Impacted Community (areas with high concentration of air pollution and populations most vulnerable to air pollution's health impacts). The State has met (attainment) of the U.S. Environmental Protection Agency standards for carbon monoxide, nitrogen dioxide, sulfur dioxide, and sulfates. However, the State status for particulate matter (PM10) and particulate matter-fine (PM2.5) is non-attainment.

Drilling for the each well includes one two-axle bobtail dump truck pulling a portable mud system on a two-axle trailer, one 4,000 gallon water truck, one three-axel drilling rig (69,000 lbs), one pickup truck pulling a mini excavator, and four pickup trucks (inclusive of the one pickup truck pulling the mini excavator). Each well drilling is anticipated to occur over a four day period. All equipment will remain on site during the drilling with exception to the four pickup trucks that will arrive and leave once per day. No operational emissions are expected. To ensure potential significant impacts are minimized, the following mitigation measure is recommended.

Mitigation Measure 2: The applicant shall implement the following basic construction measures at all times:

a. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measures Title 13, Section 2485 of California Code of Regulations [CCR]).

b. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.

Source: Bay Area Air Quality Management District

3.c.	Result in a cumulatively considerable net increase of any criteria pollutant for which the project region is non-attainment under an applicable Federal or State ambient air quality standard (including releasing emissions which exceed quantitative thresholds for ozone precursors)?		X		
Discussion: The State is a non-attainment area for PM10 and PM2.5. Construction equipment may minimally contribute on a temporary basis to PM 10 and PM 2.5 levels. However, implementation of Mitigation Measures 1 and 2 will ensure potential impacts are reduced to less than significant levels. No operational emissions are expected. **Source:** Bay Area Air Quality Management District					
3.d.	Expose sensitive receptors to significant pollutant concentrations, as defined by BAAQMD?			X	
Discussion: Sensitive receptors include, but are not limited to, hospitals, schools, daycare facilities, elderly housing and convalescent facilities. Well drilling will occur on the subject property that also serves the Pescadero Middle and High School. Pollutants are limited to that of construction vehicles and drilling activities and are not expected to continue once well construction is completed. Well drilling is expected to occur during the mid-winter school break (February 18 – February 22) to minimize potential impacts to students and staff at the school. **Source:** Bay Area Air Quality Management District					
3.e.	Create objectionable odors affecting a significant number of people?			X	
Discussion: No objectionable odors are expected at the conclusion of well drilling. Odors resulting from construction vehicles may occur during well drilling (e.g., gasoline and diesel-fueled construction equipment) however these odors would be temporary in nature. Drilling is expected to occur during the mid-winter school break to minimize potential impacts to students and staff. **Source:** Project Scope					
3.f.	Generate pollutants (hydrocarbon, thermal odor, dust or smoke particulates, radiation, etc.) that will violate existing standards of air quality on-site or in the surrounding area?		X		
Discussion: Minor construction related pollutants are anticipated to result from the construction vehicles and well drilling activities, refer to discussion under Question 3.b. for detailed construction vehicle discussion. Implementation of Mitigation Measures 1 and 2 will ensure potential impacts are reduced to less than significant levels. No operational emissions are expected. **Source:** Project Scope					

4.	**BIOLOGICAL RESOURCES**. Would the project:				
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
4.a.	Have a significant adverse effect, either directly or through habitat modifications, on any species identified as a candidate, sensitive, or special status species in local or regional plans, policies, or regulations, or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		

Discussion: A Preliminary Biological Assessment was conducted in March 2017 for a potential fire station to be located on the subject property. Though it has not been determined if the fire station will be located on this parcel, the assessment is applicable to the current well project.

A drainage ditch (wetland) is located approximately 420 feet from the project site along the west property line (Cloverdale Road). Pescadero Creek is located over 870 feet from the project area and separated from the project area by development (e.g., driveways, buildings). Special-status plant and animal species were identified within the drainage ditch, as discussed below.

Special-Status Plant Species

Vegetation within the drainage ditch, which runs outside of the west property line, consists predominately of cattails, horsetail, blackberry, and wild radish. Sensitive plant species known to occur in the vicinity of the project site include Choris' popcorn-flower and coastal marsh milk vetch. A site survey conducted during the blooming period (June 2016) for Choris' popcorn-flower and coastal marsh milk vetch did not result in either species being detected. Although coastal milk vetch has not been documented within a 1/2-mile radius of the project site, there is potential suitable habitat within the drainage ditch. The biological assessment concluded that the site contains low quality habitat for special-status species. Given the distance of the well sites to the drainage ditch it is not anticipated that this project will result in significant adverse impacts to protected plants species.

Special-Status Animal Species

California Red-Legged Frog (CRLF). CRLF typically inhabit marshes, ponds, and slow-moving streams with well-developed riparian canopy. Breeding habitat occur in aquatic habitats including pools and backwaters within streams and creeks, ponds, marshes, among others. CRLF have been observed in the Cloverdale drainage ditch and are expected to occur within the project area.

San Francisco Garter Snake (SFGS). This semi-aquatic species is often found hunting in ponds, slow moving streams, and ephemeral wetlands occupied by their prey, Pacific chorus frog and CFLF. SFGS have been documented in the vicinity of the project and it is likely that this species could occur within the project area.

San Francisco Dusky-Footed Woodrat (SFDW). SFDW is expected to occur in the coastal scrub habitat on the west side of Cloverdale Road and within riparian habitat along Pescadero Creek. The California Natural Diversity Database (CNDDB) records do not identify SFDW within a 1/2-mile radius of the project area and suitable habitat/nest was observed over 800 feet from the project area. SFDW are expected to occur within the vicinity of the project area however, impacts to this species are not anticipated.

