# County of Santa Cruz

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# CALIFORNIA ENVIRONMENTAL QUALITY ACT (CEQA) ENVIRONMENTAL REVIEW INITIAL STUDY

**Date**: September 12, 2011 **Application Number:** 101027

**Staff Planner**: Todd Sexauer

## I. OVERVIEW AND ENVIRONMENTAL DETERMINATION

**APPLICANT**: Barry Swenson Builder

**APN(s)**: 041-011-03, 09, 20, 24, 33; 041-561-01, 02

**OWNERS**: Constance Scarpelli & Lobue Trustees; Richard S. Hochler Trustee; Layne I. Hogan Joint Venture; Aptos Ventures LLC; SCP Woodland LLC; Aptos Station

**SUPERVISORAL DISTRICT**: 2nd

**PROJECT LOCATION**: Aptos Village, located in the Aptos Planning area within the unincorporated portion of Santa Cruz County, lies about six miles east of the City of Santa Cruz and about eight miles northwest of the City of Watsonville. The site is located just north of Highway 1 between the State Park Drive and Rio Del Mar Boulevard interchanges. The Village is 80 feet in elevation above the confluence of Aptos and Valencia Creeks and about one-half mile inland from the Monterey Bay.

**SUMMARY PROJECT DESCRIPTION**:

The project proposes to construct a mixed-use commercial and residential development (including a maximum of 63 residential units and 75,000 square feet of commercial space) for the core area of the Aptos Village, as identified in the Aptos Village Plan, adopted February 23, 2010.

The project would require the following: Planned Unit Development; Subdivision and Commercial Development Permit; Residential Development Permit; General Plan Amendment; Roadway Abandonment; Historic Preservation Plan Review; Archaeological Report Review; Soils Report Review; and Preliminary Grading Review.

The proposed project site is located within the partially undeveloped portions of the core area of Aptos Village between Aptos Creek Road, Trout Gulch Road, and Soquel Drive. Two historic structures, the Apple Barn and the Aptos Firehouse/Veterans of Foreign Wars (VFW) Hall are located within the project area. The Apple Barn would be relocated and the Firehouse/VFW Hall would be demolished as part of the proposed project.

**ENVIRONMENTAL FACTORS POTENTIALLY AFFECTED:** All of the following potential environmental impacts are evaluated in this Initial Study. Categories that are marked have been analyzed in greater detail based on project specific information.

- ☒ Geology/Soils
- ☒ Hydrology/Water Supply/Water Quality
- ☒ Biological Resources
- ☐ Agriculture and Forestry Resources
- ☐ Mineral Resources
- ☐ Visual Resources & Aesthetics
- ☒ Cultural Resources
- ☒ Hazards & Hazardous Materials
- ☒ Transportation/Traffic
- ☒ Noise
- ☒ Air Quality
- ☒ Greenhouse Gas Emissions
- ☒ Public Services
- ☒ Recreation
- ☒ Utilities & Service Systems
- ☐ Land Use and Planning
- ☒ Population and Housing
- ☐ Mandatory Findings of Significance

**DISCRETIONARY APPROVAL(S) BEING CONSIDERED:**

- ☒ General Plan Amendment
- ☒ Land Division
- ☒ Rezoning
- ☒ Commercial & Residential Development Permits
- ☒ Roadway Abandonment
- ☐ Coastal Development Permit
- ☒ Grading Permit
- ☐ Riparian Exception
- ☒ Planned Unit Development/ Development Agreement
- ☐ Other:

**NON-LOCAL APPROVALS**

Other agencies that must issue permits or authorizations: California Public Utilities Commission; California Department of Fish and Game; Soquel Creek Water District

**DETERMINATION:** (To be completed by the lead agency)
On the basis of this initial evaluation:

- ☐ I find that the proposed project COULD NOT have a significant effect on the environment, and a NEGATIVE DECLARATION will be prepared.
- ☒ 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 revisions in the project have been made or agreed to by the project proponent. 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.
- ☐ I find that the proposed project MAY have a "potentially significant impact" or "potentially significant unless mitigated" impact on the environment, but at least

one effect 1) has been adequately analyzed in an earlier document pursuant to applicable legal standards, and 2) has been addressed by mitigation measures based on the earlier analysis as described on attached sheets. An ENVIRONMENTAL IMPACT REPORT is required, but it must analyze only the effects that remain to be addressed.

☐ I find that although the proposed project could have a significant effect on the environment, because all potentially significant effects (a) have been analyzed adequately in an earlier EIR or NEGATIVE DECLARATION pursuant to applicable standards, and (b) have been avoided or mitigated pursuant to that earlier EIR or NEGATIVE DECLARATION, including revisions or mitigation measures that are imposed upon the proposed project, nothing further is required.

_____ _____

Matthew Johnston
Environmental Coordinator

Date

## II. BACKGROUND INFORMATION

### EXISTING SITE CONDITIONS

Parcel Size:
Existing Land Use: Commercial retail, office, and residential
Vegetation: Existing trees, shrubs, and grasses
Slope in area affected by project: ☒ 0 - 30% ☐ 31 – 100%
Nearby Watercourse: Aptos Creek, Valencia Creek, and Trout Gulch Creek
Distance To: Adjacent

### ENVIRONMENTAL RESOURCES AND CONSTRAINTS

Water Supply Watershed: None Mapped
Groundwater Recharge: None Mapped
Timber or Mineral: None Mapped
Agricultural Resource: None Mapped
Biologically Sensitive Habitat: Yes
Fire Hazard: None Mapped
Floodplain: Yes, south of Soquel Drive (above confluence of Aptos Creek and Valencia Creek)
Erosion: Low to Moderate Potential
Landslide: None Mapped
Liquefaction: Low to High Potential

Fault Zone: None Mapped
Scenic Corridor: No
Historic: Yes
Archaeology: Yes
Noise Constraint: None Mapped
Electric Power Lines: Yes
Solar Access: Adequate

Solar Orientation: Level
Hazardous Materials: None
Other:

### SERVICES

Fire Protection: Aptos-La Selva FPD
School District: Pajaro USD
Sewage Disposal: Santa Cruz County Sanitation District

Drainage District: Zone 6
Project Access:
Water Supply: Soquel Creek Water Dist.

### PLANNING POLICIES

Zone District: RM-2; RM-2-L; PR; C-2; RM-3; C-2-L;
General Plan: Community Commercial; Urban High Residential; Urban Medium Residential; Parks, Recreation & Open Space;

Special Designation: Historic Landmark

| | | |
|---|---|---|
| Urban Services Line: | ☒ Inside | ☐ Outside |
| Coastal Zone: | ☐ Inside | ☒ Outside |

### ENVIRONMENTAL SETTING AND SURROUNDING LAND USES:

Aptos Village, located in the Aptos Planning area within the unincorporated portion of Santa Cruz County, lies about six miles east of the City of Santa Cruz and about eight miles northwest of the City of Watsonville (see Figures 1 and 2, Regional Location Map and Project Location Map). The site is located just north of Highway 1 between the

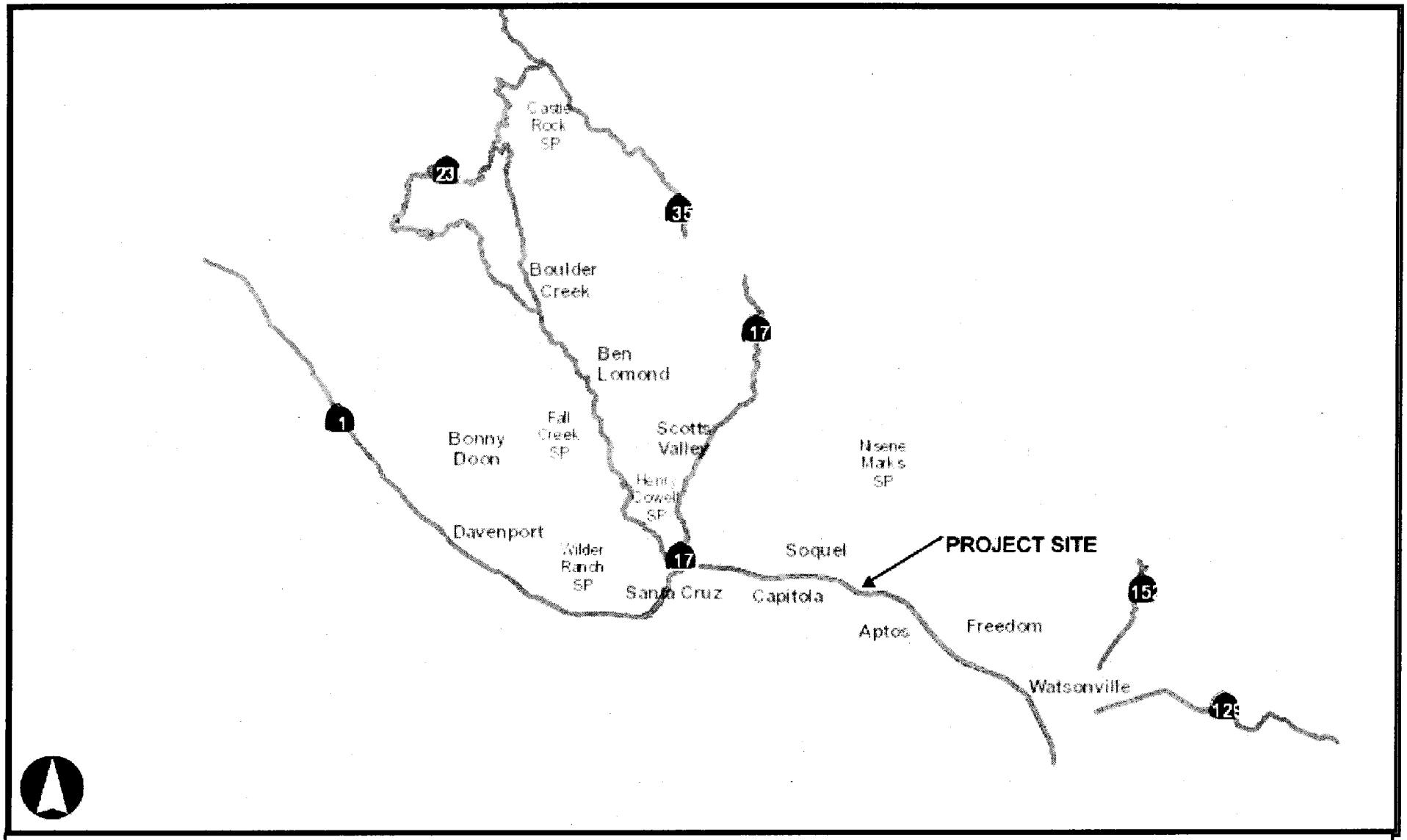
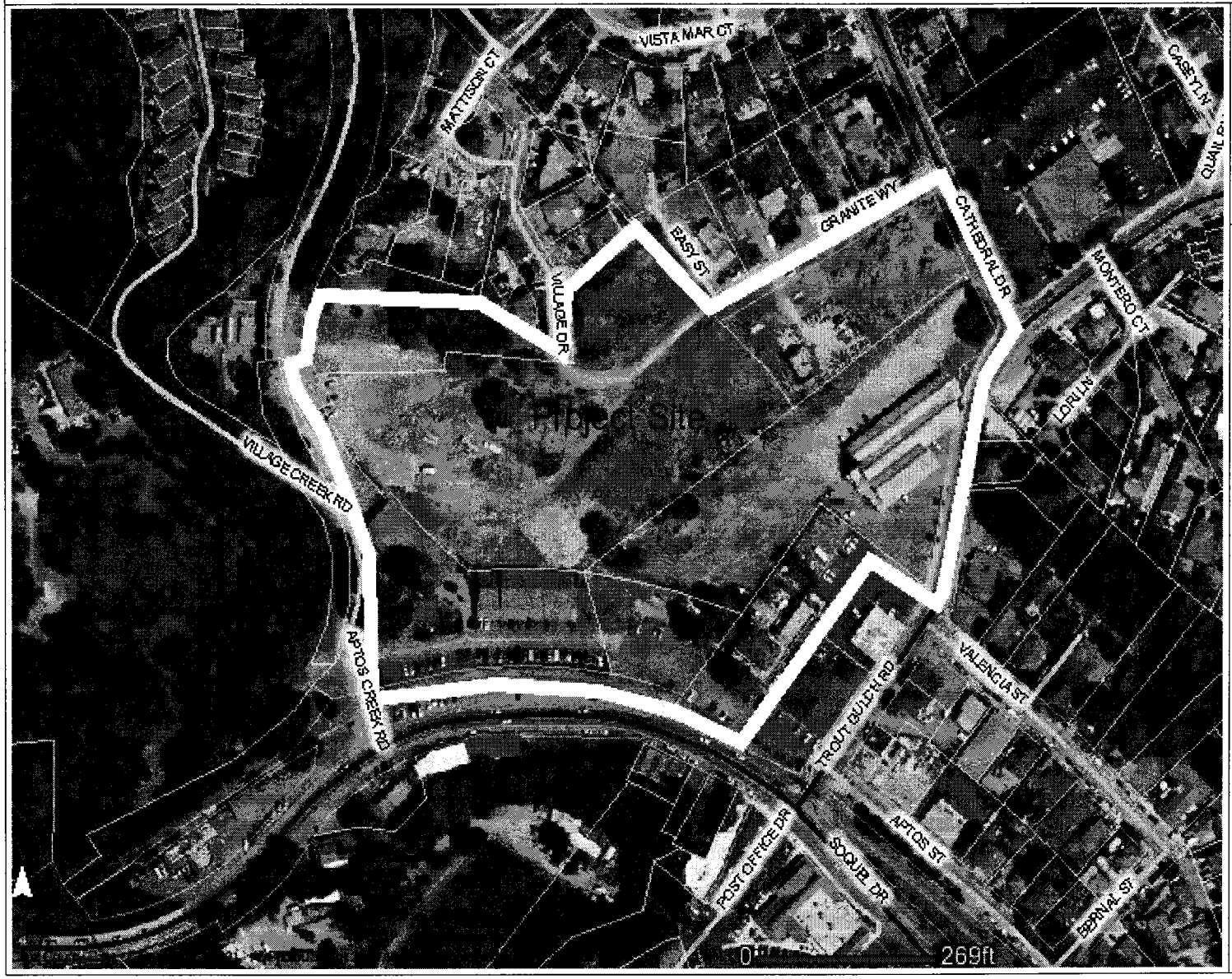
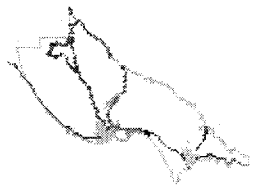



**Figure 1 – Santa Cruz County Regional Location Map**

**Source: County of Santa Cruz, 2011**

# Aptos Village Project Location Map



**Legend**

- Parcel (Assessor)
- State Highways
- STREETS
  - BR
  - MR
  - R
  - S
- Streams
  - Intermittent
  - Perennial
- City Limits
- 3in 2007
- 1FT 2008

**Figure 2**

State Park Drive and Rio Del Mar Boulevard interchanges. The Village is 80 feet in elevation above the confluence of Aptos and Valencia Creeks and about one-half mile inland from the Monterey Bay. In general, the project site is bounded on the north by Granite Way, the south by the Union Pacific Railroad and Soquel Drive, on the east by Trout Gulch Road and Cathedral Drive, and on the west by Aptos Creek Road.

The project site is currently dominated by commercial and residential uses with much of the area no longer developed (see Table 1). Two historic structures, the Hihn Apple Barn and the Aptos Firehouse, are also located within the project area. The surrounding area is mainly developed with residential uses, and the Village serves as the gateway to the 10,000-acre Forest of Nisene Marks State Park. The main access to and from the Village is Soquel Drive, a major east-west arterial that parallels Highway 1. There are both commercial and residential uses to the east and west of the Village, with the major existing commercial development being the Rancho del Mar Shopping Center, just west of the Village.

The Village itself is composed of small retail commercial and residential uses and vacant parcels. Most of the Village is level to gently sloping, although there are areas of steep slopes to the south of Soquel Drive, west of Aptos Creek Road, and to the rear of the parcels fronting on Valencia Street and Bernal Street. Vegetation consists of scattered Coast live oaks, Coast redwoods, eucalyptus, grasses, and ornamentals.

**Table 1: Aptos Village Development Project**
**Existing General Plan and Zone within the Project Area**

| Assessor Parcel No. | General Plan Designation | Zone District | Acreage |
|---|---|---|---|
| 041-011-03 | Urban High Residential – R-UH | Multi-Family Residential - RM-2 | 1.087 |
| 041-011-09 | Existing Parks & Recreation – O-R | Parks, Recreation, and Open Space – PR | 0.713 |
| 041-011-20 | Community Commercial – C-C; Urban Medium Residential R-UM | Community Commercial – C-2; and Multi-Family Residential – RM-3 | 4.030 |
| 041-011-24 | Community Commercial – C-C | Community Commercial (Landmark) –C-2-L | 0.535 |
| 041-011-33 | Urban High Residential – R-UH; Community Commercial – C-C | Multi-Family Residential (Landmark) – RM-2-L; Community Commercial C-2-L | 2.549 |
| 041-011-34 | Community Commercial – C-C | Community Commercial (Landmark) – C-2-L & C-2 | 0.868 |
| 041-561-01 | Community Commercial – C-C | Community Commercial – C-2 | 1.443 |
| **Total Acres** | | | **11.225** |

Source: County of Santa Cruz 2011.

## PROJECT BACKGROUND:

Land use decisions within the Aptos Village planning area were governed by the Aptos Village Community Design Framework (a Specific Plan that was originally adopted by the Board of Supervisors on April 17, 1979 and amended on June 18, 1985) between 1979 and 2010. On February 23, 2010, the Board of Supervisors adopted the more

detailed Aptos Village Plan to replace the outdated Aptos Village Community Design Framework. The only major new construction to occur in the Village since the late 1960s was the development of Aptos Station in 1981, the Founders Title Building in 1985, and the Appenrodt building at the southeast corner of Soquel Drive and Post Office Drive in 2006. There have been several previous attempts to develop the vacant parcels to the rear of Aptos Station and the Bayview Hotel. For a variety of reasons, including parcel configuration and lack of coordinated planning among property owners, these vacant areas were never developed.

The Board of Supervisors adopted the new comprehensive Aptos Village Plan on February 23, 2010. Recognizing the challenges involved with developing the mixed assortment of vacant parcels, the County concluded that a more detailed plan would encourage the Framework vision to be realized, including the important factors of parcel configuration and joint infrastructure planning. Without modifications to the existing parcel configuration and a joint effort to develop infrastructure for the Village, it would be difficult to create an integrated development with a Village atmosphere. The Aptos Village Plan, which builds upon the Aptos Village Community Design Framework, is intended to act as a guide for new development in the Village.

**DETAILED PROJECT DESCRIPTION:**

A large portion of the proposed project site consists of undeveloped portions of the core area of Aptos Village between Aptos Creek Road, Trout Gulch Road, and Soquel Drive (see Figure 2).

Planned Unit Development

The project would include the approval of a Planned Unit Development (PUD). As stated in Section 18.10.180(a) of the General Plan, "...the objectives of the General Plan/Local Coastal Program Land Use Plan and the County Code may be achieved by the development of planned units which do not conform in all respects with the land use regulations prescribed by the County Code. A Planned Unit Development may include a combination of different dwelling and structure types and/or a variety of land uses, which complement each other and harmonize with existing and proposed land uses, and structures in the vicinity. In order to provide locations for well-planned developments which conform with the objectives of the County Code although they deviate in certain respects from the underlying zone district and design review standards, the County Board of Supervisors may approve Planned Unit Development Permits, provided the developments comply with the regulations prescribed in this Chapter and are consistent with the County General Plan/Local Coastal Program Land Use Plan."

Parcel Reconfiguration

Table 2 provides the proposed parcel, lot and building data for the proposed project. Within the project area, the proposal includes the reconfiguration of seven existing parcels (041-011-03, 09, 20, 24, 33; 041-561-01, and 02) into 19 new parcels containing 37 lots and 15 buildings (Figure 3).

**Table 2: Aptos Village Development Project**
**Proposed Parcel, Lot and Building Data**

| Parcel Data | | | | Lot Data | | | | Building Data | |
|---|---|---|---|---|---|---|---|---|---|
| Parcel No. | Net Parcel (Sq. Ft.) | Net Parcel (Acres) | Parcel Phase No. | Lot No. | Net Lot (Sq. Ft.) | Net Lot (Acres) | Lot Phase No. | Building No. | Description |
| Parcel A | 103,788 | 2.38 | Ia | 16 | 5,179 | 0.12 | II | 3 | Mixed Use w/ Condo Flats Bldg |
| | | | | 17 | 5,331 | 0.12 | Ia | 4 | Landmark Commercial Bldg |
| | | | | 18 | 15,202 | 0.35 | Ia | 5 | Apple Barn Anchor Retail Bldg |
| | | | | 19 | 7,967 | 0.18 | Ic | 6 | Large Tennant Commercial Bldg |
| | | | | 37 | 1,657 | 0.04 | Ia | -- | Soquel Creek Water Well Lot |
| Parcel B | 36,870 | 0.85 | IIIb | 10 | 1,690 | 0.04 | IIIb | 1 | Mixed Use Bldg |
| | | | | 11 | 3,269 | 0.08 | | | |
| | | | | 12 | 1,933 | 0.04 | | 2 | Mixed Use w/Small Shops Bldgs |
| | | | | 13 | 3,688 | 0.08 | | | |
| | | | | 14 | 5,376 | 0.12 | | | |
| | | | | 15 | 1,996 | 0.05 | | | |
| Parcel C | 16,605 | 0.38 | IIIa | 7 | 5,220 | 0.12 | IIIa | 9 | Mid-block Mixed Use Bldgs |
| | | | | 8 | 3,675 | 0.08 | | 10 | West Mixed Use Bldgs |
| Parcel D | 6,811 | 0.16 | Ib | 2 | 2,993 | 0.07 | Ib | 15 | West Parade Mixed Use Bldg |
| Parcel E | 6,981 | 0.16 | Ib | 3 | 3,046 | 0.07 | Ib | 14 | East Parade Mixed Use Bldg |
| Parcel F | 5,108 | 0.12 | Ia | -- | -- | -- | -- | -- | Common Area and Public Utilities Easement |
| Parcel G | 1,082 | 0.02 | Ia | -- | -- | -- | -- | -- | |
| Parcel H | 11,908 | 0.27 | 1a | 20 | 1,005 | 0.02 | Ia | 12 | Townhouses |
| | | | | 21 | | | | | |
| | | | | 22 | | | | | |
| | | | | 23 | | | | | |
| | | | | 24 | | | | | |
| | | | | 25 | | | | | |
| | | | | 26 | | | | | |
| | | | | 27 | | | | | |
| | | | | 28 | | | | | |
| | | | | 29 | | | | | |
| | | | | 30 | | | | | |
| Parcel I | 12,145 | 0.28 | Ia | 31 | 1,011 | 0.02 | Ia | 11 | Hillside Cluster Townhouses |
| | | | | 32 | 1,098 | 0.03 | | | |
| | | | | 33 | 1,099 | 0.03 | | | |
| | | | | 34 | 1,372 | 0.03 | | | |
| | | | | 35 | 1,057 | 0.02 | | | |
| | | | | 36 | 1,278 | 0.03 | | | |
| Parcel J | 31,829 | 0.73 | Ia | -- | -- | -- | -- | -- | Street Dedication (Valencia St.) |
| Parcel K | 4,483 | 0.10 | Ia | -- | -- | -- | -- | -- | Street Dedication (Granite Way and Cathedral Drive) |
| Parcel L | 10,302 | 0.24 | Ia | -- | -- | -- | -- | -- | Street Dedication and Public Utilities Easement (Granite Way) |
| Parcel M | 555 | 0.01 | Ia | -- | -- | -- | -- | -- | Street Abandonment (Trout Gulch Road) |
| Parcel N | 98 | 0.00 | IIIb | -- | -- | -- | -- | -- | Lot Line Adjustment (Aptos Creek Road) |
| Parcel O | 14,752 | 0.34 | IIIa | -- | -- | -- | -- | -- | Street Dedication (Valencia St.) |
| Parcel P | 3,662 | 0.08 | Ib | -- | -- | -- | -- | -- | Common Area and Public Utilities Easement |
| Parcel Q | 4,031 | 0.09 | II | 6 | 3,926 | 0.09 | II | 8 | Corner Mixed Use Bldg |
| Parcel R | 8,691 | 0.20 | Ib | 5 | 2,657 | 0.06 | II | 7 | Small Mixed Use Bldg |
| Parcel S | 461 | 0.01 | IIIb | -- | -- | -- | -- | -- | Lot Line Adjustment (Aptos Creek Road) |
| Existing Parcels | 61,824 | 1.42 | -- | 1 | 61,824 | 1.42 | -- | -- | Aptos Station Shopping Center |
| | 35,223 | 0.81 | -- | 4 | 35,223 | 0.81 | -- | 13 | Existing Bayview Hotel |
| | 32,198 | 0.74 | -- | 9 | 32,198 | 0.74 | -- | -- | Future Park Site |

Source: Ifland Engineers, 2011.

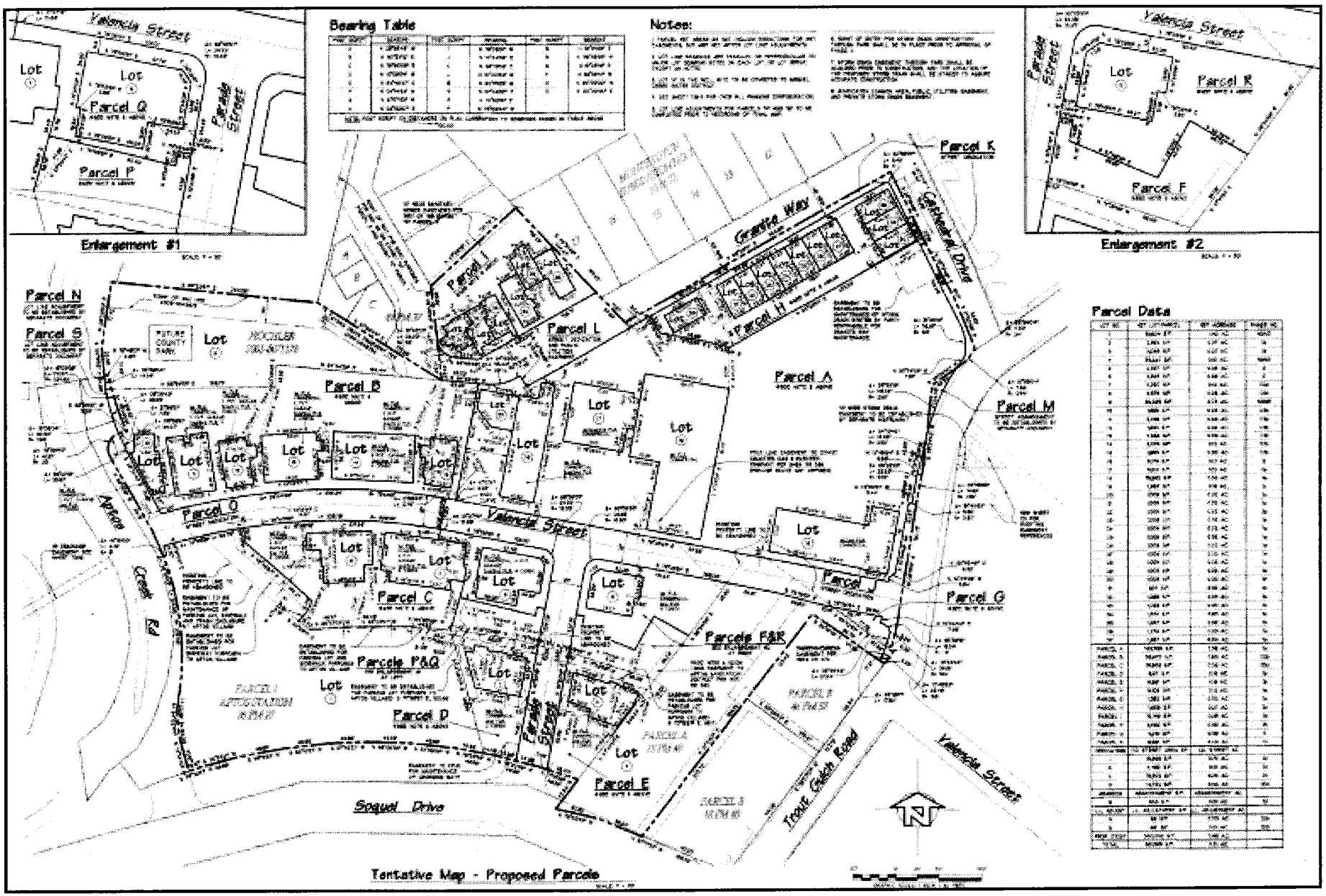



**Figure 3 – Proposed Parcel Reconfiguration**

Source: Ifland Engineering, 2010

Commercial and Mixed-Use Development

The project proposes to construct a mixed-use commercial and residential development (including a maximum of 63 residential units and 75,000 square feet of commercial space) for the core area of the Aptos Village, per the requirements of the Aptos Village Plan, adopted February 23, 2010.

Requires a PUD, Subdivision, Development Agreement, Rezoning, General Plan Amendment, Commercial Development Permit, Residential Development Permit, Roadway Abandonment, Historic Preservation Plan Review, Archaeological Report Review, Soils Report Review, and Preliminary Grading Review.

Commercial buildings would not exceed three stories in height. However, maximum heights for buildings would be allowed to exceed the zone district maximum of 35 feet as follows:

- Buildings located around the Village Green (Buildings 3 & 4) would not exceed 45 feet in height. One small cupola, or other architectural feature, would be allowed to exceed this requirement by 6 feet on the building north of the Village Green (Building 4).
- Other buildings along the east-west roadway would not exceed 40 feet in height, with building height decreasing away from the intersection with the new north-south street (Parade Street). Specific maximum building heights are as follows:
    - Building 1 - Maximum height of 38 feet. One small tower element, or other vertical feature (either detached or detached from the building), may exceed this height by no more than 3 feet; for a total height of 41 feet.
    - Building 2 - Maximum height of 40 feet.
    - Building 8 - Maximum height of 38 feet.
    - Building 9 - Maximum height of 37 feet.
- All other commercial and mixed use buildings (Buildings 6, 7, 10, 14 & 15) would be limited to the zone district maximum of 35 feet in height.

Residential buildings would not exceed the following height limitations.

- The following requirements apply to the six residential units located north of Granite Way (Building 11):
    - Maximum height would not exceed 35 feet.
    - Buildings would not exceed three stories, with two stories allowed above a parking/garage level.
- The eleven residential units located on the south side of Granite Way (Building 12) would comply with the height and story requirement for the RM-3 zone district (maximum height of 28 feet and 2 stories).

Common Interest Development Association

A Common Interest Development (CID) association shall be formed for maintenance of all areas under common ownership including, sidewalks, roadways, all landscaping,

drainage structures, water lines, sewer laterals, fences, silt and grease traps and buildings. Separate Common Interest Development (CID) associations (or Homeowners Associations) may be created for the stand alone residential units accessed off of Granite Way, and separate divisions of the CID association may be created under a single Master CID association for the residential and commercial elements of the mixed use portion of the project.

Parking

Management of parking to ensure that sufficient parking is available to residents, guests, and customers of the commercial businesses shall be the responsibility of the CID association. The CID association documents shall include provisions regarding management and allocation of parking spaces for residential and commercial uses on the project site.

Parking would be provided consistent with the approved parking plan for the proposed development. Based on the intensity of commercial and residential use proposed, the parking provided within the commercial and mixed use residential portion of the project site would include a minimum of 400 parking spaces.

A minimum of one residential reserved parking space would be provided for each residential unit in a mixed-use building that does not provide a garage parking space. The reserved spaces would be located in general proximity to the building in which the unit is located and shall be clearly labeled as reserved spaces for this purpose. Additional time-specific reserved residential parking may be provided for units that are larger than one bedroom.

Lockable storage sheds or lockable garage space would be provided for onsite bicycle storage. In addition to garage spaces, a minimum of 12 enclosed bicycle parking spaces and a minimum of 69 unenclosed bicycle parking spaces would be provided for the mixed use portion of the project.

Residential parking requirements for residential units located off of Granite Way (Buildings 11 & 12) would include the following:

- A minimum of 2 off-street parking spaces would be provided per residential unit.
- Eighteen (18) additional on-street parking spaces would be created on Granite Way for residents and guests. The on-street spaces would be available for use by residents and guests of the proposed residential development as well as residents and guests of the existing residential properties along Granite Way.
- Lockable storage sheds or lockable garage space would be provided for onsite bicycle storage. At least one bicycle space would be provided for each dwelling unit.
- The CID association or Homeowner's Association (HOA) would be responsible for ensuring that garage spaces are kept available for parking and not used for storage in a manner that would prevent the parking of vehicles.
- Management of parking to ensure compliance with these conditions and to ensure that sufficient parking is available to residents would be the responsibility

of the CID association. The CID association documents would include provisions regarding management and allocation of parking spaces for residential uses on the project site consistent with the conditions of approval for this permit.

Drainage Improvements

The proposed drainage improvements for the site include both conventional and low impact development best management practices. The Best Management Practices (BMPs) selected are designed to capture, treat, and retain the majority of runoff from the site. The system has been sized and designed based on the net increase in impervious surfaces, per Santa Cruz County Design Criteria, for a 25-year storm event with a 5-year pre-development release rate. Runoff from peak discharge events exceeding the 25-year 24-hour event would be conveyed to Aptos or Valencia creeks. The following discussion describes the type of storm water BMPs proposed to manage and treat runoff from the proposed project (Attachment 12).

*Surface Retention and Detention Systems*

The proposed drainage system would utilize several small surface water retention/detention systems, including pervious concrete and stone beds, and rain gardens and drain rock beds, to capture, treat and retain runoff (see Figure 4). All of the surface retention/detention systems have been designed to drain completely within 48 hours from the cessation of runoff as required by the County of Santa Cruz Design Criteria (June 2006).

Pervious Concrete and Stone Beds: Roof runoff from buildings would be directed to pervious concrete via downspouts to through curb drains or underground piping outleting within the stone beds. The pavement runoff would be directed to the pervious concrete by overland flow. Landscaped islands would also take in direct rainfall reducing the amount of runoff directed to the stone beds. Runoff would then be treated through bio-filtration and detained within the stone beds beneath the pervious concrete and released by means of an outlet control structure equipped with an orifice and weir at the 5-year release rate.

Rain Gardens and Drain Rock Beds: Rain gardens are passive storm water filtration systems similar to bio-retention swales that use soil and vegetation to treat runoff. The rain gardens are flow through storm water BMPs that retain and infiltrate runoff to the underlying soils. The systems are landscaped based systems and provide passive treatment of the runoff requiring little maintenance while achieving high pollutant removal efficiencies. Maintenance requirements are comparable to typical landscaped areas. Rain gardens and associated drain rock beds have been proposed along the new east-west street (Valencia Street), Parade Street, and Granite Way.

These systems are designed to capture, treat, retain/detain storm water runoff from the paved roadways and sidewalks. There are several other landscaped islands and landscaping features that would also capture minimal runoff and either infiltrate into the ground or be directed via overland flow to one of the above underground systems. The system has been sized and designed based on the net increase in development release rate. The succeeding calculations focus on the short duration storm event as required by the Santa Cruz County Design Criteria. Each retention/detention system is designed

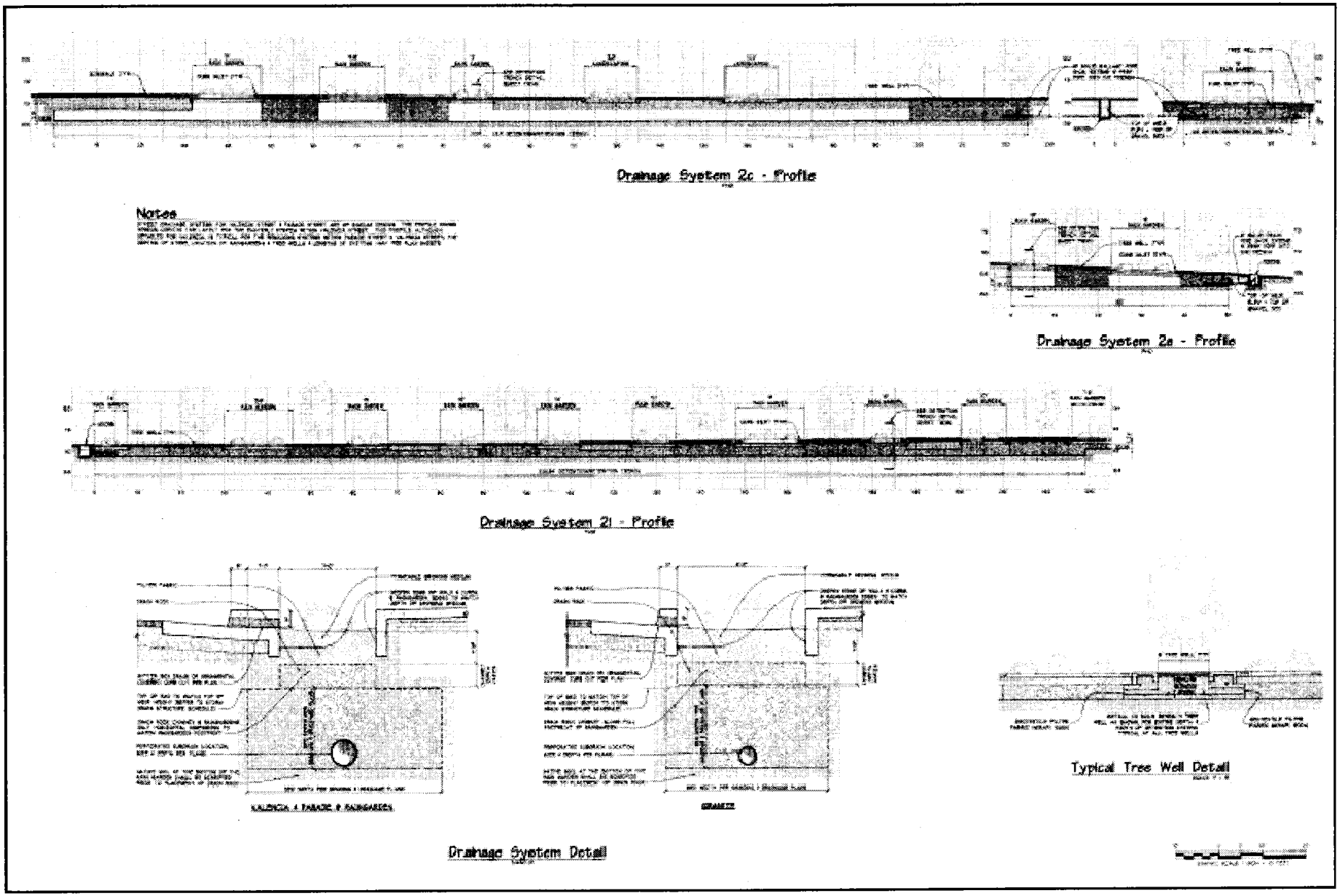



Figure 4 – Proposed Surface Retention and Detention Systems

with an outlet control structure equipped with weir and orifice plate. The runoff that would be released off-site to the west would be directed to Aptos Creek via storm drains routed down Aptos Creek Road and the adjoining hillside, across Aptos Creek Park to a riprap level spreader at the top of bank. To the east, runoff would be directed to the existing storm drain line east of Trout gulch Road.

*Subsurface Retention and Detention Systems*

The proposed project would use both subsurface retention and detention systems to capture, reuse and infiltrate runoff, and to reduce peak discharge of runoff from the site. All of the subsurface retention/detention systems (with the exception of the cistern) have been designed to drain completely within 48 hours from the cessation of runoff as required by the County of Santa Cruz Design Criteria (June 2006).

*New Aptos Creek Outfall*

The project proposes a new 450-foot long drainage outfall that would empty into Aptos Creek through a 30-foot wide flow spreader to be constructed on the east bank of Aptos Creek above the ordinary high watermark. The outfall would drain the western portion of the Village. An 18-inch diameter high density polyethylene pipe with a water quality treatment unit would be installed across Aptos Creek Park to reach Aptos Creek. No trees would be directly impacted by the proposed design.

Roadway Improvements

The project proposes the construction of a new East-West roadway, north of Soquel Drive, a North-South roadway connecting Soquel Drive to the new East-West roadway, and changes to Granite Way and Aptos Creek Road. Additional project improvements proposed include the following:

- The installation of traffic signals at Soquel Drive-Trout Gulch intersection[1], including a left-turn lane on westbound Soquel Drive at Post Office Drive;
- Installation of traffic signals at the Soquel Drive-Aptos Creek Road intersection[1], including a left-turn lane on eastbound Soquel Drive at Aptos Creek Road;
- Installation of a left turn lane on eastbound Soquel Drive at the new north-south street with a one-way stop sign with right-turn only onto Soquel Drive;
- Includes left turn and right turn lanes on the new east-west roadway at the intersection with Trout Gulch;
- Modification of signal phasing to provide permissive left-turn phasing for Aptos Rancho Road, located outside of Aptos Village;
- Installation of an exclusive right-turn lane with storage length of at least 300 feet plus transition on eastbound Soquel Drive at the Soquel Drive-State Park-Sunset

[1] Both the installation of traffic signals at Soquel Drive-Trout Gulch intersection and Soquel Drive-Aptos Creek Road intersection are part of the current Capital Improvement Program and are currently under design.

Way intersection, located outside of Aptos Village. Since the installation of a right-turn lane has right-of-way issues on the southwest corner of the intersection if ideal land widths are used, narrower lane widths are recommended.

Railroad Safety Improvements

*Trout Gulch Road at Soquel Drive*

The proposed alterations on Trout Gulch Road consist of widening the existing three-lane road with a dedicated right turn lane and a shared through-left lane (39 feet wide) to a slightly wider roadway (42 feet wide) with the same lane configuration. Railroad crossing improvements include replacing the two existing Commission Standard 9 devices with 25-foot gate arms on the northbound and southbound approaches with a new Commission Standard 9 device in the northbound direction and a new Commission Standard 9-A device in the southbound direction, both with 30-foot gate arms. Additionally, the existing railroad rubber panels will be replaced with concrete panels. The affected crossing would remain within the existing rail right-of-way.

The proposed alterations on Soquel Drive at the Trout Gulch Road intersection consist of reconstructing and restriping the roadway while maintaining a similar roadway width and lane configuration on the eastbound approach. A dedicated left turn lane will be added on the westbound approach. It should be noted that Soquel Drive runs parallel to the rail line with a horizontal separation distance of approximately 20 feet. The intersection of Soquel Drive and Trout Gulch Road would be signalized as part of this project and would be interconnected with the new rail crossing warning devices to provide railroad preemption. The intersection would act as a pre-signal at the railroad crossing, stopping vehicles prior to the crossing on the north leg. It is currently a four-way stop controlled intersection.

The project would also include pedestrian improvements such as raised curb, sidewalk, and Americans with Disabilities Act-compliant (ADA-compliant) curb ramps. Appropriate pavement markings and signage will be installed, maintained, and/or reinstalled.

*Aptos Creek Road at Soquel Drive*

At Sierra Northern Railway Mile Post 12.65, Aptos Creek Road, a private crossing, crosses an unfenced, single-track rail line at grade and intersects Soquel Drive forming a "T" intersection. Soquel Drive, a public street, runs parallel along the south side of said rail line and intersects Aptos Creek Road. Aptos Creek Road forms the intersection's north leg, and Soquel Drive forms the intersection's east and west legs. The rail crossing at Aptos Creek Road is currently stop controlled; there are no other traffic control measures at the roadway intersection.

The project proposes to convert Aptos Creek Road from a private crossing to a public crossing and construct road improvements on Aptos Creek Road and Soquel Drive, a traffic signal at the Aptos Creek Road-Soquel Drive intersection, and standard railroad crossing gates at the Aptos Creek Road railroad crossing. The affected crossing would remain within the existing rail right-of-way.

The new traffic signals would have railroad pre-emption and standard crossing gates and other warning devices, as required. The intersection would act as a pre-signal at the railroad crossing, stopping vehicles prior to the crossing on the north leg. The roadway improvements consist of widening Aptos Creek Road from a two-lane road (35 feet wide ±) to one dedicated 11-foot left turn lane and one dedicated 11-foot right turn lane in the southbound direction, one 12-foot through lane in the northbound direction, and 5-foot bike lanes in each direction and include new curb, gutter, sidewalks, and ADA-compliant curb ramps. The modified street crossing width would be 44 feet wide.

*Parade Street at Soquel Drive*

At Sierra Northern Railway Mile Post 12.55, Soquel Drive, a public street, runs parallel along the south side of the single-track, unfenced Sierra Northern Railway rail corridor. The project proposes to construct Parade Street, a new public street, as an at-grade crossing over the rail line intersecting with Soquel Drive to form a "T" intersection. The affected crossing would remain within the existing rail right-of-way.

The new street improvements consist of one dedicated 12-foot right turn only lane in the southbound direction, one 12-foot through lane in the northbound direction, and 6-foot bike lanes in each direction and include new curb, gutter, sidewalks, and ADA-compliant curb ramps. The street crossing width will be 36 feet wide. Stop control would be provided on Parade Street with standard crossing arms and other warning devices, as required, provided at the rail crossing.

The new roadway improvements would provide and improve pedestrian and bicycle safety and would facilitate safer access between the commercial developments on either side of the railroad tracks and Soquel Drive by providing an intermediary crossing between two existing crossings and relieving traffic congestion in the area. The new crossing includes railroad-crossing gates to provide safety measures for vehicular and pedestrian traffic.

*At-Grade Railroad Crossing Closures*

Two at-grade crossings would be closed as a part of the proposed project as required by the California Public Utilities Commission in response to the proposed at-grade crossing at Parade Street. The first closure location would be the Bayview Hotel private crossing [CPUC No. 017B-12.51-X] located between Trout Gulch Road (to the east) and Parade Street (the proposed crossing) to the west. The Bayview Hotel crossing is one of three existing entry points into the commercial area north of the railroad line in Aptos Village. The second proposed closure location consists of a private crossing in Davenport, California in north Santa Cruz County. The second proposed closure is located approximately 300-feet south of the end of the rail line and approximately 0.27 mile north of the existing Cement Plant Road crossing [CPUC No. 017B-31.60-C]. The Davenport crossing serves a short connector road, which connects State Highway 1 and Cement Plant Road. The closure of these two crossings would not affect access to (would not land-lock) any properties, as alternative roads for ingress and egress are available.

Historic Structures

Two historic structures, the National Register (NR) 3 eligible Apple Barn located immediately west of Trout Gulch Road between Soquel Drive and Cathedral Drive, and the Aptos Firehouse/Veterans of Foreign Wars (VFW) Hall, located immediately west of the Bayview Hotel north of Soquel Drive, are also located within the project area. The Apple Barn would be relocated within Aptos Village as part of the proposed development project. However, the Aptos Firehouse/VFW Hall is proposed for demolition due to its dilapidated and dangerous condition. The proposed demolition of the Aptos Firehouse/VFW Hall would require an amendment to the Aptos Village Plan for consistency. This is proposed as part of the project.

Preliminary Grading Estimate

Preliminary grading estimates for the project site is estimated to include 17,281 cubic yards of excavation with 9,309 cubic yards of embankment, resulting in 7,972 cubic yards of export.

Park Site Dedication

The project proposes the dedication of a proposed 0.713 acre undeveloped park site (APN 041-011-09). The future park site would be donated to the County of Santa Cruz by the landowner, with the County responsible for design, financing and construction of the improvements and operational and maintenance costs. The donation to the County would be credited against the required park in-lieu fees for the proposed project. All future park improvements would require a separate discretionary approval.

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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## III. ENVIRONMENTAL REVIEW CHECKLIST

### A. GEOLOGY AND SOILS

Would the project:

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|---|---|---|---|---|---|
| 1. | Expose people or structures to potential substantial adverse effects, including the risk of loss, injury, or death involving: | | | | |
| | A. 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 substantial evidence of a known fault? Refer to Division of Mines and Geology Special Publication 42. | ☐ | ☐ | ☒ | ☐ |

***Discussion:***

Geologic Environment

The site is located north of the confluence of Aptos and Valencia Creeks. In situ soils at the site consist of alluvial fan facies (Qof) underlain by Purisima sandstone bedrock. The alluvial material is composed of semi-consolidated, moderately to poorly sorted discontinuous layers of silty clay, silt, sand and gravel. Strata were deposited by streams, sheet flow or debris flow. These deposits are up to 50 feet thick. Bedrock was encountered during borings at the southeast corner of the site at a depth of approximately 16 feet. In Raas and Associates' boring at the northeast corner of the site, a material which was visually similar and in which similar SPT blow counts were recorded was encountered at a depth of approximately 24 feet (Attachment 13).

State Regulatory Environment

*Alquist-Priolo Earthquake Fault Zoning Act*

The Alquist-Priolo Earthquake Fault Zoning Act was passed in 1972 to mitigate the hazard of surface faulting to structures for human occupancy. The Alquist-Priolo Earthquake Fault Zoning Act's main purpose is to prevent the construction of buildings used for human occupancy on the surface trace of active faults. The Act only addresses the hazard of surface fault rupture and is not directed toward other earthquake hazards. The law requires the State Geologist to establish regulatory zones (known as Earthquake Fault Zones) around the surface traces of active faults and to issue appropriate maps. The maps are distributed to all affected cities, counties, and state agencies for their use in planning and controlling new or renewed construction. Local agencies must regulate most development projects within the zones. Projects include all land divisions and most structures for human occupancy. Single family wood-frame and steel-frame dwellings up to two stories not part of a

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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development of four units or more are exempt. However, local agencies can be more restrictive than state law requires.

*Uniform Building Code*

The Uniform Building Code (UBC) was first enacted by the International Conference of Building Officials (ICBO) on October 18-21, 1927. Revised editions of this code are published approximately every 3 years. The UBC (1997) includes provisions associated with engineering design and building requirements.

*California Building Standards Code*

The California Building Code (CBC) is another name for the body of regulations known as the California Code of Regulations (CCR), Title 24, Part 2, which is a portion of the California Building Standards Code and establishes minimum requirements for a buildings structural strength and stability to safeguard the public health, safety and general welfare. Title 24 is assigned to the California Building Standards Commission, which, by law, is responsible for coordinating all building standards. Under state law, all building standards must be centralized in Title 24 or they are not enforceable.

Published by the International Conference of Building Officials, the UBC is a widely adopted model building code in the United States. The California Building Code incorporates by reference the 2006 International Building Code with necessary California amendments.

Local Regulatory Environment

*County of Santa Cruz General Plan and Local Coastal Program*

The County of Santa Cruz General Plan and Local Coastal Program (LCP) was adopted by the Board of Supervisors in May of 1994 and certified by the California Coastal Commission in December of 1994. The following policies are applicable to geology and soils.

Policy 6.1.4: Site Investigation Regarding Liquefaction Hazard (LCP). Require site-specific investigation by a certified engineering geologist and/or civil engineer of all development proposals of more than four residential units in areas designated as having a high or very high liquefaction potential. Proposals of four units and under and non-residential projects shall be reviewed for liquefaction hazard through environmental review and/or geologic hazards assessment, and when a significant potential hazard exists a site-specific investigation shall be required.

Policy 6.3.4: Erosion Control Plan Approval Required for Development (LCP). Require approval of an erosion control plan for all development, as specified in the Erosion Control ordinance. Vegetation removal shall be minimized and limited to that amount indicated on the approved development plans, but shall be consistent with fire safety requirements.

Policy 6.3.5: Installation of Erosion Control Measures. Require the installation of erosion control measures consistent with the Erosion Control ordinance, by October 15, or the advent of significant rain, or project completion, whichever occurs first. Prior to October 15, require adequate erosion control to be provided to prevent erosion from

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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early storms. For development activities, require protection of exposed soil from erosion between October 15 and April 15 and require vegetation and stabilization of disturbed areas prior to completion of the project. For agricultural activities, require that adequate measures are taken to prevent excessive sediment from leaving the property.

Policy 6.3.7: Reuse of Topsoil and Native Vegetation Upon Grading Completion. Require topsoil to be stockpiled and reapplied upon completion of grading to promote regrowth of vegetation; native vegetation should be used in replanting disturbed areas to enhance long-term stability.

Policy 6.3.8: On-Site Sediment Containment (LCP). Require containment of all sediment on the site during construction and require drainage improvements for the completed development that will provide runoff control, including onsite retention or detention where downstream drainage facilities have limited capacity. Runoff control systems or Best Management Practices shall be adequate to prevent any significant increase in site runoff over pre-existing volumes and velocities and to maximize on-site collection of non-point source pollutants.

Policy 6.3.9: Site Design to Minimize Grading (LCP). Require site design in all areas to minimize grading activities and reduce vegetation removal based on the following guidelines:

(a) Structures should be clustered;

(b) Access roads and driveways shall not cross slopes greater than 30 percent; cuts and fills should not exceed 10 feet, unless they are wholly underneath the footprint and adequately retained;

(c) Foundation designs should minimize excavation or fill;

(d) Building and access envelopes should be designated on the basis of site inspection to avoid particularly erodable areas;

(e) Require all fill and sidecast material to be recompacted to engineered standards, reseeded, and mulched and/or burlap covered.

Potential Seismic Shaking Impacts

The primary seismic hazard associated with the proposed development appears to be the potential for strong ground shaking. Experience following the 17 October 1989 Loma Prieta earthquake indicates that the quality of construction is a primary factor affecting the amounts of earthquake damage sustained by wood framed structures. Most of the structural damage from the Loma Prieta earthquake was sustained in buildings where the foundations were not adequately embedded into firm materials, where the wood-frame was not well braced for lateral shear and/or where the wood-frame was not securely tied to the building foundations (Attachment 13).

Conversely, where wood-frame structures were supported on foundations embedded into firm material, well braced for lateral shear and securely tied to the foundation, structural damage was generally minor, even in areas quite close to the epicenter where structures sustained very strong to severe ground shaking. Based on these

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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considerations, the risk of substantial structural damage from earthquakes appears relatively low for well-built structures, which incorporates lateral shear bracing and modern building code requirements into their design and construction (Attachment 13).

It is highly probable that a major earthquake will occur in northern California during the next 50 years. During a major earthquake epicentered nearby, there is a potential for severe ground shaking at this site. Structures designed in accordance with the most current UBC should react well to seismic shaking (Attachment 13).

All of Santa Cruz County is subject to some hazard from earthquakes. However, the proposed project is not located in a fault zone mapped by the state or the County. The nearest earthquake-producing faults in the area include the Zayante Fault Zone approximately three miles northeast of Aptos Village and the San Andreas Fault Zone approximately six miles northeast of the Village. Because there is no evidence of active faulting in the immediate vicinity of the Village, potential for ground rupture in the Village is low and no significant impact from seismic shaking is anticipated.

B. Strong seismic ground shaking? ☐ ☐ ☒ ☐

***Discussion:*** See response A-1-A. Aptos will likely be subject to seismic shaking at some point in the future. Future structures and improvements would be designed in accordance with the California Building Code, as well as any additional requirements dictated by a geotechnical engineer, such that the hazard presented by seismic shaking would be considered less-than-significant.

C. Seismic-related ground failure, including liquefaction? ☐ ☐ ☒ ☐

***Discussion:*** Mapped liquefaction potential varies on the project site and portions of the project site are mapped with a high potential for liquefaction. Liquefaction and lateral spreading tend to occur in loose, saturated fine grained sands or coarse silts. Analysis of the proposed project site, including the nature of the subsurface soil, the location of the groundwater table, and the estimated ground accelerations, leads to the conclusion that the liquefaction potential is low (Attachment 13).

Future structures and improvements would be designed in accordance with the California Building Code, as well as any additional requirements dictated by a geotechnical engineer, such that the potential hazards from liquefaction would be considered less-than-significant.

D. Landslides? ☐ ☐ ☒ ☐

***Discussion*:** Most of the project is relatively flat and risks due to landslides are considered to be less-than-significant. The proposed development would not encroach into steeply sloped areas. No significant impact is anticipated.

2. Be located on a geologic unit or soil that is unstable, or that would become ☐ ☐ ☒ ☐

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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| unstable as a result of the project, and potentially result in on- or off-site landslide, lateral spreading, subsidence, liquefaction, or collapse? | | | | |

***Discussion***: See response A-1-A. Aptos will likely be subject to seismic shaking at some point in the future. The proposed structures and improvements would be designed in accordance with the California Building Code, and would include any additional requirements dictated by a geotechnical engineer. Impacts would be considered less-than-significant.

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| 3. Develop land with a slope exceeding 30%? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed development would not encroach into areas that exceed 30 percent slopes. No impact is anticipated.

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| 4. Result in substantial soil erosion or the loss of topsoil? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Some potential for erosion exists during the construction phase of the proposed project; however, this potential is minimal because best management practices and standard erosion controls are a required condition of the project. Prior to approval of a grading or building permit, the project must have an approved Erosion Control Plan, which will specify detailed erosion and sedimentation control measures. The plan will include provisions for disturbed areas to be planted with ground cover and to be maintained to minimize surface erosion. Impacts would be considered less than significant.

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| 5. Be located on expansive soil, as defined in Section 1802.3.2 of the California Building Code (2007), creating substantial risks to life or property? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: A portion of the site that is mapped as Watsonville Loam, 2 to 15 percent slopes, has a high shrink-swell potential. The California Building Code requires a geotechnical investigation for new structures. Proposed structures and improvements shall be designed in accordance with the California Building Code, as well as any additional requirements dictated by a geotechnical engineer, such that the potential hazards from expansive soils are mitigated to a less-than-significant level.

| | | | | |
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| 6. Place sewage disposal systems in areas dependent upon soils incapable of adequately supporting the use of septic tanks, leach fields, or alternative waste water disposal systems where | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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sewers are not available?

***Discussion***: No septic systems are proposed. Aptos Village is located within the Urban Services Line and sanitary sewers would serve all proposed development. The project would connect to the Santa Cruz County Sanitation District, and the applicant would be required to pay sewer connection and service fees that fund sanitation improvements within the district as a Condition of Approval for the project. No impact is anticipated.

7. Result in coastal cliff erosion? ☐ ☐ ☐ ☒

***Discussion***: The proposed project is not located in the vicinity of a coastal cliff or bluff; and therefore, would not contribute to coastal cliff erosion. No impact would occur.

**B. HYDROLOGY, WATER SUPPLY, AND WATER QUALITY**
Would the project:

1. Place development within a 100-year flood hazard area as mapped on a federal Flood Hazard Boundary or Flood Insurance Rate Map or other flood hazard delineation map? ☐ ☐ ☐ ☒

***Discussion***: According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated March 2, 2006, none of the proposed project area is located within a mapped floodplain. No impacts are anticipated.

2. Place within a 100-year flood hazard area structures which would impede or redirect flood flows? ☐ ☐ ☐ ☒

***Discussion***: According to the Federal Emergency Management Agency (FEMA) National Flood Insurance Rate Map, dated March 2, 2006, no portion of the project site lies within a 100-year flood hazard area. No impacts are anticipated.

3. Be inundated by a seiche, tsunami, or mudflow? ☐ ☐ ☐ ☒

***Discussion***: The project site is located approximately one-half mile inland from Monterey Bay at an elevation of about 100 feet above mean sea level. Therefore, the likelihood of inundation by a seiche or tsunami is extremely low. No impact is anticipated.

4. Substantially deplete groundwater supplies or interfere substantially with groundwater recharge such that there would be a net deficit in aquifer ☐ ☐ ☒ ☐

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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)?

***Discussion***: The proposed development within the project area would obtain water from the Soquel Creek Water District and thus would not rely on private well water. A Will Serve Letter from Soquel Creek Water District dated December 17, 2009, was provided to Barry Swenson Builder for the Aptos Village Project (Attachment 1). Major conditions of the service include the following: (1) The Soquel Creek Water District's Water Demand Offset Policy requires that new service reduce demand by a factor of 1.2 resulting in "zero impact" on the District's groundwater supply; (2) Satisfy all conditions for water conservation required by the District as the time of application for service to include water efficient landscaping and irrigation, low-flow interior plumbing fixtures, and EPA Energy Star clothes washers. The Village Plan proposes that any new development within the Village would be subject to these and subsequent requirements adopted by the Soquel Creek Water District. All construction would comply with the California Building Code and local ordinances regarding the conservation and use of water. Therefore, the impacts associated with the proposed project would be less-than-significant.