Western Pond Turtle (WPT). WPT habitat occurs near permanent or semi-permanent water sources including ponds, lakes, streams, and irrigation ditches, among others. There a no CNDDB records for WPT within two miles of the project site and no WPT were observed during the site survey. Impacts to WPT are not anticipated.

Saltmarsh Common Yellowthroat. No known CNDDB occurrences within 1/2-mile radius were identified and no suitable habitat is present within the project area. Impacts to this species are not anticipated.

White-Tailed Kite. No known CNDDB occurrences within 1/2-mile radius were identified; however, this species has been observed by County staff in the vicinity of Pescadero Creek. Given the distance of the creek to the well locations, impacts to this species are not anticipated.

Yellow Warbler. The yellow warbler is a seasonal resident of California during the months of April through October and breeds in the coastal riparian woodlands and wetlands. No occurrences within 1/2-mile radius were identified in the CNDDB. Suitable habitat may be present within the Pescadero Creek riparian habitat; however, the species was not observed within the project area. It is unlikely that this species will be impacted.

Due to the potential for CRLF and SFGS special-status species to occur in the project area, the following mitigation measure is recommended.

Mitigation Measure 3: Preconstruction survey(s) shall be performed prior to the start of well drilling activities by a qualified biologist. If CRLF and SFGS are found within the project area, all work shall cease until the individual(s) have been allowed to leave the project area on their own. If the CRLF or SFGS individual(s) cannot passively leave the project area, work will cease and the U.S. Fish and Wildlife Service (USFWS) will be contacted to determine the appropriate course of action.

Source: Biological Assessment

4.b.	Have a significant adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, and regulations or by the California Department of Fish and Wildlife or U.S. Fish and Wildlife Service?		X		

Discussion: Refer to Question 4.a.

Source: Biological Assessment

4.c.	Have a significant adverse effect on federally protected wetlands as defined by Section 404 of the Clean Water Act (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means?				X

Discussion: No work is proposed adjacent to or within the identified riparian habitat in the drainage ditch along Cloverdale Road or within or adjacent to Pescadero Creek to the north east of the parcel.

Source: Biological Assessment, Project Scope, Google Earth

4.d.	Interfere significantly with the movement		X		

	of any native resident or migratory fish or wildlife species or with established native resident migratory wildlife corridors, or impede the use of native wildlife nursery sites?				
Discussion: No wildlife corridor was identified in the Biological Assessment; however, special-status species may utilize the project site area. Refer to Question 4.a. for mitigation. **Source:** Biological Assessment					
4.e.	Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance (including the County Heritage and Significant Tree Ordinances)?				X
Discussion: No trees located in the project area. **Source:** Project Plans					
4.f.	Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Conservation Community Plan, other approved local, regional, or State habitat conservation plan?				X
Discussion: Project site is not located in an area with an adopted conservation plan. **Source:** Project Location					
4.g.	Be located inside or within 200 feet of a marine or wildlife reserve?				X
Discussion: No located within or adjacent to such an area. **Source:** Project Location					
4.h.	Result in loss of oak woodlands or other non-timber woodlands?				X
Discussion: No oak woodlands or other non-timber woodlands are present on the parcel. **Source:** Project Plans					

5. CULTURAL RESOURCES. Would the project:					
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
5.a.	Cause a significant adverse change in the significance of a historical resource as defined in CEQA Section 15064.5?		X		

Discussion: A referral of the project to the California Historical Resources Information System Northwest Information Center (NWIC) did not identify any record of previous cultural resources studies for the project area. NWIC recommended that a qualified archaeologist conduct archival and field study of the unsurveyed project area to identify cultural resources. A second recommendation was also made to the County to contact local Native American tribes regarding traditional, cultural, and religious heritage values. Discussion on the Native American recommendation can be found under Section 17 of this document.

As recommended, a Cultural Resources Survey was completed in November 2018 by Dr. Daniel Shoup, RPA. A paper study of past cultural resources in the vicinity of the parcel was conducted as was a field study. Percolation testing for a potential future septic system was being performed at the time the cultural resources field study was conducted, thus the archaeologist had access to open trenches were soil visibility was fair to very good. As stated in the report, all open areas were inspected for cultural evidence such as historic structures, artifacts, and features; and indicators of prehistoric archaeological deposits like midden soil, flaked lithics, groundstone, and shell. No artifacts or features over 45 years of age were noted during the trench inspection for the survey nor were any indicators of archaeological deposits observed in the seven test percolation trenches, which were all excavated at the western edge of the project area. No archaeological resources appear to be present on the project area, which is of low sensitivity for buried prehistoric resources. The proposed project does not appear to have the potential to affect historical resources as defined at 14 CCR § 15064.5. The following mitigation measure is recommended in the unlikely instance that cultural materials are encountered during construction.

Mitigation Measure 4: If buried cultural materials are encountered during construction, work should stop in that area until a qualified archaeologist can evaluate the nature and significance of the find.

Source: Cultural Resources Survey Report, November 2018

5.b.	Cause a significant adverse change in the significance of an archaeological resource pursuant to CEQA Section 15064.5?		X		

Discussion: Refer to Question 5.a. for discussion and mitigation.

Source: Cultural Resources Survey Report, November 2018

5.c.	Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature?				X

Discussion: According to the United States Geological Survey Geologic Maps map viewer, the project area is identified as having younger (outer) alluvial fan deposits (Holocene) which consists of unconsolidated fine sand, silt, and clayey silt (Qyfo); this unit type is not uncommon for the area. Thus no significant impacts to unique resources or features are anticipated.

Source: United States Geological Survey Geologic Maps National Geologic Map Database Map Viewer

5.d.	Disturb any human remains, including those interred outside of formal cemeteries?		X		

Discussion: Refer to Question 5.a. for discussion and mitigation.

Source: Cultural Resources Survey Report, November 2018

6.	**GEOLOGY AND SOILS**. Would the project:	***Potentially Significant Impacts***	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
6.a.	Expose people or structures to potential significant adverse effects, including the risk of loss, injury, or death involving the following, or create a situation that results in:				
	i. Rupture of a known earthquake fault, as delineated on the most recent Alquist-Priolo Earthquake Fault Zoning Map issued by the State Geologist for the area or based on other significant evidence of a known fault? *Note: Refer to Division of Mines and Geology Special Publication 42 and the County Geotechnical Hazards Synthesis Map.*			X	

Discussion: A Fault Evaluation Report (July 2016), prepared by ENGEO, was completed for a potential fire station located on this parcel within the project area. The project area is identified within the Alquist-Priolo Earthquake Fault Hazard Map for the Franklin Point Quadrangle (1982). A review of the United States Geological Survey San Gregorio fault zone Quaternary Fault and Fold Database (QFFD) was also included in the report due to the mapped San Gregorio fault located west of Cloverdale Road. Site exploration of the site was conducted by ENGEO and consisted of two trench excavations, one in the project area and the second trench in the adjacent parking lot. Combined trenching totaled approximately 650 linear feet and to depths ranging from approximately 8.5 to 13.5 feet.

Artificial fill was encountered within 1 to 2 feet of thickness, including soils disturbed as a result of tilling. No evidence of faulting, folding or warping was observed in the exposed trench soils.

The Report concluded that none of the fault traces depicted on the Alquist-Priolo Zone map or the QFFD are shown to pass through the project area. Thus, no impact is anticipated from construction of the well. **Source:** ENGEO Fault Evaluation Report (July 2016)				
ii. Strong seismic ground shaking?			X	
Discussion: The Modified Mercalli Intensity (MMI) estimates the intensity of shaking from an earthquake at a specific location or over a specific area by considering its effect on people, objects, and buildings per The Association of Bay Area Governments (ABAG). MMI intensity levels identify the extent of damage a building may experience during an earthquake. A 7 MMI is considered strong, 8 MMI Very Strong, and 9 MMI is Violent. The project site is located in the mapped San Andreas 7 MMI Strong and San Gregorio MMI 9 Violent. The project proposal does not include construction of any buildings or habitable structures, thus minimizing impacts to building and people. Construction of the well will be in accordance with Environmental Health Services requirements. **Source:** Association of Bay Area Governments Resilience Program Shaking Scenarios				
iii. Seismic-related ground failure, including liquefaction and differential settling?			X	
Discussion: Liquefaction susceptibility mapping estimates the amount of shaking needed to trigger liquefaction. ABAG mapping places the project site within a mapped High Susceptibility for liquefaction. Construction of the well will be in accordance with Environmental Health Services requirements. **Source:** Association of Bay Area Governments Resilience Program Liquefaction Susceptibility				
iv. Landslides?				X
Discussion: A review of the project for located within mapped landslide areas included the following sources: Association of Bay Area Governments Resilience Program Landslide GIS, San Mateo County General Plan Natural Hazards Map, and the United States Geological Survey Landslide Susceptibility in San Mateo County (1972). *ABAG*. The project site is not located in a mapped Existing Landslide Distribution, Earthquake Induced Landslide Study Zone, or Rainfall Induced Landslide Area. ABAG defines the landslide areas as: (1) Existing Landslide Distribution – the distribution of landslides evident in the landscape (e.g., slumps, translational slides) that have occurred in the past, (2) Rainfall induced landslides – are principal areas that are likely to produce debris flows (mudslides), and (3) Earthquake induced landslides – areas where site specific studies are required prior to new construction. *San Mateo County General Plan*. The project site is not located in a mapped Area of High Landslide Susceptibility as identified on the General Plan Natural Hazards Map. *United States Geological Survey (USGS)*. The project site is located in Map Unit I, which is defined as areas least susceptible to landsliding. Construction of a well within the project will not be located on mapped landslide areas nor will the well itself expose people or structures to landslides. **Source:** Association of Bay Area Governments Resilience Program Landslide Geographic Information System, General Plan Natural Hazards Map, USGS Landslide Susceptiblity in San Mateo County Map (1972)				

v. Coastal cliff/bluff instability or erosion? *Note to reader: This question is looking at instability under current conditions. Future, potential instability is looked at in Section 7 (Climate Change).*				X
Discussion: The project is not located along a coastal cliff or bluff. **Source:** Project Location				
6.b. Result in significant soil erosion or the loss of topsoil?		X		

Discussion: Well drilling is anticipated during the mid-winter school break to minimize impacts to students and staff. Well locations can be accessed from the adjacent paved driveway. The following mitigation measures are recommended to reduce potential impacts to less than significant levels.

Mitigation Measure 5: Pursuant to San Mateo County Ordinance Code 4.68.050 *Mitigation of Disturbance at Well Site*, disturbance at a well site for the purposes of construction shall be limited to the minimum amount of disturbance necessary to gain access to drill the well. Drilling fluids and other drilling materials produced or used in connection with well construction shall not be allowed to discharge onto or into streets, waterways, sensitive habitats, or storm drains. Drilling fluids shall be properly managed and disposed of in accordance with applicable local, regional, and state requirements. Upon completion of the construction, the site shall be restored as near as possible to its original condition, and appropriate erosion control measures shall be implemented. Wells constructed during a period where winterization requirements are in effect, between October 1 and May 1, shall comply with County stormwater pollution prevention measures.