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| 5. | Substantially degrade a public or private water supply? (Including the contribution of urban contaminants, nutrient enrichments, or other agricultural chemicals or seawater intrusion). | ☐ | ☐ | ☒ | ☐ |

***Discussion***: See responses A-4 and B-4.

The proposed drainage improvements for the site include both conventional and low impact development best management practices. The Best Management Practices (BMPs) selected are designed to capture, treat, and retain the majority of runoff from the site. The system has been sized and designed based on the net increase in impervious surfaces, per Santa Cruz County Design Criteria, for a 25-year storm event with a 5-year pre-development release rate. Runoff from peak discharge events exceeding the 25-year 24-hour event would be conveyed to either the new outfall at Aptos Creek or the existing outfall at Valencia Creek. The following discussion describes the type of storm water BMPs proposed to manage and treat runoff from the proposed project (Attachment 12).

Surface Retention and Detention Systems

The proposed drainage system would utilize several small surface water retention/detention systems, including rain gardens and drain rock beds, to capture,

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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treat and retain runoff (see Figure 4). All of the surface retention/detention systems have been designed to drain completely within 48 hours from the cessation of runoff as required by the County of Santa Cruz Design Criteria (June 2006).

*Pervious Concrete and Stone Beds:* Roof runoff from buildings would be directed to pervious concrete via downspouts to through curb drains or underground piping outleting within the stone beds. The pavement runoff would be directed to the pervious concrete by overland flow. Landscaped islands would also take in direct rainfall reducing the amount of runoff directed to the stone beds. Runoff would then be treated through bio-filtration and detained within the stone beds beneath the pervious concrete and released by means of an outlet control structure equipped with an orifice and weir at the 5-year release rate.

*Rain Gardens and Drain Rock Beds:* Rain gardens are passive storm water filtration systems similar to bio-retention swales that use soil and vegetation to treat runoff. The rain gardens are flow through storm water BMPs that retain and infiltrate runoff to the underlying soils. The systems are landscaped based systems and provide passive treatment of the runoff requiring little maintenance while achieving high pollutant removal efficiencies. Maintenance requirements are comparable to typical landscaped areas. Rain gardens and associated drain rock beds have been proposed along Valencia Street, Parade Street, and Granite Way.

These systems are designed to capture, treat, retain/detain storm water runoff from the paved roadways and sidewalks. There are several other landscaped islands and landscaping features that would also capture minimal runoff and either infiltrate into the ground or be directed via overland flow to one of the above underground systems. The system has been sized and designed based on the net increase in development release rate. The succeeding calculations focus on the short duration storm event as required by the Santa Cruz County Design Criteria. Each retention/detention system is designed with an outlet control structure equipped with weir and orifice plate. The runoff that would be released of-site to the west would be directed to Aptos Creek via storm drains routed down Aptos Creek Road and the adjoining hillside, across Aptos Creek Park to a riprap level spreader at the top of bank. To the east, runoff would be directed to the existing storm drain line east of Trout gulch Road.

The use and number of rain gardens and drain rock beds were maximized to the extent practical based on the site plan. In areas that could not accommodate these BMPs subsurface detention and retention systems are proposed.

Subsurface Retention and Detention Systems

The proposed project would use both subsurface retention and detention systems to capture, reuse and infiltrate runoff, and to reduce peak discharge of runoff from the site. All of the subsurface retention/detention systems have been designed to drain completely within 48 hours from the cessation of runoff as required by the County of Santa Cruz Design Criteria (June 2006).

Conclusion

The impervious surfaces that would not be captured within the pervious concrete and

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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stone beds or rain gardens and drain rock beds are minimal. Therefore, the storm water drainage system as proposed would be adequate and sufficient for the proposed development. No significant impact to a public or private water supply is anticipated with implementation of the described BMPs.

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| 6. | Degrade septic system functioning? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: See response A-6. No new septic systems are allowed within the Urban Services Line and there are no other septic systems in the site vicinity that could be affected by the project. No impact is anticipated.

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| 7. | Substantially alter the existing drainage pattern of the site or area, including through the alteration of the course of a stream or river, or substantially increase the rate or amount of surface runoff in a manner which would result in flooding, on- or off-site? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The majority of the storm water runoff enters the site from the uphill properties along Vista Mar Court, Village Drive and Granite Way via sheet flow. Runoff from the site either collects in shallow surface depressions and infiltrates into the soils or runs off of the site toward either Valencia Creek or Aptos Creek. There is an existing ridge that runs north to south through the site from near the lower end of Village Drive, through the eastern half of the Village Station property and to the existing crosswalk on Soquel Drive between Aptos Creek Drive and Trout Gulch Road. Approximately two-thirds of the site now drains toward Valencia Creek and one-third drains toward Aptos Creek. About half of the runoff toward Valencia Creek is now collected in the existing Trout Gulch Road drainage system and is discharged directly into a branch of (or gulch draining to) Valencia Creek. The rest of the drainage from the east side of the site flows toward the intersections of Trout Gulch Road with Soquel Drive and Aptos Street, and then to Valencia Creek. Runoff from the western third of the site drains to Aptos Creek via Aptos Village Park or the section of Soquel Drive near Britannia Arms. Current peak discharge to Aptos Creek was calculated to be 1.1 cubic feet per second (cfs), 1.3 cfs and 1.6 cfs for 5-year, 10-year, and 25-year storms, respectively. Current peak discharge to Valencia Creek for the same design storms was calculated to be 4.0, 4.9, and 5.9 cfs, respectively (Attachment 12).

An on–site drainage system has been designed to capture and retain/detain storm water runoff for the increases in impervious surfaces. The project would be utilizing pervious concrete, with drain rock bases, within sections of the parking stalls through the site. Each area used for retention/detention was designed as its own drainage system, accounting for the impervious areas producing runoff to that specific area. Additionally, rain gardens, and associated drain rock beds, have been proposed along Valencia Street, Parade Street, and Granite Way. These systems are designed to capture, treat, retain/detain, storm water runoff from paved roadways and sidewalks.

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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There are several other landscaped islands and landscaping features that would also capture minimal runoff and either infiltrate into the ground or be directed via overland flow to one of the underground systems. The system has been sized and designed based on the net increase in impervious surfaces, per Santa Cruz County Design Criteria, for a 25-year storm event with a 5-year pre-development release rate. The succeeding calculations focus on the short duration storm events as required by the Santa Cruz County Design Criteria. Each retention/detention system is designed with an outlet control structure equipped with a weir and orifice plate. The proposed design for the project would be graded to direct runoff, via overland flow, for each drainage basin to its associated drainage system. In areas where overland flow would not be possible, i.e. roof drains, landscape drains and site drains, through curb drains and/or subdrains that outlet within the stone beds, have been proposed. The runoff that would be released off-site to the west would be directed to Aptos Creek via storm drains routed down Aptos Creek Road and the adjoining hillside, across Aptos Creek Park to a riprap level spreader at the top of bank. To the east, runoff would be directed to the existing storm drain line east of Trout Gulch Road, just north of Building 6.

The existing drainage pattern would not be significantly altered by the proposed development, except that the area of current ponding would be captured into a new storm water drainage system. The project proposes drainage improvements that would include an engineered system of inlets and storm drains designed to convey runoff to designated points of discharge near Aptos Creek and Valencia Creek. Retention/detention basins, water gardens and other similar "Best Management Practices" have also been proposed to maintain pre-development release rates. No significant impact is anticipated.

Also see discussion for B-5.

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| 8. | Create or contribute runoff water which would exceed the capacity of existing or planned storm water drainage systems, or provide substantial additional sources of polluted runoff? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: See response to B-5. No significant impact is anticipated.

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| 9. | 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? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The majority of the storm water runoff enters the site from the uphill properties along Vista Mar Court, Village Drive and Granite Way via sheet flow. Runoff from the site either collects in shallow surface depressions and infiltrates into the soils or runs off of the site toward either Valencia Creek or Aptos Creek. There is an existing ridge that runs north to south through the site from near the lower end of

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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Village Drive, through the eastern half of the Village Station property and to the existing crosswalk on Soquel Drive between Aptos Creek Drive and Trout Gulch Road. Approximately two-thirds of the site now drains toward Valencia Creek and one-third drains toward Aptos Creek. About half of the runoff toward Valencia Creek is now collected in the existing Trout Gulch Road drainage system and is discharged directly into a branch of (or gulch draining to) Valencia Creek. The rest of the drainage from the east side of the site flows toward the intersections of Trout Gulch Road with Soquel Drive and Aptos Street, and then to Valencia Creek. Runoff from the western third of the site drains to Aptos Creek via Aptos Village Park or the section of Soquel Drive near Britannia Arms. Current peak discharge to Aptos Creek was calculated to be 1.1 cubic feet per second (cfs), 1.3 cfs and 1.6 cfs for 5-year, 10-year, and 25-year storms, respectively. Current peak discharge to Valencia Creek for the same design storms was calculated to be 4.0, 4.9, and 5.9 cfs, respectively (Attachment 12).

The existing drainage pattern would not be significantly altered by future development, except that the area of current ponding would be captured into a new storm water drainage system. With the implementation of the proposed drainage improvements, no significant impact is anticipated. No significant impact is anticipated.

Also see response for B-5.

| | | | | | |
|---|---|---|---|---|---|
| 10. | Otherwise substantially degrade water quality? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: See response to B-5. No significant impact is anticipated.

## C. BIOLOGICAL RESOURCES

Would the project:

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| 1. | Have a substantial 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 Game, or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |

***Discussion***: Development under the proposed project would be required to comply with all applicable County General Plan Policies and Ordinances, specifically, Policy 5.1.6, Development within Sensitive Habitats. The policy states, "Sensitive Habitats shall be protected against any significant disruption of habitat values; and any proposed development within or adjacent to these areas must maintain or enhance the functional capacity of the habitat. Reduce in scale, redesign, or, if no other alternative exists, deny any project which cannot sufficiently mitigate significant adverse impacts on sensitive habitats unless approval of a project is legally necessary to allow a reasonable use of the land."

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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A Biotic Assessment was prepared by Ecosystems West, dated October 2010 (Attachment 2). The following sensitive species were either identified in the project area or have potential to occur.

San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat (SFDW) is considered a California Department of Fish and Game "Species of Special Concern". The woodrat builds nests/houses from sticks, either on the ground or in trees; some up to heights of 3 to 5 feet tall on the ground and up to 30 feet up in tree canopies. They also utilize slash piles of woody debris and abandoned buildings or structures in which to forage, seek refuge, or construct nest structures (Attachment 2).

One active nest site for the SFDW was identified in the vicinity of the future park site. The nest structure was located approximately 20 feet up in the tree canopy of a coast live oak tree. The future park site (APN 041-011-09) would be donated to the County by the landowner, with the County responsible for design, financing and construction of the improvements and operational and maintenance costs. The future development of the park site would require a separate discretionary action. Therefore, no impact to SFDWs located in the future park site would occur as a result of the proposed project.

Although not observed during the 2008 survey, SFDWs have the potential to colonize scattered oak trees and structures located within the project area during the interim between the 2008 surveys and project initiation. Vegetation/tree removal, clearing activities, demolition of existing man-made structures, and initial ground disturbing activities may impact SFDW nest structures at the time of construction. As a result, the following mitigation measures would reduce this impact to a less than significant level.

Prior to construction, a qualified biologist shall examine the project area including the outfall alignment into Aptos Creek for SFDWs and nest structures. For the outfall structure alignment, surveys shall include surveying outfall pipe alignment and the Aptos Creek channel for a minimum of 300 feet up and downstream of the proposed location of the outfall structure and along the banks. If a SFDW nest structure is encountered in the project area of impact, the nest shall avoided. Exclusion zones shall be installed around the nest structures providing a minimum 25-foot buffer under the guidance of a qualified biologist. No work shall occur within these exclusion zones.

Prior to initiating storm water conveyance construction activities above Aptos Creek, a wildlife barrier shall be installed to enclose the work area under the supervision of a qualified biologist. The barrier shall be a minimum of 36 inches tall and shall extend from the bank of Aptos Creek, parallel to and on both sides of the proposed alignment for the storm water conveyance pipe, up to the open the open manicured field of Aptos Village Park. The barrier can serve the dual functions of preventing wildlife from entering the work area and preventing excavated spoils from leaving the work area and entering the creek.

A biological monitor shall be present during initial vegetation clearing, grading and trenching for installation of the flow-spreader and outfall structure to ensure that no

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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special-status wildlife species enter the work area. After this time, the qualified biologist will designate and train a "construction monitor" to inspect on-site compliance with all avoidance/impact minimization measures. The designated construction monitor will inspect the wildlife barrier daily for the duration of the storm water conveyance installation.

The construction monitor will have the authority to halt work that may result in impacts to the SFDW. The construction monitor will immediately notify the qualified biologist if a SFDW or nest structure is encountered. The construction monitor shall record the results of their inspections on a daily log that will be submitted to the biological monitor. The daily logs will be available for agency review.

The qualified biological monitor will remain "on-call." To ensure a timely response, construction monitor shall provide a weekly project activity schedule for all "on call" project activities to the qualified biologist. The construction monitor will immediately notify the qualified biologist if a SFDW is encountered.

In order to prevent entrapment of potential CDFW or other wildlife species during construction of the storm water outfall into Aptos Creek, the open segments of the trench shall be backfilled at the end of each day. If backfilling the trench at the end of each day is not feasible, temporary escape ramps a minimum of 15 feet apart shall be provided. Escape ramps may be made from filled sandbags, sloping boards, temporary backfill, or other materials to avoid entrapment. If segments of trench are covered, the edges of the cover boards and/or steel plates shall be sealed. Prior to backfilling any segment of trench, a construction monitor shall examine the open trench to ensure no wildlife is trapped. If wildlife becomes entrapped, the construction monitor shall immediately notify the qualified biological monitor to free the animal.

With implementation of the above mitigation, potential impacts to the SFDW would be reduced to a less than significant level.

California Red-legged Frog

The site does not provide suitable aquatic habitat or occur within potential California red-legged frog (CRLF; *Rana aurora drayonii*) dispersal routes between currently known breeding populations. In addition, the project area does not occur in federally designated CRLF critical habitat. Therefore, no adverse impact is anticipated.

The project site also lacks suitable habitat for the western pond turtle (WPT; *Actinemys marmorata*), but occurs within 1,300 feet of nearby Aptos and Valencia creeks. The nearest record for WPT is approximately 5 miles northwest of the site within the Soquel Creek Watershed. However, WPT are not expected to within the project area because of the distance and number of urban barriers and roadways between their know locality and the project area, as well as the lack of occurrence records for the turtle in nearby Aptos and Valencia creeks. Therefore, no adverse impact is anticipated from the proposed project.

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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Coho Salmon, Steelhead and Tidewater Goby

Protected fish species to include tidewater goby (*Eucyclogobius newberryi*), Coho salmon (*Oncorhynchus kisutch*) and steelhead (*Oncorhynchus mykiss irideus*), may be present in the creeks on the periphery of the Village Plan area at various times of the year, but were not directly observed in the onsite biotic survey. The federally-listed and state-listed endangered Coho salmon and federally-listed threatened steelhead are both anadromous fish spending part of their lives in freshwater and part in the ocean. The Aptos Creek Watershed historically supported healthy runs of both Coho salmon and steelhead trout. Aptos and Valencia creeks are currently known to support steelhead and resident rainbow trout (*Oncorhynchus mykiss*). Both creeks are federally designated as Evolutionary Significant Units for Central California steelhead. No suitable aquatic habitat occurs directly within the immediate project area; however, a proposed drainage outfall into Aptos Creek could result in potential impacts to the species.

The Coho salmon were thought to be extirpated in the Aptos Creek Watershed until recent stocking efforts by Monterey Bay Salmon and Trout Project (Kittleson and Biosearch Associates 2005). Recent fisheries assessments of perennial streams within the watershed suggest that sufficient habitat exists to support both Coho and steelhead trout (Hagar Environmental Services 2003; Santa Cruz County 2004). No suitable aquatic habitat occurs directly within the immediate project area; however, a proposed drainage outfall into Aptos Creek could result in potential impacts to the species.

The federally-listed endangered and state species of special concern tidewater goby is known to occur within Aptos Creek from the coastal lagoon to the confluence of Mangels Gulch (CDFG 2010). This segment of Aptos Creek is designated within the Greater Bay Area Recovery Unit for the tidewater goby (USFWS 2005a). No suitable aquatic habitat occurs directly within the immediate project area; however, a proposed drainage outfall into Aptos Creek could result in potential impacts to the species.

The project proposes a new 450-foot long drainage outfall that would empty into Aptos Creek through a 30-foot wide "flow spreader" to be constructed on the east bank of Aptos Creek above the ordinary high watermark at an elevation of 50 feet. The outfall would drain the western portion of the Village. An 18-inch diameter high density polyethylene pipe would be installed across Aptos Creek Park to reach Aptos Creek. A water quality treatment unit would also be installed immediately upstream of the flow spreader to remove any residual contaminants or sediment that may not have been removed by water quality best management practices located upstream in the Village. No trees would be directly impacted by the proposed alignment.

The proposed drainage improvements for Aptos Village include both conventional and low impact development BMPs. The BMPs selected are designed to capture, treat, and retain the majority of runoff from the Village. The system has been sized and designed based on the net increase in impervious surfaces, per Santa Cruz County Design Criteria, for a 25-year storm event with a 5-year pre-development release rate. Runoff from peak discharge events exceeding the 25-year 24-hour event would be

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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conveyed to Aptos or Valencia creeks. The type of storm water BMPs proposed to manage and treat runoff from the proposed project include the following: (1) surface retention and detention systems, (2) pervious concrete and stone beds, (3) rain gardens and drain rock beds, and (4) subsurface retention and detention systems. A complete description of drainage BMPs is included in under the "Detailed Project Description" in Section II of this Initial Study. In addition to the above described BMPs, an Erosion Control Plan would be required according to Section 16.22.060 of the County Code. A Storm Water Pollution Prevention Plan (SWPPP) would also be required to protect the water quality in Aptos Creek during construction operations. Both the Erosion Control Plan and the SWPPP would require the approval of the County Planning Department prior to the commencement of construction. The requirement for the above described BMPs, Erosion Control Plan, and SWPPP would result in adequate protection of water quality within Aptos Creek both during and post construction. No significant adverse impacts are anticipated to the steelhead, Coho salmon, or tidewater goby.

Nesting Birds and Raptors

Passerine birds are known to breed in the project area. The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Code prohibit the destruction or possession of individual birds, birds of prey, eggs or active nests without federal and/or state authorization. The special-status species yellow warbler has been observed within the riparian forest near the proposed location for the storm water conveyance outfall structure adjacent to Aptos Creek. Other special-status birds, including willow flycatcher and yellow-breasted chat, may utilize the riparian forest habitat for nesting and/or occur as seasonal migrants.

Birds may seasonally occupy nest structures within the project area prior to or during project activities (e.g., tree removal, construction noise, and building demolition) may disrupt bird species that nest within the project area. In response to disturbances, nesting birds may abandon their clutch or sensitive young may prematurely fledge, causing unsuccessful development of offspring or mortality. Implementation of the following mitigation measures would reduce this impact to a less than significant level.

The breeding season for nesting birds occurs from February 1 through August 31 with a peak in breeding/nesting activity between April and June for most raptors and/or other birds (Ralph et al., 1993). All vegetation and tree removal activities shall occur between September and February to avoid impacts to breeding birds. If vegetation removal must occur during the breeding season, the following program shall be implemented. Prior to construction, a qualified biologist shall conduct surveys to identify nesting birds within the project area. The survey area will encompass the project area and a 250-foot wide buffer (where accessible) to examine tree stands and structures. Surveys shall be conducted within 30 days, but not less than 15 days, prior to staging equipment, structure demolition, relocation of the Apple Barn, vegetation clearing, and/or ground disturbing activities. In the event nesting bird species are observed, project activities shall be halted until a qualified biologist has determined if the nesting birds have fledged, or:

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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(1) Raptors - Install a 250-foot buffer between project activities and the active nest site and have a qualified biologist monitor the nest site.
(2) Passerine Birds – Install a 50-foot buffer/exclusion zone between project activities and the active nest and have a qualified biologist monitor the nest.

Roosting Bats

Potential special-status bats are California Department of Fish and Game (CDFG) Species of special Concern and/or designated High Priority by Western Bat Working Group (WBWG) and qualify for protection under CEQA. In addition, the California Fish and game Code protects non-listed bat species and their roosting habitat.

Bats were detected utilizing the exterior awning and attic of the apple barn within the project area. Trees with bat roost features (small crevices or cavities, peeling bark, and areas with dense foliage) as well as other structures/buildings provide potential roosting habitat for special-status bat species.

Relocation and/or removal of bat roost features, and/or loud construction activities may disrupt active bat roosts if conducted during the breeding season (April through August) or during the fall/winter migration/hibernating season (November through March) and may result in a loss of roost habitat. A Memorandum of Understanding with CDFG is required to handle or remove roosting bats and/or to install exclusion devices.

Implementation of the following mitigation measures would reduce this impact to a less than significant level.

The bat breeding season occurs April through August and winter hibernacula are formed November through March. If feasible, relocate the apple barn, demolish existing structures, remove trees from the project area, and/or conduct loud construction activities (e.g. grading, excavation, and/or trenching) during September through October (outside of bat breeding and winter hibernacula seasons).

Prior to initiating these activities, a qualified wildlife biologist will conduct preconstruction surveys of the known bat roost in the apple barn and of potential bat roosts in other buildings and large trees. Preconstruction surveys will take place for one day and two evenings to assess the site for year-round bat presence. The daytime survey will include the evaluation of trees and buildings for bat roost features (tree cavities, senescent limbs, peeling bark) and/or evidence of bats (guano). The nighttime surveys will consist of acoustic and emergence monitoring.

If no bats are detected, crevices may be sealed to prevent re-entry of bats. In the unlikely event that year-round roosting bats are detected, the contractor will obtain an MOU with CDFG in order to have a qualified biologist install exclusion devices. If these actions do not result in exclusion, a qualified biologist in possession of an applicable CDFG MOU will remove and relocate the roosting bats to an appropriate alternate habitat (a roost with comparable spatial and thermal characteristics) (H.T. Harvey and Associates 2004).

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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A qualified wildlife biologist shall be present to monitor for bats during apple barn relocation, building demolition, and tree removal.

If scheduling work during September and October is not feasible, a qualified biologist shall conduct a bat survey. Surveys shall be conducted over four separate nights. If maternity or hibernacula roosting bats are detected, establish a minimum 100-foot buffer and avoid disturbances until a qualified biologist determines that bats are no longer roosting. If it is not feasible to halt activities within the buffer, then under the supervision of a biological monitor, permit the encroachment into the 100-foot buffer. If the monitor observes bats leaving the roost site during construction activities, then all work near the roost site will be halted and the appropriate buffer reinstated. All work involving direct removal or relocation of occupied roosts will take place after a qualified biologist has determined that bats are no longer occupying maternity roosts or winter hibernacula.

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| 2. Have a substantial adverse effect on any riparian habitat or sensitive natural community identified in local or regional plans, policies, regulations (e.g., wetland, native grassland, special forests, intertidal zone, etc.) or by the California Department of Fish and Game or U.S. Fish and Wildlife Service? | ☐ | ☒ | ☐ | ☐ |

***Discussion***: Chapter 16.30.010 (Riparian Corridor and Wetlands Protection) of the County of Santa Cruz Code states, "*The purpose of this chapter is to eliminate or minimize any development activities in the riparian corridor in order to preserve, protect, and restore riparian corridors for: protection of wildlife habitat; protection of water quality; protection of aquatic habitat; protection of open space, cultural, historical, archeological and paleontological, and aesthetic values; transportation and storage of floodwaters; prevention of erosion; and to implement the policies of the General Plan and the Local Coastal Program Land Use Plan.*"

There are two riparian corridors near the edges of the project area adjacent to both Aptos and Valencia creeks. However, the only proposed development that would occur in these areas would be a drainage outfall and energy dissipater within the Aptos Creek riparian corridor. The project proposes a new 450-foot long drainage outfall that would empty into Aptos Creek through a flow spreader to be constructed on the east bank of Aptos Creek. The outfall would drain the western portion of the Village. An 18-inch diameter high density polyethylene pipe with a water quality treatment unit would be installed across Aptos Creek Park to reach Aptos Creek. It is anticipated that riparian understory would be directly impacted during trenching for the outfall into Aptos Creek. No trees would be directly impacted by the proposed design.

Implementation of the following mitigation measures would reduce these potential impacts to a less than significant level.

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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Riparian vegetation shall be protected during construction activities. Protective fencing shall be installed for the duration of construction. All equipment shall be staged upslope and outside of the boundaries of the contiguous riparian canopy. It is anticipated that riparian vegetation would be directly impacted during construction of the flow spreader and outfall structure (temporary impact), replace riparian habitat at a ratio of 1:1 with native riparian vegetation. Replacement plantings shall include "in-kind" native riparian species similar in composition and abundance to those displaced by construction. In this area, plantings may include red alder (*Alnus rubra*), California blackberry (*Rubus ursinus*), California coffeeberry (*Rhamnus californica*), black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and Pacific willow (*Salix lucida* ssp. *lasiandra*). A revegetation plan shall be submitted to the County of Santa Cruz Planning Department for review and approval prior to commencement of ground disturbing activities.

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| 3. Interfere substantially with the movement of any native resident or migratory fish or wildlife species, or with established native resident or migratory wildlife corridors, or impede the use of native or migratory wildlife nursery sites? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: See response to C-1 above. No adverse impacts are anticipated to the migratory movement of any native resident or migratory fisher or wildlife species.

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| 4. Produce nighttime lighting that would substantially illuminate wildlife habitats? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project is located within the Aptos Village bounded on the south by Valencia Creek and on the west by Aptos Creek. The Aptos Creek channel is located approximately 600 feet west of the nearest proposed development across Aptos Creek Road, while the channel of Valencia Creek is located approximately 600 feet to the south of the nearest development across Soquel Drive. The adjacent riparian corridor of Aptos Creek is located approximately 400 feet west of the project area, while the riparian corridor of Valencia Creek is located approximately 100 feet to the south across Soquel Drive. Although the proposed project would be developed in the vicinity of riparian areas, project lighting would not adversely impact sensitive wildlife habitat. No adverse impacts would occur.

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| 5. Have a substantial 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, | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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| hydrological interruption, or other means? | | | | |

***Discussion***: No wetlands would be impacted by the proposed project. No impact is anticipated.

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| 6. | Conflict with any local policies or ordinances protecting biological resources (such as the Sensitive Habitat Ordinance, Riparian and Wetland Protection Ordinance, and the Significant Tree Protection Ordinance)? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The project would not conflict with any local policies or ordinances.

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| 7. | Conflict with the provisions of an adopted Habitat Conservation Plan, Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would not conflict with the provisions of any adopted Habitat Conservation Plan Natural Community Conservation Plan, or other approved local, regional, or state habitat conservation plan. Therefore, no impact would occur.

## D. AGRICULTURE 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 forest land, 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:

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| 1. | 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? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project site does not contain any lands designated as Prime

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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Farmland, Unique Farmland, or Farmland of Statewide Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. In addition, the project does not contain Farmland of Local Importance. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide or Farmland of Local Importance would be converted to a non-agricultural use. No impact would occur from project implementation.

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| 2. | Conflict with existing zoning for agricultural use, or a Williamson Act contract? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project site is zoned for commercial and residential uses, which is not considered to be an agricultural zone. Additionally, the project site's land is not under a Williamson Act Contract. Therefore, the project does not conflict with existing zoning for agricultural use, or a Williamson Act Contract. No impact is anticipated.

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| 3. | Conflict with existing zoning for, or cause rezoning of, forest land (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))? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project would not impact timberland resources or access to the harvest of timberland resources in the future. No impact is anticipated.

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| 4. | Result in the loss of forest land or conversion of forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: No forest land occurs on the project site or in the immediate vicinity. No impact is anticipated.

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| 5. | 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 forest land to non-forest use? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project site and surrounding area does not contain any lands designated as Prime Farmland, Unique Farmland, Farmland of Statewide Importance or Farmland of Local Importance as shown on the maps prepared pursuant to the Farmland Mapping and Monitoring Program of the California Resources Agency. Therefore, no Prime Farmland, Unique Farmland, Farmland of Statewide, or Farmland

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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of Local Importance would be converted to a non-agricultural use. In addition, the project site contains no forest land, and no forest land occurs within or adjacent to the proposed project site. Therefore, no impacts are anticipated.

## E. MINERAL RESOURCES

Would the project:

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| 1. | Result in the loss of availability of a known mineral resource that would be of value to the region and the residents of the state? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: No extraction, use, or depletion of minerals would occur directly as a result of the proposed project. No impact is anticipated.

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| 2. | 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? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project site is zoned for commercial and residential, which is not considered to be an Extractive Use Zone (M-3) nor does it have a Land Use Designation with a Quarry Designation Overlay (Q) (County of Santa Cruz 1994). Therefore, no potentially significant loss of availability of a known mineral resource of locally important mineral resource recovery (extraction) site delineated on a local general plan, specific plan or other land use plan would occur as a result of this project.

## F. VISUAL RESOURCES AND AESTHETICS

Would the project:

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| 1. | Have an adverse effect on a scenic vista? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: There is no mapped scenic road or public view that would be obstructed or otherwise adversely impacted by the proposed development within the project area. Although the southwest corner of the Village is within the mapped scenic corridor of Highway 1, the mapped scenic area is either already developed, undevelopable (steep slopes, floodplain, etc.), or not considered for future development. No significant impact is anticipated.

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| 2. | Substantially damage scenic resources, within a designated scenic corridor or public view shed area including, but not limited to, trees, rock outcroppings, and historic buildings within a state scenic highway? | ☐ | ☐ | ☒ | ☐ |

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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***Discussion***: See response F-1. No significant impact is anticipated.

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| 3. | Substantially degrade the existing visual character or quality of the site and its surroundings, including substantial change in topography or ground surface relief features, and/or development on a ridgeline? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Aptos Village is an existing urbanized area with a mix of building types. The existing visual character of the vacant areas would change with future development and some grading would be involved. However, there would be no substantial change in topography or ground surface relief features. No significant impacts are anticipated.

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| 4. | Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Although the proposed development would include additional nighttime lighting, the lighting would be focused within the developed Village area. The Aptos Village Plan states, "Lighting should illuminate the street and not upper-story residential units or the night sky." As directed by the Plan, lighting would be shielded and directed downward to reduce any illumination beyond the development areas. No significant impacts are anticipated.

## G. CULTURAL RESOURCES

Would the project:

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| 1. | Cause a substantial adverse change in the significance of a historical resource as defined in CEQA Guidelines Section 15064.5? | ☐ | ☒ | ☐ | ☐ |

***Discussion***:

On February 23, 2010, the County of Santa Cruz Board of Supervisors adopted the Aptos Village Plan. The plan sets forth a set of guidelines and requirements for development within the plan area including a strong element of historic preservation that provides for maintaining the community's historic sense of place by preserving significant physical resources, the Bayview Hotel (NR-1), and the Hihn Apple Barn (Building #5) (NR-3). Because the Aptos Village Plan calls for constructing new roadways and buildings in locations that would conflict with the preservation of the historic the Hihn Apple Barn, the plan also dictates the standards for the rehabilitation of historic buildings and where necessary, the relocation of historically important buildings. The standards for historic preservation are contained in the Santa Cruz County Code 16.42.060. The County Code cites the Secretary of the Interior's

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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Standards for the Treatment of Historic Properties and the California Environmental Quality Act- CEQA Guidelines for preserving the buildings with commercial uses.

The project proposes to relocate the Hihn Apple Barn within the Aptos Village and demolish the Aptos Firehouse/VFW Hall. The following discusses the impacts and mitigation associated with the proposed project on these resources.

Hihn Apple Barn

The Hihn Apple Barn is the only remaining building in Aptos that is associated with Frederick A. Hihn, business and civic leader in Santa Cruz County, and a key figure in the important era of the Aptos apple industry. Part of the building appears to have been constructed in 1899, with substantial additions in 1915 and c. 1920, identified by Edna Kimbro, although the last bay (88 feet long by 36 feet wide) does not show on the 1929 Sanborn map. The map could have missed the addition but that is not likely if it was constructed nine years earlier. More likely is was constructed c. 1929-31 after the map was prepared. Changes and adaptations continued and were intensified with the change to retail use when the building became the Village Fair Antique Emporium in the mid 1960's.

The Apple Barn has undergone phases of additions and remodeling throughout its existence. The primary element in a barn is the basic structure of post and beam with trusses forming the roof and shape of the building. Although these elements appear to be relatively intact, most of the interior structure has been obscured by paneling on the walls and ceiling that was installed as part of the remodeling done for later retail use. The exterior retains the siding that was part of the original building and the subsequent additions for apple packing operations. Openings on the north façade (rear), some of which are filled-in, retain the rolling industrial wood doors next to the openings and there is evidence of other openings that are now filled-in. On the east are three windows that have covered with lattice work. The south façade is similar to the north, with the exception of loading docks that appear to be separate structures from the basic building. As a result of retail use, the loading docks have enclosed sections and have been decorated with lattice work (c.1970). The west façade has the greatest extent of alterations. A shed addition (enclosed space) that is c. 1950's was added outside an existing doorway, and a contemporary glass style door has been inserted into the wall. The building is taller at the east end than at the west due to uneven terrain. Horizontal board skirting covers the gap caused by this differential. The roof, sheathed in corrugated metal covered the original shingles sometime after 1915, and may be the original cover for the 1920 addition.

Following the guidance of the Secretary of the Interior's Standards for the Treatment of Historic Property, the sequence of evaluation is to identify character defining features (building and setting) and to provide methods for protection and rehabilitation (when necessary). Integrity is essential for a historic property, to be considered eligible for listing in the registers. Prior to identifying potential impacts it is necessary to evaluate the integrity and understand the significance of the historic buildings. Properties eligible for the National Register will retain most, if not all aspects of integrity. Properties eligible for the California Register will retain some of the aspects. The

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National Register defines seven aspects that make up integrity.

- *Location*: The place where the historic property was constructed or where the historic event occurred.
- *Design*: The combination of elements that create the form, plan, space, structure, and style of a property.
- *Setting*: The physical environment of a historic property.
- *Materials*: The physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.
- *Workmanship*: The physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.
- *Feeling*: A property's expression of the aesthetic or historic sense of a particular period of time.
- *Association*: The direct link between an important historic event or person and a historic property.

The character and significance defining features of the industrial barn in priority order include:

*Significant Character Defining Features*

- The plan of three gable bays, pitched roofs with ridge pop-up venting (style and form)
- The wood timber structural system of posts, beams and trusses
- Interior of open spaces with little enclosed space (office)
- Rustic and irregular width exterior vertical board siding and the board and batt (exterior of the single-wall construction)
- Historic Hardware and industrial rolling door system
- Evidence of historic openings, repair of alterations (1899-1940)

*Contributing Character Defining Features*

- Interior side of single-wall system
- Interior rustic wood flooring and platform supporting structure
- Modified window and door styles and patterns
- Corrugated metal roof material (alteration that has gained significance)
- Loading docks

*Non-Contributing Character Defining Features*

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- Remodeling for commercial use, glass entry doors
- Interior partitions, wall coverings, and suspended or placed ceilings
- Lattice porch walls/railings
- Shed addition (north-west corner)
- Enclosed section on the porch

Following the community desire and developer's agreement to lease the building to a local grocery market, rehabilitation plans have been prepared to balance the requirements of the grocery tenant with the guidance found in the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitation*. Sections of which appear as follows:

> Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.
>
> Rehabilitation emphasizes the retention and repair of historic materials, but latitude is provided for replacement because it is assumed that property is more deteriorated prior to work. Rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.
>
> In rehabilitation, historic building materials and character-defining features are protected and maintained; however, an assumption is made prior to work that existing historic fabric has become damaged over time and, as a result, more repair and replacement will be required. This, latitude is given in the *Standards for Rehabilitation and Guidelines for Rehabilitation* to replace extensively deteriorated, damaged, or missing features using either traditional or substitute materials. Rehabilitation includes an opportunity to make possible an efficient contemporary use through alterations and additions.

*The Secretary of the Interior Standards for Rehabilitation*:

The following standards are not regulatory and do not set or interpret agency policy. They are intended to provide technical advice about archaeological and historic preservation activities and methods (National Park Service 1983).

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.
2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.
3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.
4. Changes to a property that have acquired historic significance in their own right

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will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.
6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.
7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.
8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.
9. New addition, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.
10. New additions and adjacent or related new construction will be undertaken in such a manner that, if removed in the future, the essential for and integrity of the historic property and its environment would be unimpaired.

*Proposed Relocation and Rehabilitation*

The Hihn Apple Barn is proposed to be rotated approximately 180 degrees and relocated along the eastern side of the proposed Village Green. The proposed relocation of the Hihn Apple Barn would keep the barn within the same parcel (prior to reconfiguration) and area of the Aptos as it was originally constructed. The plans for relocating the historic barn appear to follow accepted methods for bracing and moving the sections of the barn as recommended by the National Park Service.

A *Historical Resource Preservation Plan* has been prepared according to Section 16.42.070 of the Code to address project impacts to the Hihn Apple Barn (Attachment 3).

The character defining features and materials that have been identified to be critical to the significance of the historic barn are to be retained, preserved, and protected during rehabilitation work. These include the following:

- The over-all plan of three gable bays which are to remain in their entirety;
- Roofs with ridge venting that express the style and form of truss system in the building;
- Corrugated metal roofing in sheets (although not original to the building it appears to have been on the building since c. 1930's);

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- Wood Timber structural system of posts, beams and trusses inside the building;
- Exterior rustic vertical board siding and board and batt (exterior finishes-single-wall-construction);
- Historic hardware and industrial rolling door systems;
- The loading docks do convey the building's historic use as a warehouse/packing plant (along with the rail spur since removed);
- Interior open space (to be retained in the open plan of the grocery market);
- Window, door and evidence of other openings in various styles and patterns.
- Although the single-wall construction would not be visible because it would be protected behind a new structural plywood wall, a section would be retained for display to the public; and
- The existing rustic floor boards are not an approved surface for most of the grocery market floor. Therefore, the rustic floor boards would only be reused in a section close to the main door away from food stocks, and also where the single-wall construction is visible.

The largest loss of historic materials is the decision that the under-floor structure would not be retained. The under floor structural system is not the primary system and acts as a platform independent of and not supporting the primary post and beam structural system that is to be retained and preserved. The existing floor structure is not suitable as a horizontal diaphragm due to the straight sheathing employed from a seismic design standpoint. The relocation site is relatively flat and would be graded to allow a level surface for the proposed slab on grade foundation with a three foot tall stem wall and embedded metal bases for the interior historic columns. The concrete slab is designed to provide a level floor with the structural capacity for the live loads required by the adaptive reuse as a grocery market.

The primary structural system, post beam and trusses that give the barn its form are considered to be primary character defining features and when evaluated it was determined that it must be preserved and augmented with a system to meet current seismic values. The under floor platform is not a part of that system and was constructed in sections as the building was enlarged. Although an important element in historic building, it is not unique or unusual construction and is not considered a primary character defining feature.

The Apple Barn has three pitched roof sections that were constructed at different times. The porches all appear to be separate structural elements. They would be detached during the move and the posts and roofs would be reinstalled in the new location where they would provide cover for the loading dock and proposed walkway along the sides of the building, much as they do on the existing building. The majority of the historic material would be retained and reused. Historic wood posts and roofs would be repaired or if the damage is too severe, the wood would be replaced in-kind.

The rustic siding would be retained on all sides of the building, as would the rolling

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doors and evidence of former openings and vernacular characteristics such as knot-holes repaired with flattened tin cans that are part of the character defining elements that give the building the identity as a rustic, rural, industrial building. Details around doors and window openings, as well as the roof edges would be retained, repaired or replaced with in-kind materials depending upon the severity of deterioration.

Several later additions or alterations are proposed to be removed. The largest is the shed addition on the west façade of the building that appears to be c. 1950 or later, and s mentioned above detracts from the historic form of the building. Also, the historicist lattice work and décor on the porches c. 1968-88, retail signs, and alterations for the current retail use will be removed (Standard #3 to preserve the historic building as an example of its historic period without conjectural or false historicism).

A contemporary connecting element is proposed between the historic building and a new mixed-use building because the historic barn is not large enough to house a modern grocery market. (Figure 5). The project proposes a 18 foot by 36 foot single storey 12 foot high (interior) passageway linking the historic Apple Barn (Building #5) with the proposed new Building #4, necessitating the removal of approximately 37 linear feet of original wall material on the west elevation of the Apple Barn. The design of the connecting structure is not historic, and would use distinctly different materials and would not be thought of as a historic element of the barn. The exterior of the link would be sheathed in cement plaster to differentiate the historic from the new construction. Full height black framed aluminum commercial windows on both elevations of the link and low display shelving/standards within the connecting link would allow for transparency, thereby minimizing the impact of new, adjacent construction massing. The parapet would be no higher than 3 feet 6 inches in height above the wall plane of the link for a total of 16 feet of wall plane height. In addition, the Apple Barn's loading docks convey the building's historic use as a warehouse/packing plant; and therefore, its historic significance as a historic resource meeting the criteria as a County Landmark and listing on the California Register of Historic Resources, as well as potentially eligible for the National Register of Historic Places.

In summary, the proposed project would relocate and change the orientation of the Hihn Apple Barn on site; remove contributing character-defining features such as portions of the loading docks, and all of the interior floorboards; cover the interior single wall construction; increase the interior building height through the use of new steel pedestals at the base of columns; remove wall material to construct a linking passageway; and construct a new addition (the linking passageway) to adjoin the historic building with an adjacent new building.

The proposed changes to the proposed Hihn Apple Barn would have an effect on the historic resource. The proposed new link between the Apple Barn and the new adjacent building and the removal of the loading docks would result in a significant impact. To reduce the impact of the new construction, the link shall be of minimal massing and height, and of maximum transparency.

The following mitigation measures shall be implemented to reduce potentially

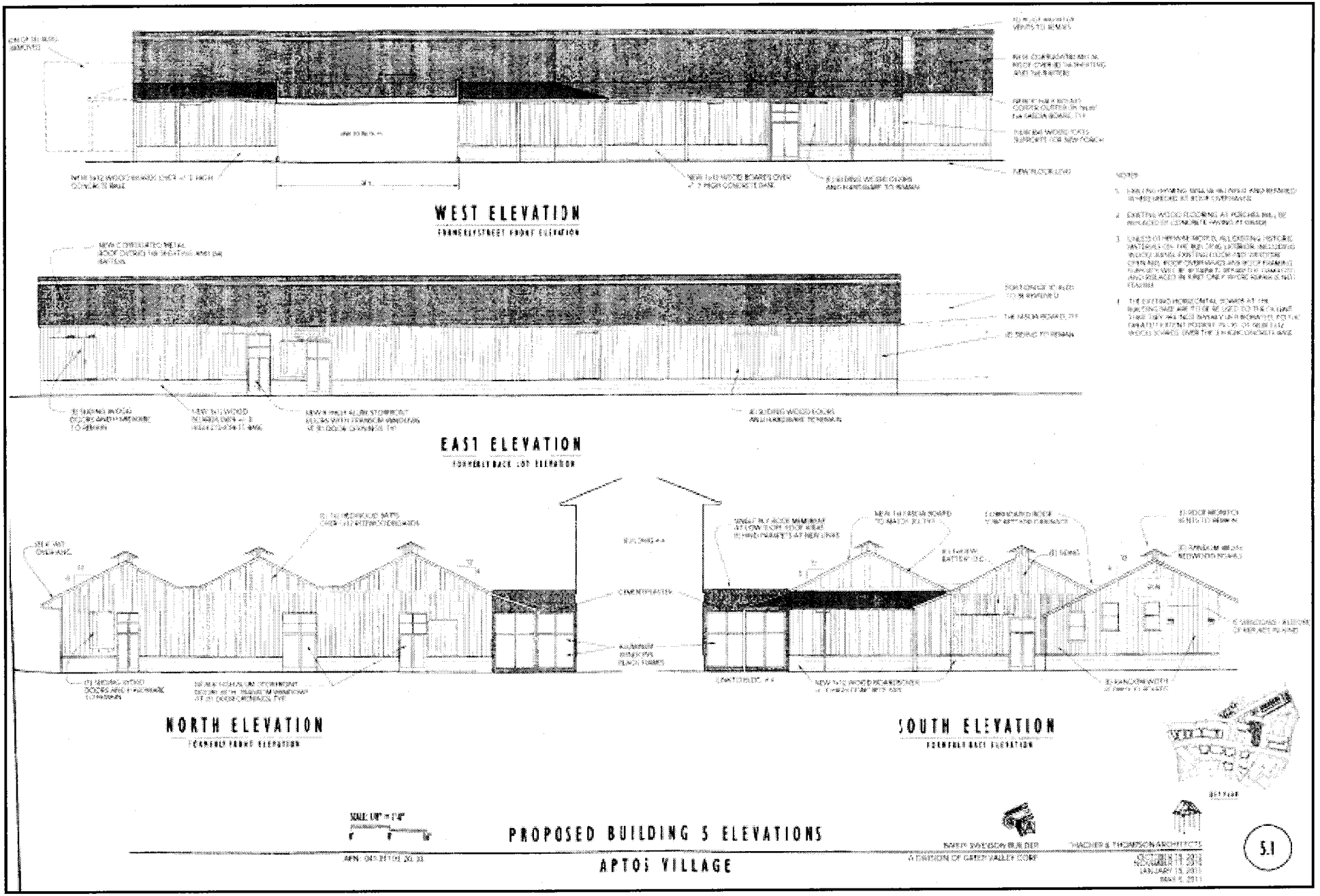


Figure 5 – Proposed Building Elevations for the Apple Barn

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significant impacts to the Hihn Apple Barn to a less than significant impact.

1. *Protection of existing historic materials and character-defining features*: A qualified preservation architect or architectural conservator shall evaluate all of the existing historic materials of the Apple Barn, identifying which materials may be repaired, and which require replacement. Detailed plans prepared by a preservation architect or an architectural conservator shall be provided prior to the issuance of a permit for relocation, noting which materials are to be retained, repaired, replaced, or relocated for use on another part of the building. An architectural conservator or preservation architect shall make period observations and shall also be retained on site during relocation and rehabilitation to ensure that the detailed plans are followed. A copy of the contract with an architectural conservator or preservation architect shall be submitted prior to the issuance of a building permit.
2. *Historic skirting*: Existing wood skirting material shall be retained to the greatest extent feasible, and shall be used to cover the concrete stem wall in an area or areas retaining the greatest visibility, such as the loading dock area adjacent to the village green. Plans showing proposed location of historic skirting materials shall be submitted with the building permit application for moving the building.
3. *Future repairs*: Consistent with the Preservation Plan, all wood siding removed from the Apple Barn to accommodate the new link building, and wood floor planks that are removed to allow for the installation of new interior flooring, shall be used as materials for the rehabilitation, with the remaining materials stored and used for future building repairs to the greatest extent feasible.
4. *Preservation of interior wood flooring*: Existing wood floorboards at the building interior, identified as a character-defining feature, shall be used throughout the building to the greatest extent feasible as allowed under state codes and local environmental health regulations relating to the grocery store use. The texture and finish of the existing floor boards shall be retained to the greatest extent feasible as is consistent with relevant state codes and local regulations. Plans for use of flooring shall be submitted to the HRC prior to the issuance of the building permit.
5. *Preservation of interior single-wall construction as an historic feature*: Existing single-wall construction at the building interior, identified as a character-defining feature, shown to be retained near the main entrance of the building, shall be retained in other areas of the building as allowed under state codes and local environmental health regulations relating to the grocery store use. Plans for retention of single-wall construction shall be submitted to the HRC prior to the issuance of the building permit.
6. *Loading dock design*: Design of the loading dock along the west side of the Apple Barn shall be revised to include only the minimum number of ramps required to comply with accessibility requirements in the California Historical Building Code.
7. *Roofing material*: Corrugated roofing shall be a mat finish.

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8. *Exterior paint color*: Consistent with County Code Requirements 16.42.060(c)(1)(I) regarding alterations to a historic resource, the exterior color of the rehabilitated apple barn shall be similar to the current color of the building, or another color appropriate for an apple packing shed during the period of significance for the building (early 1890's to the 1950's).
9. *Relocation*: As indicated in the preservation plan, Kelly Brothers Movers or another qualified contractor shall work with the engineer to relocate the Apple Barn to the new proposed location. Use of any moving contractor other than Kelly Brothers Movers shall require approval by the Planning Department.
10. *Interpretive Display*: Consistent with the recommendations in the preservation plan prepared for the project and with County Code Section 16.42.060 to preserve the historic value of structures that are relocated, one or more interpretive displays shall be installed on the property that will provide information to the public regarding the history of the Apple Barn in the context of the history and development of Aptos Village. Submittal of a contract with a qualified professional with experience preparing similar types of interpretative displays for historic purposes shall be required prior to issuance of the building permit. Installation of the interpretive display shall be required prior to final occupancy certificate.

    The display shall include historic materials and objects that are removed from the building during relocation and rehabilitation, as well as historic photographs and text documenting the history of the building, its use as a packing shed, the relationship of the building to the site, including the rail line and road, as well as documenting the association with Frederick Hihn. If available, include photographs from the Paul Johnston collection noted in the Historic Resources Inventory Sheet. The display will include historical data and photos from the documentation requirement, or other cited archival sources. The display will also include general information regarding the history of Aptos Village, and of the Bayview Hotel. These displays will be integrated into the design of Aptos Village, and will be installed outdoors in highly visible areas. Interpretive displays and the signage/ plaques installed on the exterior of this property will be sufficiently durable to withstand typical weather conditions. At least one sign shall be included on or near the retained loading dock of the Apple Barn, illustrating how the loading docks functioned as part of the apple packing operations. Displays and signage/ plaques will be of adequate size to attract the public. Installation of the interpretive display shall be required prior to issuance of the final occupancy certificate.
11. *Historical marker*: A permanent plaque will be installed at the existing historic location of the Apple Barn, describing the Apple Barn, its history as part of Aptos Village, and noting the new location of the building. Plans for the historic marker shall be submitted prior to the submittal of the building permit application. Installation of the marker shall be required prior to the issuance of the certificate of occupancy.

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12. *Documentation*: Consistent with County requirements for relocation of historic resources (16.42.060 9b)1((B)(i), the applicant shall submit a plan to document the history of the building prepared by a qualified historian/ architectural historian (according to the Secretary of the Interior's professional qualification standards) prior to the issuance of the building permit for relocation. The documentation should approximate HABS Level II documentation and include: a) selected drawings, if available, that would be photographed; b) photos following the NPS photo policy, of exterior and interior views, along with historic views, if available; and c) written data providing history and description of the property. The documentation shall include photographs and detailed architectural drawings of the historic materials, features and construction techniques that will be altered, removed or replaced by the relocation and rehabilitation of the building, including the construction methods and materials for the foundation system, the loading docks and their relation to the site and the door openings, the section of the wall that will be removed to accommodate the new link building, the relationship of the building to the site, and the flooring and single-wall construction at the interior. Photographs shall be taken of the building as it currently exists. Photographs shall also be taken during relocation and rehabilitation, documenting the construction techniques identified as the building is prepared for relocation, as well as documenting the relocation process. For the photographs, either HABS standard large format or digital photography may be used. If digital, the size of each digital image will be 1600x1200 pixels at 300 pixels per inch, or larger, color format, and printed in black and white or color. Information from the documentation process shall be included in the interpretive display for the Apple Barn building. The distribution of the documentation will include: the Aptos Chamber of Commerce and History Museum, the Museum of Art and History in Santa Cruz, the Santa Cruz Public Library's local history collection; and UC Santa Cruz. The documentation shall be completed prior to issuance of the final certificate of occupancy.

Aptos Firehouse/VFW Hall

After adoption of the Aptos Village Plan in February of 2010, Barry Swenson Builder and Aptos Ventures, LLC, proposed a plan that would relocate two historic buildings as part of a reorganization of property to accommodate the approved circulation and land use consistent with the Aptos Village Plan. During the process of preparing a Historic Resources Preservation Plan, a structural report was obtained for the Aptos Firehouse/VFW Hall. The structural report for the former Aptos Firehouse/VFW Hall was prepared by Leonard P. Willis P.E., of Redwood Engineering initially to provide a bracing plan for the relocation. However, the report concluded that the building was poorly constructed and was described as severely deteriorated and in such fragile condition that it would not withstand relocation. In addition to the report by Mr. Willis, the County Code requires an inspection by the County Inspector to determine the structural integrity of historic buildings under consideration to be relocated or altered. Following a December 17, 2010 inspection of the building, the County Building Official concluded that the structure exists in a sub-standard dilapidated state and is not a

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candidate for relocation due to its lack of a foundation and structural integrity

If relocation and rehabilitation consistent with the Secretary of the Interior's Standards is not possible, the Aptos Village Plan provides the alternative to modify the Aptos Village Plan and circulation system and consider retaining and rehabilitating the building in place. However, it was stated in the structural report, that due to the extremely deteriorated condition any reuse of the building would require reconstruction to the level of a new building.

At the request of Aptos Ventures, LLC (the building's owner), Mr. Willis of Redwood Engineering performed an additional inspection on March 10 2011. At that time, Mr. Willis noted that due to the deficiencies and the deteriorated condition of the building, the building presented potential safety issues to the public.

On June 9, 2011, a follow up inspection was initiated by the County. During that inspection, it was observed that the structure had been vacated by the tenant. Based upon the structural report by Redwood Engineering and the County inspections, the County Building Official determined that the structure presented an imminent danger to the safety of occupants and was red tagged to prevent its use by another tenant. The structure was then posted with a dangerous and unsafe building placard to protect the public and future tenants from potential fire, seismic and structural hazards/dangers that the structure presents.

Rehabilitation of the structure would require complete replacement of the foundation, structural frame, outdated plumbing, electrical and mechanical systems, front porch and decking. It was concluded that the only potentially salvageable portion of the structure would be the old 16 gauge corrugated siding and roofing material. Due to the amount of deferred maintenance and degree of structural degradation, both the County Building Official and the structural engineer determined that the relocation and/or rehabilitation of the Aptos Firehouse/VFW Hall would not be feasible. As a result, the proposal includes the demolition of the structure.

As outlined in Section 16.42.060(b) of the County Code, application for demolition requires a special inspection report by the Planning Department to evaluate the condition of the structure, and a historical documentation report. The documentation report must contain information supporting one or more of the following:

1. Preservation is not feasible due to the deteriorated condition of the structure or object, or
2. Preservation would create an exceptional hardship, or
3. Demolition is necessary to alleviate a dangerous condition.

The documentation report (Attachment 3) supports two of these criteria; that preservation is not feasible due to the deteriorated condition of the structure or object, and that demolition is necessary to alleviate a dangerous condition. As a result, the Aptos Firehouse/VFW Hall is proposed for demolition.

The demolition of the Aptos Firehouse/VFW Hall was reviewed by the County of Santa Cruz Historic Resources Commission on August 5, 2011. Four of the five

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commissioners voted to approve the demolition with one absent.

The following mitigation measures shall be implemented to reduce significant impacts from the demolition of the Aptos Firehouse/VFW Hall to a less than significant level.

1. *Documentation*: HABS-like documentation shall be required to document the historic building prior to demolition. The documentation shall approximate Historic American Buildings Survey (HABS) Level II documentation and include: a) selected drawings, if available, that would be photographed; b) photos following the National Park Service (NPS) photo policy, of exterior and interior views, along with historic views, if available and c) additional archival research providing written data regarding the history and description of the property. For the photographs, either HABS standard large format or digital photography may be used. If digital, the size of each digital image will be 1600x1200 pixels at 300 pixels per inch, or larger, color format, and printed in black and white or color. Documentation shall include preservation of significant historic materials or objects uncovered as part of the demolition process. The applicant shall submit a documentation plan prepared by a qualified historian/architectural historian (according to the Secretary of the Interior's professional qualification standards) prior to the approval of the demolition permit. Completion of the documentation shall be required prior to the final building permit inspection.

   The distribution of the documentation will include: the Aptos Chamber of Commerce and History Museum, the Museum of Art and History in Santa Cruz, the Santa Cruz Public Library's local history collection; and UC Santa Cruz.

Bayview Hotel

In 1992, the Bayview Hotel was listed into the National Register of Historic Places for its depiction of Second Empire architectural style and for its association with commerce and recreation/entertainment. It is the only building in Aptos Village listed in the Register. The three-story wood frame hotel was constructed in 1878 at the corner of Soquel Drive and Trout Gulch Road. The hotel was once set on a larger one-acre parcel located at the corner of Soquel Drive and Trout Gulch Road with gardens and open areas on both sides before it was moved to its current location in 1946. A contemporary commercial building has been constructed immediately to the east of the hotel where the hotel was formerly located. The hotel exists on a parcel that is 341.04 feet deep and 106.87 feet wide (0.87 acre). The hotel has a 20 foot access easement between the existing Aptos Firehouse/VFW Hall to the west and a setback of approximately 15 feet to the east property line where the contemporary commercial building is located. The "L" shaped building extends along the west side with an open area behind the main portion of the building on the east.

The Hotel is a commanding building, the focal identity of Aptos Village where it is located on the north side of a curve and dominates Soquel Drive. In the proposed development plan submitted by Barry Swenson Builder, no changes are contemplated for the Bayview Hotel. However, the project proposes the development of a new building on the parcel adjacent to the west side of the Bayview Hotel that is currently occupied by the former Aptos Firehouse/VFW Hall. The development plan proposes to

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demolish the building and develop a new two-story commercial building on the site. The proposed building (Building 14) would be aligned with the side set-back, which is the same setback as the existing Aptos Firehouse. To evaluate the change the addition of building 14 would create it is necessary to understand the context of the existing setting, including the circulation and existing buildings and how the context and integrity of the Bayview Hotel would be affected.

The National Register Registration (nomination) provides the following summary description. "The Bayview Hotel is an imposing three story building that dominates the surrounding small commercial district of Aptos Village by both its size and its stately Italianate style. The arrangement of windows, dormers and brackets is extremely orderly on all sides, giving the building a dignified appearance form any view." The Bayview Hotel is little altered since it was listed in the National Register of Historic Places, and retains most of the attributes of integrity defined by the National Register of Historic Places. The aspects of integrity maintained by the hotel include: the Second Empire style (design), constructed in the historic materials of native wood and glazing (materials), crafted together by the original skilled carpenters (workmanship) that continue to give the sense of the importance in the community as when it was constructed (feeling), and it continues to communicate the relationship to commerce and tourism (association).

The Aptos Village Plan identifies the hotel as the focal point of the community and the jewel of the community's historic buildings. The plan was designed to preserve the historic building by adopting policies that will require any alteration to the hotel to conform to the Secretary of the Interior's Standards for Rehabilitating Historic Buildings and the Santa Cruz County requirement for creating a Historic Preservation Plan in conformance with Chapter 16.42.060 of the County Code. In addition, the Aptos Village Plan identifies the need to respect the integrity and the historic significance of the Bayview Hotel as paramount in any future proposal.

New development in the proximity to historic resources is considered for any potential effect on historic resources. The area of study - Area of Potential Effects (APE) – is based upon the specific factors of resource. Factors include the proximity to the historic resource, proposed use, size (mass and height), design, and possible indirect effects. The effect may be adverse or beneficial.

The APE identified for the Bayview Hotel extends along the eastern property line from the railroad tracks along Soquel Drive to the proposed east-west road. The northern boundary of the APE runs along the proposed east-west road from the Bayview Hotel parcel boundary to the new Parade Street where it turns south extending to the railroad tracks. The APE does not extend further east because the proposed plan does not alter the existing buildings and proposes only infrastructure and parking areas beyond the parcel to Trout Gulch Road.