Mitigation Measure 6: During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site:

a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with stormwater.

c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges, to storm drains and watercourses.

d. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

e. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

f. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

g. Performing clearing and earth-moving activities only during dry weather.

h. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.

i. Limiting construction access routes and stabilizing designated access points.

j. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

k. The contractor shall train and provide instruction to all employees and subcontractors regarding the construction Best Management Practices.

Source: Project Scope

6.c. Be located on a geologic unit or soil that is unstable, or that would become unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, severe erosion, liquefaction or collapse?				X

Discussion: According to the United States Geological Survey Geologic Maps map viewer, the project area is identified as having younger (outer) alluvial fan deposits (Holocene) which consist of unconsolidated fine sand, silt, and clayey silt (Qyfo); this unit type is not uncommon for the area. It is not expected that this project would result in unstable soils, both on- and off-site.

Source: United States Geological Survey Geologic Maps National Geologic Map Database Map Viewer

6.d. Be located on expansive soil, as noted in the 2010 California Building Code, creating significant risks to life or property?				X

Discussion: Construction of the well is subject to the issuance of a well drilling permit by Environmental Health Services. This project scope is limited to the well only and does not include construction of habitable structures.

Source: Project Scope

6.e. Have soils incapable of adequately supporting the use of septic tanks or alternative wastewater disposal systems where sewers are not available for the disposal of wastewater?				X

Discussion: The project does not include construction or use of a septic or other disposal system.

Source: Project Scope

7.	**CLIMATE CHANGE**. Would the project:				
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
7.a.	Generate greenhouse gas (GHG) emissions (including methane), either directly or indirectly, that may have a significant impact on the environment?		X		
Discussion: The San Mateo County Energy Efficiency Climate Action Plan Development Checklist identifies measures for construction equipment for new development to comply with best management practices from Bay Area Air Quality Management District guidance. Implementation of the following will reduce GHG emissions to less than significant levels. **Mitigation Measure 7:** Construction equipment for new development shall comply with best management practices from Bay Area Air Quality Management District guidance. **Source:** San Mateo County Energy Efficiency Climate Action Plan					
7.b.	Conflict with an applicable plan (including a local climate action plan), policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases?		X		
Discussion: The San Mateo County Energy Efficiency Climate Action Plan Development Checklist identifies measures for construction equipment for new development to comply with best management practices from Bay Area Air Quality Management District guidance. Implementation of Mitigation Measure 7 will reduce GHG emissions to less than significant levels. **Source:** San Mateo County Energy Efficiency Climate Action Plan					
7.c.	Result in the loss of forestland or conversion of forestland to non-forest use, such that it would release signifi-cant amounts of GHG emissions, or significantly reduce GHG sequestering?				X
Discussion: Project does not include the removal of any trees. **Source:** Project Location and Scope					
7.d.	Expose new or existing structures and/or infrastructure (e.g., leach fields) to accelerated coastal cliff/bluff erosion due to rising sea levels?				X
Discussion: Project site is not located adjacent to a coastal cliff or bluff. **Source:** Project Location					

7.e.	Expose people or structures to a significant risk of loss, injury or death involving sea level rise?				X
Discussion: The project sites are located over 2.7 miles from the Pacific Ocean and 1.6 miles from Pescadero Marsh. The project will not expose people or structures to significant risk of loss, injury, or death resulting from sea level rise. **Source:** Project Scope					
7.f.	Place structures within an anticipated 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
Discussion: The project sites are located in Zone X (area of minimal flooding) as identified on FEMA Flood Insurance Rate Maps. **Source:** FEMA FIRM Panel 06081C0451E, Effective October 16, 2012					
7.g.	Place within an anticipated 100-year flood hazard area structures that would impede or redirect flood flows?				X
Discussion: The project site is located in Zone X (area of minimal flooding) as identified on FEMA Flood Insurance Rate Maps. **Source:** FEMA FIRM Panel 06081C0451E, Effective October 16, 2012					

8.	**HAZARDS AND HAZARDOUS MATERIALS**. Would the project:				
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
8.a.	Create a significant hazard to the public or the environment through the routine transport, use, or disposal of hazardous materials (e.g., pesticides, herbicides, other toxic substances, or radioactive material)?				X
Discussion: No use or transport of such materials. **Source:** Project Scope					

8.b.	Create a significant hazard to the public or the environment through reasonably foreseeable upset and accident conditions involving the release of hazardous materials into the environment?				X
Discussion: No use of hazardous materials proposed. **Source:** Project Scope					
8.c.	Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school?				X
Discussion: The project sites are located on a school property however, no hazardous emissions, materials, substances, or waste is proposed. **Source:** Project Scope					
8.d.	Be located on a site which is included on a list of hazardous materials sites compiled pursuant to Government Code Section 65962.5 and, as a result, would it create a significant hazard to the public or the environment?				X
Discussion: No hazardous sites or facilities were identified within the parcel vicinity. **Source:** California Department of Toxic Substances Control EnvironStor					
8.e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, result in a safety hazard for people residing or working in the project area?				X
Discussion: The parcel is not located within an airport land use plan area or within 2 miles of a public airport. **Source:** Project Location					
8.f.	For a project within the vicinity of a private airstrip, result in a safety hazard for people residing or working in the project area?				X
Discussion: The parcel is not located within the vicinity of a private airstrip. **Source:** Project Location					

8.g.	Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan?				X
Discussion: Pescadero High School is a San Mateo County Office of Emergency Services designated evacuation shelter. Construction of the well will not interfere with the use of the parcel as a designated evacuation site nor will the project impede access to the tsunami evacuation route. **Source:** Project Location					
8.h.	Expose people or structures to a significant risk of loss, injury or death involving wildland fires, including where wildlands are adjacent to urbanized areas or where residences are intermixed with wildlands?				X
Discussion: The parcel is not located in a moderate, high, or very high fire severity area. **Source:** Planning GIS Planning Map Viewer SRA-LRA Layer					
8.i.	Place housing within an existing 100-year flood hazard area as mapped on a Federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map?				X
Discussion: No housing is proposed. **Source:** Project Scope					
8.j.	Place within an existing 100-year flood hazard area structures that would impede or redirect flood flows?				X
Discussion: The project sites are located in Zone X (area of minimal flooding) as identified on FEMA Flood Insurance Rate Maps. **Source:** FEMA FIRM Panel 06081C0451E, Effective October 16, 2012					
8.k.	Expose people or structures to a significant risk of loss, injury or death involving flooding, including flooding as a result of the failure of a levee or dam?				X
Discussion: Project site is non-habitatable structure and is not located within a mapped dam failure inundation area. **Source:** Project Location and Scope, San Mateo County General Plan Natural Hazards Map					
8.l.	Inundation by seiche, tsunami, or mudflow?				X

Discussion: The parcel is not located in such mapped areas.

Source: San Mateo County Geotechnical Hazard Synthesis Map, San Mateo County General Plan Natural Hazards Map

9. HYDROLOGY AND WATER QUALITY. Would the project:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
9.a. Violate any water quality standards or waste discharge requirements (consider water quality parameters such as temperature, dissolved oxygen, turbidity and other typical stormwater pollutants (e.g., heavy metals, pathogens, petroleum derivatives, synthetic organics, sediment, nutrients, oxygen-demanding substances, and trash))?		X		
Discussion: No work will be carried out within a watercourse; however, there is the potential for waste water as part of the drilling to occur. Implementation of Mitigation Measure 5 will reduce potential impacts to less than significant levels. **Source:** Project Scope, Project Location.				
9.b. Significantly deplete groundwater supplies or interfere significantly with groundwater recharge such that there would be a net deficit in aquifer volume or a lowering of the local groundwater table level (e.g., the production rate of pre-existing nearby wells would drop to a level which would not support existing land uses or planned uses for which permits have been granted)?				X
Discussion: The project scope is limited to the construction a domestic well to determine available water quantity and quality to serve the school and potential future fire station on this site. Connection of the well for use is not included in this project scope. **Source:** Project Scope				
9.c. Significantly alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, in a manner that would result in significant erosion or siltation on- or off-site?			X	

Discussion: Minor alteration of the project site area is expected for construction of the well and 4 sq. ft. pad. No watercourses are adjacent to the project site. No significant alteration of the existing drainage is anticipated. **Source:** Project Location and Scope					
9.d.	Significantly alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or significantly increase the rate or amount of surface runoff in a manner that would result in flooding on- or off-site?				X
Discussion: Construction of a small concrete pad associated with the well will not significantly alter drainage patterns such that flooding would result on- or off-site. **Source:** Project Scope					
9.e.	Create or contribute runoff water that would exceed the capacity of existing or planned stormwater drainage systems or provide significant additional sources of polluted runoff?				X
Discussion: The surrounding rural area is not improved with storm drainage systems. Construction of the well and concrete pad will not significantly increase stormwater runoff. **Source:** Project Scope					
9.f.	Significantly degrade surface or ground-water water quality?				X
Discussion: Well construction is regulated by County Environmental Health Services. The County's Well Ordinance identifies requirements for the design and construction of wells in order to exclude contamination (e.g., sanitary seal). A well permit granted by Environmental Health Services is required prior to well drilling and will ensure that well construction and operation will not degrade ground water water quality. **Source:** Project scope, San Mateo County Ordinance Code Chapter 4.68 *Wells*					
9.g.	Result in increased impervious surfaces and associated increased runoff?			X	
Discussion: Minor increase in impervious surface construction is required as part of the well construction. A small 4 sq. ft. concrete pad will be installed to surround the well. This minimal concrete pad will not significantly increase runoff. **Source:** Project scope, San Mateo County Ordinance Code Chapter 4.68 *Wells*					

10. LAND USE AND PLANNING. Would the project:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
10.a. Physically divide an established community?				X
Discussion: Project will not physically divide an established community. **Source:** Project Scope				
10.b. Conflict with any applicable land use plan, policy or regulation of an agency with jurisdiction over the project (including, but not limited to, the general plan, specific plan, local coastal program, or zoning ordinance) adopted for the purpose of avoiding or mitigating an environmental effect?				X
Discussion: Domestic wells are allowed uses subject to permitting. **Source:** San Mateo County General Plan, Local Coastal Program, and Zoning Regulations				
10.c. Conflict with any applicable habitat conservation plan or natural community conservation plan?				X
Discussion: No conservation plans have been adopted for this area. **Source:** Project location, San Mateo County General Plan, San Mateo County Local Coastal Program, San Mateo County Parks Department				
10.d. Result in the congregating of more than 50 people on a regular basis?				X
Discussion: Project will not result in the congregation of more than 50 people on a regular basis. **Source:** Project Scope				
10.e. Result in the introduction of activities not currently found within the community?				X
Discussion: Domestic wells are common within rural areas of the County. **Source:** Project Location				

10.f. Serve to encourage off-site development of presently undeveloped areas or increase development intensity of already developed areas (examples include the introduction of new or expanded public utilities, new industry, commercial facilities or recreation activities)?			X	
Discussion: Well construction is limited to determining the quality and quantity of available water. No use of the well is proposed with this project. **Source:** Project Scope				
10.g. Create a significant new demand for housing?				X
Discussion: Well construction only. **Source:** Project Scope				

11. MINERAL RESOURCES. Would the project:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
11.a. Result in the loss of availability of a known mineral resource that would be of value to the region or the residents of the State?				X
Discussion: No known mineral resources are located on the parcel. **Source:** Project location, General Plan Mineral Resources Map				
11.b. Result in the loss of availability of a locally important mineral resource recovery site delineated on a local general plan, specific plan or other land use plan?				X
Discussion: No mapped mineral resource recovery sites located on the parcel. **Source:** Project location, General Plan Mineral Resources Map				