The first consideration is the overall plan within the APE. The proposed development includes new infrastructure, multi-story buildings, parking and landscaping. Valencia Avenue, the new Valencia Street is at the rear edge of the Bayview Hotel parcel and urban style streets, sewers, utility trenches, and street trees. These do not create the

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potential for a negative effect to the historic building other than during construction when vibration, dirt and dust may be generated in higher than normal quantities. The same appears generally true for construction of the Parade Street. The National Register nomination describes the context for the hotel as part of a vibrant commercial area during a time of economic prosperity. The historic Sanborn Maps show the hotel in the center of the commercial community on a large parcel with open space around it. The relocation of the hotel in 1946 and subsequent development has reduced that space to a parcel of less than one acre with the building occupying over half the area. The Aptos Village Plan set the parameters for new development and states that the Bayview Hotel is the most historically significant building in the community and "any new structures built adjacent to that site must be reviewed by the Santa Cruz County Historical Resources Commission to ensure that they do not compromise the historic context of this very important historic resource and center piece to the character of the Village." As part of the "Description of Development Potential of Sites" the Aptos Village Plan states, "The rear of the Bayview Hotel property must be improved to provide a welcoming presence along the new Valencia Street frontage."

The concern is for changes to the setting of the historic hotel. The Secretary of Interior's Standards define setting as "the area or environment in which a historic property is found. It may be an urban or suburban neighborhood or a natural landscape in which a building has been constructed." The setting of the Bayview Hotel has changed over time. The hotel lost the historic relationship with landscaping/open area when the building was relocated to its present location near Aptos Firehouse in 1946. The Secretary of Interior's Standards for the Treatment of Historic Property provides in Standard #10 the requirement to set the new buildings apart from the historic building and that it be designed in such a way that the historic relationship with (historic) landscape can be maintained. In this case, the space between the hotel and firehouse must be sufficient to provide the historic building with a buffer separating it from the new construction. The setback of the proposed Building 14 is proposed to have zero setback from the east parcel boundary as does the existing firehouse. The current setback of the hotel is approximately 16 feet from the property line. As a result, Building 14 would maintain the same distance from the hotel as the existing firehouse.

The important element in the hotel's setting is the prominent location and its dominance of the streetscape on Soquel Drive. This is enhanced by the curve in the road alignment that allows the hotel to appear forward of other buildings with the same setback. The relationship is maintained by restricting new buildings adjacent to the hotel to the same or greater setback from Soquel Drive than the historic hotel. The proposed Building #14 is set at the same distance from Soquel Drive and positioned so that the curve in the road allows the Bayview Hotel to remain the dominant building when viewed from the east or west. Parking would also be retained in front of the hotel.

The following mitigation measure shall be implemented to reduce potentially significant impacts to the Bayview Hotel to a less than significant level.

1. *Protection of Bayview Hotel*: Prior to construction and demolition on any parcel adjacent to the Bayview Hotel, the applicant shall consult with a structural

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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engineer to ensure that the proposed demolition and construction methods shall not negatively impact the Bayview Hotel. If any impacts are anticipated by the engineer, the proposed construction and demolition methods shall be modified as needed to protect the Bayview Hotel Building. A report from a structural engineer reviewing the proposed demolition and construction methods shall be required prior to issuance of demolition or building permits for parcels adjacent to the Bayview Hotel.

2. *Protection of Magnolia Tree*: A feature of the historic hotel's setting is the large Magnolia Tree located in front of the Bayview Hotel. This is the only landscape feature that has gained historic significance within the setting of the hotel. The Magnolia tree shall be protected during construction. A qualified arborist shall evaluate the tree prior to construction to determine the condition of the tree and to propose specific best management practices to avoid impacting the tree. An arborist report shall be provided to the Planning Department at least 6 months in advance of any ground disturbance in close proximity to the tree to allow sufficient time to implement potential avoidance measures.

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| 2. | Cause a substantial adverse change in the significance of an archaeological resource pursuant to CEQA Guidelines Section 15064.5? | ☐ | ☒ | ☐ | ☐ |

***Discussion*:**

Prehistoric Archaeological Resources

First recorded in 1979, the prehistoric component of SCR-222/H is located in the open field west of the Bay View Hotel, on both sides of Soquel Drive, and east of Aptos Creek Road. Its boundaries, as initially recorded, measure approximately 550 by 300 meters (1,800 by 985 feet), or largely the western half of the current project area. The prehistoric component is described in the original record as an extensive occupation site with a midden deposit, including fire-cracked rock, large mammal bone, and shellfish remains (Morris 1979).

Also in 1979, a general surface reconnaissance of SCR-222/H was conducted by Robert Cartier, Principal Investigator for Archaeological Resource Management, and C. Detlefs, a historic specialist. Areas that were clear of vegetation and soil brought to the surface by rodent activity contained fire-altered rock, chipped lithics, shellfish remains, and charcoal. Historic resources in the form of glassware, ceramics, and other artifacts, possibly dating as early as the mid-1800s, were also found on the surface. Cartier (1979) noted that the site had been impacted in historic times by roads, railroad tracks, and several building sites.

Between 1979 and 2008, it does not appear that SCR-222/H was documented further. In September 2008, Albion archaeologists conducted an intensive pedestrian survey of the proposed Aptos Village project area and discovered far fewer surface artifacts than the quantities noted in 1979, suggesting that SCR-222/H has since been further impacted by ongoing building demolition and interim use, and probably also by illicit

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artifact collecting. Nevertheless, Albion's survey revealed small quantities of shell, a piece of fire-affected rock, a possible ground stone artifact, and a piece of cryptocrystalline silicate stone material in the western portion of the project area. The location of these items appears to match the initial plotted location of SCR-222-H. Additionally, some fragments of clam and abalone shell were identified in the bike jump part at the eastern extent of the project area.

Following the 2008 survey, Albion archaeologists conducted Phase 1 archaeological investigations in the project area in an effort to further assess the special extent, depth, and integrity of SCR-222/H. Based on the previous survey results, five trench locations in the project area were identified for mechanical excavation. Trenches were approximately 2 meters by 1 meter in size, and were excavated to sterile yellow or gray soils (180-220 centimeters). Only two trenches produced prehistoric cultural materials, and this was limited to four flakes in the first trench and five in the second, along with a ground stone artifact. The material recovered was in a disturbed context with apparent prehistoric, historic, and modern materials all found in association with one another. Items such as metal, glass, and ceramics were encountered as deep, if not deeper in the deposit, the stone and shell cultural materials.

Based on the results of the Phase 1 archaeological investigations, several conclusions were drawn:

- The prehistoric component of SCR-222/H is present in the western and southwestern portion of the current project area;
- Shell debris present at the bike jump park may be related to redeposited site matrix as the easternmost backhoe trenches did not produce more than modern and historic materials;
- The prehistoric component of SCR-222/H does not appear to provide evidence for intensive prehistoric occupation; and
- Site integrity appears to have been severely impacted by historic and modern activities.

Historic Archaeological Resources

A review of historic maps and archival material indicates that the current project area is located within the former boundaries of a historic industrial complex (1880s-1900) that later evolved into a center for apple processing, packing and shipping (1900-1960). Though primary industrial, secondary domestic use of the complex is clearly demonstrated in conjunction with railroad, lumber and apple-processing workers' quarters, at least one owner-operators residence, and more than one hotel for visitors.

Remnant concrete foundations for several buildings, mostly those that were in operation well into the twentieth century, are still visible in the project area. Only four of the buildings and structures depicted in Figure 6 are still standing: the Bayview Hotel, the Hihn Apple-Packing Warehouse, the Aptos Firehouse/VFW Hall (Loma

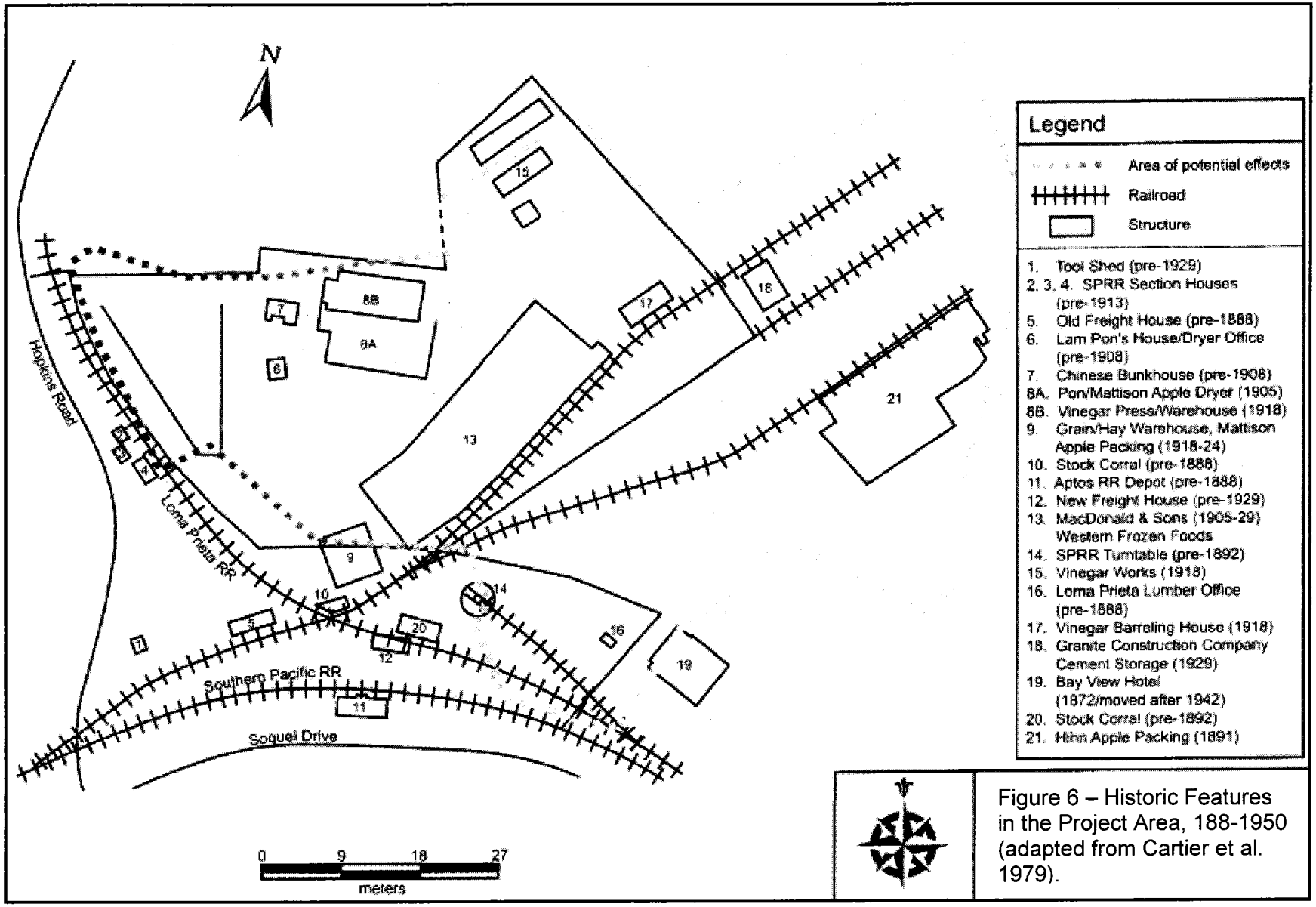


Figure 6 – Historic Features in the Project Area, 188-1950 (adapted from Cartier et al. 1979).

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Prieta Lumber Yard Office), and the Graniterock warehouse.

Most of the nineteenth century railroad buildings and structures located in Aptos Village have since been removed or demolished. This includes several sets of spur tracks that traversed the industrial complex and to which large packing buildings were oriented. At present, only the main track of the 1880s Southern Pacific Railroad (SPRR) remains along Soquel Drive, at the southern end of the project area.

In addition, a railroad turntable, constructed as early as 1883, was located in the southern part of the project area. Turntables are typically are semi-subterranean structures constructed with circular walls and a central column or pedestal of mortared brick. Circular track was mounted on top of the brick walls, and an iron pivot anchored in the center on which the locomotives were turned. Though the iron is generally removed from turntables after they are no longer in use, the brick-walled pit is often buried intact when surrounding rail houses are demolished. Several of these unique historic railroad features have been unearthed and restored for interpretive history purposes.

An excavation of the project area (APN 041-011-24) in the vicinity of the suspected railroad turntable foundation was conducted on February 23, 2009 by the property owners (Attachment 4). A backhoe was used to excavate four trenches that were 3 to 4 feet wide and 5 to 5.5 feet deep. Occasional rocks, some particles of concrete, and pieces of glass were all that was discovered. No evidence of the railroad turntable was found. Therefore, it has been determined that the railroad turntable is no longer present on within the project site.

Surface surveys and recent Phase I investigations strongly suggest that historic archaeological deposits in the project area have been disturbed or possibly obliterated by ongoing demolition and historic redevelopment of the complex, which began as early as 1900 and continued through the 1970s. Without extensive excavation (data recovery), it is difficult to identify and assess the integrity of any remaining features within this relatively large area. However, the types of historic archaeological deposits that may exist in the project area have the potential to contain important data.

Evaluation of Impacts

Section 15064.5 of CEQA provides that, in general, a resource not listed on state or local registers of historical resources shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of historical Resources (CRHR) (Public Resources Code [PRC] Section 5024.1, California Code of Regulations Section 4852). This section also provides standards for determining what constitutes a "substantial adverse change" that must be considered a significant impact on archaeological or historic resources.

When a project will impact a historical resource, it must be determined whether or not that resource:

a) Is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political or

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cultural annals of California; and

b) Meets any of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;
2. Is associated with the lives of persons important in our past;
3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or
4. Has yielded, or may be likely to yield, information important in prehistory or history.

CEQA also requires lead agencies to consider whether projects would impact "unique archaeological resources." CEQA Section 21083.2(g) states that "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.
2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.
3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

Should intact subsurface deposits, either prehistoric or historic, be identified at SCR-222/H, such deposits would have potential to yield information important in prehistory or history. Therefore SCR-222/H is a potentially significant archaeological site (a), and also has the potential to meet Criterion 4 above. Both prehistoric and historic components of SCR-222/H would also be likely to meet the CEQA definition of "unique archaeological resource as outlined above.

While results of recent test excavations at CA-SCR-222/H suggest that site components are highly disturbed and lack subsurface integrity, this cannot be determined for certainty without further investigation. In order to mitigate potential impacts the following mitigation shall be implemented.

All ground disturbing activity in the project area shall be monitored by a qualified archaeologist in the event a substantial intact deposit is found within the property. Pursuant to Section 16.40.040 of the Santa Cruz County Code, if archeological resources are uncovered during construction, the responsible persons shall immediately cease and desist from all further site excavation and comply with the notification procedures given in County Code Chapter 16.40.040. With implementation of the above mitigation, impacts to archaeological resources would be less than significant.

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| 3. Disturb any human remains, including those interred outside of formal cemeteries? | ☐ | ☒ | ☐ | ☐ |

***Discussion***: No human remains are known to occur within the project area. Due to the proximity of the project area to SCR-222/H, construction monitoring would be necessary. Therefore, implementation of the following mitigation would reduce potential impacts to a less than significant level.

Pursuant to Section 16.40.040 of the Santa Cruz County Code, if at any time during site preparation, excavation, or other ground disturbance associated with this project, human remains are discovered, the responsible persons shall immediately cease and desist from all further site excavation and notify the sheriff-coroner and the Planning Director. If the coroner determines that the remains are not of recent origin, a full archeological report shall be prepared and representatives of the local Native California Indian group shall be contacted. Disturbance shall not resume until the significance of the archeological resource is determined and appropriate mitigations to preserve the resource on the site are established. With implementation of the above mitigation, impacts to archaeological resources would be less than significant.

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| 4. Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: A database search of the University of California Museum of Paleontology Specimen Search was conducted on July 13, 2011 (http://bscit.berkeley.edu/ucmp/). No paleontological resources have been identified or are expected to occur within the Aptos Village Plan area. No impact is anticipated.

## H. HAZARDS AND HAZARDOUS MATERIALS

Would the project:

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| 1. Create a significant hazard to the public or the environment as a result of the routine transport, use or disposal of hazardous materials? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The uses allowed in the Aptos Village Plan would be residential, retail commercial, food service, and office uses. These uses do not involve the routine transport, storage, use, or disposal of hazardous materials. Small amounts of household hazardous waste, and similar chemicals, would be properly disposed of through the local solid waste service provider.

The potential release of hazardous materials along roadways is an on-going condition that is regulated by federal, state, and local regulations. This condition would exist with or without the approval of the proposed project. The actions included in the proposed project must be consistent with the goals, policies, and standards established within

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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the elements of the General Plan that are intended to protect the safety of the community. No impact is anticipated.

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| 2. | 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? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The uses proposed within the project area would include residential, retail commercial, food service, and office uses. These uses do not involve the routine transport, storage, use, or disposal of hazardous materials. Small amounts of household hazardous waste, and similar chemicals, would be properly disposed of through the local solid waste service provider.

The potential release of hazardous materials along roadways is an on-going condition that is regulated by federal, state, and local regulations. This condition would exist with or without the proposed Aptos Village Plan. The impact would be considered less than significant.

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| 3. | Emit hazardous emissions or handle hazardous or acutely hazardous materials, substances, or waste within one-quarter mile of an existing or proposed school? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Valencia Elementary School is located within one-quarter mile of the proposed project. However, no significant impact is anticipated. See discussion under H-1.

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| 4. | 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? | ☐ | ☒ | ☐ | ☐ |

***Discussion***:

Two properties within the Village are included on the April 8, 2011 list of hazardous materials sites. The Aptos Garage at 8026-8028 Soquel Drive (APN 041-561-05 & -06) and the former Terrible Herbst gas station site at 8060 Soquel Drive (APN 041-042-47). Both of these properties are currently developed, and the fuel tanks and contaminated soil were removed from the former Terrible Herbst site prior to construction of the commercial building in 2005. No change to the existing

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
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development on these properties is anticipated as a part of the proposed project.

A Phase I Environmental Site Assessment (ESA) was prepared in for Assessor Parcel Number (APN) 041-011-33 containing the Hihn Apple Barn (Attachment 5). A second Phase I ESA was prepared for APN 041-011-03. In addition, soil sampling and testing was conducted on APN 041-011-24 containing the Aptos Firehouse/VFW Hall. A summary letter of the results was prepared by Toxichem management Systems, Inc. on July 12, 2005. Soil sampling and a geophysical survey was also conducted on APN 041-011-20 by Ceres Associates. The following discussion summarizes the results of these investigations.

Assessor Parcel Number 041-011-33 (Hihn Apple Barn Site)

Weber, Hayes & Associates conducted a Phase I ESA for APN 041-011-33 (Attachment 5). The parcel contains a large, one story, historic warehouse (Hihn Apple Barn), an asphalt parking lot, and open lands. The warehouse is currently used for retail sale of antique furniture. The parcel was not listed on any of the federal or state databases.

However, a total of four sites located within a 1/4–mile radius having a current or historical record of permitted underground storage tanks (USTs), and six sites having records showing generation and proper disposal hazardous waste. One site was located within a ¼-mile radius having a record of a release of contamination to soil and/or groundwater (Advanced Tire at 8026 Soquel Drive). Field reconnaissance showed the fuel leak to be located approximately 700 feet from the subject property in the downgradient groundwater flow direction; and therefore, is not expected to be an environmental liability to the parcel.

A review of the Santa Cruz County Environmental Health Services Database had no record of hazardous materials use or releases at the site. As a result, no on-site or off-site environmental liabilities having reasonable potential to impact the parcel were identified.

Assessor Parcel Number 041-011-24 (Aptos Firehouse/VFW Hall Site)

Soil sampling and testing was conducted by Toxichem Management Systems, Inc. in 2005 in the vicinity of the former railroad turntable, as depicted on the Sanborn fire insurance map from 1892 (Attachment 6). Three, 2-inch diameter borings (B-1, B-2, and B-3) were advanced. The boring locations were measured from the northwest corner of the fence, which was assumed to be the northwest corner of the site. The borings were advanced to 8 feet below ground surface using a truck-mounted equipment.

In all three borings, a silty sand or silty sand with gravel fill was encountered to depths of 5 to 6 feet. In boring B-1, brick fragments were observed at a depth of approximately 4 feet. In boring B-2, glass fragments were observed in the upper 2 to 3 feet. In boring B-3, what appeared to be rail ballast was observed in the upper 2 to 3 feet of soil. A faint hydrocarbon odor was noted in soil from depths of approximately 4 feet from borings B-2 and B-3.

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The fill layer was underlain by silty sand, poorly graded sand with silt or sandy silt interpreted to be flood plain deposits. These deposits extended to the termination of the borings at 8 feet. No groundwater was encountered in any of the borings.

The concentration of three heavy metals detected in the site soil were compared to the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels (ESLs) for both commercial and residential shallow soil where underlying groundwater is a potential drinking water source. ESLs are health risk-based tools for evaluating properties for potential cleanup. Levels below ESLs are generally considered protective of humans over a lifetime. In cases where the naturally occurring, background concentration of a compound exceeds the ESL, it is generally acceptable to use that background concentration as the screening level instead of the ESL.

The metal concentrations were also compared to the Region 9 U.S. Environmental Protection Agency's (EPA's) Preliminary Remediation Goals (PRGs) for both industrial and residential soil, which are health-risk based goals for direct human exposure. Also compared were the U.S. EPA's Soil Screening Levels (SSLs) that are protective of groundwater. The U.S. EPA also does not generally require cleanups to below natural background levels where background levels exceed PRGs or SSLs.

Arsenic concentrations ranged from 6.1 to 9.0 mg/kg in the 1-foot samples and from 3.1 to 3.5 mg/kg in the 4-foot samples. Cadmium concentrations ranged from 0.30 to 0.37 mg/kg in the 1-foot samples and was not detected in any of the 4-foot samples above the standard detection limit. The arsenic concentrations in all six samples exceeded the PRGs and SSL (with dilution attenuation factor of 1). The arsenic levels in the three shallowest samples also exceeded the ESLs. However, arsenic is naturally occurring in soils. The U.S. EPA presents a range of naturally occurring arsenic concentrations in California soil of 0.59 – 11 mg/kg. The California EPA determined a concentration of 18 mg/kg to represent the high end of the range of naturally occurring arsenic at a site in nearby Watsonville. The maximum concentration detected in the six samples collected from the site, 9.0 mg/kg, is below both the 11 mg/kg and 18 mg/kg cited for maximum background concentrations.

Lead concentrations ranged from 49 milligrams per kilogram (mg/kg) to 99 mg/kg in the three 1-foot samples and ranged from 4.0 to 4.4 mg/kg in the three 4-foot samples. The detected concentrations of lead and cadmium were all below their respective ESLs, PRGs and SSLs. The detection limit of hexavalent chromium is also below the respective ESLs, PRGs and SSLs (no hexavalent chromium was detected in the six samples). In addition, hexavalent chromium was also not detected in the two composited samples at or above the standard detection limit.

No poly-aromatic hydrocarbons (PAHs) were detected in either of the two composited soil samples at or above the elevated detection limits. The detection limits for the 1-foot composited sample were elevated by five times and the limits for the 4-foot composited sample were elevated by 20 times due to "high organic content/matrix interference." The detection limits for PAHs for the 1-foot composited sample were below their respective ESLs, PRGs and SSLs; however, the detection limits 4-foot

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sample exceeded the residential ESL and PRG for the most toxic PAHs.

Due to the detection of elevated levels of PAHs in the initial site investigation by Toxichem Management Systems, Inc., soils across the parcel shall be sampled and evaluated for potential contaminants according to ASTM practice to determine if additional site remediation is required. If significant levels of PAHs are discovered, site remediation shall occur as recommended environmental specialist and the County of Santa Cruz Department of Environmental Health.

Assessor Parcel Number 041-011-20

Ceres Associates conducted a Phase I ESA for the parcel in December 2006 (Attachment 7). The consultant indicated that historic uses of the parcel suggested the potential presence of historic underground storage tanks (USTs) on the parcel and recommended conducting a geophysical survey as well as soil and groundwater sampling in the area of the former press house and ovens building on the parcel.

Ceres Associates conducted a geophysical survey in early January 2007 and the geophysicist identified a subsurface metal object consistent with a UST to the northwest of the former apple press house, within 10 feet of the building. Barry Swenson Builder authorized Ceres Associates to conduct the UST removal process.

Ceres associates obtained a UST removal permit from the County of Santa Cruz Environmental Health Department (EHD). The permit was for the planned removal of one 1,000-gallon UST, likely containing diesel fuel.

Ceres Associates conducted field activities on February 2, 2007. As soil was removed, Ceres Associates observed metal pipes buried within two feet of the surface. The pipes were approximately two feet in diameter, approximately three feet in length, filled with soil, and appeared to be made of steel. It appeared that four pipe sections were laying length wise in the excavation. This would be consistent with what a geophysicist would observe with their subsurface instrumentation as well as it could be construed to be a UST.

The excavation was conducted to a depth of approximately seven feet, a width of approximately four feet, and a length of approximately 14 feet. The pipe did not appear to continue either toward or away from the former building. Further physical evidence of a UST was not encountered.

The pipe materials that were removed were placed adjacent to the former building foundation and the excavation pit was backfilled with removed materials. The EHD requested a report of field activities and indicated a No Further Action letter would be issued. No mitigation would be required for this parcel.

Assessor Parcel Number 041-011-03

ODIC Environmental performed a Phase I ESA of APN 041-011-03 in conformance with the scope and limitations of the ASTM Practice E1527-05 (Attachment 8). Recognized Environmental Conditions were identified with respect to current or historical usages of the subject property:

Based on review of historical topographical maps, aerial photographs and Sanborn fire

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insurance maps, the subject property was part of the Aptos Milling Company site in the late 1800s. Developments during that time included two railroad spurs traversing the site from southwest to northeast. Railroad properties may be impacted by a wide variety of contaminants, including petroleum hydrocarbons, creosote, PBCs, and metals. ODIC was not provided with any evidence that soils at the site have been sampled and tested for any potential contaminants. Therefore, the former railroad spurs on the site may represent environmental concern.

In historical Sanborn maps from 1926 and 1929, a warehouse building or other storage enclosure used to store concrete was present on the southwestern portion of the site. A sand and rock conveyor was located on the eastern area of the site. These developments, together with a water pipeline and two hydrants along the southern boundary suggest a use of concrete manufacturing. Historical building department records showed the site was owned by Granite Rock Company in the 1980s. Therefore it appears that Granite may have owned the site and operated it to manufacture concrete from the 1920s to sometime prior to the 1980s. Concrete batch manufacturing can involve wastewater generation, and support services such as truck fueling and maintenance can involve the storage of petroleum products onsite. Therefore an environmental concern may be present related to the former onsite concrete manufacturing.

According to the 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was located just beyond the extreme southwestern boundary and partially on the subject site. ODIC searched files at the Santa Cruz County Department of Environmental Health, the local regulatory agency for underground storage tanks. No records were found indicating that the former oil UST was removed from the subject property or that any soil sampling has been conducted in this area to determine whether or not the subsurface environment has been impacted by a potential releases from the UST. The absence of such documentation represents a significant data gap and is assessed to represent a Recognized Environmental Condition (REC) pursuant to ASTM Practice E1527-05.

The eastern portion of the subject property is currently occupied by a bicycle motocross track, including jumps and berms constructed of soil fill material of an unknown origin.

The potential for a UST and soil contamination could result in a significant impact. The following mitigation measures would reduce potential impacts to a less than significant level.

A subsurface investigation shall be conducted in the vicinity of the site identified as containing an oil underground storage tank in 1926 and 1929 Sanborn fire insurance maps. In addition, soils across the site shall be sampled and evaluated for potential contaminants based on the former presence of a cement plant and railroad spurs, as well as the presence of imported soils of unknown origin.

Conclusion

With the implementation of the above mitigation measures, impacts would be reduced

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to a less than significant level.

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| 5. | For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles of a public airport or public use airport, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: Aptos Village is not located within two miles of any airport. No impact is anticipated.

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| 6. | For a project within the vicinity of a private airstrip, would the project result in a safety hazard for people residing or working in the project area? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: Aptos Village is not located in the vicinity of a private airstrip. No impact is anticipated.

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| 7. | Impair implementation of or physically interfere with an adopted emergency response plan or emergency evacuation plan? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed development proposes several roadway and traffic improvements that are consistent with the Aptos Village Plan. These improvements include: 1) the installation of a traffic signal at the Soquel Drive-Trout Gulch intersection, including a left-turn lane on westbound Soquel Drive at Post Office Drive; 2) installation of traffic signals at the Soquel Drive-Aptos Creek Road intersection, including a left-turn lane on eastbound Soquel Drive at Aptos Creek Road; 3) installation of a left-turn lane on eastbound Soquel Drive at the new Parade Street with a one-way stop sign with right-turn only onto Soquel Drive; 4) left-turn and right-turn lanes on the new Valencia Street at the intersection with Trout Gulch Road; and 5) modification of signal phasing to provide permissive left-turn phasing for Aptos Rancho Road, located outside of Aptos Village. The proposed project would result in improved emergency response due to the above proposed improvements. No impact is anticipated.

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| 8. | Expose people to electro-magnetic fields associated with electrical transmission lines? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: There are no regional high-voltage transmission lines in the Aptos Village. This impact would be considered less-than-significant.

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| 9. 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? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project design incorporates all applicable fire safety code requirements and includes fire protection devices as required by the local fire agency. No impact is anticipated.

## I. TRANSPORTATION/TRAFFIC

Would the project:

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| 1. 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? | ☐ | ☐ | ☒ | ☐ |

Policy 3.12.1 of the County General Plan states, "In reviewing the traffic impacts of proposed development projects or proposed roadway improvements, Level of Service (LOS) C should be considered the objective, but LOS D as the minimum acceptable (where costs, right-of-way requirements, or environmental impacts of maintaining LOS under this policy are excessive, capacity enhancement may be considered infeasible). Review development projects or proposed roadway improvements to the Congestion Management Program network for consistency with Congestion Management Plan goals.

Proposed development projects that would cause LOS at an intersection or on an uninterrupted highway segment to fall below D during the weekday peak hour will be required to mitigate their traffic impacts. Proposed development projects that would add traffic at intersections or on highway segments already at LOS E or F shall also be required to mitigate any traffic volume resulting in a one percent increase in the volume/capacity ratio of the sum of all critical movements. Projects shall be denied until additional capacity is provided or where overriding finding of public necessity and or benefit is provided."

A Traffic Impact Study has been prepared by TJKM Transportation Consultants that addresses the proposed mixed-use (commercial and residential) development within Aptos Village (Attachment 9). Table 3 summarizes the results of the intersection LOS

analysis for existing conditions. Under Existing Conditions, eight out of ten study intersections operate at acceptable service levels during the p.m. peak hour. The following two intersections operate unacceptable during the a.m. and p.m. peak hour:

- *Soquel Drive/Trout Gulch Road:* This all-way stop controlled intersection currently operates at LOS F during the a.m. peak hour and LOS D during the p.m. peak hour. Signalization and installation of an exclusive westbound left-turn lane as specified in the 2009/2010 County of Santa Cruz Capital Improvement Program (CIP) is expected to improve the intersection operating condition to an acceptable level.
- *Soquel Drive/Aptos Creek Road:* This one-way stop control intersection operates at LOS E during the p.m. peak hour. The 2009/2010 CIP specifies the installation of a traffic signal and an exclusive eastbound left-turn lane on Soquel Drive.

**Table 3: Intersection Level of Service – Existing Conditions**

| ID | Intersection | Control | A.M Peak Hour[1] | | P.M. Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 8.8 | A | 9.6 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.0 | A | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 14.1 | B | 12.6 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **53.4** | **F** | **26.9** | **D** |
| | *CIP Project: Install a signal and a westbound left-turn lane* | *Signal* | *19.5* | B | *27.7* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | 19.6 | C | **47.2** | **E** |
| | *CIP Project: Install a signal and an eastbound left-turn lane* | *Signal* | *11.5* | *B* | *10.3* | *B* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 16.5 | B | 12.8 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 29.0 | C | 30.1 | C |
| 8 | Soquel Drive/State Park Drive/Sunset Way | Signal | 27.7 | C | 35.6 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 14.2 | B | 8.6 | A |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 7.2 | A | 6.8 | A |

Notes: 1) A.M. Peak Hour numbers provided from Draft Aptos Village Traffic Impact Study prepared by TJKM Transportation Consultants dated, February 23, 2004.
Delay = Overall average intersection delay for Signalized/All-way Stop control intersection or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service
CIP = County of Santa Cruz Capital Improvement Program.
Source: TJKM Transportation Consultants, 2009.

The specified CIP projects are expected to improve the operation of the above intersections to acceptable County LOS standards of LOS C or better. These projects are part of the current County CIP and are currently under design.

The traffic study estimated that future development would generate approximately 1,947 daily vehicle trips (this includes 169 trips during the a.m. peak hour and 226 trips during the p.m. peak hour). Table 4 summarizes the results of the Intersection LOS

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|

analysis. Under this scenario, the same eight study area intersections that currently operate at acceptable levels of service are expected to continue operating acceptably. The CIP improvements identified in the previous scenario (Existing Conditions) are expected to be able to accommodate approved project traffic as well.

The following two intersections are expected to continue to operate unacceptably under the Existing + Approved Project Conditions:

- *Soquel Drive/Trout Gulch Road:* This all-way stop controlled intersection currently operates at LOS F during the a.m. peak hour and LOS D during the p.m. peak hour. Signalization and installation of an exclusive westbound left-turn lane is expected to improve the intersection operating condition to an acceptable level.
- *Soquel Drive/Aptos Creek Road:* This one-way stop control intersection operates at LOS F during the p.m. peak hour. Installation of a traffic signal and an exclusive eastbound left-turn lane on Soquel Drive is expected to improve the intersection operating condition to an acceptable level.

Both of the above-described improvements are part of the current CIP and are currently under design.

**Table 4: Intersection Level of Service – Existing + Approved Conditions**

| ID | Intersection | Control | A.M Peak Hour[1] | | P.M. Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 8.8 | A | 9.6 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.1 | A | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 14.3 | B | 12.7 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **58.8** | **F** | **29.7** | **D** |
| | *CIP Project: Install a signal and a westbound left-turn lane* | *Signal* | *20.3* | *C* | *27.2* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | 22.0 | C | **66.7** | **F** |
| | *CIP Project: Install a signal and an eastbound left-turn lane* | *Signal* | *8.4* | *A* | *9.8* | *A* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 17.5 | B | 13.1 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 30.6 | C | 33.3 | C |
| 8 | Soquel Drive/State Park Drive/Sunset Way | Signal | 28.5 | C | 39.1 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 14.4 | B | 9.3 | A |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 7.2 | A | 7.1 | A |

Notes: 1) A.M. Peak Hour numbers provided from Draft Aptos Village Traffic Impact Study prepared by TJKM Transportation Consultants dated, February 23, 2004.
Delay = Overall average intersection delay for Signalized/All-way Stop control intersection or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service
CIP = County of Santa Cruz Capital Improvement Program.
Source: TJKM Transportation Consultants, 2009.

Table 5 summarizes the results of intersection LOS analysis under the Existing + Approved + Project Conditions. The new east-west (Valencia Street) street would be

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|

the preferred through access within the Aptos Village project area via Trout Gulch Road and Aptos Creek Road. The alignment of Granite Way would affect forecasted turning movement volumes at five study intersections to include: 1) Aptos Creek Road/new Valencia Street; 2) new Valencia Street/new Parade Street; 3) Soquel Drive/new Parade Street; 4) Soquel Drive/Trout Gulch Road; and 5) Soquel Drive/Aptos Creek Road. In addition, the LOS of four intersections [1) Soquel Drive/Trout Gulch Road; 2) new Valencia Street/new Parade Street; 3) new Valencia Street/Trout Gulch Road; and 4) Soquel Drive/new Parade Street] would be influenced by prohibiting southbound left turns from the new Parade Street onto eastbound Soquel Drive, as well as results from the one-way stop control at the intersection of Soquel Drive/new Parade Street. The southbound left-turn restriction at the intersection of Soquel Drive/new Parade Street would cause the project trips to re-route through the intersections of new Valencia Street/new Parade Street; new Valencia Street/Trout Gulch Road; and Soquel Drive/Trout Gulch Road. Table 5 includes a summary of results of the expected traffic conditions for these intersections.

**Table 5: Intersection Level of Service – Existing + Approved +Project Conditions**

| ID | Intersection | Control | A.M Peak Hour[1] | | P.M. Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 1 | Aptos Creek Road/New Valencia Street | One-way Stop | 9.0 | A | 9.5 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.1 | A | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 14.8 | B | 13.1 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **55.0** | **F** | **31.6** | **D** |
| | *Project Feature: Install a signal and a westbound left-turn lane* | *Signal* | *19.5* | *C* | *30.2* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | 21.7 | C | **>120.0** | **F** |
| | *Project Feature: Install a signal and an eastbound left-turn lane* | *Signal* | *22.3* | *C* | *12.2* | *B* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 16.0 | B | 16.8 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 34.4 | C | **37.4** | **D** |
| | *Project Feature: Provide permissive phasing for minor street* | *Signal* | *N/A* | *N/A* | *30.5* | *C* |
| 8 | Soquel Drive/State Park Drive/Sunset Way | Signal | 28.3 | C | 44.0 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 17.8 | B | 11.4 | B |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 7.4 | A | 7.5 | A |
| 11 | New Valencia Street/New Parade Street | One-way Stop | N/A | N/A | 8.7 | A |
| 12 | New Valencia Street/Trout Gulch Road | One-way Stop | 14.8 | B | 29.1 | D |
| 13 | Soquel Drive/New Parade Street | One-way Stop | N/A | N/A | 15.7 | C |

Notes: 1) A.M. Peak Hour numbers provided from Draft Aptos Village Traffic Impact Study prepared by TJKM Transportation Consultants dated, February 23, 2004.
Delay = Overall average intersection delay for Signalized/All-way Stop control intersection or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service
N/A = Data not available.
Source: TJKM Transportation Consultants, 2009.

Under the Existing + Approved + Project Conditions scenario, ten out of 13 study area

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|

intersections are expected to operate acceptably during the p.m. peak hour. The same two intersections that currently operate unacceptably plus one additional intersections impacted by the addition of proposed project traffic are expected to operate at unacceptable levels of service under Existing + Approved + Project Conditions:

- Soquel Drive/Trout Gulch Road
- Soquel Drive/Aptos Creek Road
- Soquel Drive/Aptos Rancho Road

A previous study for a mixed-use project was analyzed for Aptos Village in February 2004. The previous study analyzed weekday a.m., mid-day, and p.m. peak hour conditions. This 2004 study found that the p.m. peak was the critical peak period at most study intersections. The proposed intersection improvements in the 2004 study were found to result in acceptable operations, even for the few intersection where a.m. or mid-day peaks were the critical periods. Therefore, since the p.m. peak was previously found to be the critical traffic period for the overall study area, the current proposal was evaluated only for the p.m. peak hour conditions. As a result, all impacted intersections would operate at an acceptable LOS following implementation of the proposed intersection improvements during a.m. peak hour.

The proposed CIP projects/Aptos Village Plan intersection improvements identified for the first two intersections are expected to accommodate the proposed project traffic as well. The County is currently in the design process for these intersection improvements as CIP projects, and the traffic signals would be functional prior to full occupancy of any future development. At the intersection of Soquel Drive and Aptos Rancho Road, the delay is expected to increase by approximately four seconds, which would cause the LOS to decrease from C to D due to the traffic added from the project. Currently, Aptos Rancho Road operates with split phasing. Modifying the Aptos Rancho Road signal phasing to permissive left-turn phasing would be required. With this improvement, the intersection is expected to operate at an acceptable LOS C. There is sufficient capacity for left turns, and no protected left turn arrow would be required for this minor street.

The proposed development project would be required to pay Traffic Impact Area (TIA) fees intended to mitigate the impact of the proposed development on County-maintained roads. These fees, Transportation Improvement Fees and Roadside Improvement Fees, are calculated by using a standard flat fee depending on the type of unit constructed (i.e., single-family residential, multi-family residential, and new bedroom). Non-residential uses calculate fees based on an estimate of the increase in trip-ends generated by the project. According to the traffic study, the proposed development of the Village Core is estimated to generate approximately 1,947 daily vehicle trips. The TIA fees are used to fund projects identified in the Capital Improvement Program within the TIA. The 2009-2010 CIP includes funding for the design and construction of signals at the Soquel Drive/Trout Gulch Road intersection and the Soquel Drive/Aptos Creek Road intersection. These signals would be installed and operational prior to the occupancy of the proposed development.

As a result of the traffic improvements proposed by the project, no significant impact

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

from increased project traffic is anticipated.

| | | | | | |
|---|---|---|---|---|---|
| 2. | Result in a change in air traffic patterns, including either an increase in traffic levels or a change in location that results in substantial safety risks? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project is a mixed-use development project that would not result in changes to air traffic patterns, or an increase in air traffic levels. The project is located approximately seven miles from the nearest airport. No impact would occur.

| | | | | | |
|---|---|---|---|---|---|
| 3. | Substantially increase hazards due to a design feature (e.g., sharp curves or dangerous intersections) or incompatible uses (e.g., farm equipment)? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed development within the Aptos Village is likely to result in an increase in the number of motor vehicles, bicycles, and pedestrians. However, new signals at the Soquel Drive/Trout Gulch Road and Soquel Drive/Aptos Creek Road intersections are included in the Capital Improvement Program for 2009-2010 and are part of the proposed project. These improvements would result in an increased level of safety for motorists, bicyclists, and pedestrians in the Village Plan area.

The proposed development within the Village Core area would include two new roadways and new sidewalks that would allow for ease of pedestrian access through the Village. All of the proposed improvements would be designed to applicable traffic engineering standards to ensure safety for motorists, bicyclists, and pedestrians in the Aptos Village Plan area. No significant impact is anticipated.

| | | | | | |
|---|---|---|---|---|---|
| 4. | Result in inadequate emergency access? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project's road access meets County standards and has been approved by the Aptos-La Selva Fire Protection District, as appropriate. No impact is anticipated.

| | | | | | |
|---|---|---|---|---|---|
| 5. | Cause an increase in parking demand which cannot be accommodated by existing parking facilities? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed development would be required to provide sufficient parking for the proposed uses as required by County Code and the approved parking plan for the proposed development. Based on the intensity of commercial and residential use proposed, the parking provided within the commercial and mixed use residential portion of the project site would include a minimum of 400 parking spaces. No significant impact is anticipated.

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| 6. Conflict with adopted policies, plans, or programs regarding public transit, bicycle, or pedestrian facilities, or otherwise decrease the performance or safety of such facilities? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would comply with current road requirements to prevent potential hazards to motorists, bicyclists, and/or pedestrians. No impact is anticipated from the proposed project.

| | | | | |
|---|---|---|---|---|
| 7. Exceed, either individually (the project alone) or cumulatively (the project combined with other development), a level of service standard established by the County General Plan for designated intersections, roads or highways? | ☐ | ☒ | ☐ | ☐ |

***Discussion***: Under the 2025 Cumulative + Project Conditions scenario, ten study intersections are expected to continue to operate at acceptable levels of service during both the a.m. and p.m. peak hours. Table 6 summarizes the results of the LOS analysis under Year 2025 Cumulative + Project Conditions. The intersection improvements identified in the previous scenario, Existing + Approved + Project Conditions (see H-1) are expected to accommodate the Aptos Village Plan generated traffic as well. However, the following two intersections would continue to operate unacceptably:

- *Soquel Drive/Aptos Rancho Road:* This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Currently, Aptos Rancho Road operates with split phasing. The project proposes modification of the Aptos Rancho Road signal phasing to provide permissive left turn phasing. As a result, the intersection is expected to operate at an acceptable LOS D.
- *Soquel Drive/State Park Drive/Sunset Way:* This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. The following mitigation measures would be required to improve the LOS to an acceptable level. Installing an exclusive eastbound right-turn lane on Soquel Drive is expected to improve the intersection LOS to an acceptable level. However, the installation of a right-turn lane has right-of-way issues on the southwest corner of the intersection if ideal lane widths are used. As a result, narrower lane widths are recommended. The analysis of this mitigation measure was also performed for the a.m. peak hour, and the intersection was found to operate acceptably at LOS D. However, a right-turn lane storage length of at least 300 feet plus transition will be required.

A previous study for a mixed-use project was analyzed for Aptos Village in February 2004. The previous study analyzed weekday a.m., mid-day, and p.m. peak hour

| Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|

conditions. This 2004 study found that the p.m. peak was the critical peak period at most study intersections. The proposed intersection improvements in the 2004 study were found to result in acceptable operations, even for the few intersections where a.m. or mid-day peaks were the critical periods. Therefore, since the p.m. peak was previously found to be the critical traffic period for the overall study area, the current proposal was evaluated only for the p.m. peak hour conditions. As a result, all impacted intersections would operate at an acceptable LOS following implementation of the proposed intersection improvements proposed under the Aptos Village Plan during a.m. peak hour.

**Table 6: Intersection Level of Service – (Year 2025) Cumulative +Project Conditions**

| ID | Intersection | Control | Cumulative P.M. Peak Hour | | Cumulative + Project P.M. Peak Hour | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 1 | Aptos Creek Road/New Valencia Street | One-way Stop | 9.9 | A | 9.9 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.1 | A | 9.1 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 15.8 | C | 16.4 | C |
| 4 | Soquel Drive/Trout Gulch Road | Signal | 33.6 | C | 36.3 | D |
| 5 | Soquel Drive/Aptos Creek Road | Signal | 11.5 | B | 14.9 | B |
| 6 | Soquel Drive/Spreckels Drive | Signal | 23.2 | C | 45.6 | D |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | **56.1** | **E** | **72.0** | **E** |
| | *Project Feature: Provide permissive phasing for minor street* | *Signal* | *37.4* | *D* | *43.6* | *D* |
| 8 | Soquel Drive/State Park Drive/Sunset Way | Signal | 58.3 | E | 66.8 | E |
| | *Install an eastbound right-turn lane* | *Signal* | *35.6* | *D* | *41.7* | *D* |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 13.3 | B | 18.1 | B |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 8.1 | A | 8.0 | A |
| 11 | New Valencia Street/New Parade Street | One-way Stop | - | - | 8.9 | A |
| 12 | New Valencia Street/Trout Gulch Road | One-way Stop | - | - | 28.6 | D |
| 13 | Soquel Drive/New Parade Street | One-way Stop | - | - | 15.4 | C |

Notes: 1) A.M. Peak Hour numbers provided from Draft Aptos Village Traffic Impact Study prepared by TJKM Transportation Consultants dated, February 23, 2004.
Delay = Overall average intersection delay for Signalized/All-way Stop control intersection or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service
Source: TJKM Transportation Consultants, 2009.

As a result of the traffic improvements specified in the Aptos Village Plan and the recommended mitigation measures at the intersection of Soquel Drive/State Park Drive/Sunset Way, no significant impact from increased Cumulative project traffic is anticipated.

## J. NOISE

Would the project result in:

| | | | | | |
|---|---|---|---|---|---|
| 1. | A substantial permanent increase in ambient noise levels in the project | ☐ | ☐ | ☒ | ☐ |

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| vicinity above levels existing without the project? | | | | |

***Discussion***: The development of new residential and commercial uses typically increases the traffic volumes in the vicinity of new development. Because traffic noise is a primary contributor to the local noise environment, any increase in traffic resulting from the development of new residential and commercial uses would be expected to proportionally increase local noise levels. The following General Plan policies are applicable to noise generation: Policy 6.9.1, Land Use Compatibility Guidelines; Policy 6.9.2, Acoustical Studies; Policy 6.9.3, Noise Sensitive Land Uses; Policy 6.9.5, Residential Development; and Policy 6.9.7, Construction Noise. The proposed project would create an incremental increase in the existing noise environment. However, this increase would be small, and would be similar in character to noise generated by the surrounding existing uses. Adherence to applicable County and/or state noise standards would ensure that potential impacts related to this issue are less-than-significant.

| | | | | |
|---|---|---|---|---|
| 2. Exposure of persons to or generation of excessive groundborne vibration or groundborne noise levels? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Minimal groundborne vibration may occur during the construction phase of the proposed project. The impact would be temporary; and therefore, is not expected to be significant. Also see discuss under J-3.

| | | | | |
|---|---|---|---|---|
| 3. Exposure of persons to or generation of noise levels in excess of standards established in the General Plan or noise ordinance, or applicable standards of other agencies? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Per County policy, average hourly noise levels shall not exceed the General Plan threshold of 50 $L_{eq}$ during the day and 45 $L_{eq}$ during the nighttime. Impulsive noise levels shall not exceed 65 db during the day or 60 db at night. No significant impact is anticipated.

| | | | | |
|---|---|---|---|---|
| 4. A substantial temporary or periodic increase in ambient noise levels in the project vicinity above levels existing without the project? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: Noise generated during construction would increase the ambient noise levels for adjoining areas. Construction would be temporary, however, and given the limited duration of this impact it is considered to be less than significant.

| | | | | |
|---|---|---|---|---|
| 5. For a project located within an airport land use plan or, where such a plan has not been adopted, within two miles | ☐ | ☐ | ☐ | ☒ |

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| of a public airport or public use airport, would the project expose people residing or working in the project area to excessive noise levels? | | | | |

***Discussion***: The proposed project is not located within 2 miles of a public or public use airport. The nearest airport is located in the City of Watsonville approximately 10 miles to the southeast. No impact is anticipated.

| | | | | |
|---|---|---|---|---|
| 6. For a project within the vicinity of a private airstrip, would the project expose people residing or working in the project area to excessive noise levels? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: No impact would occur. See discussion under J-5.

## K. AIR QUALITY

Where available, the significance criteria established by the Monterey Bay Unified Air Pollution Control District (MBUAPCD) may be relied upon to make the following determinations. Would the project:

| | | | | |
|---|---|---|---|---|
| 1. Violate any air quality standard or contribute substantially to an existing or projected air quality violation? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: As of January 2009, the North Central Coast Air Basin did not meet state standards for ozone and particulate matter ($PM_{10}$). The regional pollutants of concern that would be emitted by the project include ozone precursors (Volatile Organic Compounds [VOCs] and nitrogen oxides [$NO_x$]), and dust.

Given the modest amount of new traffic that would be generated by the project, there is no indication that the additional project emissions of VOCs or $NO_x$ would exceed MBUAPCD thresholds for these pollutants; and therefore, there would not be a significant contribution to an existing air quality violation.

Project construction may result in a short-term, localized decrease in air quality due to generation of dust. However, standard dust control best management practices, such as periodic watering, will be implemented during construction. As a result, no significant impact is anticipated.

| | | | | |
|---|---|---|---|---|
| 2. Conflict with or obstruct implementation of the applicable air quality plan? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project would not conflict with or obstruct implementation of the regional air quality plan. The Association of Monterey Bay Area Governments (AMBAG) compared the total potential population growth accommodated by the

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

proposed project with the forecast growth for the jurisdiction and region. It was concluded that the estimated population delta in the project and associated trips would not exceed the forecast, indirect emissions associated with the project (Attachment 10). As a result, the proposed project was determined to be consistent with the 2008 Air Quality Management Plan. No impact is anticipated. Also see K-1 above.

| | | | | |
|---|---|---|---|---|
| 3. 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)? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: No impact is anticipated. See discussion under K-2 above.

| | | | | |
|---|---|---|---|---|
| 4. Expose sensitive receptors to substantial pollutant concentrations? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed project would not generate substantial pollutant concentrations. Some minor dust may be generated during construction and would be temporary. No significant impact would occur.

| | | | | |
|---|---|---|---|---|
| 5. Create objectionable odors affecting a substantial number of people? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed new uses include residential, retail commercial, food service, and office uses. Food service establishments shall be required to comply with all applicable sanitation, ventilation, and odor control standards of the County Department of Environmental Health Services. New development within the County must comply with the density and intensity standards outlined in the Land Use Element and the County's Zoning Ordinance. The proposed project would be consistent with all General Plan goals, objectives, and policies. Furthermore, the construction of residential and commercial uses, in addition to the activities associated with those uses would not result in the creation of objectionable odors. Adherence to all applicable standards and guidelines would ensure that potential impacts related to sensitive receptors would be less-than-significant.

## L. GREENHOUSE GAS EMISSIONS

Would the project:

| | | | | |
|---|---|---|---|---|
| 1. Generate greenhouse gas emissions, either directly or indirectly, that may have a significant impact on the environment? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed project, like all development, would be responsible for an incremental increase in green house gas emissions by usage of fossil fuels during the

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

site grading and construction. At this time, Santa Cruz County is in the process of developing a Climate Action Plan (CAP) intended to establish specific emission reduction goals and necessary actions to reduce greenhouse gas levels to pre-1990 levels as required under AB 32 legislation. Until the CAP is completed, there are no specific standards or criteria to apply to this project. All project construction equipment would be required to comply with the Regional Air Quality Control Board emissions requirements for construction equipment. In addition, the proposed mixed-use project would be pedestrian friendly, provide access to public transit and shopping within walking distance of the proposed residential units. This would likely result in a reduction in vehicle miles travelled. As a result, impacts associated with the temporary increase in green house gas emissions are expected to be less than significant.

| | | | | | |
|---|---|---|---|---|---|
| 2. | Conflict with an applicable plan, policy or regulation adopted for the purpose of reducing the emissions of greenhouse gases? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: See the discussion under L-1 above. No impacts are anticipated.

**M. PUBLIC SERVICES**

Would the project:

| | | | | | |
|---|---|---|---|---|---|
| 1. | Result in substantial adverse physical impacts associated with the provision of new or physically altered governmental facilities, 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: | | | | |
| | a. Fire protection? | ☐ | ☐ | ☒ | ☐ |

The project site is located within the Aptos/La Selva Fire Protection District located at 6934 Soquel Drive, Aptos, California. The station is located approximately 1.3 miles northwest of the project site. There would be an incremental increase in demand for fire protection services with project implementation, but not sufficient to warrant additional personnel or equipment. No significant impact is anticipated.

| | | | | | |
|---|---|---|---|---|---|
| | b. Police protection? | ☐ | ☐ | ☒ | ☐ |

The project site is within the jurisdiction of the County of Santa Cruz Sheriff's Department located at 701 Ocean Street in Santa Cruz. The Sheriff's Department is located approximately 8 miles west of the proposed project site. However, the Aptos Sheriff's Service Center is located at 19D Rancho Del Mar Shopping Center in Aptos

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

located approximately 0.5 mile from the project site. The Aptos Service Center is staffed with a sergeant and a team of volunteers.

Response time depends on the character of the call, the availability of an officer, and the office's proximity to the site. Emergency response time to the project site is estimated at three minutes (for burglaries in progress or domestic violence) to two hours (for investigations of a non-emergency nature). The department also maintains a service agreement with the California Highway Patrol. No significant impact is anticipated.

c. Schools? ☐ ☐ ☒ ☐

The proposed project site is located within the Pajaro Valley Unified School District (PVUSD). While the project represents an incremental contribution to the need for services, the increase would be minimal. School, park, and transportation fees to be paid by the applicant would be used to offset the incremental increase in demand for school and recreational facilities and public roads. No significant impact is anticipated.

d. Parks or other recreational activities? ☐ ☐ ☒ ☐

The proposed project site is located within the jurisdiction of the County of Santa Cruz Department of Parks, Open Space and Cultural Services. The project proposes the dedication of a proposed 0.713 acre undeveloped park site (APN 041-011-09). The future park site would be donated to the County of Santa Cruz by the landowner, with the County responsible for design, financing and construction of the improvements and operational and maintenance costs. The donation to the County would be credited against the required park in-lieu fees for the proposed project. The proposed future park site dedication would be used to offset the incremental increase in demand for recreational facilities. No significant impact is anticipated.

e. Other public facilities; including the maintenance of roads? ☐ ☐ ☒ ☐

***Discussion (a through e)*:** While the project represents an incremental contribution to the need for services, the increase would be minimal. Moreover, the project meets all of the standards and requirements identified by the local fire agency as applicable, and school, park (site dedication), and transportation fees to be paid by the applicant would be used to offset the incremental increase in demand for school and recreational facilities and public roads. No significant impact is anticipated.

## N. RECREATION

Would the project:

1. Would the project increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical ☐ ☐ ☒ ☐

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

deterioration of the facility would occur or be accelerated?

***Discussion***: See response to M-1(d). No significant impact is anticipated.

2. Does the project include recreational facilities or require the construction or expansion of recreational facilities which might have an adverse physical effect on the environment? ☐ ☐ ☐ ☒

***Discussion***: The project includes the dedication of a future park site within Aptos Village. Development of the future park site by the County of Santa Cruz Department of Parks, Open Space and Cultural Services would require subsequent environmental review. No impacts would occur as a result of the proposed project.

## O. UTILITIES AND SERVICE SYSTEMS

Would the project:

1. Require or result in the construction of new storm water drainage facilities or expansion of existing facilities, the construction of which could cause significant environmental effects? ☐ ☒ ☐ ☐

***Discussion***: The project proposes the construction of a new 18-inch diameter drainage outfall into Aptos Creek as part of the proposed project. Some impacts would result from during construction. Mitigation measures provided in C-2 of this Initial Study would reduce potential impacts to riparian habitat to a less than significant level.

2. 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? ☐ ☐ ☒ ☐

***Discussion***: The project would connect to an existing municipal water supply. The Soquel Creek Water District has determined that adequate supplies are available to serve the project (Attachment 1). Municipal sewer service is available to serve the project, as reflected in the attached letter from the Santa Cruz County Sanitation District (Attachment 11).

3. Exceed wastewater treatment requirements of the applicable Regional Water Quality Control Board? ☐ ☐ ☐ ☒

***Discussion***: The project's wastewater flows would not violate any wastewater

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

treatment standards.

| | | | | | |
|---|---|---|---|---|---|
| 4. | Have sufficient water supplies available to serve the project from existing entitlements and resources, or are new or expanded entitlements needed? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed development within the project area would obtain water from the Soquel Creek Water District and thus would not rely on private well water. A Will Serve Letter from Soquel Creek Water District dated December 17, 2009, was provided to Barry Swenson Builder for the Aptos Village Project (Attachment 1). Major conditions of the service include the following: (1) The Soquel Creek Water District's Water Demand Offset Policy requires that new service reduce demand by a factor of 1.2 resulting in "zero impact" on the District's groundwater supply; (2) Satisfy all conditions for water conservation required by the District as the time of application for service to include water efficient landscaping and irrigation, low-flow interior plumbing fixtures, and EPA Energy Star clothes washers. The Village Plan proposes that any new development within the Village would be subject to these and subsequent requirements adopted by the Soquel Creek Water District. All construction would comply with the California Building Code and local ordinances regarding the conservation and use of water. Therefore, the impacts associated with the proposed project would be less-than-significant.

| | | | | | |
|---|---|---|---|---|---|
| 5. | Result in determination by the wastewater 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? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: Municipal sewer service is available to serve the project, as reflected in the attached letter from the Santa Cruz County Sanitation District (Attachment 11). No impact is anticipated.

| | | | | | |
|---|---|---|---|---|---|
| 6. | Be served by a landfill with sufficient permitted capacity to accommodate the project's solid waste disposal needs? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed project would make an incremental contribution to the reduced capacity of regional landfills. However, this contribution would be relatively small and would be of similar magnitude to that created by existing land uses around the project. No significant impact is anticipated.

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| 7. Comply with federal, state, and local statutes and regulations related to solid waste? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would not breach federal, state or local statutes and regulations related to solid waste management. No impact is anticipated.

## P. LAND USE AND PLANNING

Would the project:

| | | | | |
|---|---|---|---|---|
| 1. 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? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project does not conflict with any regulations or policies adopted for the purpose of avoiding or mitigating an environmental effect.

| | | | | |
|---|---|---|---|---|
| 2. Conflict with any applicable habitat conservation plan or natural community conservation plan? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would not conflict with any habitat conservation plan or natural community conservation plan. No impact is anticipated.

| | | | | |
|---|---|---|---|---|
| 3. Physically divide an established community? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The project would not include any element that would physically divide an established community. No impact is anticipated.