12. NOISE. Would the project result in:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
12.a. Exposure of persons to or generation of noise levels in excess of standards established in the local general plan or noise ordinance, or applicable standards of other agencies?			X	
Discussion: Some construction-related noise is anticipated during well drilling. Well drilling is expected to occur during the mid-winter school break (February 18 – February 22) to minimize potential impacts to students and staff at the school. **Source:** Project Scope				
12.b. Exposure of persons to or generation of excessive ground-borne vibration or ground-borne noise levels?			X	
Discussion: Some construction-related vibration is anticipated during well drilling. Well drilling is expected to occur during the mid-winter school break (February 18 – February 22) to minimize potential impacts to students and staff at the school. **Source:** Project Scope				
12.c. A significant permanent increase in ambient noise levels in the project vicinity above levels existing without the project?				X
Discussion: No permanent increase in noise levels resulting from the project; well does not generate noise. **Source:** Project Scope				
12.d. A significant temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project?			X	
Discussion: Temporary construction-related noise is anticipated which may result from construction vehicles and well drilling though are not considered significant give the temporary nature. Well drilling activities are expected to occur over a five day period for each well drilled (one well to be drilled at a time). Total expected drilling is one to three weeks. **Source:** Project Scope				

12.e.	For a project located within an airport land use plan or, where such a plan has not been adopted, within 2 miles of a public airport or public use airport, exposure to people residing or working in the project area to excessive noise levels?				X
Discussion: The project area is located over 19 miles south of Half Moon Bay Airport and over 19 miles west of San Carlos airport. **Source:** Project location, Google Earth					
12.f.	For a project within the vicinity of a private airstrip, exposure to people residing or working in the project area to excessive noise levels?				X
Discussion: No private airstrips are located within the project area vicinity. **Source:** Project Location, Google Earth					

13. POPULATION AND HOUSING. Would the project:					
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
13.a.	Induce significant population growth in an area, either directly (for example, by proposing new homes and businesses) or indirectly (for example, through extension of roads or other infrastructure)?				X
Discussion: No new homes or businesses are proposed with this project. Connection of the well to any uses is not included in this project scope. **Source:** Project Scope					
13.b.	Displace existing housing **(including low- or moderate-income housing)**, in an area that is substantially deficient in housing, necessitating the construction of replacement housing elsewhere?				X
Discussion: No housing is located on the parcel. **Source:** Project Location					

14.	**PUBLIC SERVICES**. Would the project result in significant adverse physical impacts associated with the provision of new or physically altered government facilities, the need for new or physically altered governmental facilities, the construction of which could cause significant environmental impacts, in order to maintain acceptable service ratios, response times or other performance objectives for any of the public services:				
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
14.a.	Fire protection?				X
14.b.	Police protection?				X
14.c.	Schools?				X
14.d.	Parks?				X
14.e.	Other public facilities or utilities (e.g., hospitals, or electrical/natural gas supply systems)?				X
Discussion: No adverse impacts to the above public services resulting from well construction. **Source:** Project Scope					

15.	**RECREATION**. Would the project:				
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
15.a.	Increase the use of existing neighborhood or regional parks or other recreational facilities such that significant physical deterioration of the facility would occur or be accelerated?				X
Discussion: No neighborhood or regional parks are located in the parcel vicinity. **Source:** Project Location					
15.b.	Include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment?				X

Discussion: No new recreational facilities are proposed nor are existing recreational facilities proposed for expansion.

Source: Project Scope

16. TRANSPORTATION/TRAFFIC. Would the project:					
		Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
16.a.	Conflict with an applicable plan, ordinance or policy establishing measures of effectiveness for the performance of the circulation system, taking into account all modes of transportation including mass transit and non-motorized travel and relevant components of the circulation system, including, but not limited to, intersections, streets, highways and freeways, pedestrian and bicycle paths, and mass transit?				X
Discussion: As discussed in Section 3.b, minor vehicle trips are expected. **Source:** Project Scope					
16.b.	Conflict with an applicable congestion management program, including, but not limited to, level of service standards and travel demand measures, or other standards established by the County congestion management agency for designated roads or highways?				X
Discussion: According to the 2015 Congestion Management Program for San Mateo County (and Final Draft 2018 Program), Pescadero Creek Road is not a monitored route, however, roadways leading to Pescadero Creek Road, namely Highway 1, are monitored. Minor vehicle trips consisting of four well drilling related vehicles (e.g., dump truck, water truck, drilling rig, and mini excavator) arriving on day 1 and to remain on-site in addition to four pickup trucks arriving and leaving once per day are anticipated over the course of the well drilling. Given the number of vehicles and trips, it is not likely that the project will conflict with the 2015 Congestion Management Program. **Source:** City/County Association of Governments of San Mateo County 2015 Congestion Management Program for San Mateo County, Project Scope					
16.c.	Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in significant safety risks?				X

Discussion: Well construction will not impact air traffic patterns or traffic. **Source:** Project Scope				
16.d. Significantly increase hazards to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)?			X	
Discussion: The well locations are proposed in the dirt field south of the parking lot which is not in a path of travel for either vehicles or pedestrians. **Source:** Project Plans				
16.e. Result in inadequate emergency access?				X
Discussion: This project will not result in inadequate emergency access. **Source:** Project Scope				
16.f. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities?				X
Discussion: Well construction will not conflict with such plans. **Source:** Project Scope				
16.g. Cause noticeable increase in pedestrian traffic or a change in pedestrian patterns?				X
Discussion: Well construction will not occur along/within pedestrian paths. **Source:** Project Scope				
16.h. Result in inadequate parking capacity?				X
Discussion: Well construction will not increase the need for parking nor will it reduce the existing on-site parking. **Source:** Project Location, Project Scope				