## Q. POPULATION AND HOUSING

Would the project:

| | | | | |
|---|---|---|---|---|
| 1. Induce substantial 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)? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The proposed project is designed at the density and intensity of development allowed by the Aptos Village Plan and zoning designations for the project site. Although the project proposes the extensions of utilities (e.g., water, sewer, or new road systems) into the project area, it is considered to be urban infill. The project

| | Potentially Significant Impact | Less than Significant with Mitigation Incorporated | Less than Significant Impact | No Impact |
|---|---|---|---|---|

site was previously developed during the late-nineteenth to mid-twentieth centuries. Much of the infrastructure that was in place then is now gone. The project would redevelop the site with two new roads (Parade Street and Valencia Street) that would connect to existing roadways (Soquel Drive, Valencia Street, and Aptos Creek Road). In addition, the new utilities infrastructure that is proposed could only serve the project site. Consequently, it is not expected to have a significant growth-inducing effect.

| | | | | | |
|---|---|---|---|---|---|
| 2. | Displace substantial numbers of existing housing, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would not displace any existing housing since most of the site is currently vacant. No housing would be displaced as a result of the proposed project. No impact would occur.

| | | | | | |
|---|---|---|---|---|---|
| 3. | Displace substantial numbers of people, necessitating the construction of replacement housing elsewhere? | ☐ | ☐ | ☐ | ☒ |

***Discussion***: The proposed project would not displace a substantial number of people since much of the site is currently vacant. No existing residential housing would be impacted by the proposed project. No impact is anticipated.

## R. MANDATORY FINDINGS OF SIGNIFICANCE

| | Potentially Significant Impact | Less than Significant with Mitigation | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| 1. Does the project have the potential to degrade the quality of the environment, substantially 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 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? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: The potential to degrade the quality of the environment, substantially 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 were considered in the response to each question in Section III of this Initial Study. No resources that have been evaluated as significant would be impacted by the project. Therefore, no mitigation has been included. As a result of this evaluation, there is no substantial evidence that significant effects associated with this project would result. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

| | Potentially Significant Impact | Less than Significant with Mitigation | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| 2. 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)? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: In addition to project specific impacts, this evaluation considered the projects potential for incremental effects that are cumulatively considerable. As a result of this evaluation, there were determined to be potentially significant cumulative effects related to transportation and traffic. However, mitigation has been included that clearly reduces these cumulative effects to a level below significance. This mitigation includes payment of the transportation impact fee. As a result of this evaluation, there is no substantial evidence that, after mitigation, there are cumulative effects associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

| | Potentially Significant Impact | Less than Significant with Mitigation | Less than Significant Impact | No Impact |
|---|---|---|---|---|
| 3. Does the project have environmental effects which will cause substantial adverse effects on human beings, either directly or indirectly? | ☐ | ☐ | ☒ | ☐ |

***Discussion***: In the evaluation of environmental impacts in this Initial Study, the potential for adverse direct or indirect impacts to human beings were considered in the response to specific questions in Section III. As a result of this evaluation, there were determined to be potentially significant effects to human beings related to the following: Cultural Resources, Hazards & Hazardous Materials, and Transportation/Traffic. However, mitigation has been included that clearly reduces these effects to a level below significance. This mitigation includes consistency with the Secretary of Interior Standards for Historic Resources; construction monitoring for historic and prehistoric archaeological resources; subsequent environmental site investigations for hazardous materials; and traffic mitigation. As a result of this evaluation, there is no substantial evidence that, after mitigation, there are adverse effects to human beings associated with this project. Therefore, this project has been determined not to meet this Mandatory Finding of Significance.

## IV. TECHNICAL REVIEW CHECKLIST

| | REQUIRED | DATE COMPLETED |
|---|---|---|
| Agricultural Policy Advisory Commission (APAC) Review | Yes ☐ No ☒ | |
| Archaeological Review | Yes ☒ No ☐ | February 2009 |
| Biotic Report/Assessment | Yes ☒ No ☐ | November 2009 |
| Geologic Hazards Assessment (GHA) | Yes ☐ No ☒ | |
| Geologic Report | Yes ☐ No ☒ | |
| Geotechnical (Soils) Report | Yes ☒ No ☐ | March 2011 |
| Riparian Pre-Site | Yes ☐ No ☒ | |
| Septic Lot Check | Yes ☐ No ☒ | |
| Other: | Yes ☐ No ☐ | |

## V. REFERENCES USED IN THE COMPLETION OF THIS ENVIRONMENTAL REVIEW INITIAL STUDY

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## VI. ATTACHMENTS

1. Soquel Creek Water District Will Serve Letter.
2. Biotic Assessment for the Aptos Village Plan, Prepared by Ecosystems West, October 2010.
3. A. Historic Resources Preservation Plan for the Bayview Hotel and Hihn Apple Barn, Prepared by Urban Programmers, July 17, 2011.

   B. Circa peer review of Historic Preservation Plan

   C. Documentation Report for the Aptos Firehouse/VFW Hall, Prepared by Urban Programmers, dated July 19, 2011; and Staff Report to the Historic Resources Commission, dated July 20, 2011.

   D. Circa peer review of Documentation Report for the Aptos Firehouse.

   E. Cultural Resources Study for the Proposed Aptos Village Project, dated February 2009. Prepared for Barry Swenson Builder by Albion Environmental, Inc.
4. Letter from Joe Appenrodt regarding the Historic Railroad Turntable, dated July 22, 2011.
5. Phase 1 Environmental Site Assessment for APN 041-011-33.
6. Soil Sampling and Testing Report for APN 041-011-24.
7. Phase 1 Environmental Site Assessment for APN 041-011-20.

8. Phase 1 Environmental Site Assessment for APN 041-011-03.
9. Traffic Impact Study, Prepared by TJKM Transportation Consultants, November 3, 2009.
10. Association of Monterey Bay Area Governments Air Quality Consistency Determination letter, dated January 12, 2011.
11. Santa Cruz County Sanitation District Will Serve Letter, dated November 23, 2010.
12. Drainage Studies
13. Geotechnical Reports

# Attachment 1

SOQUEL CREEK WATER DISTRICT

Board of Directors
Dr. Thomas R. LaHue, *President*
Bruce Daniels, *Vice President*
Dr. Don Hoernschemeyer
Dr. Bruce Jaffe
Daniel F. Kriege

Laura D. Brown, *General Manager*

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BARRY SWENSON BUILDER

December 17, 2009

Ms. Jesse Thielen
c/o Barry Swenson Builder
777 N. First Street, 5th Floor
San Jose, CA 95112

**SUBJECT: Conditional Water Service Application –Aptos Village Project, Aptos, APN's 041-011-33, 041-011-20 & 041-011-03**

Dear Ms. Thielen:

In response to the subject application, the Board of Directors of the Soquel Creek Water District at their regular meeting of December 15, 2009 voted to grant you a Conditional Will Serve Letter for your proposed project located on three parcels next to Soquel Drive between Trout Gulch Road and the T-Hopkins Right-Of-Way in Aptos, so that you may proceed through the appropriate planning entity. An Unconditional Will Serve Letter cannot be granted until such time as you are granted a Final Discretionary Permit on your project. At that time, an Unconditional Will Serve Letter will be granted subject to your meeting the requirements of the District's Water Demand Offset Program and any additional conservation requirements of the District prior to obtaining the actual connection to the District facilities subject to the provisions set forth below.

| **Possible Infrastructure Check List** | yes | no |
|---|---|---|
| 1. LAFCO Annexation required | | X |
| 2. Water Main Extension required off-site | X | |
| 3. On-site water system required | X | |
| 4. New water storage tank required | | X |
| 5. Booster Pump Station required | | X |
| 6. Adequate pressure | X | |
| 7. Adequate flow | X | |
| 8. Frontage on a water main | X | |
| 9. Other requirements that may be added as a result of policy changes. | X | |

This present indication to serve is valid for a two-year period from the date of this letter; however, it should not be taken as a guarantee that service will be available to the project in the future or that additional conditions, not otherwise listed in this letter, will not be imposed by the District prior to granting water service. Instead, this present indication to serve is intended to acknowledge that, under existing conditions, water service would be available on condition that the developer agrees to provide the following items without cost to the District:

1) Destroys any wells on the property in accordance with State Bulletin No. 74;
2) Satisfies all conditions imposed by the District to assure necessary water pressure, flow and quality;
3) Satisfies all conditions of Resolution No. 03-31 Establishing a Water Demand Offset Policy for New Development, which states that all applicants for new water service shall be required to offset expected water use of their respective development by a 1.2 to 1 ratio by retrofitting existing developed property within the Soquel Creek Water District service area so that any new development has a "zero impact" on the District's groundwater supply. Applicants for new service shall bear those costs associated with the retrofit as deemed appropriate by the District up to a maximum set by the District and pay any associated fees set by the District to reimburse administrative and inspection costs in accordance with District procedures for implementing this program;
4) Satisfies all conditions for water conservation required by the District at the time of application for service, including the following:
    a) Plans for a water efficient landscape and irrigation system shall be submitted to District Conservation Staff for approval. Current Water Use Efficiency Requirements are enclosed with this letter, and are subject to change;
    b) All interior plumbing fixtures shall be low-flow and all Applicant-installed water-using appliances (e.g. dishwashers, clothes washers, etc.) shall have the EPA Energy Star label plus new clothes washers also shall have a water use factor of 8.5 or less;
    c) District Staff shall inspect the completed project for compliance with all conservation requirements prior to commencing domestic water service;
5) Completes LAFCO annexation requirements, if applicable;
6) All units shall be individually metered with a minimum size of 5/8-inch by ¾-inch standard domestic water meters;
7) A memorandum of the terms of this letter shall be recorded with the County Recorder of the County of Santa Cruz to insure that any future property owners are notified of the conditions set forth herein.

Future conditions which negatively affect the District's ability to serve the proposed development include, but are not limited to, a determination by the District that existing and anticipated water supplies are insufficient to continue adequate and reliable service to existing customers while extending new service to your development. In that case, service may be denied.

You are hereby put on notice that the Board of Directors of the Soquel Creek Water District is considering adopting additional policies to mitigate the impact of new

development on the local groundwater basins, which are currently the District's only source of supply. Such actions are being considered because of concerns about existing conditions that threaten the groundwater basins and the lack of a supplemental supply source that would restore and maintain healthy aquifers. The Board may adopt additional mandatory mitigation measures to further address the impact of development on existing water supplies, such as the impact of impervious construction on groundwater recharge. Possible new conditions of service that may be considered include designing and installing facilities or fixtures on-site or at a specified location as prescribed and approved by the District which would restore groundwater recharge potential as determined by the District. The proposed project would be subject to this and any other conditions of service that the District may adopt prior to granting water service. As policies are developed, the information will be made available at the District Office.

Sincerely,
SOQUEL CREEK WATER DISTRICT

Jeffery N. Gailey.
Engineering Manager/Chief Engineer

*Enclosures: Water Use Efficiency Requirements & Sample Unconditional Water Service Application*

SOQUEL CREEK
WATER DISTRICT

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**Board of Directors**
Dr. Thomas R. LaHue, *President*
Bruce Daniels, *Vice President*
Dr. Don Hoernschemeyer
Dr. Bruce Jaffe
Daniel F. Kriege

Laura D. Brown, *General Manager*

July 6, 2010

Jessie Thielen
Senior Development Manager
Barry Swenson Builder
777 North First Street, 5th Floor
San Jose, CA 95112

Re: Rispin WDO credit transfer to Aptos Village Project

Dear Jessie,

The Water Demand Offset credits that had been assigned to Barry Swenson Builder's proposed development at the Rispin Mansion have been re-assigned to the Aptos Village project. The full amount of credit has been transferred. The amount is 6.3 acre-feet, including .32 acre-feet obtained from the retrofit of the Soquel Union School District's property at Jade Street Park in Capitola.

It is our understanding that the Rispin project was not able to be funded. Under this condition, the credits were transferred to the Aptos Village project per Soquel Creek Water District policy. Accordingly, any future development at the Rispin site may be subject to water demand offset requirements.

As of the date of this letter, the portion of Aptos Village owned by Barry Swenson Builder results in a water demand offset requirement of 36.697 acre-feet. With the transfer of the 6.3 acre-feet from the Rispin project, 29.700 acre-feet of offset credit is assigned to Aptos Village. 6.997 acre-feet are outstanding.

Please contact me at the number below if you have any questions or concerns.

Sincerely,

Roy Sikes
Water Conservation Specialist
Soquel Creek Water District
(831) 475-8501 ext 146

# Attachment 2

# BIOTIC ASSESSMENT FOR THE PROPOSED APTOS VILLAGE CORE REDEVELOPMENT PROJECT SANTA CRUZ COUNTY, CALIFORNIA

*Prepared for*

**Barry Swenson Builders**
**5300 Soquel Avenue, Suite 103**
**Santa Cruz, CA 95062**

*Prepared by*

**EcoSystems West Consulting Group**
**819 ½ Pacific Avenue, Suite 4**
**Santa Cruz, CA 95060**

**October 2010**

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# INTRODUCTION

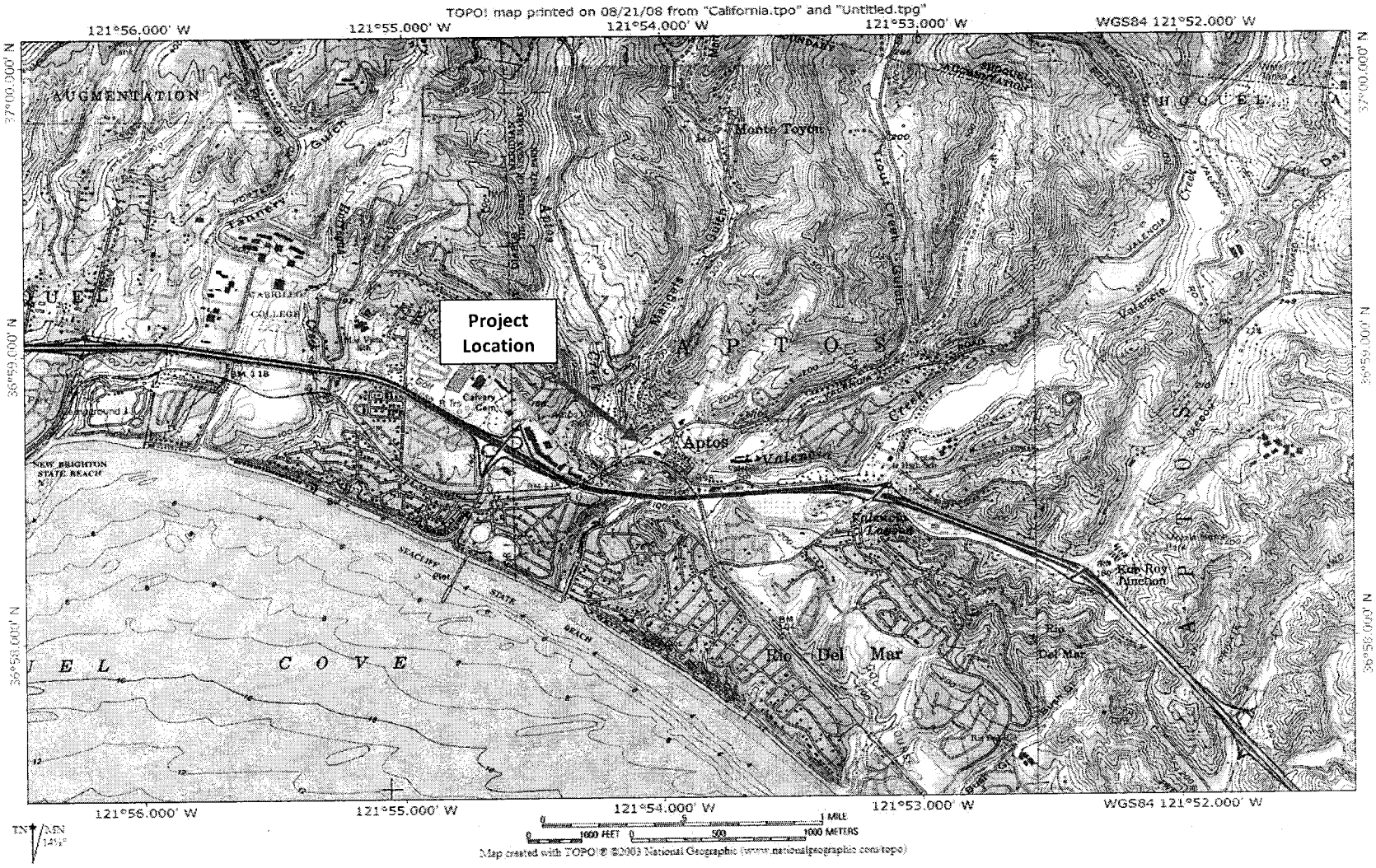
This report presents the methodologies, findings, and impact analysis of a botanical and wildlife assessment conducted by EcoSystems West Consulting Group for the proposed Aptos Village Core re-development project in Santa Cruz County, California. The objectives of this botanical and wildlife assessment include:

- Characterization of the vegetation in the vicinity of proposed project area.
- Identification of the wildlife resources (habitats and species) in the vicinity of the project area.
- Identification of special-status plant and wildlife species and sensitive habitats occurring, or potentially occurring, in the project area; and
- Impact analysis and recommended measures to avoid or reduce potential impacts to less-than significant levels following significance criteria guidelines from the California Environmental Quality Act (CEQA).

# SITE DESCRIPTION

The project area is located within the community of Aptos, north of State Highway 1. The site is located adjacent to the present footprint of the Aptos Village commercial district and is within the area designated 'Plan Area III - Village Core' in the Aptos Village Plan (County of Santa Cruz Planning Department 2010). The project area is located in close proximity to Aptos Village Park and the Forest of Nisene Marks State Park. The approximately 13.5 acre site is bordered by Soquel Drive to the south, Village Drive, Granite Way and Cathedral Avenue to the north, Trout Gulch Road to the east, and Aptos Creek Road to the west (Figure 1). The site is situated in an open area between Aptos Creek to the west, Trout Gulch to the east and Valencia Creek to the south. Residential neighborhoods comprise the majority of the surrounding areas.

Existing features within the proposed project area include various businesses such as a historic apple barn built in 1891 that presently operates as an antique dealership, the historic Bayview Hotel, retail merchants, and professional office buildings along Soquel Drive. The Aptos Bike (BMX) Park, the foundations of several remnant structures, an open ruderal field, a densely vegetated wooded hillside, and unpaved roads and parking areas occupy the remainder of the site.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Project Location
Aptos
Valencia
Monte Toyon
Rio Del Mar
Rio Del Mar
Rio Roy Nielson
Calvary Cem.
Valencia Creek
Aptos Creek
Trout Gulch
Borregas Gulch
Valencia Creek
Rio Del Mar
Rio Del Mar
Rio Del Mar

# PROJECT DESCRIPTION

The project applicant plans to redevelop the Aptos Village Core area for residential and commercial mixed-use development and public open space, including a network of sidewalks and bike paths. Previous plans for this site were proposed in 1979, updated in 1985, and again in 2010. The County Board of Supervisors supported updating the original plan to reflect inputs from the community gathered during a series of public meetings held between 2002 and 2003 and again in 2009. Community members, business representatives, and planning staff discussed issues such as traffic, housing, shopping, parking and a town plaza. The current Aptos Village Plan was adopted by the Santa Cruz County Board of Supervisors on February 23, 2010 (County of Santa Cruz Planning Department 2010).

The proposed village plan includes the construction of 3 stand alone commercial/retail buildings, 17 stand alone residential units, and 8 mixed use buildings with 46 condominiums or apartment flats. The proposed plan also incorporates a town plaza to integrate existing merchants and residential and commercial structures. A park is proposed near the entrance to the Forest of Nisene Marks State Park. The total gross building area consists of 156,308 square feet. The total gross commercial area totals 74,948 square feet. The residential area consists of 63 units and 81,360 square feet. The net commercial area is 63,706 square feet.

The project design proposes to extend Valencia Street (the Valencia Street extension), from the east, across Trout Gulch Road, to the west, connecting it to Aptos Creek Road. A new road will connect Soquel Drive from the south to the Valencia Street extension to the north. The intersection of Cathedral Drive and Granite Way at the northeast corner of the project will be improved and a cluster of new townhouses will occupy the area where the bike park is currently located. The new design also is planned to change the use of the historic apple barn from an antique furniture outlet into a grocery store. The barn will be lifted and moved approximately 60 feet and rotated 90 degrees to be repositioned off of Trout Gulch Road. The Bayview Hotel will remain in its current location.

New infrastructure construction for the proposed project will include installing underground utilities, sewer lines, roads, street lighting, parking areas, and storm water conveyance systems (described in detail below). No work will occur directly within Aptos and/or Valencia Creeks.

Site preparations will include removing remnant foundations, vegetation, and trees. An estimated 22 trees are proposed to be removed from the site along with existing large eucalyptus stumps and debris from tree removal conducted prior to 2008. Before clearing and grading the site, erosion control measures will be implemented to prevent spoils and sediment from leaving the project area. Following vegetation removal activities, restoration/stabilization of exposed upland slopes may be necessary.

## STORM WATER CONVEYANCE SYSTEMS

Potential storm water impacts from the proposed project are mitigated through development of a drainage system that incorporates a series of best management practices into the design. Storm water will be conveyed through a system of underground pipes, bio-retention swales, rain gardens, and subsurface retention and detention basins, as well as a cistern. Part of the drainage plan improvements will tie into an existing storm water pipe under Trout Gulch Road that currently discharges into Valencia Creek. A new proposed storm drain system will also convey water through a biotreatment system and across Aptos Village Park before discharging into a flow spreader and rock catchment that will dissipate flows before entering Aptos Creek.

Granite Way, an existing minimally improved road, will be paved and improved with a curb, gutter, sidewalks, and storm drain system. The other two roads within the project limits, Valencia Street and Parade Street, will be new construction.

Runoff from the proposed project area will be collected and treated in a new decentralized storm drain system designed to meet or exceed the County's current storm water design criteria requirements by maximizing onsite retention of runoff, treating runoff, and ultimately capturing and reusing a portion of the storm water for landscape irrigation. As designed, the drainage system will consist of a series of landscape based storm water treatment and storage systems, subsurface detention and infiltration systems, a subsurface rainwater catchment and reuse system, and standard collection and conveyance facilities (storm drain pipes, manholes, catch basins and drop inlets). Storm water runoff entering the project area from areas upslope of the project area will be intercepted and directed into lined swales, catch basins, and pipes which are to be connected to the existing storm drain systems.

Runoff is initially captured and treated in bioswales, raingardens, and/or control structures with oil/sediment separators. Bioretention swales and raingardens, Low Impact Development (LID) Best Management Practices (BMPs), are passive flow-through storm water filtration systems that use vegetation and soils to store, treat, and infiltrate runoff. For the majority of the project area, water that has not infiltrated in the pretreatment systems will flow into the retention/detention system for slow infiltration into the soil. Runoff from a limited area in the center of the Aptos Village Core (Fall Creek Engineering 2008, Figure 8, Area 5), which includes a parking area, the village green, rooftop collection from three buildings, and associated hardscape areas, will be collected and treated in raingardens, then will flow to a large cistern with an impervious liner located underneath the village green. Water stored in the cistern will be reused for landscape irrigation.

The pretreatment and retention/detention systems are designed to hold and infiltrate run-off for up to a 5-year storm event. For above 5-year to 25-year storm events, overflows will be released to the central storm drain system at a flow rate that does not exceed the predevelopment flow rate for each drainage area. For storms greater than 25-year events, overflows will enter the central storm drain system and flow to the new proposed outfall structure adjacent to Aptos Creek and to the existing outfall structure adjacent to Valencia Creek.

A new drainage line will convey runoff from the project area along Aptos Creek Road, down the slope through a 15 to 20 foot gap between redwood trees, across the Park access drive and between the intersecting canopy drip lines of two oak trees located at the southeastern edge of the large grass field (green) of Aptos Village Park, across the southerly end the Aptos Village Park green through an 18-inch-diameter, approximately 130 foot long pipeline to the new outfall structure above Aptos Creek. The proposed locations of the conveyance pipe and outfall structure were selected where existing breaks in the vegetation and tree canopy occur, in order to avoid tree removal both near Aptos Village Park and in the riparian habitat associated with Aptos Creek.

The Aptos Creek outfall structure is proposed to be located at the top of bank on the westerly edge of the uppermost of three river terraces above Aptos Creek, above the 100-year flood elevation, approximately 110 feet beyond the ordinary high water mark (OHW). The water will be discharged through a "flow spreader", which is a perforated pipe oriented along the slope that will be in a rock filled trench, with a 4 foot wide by 40 foot long rock bed immediately down slope from the flow spreader. The intent is to spread the discharge from the storm drain outfall over a wide area so that there is no concentrated flow. The rock bed will serve to further reduce the energy of the water as it flows down

the bank slope towards the creek. The proposed location of the outfall structure was chosen in order to keep the outfall structure out of the riparian corridor and active channel of the creek during a major storm event, and thus to prevent any damage to the outfall that might result from the high velocity flow during a major storm.

The new drainage facilities on the easterly two-thirds of the project area will connect to the existing Trout Gulch Road drainage facilities that now discharge into a branch of Valencia Creek. The existing pipe discharging toward Valencia Creek is a 42-inch reinforced concrete pipe which does not require any modification to carry the relatively low flows draining from the site. The existing outfall structure consists of a poured-in-place concrete energy dissipater that includes two vertical concrete baffles that greatly reduce the energy of storm water discharged through the structure. The structure was evaluated by Ifland Engineers in October 2010 and was deemed to be in good condition. The project does not include improving this existing storm drain outlet structure that discharges toward Valencia Creek.

# METHODS

## BOTANY

### Review of Literature and Data Sources

EcoSystems West botanists reviewed literature and botanical resource databases to identify special-status plant species and sensitive habitat types with potential to occur in the study area. (Regulatory background for sensitive resources is contained in Appendix A.) Sources reviewed include California Natural Diversity Data Base (CNDDB) occurrence records for the Soquel USGS 7.5 minute quadrangle; county occurrence records (CDFG 2003; CNDDB 2010), USGS quadrangle occurrence records in the California Native Plant Society's (CNPS) Online Inventory of Rare and Endangered Vascular Plants of California (Tibor 2001; CNPS 2010) for the Soquel quadrangle and the seven surrounding quadrangles, and local and regional floras (Thomas 1960; Munz and Keck 1973; Hickman 1993; Morgan et al. 2005).

Sources consulted for current agency status information include U.S. Fish and Wildlife Service (USFWS) (2010a, b, c) for federally listed species (including federal Proposed and Candidate species) and California Department of Fish and Game (CDFG) (2010a) for State of California listed species. Special-status species also include species listed on List 1A (Plants Presumed Extinct in California), List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere), or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere) of the CNPS Inventory (Tibor 2001; CNPS 2010). These species fall under state regulatory authority under the provisions of the California Environmental Quality Act (CEQA) Guidelines.

Also considered special-status species are species included on List 3 (Plants About Which We Need More Information -- A Review List) or List 4 (Plants of Limited Distribution - A Watch List) of the CNPS Inventory. These species are considered to be of lower sensitivity, and generally do not fall under specific state or federal regulatory authority. Specific mitigation considerations are not generally required for species in these categories. Based on information from the above sources, we developed a target list table of special-status plants with potential to occur in the vicinity of the Study Area. This table is presented in Appendix B.

Sensitive habitats may include riparian corridors, wetlands, habitats for special-status species, areas of high biological diversity, areas providing important wildlife habitat, and unusual or regionally restricted habitat types. Habitat types considered sensitive include those listed on the CNDDB working list of "high priority" habitats for inventory (i.e., those habitats that are rare or endangered within the borders of California) (Holland 1986; CDFG 2003) or those included in city and county general plans. EcoSystems West botanists reviewed the CNDDB list of "high priority" habitats and local Santa Cruz County riparian protection and sensitive habitat ordinances (Santa Cruz County General Plan 1994). (Regulatory background for sensitive habitats is contained in Appendix A.)

### Field Survey

EcoSystems West botanists conducted a botanical assessment of the proposed project area in June 2008 and May and July 2010. The entire site was evaluated on foot. All vascular plant species that were in identifiable condition at the time the site visit was conducted, regardless of regulatory status, were identified to species or infraspecific taxon using keys and descriptions in Thomas (1960); Munz and Keck

(1973); and Hickman (1993). The timing of the surveys was appropriate for identification of the special-status species listed in Appendix B.

EcoSystems West characterized and mapped all habitat types occurring on the site, and recorded data on physiognomy, dominant and characteristic species, topographic position, slope, aspect, substrate conditions, hydrologic regime, and evident disturbance for each habitat type. In classifying the habitat types on the site, we consulted the generalized plant community classification schemes of Holland (1986); Sawyer and Keeler-Wolf (1995); and CDFG (2003). Our final classification and characterization of the habitat types of the study area was based on field observations.

## Wetland Assessment

EcoSytems West evaluated the project area for potential wetlands and "other waters" of the United States (U.S.) subject to regulation under Section 404 of the Clean Water Act, and for isolated wetlands or waters of the State of California, subject to regulation under Section 401 of the Clean Water Act (CWA) and the Porter-Cologne Water Quality Act (2002). EcoSystems West also reviewed project plans to assess potential impacts to Aptos and Valencia Creeks. We identified any features within the vicinity of the project area with evidence of prolonged standing or flowing water and OHW marks. (Regulatory background for wetlands, "other water", waters of the state, lakes, and streambeds is contained in Appendix A.)

## WILDLIFE

## Review of Literature and Data Sources

EcoSystems West biologists reviewed CNDDB occurrence records of special-status wildlife species for the USGS 7.5 minute Soquel quadrangle (CNDDB 2010). In addition, we reviewed documents for previous projects in the vicinity that contained sensitive wildlife species lists. We consulted the following sources for up-to-date agency status information: USFWS (2000, 2005a, 2006, 2008a and 2010b, c, d, e, f) and the National Oceanic Atmospheric Administration (NOAA) (2005, 2006) for federally listed species and/or designations of critical habitats; and CDFG for species listed by the state as 'Threatened' or 'Endangered' or as 'Species of Special Concern', (CDFG 2009; 2010b). We also reviewed maps produced by the Biogeographic Information and Observation System (BIOS) (CDFG 2010c) and Santa Cruz County (2004) to obtain distribution information for special-status species.

EcoSystems West reviewed the preliminary and revised list of CDFG Mammal Species of Special Concern (Williams 1986; Bolster et al. 1998), as well as the list of species considered 'High Priority' by the Western Bat Working Group (WBWG) (1998). According to the CDFG Special Animals List, bat species designated as 'High Priority' by WBWG are defined as "imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats" (CDFG 2009). These species fall under State regulatory authority under the provisions of the CEQA Guidelines.

From these sources we developed a target list of special status wildlife species and their habitat requirements to consider while assessing the project area (Table 1). (Regulatory background for sensitive wildlife species is contained in Appendix A.)

**Table 1. Conservation status and habitat requirements for special-status wildlife species that may occur in the vicinity of the proposed Aptos Village Core Redevelopment project area, Santa Cruz County, California.**

| Common Name<br>*Scientific Name* | Status | | | Habitat Requirements | Potential Occurrence |
|---|---|---|---|---|---|
| | Federal | State | Other | | |
| **Fish** | | | | | |
| Tidewater goby<br>*Eucyclogobius newberryi* | FE | - | SC; AFS-E | Coastal lagoons and creeks; found up to 3 miles upstream in slow-moving water; nearest known record occurs in Aptos Creek. | **Present**<br>Presumed present along the segment of Aptos Creek from the coastal lagoon upstream to the confluence with Mangels Gulch. This segment of Aptos Creek is designated within the Greater Bay Area Recovery Unit for the tidewater goby (USFWS 2005a). Immediate project work area does not provide aquatic habitat. |
| Coho salmon<br>*Oncorhynchus kisutch* | FE | SE | AFS-E | Spawns in loose silt-free coarse gravel; requires sufficient fall stream flow for spawning. Re-introduced into Aptos Creek by Monterey Bay Salmon and Trout Project and agency recovery teams. | **Present**<br>Presumed present in Aptos Creek from reintroduction efforts. May also occur in Valencia Creek. Immediate project work area does not provide aquatic habitat. |
| Steelhead<br>*Oncorhynchus mykiss irideus* | FT | - | AFS-TH | Requires silt-free gravel for spawning; spends the first few years of its life in fresh water before migrating to the ocean. Adults later return to breed in the same freshwater locations where they were spawned. | **Present**<br>Present in segment of Aptos and Valencia creeks west and east of the project site. Aptos Creek and Valencia Creek are federally designated as Evolutionary Significant Units for Central California Coast steelhead. Immediate project work area does not provide aquatic habitat. |
| **Amphibians and Reptiles** | | | | | |
| California red-legged frog<br>*Rana aurora draytonii* | FT | - | SC | Requires the presence of surface water until mid to late summer for reproduction; utilizes ephemeral and/or perennial systems with standing or slow moving flows; upland habitat includes leaf litter, burrows and crevices; adults may travel over 2 miles overland between aquatic sites. | **Possible**<br>Potential habitat occurs in Aptos Creek adjacent to the area where storm drain outflow installation activities will occur. The immediate Village Core project area does not provide aquatic habitat. Nearest historic record (1963) is within less than one mile north of project area off Cathedral Drive near Mangles Gulch (Kittleson & Biosearch 2005). Nearest known breeding population is in Millsap Pond approximately 4 mi SE of project area. |

| Common Name<br>*Scientific Name* | Status | | | Habitat Requirements | Potential Occurrence |
|---|---|---|---|---|---|
| | Federal | State | Other | | |
| Foothill yellow-legged frog | - | - | SC | | **Possible**<br>Potential habitat occurs in Aptos Creek adjacent to the area where storm drain outflow installation activities will occur. The immediate Village Core project area does not provide aquatic habitat. |
| Western pond turtle<br>*Actinemys marmorata* | - | - | SC | Found in ponds, marshes, rivers, streams, and ditches containing aquatic vegetation; usually seen sunning on logs, banks, or rocks. Moves up to 3-4 miles within a creek system; nests in burrows in upland areas up to several hundred feet away from aquatic habitat, in woodlands, grasslands, or open forest. | **Possible**<br>Potential habitat occurs in Aptos Creek adjacent to the proposed location for the new storm drain outflow. The Aptos Village Core project area does not provide aquatic or upland habitat. |
| **Raptors and Birds (Nesting and/or Wintering)** | | | | | |
| Nesting birds of prey<br>(various species) | - | - | 3503.5 | Variety of woodland, riparian, and savanna habitats. | **Possible**<br>Tree stands in project area provide potential habitat for nesting birds of prey including owls and hawks. |
| Golden eagle<br>*Aquila chrysaetos* | - | - | SC; FP; BCC | Resident in open mountains, foothills, canyons, and open fields in Santa Cruz County. Nests in a mass of sticks on cliffs or in trees. | **Unlikely**<br>Study area lacks suitable nesting habitat; may forage or occur as migrant. |
| White-tailed kite<br>*Elanus leucurus* | - | - | FP | Nests in conifers on the margins of open areas including grasslands and sloughs containing a high abundance of small mammals and lizards. | **Unlikely**<br>Study area lacks suitable nesting habitat; may forage over site or occur as migrant. |
| Bald eagle<br>*Haliaeetus leucocephalus* | Delisted | SE | FP | In western North America, nests and roosts in coniferous forests within approximately one mile of a lake, reservoir, stream, river, or the ocean. | **Unlikely**<br>Study area lacks suitable nesting habitat; may forage over Aptos and Valencia Creeks or occur as seasonal migrant. |
| Merlin<br>*Falco columbarius* | - | - | BCC | Does not nest in California. Rare but widespread winter visitor to the Central Valley and coastal areas. Forages along coastline in open grasslands, savannas, and woodlands. Often forages near lakes and other wetlands | **Possible (wintering)**<br>May forage or migrate through site. |
| Long-eared owl<br>*Asio otus* | - | - | SC | Utilizes abandoned stick nests of other large birds or squirrel nests in a variety of wooded areas, including orchards and usually near aquatic and open areas for foraging; forages mostly on rodents. | **Unlikely**<br>Tree stands in project area lack potential nesting habitat Nearest recent (2008) detections were approximately 5 miles west at O'Neill Ranch Open Space in Soquel. May forage or migrate through site. |

| Common Name<br>*Scientific Name* | Status | | | Habitat Requirements | Potential Occurrence |
|---|---|---|---|---|---|
| | Federal | State | Other | | |
| Willow flycatcher<br>*Empidonax traillii* | - | SE | BCC | Nests in riparian areas and large wet meadows with abundant willows. Usually found in riparian habitats during migration | **Possible**<br>Potential nesting habitat occurs along Aptos Creek, near the location of the proposed storm water outflow structure; Village Core project area lacks dense willow riparian stand for nesting; may forage or occur as migrant. |
| Yellow-breasted chat<br>*Icteria virens* | - | - | SC | Nests in dense riparian vegetation 1-8 ft. above the ground, with a well-developed understory. | **Possible**<br>Potential nesting habitat occurs along Aptos Creek, near the location of the storm water outflow structure. Village Core project area lacks dense riparian vegetation for nesting; may forage or occur as migrant. |
| Yellow warbler<br>*Dendroica petechia brewsteri* | - | - | SC | Nests in deciduous riparian woodland with open canopy along streams or other watercourses; forages in dense understory of riparian woodland. | **Present**<br>Fall season migrants known from Aptos Village Park, (eBird 2010) near location of proposed storm water outflow structure. The Village Core project area lacks dense willow riparian vegetation for nesting; may forage or occur as migrant. |
| Vaux's swift<br>*Chaetura vauxi* | - | - | SC | Nests communally, usually in large diameter hollow trees or chimneys. Nesting habitat is forest, either coniferous or mixed, but primarily old growth with snags for nesting and roosting. Foraging habitat is open sky over woodlands, lakes, and rivers, where flying insects are abundant. | **Unlikely**<br>Nearest historical nesting record (1999) is from a chimney of a private home near the corner of Trout Gulch Road and Valencia Street. Also known from Nisene Marks State Park. (Suddjian personal communication 2008). May forage over site or occur as migrant. |
| **Mammals** | | | | | |
| Townsend's western big-eared bat<br>*Corynorhinus townsendii townsendii* | - | - | SC; HP | Roost sites are highly associated w/ caves and mines; buildings must offer "cave-like" features; known to roost in tree hollows, under bridges, in residential attics and under decks. | **Possible**<br>Potential roost sites available in structures in study area. |
| Pallid bat<br>*Antrozous pallidus* | - | - | SC; HP | Roost sites are primarily associated with oak, redwood, ponderosa pine, and giant sequoia forests. Will also roost under bridges and in buildings and rock outcrops. | **Possible**<br>Potential roost sites available in structures in project area. May forage over site or occur as migrant. |

| Common Name<br>*Scientific Name* | Status | | | Habitat Requirements | Potential Occurrence |
|---|---|---|---|---|---|
| | Federal | State | Other | | |
| Western red bat<br>*Lasiurus blossevillii* | - | - | SC;<br>HP;** | Roosts in foliage, primarily in riparian and wooded habitats. | **Possible**<br>Potential roosting habitat occurs in the riparian forest surrounding the proposed storm drain outflow structure area. Village Core project area lacks suitable roosting habitat. May forage over site or occur as seasonal migrant. |
| Fringed myotis<br>*Myotis thysanodes* | - | - | HP; ** | Roost sites in California are primarily in buildings or mines; will also roost in large conifer snags and caves. | **Possible**<br>Potential roost sites available in structures in project area. May forage over site or occur as migrant. |
| Long-legged myotis<br>*Myotis volans* | - | - | HP;** | Roosts primarily in large hollow tree snags or live trees with exfoliating bark; also uses rock crevices, mines, and buildings. | **Possible**<br>Potential roost sites available in structures, snags, and trees with exfoliating bark in project area. May forage over site or occur as migrant. |
| San Francisco dusky-footed woodrat<br>*Neotoma fuscipes annectens* | - | - | SC | Associated with riparian, oak woodland and redwood forest habitats. Builds stick nests under or in buildings, hollow trees, or in tree canopy. | **Present**<br>Occurs onsite in area proposed for public park. Potential habitat occurs among other scattered oaks and structures. |

**TABLE 1 NOTES:**

**Federal Status (USFWS 2010d; CDFG 2010b)**

**FE** = Endangered:

**FT** = Threatened: Any species, which is likely to become an endangered species within the foreseeable future throughout all, or a significant portion of its range.

**Delisted** = Delisted from the federal Endangered Species List.

**State Status (CDFG 1996; CDFG 2009; CDFG 2010b)**

**SE** = Endangered: A native species or subspecies of animal which is in serious danger of becoming extinct throughout all, or a significant portion of its range, due to loss of habitat, change in habitat, over exploitation, predation, competition and/or disease.

**ST** = Threatened: A native species or subspecies that, although not presently threatened with extinction, is likely to become an endangered species in the foreseeable future in the absence of special protection and management efforts.

**Other (CDFG 2009; USFWS 2008a; WBWG 1998)**

**SC** = CDFG 'Species of Special Concern' are taxa given special consideration because they are biologically rare, very restricted in distribution, declining throughout their range, or at a critical stage in their life cycle when residing in California; or taxa that are closely associated with a habitat that is declining in California (e.g., wetlands).

**FP** = Fully Protected: This classification was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for collecting these species for necessary scientific research and relocation of bird species for the protection of livestock.

**AFS-E; AFS-TH** = Fish species considered 'Endangered' or 'Threatened' by the American Fisheries Society under a set of criteria developed from peer review and expert scientific opinion.

**3503.5** = Protected birds of prey (Order Falconiformes and Strigiformes) under California Fish and Game Code 3503.5.

**BCC** = Species of migratory nongame birds that USFWS considers to be of concern in the United States because of (1) documented or apparent population declines, (2) small or restricted populations, (3) dependence on restricted or vulnerable habitats.

**HP** = Considered "High Priority" on the Western Bat Working Group's (WBWG) Western Bat Species Regional Priority Matrix (1998).

** = Included on preliminary list of revised CDFG Mammal Species of Special Concern (Williams 1986; Bolster et.al 1998).

## Field Survey and Distribution Information

EcoSystems West wildlife biologists reviewed distribution information and conducted site visits in June and August 2008 and June and July 2010. Our objective during these visits was to evaluate the site to determine if the identified target wildlife species (Table 1) are present or if potential habitat for these species occurs in the vicinity of the proposed project area. Focused-level wildlife surveys were not conducted as part of this assessment, with the exception of inspecting the interior of the apple barn and conducting an acoustic/emergence survey for bats on June 11, 2010. Habitat evaluation methods for specific taxa are described below.

### Fish

Prior to visiting the proposed project area, EcoSystems West reviewed distribution information from BIOS maps (CDFG 2010c) and documents detailing the status of special-status fish species and their habitat within the Aptos Creek Watershed (Hagar Environmental 2003; Kittleson and Biosearch 2005; Adelman and Adelman 2006; Santa Cruz County 2004). Distribution information and habitat requirements for special-status fish including the tidewater goby, coho salmon, and steelhead are discussed in the results.

### Amphibians and Reptiles

Our habitat evaluation of the site was conducted for the California red-legged frog), foothill yellow-legged frog (FYLF), and the western pond turtle (WPT) (Table 1). Frogs and turtles depend on both aquatic and non-aquatic habitats for substantial portions of the year. EcoSystems West gathered information from aerial maps and from BIOS maps (CDFG 2010c) showing the location of potential aquatic and upland habitat and locations of documented resources within one mile of the project area (USFWS 2005b). We also reviewed museum and data base records.

With this information, an evaluation was made to determine the likelihood that transient frogs would migrate from nearby known locations through the project area. Our biologists made a preliminary evaluation of upland (non-aquatic) habitat within the Village Core project area, including locations with, vegetative cover, and the amount of sun exposure near suitable aquatic habitat. We estimated the project boundary distances from nearby aquatic habitats in Aptos and Valencia Creeks. We also evaluated the aquatic habitat along a segment of Aptos Creek adjacent to the location of where the storm drain outflow structure is proposed to be installed. Substrate type, the presence of emergent, submergent, and aquatic vegetation, pool features, canopy cover, and basking habitat were included in our evaluation. A formal protocol-level set of surveys (USFWS 2005b) for CRLF was not conducted as part of this effort.

### Raptors and Other Birds

EcoSystems West biologists conducted a visual assessment to evaluate the suitability of available habitat in order to determine which birds could potentially nest, migrate through, or winter on the site, and which species would not be expected to occur within the project area. During this evaluation we identified and documented the location of any active nests or existing stick nest structures within the tree stands of the project area. Locations of active nest sites and potential nest structures were noted on field maps.

## MAMMALS

During our initial site visits, our biologists assessed the availability and suitability of potential habitat for the five special-status bats listed in Table 1 as well as for the San Francisco dusky-footed woodrat. To assess the site for bats, during the day, we visually inspected the stand of trees and fallen trees within the project area for potential bat roosting features, such as senescent limbs, hollows, crevices, holes, and furrowed bark. We briefly examined the exterior of some of the structures (e.g., sheds, awnings, storage space, and businesses) on site to determine the potential for bat use.

On June 11, 2010, EcoSystems West biologists conducted a follow-up survey for bats. We inspected the interior of the apple barn, and conducted evening bat acoustic monitoring and an emergence survey. We were only able to safely access one (the northwest side) of three attic spaces beneath the three apex rooftops. Acoustic monitoring was conducted using an Anabat II echolocation detection system to collect acoustic files of the echolocation calls of the bats. Two Anabat II echolocation monitoring units were deployed. Unit 1 was positioned to detect calls from the exterior of the southwest and northwest facing sides of the barn. Unit 2 was positioned to detect calls along the southeast and northeast facing sides of the barn. Acoustic monitoring was conducted from 1930 to 2330 hours, encompassing the entire emergence activity period. The Anabat acoustic monitoring system uses a bat detector to detect bat ultrasonic echolocation calls in the field and uses a zero-crossing unit to convert the detected signals into frequency/time graphs on a laptop computer. The graphs are then used together with reference knowledge of acoustic signatures of different species to identify calls to species level. Calls are identified by comparison with calls previously recorded from bats that have been visually identified at the time of recording and by comparison with existing bat vocal signature libraries.

Emergence surveys included positioning two biologists in two different areas to witness any emerging bats from exterior features of the barn. Emergence counts were conducted from approximately one-half hour before sunset to one and one-half hours after sunset or until biologists could no longer see. We recorded the number of bats observed emerging from any barn features and documented the time of their emergence. After emergence, we walked around the entire project area with hand-held Anabat units to record any additional bat activity inside and outside the barn until approximately 11:30 PM.

In addition, biologists searched the project area for individual woodrats and their stick nest structures. An examination was made of the ground, understory vegetation, tree stand canopies, slash piles, and structures (when accessible) within the project area. Locations of active woodrat nest structures were noted on field maps.

# RESULTS

## BOTANY

### Floristic Inventory and Habitat Characterization

We recorded a total of 85 species of vascular plants in the vicinity of project area. Of these, 29 species are native, and 56 species are non-native. A complete species list is presented in Appendix C. The majority of vegetation consists of an assortment of weedy grasses and herbaceous species with coast live oak, eucalyptus and acacia scattered throughout the project area and on a hillside along the northwestern boundary.

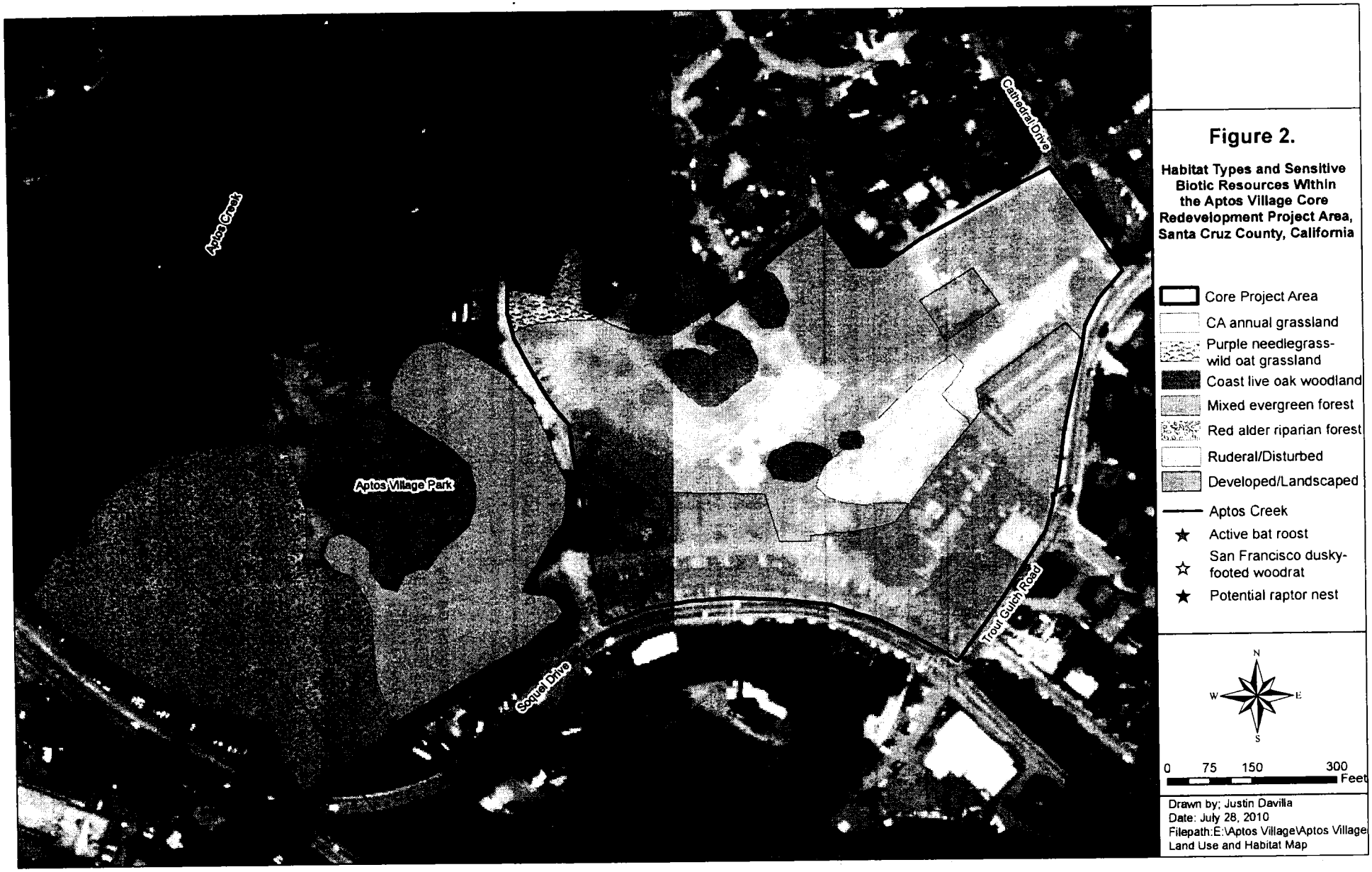
We recognize five predominant habitat types occurring in the Core project area: California annual grassland, purple needlegrass-wild oat grassland, coast live oak woodland, ruderal/disturbed, and developed/landscaped areas (Figure 2). Only coast live oak woodland and purple needlegrass-wild oat grassland are considered native habitats in the sense that they are not primarily associated with heavy, ongoing or repeated human disturbance. California annual grassland habitat is typically comprised of a dense assortment of naturalized grasses and herbs of Eurasian origin. Ruderal habitat is present in heavily disturbed areas where opportunistic weeds and bare ground predominate. Developed/Landscaped areas are those with existing structures, roads and ornamental vegetation.

The proposed new storm water conveyance pipe and outfall structure will be located to the west of the Core project area within or immediately adjacent to several habitat types: the developed/landscaped habitat types along Aptos Creek Road and the access drive into Aptos Village Park and the Park itself; mixed evergreen forest that borders the road and driveway; red alder riparian forest associated with Aptos Creek; and the aquatic habitat of the perennial Aptos Creek.

#### CALIFORNIA ANNUAL GRASSLAND

This habitat type corresponds to the California annual grassland series of Sawyer and Keeler-Wolf (1995) and to a phase of the non-native grassland type described by Holland (1986). California annual grassland occurs on the flat to gently sloped areas throughout the majority of undeveloped portions of the project area. Due to isolation from nearby coastal prairie habitat, as well as close proximity to urban development, annual grassland within the site is highly disturbed and comprised primarily of weedy, non-native species.

Within the Aptos Village plan area, California annual grassland is dominated by brome grasses (*Bromus diandrus*, *B. hordeaceus*), wild oats (*Avena* spp.), foxtail barley (*Hordeum murinum*), Italian ryegrass (*Lolium multiflorum*), filaree (*Erodium botrys*), wild radish (*Raphanus sativus*), black mustard (*Brassica nigra*), English plantain (*Plantago lanceolata*), and rough cat's ear (*Hypochaeris radicata*). A large percentage of plant species identified within this habitat type are listed as invasive weeds with "moderate to high ecological impacts" by the California Invasive Plant Council (Cal-IPC).


Aptos Creek
Aptos Village Park
Soquel Drive
Cathedral Drive
Trout Gulch Road
Figure 2.
Habitat Types and Sensitive Biotic Resources Within the Aptos Village Core Redevelopment Project Area, Santa Cruz County, California
Core Project Area
CA annual grassland
Purple needlegrass-wild oat grassland
Coast live oak woodland
Mixed evergreen forest
Red alder riparian forest
Ruderal/Disturbed
Developed/Landscaped
Aptos Creek
Active bat roost
San Francisco dusky-footed woodrat
Potential raptor nest
N
W
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Feet
Drawn by; Justin Davilla
Date: July 28, 2010
Filepath:E:\Aptos Village\Aptos Village Land Use and Habitat Map

### PURPLE NEEDLEGRASS-WILD OAT GRASSLAND

This habitat type represents an association of the purple needle grass series (Sawyer Keeler-Wolf 1995) and a phase of the valley and foothill grassland habitat type of Holland (1986). Within the project area, this habitat type is located on a steep embankment in the northwest corner of the site in a mosaic of grassland and coast live oak woodland. The soils are shallow and rocky as is typical for patches of remnant needlegrass along the Central California coast.

While many of the plants in this patch are non-native, there is a substantial remnant stand of the native bunchgrass purple needlegrass (*Nassela pulchra*) intermixed with wild oats (*Avena barbata, A. fatua*), Italian ryegrass, wild pea (*Lathyrus latifolius*), poison oak (*Toxicodendron diversilobum*), California blackberry (*Rubus ursinus*), and narrowleaf crimson clover (*Trifoium angustifolium*). Broadcast seeding of narrowleaf crimson clover may have occurred for slope stabilization and erosion control upon completion of the Mattison Court subdivision immediately north of the project area in 2008.

### COAST LIVE OAK WOODLAND

The coast live oak woodland habitat type corresponds to a phase of the coast live oak series of Sawyer Keeler-Wolf (1995) and to the coast live oak woodland habitat type of Holland (1986). This habitat type is present along the intermediate to steep slopes forming the northwestern boundary of the project area along Village Drive and represents a fragment of a larger remnant oak woodland/mixed evergreen forest largely displaced by urban development. Due to the patchy distribution of oaks and highly disturbed non-native understory species, remnant coast live oak woodland is not considered a sensitive habitat type within the project area.

Within the project area, coast live oak woodland contains an overstory dominated almost entirely by scattered coast live oak trees (*Quercus agrifolia*) with silver wattle acacia (*Acacia dealbata*), cotoneaster (*Cotoneaster pannosus*), and blue gum eucalyptus (*Eucalyptus globulus*) widely interspersed throughout. The understory is comprised of a mixture of herbaceous shrubs including California blackberry, Himalayan blackberry (*Rubus discolor*) and poison oak, and herbaceous species such as periwinkle (*Vinca major*), English ivy (*Hedera helix*), Cape ivy (*Delairea odorata*), snakeweed (*Ageratina adenophora*), Italian thistle (*Carduus pycnocephalus*), and narrowleaf crimson clover.

### MIXED EVERGREEN FOREST

The mixed evergreen forest on the site is best described as a phase of the coast live oak and mixed evergreen forest types described by Holland (1986). It also has a close affinity to the mixed oak series of Sawyer and Keeler-Wolf (1995). A narrow remnant band of mixed evergreen forest is found on either side of the main driveway leading into Aptos Village Park and is contiguous with mixed evergreen forest extending into Nisene Marks State Park. This habitat type grades into red alder riparian forest associated with Aptos Creek to the west.

The mixed evergreen forest is a dense, mostly closed-canopy forest dominated by broadleaved tree species including coast live oak, big leaf maple (*Acer macrophyllum*), California coffeeberry (*Rhamnus californica*), and coast redwood (*Sequoia sempervirens*). Other trees encountered at a lower density include Northern California black walnut (*Juglans californica* var. *hindsii*), red willow (*Salix laevigata*) and silver wattle. The large invasive perennial species pampas grass (*Cortaderia selloana*) is also common along the margin of the forested canopy. The understory is densely vegetated and dominated by herbaceous vines and forbs common to the surrounding areas including poison oak, English ivy, periwinkle, and California blackberry.

### RED ALDER RIPARIAN FOREST

Red alder riparian forest corresponds to the red alder series of Sawyer and Keeler Wolf (1995) and to the red alder riparian forest of Holland (1986). This habitat type is located on alluvial sites associated with perennial streams along the immediate California coast. Red alder riparian forest is situated along the immediate embankments of Aptos Creek in loose, sandy soils.

Within the vicinity of the proposed storm water flow spreader and outfall structure, this riparian habitat is dominated by an overstory comprised almost entirely of red alder (*Alnus rubra*), with widely scattered big leaf maple, coast redwood, black cottonwood (*Populus balsamifera* ssp. *trichocarpa*), and willows (*Salix* sp.). The understory is dominated by herbaceous species including stinging nettle (*Urtica dioica*), English ivy, periwinkle, and California blackberry. Near the margin of the riparian woodland, bracken fern (*Pteridium aquilinum* var. *pubescens*) and tanoak (*Lithocarpus densiflorus*) are also present.

### AQUATIC

Aptos Creek flows north to south and is located immediately west of Aptos Creek Road, just west of the proposed Village Core project area. Aptos Creek is a first order tributary of the Pacific Ocean and its headwaters are located further upstream on the western slope of the Santa Cruz Mountains. Trout Gulch and Valencia Creek are tributaries to Aptos Creek. The confluence of Trout Gulch and Valencia Creek is located approximately 760 feet east of the project area. From that point, Valencia Creek continues to travel east to west, south of the project area, to the confluence of Valencia Creek and Aptos Creek. After this confluence, Aptos Creek turns south and empties into the Pacific Ocean at Rio del Mar.

Aptos Creek is a perennial waterway with steep streambanks giving way to graduated alluvial terraces along the eastern side of the creek. In the segment of the creek located below the proposed storm water outfall project area, the Aptos Creek channel is approximately 10-15 feet wide with a rocky/gravelly bottom and very little sediment or persistent herbaceous vegetation. The stream course supports riffles and pools, overhanging vegetation and high tree canopy with exposed roots at and below the ordinary high water level. Coltsfoot (*Petasites frigidus* var. *palmatus*), periwinkle, and California blackberry predominate just above the ordinary high water mark of the creek. During the July 2010 site visit, the OHW mark of Aptos Creek was approximately 4 to 5 feet above summer creek flows.

On the east bank of the creek, two graduated alluvial terraces rise steeply from the creek bed. The first gently-sloping alluvial terrace is approximately 8 feet above the OHW mark, and approximately 25 feet wide. The bank rises steeply from the first terrace approximately 10 feet to the second terrace. The second terrace is set back from the creek approximately 90 to 100 feet and is approximately 85 feet wide. This second terrace coincides with the FEMA 100 year floodplain. From the second terrace, the bank rises steeply approximately 25 feet to a third terrace, which is at the same elevation as the Aptos Village Park green. This uppermost terrace is not alluvial in nature, but is likely the result of grading, and is the proposed location for the new storm water conveyance outfall structure.

### RUDERAL/DISTURBED

Ruderal areas are not described by Sawyer and Keeler-Wolf (1995) or Holland (1986). Within the project area, ruderal communities consist of highly disturbed, weedy areas immediately adjacent to existing urban infrastructure or in recently reclaimed areas along old road cuts, the BMX park, or untended landscaped areas. Ruderal vegetation is comprised of aggressive, early-successional species such as bull

mallow (*Malva nicaensis*), smartweed (*Polygonum arenastrum*), sand spurry (*Spergularia rubra*), pineapple weed (*Chamomilla suaveolens*), poison hemlock (*Conium maculatum*), wild radish, black mustard, and filaree.