17. TRIBAL CULTURAL RESOURCES. Would the project:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
17.a. Cause a substantial adverse change in the significance of a tribal cultural resource, defined in Public Resources Code Section 21074 as either a site, feature, place or cultural landscape that is geographically defined in terms of the size and scope of the landscape, sacred place, or object with cultural value to a California Native American tribe, and that is:				X
i. Listed or eligible for listing in the California Register of Historical Resources, or in a local register of historical resources as defined in Public Resources Code section 5020.1(k)				
Discussion: A Sacred Lands File and Native American Contacts List Request was sent to the Native American Heritage Commission on September 10, 2018. A record search of the Native American Heritage Commission Sacred Lands File was completed and the results were negative. Although the project is not subject to Assembly Bill 52 (Tribal Consultation), as the County has no records of written requests for formal notification of proposed projects within the County from any traditionally or culturally affiliated California Native American tribes, the County seeks to satisfy the Native American Heritage Commission's best practices to consult with California Native American tribes that are traditionally and culturally affiliated with the geographic area of the proposed project to avoid inadvertent impacts on tribal cultural resources. On September 20, 2018, a letter was mailed via certified mail to the tribes identified by the Native American Heritage Commission. To date, no request for consultation was received. **Source:** Native American Heritage Commission				
ii. A resource determined by the lead agency, in its discretion and supported by substantial evidence, to be significant pursuant to criteria set forth in Subdivision (c) of Public Resources Code Section 5024.1. (In applying the criteria set forth in Subdivision (c) of Public Resource Code Section 5024.1, the lead agency shall consider the significance of the resource to a California Native American tribe.)				X

Discussion: No resources were identified within the project area as a result of the Cultural Resources Survey.

Source: Cultural Resources Survey

18. UTILITIES AND SERVICE SYSTEMS. Would the project:				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
18.a. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board?				X
Discussion: Project does not include nor necessitate wastewater treatment. **Source:** Project Scope				
18.b. Require or result in the construction of new water or wastewater treatment facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?			X	
Discussion: The proposed domestic well to determine water quality and quantity to serve the existing school and a potential future fire station. This project does not include installation of a water treatment facility. If raw water quality testing reveals a need for water treatment, a separate environmental review and permitting will be required. **Source:** Project Scope				
18.c. Require or result in the construction of new stormwater drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects?				X
Discussion: No new stormwater drainage facilities are required or proposed. **Source:** Project Scope				
18.d. Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed?				X
Discussion: No expansion of the school or other development is proposed under this project. **Source:** Project Scope				

18.e.	Result in a determination by the waste-water treatment provider which serves or may serve the project that it has adequate capacity to serve the project's projected demand in addition to the provider's existing commitments?				X
Discussion: No wastewater treatment providers exist in the area; all wastewater is treated via on-site septic systems. This project does not require wastewater treatment. **Source:** Project Scope					
18.f.	Be served by a landfill with insufficient permitted capacity to accommodate the project's solid waste disposal needs?				X
Discussion: No solid waste will be generated by this project. **Source:** Project Scope					
18.g.	Comply with Federal, State, and local statutes and regulations related to solid waste?				X
Discussion: No solid waste will be generated by this project. **Source:** Project Scope					
18.h.	Be sited, oriented, and/or designed to minimize energy consumption, including transportation energy; incorporate water conservation and solid waste reduction measures; and incorporate solar or other alternative energy sources?				X
Discussion: This project does not include energizing of the well. Well construction is to determine water quality and quantity viability only. **Source:** Project Scope					
18.i.	Generate any demands that will cause a public facility or utility to reach or exceed its capacity?				X
Discussion: No public utilities serve the parcel. Well construction will not impact existing public facilities. **Source:** Project Location					

19. MANDATORY FINDINGS OF SIGNIFICANCE.				
	Potentially Significant Impacts	***Significant Unless Mitigated***	***Less Than Significant Impact***	***No Impact***
19.a. Does the project have the potential to degrade the quality of the environment, significantly reduce the habitat of a fish or wildlife species, cause a fish or wildlife population to drop below self-sustaining levels, threaten to eliminate a plant or animal community, reduce the number or restrict the range of a rare or endangered plant or animal or eliminate important examples of the major periods of California history or prehistory?		X		
Discussion: Without implementation of the identified mitigation measures, the project could impact on air quality, biological resources, cultural resources, and climate. Implementation of the recommended mitigation measures will ensure that potential adverse impacts are reduced to less than significant levels. **Source:** Project Scope				
19.b. Does the project have impacts that are individually limited, but cumulatively considerable? ("Cumulatively considerable" means that the incremental effects of a project are considerable when viewed in connection with the effects of past projects, the effects of other current projects, and the effects of probable future projects.)			X	
Discussion: Staff is unaware of any approved or pending projects on this parcel or near the project site. The location of a potential future fire station on this property, should the well project result in adequate water quality and quantity to serve the station and the school, will be subject to a separate CEQA review and permitting. **Source:** Project Scope				
19.c. Does the project have environmental effects which will cause significant adverse effects on human beings, either directly or indirectly?			X	
Discussion: Given the limited project scope, timing of well drilling, and implementation of mitigation measures, the project will not result in significant impacts. **Source:** Project Scope				

RESPONSIBLE AGENCIES. Check what agency has permit authority or other approval for the project.