DEVELOPED/LANDSCAPED

Developed and landscaped areas are comprised of urban and light-industrial infrastructure including existing office buildings, commercial space, paved roads and parking lots, as well as actively landscaped areas associated with these features. Within the Core project area, several developed areas occur along the western and southern perimeters. These include the Bayview Hotel, commercial buildings along Soquel Drive and Trout Gulch Road, and the historic Apple Barn structure. West of the Core, in the area proposed for storm water conveyance to the Aptos Creek outfall structure, developed/landscaped areas include Aptos Creek Road, the driveway to Aptos Village Park, and the park itself.

## Special-status Species

We did not observe any of the special-status plant species (listed in Appendix B) in the project area during the assessment site visit. Only one species, Santa Cruz tarplant (*Holocarpha macradenia*), was considered to have a moderate potential for occurrence within the study area prior to the site visit due to specific habitat requirements and proximity of extant occurrences of these species (Appendix B). Santa Cruz tarplant is often found in disturbed grassland and coastal prairie habitat with a high percent cover of non-native species (Bainbridge 2003). Santa Cruz tarplant was not observed within the project area during the June site visit, which was conducted during peak phenology for the Santa Cruz tarplant. No species with flowering periods outside of the timing of the assessment were considered to have potential for occurrence on the site.

One species occurring on the site, Northern California black walnut, is a special-status species where it is native. Northern California black walnut is, or historically was, native from Contra Costa County to Lake County (Munz and Keck 1973; Hickman 1993; Tibor 2001; CNPS 2010). This species is, however, widely naturalized both within and outside its native range. It is not known to be native in Santa Cruz County or elsewhere in the Santa Cruz Mountains (Thomas 1960; Tibor 2001; Morgan et al. 2005; CNPS 2010). This species is not recognized as a special-status species within the survey area because it is certainly naturalized on the site rather than native.

## SENSITIVE HABITATS

## Potential Wetlands and Aquatic Habitat

No wetlands or "other waters" were identified within the Core Aptos Village Core project area. However, Valencia Creek and Aptos Creek are both located less than one quarter mile from the project area and have direct connectivity with the Pacific Ocean.

Aquatic habitats are considered sensitive habitats by the County of Santa Cruz. Aptos and Valencia Creek are further designated as sensitive because they provide habitat for federally listed fish species. The segment of Aptos Creek adjacent to the project area is designated within the Greater Bay Area Recovery Unit for the federally endangered tidewater goby and both Aptos and Valencia Creek are designated as Evolutionary Significant Units for the federally threatened steelhead. Federally endangered coho salmon are also presumed present in Aptos Creek and possible in Valencia Creek from reintroduction efforts.

CDFG requires a Section 1600 Streambed Alteration Agreement (SAA) for any project related activities determined to be within the bed and bank of a perennial stream. For the purposes of Section 1600 consultation, the lateral extent of a watercourse is defined by CDFG as the top of the bank represented by a physical break in slope or the outward extent of contiguous riparian canopy, whichever is greater. Consultation with CDFG will be necessary to determine if the project will require a SAA.

## Riparian Habitat

Red alder riparian forest is considered a high priority habitat by CNDDB and is included as a sensitive habitat type by the County of Santa Cruz. Riparian habitats are valued for wildlife habitat, stream bank stabilization, and flood control. Red alder riparian forest is located along the embankments of Aptos Creek, immediately east of Aptos Village Park. A storm water conveyance pipe, flow spreader and outfall structure are proposed outside of the riparian habitat in this area.

The County of Santa Cruz riparian ordinance limits development activities in riparian areas and provides buffer/setback requirements based on slope and vegetation composition. Specifically, the ordinance states that a buffer "shall always extend fifty (50) feet beyond the edge of riparian woodland and twenty (20) feet beyond the edge of other woody vegetation as determined by the dripline" (County of Santa Cruz 1994). Once the appropriate buffer has been determined, an additional 10 foot setback is required for any structures. Exemptions are made for continuance of a preexisting use, pest control and eradication, drainage and erosion control, habitat restoration, and/or maintenance of existing levee structures. The proposed project may qualify for an exemption.

## Purple Needlegrass-Wild Oat Grassland

The purple needlegrass-wild oat grassland alliance (Sawyer Keeler-Wolf 1995) is considered a "high priority" habitat type by the CNDDB. This habitat type corresponds to remnant stands of purple needlegrass, a native bunchgrass that once predominated in many of California's grasslands prior to European settlement in the early 1800's. The vast majority of needlegrass grasslands have been replaced by non-native grasses and forbs or Eurasian origin. Within the project area, this habitat type is located in a small 0.25 acre patch in the northwestern corner of the site on a steep hillside east of Aptos Creek Road and north of Village Drive.

## Significant Tree Protection

The Village Core project area is not located within the coastal zone and does not contain riparian habitat; therefore, none of the trees within the Core are subject to the Santa Cruz County Significant Tree Ordinance. Proposed locations for storm water conveyance and outfall into Aptos Creek adjacent to riparian habitat are situated to avoid tree removal within the riparian vegetation. Further discussion is contained within the riparian vegetation sections (habitat types, sensitive habitats, and impacts and mitigations).

# WILDLIFE

## Fish

### TIDEWATER GOBY

The tidewater goby is listed by USFWS as 'Endangered' under the federal Endangered Species Act and is recognized as a 'Species of Special Concern' by the CDFG (USFWS 2000; CDFG 2009 and 2010b). It is also listed as 'Endangered' based on a set of criteria developed by the American Fisheries Society (AFS) to determine global extinction risk (CDFG 2009; Jelks et. al, 2008).

The tidewater goby is presumed present along the segment of Aptos Creek from the coastal lagoon upstream to the confluence with Mangels Gulch (CDFG 2010c). This segment of Aptos Creek is designated within the Greater Bay Area Recovery Unit for the tidewater goby (USFWS 2005a). The Aptos Creek population is genetically distinct from all other nearby localities and is dominated by an ancestral line found originally in that location, according to the federal Recovery Plan for the Tidewater Goby (USFWS 2005a). The Aptos Creek population is considered a source for re-colonization efforts in neighboring watersheds in Santa Cruz County (e.g. Soquel Creek) (USFWS 2005a).

No suitable aquatic habitat occurs directly within the immediate Aptos Core project area; however, habitat for the goby lies immediately downstream of the proposed location for the flow spreader and outfall structure that will dissipate storm water discharges into Aptos Creek and from the existing outfall structure into Valencia Creek.

The tidewater goby is uniquely adapted to coastal lagoons and the uppermost brackish zone of larger estuaries. Its life history is keyed to the annual cycles of the coastal lagoons and estuaries (Swift et al. 1989; Swenson 1999; USFWS 2005a). Goby may be found approximately 3 to 5 miles upstream from coastal lagoon environments. The species is typically found in water less than 1 meter (3.3 feet) deep and salinities of less than 12 parts per thousand (USFWS 2005a).

Male tidewater gobies begin digging breeding burrows in relatively unconsolidated, clean, coarse sand in April or May after lagoons become closed to the ocean (Swift et al. 1989; USFWS 2005a). Female tidewater gobies aggressively spar with each other for access to males and burrows in which to lay their eggs. They may lay several clutches of hundreds of eggs per clutch per year. Eggs are attached to sand grains in the burrow ceiling and walls. Males remain in the burrow to guard and care for the eggs for approximately 9 to 11 days until they hatch, rarely if ever emerging from the burrow to feed. Reproduction occurs year-round with the peak of spawning occurring during the spring and again in late summer. Impacts from increases in sediment loads, urban runoff, introduced non-native predators, and diversions are known to affect the reproductive success of tidewater gobies (USFWS 2005a).

### COHO SALMON AND STEELHEAD

The coho salmon is listed by the USFWS (2010d) as federally endangered and by CDFG (2010b) as state endangered. The steelhead is listed as federally threatened (USFWS 2010d).

The Aptos Creek Watershed historically supported healthy runs of both coho salmon and steelhead trout. Aptos and Valencia creeks are currently known to support steelhead and resident rainbow trout (*Oncorhynchus mykiss*). Both creeks are federally designated as Evolutionary Significant Units for Central California Coast steelhead (NOAA 2005 and 2006).

The coho salmon were thought to be extinct in the Aptos Creek watershed until recent stocking efforts by the Monterey Bay Salmon and Trout Project (Kittleson and Biosearch Associates 2005). Recent fisheries assessments of perennial streams within the watershed suggest that sufficient habitat exists to support both coho and steelhead (Hagar Environmental Services 2003; Santa Cruz County 2004).

Coho salmon and steelhead are both anadromous fish spending part of their lives in fresh water and part in the ocean. The coho spends its initial 12 to 18 months in the fresh water river or stream where it hatched and then up to two years in the ocean while developing into an adult. During its third year, coho return to their natal stream to spawn and then die. Along the Central California Coast, upstream migration of adult coho usually occurs in November and December with peak migration in December, depending upon river flows. Migration may vary widely according to local rainfall and runoff (Titus et al 1994; Moyle 2002).

The life cycle of the steelhead differs from the coho in that it initially spends up to two years in fresh water and continues to migrate between the ocean and its freshwater natal streams to repeat spawning cycles in the adult stage before dying (Alley 2001; Flosi et al 1998). Along the Central California Coast, upstream migrations of adult steelhead typically occur between December and April with a peak between late December and March (Leidy 2005). Downstream migrations of juvenile and adult steelhead generally occur between April and June with a large percentage of the population completing migration by May. However, the timing of their migration depends on the level of river/creek flow. Both the coho and steelhead require silt-free gravel and sufficient flows for spawning.

## Amphibians and Reptiles

### California red-legged frog

The CRLF is federally listed as 'Threatened' and as a state Species of Special Concern (CDFG 2009).

A historic record (1963) documents a CRLF occurrence within one mile north of the project area along Mangles Gulch (Kittleson and Biosearch 2005). The record is from a large pond, located on private land, which was not physically accessible during our site evaluation. No other museum or current records document CRLF occurring in the Aptos Creek watershed, including Valencia Creek; however, unidentified frogs have been observed downstream of Mangles Creek as recently as 2009, along the segment of Aptos Creek adjacent to the proposed location for the storm water flow spreader (C. Steiner, personal communication 2010). The nearest known breeding CRLF are located approximately 4 miles southeast of the project area at Millsap Pond (Kittleson and Biosearch 2005).

Radio-tracking studies have shown that CRLF may travel across watersheds and out of riparian corridors; therefore, upland (non-aquatic) habitat was evaluated within the Village Core project area and adjacent to the proposed location of the storm drain outflow structure near Aptos Creek. CRLF are not expected to occur within the Village Core project area as it does not provide suitable aquatic or upland habitat. Potential non-reproductive aquatic and upland refuge habitat occurs along Aptos Creek downstream of Mangles Gulch, adjacent to the proposed location for the new storm water conveyance and outfall structure. The project area does not occur in federally designated CRLF critical habitat (USFWS 2006 and 2010f).

The proposed new storm water conveyance pipe and outfall structure will be located on the third terrace (approximately 110 feet) above Aptos Creek. No construction will take place within potential aquatic habitat, the associated adjacent riparian forest, nor within potential upland refuge habitat. No

permanent loss of habitat is anticipated as a result of project activities. Should the proposed location of the storm water conveyance and outfall structure be moved to within or immediately adjacent to aquatic or riparian habitat, additional protective measures may be required.

Based on the results of our CRLF evaluation, EcoSystems West concludes that CRLF are unlikely to enter the work area; however inadvertent take of this species is a violation of the federal Endangered Species Act. To ensure that no CRLF or other special-status amphibians and reptiles are displaced, harmed, or killed during construction:

***Cease all project activities if a sensitive resource is encountered in the work area. Contact an on-call qualified biologist to make an accurate identification of the animal. If a CRLF is observed within the survey area or project area, stop project activities and immediately notify USFWS for further guidance. No "take" of CRLF is permitted without formal consultation with the USFWS. If FYLF and/or WPT are observed in the survey or project area immediately notify CDFG for further guidance. Avoid handling or harassing any CRLF, FYLF, or WPT if encountered in or near the work area. Authorization from the resource agencies is required prior to handling these sensitive species.***

The CRLF breeds in still water such as ponds, or in creek environments with off-channel pools or backwater areas. Although most CRLF are thought to stay within approximately 300 feet of a suitable aquatic environment, dispersing frogs have been found at much greater distances (Bulger 2003; USFWS 2006, 2010f). Dispersing CRLFs are known to travel overland for distances of over two miles.

### Foothill Yellow-legged Frog

The foothill yellow-legged frog is considered by the state as a 'Species of Special Concern. Foothill yellow-legged frogs are known to occur in the upper Aptos Creek watershed, in Bridge and Valencia Creeks (Conrad and Dvorsky 2003; CDFG 2010c). Unidentified frogs have been observed as recently as 2009 in Aptos Creek along the segment of creek adjacent to the proposed location for the storm water flow spreader (C. Steiner, personal communication 2010). Potential habitat occurs along this segment of Aptos Creek. FYLF are not expected to occur within the Village Core project area as it does not provide suitable aquatic or upland habitat.

The foothill yellow-legged frog is typically found in partially-shaded streams with portions of rocky substrate and shallow pools. Foothill yellow-legged frogs tend to spend most of their time in or near streams and have an average home range of less than 35 feet (Morey, 2000). The nearest occurrence records of FYLF are from the upper Aptos Creek watershed, in Bridge Creek, and in the upper reaches of Valencia Creek (Conrad and Dvorsky 2003; CDFG 2010c).

### Western Pond Turtle

The WPT is considered by the state as a 'Species of Special Concern' (CDFG 2009). Potential aquatic and upland habitat occurs along the segment of Aptos Creek, down slope from the proposed location for the storm water conveyance outfall structure. The Village Core project area lacks suitable aquatic and upland habitat for WPT. The nearest record for WPT is approximately 5 miles northwest of the site within the Soquel Creek watershed. Focused surveys for WPT have not been conducted in the Aptos Creek watershed. No other museum or current records document WPT occurring in the Aptos Creek watershed, including Valencia Creek. WPT are not expected to utilize the Village Core project area because of the lack of aquatic and suitable upland habitat in the vicinity of the project area. The distance and extent of urban barriers and roadways between known localities and the project area further reduce the likelihood of occurrence in the Village Core area.

In riverine environments, the WPT is known to travel a few miles along riparian corridors and to choose an upland nest location as far as approximately 1300 feet above suitable aquatic habitat, but it generally uses an area within approximately 650 feet (Rathbun et al. 1992). Areas with vegetation cover, sun exposure to incubate eggs, and well-drained soils with some clay content provide suitable nest locations for the WPT (Rathbun et al. 1992).

## Raptors and Birds

The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Codes (CFGC) Section 3503.5 (CFCG 2006) prohibit the destruction or possession of individual birds, birds of prey, eggs or active nests without federal and/or State authorization.

Occurrence records document long-eared owls approximately 5 miles west of the project area at O'Neill Ranch Open Space Area in Soquel (Suddjian 2008), and Vaux's swifts formerly nesting in a chimney of a private residence at the corner of Valencia Street and Trout Gulch Road (Suddjian, personal observation 1999; Sterling and Paton 1996). The swifts have not utilized the chimney since the top was covered with a spark arrestor (Suddjian, personal communication 2008). Recent observations of merlins have been made in March 2010 in the community of Aptos, at the Rancho del Mar Shopping center and at New Brighton State Beach (eBird 2010). Observations of yellow warblers along the riparian forest neighboring Aptos Village Park have been made as recently as 2009 (eBird 2010). The nearest observation to the project area of willow flycatchers is at nearby New Brighton State Beach, where the species was observed as recently as 2009 (eBird 2010). The understory of the riparian forest along Aptos Creek provides potential nesting habitat for the yellow-breasted chat.

Many of the other special status raptors and other bird species listed in Table 1 are not expected to nest within the Village Core and storm water conveyance project areas because of lack of suitable nesting habitat and exposure to urban-related noise. At the time of our spring and summer season site visits, we did not observe any special-status birds or their active nests within the project area (Table 1). We observed one potential stick-nest structure that could be utilized by a raptor within the tree canopy of the project area, near the entrance to Nisene Marks State Park (Figure 2). Special-status raptors and/or passerine birds may utilize the trees in the project area for foraging and/or occur as seasonal migrants.

The tree stands above and surrounding the Village Core and storm water conveyance project areas provide potential habitat for more common species such as the red-shouldered hawk, red-tailed hawk, great horned owl, and many other passerine birds that are not considered special-status species. We heard an individual red-shouldered hawk calling within the vicinity of the project area. Within the Village Core area, we also observed two active Anna's hummingbird nests in two separate coast live oak trees and two California towhee nests: one within the understory of a large coast live oak tree and one among shrubs next to the southeast corner of the antique barn.

Wintering season for migrating raptors generally occurs between the fall and late winter (October to February). Nesting seasons for raptors takes place between February and August. The smaller passerine birds listed in Table 1, such as the willow flycatcher, yellow-breasted chat, and yellow warbler, utilize similar nesting habitats in riparian areas, primarily with a well-developed understory. Their nesting season generally occurs during the spring and summer with a peak between April and June. Common passerines, such as the Anna's humming bird, may begin breeding as early as January.

## Mammals

### BATS

Three of the five target bat species listed in Table 1 are considered 'Species of Special Concern' by the State (CDFG 2009) and all five are considered 'High Priority' by the Western Bat Working Group (WBWG 1998). The California Fish and Game Codes (CFGC) protect non-listed bat species and their roosting habitat, including individual roosts and maternity colonies. These include CFGC Section 86; 2000; 2014; 3007; 4150, along with several sections under Title 14 of California Code of Regulations (CFGC 2006).

Our preliminary assessment in 2008 was conducted when many of the target bat species (Table 1) would have had maternity colonies during the summer season. The project area is within the range of more common bat species found in California. These species include but are not limited to the big brown bat (*Eptesicus fuscus*), California myotis (*Myotis californicus*), and hoary bat (*Lasiurus cinerueus*). All of the bats in Table 1 and other more common bat species may forage in or migrate through the project area.

The structures and trees within the Village Core, bordering Aptos Creek Road and the driveway into Aptos Village Park, and riparian forest canopy near the storm water conveyance flow spreader near Aptos Creek provide potential roosting habitat for special status bat species (Table 1) and for more common species of bats.

During the interior inspection and acoustic and emergence survey of the apple barn in 2010, biologists observed three bats emerging from the northwest and southwest-facing sides of the exterior of the barn. One individual bat emerged from the exterior awning on the northwest side of the barn and two bats emerged from the apex of the southwest facing side of the center rooftop. This center rooftop was not safely accessible during our interior inspection.

A total of 15 call sequences were recorded over the duration of our acoustic monitoring of the apple barn. Different species of bats were recorded during the peak of emergence. Two common myotis species, the Yuma myotis (*Myotis yumanensis*) and California myotis (*Myotis californicus*) have indistinguishable echolocation calls and are lumped into a phonic group called 50 Kilohertz (KHz) Myotis. A low number of signals were detected from the 50 KHz Myotis phonic group around the time of emergence along the southern and eastern sides of the apple barn. In addition, a few signals within the 25KHz phonic group were detected during emergence and later, echolocating and feeding over the parking lot on the southeast side of the barn and over the open, graded area on the northwest side of the barn. These detections were most likely from the common Mexican free-tailed bat (*Tadarida braziliensis*). The Yuma myotis, California myotis, and Mexican free-tailed bats are protected under CFGC codes discussed above.

Specific habitat requirements for each of the five special status species of bats are briefly summarized in Table 1. The typical breeding season for bats occurs from May to September. Female bats congregate during the spring and summer to give birth and rear their young (maternity colonies), while males roost separately as individuals or in small bachelor groups. Juvenile bats begin flying by the fall season to forage and/or prepare for migration. In the fall some bat species move or migrate to other localities. Other species (e.g. the pallid bat) may occupy the same roost year round. Still other species form communal roosts of males and females and may form hibernacula for the winter season (Brown et al., 1996).

### San Francisco Dusky-footed Woodrat

The San Francisco dusky-footed woodrat is considered a state 'Species of Special Concern' (CDFG 2009). During our preliminary assessment of the immediate project area, we observed one active San Francisco dusky woodrat nest structure. The nest structure was observed within the understory of the coast live oak woodland in the area that is proposed for a future park (Figure 2). According to the project drawings, the stand of trees surrounding the woodrat nest will be retained. Potential habitat for the woodrat also occurs in the riparian forest and mixed evergreen woodland habitats near the proposed location for the new storm water conveyance and outfall structure.

The woodrat builds nests/houses from sticks, either on the ground or in trees; some up to heights of 3-5 feet on the ground, and up to approximately 30 feet above the ground in tree canopies. They also utilize slash piles of woody debris and abandoned buildings or structures in which to forage, seek refuge, or construct nest structures (Sakai and Noon 1993).

## Wildlife Dispersal Routes

The Aptos Village Plan area is located between Aptos Creek, Trout Gulch, and Valencia Creek, which are part of the larger Aptos Creek watershed within Santa Cruz County. During our initial site visit in 2008, and subsequent visit in 2010, EcoSystems West observed individual wildlife, and/or their trails, tracks, and scat including black-tailed deer (*Odocoileus hemionus*), raccoon (*Procyon lotor*), and brush rabbit (*Sylvilagus bachmani*) within open and vegetated areas of the project area and along Aptos Creek. Numerous migratory bird species were also observed nesting, foraging, and/or moving through the area. Minimal evidence of terrestrial wildlife movement was observed on the existing developed areas of the Village Core project area; however, raccoon tracks and Santa Cruz garter snakes (*Thamnophis atratus atratus*) were observed near the structures and debris piles in the Village Core area and two deer, raccoon, and skunk tracks were observed in the location of the proposed outflow structure adjacent to Aptos Creek.

The project area is situated such that the ruderal open space and vegetated areas provide a spatial link between three nearby branches of the Aptos Creek watershed. Our direct observations of resident wildlife further suggest that wildlife utilize the space for foraging. While the proposed project will restrict wildlife from using the open space of the project area for foraging or as an upland link between the nearby creeks, connectivity between wildlife habitats upstream will be maintained through the riparian corridors.

# IMPACTS AND MITIGATION MEASURES

## CRITERIA FOR DETERMINING SIGNIFICANCE

In accordance with CEQA, State CEQA Guidelines, agency and professional standards, a project impact would be considered significant if the project would:

- Have a substantial 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 CDFG or USFWS.
- Have a substantial adverse effect on any riparian habitat or other sensitive natural community identified in local or regional plans, policies, regulations, or by the California Department of Fish and Game or U.S. Fish and Wildlife Service.
- Have a substantial adverse effect on federally protected wetlands as defined by Section 404 of the CWA (including, but not limited to, marsh, vernal pool, coastal, etc.) through direct removal, filling, hydrological interruption, or other means.
- Interfere substantially with the movement of any native resident or migratory fish or wildlife species or with established native resident or migratory wildlife corridors, or impede the use of native wildlife nursery sites.
- Conflict with any local policies or ordinances protecting biological resources, such as a tree preservation policy or ordinance.
- Conflict with the provisions of an adopted Habitat Conservation Plan (HCP), NCCP, or other approved local, regional, or state HCP.

## BOTANY

### Purple Needlegrass-Wild Oat Grassland

A 0.25 acre patch of remnant purple needlegrass-wild oat grassland is located on a steep hillside immediately north of the proposed county park in the northwest corner of the project area. This habitat type is a CNDDB 'high priority' habitat. As presently designed, the proposed park boundaries lie down slope of the sensitive habitat, and therefore, construction of the park will not result in a direct impact. However, indirect impacts may result from proposed construction and subsequent use of the park.

**Impact BIO-B1** The proposed development may result in disturbance or loss of the sensitive habitat, purple needlegrass-wild oat grassland, through construction activities and land use changes. Construction and subsequent use of the proposed park may result in the introduction of non-native vegetation from ornamental plantings associated with the park, and trampling of the grassland during construction and/or by park users. These impacts are **potentially significant.**

Implementation of the following mitigation measures would reduce these potential impacts to a **less than significant level.**

**MM BIO-B1.1** Prior to initiating park construction and other project activities associated with development of the Aptos Village Core; protect the sensitive habitat by constructing a fence along the toe of the hill slope, separating the park and project area from the purple needlegrass-wild oat grassland. After construction, retain appropriate fencing to prevent trampling.

**MM BIO-B1.2** All ornamental plantings used for landscaping within the park and project area should be reviewed by a county approved botanist/landscape architect to ensure that plantings do not have the potential to escape into the adjacent sensitive habitat and establish as invasive weeds. Use native vegetation in landscaping wherever possible.

## Aptos Creek Red Alder Riparian Forest

Red alder riparian forest occurs along Aptos Creek adjacent to the area proposed for a storm water conveyance outfall structure. Red alder riparian forest is a CNDDB 'high priority' habitat and is recognized as a sensitive habitat by the County of Santa Cruz. County of Santa Cruz ordinances protect sensitive and riparian habitats; the proposed project may qualify for an exemption.

Proposed project plans for a storm water conveyance system include a conveyance pipe that terminates in a 40-foot long "flow spreader", and rock catchment outfall structure near the edge of the contiguous riparian vegetation associated with Aptos Creek.

As presently designed, storm water release will occur through a flow spreader which consists of as 40-foot-long perforated pipe in a shallow rock-lined trench situated along the slope of the third terrace above Aptos Creek. Water will exit through lateral perforations along the pipe and enter the rock lined trench and the outfall structure, a four-foot wide rock catchment, positioned just down slope of the flow spreader, to further dissipate energy prior to release. Storm water is anticipated to be conveyed to the flow spreader and outfall structure only for 5-year or greater storm events. At low flows the water will slowly percolate through the loamy soils of the upper slope and eventually into the sandy, alluvial soils above Aptos Creek. The majority of storm water is expected to enter the water table prior to entering the creek and is not expected to create an incised channel or compromise the embankments of Aptos Creek. At higher flows, storm water discharges may acquire enough head to result in minor surface erosion and minor indirect impacts to nearby riparian habitat.

The proposed location of the flow spreader and rock catchment is above the FEMA 100 year floodplain, on the westerly edge of the uppermost of three consecutive terraces above the creek bed, approximately 110 feet beyond the OHW. The flow spreader and rock catchment are proposed to be located adjacent to the contiguous riparian canopy, at the edge of the Aptos Village Park green. No trees are proposed for removal.

Shallow trenching and excavation will be required to install the perforated pipe, rock-lined trench, and rock catchment. Construction activities may result in compaction of the root zones or other disturbances to the vegetation.

CDFG will require a Section 1600 Streambed Alteration Agreement (SAA) for any project related activities determined to be within the bed and bank of a perennial stream. For the purposes of Section 1600 consultation, the lateral extent of a watercourse is defined by CDFG as the top of the bank represented by a physical break in slope or the outward extent of contiguous riparian canopy, whichever

is greater. Consultation with CDFG will determine if the project will require a SAA. The approved SAA may require minor modifications to project designs, and specific restoration and/or other project conditions.

The proposed project requires that work be conducted immediately adjacent to riparian vegetation. County of Santa Cruz ordinances protect sensitive and riparian habitats. Exceptions may be granted for drainage improvements; on this basis, the proposed project may qualify for an exemption. The County of Santa Cruz will require a final restoration plan prior to project approval. The plan will identify the Area of Impact and any potential temporary or permanent and direct or indirect impacts to riparian habitat. The plan will include assessment of the following potential impacts and incorporate the following mitigation measures:

**Impact BIO-B2.1** Although currently designed to avoid tree and vegetation removal, proposed construction of the storm water conveyance, flow spreader, and rock catchment outfall structure adjacent to Aptos Creek may result in temporary disturbance to adjacent riparian habitat (e.g. heavy equipment may compact the root zone or damage vegetation in order to access the site from below). Erosion associated with storm water discharges may result in indirect impacts to riparian habitat. These impacts are **potentially significant**.

Implementation of the following mitigation measures would reduce these potential impacts to a **less than significant level**.

**MM BIO-B2.1** Protect riparian vegetation during construction activities. Install protective fencing for the duration of construction. Stage equipment upslope and outside of the boundaries of the contiguous riparian canopy. If riparian vegetation is damaged or killed during construction of the flow spreader and outfall structure (temporary impact), replace riparian habitat at a ratio of 1:1 with native riparian vegetation. Replacement plantings should include "in-kind" riparian species similar in composition and abundance to those displaced by construction. In this area, plantings may include red alder, California blackberry, California coffeeberry black cottonwood, and Pacific willow.

**MM BIO-B2.2** Incorporate into outfall structure designs measures to prevent erosion from storm water discharges. Measures should include at a minimum, use a rock size and cover that will discharge storm water as sheet flow down slope and prevent head cut and rill erosion. Design slope stabilization measures below the outfall structure to physically prevent slope failure from saturation of the slope substrate. Include revegetation of any bare areas with shrubs and vines.

## WILDLIFE

### Fish

Federally listed fish species (tidewater goby, coho salmon, and steelhead) are known to occur in Aptos and/or Valencia Creeks. Aptos Creek is within the Greater Bay Area Recovery Unit for the tidewater goby (USFWS 2005a). Both Aptos and Valencia Creeks are federally designated as Evolutionary Significant Units for Central California Coast steelhead (NOAA 2005 and 2006). Through recovery efforts, coho are known to occur in Aptos Creek and may occur in Valencia Creek.

Proposed project plans for a storm water conveyance system include development of a new conveyance pipe and outfall structure into Aptos Creek as well as directed conveyance of runoff from the proposed project area into an existing storm water conveyance system which outfalls into Valencia Creek. The proposed storm water conveyance system has been designed to minimize high energy flows, sedimentation, and contaminants entering Aptos and Valencia Creeks. To remove contaminants and sediment, runoff will be pretreated in bioretention swales, rain gardens, and/or control structures with oil/sediment separators. Water that does not infiltrate in the bioretention swales and rain gardens will flow into the retention/detention systems where it will be retained within a large cistern for landscape irrigation or detained within unlined basins for slow percolation into the soil. Only 5-year or greater storm events are anticipated to convey runoff into the storm drain system to the outfall structures.

The proposed storm water conveyance systems include many of the recommended BMPs to conserve habitat for federally-listed fish species, by reducing discharge volumes, sediment load, and pollutants, as outlined by the agencies and in associated publications (USFWS 2005; EPA 1993; NOAA Fisheries 2003; and Spence, B.C. et. al. 1996); however, the agencies (NOAA fisheries and USFWS) may require specific standards for storm water and sediment discharges into federally-listed fish habitat in Aptos and Valencia Creeks. USFWS and NOAA will review project construction plans and documents to ensure that storm water conveyance system designs, including control structures for retaining contaminants, conform to all water quality standards for Essential Fish Habitat and Critical Habitat.

**Impact BIO-W1** Proposed construction of storm water conveyance, including a new outfall structure into Aptos Creek, will result in new storm water discharges into Aptos Creek and a new drainage line into existing discharge facilities into Valencia Creek. Federally listed tidewater goby, coho salmon, and steelhead are known to occur in the creeks. Potential discharge of storm water, sediments, and contaminants into the creeks may be considered a **potentially significant** impact.

Implementation of the following mitigation measures would reduce these potential impacts to a **less than significant level**.

**MM BIO-W1.1** Storm water conveyance systems, including control structures for retaining contaminants, will be designed to withstand extreme storm events and will conform to all water quality standards for Essential Fish Habitat and Critical Habitat.

**MM BIO-W1.2** Landscaping of the Village Core project area will be "xeriscaped" (planted with native and drought- and pest-resistant plants) for decreased irrigation and to avoid use of pesticides, herbicides, and chemical fertilizers for landscape maintenance activities. Application of organic fertilizers will be minimized through soil preparation.

## Raptors and Bird Species

Anna's hummingbirds and California towhees are known to breed within the Core project area. The federal Migratory Bird Treaty Act (MBTA) and California Fish and Game Codes (CFGC) prohibit the destruction or possession of individual birds, birds of prey, eggs or active nests without federal and/or State authorization. The special-status species yellow warbler has been observed within the riparian forest near the proposed location for the storm water conveyance outfall structure adjacent to Aptos Creek. Other special-status birds, including willow flycatcher and yellow-breasted chat, may utilize the riparian forest habitat for nesting and/or occur as seasonal migrants.

Birds may seasonally occupy nest structures within the project area prior to or during project activities. Project activities (e.g., tree removal, construction noise, and building demolition) may disrupt avian species that nest within the project area. In response to disturbances, nesting birds may abandon their clutch or sensitive young may prematurely fledge, causing unsuccessful development of offspring or mortality.

**Impact BIO-W2** The project area provides potential nesting habitat for common raptor species and special-status passerine bird species including the willow flycatcher, yellow-breasted chat and yellow warbler. Common passerine bird species are known to nest within the project area. Project activities may disrupt raptor and/or bird species that utilize habitats within the project area. This is considered a **potentially significant impact.**

Implementation of the following mitigation measures would reduce this impact to a **less than significant level.**

**MM BIO-W2.1** Prior to initiating any project activities, each person working on the project will attend an environmental training program led by a qualified biologist. This program will emphasize incorporating best management practices and protective measures in order to prevent harm to any potential biological resources (including amphibians and reptiles, raptors and birds, and/or mammals) that may be encountered in the project area. The training will include procedures for inspecting the Core and storm water conveyance outfall structure sites, to determine that no special-status animals are trapped or harmed during construction activities. The environmental training is an opportunity to convey resource agency requirements that workers should be aware of while working on the site. A sign-in roster will demonstrate workers' attendance to the environmental training.

**MM BIO-W2.2** Future development within project area shall retain mature trees to the extent possible and replace removed trees with in-kind species and vegetation structure in the landscaping where possible.

**MM BIO-W2.3** The avian breeding season occurs from February 1 through August 31 with a peak in breeding/nesting activity between April and June for most raptors and/or other birds (Ralph et al., 1978). If feasible, schedule vegetation and tree removal activities and initiate project activities between September and October, in order to avoid impacts to breeding birds and to bats (see **Impact BIO-W3**).

Should project activities be initiated between September and February, no avian breeding surveys would be required. If project activities are to be initiated during breeding season, prior to construction, a qualified wildlife biologist shall conduct avian breeding surveys for all birds (and their nests) protected under the MBTA. The survey area will encompass the project area and a 250-foot-wide buffer (where accessible) to examine tree stands and structures. Surveys should be conducted within 30 days, but not less than 15 days, prior to beginning project activities including, but not limited to, staging equipment, structure demolition, repositioning of the apple barn, vegetation clearing, and/or ground disturbing activities. In the event nesting bird species are observed, postpone project activities until a qualified biologist has determined young birds have fledged or:

- For raptors, install a 250-foot buffer between project activities and the active nest site and have a qualified biologist monitor the nest site.
- For nesting passerine birds, install a 50-foot buffer/exclusion zone between project activities and the active nest and have a qualified biologist monitor the nest.

If postponing project activities and/or installing buffers are not feasible, further discussions with the appropriate resource agencies (USFWS and/or CDFG) will be necessary to develop alternative requirements.

## Bats

Potential special-status bats are CDFG 'Species of Special Concern' and/or designated 'High Priority' by WBWG and qualify for protection under CEQA. In addition, California Fish and Game Codes protect non-listed bat species and their roosting habitat.

Bats were acoustically detected utilizing the exterior awning and attic of the apple barn within the Village Core project area. Trees with bat roost features (small crevices or cavities, peeling bark, and areas with dense foliage) as well as other structures/buildings provide potential roosting habitat for special-status bat species.

Relocation and/or removal of bat roost features, and/or loud construction activities may disrupt active bat roosts if conducted during the breeding season (April through August) or during the fall/winter migration/hibernating season (November through March) and may result in a loss of roost habitat. An MOU with CDFG is required to handle or remove roosting bats and/or to install exclusion devices.

**Impact BIO-W3** Redevelopment and construction activities within both the Village Core and storm water conveyance pipe and outfall structure project areas could result in the direct loss of active roosts and/or disturbance to roosting bats. This would be considered a potentially significant impact.

Implementation of the following mitigation measures would reduce this impact to a **less than significant level**.

**BMP BIO-W3.1** See **MM BIO-W2.1**.

**MM BIO-W3.2** The bat breeding season occurs April through August and winter hibernacula are formed November through March. If feasible, relocate the apple barn, demolish existing structures, remove trees from the project area, and/or conduct loud construction activities (e.g. grading, excavation, and/or trenching) during September through October (outside of bat breeding and winter hibernacula seasons).

Prior to initiating these activities, a qualified wildlife biologist will conduct preconstruction surveys of the known bat roost in the apple barn and of potential bat roosts in other buildings and large trees. Preconstruction surveys will take place for one day and two evenings to assess the site for year-round bat presence. The daytime survey will include the evaluation of trees and buildings for bat roost features (tree cavities, senescent limbs, peeling bark) and/or evidence of bats (guano). The nighttime surveys will consist of acoustic and emergence monitoring.

If no bats are detected, crevices may be sealed to prevent re-entry of bats. In the unlikely event that year-round roosting bats are detected, the contractor will obtain an MOU with CDFG in order to have a qualified biologist install exclusion devices. If these actions do not result in exclusion, a qualified biologist in possession of an applicable CDFG MOU will remove and relocate the roosting bats to an appropriate alternate habitat (a roost with comparable spatial and thermal characteristics) (H.T. Harvey and Associates 2004).

A qualified wildlife biologist shall be present to monitor for bats during apple barn relocation, building demolition, and tree removal.

If scheduling work during September and October is not feasible, a qualified biologist shall conduct a bat survey. Surveys shall be conducted over four separate nights. If maternity or hibernacula roosting bats are detected, establish a minimum 100-foot buffer and avoid disturbances until a qualified biologist determines that bats are no longer roosting. If it is not feasible to halt activities within the buffer, then under the supervision of a biological monitor, permit the encroachment into the 100 foot buffer. If the monitor observes bats leaving the roost site during construction activities, then all work near the roost site will be halted and the appropriate buffer reinstated. All work involving direct removal or relocation of occupied roosts will take place after a qualified biologist has determined that bats are no longer occupying maternity roosts or winter hibernacula.

## San Francisco Dusky-Footed Woodrat

The San Francisco dusky-footed woodrat is a CDFG Species of Special Concern. A San Francisco dusky-footed woodrat nest structure is located in a small stand of coast live oak trees in the area planned for a future park. Additional potential habitat occurs among the tree stands and understory scattered in the Core project area, as well as in the riparian forest and mixed evergreen woodland habitats near the proposed location for the new storm water conveyance and outfall structure.

The vegetation where the nest structure is located is not currently proposed for removal; however; because of its proximity to the proposed park, the woodrat habitat and population may be disturbed by construction activities or park users. In addition, San Francisco dusky-footed woodrats may occupy potential habitat within the project area in the interim between the 2008 surveys and project initiation. Vegetation/tree removal, clearing activities, demolition of existing man-made structures, and initial ground disturbing activities may destroy potential refuge sites, nest structures, and foraging habitat, and entrap or kill woodrats.

**Impact BIO-W4** Project activities may result in destruction of potential woodrat nesting habitat and harm to individuals. This is considered a potentially significant impact.

Implementation of the following mitigation measures would reduce this impact to a **less than significant level**.

**BMP BIO-W4.1** See **MM BIO-W2.1**.

**MM BIO-W4.2** Prior to construction, a qualified biologist shall examine the Core and outfall structure project areas for San Francisco dusky footed woodrats, nest structures, (and other potential special-status species). For the outfall structure project site, surveys shall include surveying the creek channel for a minimum of 300 feet up and downstream of the proposed location of the outflow structure and along the banks and project footprint. Surveys can be done simultaneously for woodrats and other potential special-status species.

**MM BIO-W4.3** A qualified biological monitor will examine the Core project site before and during any initial vegetation, woody debris, and/or tree removal, or other initial ground disturbing activities. If a woodrat nest structure is encountered in the area of disturbance, avoid disturbing the structure or evicting the individuals. Install exclusion zones with a minimum 25 foot buffer around the nest structures under the guidance of a qualified biologist. Buffers will include understory plants. No work shall occur within these exclusion zones. To prevent wildlife entanglement, prohibit the use of snow fencing as exclusion zone material.

**MM BIO-W4.4** Prior to initiating storm water conveyance construction activities above Aptos Creek, with a qualified biological monitor present, install a wildlife barrier to enclose the work area. The barrier shall be a minimum of 36 inches tall and will extend from the bank of Aptos Creek, parallel to and on both sides of the proposed route for the storm water conveyance pipe, up to the open manicured field of Aptos Village Park. The barrier can serve the dual functions of preventing wildlife from entering the work area and preventing excavated spoils from leaving the work area and entering the creek.

**MM BIO-W4.5** A qualified biological monitor will be present during initial vegetation clearing, grading and trenching for installation of the flow-spreader and outfall structure to ensure that no special-status wildlife species enter the work area. After this time, the qualified biologist will designate and train a 'construction monitor' to inspect on-site compliance with all avoidance/impact minimization measures.

The designated construction monitor will inspect the wildlife barrier daily for the duration of the storm water conveyance installation.

The construction monitor will have the authority to halt work that may result in impacts or 'take' to special-status species encountered in the work area. The construction monitor will immediately notify the qualified biologist if a special-status species is encountered. The construction monitor shall record the results of their inspections on a daily log that will be submitted to the biological monitor. The daily logs will be available for agency review.

The qualified biological monitor will remain "on-call". To ensure a timely response, provide a weekly project activity schedule for all "on call" project activities to the qualified biologist. The construction monitor will immediately notify the qualified biologist if a special-status species is encountered.

**MM BIO-W4.6** In order to prevent wildlife entrapment during construction of the outfall facility, backfill open segments of trench at the end of each day. If backfilling the trench at the end of each day is not feasible, provide temporary escape ramps a minimum of 15 feet apart. Escape ramps may be made from filled sandbags, sloping boards, temporary backfill, or other materials to avoid entrapment. If segments of trench are covered, ensure the edges of cover boards and/or steel plates are sealed. Prior to backfilling any segment of trench, have a construction monitor examine the open trench to ensure no wildlife is entrapped. If wildlife becomes entrapped, do not touch or handle the animal. Immediately notify the qualified biological monitor.

**MM BIO-W4.7** If a woodrat is incidentally encountered in the work area and does not voluntarily move out of the area, a qualified biologist, with the appropriate CDFG permits, shall be on call during project activities to temporarily move the animal out of the construction area to the nearest safe location (as approved and authorized by CDFG). Woodrats shall not be handled without prior agency authorization from CDFG.

## GENERAL BMPS

EcoSystems West recommends the following BMPs to further reduce potential impacts to natural resources associated with the Aptos Village Core Redevelopment project.

**BMP BIO-G1.1** Minimize removal or disturbance of existing vegetation outside of the footprint of project construction activities. To the maximum extent feasible, confine project activities and operation of equipment and vehicles, including site access and parking, to designated staging areas. (See also Santa Cruz County Code Title 16, Chapter 16.22.080, Land Clearing Approval.)

**BMP BIO-G1.2** To avoid introducing or spreading invasive exotic plant species, prior to staging equipment on site, clean all equipment caked with mud, soils, or debris from offsite sources or previous project sites. When practicable, remove invasive exotic plants from the project area. All equipment used on the premises should be cleaned prior to leaving the site for future projects.

**BMP BIO-G1.3** Check under all equipment for wildlife before use. If any special-status wildlife is observed under equipment or within the work area, do not disturb or handle it. As previously recommended, cease project activities and contact the resource agencies for further guidance if the animal continues to be encountered in the project area.

**BMP BIO-G1.4** If security fencing is installed around the construction site, allow for passage of wildlife to maintain a link between Valencia and Aptos Creek during construction activities. Prohibit the use of snow fencing to prevent wildlife entrapment.

**BMP BIO-G1.5** Avoid working at night or during rain events when special status amphibians and mammals are generally more active. Consult weather forecasts from the National Weather Service at least 72 hours prior to performing work.

**BMP BIO-G1.6** All food trash that may attract predators into the work area should be properly contained and removed from the work site on a daily basis. Construction debris and trash should also be properly contained and removed from the work site on a regular basis.

**BMP BIO-G1.7** Refuel and perform all vehicle and/or equipment maintenance offsite in a legal manor. All workers should be informed of the importance of preventing spills and of the appropriate measures to take should a spill occur. Follow all state and federal laws pertaining to hazardous material handling and management.

**BMP BIO-G1.8** Position all stationary equipment such as motors, pumps, generators, and/or compressors over drip pans. At the end of each day, move vehicles and equipment as far away as possible from any water body adjacent to the site in a level staging area. Position parked equipment also over drip pans or absorbent material.

**BMP BIO-G1.9** To the greatest extent possible, stabilize all exposed or disturbed areas within the project area. We recommend installing erosion control measures such as silt fences, jute matting, weed-free straw bales, plywood, straw wattles, and water check bars, and broadcasting weed-free straw wherever silt-laden water has the potential to leave the work site and enter the nearby creeks. Prohibit the use of monofilament erosion control matting to prevent wildlife entanglement. Modify, repair, and/or replace erosion control measures as needed. (See also Santa Cruz County Code Title 16, Chapter 16.22 Erosion Control.)

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# APPENDIX A. REGULATORY BACKGROUND

# REGULATORY BACKGROUND

Local, state, and federal regulations have been enacted to provide for the protection and management of sensitive biological and water resources. Those pertinent to the proposed project are summarized below.

## FEDERAL REGULATIONS

### Federal Endangered Species Act

Federal Endangered Species Act (FESA) of 1973 (Title 16 United States Code, Section 1531 *et seq.*, as amended) provisions protect federally listed threatened and endangered species and their habitats from unlawful take[1] (http://endangered.fws.gov/ESA.html). Activities that may result in "take" of individuals are regulated by the United States Fish and Wildlife Service (USFWS). Listed species are taxa for which proposed and final rules have been published in Federal Register (USFWS 2008a, b, c, d). Candidate species are not afforded any legal protection under FESA but typically receive special attention from federal and state agencies during the environmental review process.

The ESA or its implementing regulations do not prohibit take of listed plant species. However, federal agencies cannot undertake activities that would jeopardize the continued existence of a threatened or endangered plant. In addition, the removal of threatened or endangered plants may be a violation of the Act under certain circumstances, if the action is not in compliance with state law.

Designated "Critical Habitat" for plants or animals, determined and published in the Federal Register as a formal rule, receives protection under section 7 of the ESA, through the prohibition of destruction or adverse modification of critical habitat by actions carried out, funded, or authorized by a Federal Agency. Consultation under section 7 does not apply to activities on private or other non-federal lands that do not involve a Federal nexus.

Exemptions to "take" prohibitions may be obtained through coordination with the USFWS in two ways: 1) through interagency consultation for projects with federal involvement (i.e., funded, authorized, or carried out by a Federal agency) pursuant to section 7; or 2) through the issuance of an incidental take permit under section 10(a)(1)(B) of the ESA.

### Migratory Bird Treaty Act

All migratory birds and their nests are federally protected under the Migratory Bird Treaty Act of 1918 (MBTA) (Title 16 United States Code, Section 703-712 as amended; 50 Code of Federal Regulations Section 21; and 50 Code of Federal Regulations Section 13) and by CDFG codes that support the act. The MBTA makes it unlawful to "take" any migratory bird or raptor listed in the 50 Code of Federal Regulations Section 10, including their nests, eggs or products.

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[1] Section 3(18) of the ESA defines "take" to mean to harass, harm, pursue, hunt, shoot, wound, kill, trap, capture, or collect, or to attempt to engage in any such conduct. Service regulations (50 CFR 17.3) define "harm" to include significant habitat modification or degradation which actually kills or injures wildlife by significantly impairing essential behavioral patterns, including breeding, spawning, rearing, migrating, feeding, or sheltering. Harassment" is defined by the Service as an intentional or negligent action that creates the likelihood of injury to listed species by annoying it to such an extent as to significantly disrupt normal behavioral patterns which include, but are not limited to, breeding, feeding, or sheltering.

## Birds of Conservation Concern

USFWS' *Birds of Conservation Concern* (BCC) (2008) was developed to fulfill the mandate of the 1988 amendment to the Fish and Wildlife Conservation Act (Public Law 100-653 (102 Stat. 3825) to "identify species, subspecies, and populations of all migratory nongame birds that, without additional conservation actions, are likely to become candidates for listing under the Endangered Species Act (ESA) of 1973" and to stimulate coordinated and proactive conservation actions among federal and state agencies and private entities (U.S. Fish and Wildlife Service, December 2008). The bird species included on the BCC lists include "nongame birds, game birds without hunting seasons, and Endangered Species Act candidate, proposed endangered or threatened, and recently delisted species" that USFWS considers to be of concern in the United States because of (1) documented or apparent population declines, (2) small or restricted populations, (3) dependence on restricted or vulnerable habitats. Species on this list fall under the authority of Executive Order 13186, "Responsibilities of Federal Agencies to Protect Migratory Birds" (Federal Register, vol. No, 11, January 17, 2001).

## Bald Eagle Protection Act

The Bald Eagle Protection Act of 1940 (16 U.S.C. 668-668d, 54 Stat. 250) as amended, provides for the protection of the bald eagle and the golden eagle by prohibiting, except under certain specified conditions, the taking, possession and commerce of such birds, their eggs, and their nests. In addition to immediate impacts, this definition also covers impacts that result from human-induced alterations initiated around a previously used nest site during a time when eagles are not present, if, upon the eagle's return, such alterations agitate or bother an eagle to a degree that interferes with or interrupts normal breeding, feeding, or sheltering habits, and causes injury, death or nest abandonment.

## Wetlands and Waters of the U.S.

Wetlands are defined as, "those areas that are inundated or saturated by surface or ground water at a frequency and duration sufficient to support, and that under normal circumstances do support, a prevalence of vegetation typically adapted for life in saturated soil conditions. Wetlands generally include swamps, marshes, bogs, and similar areas" (EPA, 40 CFR 230.3, and CE 33 CFR 328.3). The three criteria used to delineate wetlands are the presence of: (1) hydrophytic vegetation, (2) wetland hydrology, and (3) hydric soils. According to the ACOE Manual, evidence of at least one positive wetland indicator from each parameter must be found in order to make a positive determination.

Areas that are inundated for sufficient duration and depth to exclude growth of hydrophytic vegetation, such as lakes and ponds, or convey water, such as streams, are considered "other waters". Along the Central California coast, these "other waters" can include intermittent and ephemeral streams as well as lakes and rivers. "Other waters' are identified by the presence of an ordinary high water (OHW) mark[2], a defined river or stream bed, a bank, or by the absence of emergent vegetation in ponds or lakes.

Wetlands and "other waters" of the U.S. (i.e. that meet specific criteria as defined in the Code of Federal Regulations) are regulated by the US Army Corps of Engineers (Corps) under Section 404 of the Clean Water Act. The Corps is responsible for regulating the discharge of "fill material" into waters of the United States. In general, a permit must be obtained before fill can be placed in wetlands or other waters of the

[2] An OHW mark is defined as the natural line on the shore established by fluctuations of water.

U.S. The type of permit depends on the amount of acreage and the purpose of the proposed fill, subject to discretion of the Corps.

Section 401 of the Clean Water Act (CWA) assigns overall responsibility for water rights and water quality protection to the State Water Resource Control Board (SWRCB) and directs the nine statewide Regional Water Quality Control Boards (RWQCBs) to develop and enforce water quality standards within their boundaries. A 401 Certification is required from the RWQCB for impacts to Jurisdictional Waters of the U.S.

### EXECUTIVE ORDER 11990

Executive Order 11990 (42 FR 26961, 3 CFR, 1977 Comp., p. 121) mandates that federal or federally assisted projects and programs minimize the destruction, loss or degradation of wetlands and avoid new construction in wetlands, taking into account public health and safety, maintenance of natural systems, and other public interests.

## STATE REGULATIONS

### California Environmental Quality Act

The California Environmental Quality Act (CEQA) requires that California's state and local agencies prepare multidisciplinary environmental impact analyses and make decisions based on those studies' findings regarding the environmental effects of the proposed Project. The main objectives of CEQA are to disclose to decision makers and the public the significant environmental effects of proposed activities and to require agencies to avoid or reduce environmental effects by implementing feasible alternatives or mitigation measures.

Based on provisions of Section 15380 of the *CEQA Guidelines*, plants and animals with the following protected status must be addressed in CEQA documents on proposed development projects: federally listed Endangered or Threatened species under the FESA, federal Proposed and Candidate species, and species listed by the state of California as Endangered, Threatened, or Rare under the CESA or NPPA.

In addition, under Section 15380(d) of the *CEQA Guidelines*, a species not included on any list recognized by the State "shall nevertheless be considered rare or endangered if the species can be shown to meet the criteria" for listing. The CDFG, USFWS and U.S. Forest Service all maintain independent lists of species with designated conservation status that meet the *CEQA Guidelines* criterion for consideration. Based on provisions of Section 15380(d) of the *CEQA Guidelines*, the lead agency and the CDFG, in making a determination of impact significance, must treat non-listed plant and animal species as equivalent to listed species if the non-listed species satisfy the minimum biological criteria for listing. In assigning "impact significance" to populations of non-listed species, analysts generally consider factors such as population-level effects, proportion of the taxon's range affected by a project, regional effects, and impacts to habitat features.

### California Endangered Species Act

The 1984 California Endangered Species Act (CESA) (Fish & Game Code, Section 2050-2098) prohibits the "take" of State-listed threatened and endangered species. The CDFG maintains lists of Endangered, Threatened and Rare plant and animal species (CDFG, 20010a, b), as designated by the California Fish and Game Commission or under the California Native Plant Protection Act (NPPA), and the Habitat

Conservation Planning Branch of the CDFG administers the State's rare species program. In addition to recognizing three levels of endangerment, the CDFG can afford interim protection to candidate species while the Fish and Game Commission is reviewing them. Habitat degradation or modification is not expressly included in the definition of "take" under the California Fish and Game Code; however, the CDFG has interpreted "take" to include the "killing of a member of a species which is the proximate result of habitat modification..."

## California Native Plant Protection Act

Project permitting and approval requires compliance with the 1977 NPPA (Fish & Game Code, Section 2050-2098). Along with the CESA, the act authorizes the California Fish and Game Commission to designate Endangered, Threatened, and Rare plant species and to regulate the taking of these species. In addition to the Endangered and Threatened categories established by CESA, the NPPA establishes a "Rare" category for plant species only.

## California Native Plant Society Inventory

The California Native Plant Society (CNPS) prepares and regularly updates an *Inventory of Rare and Endangered Vascular Plants of California*. In general, the CDFG qualifies, for legal protection under CEQA, those plant species on List 1A (Plants Presumed Extinct in California), List 1B (Plants Rare, Threatened, or Endangered in California and Elsewhere) or List 2 (Plants Rare, Threatened, or Endangered in California, But More Common Elsewhere) of the CNPS *Inventory* (Tibor, 2001; CNPS 2010). Species on CNPS List 3 (Plants About Which We Need More Information--A Review List) or List 4 (Plants of Limited Distribution--A Watch List) are considered to be of lower sensitivity, and generally do not fall under specific state or federal regulatory authority. Specific mitigation considerations are not generally required for species in these two categories.

## CDFG Species of Special Concern

In addition to lists of designated Endangered, Threatened, and Rare plant and animal species, the CDFG maintains a list of animal "Species of Special Concern," (CDFG 2009) most of which are species whose breeding populations in California may face extirpation.[3] Although these species have no legal status under the CESA, the CDFG recommends considering these species during analysis of proposed project impacts to protect declining populations, and to avoid the need to list them as threatened or endangered in the future. These species may "be considered rare or endangered [under CEQA] if the species can be shown to meet the criteria".

## California Fish and Game Codes and Regulations (CFGC)

California Fish and Game Code (3503) protects the active nests and eggs of birds from take, possession, or needless destruction, and (3503.5) prohibits the take, possession or destruction of birds of prey (Orders Falcinoformes and Strigiformes) and their eggs and nests, while California Fish and Game Codes [Section 86; 2000; 2014; 3007; 4150, along with several sections under Title 14 of California Code of Regulations (CFGC 2006)] protect non-listed bat species and their roosting habitat, including individual roosts and maternity colonies.

[3] "Extirpate" = to destroy completely; to pull up by the root; exterminate (Merriam-Webster).

## Fully Protected Species

The California Fish and Game Code contains lists of vertebrate species designated as "Fully Protected" (California Fish & Game Code 3511 [birds], 4700 [mammals], 5050 [reptiles and amphibians], and 5515 [fish]. This classification was the State's initial effort in the 1960's to identify and provide additional protection to those animals that were rare or faced possible extinction. Fully Protected species may not be taken or possessed at any time and no licenses or permits may be issued for their take except for relocation of bird species for the protection of livestock or collecting those species necessary for scientific research. These species are considered under CEQA.

## Western Bat Working Group Lists

The CDFG maintains a list of bat species designated as "High Priority" by the Western Bat Working Group (WBWG). Species designated as "High Priority" are defined as "imperiled or are at high risk of imperilment based on available information on distribution, status, ecology and known threats (CDFG 2009). These species qualify for legal protection under Section 15380(d) of the *CEQA Guidelines*.

## CDFG Sensitive Habitats

Sensitive habitats include: riparian corridors, wetlands, habitats for legally protected species and CDFG Species of Special Concern, areas of high biological diversity, areas providing important wildlife habitat, and unusual or regionally restricted habitat types. The California Natural Diversity Data Base (CNDDB) of the CDFG maintains a working list of "high priority" habitats for inventory (i.e., those habitats that are rare or endangered within the borders of California) (CDFG 2003). CNDDB "high priority" habitats are generally considered sensitive habitats under CEQA.

## Wetlands and Waters of the State

Under California State law, "waters of the state" pertains to "any surface water or groundwater, including saline waters, within the boundaries of the state." As a result, water quality laws and permitting authority apply to both surface and groundwater.

In the absence of a federal nexus, the Porter-Cologne Water Quality Act (2002) assign overall responsibility for water rights and water quality protection to the State Water Resource Control Board (SWRCB) and directs the nine statewide Regional Water Quality Control Boards (RWQCBs) to develop and enforce water quality standards within their boundaries.

Following the 2001 U.S. Supreme Court decision in Solid Waste Agency of Northern Cook County v. Army Corps of Engineers (SWANCC) the SWRCB released a legal memorandum confirming the State's jurisdiction over isolated wetlands. The memorandum stated that under the California Porter-Cologne Water Quality Control Act, discharges to wetlands and other "waters of the state" are subject to State regulation, including wetlands isolated from navigable waters or their tributaries.

In general, the RWQCB regulates discharge into isolated waters in much the same way as they do for Federal jurisdictional waters, using Porter-Cologne rather than Section 404 authority (SWRCB 2001). In the absence of a federal permit requirement, impacts to waters of the state, including wetlands, requires a Waste Discharge Requirement (WDR) authorization from the RWQCB (SWRCB 2004).

In the recent Supreme Court decision for *Rapanos v. United States* (547 U.S. 715 (2006)), the Court recommended further restrictions on federal jurisdiction and required that a "significant nexus" test be applied to those wetlands and "other waters" which are not navigable waters. A memorandum issued in June 2007 provides guidance to the ACOE and EPA for implementing the Supreme Court's significant nexus test. Wetlands and others waters lacking a significant nexus to navigable waters of the U.S. may still be regulated by state RWQCBs.

### CDFG Lake and Streambed Alteration and Wetland Resources Policy

Jurisdictional authority of the CDFG over relatively permanent bodies of standing or flowing water is established under Sections 1600-1616 of the Fish and Game Code, which pertains to activities that would disrupt the natural flow or alter the channel, bed, or bank of any lake, river, or stream. The Fish and Game Code stipulates that it is unlawful to substantially divert or obstruct the natural flow or substantially change the bed, channel, or bank of any lake, river, or stream without notifying CDFG, incorporating necessary mitigation, and obtaining a Streambed Alteration Agreement. The lateral extent of a watercourse is defined by CDFG as the top of the bank represented by a physical break in slope or the outward extent of contiguous riparian canopy, whichever is greater.

The Wetlands Resources Policy of the CDFG states that the Fish and Game Commission will strongly discourage development in or conversion of wetlands, unless, at a minimum, project mitigation assures that there will be no net loss of either wetland habitat values or acreage. The CDFG is also responsible for commenting on projects requiring ACOE permits under the Fish and Wildlife Coordination Act of 1958.

## Local Regulations

### Riparian Habitats

The County of Santa Cruz riparian ordinance limits development activities in riparian areas and provides buffer/setback requirements based on slope and vegetation composition. Development includes, but is not limited to, the placement or erection of any solid material or structure. Specifically, the ordinance states that a buffer "shall always extend fifty (50) feet beyond the edge of riparian woodland for perennial streams and twenty (20) feet beyond the edge of other woody vegetation as determined by the dripline" (County of Santa Cruz 1994). Once the appropriate buffer has been determined, an additional 10 foot setback is required for any structures. Exemptions are made for continuance of a pre-existing use, pest control and eradication, maintenance of existing levees, drainage and erosion control, and/or habitat restoration pursuant to a county approved project. Where an exemption is not applicable, the Santa Cruz County Planning Commission may authorize a riparian setback exception on a case by case basis. Exceptions are granted pending an approved application stating the applicant's proposed activities, best management practices, and measures for mitigating impacts to the riparian corridor.

The Santa Cruz County Code defines riparian vegetation/woodland as:

> *"...those plant species that typically occur in wet areas along streams or marshes. A (riparian) woodland is a plant community that includes these woody plant species that typically occur in wet areas along streams or marshes."*
>
> (Santa Cruz County Code 16.30.030)

A universally accepted definition of riparian habitat is not currently available; however, the USFWS National Wetland Inventory defines riparian areas as:

*"Riparian areas are plant communities contiguous to and affected by surface and subsurface hydrologic features of perennial or intermittent lotic and lentic water bodies (rivers, streams, lakes, or drainage ways). Riparian areas have one or both of the following characteristics: 1) distinctively different vegetative species than adjacent areas, and 2) species similar to adjacent areas but exhibiting more vigorous or robust growth forms. Riparian areas are usually transitional between wetland and upland."*

(USFWS 1997)

## Sensitive Habitats

The County of Santa Cruz sensitive habitats ordinance is intended to minimize the disturbance of biotic communities which are rare or especially valuable because of their special nature or role in an ecosystem, and which could be easily disturbed or degraded by human activity; to protect and preserve these biotic resources for their genetic, scientific, and educational values; and to implement policies of the General Plan and the Local Coastal Program Land Use Plan. Sensitive habitats are broadly defined as areas of special biological significance as identified by the State Water Resources Control Board; areas which provide habitat for locally unique biotic species/communities; areas adjacent to essential habitats of rare, endangered or threatened species; areas which provide habitat for species of special concern as listed by the California Department of Fish and Game in the Special Animals list, Natural Diversity Database (CNDDB); and areas defined as Environmentally Sensitive Habitat Types (ESHAs) in the Local Coastal Program Land Use Plan.

Development is prohibited in sensitive habitats prior to completion of a detailed biotic assessment. A biotic report discussing sensitive biotic resources and habitats shall be prepared by a county approved biologist detailing the proposed project and any potential impacts to sensitive habitat areas. If sensitive habitats cannot be avoided by the project, development shall mitigate significant environmental impacts, as determined by the Environmental Coordinator. Additionally, dedication of an open space or conservation easement or an equivalent measure may be required as necessary to protect the portion of a sensitive habitat which is undisturbed by the proposed development activity or to protect a sensitive habitat on an adjacent parcel. Restoration of any area which is a degraded sensitive habitat or has caused or is causing the degradation of a sensitive habitat shall be required, provided that any restoration required shall be commensurate with the scale of the proposed development. Lastly, all development activities in or adjacent to a sensitive habitat area shall conform to the following types of permitted uses, and the following conditions for specific habitats shall become minimum permit conditions unless the approving body pursuant to Chapter 18.10 finds that the development will not affect the habitat based on a recommendation of the Environmental Coordinator following a biotic review pursuant to Section 16.32.070.

Exceptions are made for projects necessary for the restoration of a sensitive habitat or projects deemed necessary to protect public health or welfare. Exemptions to this ordinance apply to existing commercial agricultural operations or any development activity which as received riparian exception approval provided the Planning Director determines that such development activity has received a review, in connection with the granting of the riparian exception, equivalent to the review that would be required by this chapter.

# APPENDIX B.

# SPECIAL-STATUS PLANTS WITH POTENTIAL TO OCCUR IN THE VICINITY OF THE APTOS VILLAGE CORE REDEVELOPMENT PROJECT AREA

**Appendix B. Status, distribution and habitat of special-status plants with potential to occur in the vicinity of the proposed Aptos Village Core Redevelopment Project Area in Aptos, Santa Cruz County, California.**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Amsinckia lunaris* bent-flowered fiddleneck | None | None | List 1B.2 | Cismontane woodland, valley and foothill grassland, coastal bluff scrub | ALA, CCA, COL, LAK, MRN, NAP, SBT, SCL, SCR, SHA?, SIS?, SMT, SON, YOL | March-June | **NONE.** Poor quality grassland habitat within the project area. Nearest known occurrence in Scotts Valley. Not observed during June site visit. |
| *Arabis blepharophylla* bent-flowered fiddleneck | None | None | List 4.3 | Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest; damp rock and soil on outcrops, usually on road cuts | CCA, MRN, SCR, SFO, SMT, SON | February-May | **NONE.** Suitable habitat not present within the project site. |
| *Arctostaphylos andersonii* Santa Cruz manzanita | None | None | List 1B.2 | Chaparral; openings in and edges of broadleaved upland forest and north coast coniferous forest | SCL, SCR, SMT | November-April | **NONE.** Broadleaved forest habitat suitable to support manzanita not present within the project area. |
| *Arctostaphylos pajaroensis* Pajaro manzanita | None | None | List 1B.1 | Sandy soil, chaparral | MNT, SBT, SCR* | December-March | **NONE.** Suitable habitat not present within the project area. |
| *Arctostaphylos silvicola* Bonny Doon manzanita | None | None | List 1B.2 | Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest | SCR | February-March | **NONE.** Suitable habitat not present within the project area. |

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Arenaria paludicola* marsh sandwort | Endangered | Endangered | List 1B.1 | Freshwater marshes | LAX*, SBD*, SCR*, SFO*, SLO, Washington* | May-August | **NONE.** Suitable habitat not present within the project area. |

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Calandrinia breweri* Brewer's calandrinia | None | None | List 4.2 | Chaparral, coastal scrub; sandy or loamy, disturbed sites and burns | CCA, LAX, MEN, MNT, MPA, MRN, NAP, SBA, SBD, SCL, SCR, SCZ, SDG, SLO, SMT, SON, VEN, BA | March-June | **NONE.** Suitable habitat not present within the project area. |
| *Callitropsis abramsiana* Santa Cruz Cypress | Endangered | Endangered | List 1B.2 | Closed cone conlferous forest, chaparral, lower montane coniferous forest; sandstone or granitic substrates | SCR, SMT | N/A | **NONE.** Suitable habitat not present within the project area. |
| *Calochortus umbellatus* Oakland mariposa lily | None | None | List 4.2 | Broadleaved upland forest, chaparral, cismontane woodland, lower montane coniferous forest, valley and foothill grassland; often serpentinite. | ALA, CCA, MRN, SCL, SCR*, SMT | March-May | **NONE.** Presumed extirpated from Santa Cruz County. Almost always associated with serpentinite. |
| *Calyptridium parryi* var. *hesseae* Santa Cruz Mtns. pussypaws | None | None | List 3 | Chaparral, cismontane woodland | MNT, SBT, SCL, SCR* | May-July | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Campanula californica* swamp harebell | None | None | List 1B.2 | Moist places; bogs and fens, closed-cone coniferous forest, coastal prairie, meadows, freshwater marshes and swamps, north coast coniferous forest | MEN, MRN, SCR*, SON | June-October | **NONE.** Perennial flowing waterways not typical mesic habitat for this species. Other suitable wetland types not present within project area. |
| *Carex comosa* bristly sedge | None | None | List 2.1 | Marshes and swamps, lake margins, coastal prairie, valley and foothill grassland | CCA, LAK, MEN, SAC, SBD*, SCR*, SFO*, SHA, SJQ, SON, Idaho, Oregon, Washington, other states | May-September | **NONE.** Perennial wetland types associated with this species not present within the project area. Presumed extirpated from Santa Cruz County. |
| *Carex saliniformis* deceiving sedge | None | None | List 1B.2 | Coastal prairie, coastal scrub, meadows, coastal salt marshes | HUM, MEN, SCR*, SON | June-July | **NONE.** Perennial saline wetland habitat not present within the project area. |
| *Castilleja latifolia* Monterey paintbrush | None | None | List 4.3 | Closed cone coniferous forest, cismontane woodland (openings), coastal dunes, coastal scrub; sandy soils | MNT, SCR | February-September | **NONE.** Suitable habitat not present within the project area. |
| *Ceanothus cuneatus* var. *rigidus* Monterey ceanothus | None | None | List 4.2 | Closed cone coniferous forest, chaparral, coastal scrub; sandy soils | MNT, SLO, SCR* | April-June | **NONE.** Suitable habitat not present within the project area. |
| *Ceanothus ferrisiae* Coyote ceanothus | Endangered | None | List 1B.1 | Chaparral, coastal scrub, valley and foothill grassland; serpentinite | SCL | January-March | **NONE.** Serpentinite soils not present within project area. Not known from Santa Cruz County. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Centromadia parryi* ssp. *congdonii* Congdon's tarplant | None | None | List 1B.2 | Valley and foothill grassland; alkaline soils | ALA*, CCA*, MNT, SCL(*?), SCR*, SLO, SOL* | May-November | **NONE.** Alkaline soils not present within the project area. |
| *Chorizanthe pungens* var. *hartwegiana* Ben Lomond spineflower | Endangered | None | List 1B.1 | Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest | SCR | April-July | **NONE.** Suitable habitat not present within the project area. |
| *Chorizanthe pungens* var. *pungens* Monterey spineflower | Threatened | None | List 1B.2 | Maritime chaparral, cismontane woodland coastal dunes, coastal scrub, valley and foothill grassland; sandy soils | MNT, SCR | April-June | **NONE.** Disturbed grassland with sandy loam soils not likely to provide suitable habitat for this species. Not observed during June area visit. |
| *Chorizanthe robusta* var. *hartwegii* Scotts Valley spineflower | Endangered | None | List 1B.1 | Meadows, grasslands in sandy or mudstone soil | SCR | April-July | **NONE.** Suitable sandstone or mudstone habitat not present within the project area. |
| *Chorizanthe robusta* var. *robusta* robust spineflower | Endangered | None | List 1B.1 | Coastal dunes, coastal scrub, openings in cismontane woodland, in sandy or gravelly soil | ALA*, MNT, MRN, SCL*, SCR, SFO, SMT* | April-September | **NONE.** Suitable habitat not present within the project area. |
| *Clarkia concinna* ssp. *automixa* Santa Clara red ribbons | None | None | List 4.3 | Cismontane woodland | ALA, SCL | April-July | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Cordylanthus rigidus* ssp. *littoralis* seaside bird's beak | None | Endangered | List 1B.1 | Closed cone coniferous forest, maritime chaparral, cismontane woodland, coastal dunes, coastal scrub; sandy, often disturbed sites | MNT, SBA | May-September | **NONE.** Suitable habitat not present within the project area. |
| *Cypripedium fasciculatum* clustered lady's slippers | None | None | List 4.2 | Lower montane coniferous forest, North Coast coniferous forest; usually serpentinite seeps and streambanks | BUT, DNT, HUM, NEV, PLU, SCL, SCR*, SHA, SIE, SIS, SMT, TEH, TRI, YUB, ID, OR, UT, WA+ | March-July | **NONE.** Suitable habitat not present within the project area. |
| *Cypripedium montanum* mountain lady's slipper | None | None | List 4.2 | Broadleaved upland forest, cismontane woodland, lower montane coniferous forest, North Coast coniferous forest | DNT, HUM, MAD, MEN, MOD, MPA, PLU, SIE, SIS, SMT, SON, TEH, TRI, TUO, OR, WA++ | March-July | **NONE.** Low quality broadleaved upland forest within the project area does not provide suitable mesic habitat for this species. |
| *Elymus californicus* California bottle-brush grass | None | None | List 4.3 | Broadleaved upland forest, cismontane woodland, North Coast coniferous forest, riparian woodland | MNT, MRN, SCR, SMT, SON | July-September | **NONE.** Very limited potential for occurrence within low quality broadleaved upland forest habitat within the project area. Not observed during June area visit. |
| *Eriogonum nudum* var. *decurrens* Ben Lomond buckwheat | None | None | List 1B.1 | Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest | ALA, SCL, SCR | June-October | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Erysimum ammophilum* sand-loving wallflower | None | None | List 1B.2 | Chaparral, coastal dunes, coastal scrub; sandy openings | SCR | March-July | **NONE.** Suitable habitat not present within the project area. |
| *Erysimum fransicanum* San Franciso wallflower | None | None | List 4.2 | Chaparral, coastal dunes, coastal scrub, valley and foothill grassland; often serpentinite or granitic substrates, roadcuts | MRN, SCL, SCR, SFO, SMT, SON | March-June | **NONE.** Granitic or serpentine soils not present within the project area. Nearest known occurrence north of Santa Cruz. |
| *Erysimum teretifolium* Santa Cruz wallflower | Endangered | Endangered | List 1B.1 | Inland marine sands in chaparral, closed-cone coniferous forest, sand parkland, sandhill ponderosa pine forest | SCR | March-July | **NONE.** Suitable habitat not present within the project area. |
| *Fritillaria agrestis* stinkbells | None | None | List 4.2 | Chaparral, cismontane woodland, pinyon and juniper woodland, valley and foothill grassland; clay or serpentinite. | ALA, CCA, FRE, KRN, MEN, MNT, MPA, PLA, SAC, SBT, SCR*, SMT*, STA, TUO, VEN, YUB | March-April | **NONE.** Poor quality grassland habitat within the project area does not contain clayey or serpentine soils. |
| *Gilia tenuiflora* ssp. *arenaria* sand gilia | Endangered | Threatened | List 1B.2 | Chaparral, cismontane woodland, coastal dunes, coastal scrub, valley and foothill grassland; sandy openings | MNT | April-June | **NONE.** Not known from Santa Cruz County, sandy openings not present within the project area. |
| *Grindelia hirsutula* var. *maritima* San Francisco gumplant | None | None | List 1B.2 | Coastal bluff scrub, coastal scrub, valley and foothill grassland; sandy or serpentinite soils | MNT, MRN, SCR, SFO, SLO, SMT | June-September | **NONE.** Not known from Santa Cruz County, sandy openings not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Hoita strobilina* Loma Prieta hoita | None | None | List 1B.1 | Moist sites in chaparral, cismontane woodland, riparian woodland, often serpentinite soil | ALA*, CCA*, SCL, SCR | May-July (August-October) | **NONE.** Suitable habitat not present within the project area. |
| *Holocarpha macradenia* Santa Cruz tarplant | Threatened | Endangered | List 1B.1 | Coastal prairie, valley and foothill grassland, coastal scrub, often in clay or sandy soils | ALA*, CCA*, MNT, MRN*, SCR, SON* | June-October | **NONE.** Suitable low quality grassland habitat with Watsonville sandy loam soils present within the project area. Nearby extant occurrences located within several miles of the project area. Not observed during June site visit. |
| *Horkelia cuneata* ssp. *sericea* Kellogg's horkelia | None | None | List 1B.1 | Openings in closed-cone coniferous forest, maritime chaparral, coastal scrub, coastal prairie, in sandy or gravelly soil | ALA*, MRN*, MNT, SBA, SCR, SFO*, SLO, SMT | April-September | **NONE.** Suitable habitat not present within the project area. |
| *Horkelia marinensis* Point Reyes horkelia | None | None | List 1B.2 | Coastal dunes, coastal prairie, coastal scrub, in sandy soil | MEN, MRN, SCR, SMT, SON | May-September | **NONE.** Suitable habitat not present within the project area. |
| *Leptosiphon ambiguous* serpentine leptosiphon | None | None | List 4.2 | Cismontane woodland, coastal scrub, valley and foothill grassland; serpentinite | ALA, CCA, MER, SBT, SCL, SCR, SJQ, SMT, STA | March-June | **NONE.** Serpentinite not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Leptosiphon grandiflorus* large-flowered leptosiphon | None | None | List 4.2 | Coastal bluff scrub, closed cone coniferous forest, cismontane woodland, coastal dunes, coastal prairie, coastal scrub, valley and foothill grassland; usually sandy | ALA, KRN, MAD, MER, MNT, MRN, SBA*, SCL, SCR*, SFO, SLO, SMT, SON | April-August | **NONE.** Low quality grassland habitat exists within the project area; however, no recent extant occurrences known from Santa Cruz County. Not observed during June site visit. |
| *Lessingia micradenia* var. *glabrata* smooth lessingia | None | None | List 1B.2 | Chaparral, cismontane woodland, valley and foothill grassland, roadsides, usually in serpentine soils | SCL | July-November | **NONE.** Not known from Santa Cruz County. Serpentine soils not present within the project area. |
| *Lilium rubescens* redwood lily | None | None | List 4.2 | Broadleaved upland forest, lower montane coniferous forest, North Coast coniferous forest, upper montane coniferous forest; sometimes serpentinite and/or roadsides | DNT, HUM, LAK, MEN, NAP, SCR*, SHA, SIS | June-July | **NONE.** Suitable habitat not present within the project area. |
| *Lomatium parvifolium* small-leaved lomatium | None | None | List 4.2 | Closed cone coniferous forest, chaparral, coastal scrub, riparian woodland; serpentinite soils | MNT, SCR, SLO | February-June | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Lotus formosissimus* harlequin lotus | None | None | List 4.2 | Moist to wet places, broadleaved upland forest, coastal scrub, coastal bluff scrub, closed-cone coniferous forest, cismontane woodland, coastal prairie, meadows and seeps, marshes, north coast coniferous forest, valley and foothill grassland | DNT, HUM, MEN, MNT, MRN, SBT, SCR, SFO, SLO, SMT, SON, Oregon, Washington | March-July | **NONE.** Low quality grassland and broadleaved upland forest present within the project. Seasonal wetland depression not likely to support this species. No documented occurrences in nearby vicinity of the project area. Not observed during June site visit. |
| *Malacothamnus arcuatus* arcuate bush mallow | None | None | List 1B.2 | Chaparral, cismontane woodland | SCL, SCR, SMT | April-September | **NONE.** Suitable habitat not present within the project area. |
| *Micropus amphibolus* Mt. Diablo cottonweed | None | None | List 3.2 | Rocky areas in broadleaved upland forest, chaparral, cismontane woodland, valley and foothill grassland, coastal scrub | ALA, CCA, COL, LAK, MNT, MRN, NAP, SBA, SCL, SCR, SJQ, SLO, SOL, SON | March-May | **NONE.** Rocky areas not present in broadleaved upland forest and grassland habitat located within the project area. |
| *Microseris paludosa* marsh microseris | None | None | List 1B.2 | Moist places in closed-cone coniferous forest, cismontane woodland, coastal scrub, valley and foothill grassland | MEN, MNT, MRN, SBT, SCR, SFO*, SLO, SMT*, SON | April-June | **NONE.** Mesic, marshy habitat required for this species not present within the project area. |
| *Mimulus rattanii ssp. decurtatus* Santa Cruz County monkeyflower | None | None | List 4.2 | Chaparral, lower montane coniferous forest/margins; gravelly substrates | SCR | May-July | **NONE.** Suitable habitat not present within the project area. |

Appendix B. (continued)

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Monardella undulata* curly leaved monardella | None | None | List 4.2 | Closed cone coniferous forest, chaparral, coastal dunes, coastal prairie, coastal scrub, lower montane coniferous forest (pine sandhills); sandy areas | MNT,MRN, SBA, SCR,SFO,SLO, SMT, SON | May-July | **NONE.** Sandhill habitat or true sand soils not present within the project area. |
| *Monardella villosa* var. *globosa* robust monardella | None | None | List 1B.2 | Broadleaved upland forest, chaparral, cismontane woodland, coastal scrub, valley and foothill grassland | ALA, CCA, HUM, LAK, MRN, NAP, SMT, SON | June-August | **NONE.** Low quality broadleaved upland forest and grassland habitat has limited potential to support this species. Nearest known occurrence on eastern slope of Santa Cruz mountains. Not observed during June site visit. |
| *Pedicularis dudleyi* Dudley's lousewort | None | Rare | List 1B.2 | Maritime chaparral, north coast coniferous forest, cismontane woodland, valley and foothill grassland | MNT, SCR*, SLO, SMT | April-June | **NONE.** Last known record for Santa Cruz County dates to 1884 collection. Extant occurrences in adjacent counties occur primarily in mixed evergreen forest habitat. |
| *Penstemon rattanii* var. *kleei* Santa Cruz Mtns. Beardtongue | None | None | List 1B.2 | Chaparral, lower montane coniferous forest, North Coast coniferous forest, often in sandy soil | SCL, SCR | May-June | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Pentachaeta bellidiflora* white-rayed pentachaeta | Endangered | Endangered | List 1B.1 | Valley and foothill grassland, coastal scrub, coastal prairie | MNT, MRN*, SCR*, SMT | March-May | **NONE.** Nearest possibly extant occurrence north of Santa Cruz near Eagle Rock. Presumed extirpated in Santa Cruz County. |
| *Perideridia gairdneri* ssp. *gairdneri* Gairdner's yampah | None | None | List 4.2 | Moist sites in coastal prairie, broadleaved upland forest, chaparral, valley and foothill grassland, vernal pools | CCA, DNT, KRN, LAX*, MEN, MNT, MRN, NAP, ORA*, SBT, SCL, SCR, SDG*, SLO, SMT(*?), SOL, SON | June-October | **NONE.** Moist areas in broadleaved upland forest or grassland habitat not present within the project area. Low quality seasonal wetland depression in project dominated entirely by non-native weedy species. |
| *Pinus radiata* Monterey pine | None | None | List 1B.1 | Closed cone coniferous forest, cismontane woodland | MNT, SCR, SLO, SMT, BA, GU | N/A | **NONE.** Suitable habitat not present within the project area. Monterey pine only considered native to three areas in California: Cambria, Monterey Peninsula, and Swanton/Ano Nuevo. |
| *Piperia candida* white-flowered rein orchid | None | None | List 1B.2 | Lower montane coniferous forest, North Coast coniferous forest; sometimes serpentinite | DNT, HUM, MEN, SCR, SIS, SMT, SON, TRI, OR, WA+ | May-August | **NONE.** Suitable habitat not present within the project area. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Piperia michaelii* Michael's rein orchid | None | None | List 4.2 | Coastal bluff scrub, closed cone coniferous forest, chaparral, cismontane woodland, coastal scrub, lower montane coniferous forest | ALA, CCA, HUM, MNT, MRN, SBT, SCR, SCZ, SFO, SLO, SMT | May-August | **NONE.** Suitable habitat not present within the project area. |
| *Plagiobothrys chorisianus var. chorisianus* Choris' popcorn-flower | None | None | List 1B.2 | Moist places in chaparral, coastal prairie, coastal scrub | ALA(*?), SCR, SFO, SMT | March-June | **NONE.** Suitable habitat not present within the project area. |
| *Plagiobothrys chorisianus* var. *hickmanii* Hickman's popcorn-flower | None | None | List 4.2 | Moist places in closed-cone coniferous forest, chaparral, coastal scrub, marshes and swamps, vernal pools | MNT, SBT, SCL, SCR, SLO, SMT? | April-June | **NONE.** Suitable habitat not present within the project area. |
| *Plagiobothrys diffusus* San Francisco popcornflower | None | Endangered | List 1B.1 | Coastal prairie, valley and foothill grassland | ALA, SCR, SFO*, SMT | March-June | **NONE.** This species occurs almost exclusively in coastal prairie or seasonally wet areas. The low quality seasonal wetland within the project area is not expected to support this species. Not observed during June site visit. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Polygonum hickmanii* Scotts Valley polygonum | Endangered | Endangered | List 1B.1 | Valley and foothill grassland; sandstone | SCR | May-August | **NONE.** This sandstone specific species is known only from two small populations in Scotts Valley. |
| *Ranunculus lobbii* Lobb's aquatic buttercup | None | None | List 4.2 | Cismontane woodland, North Coast coniferous forest, valley and foothill grassland, vernal pools; mesic areas | ALA, CCA, MEN, MRN, NAP, SCL, SOL, SON | March-April | **NONE.** Not known from Santa Cruz County. Small seasonal wetland depression within project area supports mix of ruderal weedy species. |
| *Rosa pinetorum* pine rose | None | None | List 1B.2 | Closed cone coniferous forest | MNT, SCR | May-July | **NONE.** Suitable habitat not present within the project area. |
| *Sanicula hoffmannii* Hoffmann's sanicle | None | None | List 4.3 | Broadleaved upland forest, mixed evergreen forest, chaparral, coastal scrub; serpentinite or clay | MNT, SBA, SCR, SCZ, SLO, SMT, SRO | March-May | **NONE.** Low quality broadleaved upland forest within the project area is not expected to support this species. |
| *Sidalcea malachroides* maple-leaved checkerbloom | None | None | List 4.2 | Broadleaved upland forest, coastal prairie, coastal scrub, valley and foothill grassland; sandy areas | HUM, MEN, MNT, SCL, SCR, OR | May-August | **NONE.** Typically found in mesic forest habitats. Limited potential for occurrence in understory of low quality broadleaved upland forest within the project area. Not observed during June site visit. |

**Appendix B. (continued)**

| Species Common Name[1] | USFWS Listing[2] | State Status[3] | CNPS Status[4] | Habitat Type[5] | Distribution by County[6] | Flowering Period[7] | Potential for Occurrence |
|---|---|---|---|---|---|---|---|
| *Silene verecunda* ssp. *verecunda* San Francisco campion | None | None | List 1B.2 | Coastal bluff scrub, chaparral, coastal prairie, coastal scrub, valley and foothill grassland, in sandy or rocky soil | SCR, SFO, SMT, SUT | March-August | **NONE.** Known mainly from rocky areas and rock outcrops. Nearest documented occurrence north of Santa Cruz in Swanton. Not observed during June site visit. |
| *Trifolium buckwestiorum* Santa Cruz clover | None | None | List 1B.1 | Coastal prairie; margins of broadleaved upland forest, cismontane woodland | MEN, MNT, SCL, SCR, SMT, SON | April-October | **NONE.** Known primarily from mesic meadows, suitable habitat not present within the project area. |
| *Tifolium depauperatum* var. *hydrophyllum* saline clover | None | None | List 1B.2 | Marshes and swamps, mesic valley and foothill grassland, vernal pools; alkaline soils | ALA, COL(?), MNT, NAP, SBT, SCL, SCR, SLO, SMT, SOL, SON | April-June | **NONE.** Mesic habitat with alkaline soils not present within the project area. |
| *Zigadenus micranthus* var. *fontanus* marsh zigadenus | None | None | List 4.2 | Chaparral, cismontane woodland, lower montane coniferous forest, meadows and seeps, marshes and swamps, | LAK, MEN. MNT, MRN, NAP, SBT, SCR, SLO, SMT, SON | April-July | **NONE.** Suitable habitat not present within the project area. |

## Appendix B. (continued)

Appendix B. Notes:
[1]Nomenclature follows Hickman (1993); Tibor (2001); California Native Plant Society (2010).
[2]U.S. Fish and Wildlife Service (2010a, b, c).
[3]Section 1904, California Fish and Game Code (California Department of Fish and Game 2010a).
[4]Tibor (2001); California Native Plant Society (2010).
CNPS Lists: List 1A: Presumed extinct in California. List 1B: Rare, Threatened, or Endangered in California and elsewhere. List 2: Rare, Threatened, or Endangered in California, more common elsewhere. List 3: Plants about which more information is needed. List 4: Plants of limited distribution: a watch list.
Threat Code extensions: .1: Seriously endangered in California. .2: Fairly endangered in California. .3 Not very endangered in California.
[5]Thomas (1960); Munz and Keck (1973); Hickman (1993); Tibor (2001); California Native Plant Society (2010); and unpublished information.
[6]Tibor (2001); California Native Plant Society (2010); and unpublished information; counties abbreviated by a three-letter code (below); occurrence in other states as indicated.
[7]Munz and Keck (1973); Tibor (2001); California Native Plant Society (2010)

ALA: Alameda
AMA: Amador
BUT: Butte
CCA: Contra Costa
COL: Colusa
DNT: Del Norte
FRE: Fresno
GLE: Glenn
HUM: Humboldt
KRN: Kern
LAK: Lake
LAX: Los Angeles
MAD: Madera
MEN: Mendocino
MER: Merced
MNT: Monterey
MOD: Modoc
MPA: Mariposa
MRN: Marin
NAP: Napa
NEV: Nevada
ORA: Orange
PLA: Placer
PLU: Plumas
RIV: Riverside
SAC: Sacramento
SBA: Santa Barbara
SBD: San Bernardino
SBT: San Benito
SCL: Santa Clara
SCR: Santa Cruz
SCZ: Santa Cruz Island (SBA Co.)
SDG: San Diego
SFO: San Francisco
SHA: Shasta
SIE: Sierra
SIS: Siskiyou
SJQ: San Joaquin
SLO: San Luis Obispo
SMT: San Mateo
SOL: Solano
SON: Sonoma
SRO: Santa Rosa Island (SBA Co.)
STA: Stanislaus
SUT: Sutter
TEH: Tehama
TRI: Trinity
TUL: Tulare
TUO: Tuolumne
VEN: Ventura
YOL: Yolo
YUB: Yuba

* Presumed extinct in these counties or states.

# APPENDIX C.

# LIST OF VASCULAR PLANT SPECIES OBSERVED DURING ASSESSMENT OF THE APTOS VILLAGE CORE REDEVOPELOPMENT PROJECT AREA

| Appendix C. List of Vascular Plant Species Observed During Aptos Village Core Biotic Assessment | |
|---|---|
| **Scientific Name** | **Common Name** |
| **Acacia dealbata* | silver wattle |
| *Acer macrophyllum* | big leaf maple |
| *Acer negundo* | box elder |
| **Ageratina adenophora* | snakeweed |
| *Alnus rubra* | red alder |
| *Artemisia drancunculus* | wild tarragon |
| **Anagallis arvensis* | scarlet pimpernel |
| **Avena barbata* | slender wild oat |
| **Avena fatua* | wild oat |
| *Baccharis pilularis* | coyote bush |
| **Brassica nigra* | black mustard |
| **Briza maxima* | rattlesnake grass |
| *Bromus carinatus* | California brome |
| **Bromus diandrus* | ripgut grass |
| **Bromus hordeaceus* | soft chess |
| **Carduus pycnocephalus* | Italian thistle |
| **Chamomilla suaveolens* | pineapple weed |
| **Cirsium vulgare* | bull thistle |
| **Conium maculatum* | poison hemlock |
| **Convolvulus arvensis* | bindweed |
| **Cortaderia selloana* | pampas grass |
| **Cotoneaster pannosa* | silverleaf cotoneaster |
| **Cynodon dactylon* | Bermuda grass |
| **Delairea odorata* | cape ivy |

| Appendix C. List of Vascular Plant Species Observed During Aptos Village Core Biotic Assessment | |
|---|---|
| **Scientific Name** | **Common Name** |
| *Equisetum arvense* | common horsetail |
| **Erodium botrys* | common filaree |
| *Eschscholzia californica* | California poppy |
| **Eucalyptus globulus* | blue gum eucalyptus |
| *Galium aparine* | common bedstraw |
| **Genista monsplessulana* | French broom |
| **Geranium dissectum* | cutleaf geranium |
| **Gnaphalium luteo-album* | everlasting cudweed |
| **Hedera helix* | English ivy |
| **Hordeum marinum* ssp. *gussoneanum* | Mediterranean barley |
| **Hordeum murinum* ssp. *leporinum* | foxtail barley |
| **Hypochaeris radicata* | rough cat's ear |
| **Juglans californica* var. *hindsii.* | black walnut |
| *Juncus patens* | spreading rush |
| **Lactuca serriola* | prickly lettuce |
| **Lathyrus latifolius* | perennial sweet pea |
| *Lithocarpus densiflorus* | tanoak |
| **Lolium multiflorum* | annual ryegrass |
| *Lupinus bicolor* | miniature lupine |
| **Malva nicaeensis* | bull mallow |
| **Medicago polymorpha* | burclover |
| **Melilotus indica* | yellow sweetclover |
| *Mimulus aurantiacus* | sticky monkeyflower |
| *Nassella pulchra* | purple needlegrass |

| Appendix C. List of Vascular Plant Species Observed During Aptos Village Core Biotic Assessment | |
|---|---|
| **Scientific Name** | **Common Name** |
| *Oxalis albicans* ssp. *pilosa* | radishroot woodsorrel |
| **Papaver somniferum* | opium poppy |
| *Petasites frigidus* var. *palmatus* | coltsfoot |
| **Phalaris aquatica* | Harding grass |
| **Picris echioides* | prickly ox-tongue |
| **Plantago lanceolata* | English plantain |
| **Polygonum arenastrum* | common knotweed |
| **Polypogon monspeliensis* | rabbit-foot grass |
| *Populus balsamifera* ssp. *trichocarpa* | black cottonwood |
| *Quercus agrifolia* | Coast live oak |
| **Raphanus sativus* | wild radish |
| *Rhamnus californica* | California coffeeberry |
| *Ribes divaricatum* ssp. *pubiflorum* | spreading gooseberry |
| *Rosa californica* | California wild rose |
| **Rubus discolor* | Himalayan blackberry |
| *Rubus ursinus* | California blackberry |
| **Rumex acetosella* | sheep sorrel |
| **Rumex crispus* | curly dock |
| **Rumex pulcher* | fiddle dock |
| *Salix laevigata* | red willow |
| *Salix lucida* ssp. *lasiandra* | Pacific willow |
| *Sambucus nigra* | black elderberry |
| *Sequoia sempervirens* | Coast redwood |
| *Smilacena racemosa* | false Solomon's seal |

| Appendix C. List of Vascular Plant Species Observed During Aptos Village Core Biotic Assessment | |
|---|---|
| **Scientific Name** | **Common Name** |
| **Sonchus asper* | prickly sow thistle |
| **Sonchus oleraceus* | common sow thistle |
| **Spergularia rubra* | sand spurry |
| **Spirea sp.* | spirea |
| **Taraxacum officinale* | common dandelion |
| *Toxicodendron diversilobum* | poíson oak |
| **Tragopogon porrifolius* | purple salsify |
| **Trifolium hirtum* | rose clover |
| **Trifolium angustifolium* | crimson clover |
| *Urtica dioica* | stinging nettle |
| **Vicia sativa* | common vetch |
| **Vinca major* | periwinkle |
| **Vulpia bromoides* | six-weeks fescue |

* non-native plant species

# Attachment 3

# COUNTY OF SANTA CRUZ

HISTORIC RESOURCES COMMISSION
PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

July 27, 2011

**AGENDA: August 5, 2011**

## HISTORIC RESOURCE PRESERVATION PLAN REVIEW: APPLE BARN AND BAYVIEW HOTEL (WITHIN APTOS VILLAGE)

**Applicant:** .....Barry Swenson Builder
**Owner:** .....Various
**Application No.:** .....101027
**APN:** .....041-011-33 (Apple Barn, current location), 041-011-20 and 041-011-33 (Apple Barn, proposed location), 041-011-34 (Bayview Hotel)
**Situs:** .....417 Trout Gulch Road (Apple Barn); 8041 Soquel Drive (Bayview Hotel)
**Location:** .....Area north of Soquel Drive in Aptos, between Trout Gulch Rd. on the east and Aptos Creek Road on the west.
**Historic Name:** ..... Apple Barn; Bayview Hotel
**Current Name:**..... Village Fair Antiques; Bayview Hotel
**Rating:** ..... NR-3 (Apple Barn), and NR-1 (Bayview Hotel)

### Existing Site Conditions

Parcel Size: .....Approximately 7.45 acres, combined
Use:.....Antique sales (Apple Barn); Hotel (Bayview)

### Planning Policies

Planning Area: .....Aptos
Zone District: .....041-011-33: RM-2-L, C-2-L;
041-011-20: C-2, PR, RM-3;
041-011-34: C-2-L, C-2
General Plan Land Use Designation:.....041-011-33: Urban High Residential, Community Commercial
041-011-20: Urban Medium Residential, Community Commercial; Existing Parks and Recreation;
041-011-34: Community Commercial;
Coastal Zone: .....No

**PROJECT DESCRIPTION**

Application for an Historic Resource Preservation Plan, submitted as part of the development application for Aptos Village, to relocate and rehabilitate the historic "Apple Barn" (Hihn Apple Packing Sheds) (rated NR-3), to allow for a contemporary use while preserving the essential features and the historic integrity of the building, and to preserve the setting for the historic Bayview Hotel (NR-1) listed on the National Register, in accordance with the Aptos Village Plan, Santa Cruz County Historic Preservation Ordinance, and the Secretary of the Interior Standards for Rehabilitation. No changes are proposed to the Bayview Hotel Building. The plan proposes to rehabilitate and preserve the Apple Barn, currently being used for antique sales, to accommodate the new proposed use as a grocery store, and relocate the structure approximately 50 feet to the west to a new location on the same site, and rotate the building 90 degrees at the new location. The plan would preserve significant historic features and materials of the exterior of the Apple Barn, including the overall form with 3 distinct bays, peaked gable roofs with ridge pop-up venting, vertical wood siding, sliding wood doors and hardware, door and window openings, and a portion of the loading dock. Non-historic changes and additions to the building exterior would be removed, including exterior latticework and a shed addition. Proposed changes to the exterior to accommodate the proposed use include attaching the Apple Barn to a new building via a small link building to provide additional floor area, adding contemporary doors and windows within existing door openings, and raising the height of the building at the west end to accommodate the change in grade from a sloping site at the existing location to a level site at the proposed location. At the interior, significant historic features would be preserved, including the timber post, girder and truss roof system, the interior open spaces, and portions of the wood plank flooring and single-wall construction. Interior changes to accommodate the proposed grocery store use would include replacement of the existing foundation system with a concrete foundation, lowering the raised floor to ground level thereby increasing the overall height of the building interior, and adding plywood walls and new flooring to a portion of the interior.

The setting of the Historic Bayview Hotel would be protected, by preserving much of the existing open space around the hotel. The new building proposed to the west of the hotel on an adjacent parcel (044-011-24) would be lower in height than the Bayview Hotel, and would maintain the same setback from the Hotel and from Soquel Drive as the current building to preserve the prominence of the hotel within Aptos Village and when viewed from Soquel Drive.

**Introduction**

Barry Swenson Builder submitted a development application for Aptos Village, to be consistent with the Aptos Village Specific Plan approved by the Santa Cruz County Board of Supervisors in February 2010. Due to the presence of historic structures on the site, proposed new construction on historic sites, and alterations to and relocation of historic resources, the applicant is required by the Santa Cruz County Code to submit a Historic Preservation Plan as part of the application. As required under County Code Section 16.42.040(a), your Commission is required to review and approve the historic preservation plan before any development application can be approved and before any development can proceed. Additionally, your Commission is to evaluate the Preservation Plan for consistency with the provisions in the Aptos Village Plan for protection of the historic resources with the project area.

In this report, staff has evaluated the preservation plan for consistency with local regulations for historic preservation (Chapter 16.42 of the County Code), the Aptos Village Plan (AVP), and with the Secretary of the Interior Standards for Rehabilitation. Staff has also reviewed supplemental reports and the peer review of the preservation plan. Staff has concluded that with the proposed conditions, the preservation plan is consistent with the AVP, with County Code requirements for historic preservation, and with relevant Secretary of the Interior standards. Therefore, staff is recommending that your Commission approve the proposed preservation plan with the attached

considered under a separate application for demolition due to the severely deteriorated and dangerous condition of the building.

**Background**

Aptos Village Plan

The development application for Aptos Village, including the Historic Preservation Plan (HPP) (Exhibit C), has been submitted by Barry Swenson Builders to implement the Aptos Village Specific Plan. To briefly review, the Aptos Village Specific Plan (AVP) is a conceptual plan which provides a blueprint for Aptos Village, focusing on the mostly undeveloped area of Aptos Village behind the Bayview Hotel and Aptos Station within Aptos Village, referred to as the village core area (see HPP, part 1). The AVP, approved by the Board of Supervisors in February 2010 following several years of community participation, provides a new center for Aptos Village with new housing and commercial development. (The portion of the AVP relating to historic resources is included as Exhibit I.)

Three historic buildings exist within this core area: the Bayview Hotel (NR-1), the Apple Barn (NR-3), and the old Aptos Firehouse/ VFW Hall (NR-5). The plan provides a new center for Aptos Village with mixed commercial and residential development, a new circulation pattern and street alignment to accommodate the new development, and a "village green" area at the center of the village. Under the Plan, the Apple Barn building would be relocated from its current location at the eastern edge of the Village Core to its center next to the village green, incorporating this historic building into the heart of the Village (see pages 6, 8 and 24 of the Preservation Plan) The building would be rehabilitated for a contemporary use, while preserving the form, materials, and essential features of the building that convey its history as an Apple Packing Shed and its important role in the history of Aptos. At the center of the village, the Apple Barn building could be better appreciated by the public and preserved for future generations. The Bayview Hotel is to remain in its current location, and the building will not be altered under the proposed plan. As noted previously, the Firehouse/ VFW Hall is being considered in a separate application.

Review of the Aptos Village Plan by your Commission

In April and August of 2009, your Commission reviewed the portions of the draft Aptos Village Plan relating to historic resources. Your Commission also reviewed a Cultural Resources Study by Albion Environmental, and a later study by Urban Programmers, evaluating the proposed project for potential impacts to historic resources. Your Commission also reviewed the peer review completed by Circa, the County's historic consultant. Circa's review concluded that the proposed conceptual plans for relocation and rehabilitation of the Apple Barn, and for new construction adjacent to the Bayview, were in general consistent with the Secretary of the Interior Standards, but that the details of the actual development plan would need to be carefully evaluated for consistency with the Standards and any effects on the ratings of the historic buildings.

At the August meeting, your Commission did not provide an overall recommendation to the Board of Supervisors. However your Commission provided several important comments regarding the Plan, which were incorporated into the final draft of the plan that was approved by the Board in February 2010 (Exhibit I), and are discussed on page 4 of this report. At the recommendation of your Commission, the Plan was also revised to include a brief history of Aptos Village prepared by historian Sandy Lydon. After the AVP was approved by the Board of Supervisors in February 2010, your Commission continued to provide guidance to staff regarding development within Aptos Village, including that the Apple Barn be evaluated by a structural engineer to ensure that the building could physically be relocated, and that the County's historic consultant continue to be involved in the review of the development plans. Your recommendations have been followed in the current phase of the

project involving the submittal and review of the development application for Aptos Village to implement the Aptos Village Plan.

**Discussion**

Historic Preservation Plan: Approval Criteria

As is the case for all projects involving alterations to historic resources, your Commission is to evaluate the proposed preservation plan for consistency with local regulations regarding alterations to historic structures. Staff has evaluated the proposed project for consistency with criteria in County Code Chapter 16.42 regarding alterations, additions, and new construction, and has found the proposed project to be consistent with these criteria (Exhibit E).

Additionally, the Aptos Village Plan specifies criteria for protecting the integrity and significance of historic structures within the Village, most of which were included at the direction of your Commission. For the Apple Barn, adjacent buildings must be architecturally compatible, any exterior changes must be sensitive to the historic significance and architectural features of the building, and any relocation must follow the Secretary of the Interior Standards for relocation such that the NR-3 rating of the Apple Barn is not compromised.

For the Bayview Hotel, the Village Plan specifies that "any new structures built adjacent to that site must be reviewed by the HRC to ensure that they do not compromise the historic context of this very important historic resource."

The Secretary of the Interior Standards cited above for relocation and rehabilitation of the Apple Barn, and for construction adjacent to the Bayview Hotel, are discussed in greater detail later in this report.

Additionally, the project must be evaluated under CEQA, for potential impacts to historic resources. Potential impacts under CEQA are discussed later in this report.

Documentation and reports

The Historic Preservation Plan (HPP) prepared by Urban Programmers (Exhibit C), reviews the development proposal submitted by Barry Swenson Builders for Aptos Village, evaluating the proposed project for consistency with the Aptos Village Plan, with the Secretary of the Interior Standards, and with the Santa Cruz County Historic Preservation Ordinance (Chapter 16.42). The HPP evaluates the consistency of the proposed relocation and rehabilitation plan for the Apple Barn as shown on the attached plans with the Secretary of the Interior Standards for Rehabilitation and with the seven Aspects of Integrity. Regarding the Bayview Hotel, the HPP evaluates proposed construction adjacent to the Hotel for consistency with Standards for Rehabilitation relating to new construction, and evaluates whether the proposed construction impacts the setting of the Hotel or its historic Integrity. The HPP also considered the proposed project for potential impacts to the Apple Barn and Bayview Hotel under CEQA, recommends several mitigations, and concludes that with the recommended mitigations the project is consistent with the Secretary of the Interior Standards for Rehabilitation, and would not result in significant impacts under CEQA. The preservation plan includes full size pages of the project plans relating to the historic resources on the site.

Additional reports and studies have been requested by the County to assist in the review of the project, and ensure the preservation plan protects historic resources consistent with the Secretary of the Interior Standards and with the California Environmental Quality Act (CEQA). These reports are noted and summarized below:

- Peer Review by Circa (Exhibit F): Provides peer review of the Preservation Plan for consistency with the Secretary of the Interior Standards and for potential impacts under CEQA.

As requested by the County, Circa evaluates specific aspects of the project, including relocation of the Apple Barn, connecting the Barn to a new building via a small corridor structure, other proposed changes to the exterior and interior of the Apple Barn, and construction of a new building on the parcel adjacent to the west side of the Bayview Hotel. Provides an overall determination regarding consistency with the Secretary of the Interior Standards for Rehabilitation and potential impacts under CEQA. Proposes additional project conditions and mitigation to ensure that the project as proposed is consistent with the Secretary of the Interior Standards, and that any potentially significant impacts to the Apple Barn are mitigated to a less than significant level. The peer review concludes that the project as proposed, and with incorporation of additional mitigation measures as recommended, is consistent with the Secretary of the Interior Standards for Rehabilitation and would not result in significant impacts to historic resources under CEQA .

- Letter from Circa regarding the 'link' building connecting the Apple Barn to building #4 (Exhibit G): As requested by the County, Circa evaluates the connecting of the Apple Barn to a new building via a small link building constructed mostly of glass and sheathed in cement plaster. The letter notes that the connection to the new building will provide additional square footage for the proposed grocery store, and is necessary to accommodate the proposed use and provide an economically viable project. Concludes that the small link building as designed will minimize the connection between the Apple Barn and the new Building and is generally consistent with the Secretary of the Interior Standards.

- Report by a Structural Engineer (McLucas Engineers), included in the Preservation Plan: Evaluates the structural integrity of the Apple Barn, discusses necessary modification to the structure to comply with seismic and other requirements of the California Historical Building Code and ensure a structurally sound building. These modifications include the replacement of the existing foundation with a concrete foundation, necessary to accommodate a proposed grocery store use and to preserve the building. Additionally, a new post and girder system and new load bearing walls would be constructed at the interior of the structure, while leaving the existing walls intact. The existing interior columns would be retained, replaced only if structurally unsound, and would be placed on steel bases to accommodate the increased height at the building interior. The existing beams and trusses at the roof of the building would be retained, and would become visible from the interior after the removal of the false ceiling currently in place. The modifications proposed by the engineer ensure a structurally sound building with longevity that retains the form, character, and significant architectural features and materials of the historic building.

- Letter by Kelly Movers (included in Preservation Plan): Circa has recommended that the applicant contract with Kelly Movers to move the building due to their extensive experience successfully moving historic buildings. Letter from Kelly Brothers notes that in their opinion the building can successfully be moved in two sections, working closely with the engineer.

- Cultural Resources Study by Albion Environmental (Exhibit J): Evaluates the site for potential archaeological resources, including five backhoe trenches and two surface transect units, and did not encounter intact cultural features. Notes that " investigations strongly suggest that historic archaeological deposits in the project area have been disturbed or possibly obliterated by ongoing demolition and historic redevelopment of the complex, which began as early as 1900 and continued through the 1970's." The report draws a similar conclusion for prehistoric archaeological resources. Notes that it is possible that intact deposits may be found in areas of the site that were not investigated. Recommends a general mitigation that all ground disturbing activity be monitored by qualified archaeologist, and that all work within 50 feet of any

substantial intact deposit that is found be halted, and that the deposit be investigated by an archaeologist and an appropriate treatment identified, in order to protect any significant archaeological resources found on site and ensure no significant impacts to archaeological resources.

**Analysis: Consistency of the Preservation Plan with the Secretary of the Interior Standards for Rehabilitation**

The following sections of this report reviews the documentation and reports noted above, and analyzes the project for consistency with the appropriate Secretary of the Interior Standards.

Bayview Hotel: Adjacent Construction and Historic Setting

The project proposes to remove the historic single- story Aptos Firehouse Building adjacent to west side of the Bayview Hotel from the parcel, and to replace it with a larger two-story building, as shown in figure 2-E of the Historic Preservation Plan (HPP). As noted previously, there are no changes proposed to the Bayview Hotel itself, which is listed on the National Register of Historic Places. As there is no federal agency involvement in this project, the proposed construction of a new building on the adjacent parcel does not required review or approval by any state or federal agency. However, based on criteria in the Aptos Village Plan, it is appropriate to apply the Secretary of the Interior Standards for Rehabilitation to the project as it relates to the Hotel Setting and to its overall historic integrity, to ensure that the historic context for the hotel is not impacted by adjacent construction.

In terms of the Hotel setting, one question is whether the Aptos Firehouse Building currently adjacent to the Hotel is important to the setting of the hotel, since the building is to be removed from the site (page 1 of HPP). As noted in the National Register Form (Exhibit H), the hotel was moved 60 feet to the north to its current location adjacent to the Firehouse in 1946. As this is outside the period of significance for the Hotel (1878-1919), the current close proximity of the Hotel to the Firehouse is not significant historically. Additionally, as noted in the HPP, the National Register Nomination form does not mention the Firehouse as a contributing feature to the setting of the Hotel.

In terms of the proposed new construction, Rehabilitation Standard #9 notes:
"(N)ew construction shall not destroy the historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale and architectural features to protect the historic integrity of the property and its environment." In addition, as noted in Section 2.5 of the PP, the setting of a building contributes to its overall historic integrity. Therefore, the construction of the new building should be evaluated for impact to the historic setting of the Hotel.

As noted in the National Register nomination form, the hotel "was from the beginning a focus point for the community." The preservation plan maintains the predominance of the Hotel within the village, by maintaining its visibility from Soquel Drive, and its stature in relation to adjacent buildings. Building 14, proposed to be located on the west side of the hotel, is shorter in height (30') than the hotel building (48'), maintaining the dominance of the hotel at its current location in relation to other buildings (see figure 2-E, page 20 of Preservation Plan). Additionally, although the Building 14 would occupy a larger footprint than the Firehouse, the building would maintain the same setbacks from Soquel Drive and from the Hotel as the Firehouse. The area to the front of the Hotel fronting Soquel Drive would consist of parking and low landscaping, such that the views of the Hotel would not be blocked from Soquel Drive. Contemporary buildings already exist to the east of the Hotel. The design of the proposed adjacent building is contemporary to differentiate it from the Hotel, while incorporating horizontal wood siding and second story railings to provide compatibility with architectural features and materials of the Bayview Hotel.

Based upon the information and analysis provided Section 2.5 of the Preservation Plan, and peer review provided by Circa, staff concludes that the construction adjacent to the Bayview is consistent with the Secretary of the Interior standards relating to new construction adjacent to historic structures, and would not significantly affect the historic setting for the Hotel or its overall historic integrity.

Apple Barn: Relocation

As noted in the HPP (Section 3.1), the building current sits on the road right of way for Trout Gulch, which is not an optimal location for the building and does not allow for an economically viable use. By relocating the building approximately 50 feet to the west on the same site, the building can be protected for the future, and put to a viable economic use. Therefore, relocation is necessary for the long-term preservation of the building.

As an NR-3 rated building, the Apple Barn is eligible in the opinion of the Historic Resources Commission for listing on the National Register. To retain this rating it should continue to comply with criteria in the Secretary of the Interior Standards for listing historic buildings. In general, the standards do not normally consider buildings that have been relocated outside their period of significance for listing. However, buildings which are relocated as a last resort to demolition and which meet other criteria can be considered for listing. Under Criteria Consideration B, "a property removed from its original or historically significant location can be eligible for listing if it is significant primarily for architectural value or it is the surviving property most importantly associated with a historic person or event." As noted on page 74 of the Preservation Plan, the Apple Barn is the last building associated with the community's apple industry during an era when the apple industry provided the economic sustenance of the village, and F. A. Hihn and his local apple business.

To be eligible for listing, a building must also retain its historic integrity after relocation. Relocating the building, by moving the building approximately 50 feet to the west and rotating it 90 degrees at the new location, would change the setting of the building, which is one component of integrity for historic structures. The peer review provided by Circa notes that the setting of the Apple Barn has been considerably altered over the years, such that the existing setting is not essential to the overall integrity of the building. For example, the rail line formerly running along the back (southwest side) of the building, and other buildings associated with the apple packing industry, are no longer present. Due to previous changes to the existing setting of the Apple Barn, and consistency with Criterion B, relocation to another location on the same site is not considered significant for the Apple Barn, such that the current NR-3 rating for the Apple Barn would not be jeopardized by the proposed relocation.

Apple Barn: Rehabilitation

Under the Secretary of the Interior Standards, Rehabilitation is defined as "the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions or features of the property which are significant to its historic, architectural, and cultural values." As noted in Preservation Plan (page 34), "Rehabilitation Standards focus attention on the preservation of those materials, features, finishes, spaces and spatial relationships that, together, give a property its historic character."

The proposed use of the building as a grocery store will provide a contemporary use for the building. Although the new use does require alterations to the building, the rehabilitation plan as presented and with recommended conditions will preserve the significant character-defining features of the building exterior and interior which "tell the story" of the building as an apple packing shed built in the late 1800's and as a significant building to the history of Aptos and the local apple industry.

Planning Staff has worked closely with the project architect to ensure that the proposed rehabilitation

plan preserves the significant character defining features of the building. Pages 61-64 of the HPP compare the existing elevations of the building with the proposed elevations after rehabilitation. As can be seen in the architectural drawings, the proposed rehabilitation will retain most of the significant character-defining features of the building's exterior, including the overall form with 3 distinct gable bays, peaked gable roofs with ridge pop-up venting, the wood timber structural system of the roof (posts, beams and trusses), the rustic exterior vertical board siding, industrial wood sliding doors and associated hardware, and existing door and window openings. The project will not introduce any new door or window openings. The proposed rehabilitation will remove lattice work, and a shed addition, which are recent changes which detract from the industrial character and obscure the overall form of the building. The rehabilitation plan will retain the overall form, materials, and character of the building, and will help to reveal the overall form of the building. At the interior, the roof structure is to be retained, and will again be visible from the interior after removing the recent false ceilings addition.

Changes to the building include connecting the Apple Barn to a new building to the west via a small link building, with removal of 36 feet of siding. The change in grade at the new location from a sloping site to a level site will also require leveling the height of the building when viewed from the exterior. Currently, the building is approximately 27.5 feet tall at the east end of the building with a lower grade, and 24 feet tall at the west end. Additionally, the new concrete foundation will lower the existing floor at the building interior to grade level, increasing the height of the interior of the building by approximately 3 feet. The door openings will also be lowered so that the doors open at ground level.

Staff has reviewed the proposed project for consistency with each of the ten Rehabilitation Standards (Exhibit E), considering the analysis provided in the Preservation Plan and peer review comments provided by Circa. Overall, staff finds that the rehabilitation plan is consistent with these standards.

In Circa's peer review of the proposed rehabilitation of the Apple Barn, as the project was originally proposed Circa identified two potentially significant impacts: the loss of the loading dock on the existing street-front elevation, and the proposed design for the link building. As recommended by Circa, the project architect has modified the project design to retain a portion of the existing porch/ loading dock along the west side of the building (see plan pages 5.1 and 5.2). The retention of this feature will help to convey the historic relationship of the building to the site, as the loading dock allowed apples to be loaded and unloaded from the raised floor at the interior of the building to carts, trucks, etc. at the building exterior, and was essential to the functioning of the packing house operation. A recommended project condition is that interpretive signs and materials be included for the loading dock, to show how the loading dock functioned historically. The historic photograph taken in the early 20th century of the Apple Barn prior to the addition of the third bay (page 45 of the HPP), shows apples being loaded onto horse drawn carts from the loading dock.

Additionally, as recommended by Circa the design of the link building has been revised to lower the overall height, and reduce the parapet height to 4.5 feet, which is the minimum required to screen mechanical equipment as required by the Santa Cruz County Code. Also as recommended by Circa, the redesigned link building includes mostly glass, to increase the transparency of the building and allow the Apple Barn to appear visually as a separate building. As noted in the peer review, the above-mentioned changes would mitigate potentially significant impacts under CEQA to a level of less than significant.

Apple Barn: Integrity

The analysis provided in Section 3.7.1 of the Preservation Plan analyzes the 7 aspects of integrity, and concludes that the building will retain most aspects of integrity after relocation, and will therefore be consistent with National register criteria. The peer review prepared by Circa confirms this conclusion, noting that "the historic context of the site of the Apple Barn has been significantly changed. What

integrity that remains of the building itself will be retained/ repaired to a sufficient level that it will maintain most aspects of integrity."

**CEQA Review**

Under the California Environmental Quality Act, projects involving historic resources that are consistent with the Secretary of the Interior standards are considered to be mitigated to a less than significant impact. Section 3.8 of the Preservation Plan concludes that with inclusion of recommended mitigation measures, the project is consistent with the Secretary of the Interior Standards for Rehabilitation, and therefore would be consistent with CEQA. The mitigation measures recommended have either already been incorporated into the project, or are included as project conditions (Exhibit B).

As part of the peer review of the Historic Preservation Plan, Circa considered the proposed changes to the Apple Barn building and site, and to the setting of the Bayview Hotel, both individually and collectively, for potential impacts under CEQA. For the Bayview Hotel, Circa did not identify any potential impacts from the proposed new construction. For the Apple Barn, as discussed above, with project modifications to include retention of the majority of the existing loading dock and redesign of the link building with greater transparency and a lower overall height, Circa has concluded that the project would not result in significant environmental impacts to either the Apple Barn or the Bayview Hotel.

As noted earlier in this report, the cultural resources study prepared by Albion Environmental for this project included trenching and surface transects, and did not identify any intact historic or prehistoric archaeological deposits. Appropriate mitigation measures, following the recommended in the Albion report to provide an archaeological monitor on site during all demolition and construction for the project to ensure protection of any significant cultural resources that may be found on site, will be included as a project requirement.

Commissioner Swift recently raised concerns regarding the historic site of the railway turntable, which was historically located near the current location of the Aptos Firehouse/ VFW hall (page 15 of Exhibit J). Staff has communicated with the owner of the Aptos Firehouse parcel, Joe Appenrodt, who indicated that further investigations by a contractor, including excavation of four trenches at that location found only "occasional rocks, some particles of concrete, and some pieces of glass." No evidence of that any significant portion of the railway turntable remains at the site. The letter from the property owner with a map showing approximate locations of trenches in relation to the railway turntable location shown on the 1892 Sanborn Map, is provided as Exhibit K. The general mitigation measure noted above will also apply to the any ground-disturbing activity near the historic site of the railway turntable.

The attached historic preservation plan, along with changes discussed above and the additional proposed project conditions (Exhibit B) has been found to be consistent with the Standards for Rehabilitation, and therefore is not anticipated to result in significant impacts to historic resources under CEQA. Environmental Review will be completed for this project. The environmental review documents will be provided to your Commission for your review and comment during the comment period.

**Conclusion and Recommendations**

Staff has reviewed the attached Preservation Plan and project plans for the Bayview Hotel and the Apple Barn, and related reports and documentation, for consistency with local regulations in Chapter 16.42 relating to alterations and additions to historic resources, new construction on an historic site, and relocation of an historic resource, and with findings required in Chapter 16.42. Staff has also reviewed the proposed preservation plan for consistency with criteria specified in the Aptos Village Plan, especially regarding relocation and rehabilitation of historic structures under the Secretary of the Interior Standards, criteria for new construction adjacent to historic structures. Additionally, staff has evaluated the proposed project to ensure that the NR-3 rating of the Apple Barn is protected, and that the National Register listing of the historic Bayview Hotel is not impacted by the proposed project.