AGENCY	YES	NO	TYPE OF APPROVAL
U.S. Army Corps of Engineers (CE)			
State Water Resources Control Board			
Regional Water Quality Control Board			
State Department of Public Health			
San Francisco Bay Conservation and Development Commission (BCDC)			
U.S. Environmental Protection Agency (EPA)			
County Airport Land Use Commission (ALUC)			
Caltrans			
Bay Area Air Quality Management District			
U.S. Fish and Wildlife Service			
Coastal Commission	X		Appeals jurisdiction
City			
Sewer/Water District:			
Other: County Environmental Health Services	X		Well Drilling Permit

MITIGATION MEASURES

	Yes	No
Mitigation measures have been proposed in project application.	X	
Other mitigation measures are needed.	X	

The following measures are included in the project plans or proposals pursuant to Section 15070(b)(1) of the State CEQA Guidelines:

Mitigation Measure 1: The applicant shall require construction contractors to implement all the Bay Area Air Quality Management District's Basic Construction Mitigation Measures, listed below:

a. Water all active construction areas at least twice daily.

b. Apply water two times daily, or apply (non-toxic) soil stabilizers on all unpaved access roads, parking, and staging areas at construction sites. Also, hydroseed or apply non-toxic soil stabilizers to inactive construction areas.

c. Sweep adjacent public streets daily (preferably with water sweepers) if visible soil material is carried onto them.

d. Limit traffic speeds on unpaved roads within the project parcel to 15 miles per hour.

e. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications. All equipment shall be checked by a certified mechanic and determined to be running in proper condition prior to operation.

f. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California airborne toxics control measure Title 13, Section 2485 of the California Code of Regulations [CCR]). Clear signage shall be provided for construction workers at all access points.

Mitigation Measure 2: The applicant shall implement the following basic construction measures at all times:

a. Idling times shall be minimized either by shutting equipment off when not in use or reducing the maximum idling time to 5 minutes (as required by the California Airborne Toxic Control Measures Title 13, Section 2485 of California Code of Regulations [CCR]).

b. All construction equipment shall be maintained and properly tuned in accordance with manufacturer's specifications.

Mitigation Measure 3: Preconstruction survey(s) shall be performed prior to the start of well drilling activities by a qualified biologist. If CRLF and SFGS are found within the project area, all work shall cease until the individual(s) have been allowed to leave the project area on their own. If the CRLF or SFGS individual(s) cannot passively leave the project area, work will cease and the U.S. Fish and Wildlife Service (USFWS) will be contacted to determine the appropriate course of action.

Mitigation Measure 4: If buried cultural materials are encountered during construction, work should stop in that area until a qualified archaeologist can evaluate the nature and significance of the find.

Mitigation Measure 5: Pursuant to San Mateo County Ordinance Code 4.68.050 *Mitigation of Disturbance at Well Site*, disturbance at a well site for the purposes of construction shall be limited to the minimum amount of disturbance necessary to gain access to drill the well. Drilling fluids and other drilling materials produced or used in connection with well construction shall not be allowed to discharge onto or into streets, waterways, sensitive habitats, or storm drains. Drilling fluids shall be properly managed and disposed of in accordance with applicable local, regional, and state requirements. Upon completion of the construction, the site shall be restored as near as possible to its original condition, and appropriate erosion control measures shall be implemented. Wells constructed during a period where winterization requirements are in effect, between October 1 and May 1, shall comply with County stormwater pollution prevention measures.

Mitigation Measure 6: During project construction, the applicant shall, pursuant to Chapter 4.100 of the San Mateo County Ordinance Code, minimize the transport and discharge of stormwater runoff from the construction site:

a. Stabilizing all denuded areas and maintaining erosion control measures continuously between October 1 and April 30. Stabilizing shall include both proactive measures, such as the placement of hay bales or coir netting, and passive measures, such as revegetating disturbed areas with plants propagated from seed collected in the immediate area.

b. Storing, handling, and disposing of construction materials and wastes properly, so as to prevent their contact with stormwater.

c. Controlling and preventing the discharge of all potential pollutants, including pavement cutting wastes, paints, concrete, petroleum products, chemicals, wash water or sediments, and non-stormwater discharges, to storm drains and watercourses.

d. Avoiding cleaning, fueling, or maintaining vehicles on-site, except in a designated area where wash water is contained and treated.

e. Delineating with field markers clearing limits, easements, setbacks, sensitive or critical areas, buffer zones, trees, and drainage courses.

f. Protecting adjacent properties and undisturbed areas from construction impacts using vegetative buffer strips, sediment barriers or filters, dikes, mulching, or other measures as appropriate.

g. Performing clearing and earth-moving activities only during dry weather.

h. Limiting and timing application of pesticides and fertilizers to prevent polluted runoff.

i. Limiting construction access routes and stabilizing designated access points.

j. Avoiding tracking dirt or other materials off-site; cleaning off-site paved areas and sidewalks using dry sweeping methods.

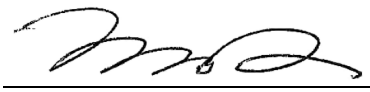
k. The contractor shall train and provide instruction to all employees and subcontractors regarding the construction Best Management Practices.

Mitigation Measure 7: Construction equipment for new development shall comply with best management practices from Bay Area Air Quality Management District guidance.

DETERMINATION (to be completed by the Lead Agency).

On the basis of this initial evaluation:

	I find the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared by the Planning Department.
X	I find that although the proposed project could have a significant effect on the environment, there WILL NOT be a significant effect in this case because of the mitigation measures in the discussion have been included as part of the proposed project. A MITIGATED NEGATIVE DECLARATION will be prepared.
	I find that the proposed project MAY have a significant effect on the environment, and an ENVIRONMENTAL IMPACT REPORT is required.



(Signature)

11/27/2018

Date

Senior Planner

(Title)

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