After reviewing the proposed project as discussed above, staff has concluded that the project is consistent with the Aptos Village Plan, Santa Cruz County Code Chapter 16.42, and the Standards for Rehabilitation. Additionally, as the Preservation Plan is consistent with Secretary of the Interior Standards, no significant impacts are anticipated as a result of the proposed project under CEQA. Therefore, it is recommended that your Commission Approve the Historic Resource Preservation Plan as submitted (Exhibit C), the project plans (Exhibit D), with the expiration date for the project to be determined as part of the overall development application (101027), based upon the attached findings (Exhibit A), and the thirteen recommended Conditions of Approval (Exhibit B).

**Action Date:** _____

**Effective Date:** _____

**Expiration Date:** To be specified in Application #101027

**ACTION:** **Ayes:** _____

**Noes** _____

**Absent** _____

**Date:** _____

_____
Annie Murphy
Secretary to the Commission

Exhibits

A. Findings
B. Conditions
C. Historic Preservation Plan, including photographs and reports: Urban Programmers
D. Copies of the Project Plans
E. Secretary of the Interior Standards for Rehabilitation, Santa Cruz County Code Criteria for Alterations, and Santa Cruz County Code Criteria for New Construction
F. Peer Review of Preservation Plan: Circa

G. Letter regarding Apple Barn "Link Building: Circa

H. Historic Resources Inventory pages for the Apple Barn and the Bayview Hotel

I. Aptos Village Plan, sections relating to historic resources

J. Report from Albion Environmental, submitted to the HRC in April 2009

K. Letter from Joe Appenrodt regarding previous railway turntable site

L. Location Map

M. Aerial Photograph with site topography

## Historic Development Findings

1. *The Historic Resource Preservation Plan is consistent with the purposes and goals of County Code Chapter 16.42 and the County General Plan.*

The Historic Resource Preservation Plan submitted is consistent with the policies of the general Plan and Chapter 16.42 of the County Code in that the overall goal is to protect and preserve both the Apple Barn, by allowing its rehabilitation, and protecting the setting for the Bayview Hotel.

2. *The Historic Resource Preservation Plan is in conformance with the requirements of Chapter 16.42 of the County Code.*

As shown in Exhibit E, the Historic Resource Preservation Plan submitted is in conformance with the requirements contained in Chapter 16.42 (Historic Preservation).

3. *The Historic Preservation Plan will preserve and maintain the cultural and historical heritage of the County and/or further cultivate the knowledge of the past.*

The Historic Resource Preservation Plan does not alter the Bayview Hotel building, includes only minimal changes to the overall setting for the Hotel, and may result in additional public appreciation of the historic building due to increased public presence within the village as a result of new development. For the Apple Barn, as conditioned the plan will include documentation of the resource prior to rehabilitation, and will provide an interpretive display for the public, informing the public of the history of the building in the context of Aptos Village. Additionally, the rehabilitation of the building will strengthen and preserve the building, thereby allowing future generations to appreciate the historic Apple Barn and understand its role in the history of Aptos Village.

**Recommended Conditions**

Apple Barn:

1. Protection of existing historic materials and character-defining features: A qualified architectural conservator shall evaluate all of the existing historic materials of the Apple Barn, identifying which materials require repair or replacement, and which materials may be repaired. Detailed plans prepared by an architectural conservator shall be provided prior to the issuance of a permit for relocation, noting which materials are to be retained, repaired, replaced, or relocated for use on another part of the building. An architectural conservator shall also be retained on site during relocation and rehabilitation to ensure that the detailed plans are followed. A copy of the contract with an architectural conservator shall be submitted prior to the issuance of a building permit.

2. Historic Skirting: Existing wood skirting material shall be retained to the greatest extent feasible, and shall be used to cover the concrete stem wall in an area or areas retaining the greatest visibility, such as the loading dock area adjacent to the village green. Plans showing proposed location of historic skirting materials shall be submitted with the building permit application for moving the building.

3. Future repairs: Consistent with the Preservation Plan, all wood siding removed from the Apple Barn to accommodate the new link building, and wood floor planks that are removed to allow for the installation of new interior flooring, shall be stored and used for future building repairs.

4. Preservation of interior wood flooring: Existing wood floorboards at the building interior, identified as a character-defining feature, shall be used throughout the building to the greatest extent feasible as allowed under state codes and local environmental health regulations relating to the grocery store use. The texture and finish of the existing floor boards shall be retained to the greatest extent feasible as is consistent with relevant state codes and local regulations. Plans for use of flooring shall be submitted to the HRC prior to the issuance of the building permit.

5. Roofing material: Corrugated roofing shall be a mat finish.

6. Exterior paint color: Consistent with County Code Requirements 16.42.060(c)(1)(l) regarding alterations to a historic resource, the exterior color of the rehabilitated apple barn shall be similar to the current color of the building, or another color appropriate for an apple packing shed during the period of significance for the building (early 1890's to the 1950's)

7. Relocation: As indicated in the preservation plan, Kelly Brothers Movers shall work with the engineer to relocate the Apple Barn to the new proposed location. Any change in moving contractor shall require approval by the Planning Department.

8. Interpretive Display: Consistent with the recommendations in the preservation plan prepared for the project and with County Code Section 16.42.060 to preserve the historic value of structures that are relocated, one or more interpretive displays shall be installed on the property that will provide information to the public regarding the history of the Apple Barn in the context of the history and development of Aptos Village. Submittal of a contract with a qualified professional with experience preparing similar types of interpretative displays for historic purposes shall be required prior to issuance of the demolition permit. Installation of the interpretive display shall be required prior to final inspection for the demolition permit.

The display shall include historic materials and objects that are removed from the building during relocation and rehabilitation, as well as historic photographs and text documenting the history of the building, its use as a packing shed, the relationship of the building to the site, including the rail line and road, as well as documenting the association with Frederick Hihn. If available, include photographs from the Paul Johnston collection noted in the Historic Resources Inventory Sheet. The display will include historical data and photos from the documentation requirement, or other cited archival sources. These displays will be integrated into the design of Aptos Village, and will be installed outdoors in highly visible areas. Interpretive displays and the signage/ plaques installed on this property will be sufficiently durable to withstand typical weather conditions. Displays and signage/ plaques will be of adequate size to attract the public. Installation of the interpretive display shall be required prior to final inspection for the relocation permit.

8. Historical Marker: A permanent plaque will be installed at the existing historic location of the Apple Barn, describing the Apple Barn, its history as part of Aptos Village, and noting the new location of the building. Plans for the historic marker shall be submitted prior to the issuance of the demolition. Installation of the marker shall be required prior to the final inspection for the demolition permit.

9. Documentation: Consistent with County requirements for relocation of historic resources (16.42.060 9b)1((B)(i), the applicant shall submit a plan to document the history of the building prepared by a qualified historian/ architectural historian (according to the Secretary of the Interior's professional qualification standards) prior to the issuance of the permit for relocation. The documentation should approximate HABS Level II documentation and include: a) selected drawings, if available, that would be photographed; b) photos following the NPS photo policy, of exterior and interior views, along with historic views, if available; and c) written data providing history and description of the property. The documentation shall include photographs and detailed architectural drawings of the historic materials, features and construction techniques that will be altered, removed or replaced by the relocation and rehabilitation of the building, including the construction methods and materials for the foundation system, the loading docks and their relation to the site and the door openings, the section of the wall that will be removed to accommodate the new link building, the relationship of the building to the site, and the flooring and single-wall construction at the interior. Photographs shall be taken of the building as it currently exists. Photographs shall also be taken during relocation and rehabilitation, documenting the construction techniques identified as the building is prepared for relocation, as well as documenting the relocation process. For the photographs, either HABS standard large format or digital photography may be used. If digital, the size of each digital image will be 1600x1200 pixels at 300 pixels per inch, or larger, color format, and printed in black and white or color. Information from the documentation process shall be included in the interpretive display for the Apple Barn building. The distribution of the documentation will include: the Aptos Chamber of Commerce and History Museum, the Museum of Art and History in Santa Cruz, the Santa Cruz Public Library's local history collection; and UC Santa Cruz. The documentation shall be completed prior to final inspection of the building permit.

12. Conformance with project conditions:
Building permit plans shall be submitted to the Historic Planner with the County of Santa Cruz for staff level review to ensure consistency with the conceptual plans submitted with the Historic Preservation Plan application and with Chapter 16.42 of the Santa Cruz County Code.

13. Protection of Bayview Hotel: Prior to construction and demolition on any parcel adjacent to the Bayview Hotel, the applicant shall consult with a structural engineer to ensure that the proposed demolition and construction methods shall not negatively impact the Bayview Hotel. If any impacts are anticipated by the engineer, the proposed construction and demolition methods shall be modified as needed to protect the Bayview Hotel Building. A report from a structural engineer reviewing the proposed demolition and construction methods shall be required prior to issuance of demolition or building permits for parcels adjacent to the Bayview Hotel.

***Consistency with the Secretary of the Interior Standards for Rehabilitation; and with County Code Requirements for Alteration to Historic Resources, and New Construction on Historic Properties***

Consistency with the Secretary of the Interior Standards for Rehabilitation (Exhibit C, pages 67-74)

**Note:** As the Criteria in Section 16.42.060(c) of the Santa Cruz County Code for alterations to historic structures are based upon these federal criteria, this analysis of consistency applies also to local standards

*1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*

As noted above, the proposed use as a grocery store does requires alterations to the building. One change is the relocation of the building and reorientation of the building at the new location, altering the spatial relationship of the building to Trout Gulch Road, and to the railway line that formerly existed at the rear (northwest) side of the building. However, as noted in the peer review from Circa, much of the original setting for the Apple Barn has been lost, due to the loss of the railway, road realignment, and loss of remaining buildings at the site related to apple processing. As such, the loss of the existing setting is not significant for the building. Additionally, the new location places the building at a central location within the village, situated near a road, similar to its current location. The new location adjacent to the village green will also provide open space around the building, consistent with its current location. The new central location will also allow the building to be better viewed and appreciated by the public.

The change in grade at the new location will also even out the height of the building when viewed from the exterior. Additionally, the new concrete foundation will lower the existing floor at the building interior, increasing the height of the interior of the building. The door openings will also be lowered so that the doors open at ground level. These changes are needed to accommodate the new use, and are not in themselves considered by the County's historic consultant to be significant impacts to the building. As noted in #2 below, a portion of existing loading dock will be retained, indicating the original relationship of the building to the exterior, with a raised foundation and doors, and loading docks allowing for loading and unloading of apple crates from trucks and carts in and out of the building (figure 3-D of Exhibit C).

*2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

The proposed rehabilitation plan retains the most significant materials and features at the interior and exterior of the building that give the building its character as an apple packing plant (see plan pages 5.1 and 5.2, and pages S-1 and S-2 in the Preservation Plan). Page 38 of the Preservation Plan identifies the significant character-defining features of the Barn, including its overall form with 3 distinct gable bays, peaked gable roofs with ridge pop-up venting, the wood timber structural system of the roof (posts, beams and trusses), exterior vertical board siding, industrial wood sliding doors and associated hardware, and existing door and window openings. In the proposed rehabilitation plan, all of the significant character-defining features will be preserved. In addition to these features, the peer review by Circa has identified the historic loading dock on the southeast side of the building in its current orientation as a significant character-defining feature, indicating the historic use of the building as an apple packing shed with a raised loading dock for loading and unloading of apple crates. Therefore, project plans have been revised to retain a significant portion of the loading dock.

The plan also identifies features that contribute to the overall character of the building, including the interior single wall system, the rustic wood flooring and raised platform foundation system, and corrugated metal roofing, which was not part of the original building but which has acquired historic significance over time. Of these features, the corrugated metal roofing material will be replaced in kind, and portions of the single-wall construction and rustic wood flooring will be retained in the interior at the entrance of the building (see plan pages 5.1 and 5.2). At the recommendation of the County's historic consultant, a condition will be added that the wood flooring be used throughout the store, treated as minimally as possible to retain its original texture and patina, and used to the extent allowed under state law and local environmental health regulations. The raised foundation system will not be retained, as it is not sufficient to support the proposed grocery store use.

The plan also identifies non-contributing features, which have been added more recently and are not historically significant and are proposed for removal, including latticework, a shed addition, modifications to historic door and window openings, and interior partitions, wall coverings, and false ceiling. The removal of the latticework and shed addition at the exterior will reveal the overall simple form, industrial/ agricultural character and historic details of the building's exterior, and the removal of the false ceiling and partitions at the interior will reveal the wood post, beams and trusses of the roof, restoring much of the original form and spaciousness of the building's interior.

*3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties will not be undertaken.*

Changes to the building to accommodate the new use include modern doors and windows in existing openings, the link building connecting the barn to building #4 to the west, and new flooring and wall coverings at the interior of the building. These alterations and additions will be clearly differentiated from the historic materials and features, so that it is clear what is original to the building and what are recent changes.

*4. Changes to the property that have acquired significance in their own right will be retained and preserved.*

As noted under standard #2, changes to the building that have acquired significance include the corrugated metal roofing, which will be retained. More recent changes and additions which are not historic and detract from the historic significance of the building will be removed.

*5. Distinctive materials, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

*6. Deteriorated historic features will be repaired rather than replaced. When the severity of the deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

As noted under standard #2, the historic materials, finishes, and construction techniques will be retained whenever feasible. To ensure these historic attributes are retained, a condition will be added that the building be evaluated in detail to determine which of the historic materials can be retained, which are in need of repair, and which need to be replaced in kind. A monitor will be retained during relocation and rehabilitation to ensure that the historic materials will be retained as specified.

*7. Chemical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

No chemical treatments are proposed for the building.

*8. Archaeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

As noted on page 70 of the rehabilitation plan, a cultural resources study for the project site was prepared Cultural Resources Study by Albion Environmental presented to your Commission in April 2009 (Exhibit J). The study notes that " investigations strongly suggest that historic archaeological deposits in the project area have been disturbed or possibly obliterated by ongoing demolition and historic redevelopment of the complex, which began as early as 1900 and continued through the 1970's." The report draws a similar conclusion for prehistoric archaeological resources. The report notes that it is possible that intact deposits may be found in areas of the site that were not investigated. As recommended in the Albion report, the project will include a requirement that all ground disturbing activity in the project area be monitored by a qualified archaeologist, in the event that a substantial intact deposit is found during construction. This will ensure the protection of any significant cultural resources on site.

*9. New additions, exterior alterations, or related new construction shall not destroy the historic materials, features and spatial relationships that characterize the property. The new work shall be differentiated from the old and shall be compatible with the historic materials, size, scale, and proportion and massing to protect the historic integrity of the property and its environment.*

The rehabilitation plan for the Apple Barn proposed a link connecting the building to a new building. Circa has evaluated the design for the proposed link building, and has determined the building to be consistent with the Secretary of the Interior Standards, with the most recent redesign included in the attached plans. The link building is designed to "disappear' visually, allowing the Apple Barn to stand as a separate building. The design and materials clearly differentiate the small building from the historic Apple Barn.

*10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

The proposed link building requires the removal of approximately 36' feet of siding. The project will be conditioned to require that the removed siding be stored, allowing the portion of the building to which the link building is attached to be restored at a future date if the link building were to be removed. At the building interior, the new plywood sheathing will be constructed separate from the existing single-wall construction, and could also be removed at a later date, leaving the single-wall construction intact.

**Criteria in Section 16.42.060 of the Santa Cruz County Code for new construction on historic properties**

These criteria apply to new construction on an historic property, and apply to new construction adjacent to the Apple Barn. (Note: these criteria do not apply to construction adjacent to the Bayview Hotel, since the new construction is proposed for the adjacent property.)

*(d) New Construction. Historic Resource Preservation Plans for construction of new structures on*

*historic properties or in historic districts shall conform to the following criteria:*

*(1) The location, siting and size of new construction on an historical property shall not detract from the historic character of the property, and between existing buildings, landscape features and open space.*

The proposed link building connecting the Apple Barn to the building 4 proposed to the west of the Apple Barn is smaller in height and footprint than the Apple Barn, and is designed with glass walls and gray plaster to reduce the buildings visibility and allow the Apple Barn to stand visually as a separate building (see page 3.1 of the project plans). Building 4 it proposed to be located approximately 18 feet to the west of the Apple Barn, represents a change in the current setting of the Apple Barn, which includes more open space. However, historically other industrial building existed nearby, such that a more intensively developed site is consistent with the historic context for the building. As noted in the Preservation Plan (page 33), aside from building 4, the new setting adjacent to the Village Green, as well as the parking around the Apple Barn, will provide open space around the Apple Barn, in many respects similar to its current site.

*(2) All structures shall be designed in proportion and integrated into the historic character of the property or district by the use of compatible building materials and textures, construction methods, design, and color.*

Building 4 includes compatible materials to the Apple Barn, such as wood siding. However, the design of the building is more contemporary. This is consistent with Standard #9 of Secretary of the Interior Standards for Rehabilitation, which states that "*The new work shall be differentiated from the old.*"

*(3) The size, location and arrangement of new on-site parking or loading ramps shall be designed so that they are as unobtrusive as possible and preserve the features of the property or district.*

The loading area for the new use of the Apple Barn as a grocery store is proposed to be located at the rear (east) of the Apple Barn building. Although parking is proposed around the Apple Barn to accommodate the proposed grocery store use, this is consistent with parking that currently exists at the site, and consistent with the industrial use of the building. In its location adjacent to the village green, the visibility of parking when viewed from the most public side of the building will be minimized.

*(4) Ingress and egress, and internal traffic circulation shall preserve the historic features of the property.*

Ingress and egress patterns will change from the current patterns, as is consistent with the approved Aptos Village Plan. However, the new road and circulation patterns will not require removal of any important historic features of the property.

*(5) Landscaping should be provided in keeping with the character and design of the historic site, property or district.*

Currently, the Apple Barn is surrounded by paved area and parking, with little landscaping, consistent with the historic use of the building as an industrial apple packing shed (see pages 54-56 of the Preservation Plan, and page 45). The setting at the proposed location will be similar, with parking area and the village green providing open space around the Apple Barn building.

*(6) Disturbance of terrain around existing buildings or elsewhere on the property should be minimized to reduce the possibility of destroying unknown archaeological materials. Where any proposed land alterations may impact important archaeological resources, a professional archaeological survey shall be provided and its recommendations implemented to mitigate potential impacts as provided for in Chapter 16.40 of the County Code.*

See Rehabilitation Standard #8 above.

CIRCA Historic Property Development

June 29, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

RE: Peer Review of "Aptos Village Preservation Plan"

County of Santa Cruz asked Circa to complete a peer review of the "Aptos Village Preservation Plan – Considering a Development Plan Submitted by Barry Swenson Builders to Preserve the Historic Eligibility of Two Historic Buildings" prepared by Urban Programmers. Additionally, Circa was asked to evaluate the proposed alterations to the Apple Barn for consistency with the Secretary of the Interior Standards "Rehabilitation" treatment. This request also included consideration of the proposed changes regarding any significant impacts under the California Environmental Quality Act (CEQA). CEQA provides the legal framework by which historical resources are identified and given consideration during the planning process [Public Resources Code §§21000-21177.] If there are potential significant impacts, Circa was asked to evaluate whether the proposed mitigations are adequate to mitigate to a less than significant impact and to recommend any appropriate mitigations. Santa Cruz County also requested a review of specific aspects of the proposed project. I have reviewed the Preservation Plan, and associated documents. In general, I find that the Preservation Plan to be consistent with the Secretary of the Interior Standards for Rehabilitation, and that the project, with the mitigations recommended below, would not result in significant impacts to historic resources under CEQA. My detailed evaluation is as follows.

According to CEQA, "Generally, a project that follows The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or The Secretary of the Interior's Standards for Rehabilitating Historic Buildings...shall be considered as mitigated to a level of less than a significant impact on the historical resource".[1]

*Rehabilitation* is defined as "the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values." Rehabilitation assumes that at least some repair or alteration of the historic building will need to take place in order to provide for an efficient contemporary use; however these repairs and alterations must not damage or destroy the materials and features - including their finishes - that are important in defining the building's historic character.

The proposed Aptos Village project proposes, but limited to, the demolition of the former Aptos Firehouse; relocation of the Apple Barn; removal of the loading docks and removal of interior floorboards; covering of interior single wall construction; increase in building height, and construction of a new linking passageway to adjoin the historic with an adjacent new building.

Questions from the County (numbered) and corresponding answers follow:

1. Loss of loading docks/ porches on the South (front) and east sides of the Apple Barn, and new entrances at ground level.

Loss of the lattice/rail material is not an issue since they are not contributing character-defining features.

The loading docks are important, contributing character-defining features (CDFs), though not identified as such in the Preservation Plan. The loading docks convey the building's historic use as a warehouse/packing plant (along with associated rail spur since removed) therefore are considered character-defining features.

[1] State CEQA Guidelines Section 15064.5 (b)(3)

CIRCA Historic Property Development

Removal of the loading docks will be a significant impact and their removal will also contribute to the collective impacts of the overall project.

New entrances at the ground level but within the original openings will introduce a new proportion that never existed. This is neither an impact nor an asset that increases the building's physical integrity. It will help differentiate the new from the old. The original, existing sliding doors and other fenestration features are to remain.

2. Loss of wood planks on porches and replacement with concrete walkway.

The wood planks on the porches are not identified as contributing character-defining features in the Preservation Plan. Given the age of the building and the many years of heavy use it is likely that the majority of the boards have been replaced over time therefore their removal is not a significant impact.

The new concrete walkway will introduce a new material but will also help the building to comply to ADA standards. This is neither an impact nor an asset that increases the building's physical integrity. It will help differentiate the new from the old.

3. Loss of wood flooring materials, with reuse of a few floor boards at building entrance. Recommendation for appropriate flooring in the rest of the building?

The Rehabilitation standard allows for a building to be placed in a new use that requires minimal change to the character defining features. The proposed new use of a grocery store in the former apple barn will require certain upgrades to meet the appropriate code for this use. Among these upgrades is flooring material that is easy to maintain and meets food-related retail use standards. The most common grocery store flooring is polished concrete, however, laminated or coated flooring such as vinyl are also used. The new flooring for the grocery store should be appropriate and reflect the original utilitarian/warehouse use while differentiated from the historic.

The retention and reuse of the existing historic, interior floor boards is appropriate and should be maximized, and utilized not only in the entranceway but wherever the code allows such as non-refrigerated and/or passive display areas. However, removal of the boards will contribute to the collective impacts of the overall project. The remaining rustic boards should <u>not</u> be sanded, painted, finished in a high gloss clear coat or treated in anyway that will remove the texture and patina of the original. The boards should be cleaned and sealed with a sealer such as Penofin or similar wood protection treatment.

4. Increase in the building height on the interior and appearance at exterior.

The increase in building height, both interior and exterior, is based on the removal of the existing floor system. The floor system and platform structure are important character-defining features, however, in order to accommodate the needs of the grocery store their loss is less of an impact then the loss of other CDFs that are more significant. The existing height conveys the building's historic use as a warehouse/packing plant (along with associated loading dock) therefore are considered character-defining features. Removal of these are not significant in and of themselves, however, they will contribute to the collective impacts of the overall project.

5. Replacement of foundation system with a new type of foundation (concrete slab). Is mitigation #4 in the HPP (page 83) appropriate and necessary? Is mitigation #5 appropriate instead?

The replacement of the exiting foundation system with a new at-grade concrete foundation is necessary for the stabilization of the building and therefore protection of the overall building. This protection has greater benefit to the building than retention of the existing platform structure.

CIRCA Historic Property Development

6. Mitigation #8, page 84: Is it necessary to stain new wood used for skirting a different color to differentiate it from the original materials?

Reuse of the existing, historic horizontal wood siding should be condensed and concentrated in an area (or areas) that provides the most visibility, rather then intermixing new with old throughout the building's skirting. Whether it's a stain or paint the new wood skirting should be differentiated from the historic as outlined in #9 of the Rehabilitation standard:

> "New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment."

7. Covering single wall construction at building interior with plywood walls.

As explained in #3 above the Rehabilitation standard allows for a building to be placed in a new use that requires minimal change to the character defining features. The proposed new use of a grocery store in the former apple barn will require certain upgrades to meet the appropriate code for this use. Among these upgrades is wall covering material that is easy to maintain and meets food-related retail use standards. The proposed plywood, insulation and sheetrock interior wall sheathing should only be installed where code requires and in non-public areas. The plywood and sheetrock should be applied in a way that is removable with the least amount of damage to the original, historic siding. The covering over (obscuring) the interior single wall construction will contribute to the collective impacts of the overall project.

The retention and exposure of the existing historic single wall construction is appropriate and should be maximized, and utilized not only in the entranceway but wherever the code allows. This is particularly appropriate in high traffic public areas such as, but not limited to, the entranceway. The original interior walls should not be sanded, painted, finished in a high gloss clear coat or treated in anyway that will remove the texture and patina of the original. The walls should be gently cleaned and maintained.

8. Use of steel pedestals at building interior at base of columns to support additional building height.

Strengthening of the historic columns to support the additional building height (if truly needed) is appropriate and the steel pedestals, if compatible and appropriate in design, will differentiate the historic from the new.

9. Appropriateness of new addition, including design, materials, and loss of historic materials required to install addition.

Revised draft plans (dated May 5, 2011) regarding the new "link" or hyphen section connecting the historic Apple Barn with the proposed new building #4 propose a 18' by 36' single storey 12 foot high (interior) passageway linking the historic Apple Barn (building #5) with the proposed new building #4. This will necessitate the removal of approximately 37' linear feet of original wall material on the west elevation of the Apple Barn. In proportion to the extent of the remaining exterior wall material of the entire barn, this is not a significant impact, however, removal of the wall material will contribute to the collective impacts of the overall project.

The exterior of the link will be sheathed in cement plaster to differentiate the historic from the new construction. Black framed aluminum, full height commercial windows on both elevations of the link and low display shelving/standards within the connecting link will allow for transparency and thereby minimize the impact of new, adjacent construction massing. It was understood during the consulting process that the parapet would be 3' 6" foot high continuing from the roofline for a total of just over 16 feet of wall plane height. However, the plans show a 5' parapet that will increase the height of the wall plane of the link. The height of the link's wall plane should be minimized as much as possible to meet the SIS.

In addition, the Preservation Plan states that the Apple Barn will be set apart from other buildings and able to be viewed on all sides (pg32). According to the plans reviewed this will not be the case. The Preservation Plan should correct this and all other statements that do not reflect the most current plans.

10. Relocation of Apple Barn.

The historic context of the site of the Apple Barn has been significantly changed over the years due to the demolition/removal of the other apple industry buildings, structures and objects, and road realignment. While relocation of buildings is generally not desired, except as a last resort to demolition, the barn's setting is not original. In this case, the relocation is not significant but will contribute to the collective impacts of the overall project. Its retention on the site is appropriate for this situation, however the Preservation Plan should correct statements about the visibility of the barn.

11. Review "Evaluation of Integrity" (page 70-73). Will the building retain sufficient integrity after relocation and alterations to remain eligible for listing? Note the conclusion on page 73 – does it really maintain most aspects of integrity, if several aspects are lost or diminished?

As discussed above, the historic context of the site of the Apple Barn has been significantly changed. What integrity that remains of the building itself will be retained/repaired to a sufficient level that it will maintain most aspects of integrity. Remember that there is no "magic number" or percentage defining what the National Park Service meant by "most". The rule of thumb is to weigh and prioritize the character defining features that convey its historic significance - in this case - that of the last industrial building related to the apple industry in Aptos.

B. Please evaluate approach for moving building – how can we ensure that building will not collapse when it is moved? Is peer review by another engineer warranted?

Kelly Bros. House Movers are highly regarded professionals. I am confident that the approach they plan will be protective. However, during the relocation, setting on the new foundation, etc. should be monitored by knowledgeable professionals.

C. Please recommend conditions to ensure that historic materials, including interior columns, siding, roof beams and rafters, are evaluated for retention, repair, or replacement only if they cannot be repaired, so that only those materials that cannot be repaired are replaced, and that replacement is with in-kind materials. Please recommend qualifications for an appropriate professional to make these assessments.

Careful analysis of true areas of decay must be identified so that any replacement and/or repairs are isolated and appropriate. A qualified architectural conservator should be consulted to ensure that historic materials are protected. This would include identification and recommendations of such repair/replacement, and monitoring.

In addition, the Preservation Plan states that the Bayview Hotel, which is on the National Register, will remain the focal point of the streetscape. The hotel is indeed a handsome, commanding building along the streetscape. To protect the hotel's integrity extensive precautions should be made both around the demolition zone (of the former Aptos Firehouse) and around the construction zone, including dust and vibration monitoring, and movement of construction equipment.

Summary:
The proposed Aptos Village project requires the demolition of the former Aptos Firehouse; relocation of the historic Apple Barn on site, including change in orientation of the building; removal of contributing character-defining features (CDFs) such as the loading docks and removal of interior floorboards; covering of interior single wall construction; increase in building height/new steel pedestals at building interior at base of columns; the removal of

CIRCA Historic Property Development

wall material to construct a linking passageway; and construction of a new addition (the linking passageway) to adjoin the historic with an adjacent new building.

In general, Circa finds that the proposed changes/demolition and new construction/alterations, when added together, will have an effect on the historic resource (the Apple Barn). However, with the mitigations recommended below, the impacts of the project would be reduced to less than significant. The most significant impacts, both individually and collectively, are the proposed new "link" and the removal of the loading docks. The proposed new link will require removal of wall material and introduce a new element (addition) to the historic Apple Barn. To reduce the impact of the new construction, the new link should be of minimal massing and height, and of maximum transparency[2]. The Apple Barn's loading docks convey the building's historic use as a warehouse/packing plant and therefore its historic significance as a historic resource meeting the criteria as a County Landmark and listing on the California Register of Historic Resources, as well as potentially eligible for the National Register of Historic Places. For CEQA purposes (as discussed above), to reduce the proposed project impacts from Significant to Less-Than-Significant the loading docks must be retained.

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy
Principal, Circa: Historic Property Development

[2] See memo date June 6, 2011 from Circa to Annie Murphy.

EXHIIBIT G

CIRCA Historic Property Development

June 6, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

Re: Aptos Village - Apple Barn Link

Annie,

Circa: Historic Property Development (Circa) recently assisted the County of Santa Cruz with reviewing and recommending revisions to draft plans (dated May 5, 2011) for the proposed Aptos Village Apple Barn rehabilitation project, specifically the new "link" or hyphen section connecting the historic Apple Barn with the proposed new building #4.

Internally the linking of the Apple Barn and Building #4 will allow for a new use within the existing footprint of the historic Apple Barn while accommodating the full needs of a (planned) grocery store in the expanded area of the ground floor of building #4. The plans propose a 18' by 36' single storey 12 foot high (interior) passageway linking the historic Apple Barn (building #5) with the proposed new building #4, necessitating the removal of approximately 37' linear feet of original wall material on the west elevation of the Apple Barn. The exterior of the link will be sheathed in cement plaster to differentiate the historic from the new construction. Black framed aluminum, full height commercial windows on both elevations of the link and low display shelving/standards within the connecting link will allow for transparency and thereby minimize the impact of new, adjacent construction massing. It was understood during the consulting process that the parapet would be 3' 6" foot high continuing from the roofline for a total of just over 16 feet of wall plane height. However, the plans show a 5' parapet that will increase the height of the wall plane of the link. The height of the link's wall plane should be minimized as much as possible to meet the Secretary of Interior Standards (SIS).

In conclusion, the proposed "link" is generally consistent with the SIS for Rehabilitation; however, reduction of the link's roof and parapet height would further minimize the structure's overall presence and allow the historic Apple Barn to be interpreted as a separate building.

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy

Sheila McElroy
Principal, Circa: Historic Property Development

EXHIBIT H

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code
Other Listings
Review Code
Reviewer
Date

Page 1 of 2 *Resource Name or #: (Assigned by recorder) 417 Trout Gulch Road

P1. Other Identifier: Hihn Apple Packinghouse

*P2. Location: ☐ Not for Publication ☒ Unrestricted a. County: Santa Cruz

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

b. USGS 7.5' Quad Soquel Date 1994 Revised T 11S R 1E B.M. Mt. Diablo

c. Address 417 Trout Gulch Road City Aptos Zip 95003

d. UTM: (Give more than one for large and/or linear resources) Zone 10S 598022mE 4092319mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Assessor's Parcel Number: 041 011 33

*P3a Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

CONTRIBUTING BUILDING (NR 3D)
The Hihn Apple Packinghouse is located at 417 Trout Gulch Road. Constructed in the early 1890s for Frederick Hihn, this building served as an apple-packing barn for many years.

This building is comprised of three distinct bays. It is probable that a mudsill foundation supports the walls that are clad in board and batten and vertical wood siding. Three side-by-side monitor roofs, sheathed in metal, crown this primarily rectangular-shaped barn. The present-day entrance is located on the southwest end and and is denoted by two large sliding doors, each with decorative spindles. A porch added at an unknown date wraps around the building part of the southwest end, the southeast side, and a portion of the northeast end of the building. The roof over the porch is supported by square posts that are evenly spaced between the ornate balustrades of wood cutouts. Lattice is located above the balustrade and stops approximately twelve to sixteen inches below the roofline. Many of the original openings for doors and windows are still (Continued page 2)

*P3b. Resource Attributes: (List attributes and codes) HP6, HP8 - Apple Packing Facility

*P4 Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☒ Element of District ☐ Other (Isolates, etc.)

P5b. Description of Photo: (View, date, accession #)
Photo of the northeast elevation.
June 2002, K. Oosterhous

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both
Early 1890s

*P7. Owner and Address:
Patricia Toney Thompson &
Gail T. Costello
P.O. Box 391
Aptos, CA 95002

*P8. Recorded by: (Name, affiliation, and address)
Kara Oosterhous
Dill Design Group
110 N Santa Cruz Ave
Los Gatos, CA 95030
Charlene Duval (Consultant)

*P9. Date Recorded: 06/02 Rev 3/7/03

*P10. Survey Type: (Describe)
Reconnaissance

*P11. Report Citation: (Cite survey report and other sources or enter none) None

*Attachments: ☐ NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☐ Building, Structure and Object Record ☐ Archaeological Record
☒ District Record ☐ Linear Feature Record ☐ Milling State Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

State of California -- The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary # 4
HRI # 3
Trinomial

Page 2 of 2 Resource Name or # (Assigned by Recorder) 417 Trout Gulch Road

Recorded By: K. Oosterhous & C. Duval Date: 8/31/02 Rev 3/7/03 ___ Continuation _X_ Update

present but have been infilled with sheets of plywood or vertical wood siding. Many of the original large sliding doors are intact while only the hinges and track remain for others. This barn, which currently serves as an antique shop, is set in the commercial center of Aptos, which is comprised of both historic and non-historic income producing businesses. It is also a contributing resource to the Aptos Village Historic District. Despite the new construction, this area of Aptos still possesses a sense of place. Overall, this building possesses integrity of location, setting, design, feeling, association, workmanship, and materials as it remains true to its historic design and appearance. This building may become eligible for individual listing on the National Register if additional research provides a stronger statement of significance.

History

The apple packing and distribution history of Aptos began quickly upon the completion of Frederick Hihn's narrow gage railroad, the Santa Cruz-Pajaro line of the Santa Cruz Railroad. Oral histories credit Hihn with the first packing sheds in 1878, but early maps show no such use of the existing Village Fair buildings before 1892. Following the decline of the lumbering industry, apple packing was concentrated at the site in several buildings, including Hihn's early packing shed. A 1905 photo includes a packing shed identical in appearance to the current Village Fair shops. Mid-County historian Vincent Leonard noted that additions to Hihn's packing shed were made in 1899, 1915, and 1920, before the first structure was removed in the early 1950s by Aptos promoter Fred Toney. Numerous photographs from the Paul Johnston collection depict the activities in the sheds, where Aptos area women found employment during the long fall through winter season grading and packing apples for shipment, and local men made pinewood apple boxes at award-winning speed. With the advent of lug hauling by truck in the 1920s and 30s, the Aptos packing industry withered. The remaining packing sheds dating from 1899 found new life as Village Fair, a collection of antique shops. The industrial style buildings offer a rich reminder of the mid-county's agricultural history and apple heyday (Quoted directly from survey document research and produced by the firm of Bonnie L. Bamburg, April 1985, amended by Edna Kimbro in 1988).

Sources

Bamburg, Bonnie.
1985 *Survey Document.*

EXHIBIT H

State of California — The Resources Agency
DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

Ser. No. - 81 -
HABS ___ HAER ___ Loc ___ SHL No. ___ NR Status 5
UTM: A 10/597994.4092835 C ___
B ___ D ___

IDENTIFICATION

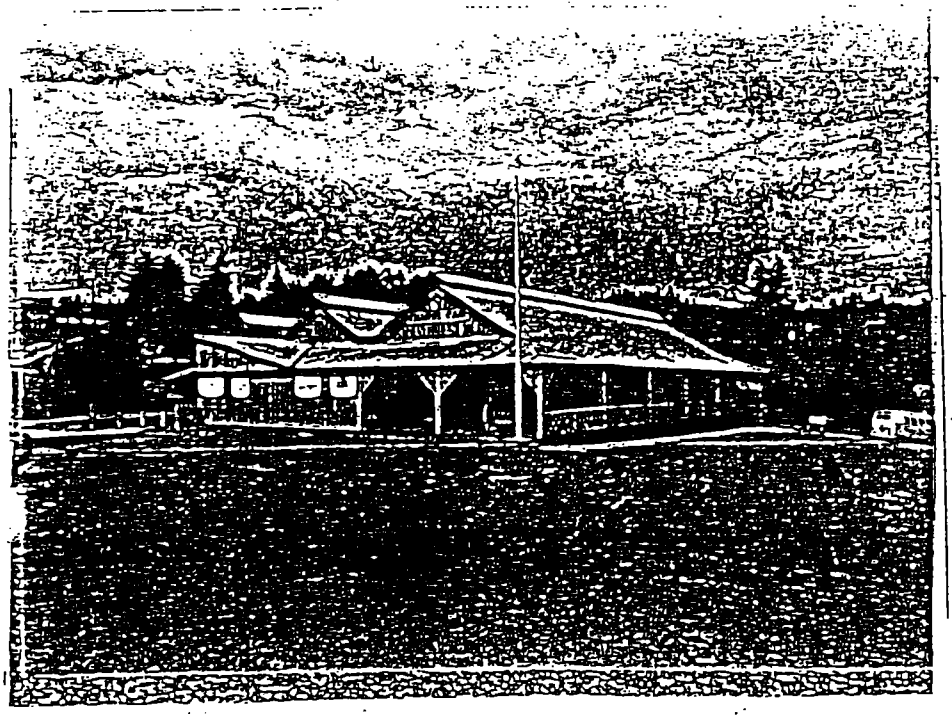
1. Common name: Village Fair
2. Historic name: Apple Packing Sheds
3. Street or rural address: 417 Trout Gulch Road
   City Aptos Zip 95003 County Santa Cruz
4. Parcel number: 41-011-05
5. Present Owner: Fred & Elma Toney Address: P. O. Box 391
   City Aptos Zip 95003 Ownership is: Public ___ Private Y
6. Present Use: Retail Original use: Apple Warehouse

DESCRIPTION

7a. Architectural style: Wood Warehouse

7b. Briefly describe the present *physical appearance* of the site or structure and describe any major alterations from its original condition:

1e story rectangular warehouse structure. Four structures with medium itched gable roofs that extend at each end and slope along the side to form canopy over long porches (formerly loading areas). Canopy supports are s with carpenter cut-out decorative braces. A decorative railing lines porch. The structures are sheathed in vertical board.



8. Construction date:
   Estimated ___ Factual 1890
9. Architect Unknown
10. Builder Unknown
11. Approx. property size (in feet)
    Frontage 336 Depth 400
    or approx. acreage 3 ACRES
12. Date(s) of enclosed photograph(s)
    May 1986

EXHIBIT H

Condition: Excellent ___ Good ___ Fair X Deteriorated ___ No longer in existence ___

Alterations: Altered to accomodate retail use - decorative woodwork

Surroundings: (Check more than one if necessary) Open land ___ Scattered buildings ___ Densely built-up ___
Residential ___ Industrial ___ Commercial X Other: ___

Threats to site: None known X Private development ___ Zoning ___ Vandalism ___
Public Works project ___ Other: ___

Is the structure: On its original site? X Moved? ___ Unknown? ___

Related features: ___

NIFICANCE

Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site.)

The apple packing and distribution history of Aptos got off to an abrupt start with the completion of Frederick Hihn's narrow gauge, the Santa Cruz-Pajaro line of the SAnta Cruz Rail Road. Oral histories credit Hihn with the first packing sheds in 1878, but early maps show no such use of the existing Village Fair buildings before 1892. Following the decline of the lumbering industry, apple packing was concentrated at this site in several buildings, including Hihn's early packing shed. A 1905 photo includes a packing shed identical in appearance to the current Village Fair shops. Mid-COunty historian Vincent Leonard noted that additions to Hihn's packing shed were made in 1899, 1915 and 1920, before the first structure was removed in the early 1950s by APtos promotor Fred Toney. Numerous photographs from the Paul Johnston collection depict the activities in the sheds, where APtos area women found employment during the long fall through winter season grading and packing apples for shipment, and local men made pinewood apple boxes at award-winning speed. With the advent of lug hauling by truck in the 1920s and 30s, the APtos packing industry withered. The remaining packing sheds dating from 1899 found new life as Village Fair, a collection of antique shops. The industrial style buildings offer a rich reminder of the mid-county's agricultural history and apple heydays.

20. Main theme of the historic resource: (If more than one is checked, number in order of importance.)

Architecture ___ Arts & Leisure ___
Ecor mic/Industrial 1 Exploration/Settlement ___
Go ment ___ Military ___
S ion ___ Social/Education ___

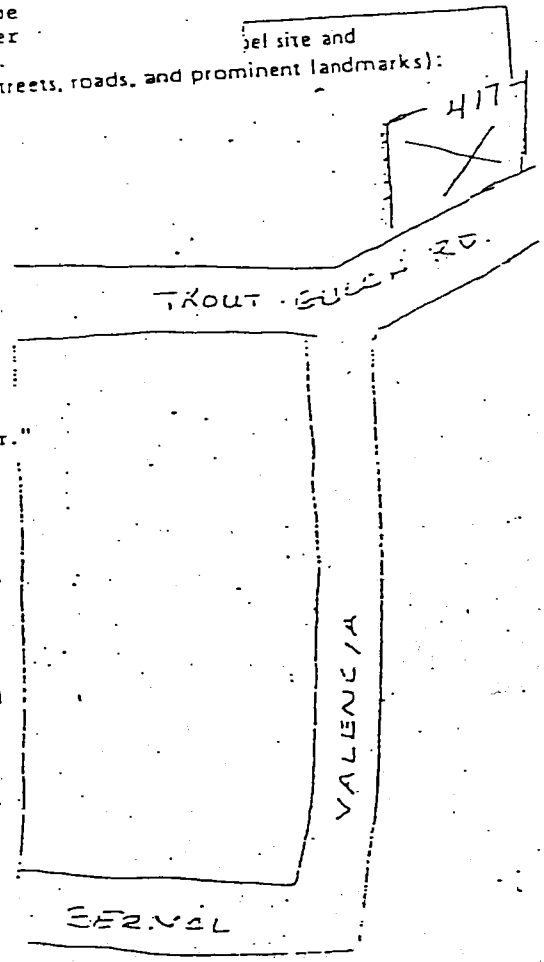
21. ources (List books, documents, surveys, personal interviews and their dates).

Ryan interview files: Vincent Leonard, Paul D. Johnston, 1978, 1985-86.
Vincent Leonard, Aptos Green Sheet n.d., "When Aptos was an apple center."
Aptos Public Library files.
Ralph D. Mattison, correspondence, 1988.
Richard G. Polse, correspondence, 1988.
Sanborn Insurance Maps, 1888-1908.

22. Date form prepared April 1988
By (name) The Firm of
Organizati BONNIE L. BAMBURG
Address: 247 W. Third Street
City San Jose, CA 95112 Zip
Phone: ( ) 971-1421

Amended by Edna Kimbro (9/88)

bel site and surrounding streets, roads, and prominent landmarks):



State of California – The Resources Agency Primary #
DEPARTMENT OF PARKS AND RECREATION HRI #
PRIMARY RECORD Trinomial
NRHP Status Code
Other Listings
Review Code Reviewer Date

Page 1 of 3 *Resource Name or #: (Assigned by recorder) 8041 Soquel Drive

P1. Other Identifier: Bay View Hotel

*P2. Location: ☐ Not for Publication ☒ Unrestricted a. County: Santa Cruz

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

b. USGS 7.5' Quad Soquel Date 1994 Revised T 11S R 1E B.M. Mt. Diablo

c. Address 8041 Soquel Drive City Aptos Zip 95003

d. UTM: (Give more than one for large and/or linear resources) Zone 10S 597962mE 4092738mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Assessor's Parcel Number: 041 011 34

*P3a Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

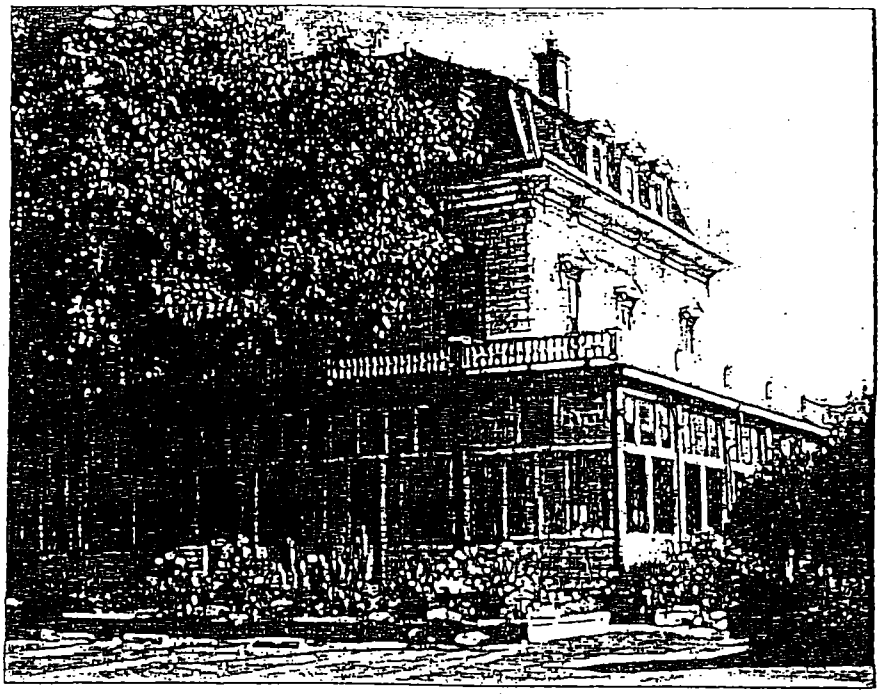
CONTRIBUTING BUILDING (NR 1D)

The Bay View Hotel is located at 8041 Soquel Drive. Constructed in 1878 at the corner of Soquel and Trout Gulch Road, the hotel was moved in 1946 to its present-day location. This hotel is a good example of the Second Empire architectural style.

This frame-constructed building, clad in Channel Rustic siding, sits atop what appears to be a cripplewall on concrete perimeter foundation. The style-defining mansard roof - clad in composition shingles and pierced by a red brick chimney - shelters what was originally a square floor plan. Later rear additions have made the present-day floor plan more rectangular. A wrap-around two-story front porch dominates the south and east elevations. Square Tuscan columns support the flat roof of the porch that is now enclosed with glass and V-groove siding and serves as a dining area. Large heavily ornamented brackets are located beneath the slightly overhanging eaves that shelter a dentil frieze and panel entablature. (Continued page 2)

*P3b. Resource Attributes: (List attributes and codes) HP5

*P4 Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☒ Element of District ☐ Other (Isolates, etc.)



P5b. Description of Photo: (View, date, accession #)
Photo of the south elevation.
June 2002, K. Oosterhous

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both

1878

*P7. Owner and Address:
Christina Locke
300 Newpark Mall Rd, #104
Newark, CA 94560

*P8. Recorded by: (Name, affiliation, and address)
Kara Oosterhous
Dill Design Group
110 N Santa Cruz Ave
Los Gatos, CA 95030
Charlene Duval (Consultant)

*P9. Date Recorded: 06/02 Rev 3/7/03

*P10. Survey Type: (Describe)
Reconnaissance

*P11. Report Citation: (Cite survey report and other sources, or enter none) Bay View Hotel National Register Nomination, 30 March 1992.

*Attachments: ☐ NONE ☐ Location Map ☐ Sketch Map ☐ Continuation Sheet ☐ Building, Structure and Object Record ☐ Archaeological Record ☒ District Record ☐ Linear Feature Record ☐ Milling State Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

State of California – The Resources Agency — Primary #
DEPARTMENT OF PARKS AND RECREATION — HRI #
CONTINUATION SHEET — Trinomial

Page 2 of 3 — Resource Name or # (Assigned by Recorder) 8041 Soquel Drive

Recorded By: K. Oosterhous & C. Duval — Date: 8/31/02 Rev 3/7/03 — ___ Continuation — X Update

Two-over-two windows with wood sash and wood window casings fenestrate the oldest portion of the house. First story windows are topped with a decorative crown while second story windows are topped with heavy pediments and decorative brackets. Dormer windows are one-over-one, double-hung with wood sash. Other architectural accents include the quoining on the edges of the building made of wood to simulate stone, elaborately cut balustrade on the porches, and bay window projections. A large addition, which serves as the commercial-style kitchen and a small living area has been added to the rear of the original building.

Historic plantings associated with the house include a mature Magnolia tree and rosebush.

This historic hotel is set in the commercial center of Aptos, which is comprised of both historic and non-historic income producing businesses. It is also a contributing resource to the Aptos Village Historic District. Despite the new construction, this area of Aptos still possesses a sense of place. Overall, this building possesses integrity of location, setting, design, feeling, association, workmanship, and materials as it remains true to its historic design and appearance.

History

The Bay View Hotel, originally named the Anchor House, was constructed in 1878 by Joseph and Augstia Arano. Augustia was the daughter of Rafael Castro, grantee of Rancho Aptos. The one-acre piece of property for the hotel was purchased from Augustia's sister and husband, Maria Antonia and Guadalupe Bernal on November 7, 1872. On June 1, 1878, the *Santa Cruz Sentinel* announced that a contract had been let to J. E. Doyle & Co. for $3,268. Local historian Sandy Lydon attributes the architecture to Thomas Beck who built other similar style buildings during this period. Upon its completion, the Aranos moved from their home located on Aptos Wharf Road. Jose Arano was born in Barcelona Spain, and immigrated to California in 1852. In 1862, he and Augustia Castro married. In 1867, they leased the property where their first home stood on Wharf Road from Rafael Castro. This home had been the first store and post office in the area. The new location was ideally located adjacent to the new Santa Cruz Narrow Gauge Railroad, which was completed as far as Aptos in 1875. The Aranos moved their grocery store into the main floor of the hotel. Augustia died in 1896; Jose lived until 1928, wh[illegible] he died in the hotel. The hotel's dining room, which was attached to the rear of the building, burned in 192[illegible], but the original structure remained intact. In 1929, Edward Arano, the son of Jose and Augustia, renovated the hotel. In 1942, the hotel was sold to Fred and Elma Toney by Amelia Arano. In 1946, the building was moved west to its present location and a fourth floor attic constructed. Fred and Elma Toney passed away in 1979, his daughter's maintained ownership until selling the hotel in 1989 to Bayview Partners who operate a bed and breakfast in the building. In 1992, the building was placed on the National Register of Historic Places.

Sources:


Collins, A.
1990 The Hostels of Aptos, Historical Sketches. Ms prepared for Charles P. Holcomb.

Craigo, S. R.
1992 Letter to Joan Brady, County of Santa Cruz Planning Department concerning placement of the Bayview Hotel on the National Register of Historic Places. 7 May.

Elliott, W. W. (Pub.)
1879 *Santa Cruz County, California.* San Francisco: W. W. Elliott.

Gibson, R.
1994 The Spirit of Aptos, 116-Year-Old Hotel to Become Landmark. *San Jose Mercury News*, 26 April.

Lydon, S.
1990 Canyons, Tracks and Bridges Keep Aptos Stroll Interesting. *Santa Cruz Sentinel*. 15 July.

Santa Cruz Evening News
1929 Memories of Don Rafael Castro and his Day when California's Historic Hospitality Thrived. 16 May.

Santa Cruz County
1872 Bernal to Arano. Deed Book 15:204.

*Santa Cruz Sentinel*
1875 Great Event of the Season. Formal Opening of the S.C.N.G.R.R. to Aptos. 22 May.

1875 Jos Arano. 6 November.


*Required Information

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI #
Trinomial



Resource Name or # (Assigned by Recorder) 8041 Soquel Drive

Recorded By: K. Oosterhous & C. Duval Date: 8/31/02 Rev 3/7/03 X Continuation ___ Update

Swift, C.
n.d. The Heart of Aptos Village. *The Mid-County Post*. Clipping on file at the Aptos Museum/Aptos Chamber of Commerce.

Toney, F.
1979 Personal communication with C. Detlefs [Duval] and tour of Bay View Hotel.

Wilcox, Kay
1984 The Bay View Hotel. MS prepared for History of Santa Cruz, Sandy Lydon, Instructor, Cabrillo College.

, DEPARTMENT OF PARKS AND RECREATION

HISTORIC RESOURCES INVENTORY

HABS___ HAER___ Loc___ SHL No.___ NR ~~SAN1041~~ M

UTM: A 10/597937.4092792 C___

B___ D___

IDENTIFICATION

1. Common name: Bay View Hotel
2. Historic name: Anchor Hotel
3. Street or rural address: 8041 Soquel Drive

City Aptos Zip 95003 County Santa Cruz

4. Parcel number: 041-011-31
5. Present Owner: BAYVIEW PARTNERS Address: 331 Capitola Ave.

City Capitola, CA Zip 95010 Ownership is: Public ___ Private Y

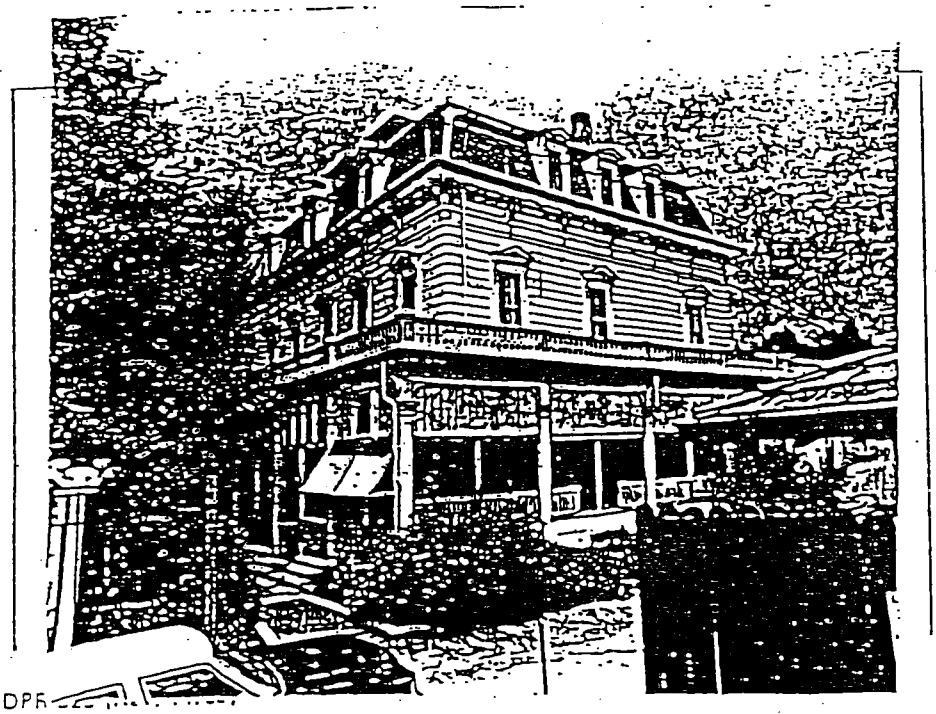
6. Present Use: Restaurant Original use: Hotel

DESCRIPTION

7a. Architectural style: Italianate

7b. Briefly describe the present *physical appearance* of the site or structure and describe any major alterations from its original condition:

This three story structure was originally a two story rectangular structure of Italianate proportions. The addition of the Mansard roof third story was a roof raising that left the hipped roof in tact above a new floor. Dormers in this band have elaborate molded and bracketed triangular pediments as do the windows of the second floor. Classic Italianate details quions, brackets, and decorated frieze bands are all present. The first floor is surrounded on two sides by a wide veranda that has been enclosed. A decorative rail surmounts the veranda creating an upper porch or deck.



DPR

8. Construction date: Estimated ___ Factual 1871
9. Architect Unknown
10. Builder Unknown
11. Approx. property size (in feet) Frontage 100 Depth 260 or approx. acreage 1.143
12. Date(s) of enclosed photograph(s) May 1986

EXHIBIT H

Condition: Excellent ___ Good X Fair ___ Deteriorated ___ No longer in existence ___

Alterations: ~~Raised Roof Extension to the rear~~

Surroundings: (Check more than one if necessary) Open land ___ Scattered buildings ___ Densely built-up X
Residential ___ Industrial ___ Commercial Y Other: ___

Threats to site: None known X Private development ___ Zoning ___ Vandalism ___
Public Works project ___ Other: ___

Is the structure: On its original site? ___ Moved? X Unknown? ___

Related features: ___

SIGNIFICANCE

Briefly state historical and/or architectural importance (include dates, events, and persons associated with the site.)

eveloped by Jose Arano to accommodate visitors to Aptos, the Bay View Hotel
s host to many famous persons, many of whom came to visit Claude Spreck-
les. King Kalakaua and Lillian Russell are reported to have been guests of
he hotel. The hotel functioned during the lumbering of the redwood trees
nd closed in the early 1900s. In 1944 the hotel was moved 100 feet and
pened as a restaurant. Restaurant owners Fred an Elma Toney were renowned
or the fine food served at the Bay View. Since its construction, the Bay
iew Hotel has been the architectural focal point in Aptos Village.

20. Main theme of the historic resource: (If more than one is checked, number in order of importance.)

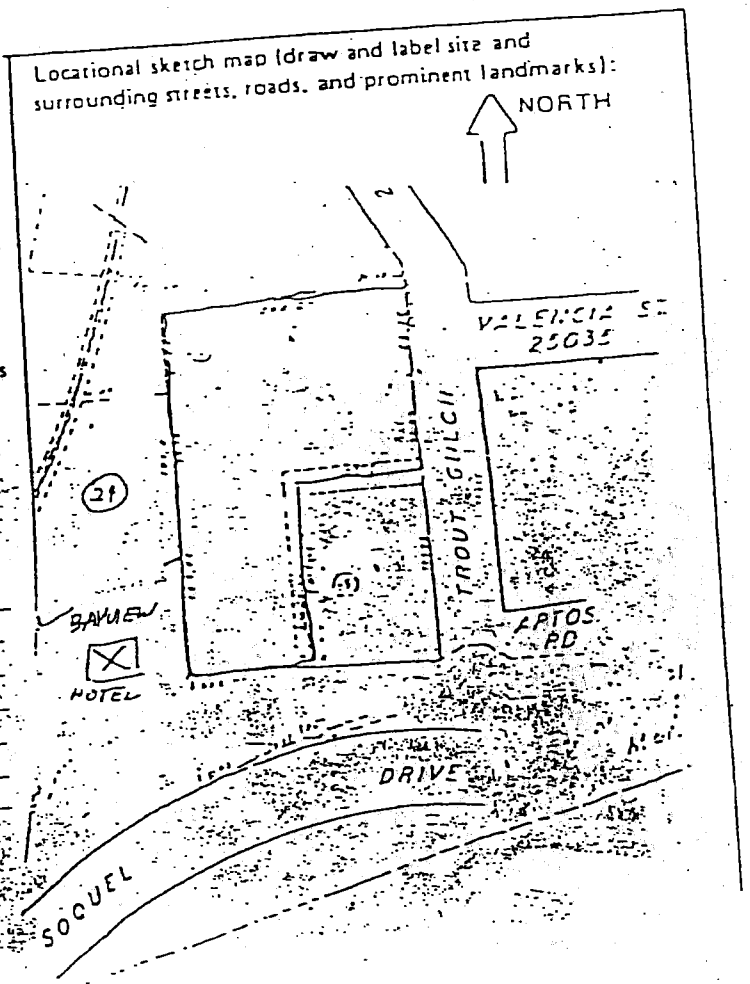
Architecture 1 Arts & Leisure ___
Economic/Industrial ___ Exploration/Settlement 2
Government ___ Military ___
Religion ___ Social/Education ___

21. Sources (List books, documents, surveys, personal interviews and their dates).

Sanborn Maps 1888, 1906
Parade of the Past, Margaret Koch
American Architecture Since 1760, Whiffen

22. Date form prepared ~~April 1985~~
By (name) ~~The Firm of~~
Organization ~~DUANE L. BAMBURG~~
Address: ~~247 N. Third Street~~
City ~~San Jose, CA~~ ~~95112~~ Zip
Phone: ~~(408) 971 1421~~

Locational sketch map (draw and label site and surrounding streets, roads, and prominent landmarks):



Anchor Hotel-Bay View (8041 Soquel Drive)

## ADDENDUM—1994

PHYSICAL INSPECTION

Date: April 8, 1994

Result of Inspection: No apparent structural change.

CONSULTANT'S PRELIMINARY RECOMMENDATIONS:
Structure has been listed in the National Register of Historic Places. Change designation to 1.

(Change of rating pending public hearing before the Historical Resources Commission with final approval by the Board of Supervisors).

Context: 1 (tourism), 2 (architecture)
Property type: hotel

NPS Form 10-900
(Rev. 8-86)

OMB No. 1024-0018

EXHIBIT H

United States Department of the Interior
National Park Service

# National Register of Historic Places Registration Form

FEB 2 8 1991

This form is for use in nominating or requesting determinations of eligibility for individual properties or districts. See instructions in *Guidelines for Completing National Register Forms* (National Register Bulletin 16). Complete each item by marking "x" in the appropriate box or by entering the requested information. If an item does not apply to the property being documented, enter "N/A" for "not applicable." For functions, styles, materials, and areas of significance, enter only the categories and subcategories listed in the instructions. For additional space use continuation sheets (Form 10-900a). Type all entries.

## 1. Name of Property

historic name: Bayview Hotel

other names/site number: Anchor House, Bay View Hotel, Hotel Bay View, Hotel Bayview

## 2. Location

street & number: 8041 Soquel Drive ☐ not for publication

city, town: Aptos ☐ vicinity

state: California code: CA county: Santa Cruz code: 087 zip code: 95003

## 3. Classification

| Ownership of Property | Category of Property | Number of Resources within Property | |
|---|---|---|---|
| | | Contributing | Noncontributing |
| [X] private | [X] building(s) | 1 | ____ buildings |
| [ ] public-local | [ ] district | ____ | ____ sites |
| [ ] public-State | [ ] site | ____ | ____ structures |
| [ ] public-Federal | [ ] structure | ____ | ____ objects |
| | [ ] object | 1 | 0 Total |

Name of related multiple property listing: NA

Number of contributing resources previously listed in the National Register: 0

## 4. State/Federal Agency Certification

As the designated authority under the National Historic Preservation Act of 1966, as amended, I hereby certify that this [ ] nomination [ ] request for determination of eligibility meets the documentation standards for registering properties in the National Register of Historic Places and meets the procedural and professional requirements set forth in 36 CFR Part 60. In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of certifying official — Date

State or Federal agency and bureau

In my opinion, the property [ ] meets [ ] does not meet the National Register criteria. [ ] See continuation sheet.

Signature of commenting or other official — Date

State or Federal agency and bureau

## 5. National Park Service Certification

I, hereby, certify that this property is:

[ ] entered in the National Register.
[ ] See continuation sheet.

[ ] determined eligible for the National Register. [ ] See continuation sheet.

[ ] determined not eligible for the National Register.

[ ] removed from the National Register.

[ ] other; (explain:) _____

Signature of the Keeper — Date of Action

EXHIBIT H

6. Function or Use

Historic Functions (enter categories from instructions)
Domestic/Hotel

Current Functions (enter categories from instructions)
Domestic/Hotel

7. Description

Architectural Classification (enter categories from instructions)
~~Late Victorian~~/Italianate

Materials (enter categories from instructions)
foundation Concrete
walls Wood/Weatherboard
roof Wood/Shake
other

Describe present and historic physical appearance.

The Bayview Hotel is an imposing three story building that dominates the surrounding small commercial district of Aptos Village both by its size and its stately Italianate style. The arrangement of windows, dormers and brackets is extremely orderly on all sides, giving the building a dignified appearance from any view.

The walls of the first two floors are covered with shiplap siding, finished with quoins at all corners. A porch extends across the entire front (southern) facade and wraps around half of the eastern side as well. Originally open, the porch was partially enclosed with glass around 1946; its original chamfered posts and decorative scrollwork remain intact. A shallow course of platform stairs runs the full length of the porch. The porch is topped with a scrollwork balustrade. Entrance to the hotel is through two doors at either end of this facade. (Originally there were three identical panelled doors with transoms above; two of these now fall within the enclosed porch, but remain intact.) The first floor windows are tall 2/2 double hung, with decorated lintel and surround.

Windows on the second floor repeat the tall 2/2 shape of the first floor, but are topped with triangular pediments supported by brackets. Setting off the second floor from the mansard roof is a boxed cornice and frieze; the frieze decorated with panels and substantial regularly spaced brackets. Wooden letters attached to the frieze spell Bay View Hotel on the south and west sides.

The mansard roof that comprises the third floor is covered with wood shakes, as is the hipped roof above. Projecting from the third floor mansard on all sides are gabled dormers with pediments, and 2/2 double hung windows as on the second floor. The north face of the mansard has four flush windows of various shapes as well. A very simple pipe railing, installed after 1946, runs around the perimeter of the mansard roof. Historic photographs and illustrations indicate that the mansard was originally topped with a wooden balustrade; a tall cupola with bellcast mansard, cresting and flagpole rose from the center. The removal of the cupola appears to have occured between 1896 and 1918. The hipped roof, added at that time, has two squat hipped dormers on the south side.

The north side of the hotel is the "service" side, with a small back porch similar in construction to the front. Overgrown utility sheds project at the northwest side; a one-story cement block utility building with shed roof and metal windows has been added at t north east corner. Between them is a simple patio of relatively recent origin.

In front of the hotel is a huge magnolia tree which contributes to the well-established tmosphere. In the landscaped area immediately to the west is a recently-constructed izebo of wood and lattice.

The Bayview Hotel was moved in 1946 approximately 60 feet to its current site. The orientation of the hotel to the town, street and railroad as recorded in aerial photographs was not altered, and the Bayview Hotel remains the most significant landmark of Aptos Village as it has for over 100 years.

☐ See continuation sheet

EXHIBIT H

## Statement of Significance

Certifying official has considered the significance of this property in relation to other properties:
☐ nationally ☐ statewide ☒ locally

Applicable National Register Criteria ☒ A ☐ B ☐ C ☐ D

Criteria Considerations (Exceptions) ☐ A ☒ B ☐ C ☐ D ☐ E ☐ F ☐ G

Areas of Significance (enter categories from instructions)
Commerce
Entertainment/Recreation
Architecture

Period of Significance
1878-1919

Significant Dates
1878

Cultural Affiliation
NA

Significant Person
NA

Architect/Builder
J.E. Doyle and Company

State significance of property, and justify criteria, criteria considerations, and areas and periods of significance noted above.

SUMMARY: The Bayview Hotel represents a type of construction that occurred during a period of economic development throughout Santa Cruz County in the 1870s as rail lines were extended to once-remote areas, leading to parallel expansion of both tourism and commerce. Joseph Arano, already a successful merchant, chose the Aptos location specifically because of the newly-established rail connection. The hotel was designed to serve a "first class" clientele of travelers, business visitors, and well-to-do vacationers, all of which were being attracted to the area. Two other comparable hotels were built in the area around the same time, but these no longer exist. Because of its quality design and construction, its size in relation to adjoining buildings, and its function as a hub of social activity, the Bayview Hotel was from the beginning a focus point for the community. Although the hotel fell into a period of disuse between the two wars, at a time when the county's economy was virtualy stagnant, it has in recent years revived to play its historic role.

☒ See continuation sheet

## Major Bibliographical References

Elliott, Wallace; Santa Cruz County Illustrations; San Francisco, 1879
Francis, Phil; Santa Cruz County; Santa Cruz, 1896
Register Pajaronian; Sept. 22, 1928
id; November 19, 1975
Santa Cruz County Historical Trust; photo clipping files
Santa Cruz Sentinel; March 27, 1875
Ibid; July 13, 1878
Ibid; Sept. 21, 1878
University of California at Santa Cruz; Special Collections photo files
Wulf, William; Early History of Hotels of Aptos; Unpublished Ms., 1977
Aptos Branch Library

☐ See continuation sheet

Previous documentation on file (NPS):
- ☐ preliminary determination of individual listing (36 CFR 67) has been requested
- ☐ previously listed in the National Register
- ☐ previously determined eligible by the National Register
- ☐ designated a National Historic Landmark
- ☐ recorded by Historic American Buildings Survey # _____
- ☐ recorded by Historic American Engineering Record # _____

Primary location of additional data:
- ☐ State historic preservation office
- ☐ Other State agency
- ☐ Federal agency
- ☒ Local government
- ☐ University
- ☐ Other

Specify repository: Aptos Branch, Santa Cruz City-County Library System

## 10. Geographical Data

Acreage of property 1.5 acres

UTM References

| | Zone | Easting | Northing |
|---|---|---|---|
| A | 10 | 597965 | 4092750 |
| B | | | |
| C | | | |
| D | | | |

☐ See continuation sheet

### Verbal Boundary Description

The nominated property occupies county parcel #41-011-31 located in the community of Aptos. This parcel measures approximately 100' x 300' fronting on Soquel Drive, with a 20' easement extending from the northeast corner to Trout Gulch Road.

☐ See continuation sheet

### Boundary Justification

The boundary includes the entire parcel on which the Bayview Hotel is located.

☐ See continuation sheet

### Form Prepared By

name/title Doreen Ferguson, Cynthia Mathews, Micki Ryan
organization Santa Cruz County Historical Trust date 9-30-89
street & number 118 Cooper Street telephone 408-425-2540
city or town Santa Cruz state CA zip code 95060

United States Department of the Interior
National Park Service

# National Register of Historic Places Continuation Sheet



Local Historical Context

The area of central coastal California that was to be politically defined as Santa Cruz County has consistently attracted settlement by its natural resources. Abundantly endowed with copiously flowing freshwater streams, loamy bottomlands, heavily forested hills, subsurface mineral deposits, and diverse maritime resources, the area attracted a series of prehistoric settlers from 12,000 BP. The well favored area was selected as a Spanish mission site in 1791, and as one of only three Alta California pueblos, Villa de Branciforte, in 1796. By 1810 the mission at Santa Cruz had profoundly disrupted pre-contact settlement patterns through depletion of the native local population, while the mission's limited subsistence agriculture and grazing economy had little impact on the natural resources. Secularization of mission lands under the Mexican political regime brought little change in broad patterns of land use, and repopulation by Mexican settlers never reached the numbers estimated in local residence prior to missionization. The richness of the region did not escape the notice of entrepreneurial foreigners, who were quick to manipulate restrictive Mexican land laws to their advantage.

The Gold Rush brought tens of thousands to California, and many of those seekers recognized the potential for reward in agricultural, industrial and land speculation ventures. With the passage of United States land redistribution laws in 1851, a new era of concentrated settlement and resource use began, and at this time Santa Cruz County was created as a political entity.

The earliest American development in the new County took place within agricultural floodplains or in the forested hills around major rivers, creating landings, ports and shipping wharves strategically located around Monterey Bay. From the 1850s to the 1870s the valleys were a sea of grain in summer, and a quagmire of interlocking sloughs in winter. As bottomlands were drained and rivers leveed or bridged, a narrow gauge rail system was developed by private investors in the area's land speculation and industrial enterprises. The local rail system linked communities, provided connections with spur lines into the mountain lumber camps, and most importantly met the national rail system with its market contacts in the south county.

The 1870s and 1880s were boom times for the County, marked by the rapid development of labor intensive agricultural, forest, maritime and mineral industries. During this period the landscape was reorganized into economically stratified communities along primary transportation routes, surrounded by well spaced farmsteads; industrial sites such as mills and factories

NPS Form 10-900-a
(8-86)

United States Department of the Interior
National Park Service

# National Register of Historic Places Continuation Sheet



were located along the major rivers; and temporary camp communities moved from canyon to canyon in the mountains. By the mid 1890s each of these activities had left the indelible mark of their presence in the form of settlement patterns and place names; domestic, commercial, industrial, public and recreational architectural forms; ethnic enclaves; and the beginnings of polarization of political alliances and resource bases in the "north" and "south" county.

As the county emerged from the widespread economic recession of the 1890s, which had been exacerbated locally by profit-driven depletion of the area's natural resource base, a new industry emerged in the promotion of tourism. Always recognized as a place of retreat and restorative leisure by leading families from the San Francisco Bay area, the county's natural attributes were touted to a new market as the idea of Everyman's vacation spot. Grand hotels were joined by tent camps, while the lumber camp spur lines were rejuvenated to carry the adventurous into the mountains, and an electric trolley system carried guests to the seashore. Casinos, dance pavilions and bath houses were erected at the shoreline, pushing the fishing industry into ethnic and geographic enclaves. A preservation ethic was born as excursions revealed the beauty of the remaining redwood forests and shoreline marshes to the city dwellers. The automobile soon overtook rail as the favored mode of transportation, giving rise to a sprinkling of en-route communities supported by traveler services.

The post World War II era brought renewed agricultural and food processing industries to the south county, widening the schism between the stable agricultural south county and the more heavily populated, tourism dependent north county. Today, residential infill with its attendant services and a burgeoning high technology industry blue the distinctions created by late nineteenth century settlement processes, but the landscape retains a visible memory of its history. Historical resources representing each of the chronological periods and activities described above were identified in a 1987 Historical Resources Inventory for the unincorporated county areas, and are summarized here:

A) Prehistoric to early mission era, 12,000 BP - 1810 AD:

Organized villages, resource camps, shrines, trade and communication routes; represented in archaeological distribution and place names.

(B) Frontier settlement, subsistence agriculture and grazing, early industries, 1797 - 1850:

Mission architecture and outpost buildings, hacienda style ranchsteads with associated laborer villages, townhouses and commercial buildings, sawmills and flouring mills. Activities represented in adobe architecture, wood frame architecture, foundation ruins, place names.

United States Department of the Interior
National Park Service

# National Register of Historic Places
# Continuation Sheet

Section number 8 Page 4

(C) Commercial agriculture, extractive industries, manufacturing, resource processing, trade and shipping, community development, 1850 - 1880:

Special function industrial architecture of wood frame, mortared stone, brick and iron; domestic and commercial architecture reflecting period styles interpreted by local carpenters; farmsteads of vernacular construction; small hotels; village and community landscape organization; wharf and rail depot and terminus structures. Activities represented in landscape remnants, agriculture buildings, wood frame and brick domestic architecture, wood frame, brick and stone industrial and commercial buildings, depots and depot sites, wharf remnants and sites, place names.

(D) Commercial agriculture and horticulture, commercial lumbering, extractive industries, dairying, manufacturing, packing and bottling, rail transportation and trade, recreation, community development, 1875 - 1895.

Ethnic communities, company camps, laborer housing, stratified community development with architecture reflecting influence of period styles using standard decorative elements and local architect/builders, large hotels and resorts, country estates, special function architecture for industries and manufacturing, rail depots and terminals. Activities represented by architectural constructions of wood frame, stone, brick, and iron; transportation and communication routes; social service architecture; recreation sites; community social and political organization.

(E) Promotion of tourism, expansion of transportation system, development of transportation strip communities, polarization of economic bases, 1890 - 1940:

Day visitor facilities, recreational services, publicly owned nature reserves, public works facilities and services, conversion of country estates to apartment housing, packing and processing industrial plants, in addition to continued activities and use of sites and facilities from previous era. Activities represented by recreation and amusement structures; multi-unit domestic architecture; residential infill; camp and recreation facilities; public transportation, communication, water and power system facilities; fair-weather cottage construction; in addition to domestic, public, and commercial structures of recognized architectural style rendered by professional architects.

(F) Post-war mass housing, high-technology industries, residential housing replacing agricultural lands, increased polarization of economic base and multi-cultural community, 1940 - 1960.

Tract domestic architecture; clustered services away from town centers; industrial park development with tilt-up construction; continued application of formal architectural style in domestic, commercial and public architecture; expansion of publicly funded preserves and recreation sites. Activities represented by structures of wood frame, concrete, stone, brick, post and adobe, steel frame; concrete bridges, transportation routes.

Site Context:

The Bayview Hotel represents context D in chronological and land use setting. Its architectural and cultural significance continued into context E as an active contributor to the tourism industry.

History:

An Aptos correspondent to the Santa Cruz Sentinel wrote on March 27, 1875, "The engine is here. It crossed the Aptos creek on last Saturday afternoon for the first time. Although the present engine is of rather a diminutive pattern, nevertheless it will bring important changes to our flourishing village." And change it did.

By 1879 Wallace Elliott observed, "The twenty miles of narrow gauge railroad from the Pajaro Valley to the Bay of Monterey at Santa Cruz has been in operation about eighteen months, and has wonderfully quickened the growth of the town. It connects with the Southern Pacific Railroad at Pajaro, and acts as a feeder to that line. . . The railroad, by giving the means of rapid communication with San Francisco, and all parts of the State and the East, has called attention to the town and valley."

Establishment of the line encouraged expansion of lumbering operations throughout the Aptos hills. The numerous mills along Valencia Creek and Aptos Creek now had an efficient transportation system to reach larger markets throughout the state, where their high grade lumber was in great demand. At the same time, agriculture was a developing economy in the area, with a need for quick, reliable transport to distant markets.

But certainly the most noticeable demand for hotel space was that created by the emerging tourist industry. The fabulous Aptos Hotel built by sugar-baron Claus Spreckles in 1874 had established the community as a fashionable destination for wealthy vacationers. Promotions for the resort mention its elegantly furnished rooms, grounds and recreational facilities, magnificent panoramic views, nearness to the long safe beach, and also note that "Aptos is very easy of access. The cars of the Southern Pacific Railroad Company make daily trips connecting the narrow-gauge road at Pajaro, which passes within a short distance of the hotel."

During this period in the mid 1870s, Jose Arano had already established himself as a successful merchant in the town of Aptos. A native of France who had reached California in 1852, Arano married a daughter of Californio Rafael Castro in 1862 and established his business in Aptos. Described as intelligent, multi-lingual, an astute businessman, genial and well-respected, Arano established his store and post office as a principal focus for the town.

Perceiving the potential impact of the new railway on the town's economy, Arano began in 1874 to plan for expansion of his business at a location right next to the train line. The building was completed in 1878, and an account written the following year states:

"This fine hotel building, known as the Anchor House was erected by Joseph Arano, at the Aptos depot on the Santa Cruz Railroad, and about one hundred yards from the beach, on a nice level plateau, between two of the finest trout streams in the State. The house contains, on the first floor, one fine store, Post Office and bar-room. The hotel proper contains 28 fine, large sunny rooms, all of which are in elegant order. The grounds contain one and one-half acres of land, with good outbuildings, and plenty of good mountain water. The house is new and elegantly finished. It is in every respect a first-class hotel. Our illustration shows the situation of this fine property close to the railroad, with a view of the hills in the immediate rear. Attached to the hotel is a fine yard and garden, with arbors and fountains."

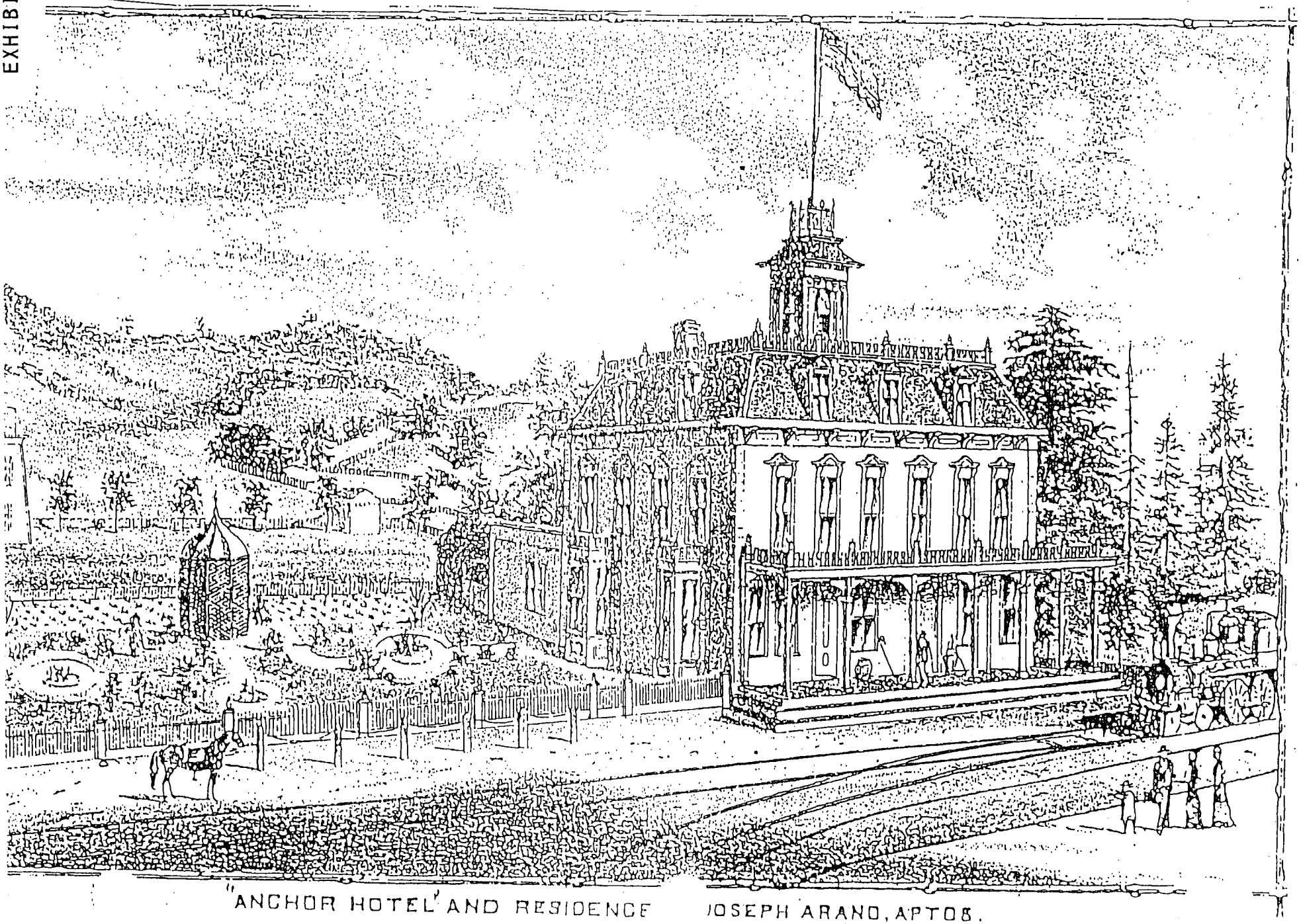
The name of the hotel was changed within a few years to the Bay View Hotel. Its best years came during the period of the 1880s and 1890s. During this time the Loma Prieta Mill on Aptos Creek became one of the largest lumber operations in the state, contributing to a thriving local economy. The personal estates of Claus Spreckles and his brother-in-law Henry Mangels drew frequent parties of distinguished visitors to the area. By 1896 Spreckl had torn down his own hotel for the expansion of his estate, and a contemporary account notes, "The principal hotel is owned and kept by the Aranos, whose Spanish dinners are famous." Famous guests included Lillian Russell, King Kalakaua and many European visitors.

Arano (by this time known as Joe or Joseph) and his daughter Amelia continued to run the hotel until 1914; Amelia then ran the hotel with the help of two nieces until 1919. The advent of World War I and changing fashions led to a decline in fortunes for the hotel, and in 1919 it was closed up. A service wing of the unused hotel was destroyed by fire in 1928, a great personal blow to Arano who was 94 years old at the time.

In 1942, Arano's heirs sold the hotel to Fred Toney. Toney's original plan was to demolis the hotel for the lumber, but coincidentially a local utility crew needed short term housing and so Toney was convinced to reopen the hotel. In 1946 Toney decided to move the hotel about 60 feet north and west back from the intersection, leaving that land available for other commercial uses. The move was done by Toney himself with a crew of local workers. At this time modern plumbing and electric lights were installed, but care was tal to preserve the marble fireplaces and other interior features. Other than partial enclosu of the porch, very few alterations were made. The hotel retained its historic proximity a southerly orientation to the train tracks. Toney reopened the hotel and restaurant, which was operated by his family until 1973. At that time, the business itself was leased, whil ownership of the property remained in the hands of Toney's daughters. A 1975 fire destroy the hipped roof, which was rebuilt. The business was sold again in 1982 and 83, at which the modern wrought iron fence was installed. In 1989 the business and property were sold again to a local partnership which intends to restore the building to its original use as quality accommodations for visitors.

EXHIBIT H

Harrison's "SANTA CRUZ COUNTY" 1879



"ANCHOR HOTEL" AND RESIDENCE JOSEPH ARANO, APTOS.

# CHAPTER 1: THE VILLAGE OVERVIEW

## INTRODUCTION

Aptos Village, located in the Aptos Planning area within the unincorporated portion of Santa Cruz County, lies about six miles east of the City of Santa Cruz and about eight miles northwest of the City of Watsonville. It is located just north of Highway 1 between the State Park Drive and Rio Del Mar Boulevard interchanges. The Village is 80 feet above the confluence of Aptos and Valencia Creeks and about one-half mile inland from the Monterey Bay.

The surrounding area is mainly developed with residential uses, and the Village serves as the gateway to the 10,000-acre Forest of Nisene Marks State Park. The main access to and from the Village is Soquel Drive, a major east-west arterial that parallels Highway 1. There are both commercial and residential uses to the east and west of the Village, with the major existing commercial development being the Rancho del Mar Shopping Center, just west of the Village.

There are 65 existing parcels within the boundaries of the Aptos Village Plan with a variety of land uses. These parcels range in size from 2,400 square feet to 4 acres. Previous patterns of development are reinforced by the various parcel sizes, especially in the Village Core, with the large parcels behind the Bay View Hotel and Aptos Station reflecting their previous industrial uses related to the lumber and fruit packing industries.

Most of the parcels that lie south of Soquel Drive are either small or have potentially severe development constraints such as steep slopes, riparian corridors, and floodplains.

The small parcels that front on Valencia Street, Bernal Street, and Aptos Street are part of the Hihn subdivision, laid out in the late 1800s for residences. These parcels are mostly developed and have a mix of commercial and residential uses.

Figure 1 below provides an overview of land uses in the area, while Figure 2 provides an illustration of the current development pattern in the Village.

FIGURE 1: SUMMARY OF CURRENT USES IN APTOS VILLAGE AREA (2008)

| Category of Development | Number of uses in category | Bldg Area Sq. Ft. | % of Bldg. Area |
|---|---|---|---|
| Retail | 9 | 25,118 | 19.0 |
| Office | 20 | 29, 707 | 22.4 |
| Dining and Hospitality | 7 | 22,799 | 17.2 |
| Government | 3 | 19,010 | 14.3 |
| Commercial Service | 3 | 10,158 | 7.7 |
| Grooming/Fitness | 8 | 6,358 | 4.8 |
| Subtotal | *50* | *113,150* | *85.4* |
| Residential | 32 units | 19,398 | 14.6 |
| TOTAL | 82 | 132,548 | 100.0 |

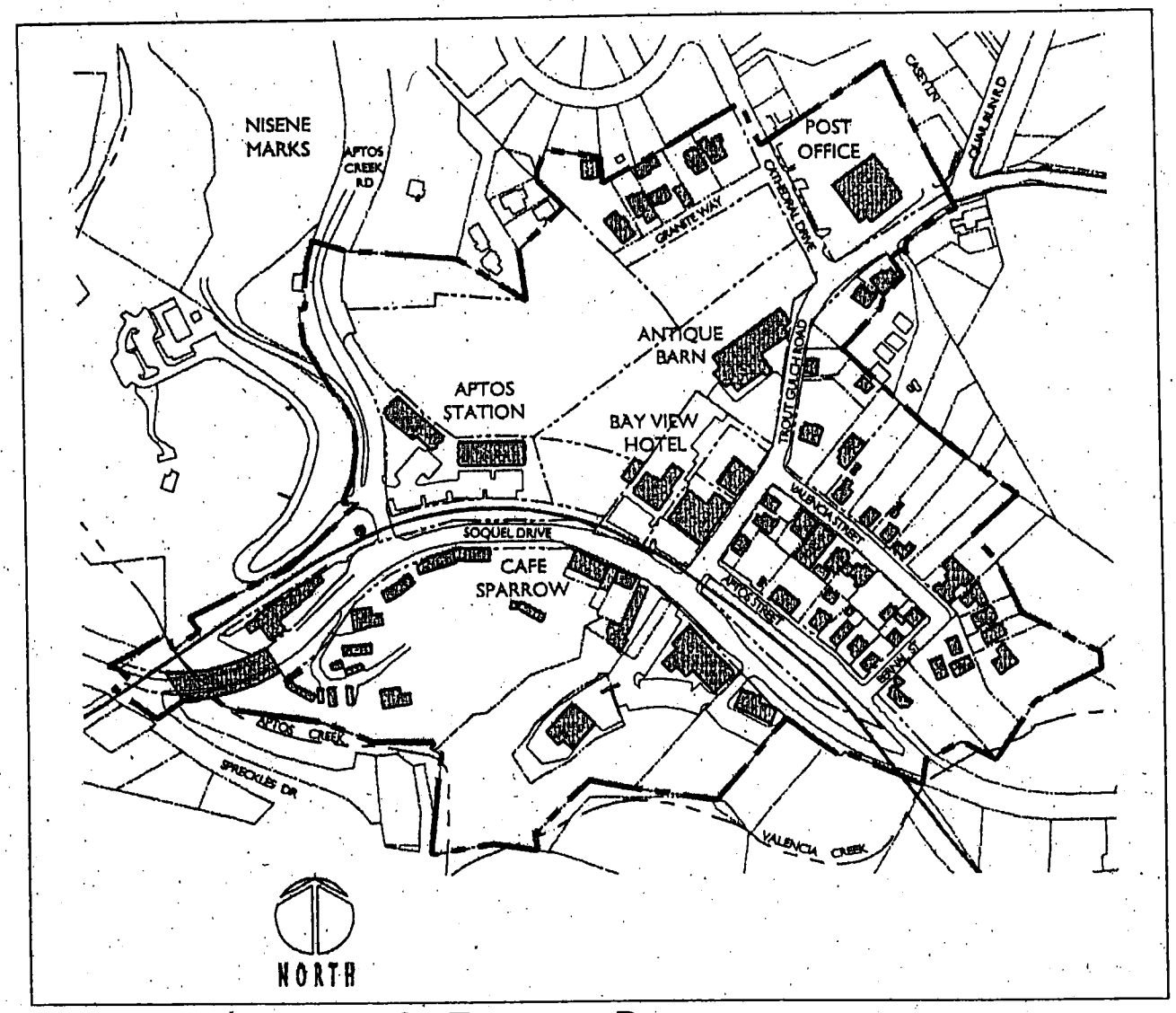



FIGURE 2: EXISTING DEVELOPMENT MAP

# VILLAGE PLAN HISTORY

## PAST PLANNING EFFORTS

Since 1979, land use in Aptos Village has been governed by the Aptos Village Community Design Framework, a Specific Plan which was originally adopted by the Board of Supervisors on April 17, 1979 and amended on June 18, 1985. The only major new buildings constructed since the late 1960s include the Aptos Station (APN 041-561-01) in 1981, the Founders Title Building (APN 041-042-39) in 1985, and the Appenrodt building (APN 041-042-47) at the southeast corner of Soquel Drive and Post Office Drive in 2006. There were several previous attempts to develop the vacant parcels adjacent to Aptos Station, the Bayview Hotel, and the Hihn apple packing shed (Apple Barn), but for a variety of reasons (including parcel configuration and lack of coordinated planning among all parties regarding development) none of those ever came to fruition.

The Aptos Village Community Design Framework covered an area of about 80 acres, including the area covered by this Village Plan. Even though the Framework covered an area larger than the Village, its primary focus was on future development of the Village core area. Due to the lack of progress over the years following approval of the Framework, members of the community felt that a more detailed plan would encourage the Framework vision to be realized. In addition to updating the Framework and re-evaluating the mix of land uses, it was critical to review parcel configuration and infrastructure planning. Therefore, this Plan, which builds upon the Framework, is structured to provide more clarity to guide possible new development. It is intended that, upon adoption of this Plan by the Board of Supervisors, it will replace the Aptos Village Community Design Framework Specific Plan, focusing on the Village Core area.

## SETTING THE STAGE FOR A NEW PLAN

In 2001, the Aptos business community and the County began discussing the possibilities of coordinated development of the vacant parcels in the context of the overall development of Aptos Village. In mid-2002, the County conducted two public meetings to elicit comments from area residents, business owners, and other interested parties about what future development, if any, should occur in the Village.

On a parallel track to that process, the County has, through its Capital Improvement Program (CIP), established a plan for upgrading infrastructure in the Village area. Those efforts will serve to complement the activities called for in this Plan.

# HISTORIC ISSUES

## A BRIEF HISTORY OF APTOS VILLAGE - LINKING SANTA CRUZ COUNTY TOGETHER

On a foggy Sunday morning in May of 1929, two men representing opposite ends of Santa Cruz County met in the middle of the concrete bridge over Aptos Creek and shook hands at the dedication of the bridge. Prohibition required that a bottle of non-

alcoholic sparkling apple cider be used in the ceremonial christening. The ceremony emphasized the historic role that Aptos had played as the main transportation connection within Santa Cruz County. Aptos was and is a place where the major transportation elements come together, where highways and railroad snake around and across a daunting natural landscape.

## THE DOMINANT GEOGRAPHY—*DOS MALOS PASOS*

The Aptos Village site is triangle bounded on the north by foothills, on the east by a ravine cut by Valencia Creek and on the west by a steeper canyon carved by Aptos Creek. The two streams meet at the tip of the triangle, join, and flow to Monterey Bay. This junction of the two creeks was such a dominant feature that many early residents believed the name "Aptos" to be an Indian word meaning "the joining of two waters." There is little evidence in early literature to support that definition, however, and as Donald T. Clark notes in his classic *Santa Cruz County Place Names*, the source of the name Aptos is "uncertain."

There is nothing uncertain, however, about the transportation challenge posed by those two canyons, and beginning with that first crossing of the "*dos malos pasos*" Aptos was a challenge for those wishing to travel through it.

## THE APTOS TRIBE AND VILLAGE

The prehistoric past of the region is represented by numerous archaeological deposits in Santa Cruz County, and it is doubtless that the ancestors of the historical and present-day Ohlone communities have occupied the county for at least 6,000 years, and likely longer. The Aptos group of Ohlone lived along the shores of Monterey Bay from the present location of Aptos and eastward about half way to the mouth of the Pajaro River. The Aptos peoples were one of four early groups converted at Mission Santa Cruz, but were actually the last of those four nearby groups to be completely absorbed into the mission in 1796. Although they did marry with their neighbors the Cotoni, Sayanta, and Uypi, they were completely mixed together with the Cajastaca people of the Corralitos area. So much mixing occurred within the nuclear family groups that the idea arises that the Aptos and the Cajastaca were a single tribal group (Milliken 1995).

Several early references from the early Spanish explorers and Spanish Missionary records describe the presence of Indians in the Aptos area when a 1769 exploratory land expedition led by Don Gaspar de Portola saw an Indian village at the confluence of the Valencia and Aptos creeks. The Spaniards recorded the site as "Aptos". In 1791, the Santa Cruz Mission was established west of the San Lorenzo River. Indians from the Aptos area were brought into the Mission compound. Records of Father Crespi in 1769, Father Palou in 1774, and the Santa Cruz Mission in 1791 describe the Aptos region, with some mention of the Native Americans who called their area "Aptos". (Brown, 2001). The first recorded contact came in 1774 when the Rivera Expedition encountered residents of the village at Aptos and offered gifts. The accounts mention seven (or eleven) grass huts and a population that added up to the diarists' estimation of a 'medium sized village" (Brown, 2001)

## THE SPANISH ERA—1769-1822

The Spanish found traveling across the coastal terrace so "difficult" and "tiresome" that in 1774 they chose the more level and direct route through the Santa Clara Valley connecting Monterey and San Francisco. (Present-day Highway 101.) Santa Cruz and Aptos were on a dead end and the easiest access was by sea. The Indians living in the Aptos area provided most of the converts for the Mission Santa Cruz between 1791 and 1797, and once they were gathered at the mission, except for cattle grazing on the coastal terrace, there is very little activity in Aptos. The road was little traveled, and most access was by sea.

## THE CASTRO ERA—1833-1876

In 1833 Rafael Castro, a retired soldier and native of the Villa de Branciforte was awarded a private land grant named Rancho Aptos. The original 4,486 rancho was bounded on the west by Aptos Creek, but in 1840 Castro was granted an additional 2,200 acres extending the boundaries west to Borregas Gulch. Castro built his home on the western bank overlooking Aptos Creek and began raising cattle, shipping the hides off the beach at the mouth of Aptos Creek.

## APTOS WHARVES AND THE FIRST APTOS VILLAGE - SHIPPING BY SEA

Rafael Castro took his Rancho Aptos land title papers to the Land Commission in the early 1850s and in 1860 he received confirmation. Even before he had clear title, Castro received numerous offers to sell his property, but he declined, preferring instead to negotiate leases with the various sawyers and loggers who were interested in the redwood trees growing in the canyons to the north. To ship the products coming off his own property and those land grants to the east, in 1850 Castro built a relatively short five hundred-foot wharf just west of the creek mouth and during the next twenty-five years, hides, lumber, flour and agricultural products were shipped out across what became known as Aptos Landing. (Collins 1995)

Castro's wharf inspired a small commercial development at the intersection of the County road and the road to the wharf (present-day Wharf Road and Soquel Drive) while several of Castro's adult children built homes along the road to the west. The wharf was improved and extended in the 1860s and lumber, firewood, and agricultural products were shipped off it to San Francisco.

Meanwhile, efforts to create a dependable crossing of Aptos Creek continued. The first bridge built in 1860 was washed out in the 1862 flood and eventually replaced with a covered wagon bridge.

Finally, in 1872 beset with marital difficulties and declining health, sixty-nine year old Rafael Castro sold the bulk of his property to sugar magnate Claus Spreckels for $71,900 in gold coin. The Castro era of Aptos Village on the western banks of Aptos creek ended in the 1870s with the coming of Claus Spreckels (1872), the arrival of Frederick Augustus Hihn and incorporation of the Santa Cruz Rail Road (1873) and the death of Rafael Castro (1878).

## APTOS VILLAGE MOVES EAST: THE LUMBER ERA—1876-1900

Frederick Augustus Hihn had long held a dream of a dependable trans-county railroad and, as the president of the Santa Cruz Rail Road (incorporated, 1873), he led the construction of a narrow gauge railroad between Santa Cruz and the Southern Pacific Railroad junction south of Watsonville. Claus Spreckels was a major stockholder in Hihn's railroad. All of the construction of the Santa Cruz Rail Road was done by Chinese railroad workers. Their conical shaped hats, quilted blue coats and Cantonese work songs were a regular part of the Santa Cruz County landscape during the 1870s and 1880s.

Seeing the potential for his own properties located up Valencia Creek, Hihn guided the route of the Santa Cruz Rail Road into the Aptos Village site even though it required two trestles compared to an easier route downstream that would need but one. Hihn's bringing of the Santa Cruz Rail Road into the present-day Aptos Village set off a boom the results of which are still visible today.

## SALOONS AND HOTELS

Before the Santa Cruz Railroad crossed Aptos Creek into Aptos Village in 1876, there was only one small hotel in Aptos Village, but by 1880 there were three hotels and several saloons. One of those hotels, the Anchor House (present-day Bayview) was built beside the railroad track in 1878 by Basque immigrant, Jose Arano. Aptos historians have counted up to 15 saloons in the area by the mid 1880s, serving the needs of the lumbermen and loggers who came into the forests to the north.

## ENTER THE SOUTHERN PACIFIC RAILROAD: THE LUMBER BOOM—1883-1900

Though the 1870s were busy in Aptos, the Santa Cruz Rail Road operated at a loss, and in 1882 was sold at a bankruptcy auction to the Southern Pacific Railroad. The entry of the Southern Pacific into Aptos Village brought the fledgling railroad era to its maturity. Almost immediately after acquiring the narrow gauge Santa Cruz Rail Road, the Southern Pacific announced it would broad gauge the line, and in the fall of 1883, the first standard gauge locomotive made the trip between Santa Cruz and the SP mainline south of Watsonville. Products could be loaded onto a railroad car and shipped directly anywhere in the United States without having to be re-loaded.

## THE LOMA PRIETA LUMBER COMPANY—1883

The Southern Pacific Railroad Company then purchased a 7,000-acre tract of uncut redwood up in the Aptos Canyon and punched a standard gauge railroad up the canyon to get it. Once the Chinese railroad crew had the first three miles of line built, the largest lumber mill in Santa Cruz County in the 1880s began to send a torrent of lumber, railroad ties, shakes and shingles down into Aptos and out to markets all over California.

## THE HIHN VALENCIA MILL—1883-1892

Undaunted by losing the Santa Cruz Rail Road and quite willing to take advantage of the Southern Pacific standard gauge railroad connection in the now bustling Aptos Village, in 1883 Hihn built a medium-sized sawmill in Aptos and began cutting, milling and shipping part of what he estimated to be hundred million board feet of lumber to his lumberyard in Santa Cruz. The following year Chinese crews built a two-mile narrow gauge track into Valencia Canyon, and over the next eight years redwood lumber flowed out of the Valencia down to Aptos Village. Echoing the paths of the two creeks that framed the village, redwood lumber flowed down into Aptos Village and was shipped out to markets all over the Pacific.

During the 1880s and into the early 1890s, Aptos Village was a major transportation hub, the area criss-crossed with railroad lines, a depot, and a turntable. One of the legacies of this era is that the land comprising today's Aptos Village was a puzzle of parcels and rights of way. The many parcels, disparate owners and old railroad rights of way became a formidable barrier to later development of the village.

The closing of Hihn's Valencia Mill in 1893 and the Loma Prieta mill in 1899 marked the decline of the Aptos Lumber Boom. Though there were smaller episodic lumber operations into the twentieth century, in 1893 Hihn shut down his Valencia Mill, and in 1899 the Loma Prieta mill was closed, marking the end of the Aptos Lumber Boom. Smaller episodic lumber operations continued north of the village, but when the Loma Prieta tracks up Aptos Canyon were removed in 1926, the lumber era was over.

## THE WAREHOUSE—PRESENT-DAY VILLAGE FAIR

In early 1881, in anticipation of opening up his lumber operations in the Valencia watershed, Hihn purchased 27 acres on the Aptos Village site from the Bernals. He used part of the property as a lumber yard and leased some of it to a local farmer to grow hay. There is evidence that he had a barn on the property by the mid-1880s. A series of recently found Hihn documents leads one to conclude that the main building of the present-day Village Fair (referred to as the Apple Barn in this document) was constructed in 1891.

## APTOS VILLAGE: THE APPLE ERA—1900-1959

By the late 1890s, paralleling the agricultural trend going on in the Pajaro Valley, apples became the focus of activities on the Apple Village Site. The same railroad that carried lumber to the far corners of the country now began carrying railroad cars filled with apples. Most of the orchards were located north and east of Aptos Village and Frederick Hihn was one of the leaders of this new Aptos industry.

By the 1920s Aptos was the second most important apple shipping location in Santa Cruz County. Over 90% of the apples shipped in the 1920s came from Watsonville, and though only 5% of the county's apple crop went through Aptos each year, it was enough to create a microcosm of the apple industry in the Aptos Village. Box making, apple packing, an apple dryer and vinegar works were

represented in what became a small apple-centered industrial park.

## THE LAM-MATTISON DRYER—1905-1940

While Hihn built the first apple dryer in the Aptos Village, it was not as successful as the Lam-Mattison apple dryer founded in 1905. Lam Pon, an immigrant from China, became a partner with Ralph Mattison and their dryer became a landmark in the village. Each fall a large group of Chinese laborers came into the village to work in the dryer, and in later years Filipino laborers were the primary laborers. The Lam family continued its partnership with the Mattisons up to 1940. The last of the Aptos apple packing facilities closed in 1959.

## A DIVERSE MULTI-CULTURAL AND MULTI-ETHNIC COMMUNITY

In 1920, the U.S. Census taker went from door to door in the Aptos Village, and the surviving manuscript census shows a diverse population living in and around it. Along with those born in California and elsewhere in the United States, nearby farmers included immigrants from Russia, Germany, Spain, Sweden, Denmark, Portugal (Azores), Ireland and England. There was a crew of Italian loggers up in the Aptos Canyon (with their Chinese cook) along with a small crew of woodchoppers from Japan. Croatian apple farmers lived up along Valencia Creek, and that fall the Chinese apple dryer crew would move in to begin working on some of the apples grown up there.

## TRANSPORTATION - IMPROVING THE BRIDGES - THE 1920S

Over the years, as automobiles replaced horse-drawn wagons on county roads, the road bridges at the edges of Aptos Village proved to be too narrow for the ever-increasing automobile speeds. In 1925, Santa Cruz County approved and paid for a realignment on the eastern side of Aptos Village, replacing what heretofore had been a bridge at the end of Valencia Street, rerouting the road to the south and replacing the railroad overcrossing with an undercrossing. Valencia Creek was diverted into a large concrete culvert to allow for the road to cross without building an expensive bridge. That is still the configuration of the Valencia Creek crossing at this writing.

Meanwhile, the approaches at the Aptos Creek road bridge were so abrupt and prone to accidents that by the mid 1920s the first turn was known as the "death curve." In May 1929 a two-lane curved concrete arch replaced the older bridge, and at the dedication representatives from Santa Cruz and Watsonville shook hands at the center of the bridge to signify the unity of the entire county. That bridge continues to be the only western access to the Aptos Village site.

## RE-ROUTING HIGHWAY 1—1949

As part of a county-wide effort to straighten and widen the old-fashioned, narrow state Highway 1, in 1949 the State constructed a new throughway that completely by-passed the original Santa Cruz-Watsonville Road and Aptos Village. As a result, the Village

slipped into what several old-timers termed "the doldrums." Even the venerable Bayview Hotel closed for a time. The Aptos Village site continued to have the look of an industrial park, but one by one the businesses closed and the buildings grew empty.

## APTOS RENAISSANCE: 1962-1979—THE COMING OF CABRILLO COLLEGE

In 1958, Santa Cruz County voters approved the formation of a junior college with the understanding that the site of a new campus would be located somewhere in or near Aptos. Eventually the site committee selected the Porter-Sesnon property located about two miles west of the Aptos Village site. The coming of Cabrillo Junior College campus in 1962 had an immediate effect on the Aptos area. Resurrection Church opened, Rancho del Mar shopping center opened and Soquel Drive was widened between Porter Gulch and State Park Drive. Also in 1962, the old Loma Prieta Lumber Company property up Aptos Canyon was dedicated as the Forest of Nisene Marks State Park. Surrounding residential neighborhoods which had been primarily dedicated to seasonal, vacation homes slowly changed into permanent housing.

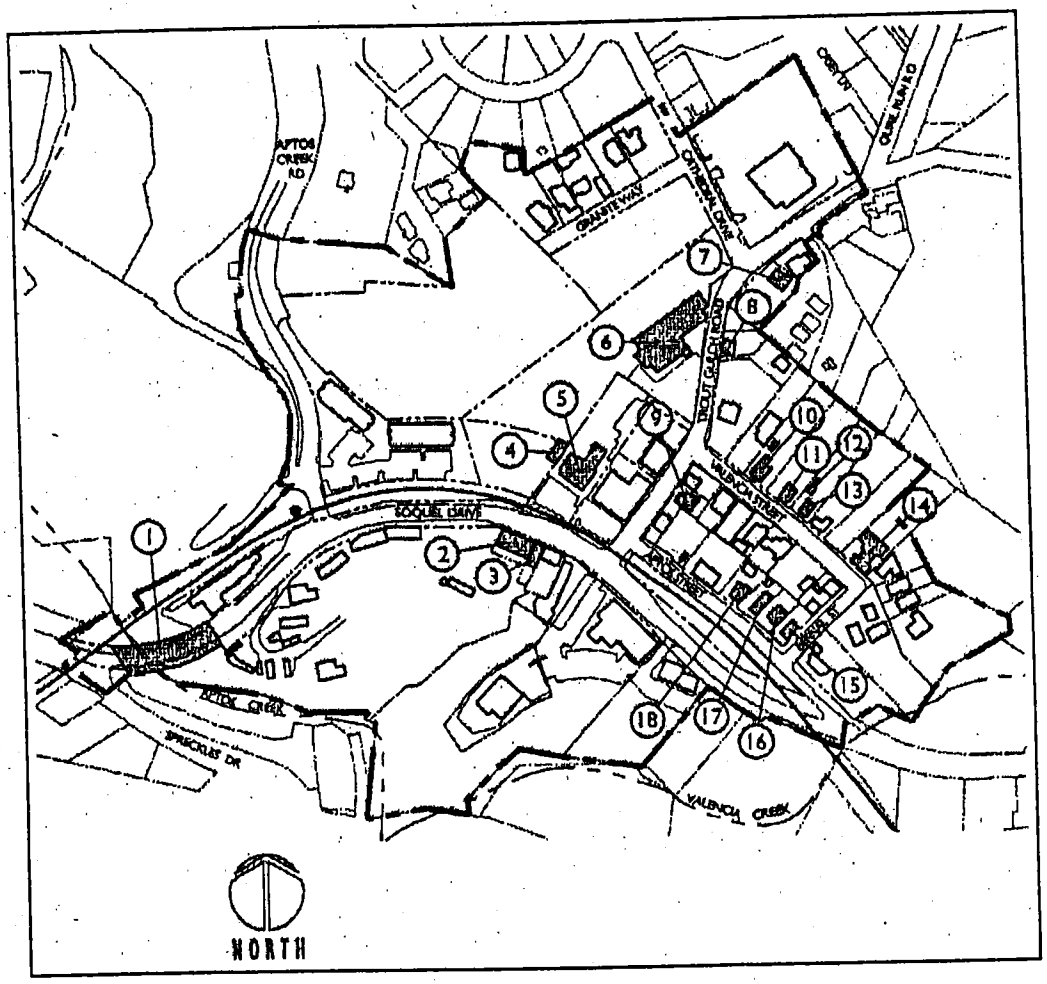
But the Aptos Village site saw few direct effects from this 1960s Aptos renaissance. Many of the older industrial buildings were razed during the 1960s and the lumber-apple industrial history slowly faded away. A strip of older businesses remained on the south side of Soquel Drive, but building activity on the Aptos Village site was sporadic. Efforts to connect with Aptos' history were mostly cosmetic - the naming of the Aptos Station development, for example, in 1974.

Today, there are few visible reminders of Aptos' rich history, save for two notable exceptions: the Apple Barn building representing the lumber and apple industries and the influence of Frederick Augustus Hihn, and the Bayview Hotel, a reminder of the time when Aptos was one of the major redwood labor hubs in Northern California. Perhaps the most visible historical theme is that of transportation - the various pairs of wagon bridge abutments still visible along both Aptos and Valencia Creeks, with Soquel Drive (the old Santa Cruz-Watsonville Road) and the Union Pacific tracks slicing through it all.

## HISTORIC RESOURCES

Since the creation of the County's first historic preservation ordinance in the 1970s, a significant number of buildings have been designated as historically significant and have been protected. These buildings add to the character of the Village and County policies require that they be respected by new development in terms of design and scale. The following list contains the sites currently identified in the County's Historic Inventory as historically significant in the Village area, which are illustrated on Figure 3.

1. Aptos Creek Bridge - Soquel Dr. at Spreckles Dr.
2. General Store and Post Office - 8040, 8042 Soquel Dr.
3. Village House - 8044 Soquel Dr.
4. Aptos Firehouse/VFW Hall - 8037 Soquel Dr.
5. Anchor Hotel - Bay View - 8041 Soquel Dr.
6. Apple Barn - 417 Trout Gulch Rd.
7. - 502 Trout Gulch Rd.
8. Bonner House - 420a Trout Gulch Rd.
9. Ray McCawley Real Estate - 408 Trout Gulch Rd.
10. Hihn - Aptos Subdivision - 140 Summa Court
11. Hihn - Aptos Subdivision - 140 Summa Court
12. Hihn - Aptos Subdivision - 8059 Valencia Street
13. Somerset House - 8061 Valencia Street
14. Calvary Chapel - 8065 Valencia Street
15. Hihn - Aptos Subdivision - 8067 Aptos Street
16. Hihn - Aptos Subdivision - 8065 Aptos Street
17. Hihn - Aptos Subdivision - 8063 Aptos Street
18. Twitchell House - 8061 Aptos Street



# CHAPTER 2: CONTEXT FOR VILLAGE PLAN

## GENERAL PLAN CONTEXT

The Village Plan is intended to comply with General Plan Objective 2.24 and specifically with Program "b", which relates to Aptos Village. Objective 2.24 of the General Plan calls for the continued use of:

> Village, town, community and specific plans to provide a planning framework to guide future public and private improvements in town centers.... to provide a higher level of planning detail and public involvement; and to promote economic viability, coherent community design and enhancement of the unique characteristics of the village areas.... as focal points for living, working, shopping and visiting.

Program "b" of Objective 2.24 recommends that the County "[r]eview and update the Aptos Village Community Design Framework to develop a more specific plan governing land use, circulation, design, and improvements in the village area."

## OPPORTUNITIES FOR CHANGE

### UNDERUTILIZED PROPERTIES

As mentioned previously, there are several relatively large vacant parcels in the Village Core. These parcels have remained vacant since the demolition of the apple packing related buildings some 40 years ago. Even the Apple Barn property is underutilized, with only about 25 percent of its area developed with buildings and parking. If more fully developed, these sites could significantly add to the vitality and character of the Village in the future.

### MARKET STUDY - COMMERCIAL OPPORTUNITIES

A market study to evaluate the market and financial feasibility of future commercial and residential development in Aptos Village was commissioned by the County and completed by Keyser Marston Associates Inc. in early 2003.

The market study looked first at the Aptos trade area, which the study defined generally as including "all or portions of the communities of Aptos, Seacliff, Rio del Mar, La Selva Beach, and Freedom..." According to the market study "there appears to be sufficient market support for an additional 235,000 square feet of comparison retail, 90,000 square feet of convenience retail and 50,000 square feet of eating and drinking space in the Aptos trade area." The square footages mentioned are net, or leasable, square feet.

The 2003 market study generally described a range of possible mixed- use developments that could occur in the Village to address the market demand. By way of example, they described a mixed-use commercial/housing project that contained 30,000 to 40,000 square feet of retail uses, with office space totaling from 5,000 to 7,500 square feet.

## RESIDENTIAL USES

Residential uses developed in conjunction with commercial uses enhance the economic viability of commercial uses. Having people living in the Village helps create a more vibrant and livable community. New housing is clearly indicated as a component of new development in the Village Core.

Recognizing that the amount of new residential development must be limited so as not to overwhelm the Village commercial activities, this Plan limits the number of new residential units in the Village Core to not exceed 63 units (this figure includes transitional residential units at the north of the Village Core). As well, the total unit sizes should not exceed 50% of the square footage of the mixed-use and commercial buildings so that they do not overwhelm the scale of the commercial uses in the Village.

The Village Core is adjacent to an established Urban Low density residential neighborhood to the north. In order to provide an orderly transition from this area to the commercial areas in the Village Core, the existing area designated Urban Medium density residential on the north side of Granite Way will remain residential and, in addition, a portion of the area on the south side of Granite Way (at the corner with Cathedral Drive) may be used for exclusive attached housing residential purposes.

Like all projects containing residential development, residences built in the Village Core will be required to meet the housing affordability requirements of the County. An allowance for clustering required affordable units may be considered as part of a Planned Unit Development application for the Village Core.

## KEY HISTORIC STRUCTURES

As noted previously, the Village Core was the site of lumber milling and several apple processing and packing operations. One building from the area's past use of apple processing remains: the Apple Barn at the corner of Trout Gulch Road and Cathedral Drive (given an historic rating of NR-3—a designation that recognizes its nomination by the County for national designation). Also located in the Village Core is the Bayview Hotel (rated NR-1 - a nationally recognized structure) and the old Aptos Firehouse/VFW Hall just west of the Bayview Hotel (rated NR-5 - of local interest).

New buildings proposed adjacent to the Apple Barn building shall be architecturally compatible with the Apple Barn. It is envisioned that the Apple Barn could be used as an anchor store. This Plan envisions that the Apple Barn will be relocated to allow its presence on the Village Common and properly interact with the other new buildings. Any such movement will likely require some reconstruction. Because it is an historic resource of significance, any movement, exterior change, or reconstruction of the Apple Barn will require special review and approval by the County's Historic Resources Commission. Available technical information suggests that a minor change in location will not adversely affect the significance of the Apple Barn, given the condition of the surrounding setting. The Plan assumes that the small warehouse, a non-historic building adjacent to the Apple Barn, will be demolished. Any exterior changes must be sensitive to the historic

significance and architectural features of the building and any relocation must follow the Secretary of the Interior standards for relocation such that the NR 3 rating of the Apple Barn is not compromised.

To facilitate the new north-south street and the development of additional buildings, the historic Aptos Firehouse/VFW Hall will need to be relocated within the Village Plan area. Technical studies have determined that a portion of the rear of the building has been added since its period of significance. This Plan assumes that this newer area will be removed to restore the structure to its more original size. Any exterior changes must be sensitive to the historic significance and architectural features of the building and any relocation must follow the Secretary of the Interior standards for relocation such that the NR 5 rating is not compromised. If relocated, the building must be located on a prominent street within the Village and present to the street in its current narrow-side configuration. Before moving this building, the County's Historic Resources Commission must approve the relocation and associated reconstruction work.

When future developers submit Historic Resource Preservation Plan applications to relocate the Apple Barn and/or Aptos Firehouse/VFW Hall, the Historic Resources Commission will determine if the relocations can be accomplished in a manner that preserves the buildings' historic integrity and NR ratings and impose appropriate conditions. If the Historic Resources Commission finds that this cannot be accomplished, the Aptos Village Plan will need to be amended to address the land use of the structures in their current location.

Finally, given the highest rating of historic significance assigned to the Bayview Hotel, any new structures built adjacent to that site must be reviewed by the Historic Resources Commission to ensure that they do not compromise the historic context of this very important historic resource and centerpiece to the character of the Village.

Figure 12 illustrates in one place the key elements proposed by this Chapter for the Village Core. In addition to new roadways and private and public open spaces, it suggests the likely relocation of historic structures and possible footprints for new residential, commercial and mixed-use buildings. Figures 23 & 24 in Chapter 6 provide more detailed requirements for these possible buildings.

EXHIBIT K

APPENRODT COMMERCIAL properties

July 22, 2011

Todd Sexauer
Environmental Planner
County of Santa Cruz
701 Ocean Street, 4th Floor
Santa Cruz, CA 95060

Dear Todd,

In response to your request I have listed the salient points related to the excavation done on 2/26/09.

- APN: 041-011-24
- Date of Excavation: 2/26/09
- Purpose: locate turntable mentioned in various reports
- Contractor: Jeff Taylor
- People Present: Christine & George Mead (Toxichem), Pete Testorff, Joe Appenrodt & Jeff Taylor
- Scope of Excavation: 4 trenches: 3-4' wide/5-5.5' deep/40-50' long
- Location of Excavation: See Attached Sheet
- Findings: Occasional rocks, some particles of concrete, & pieces of glass.

There was no evidence of a turntable or any other items of historical significance. Please let me know if any additional information needed.

Sincerely,

for

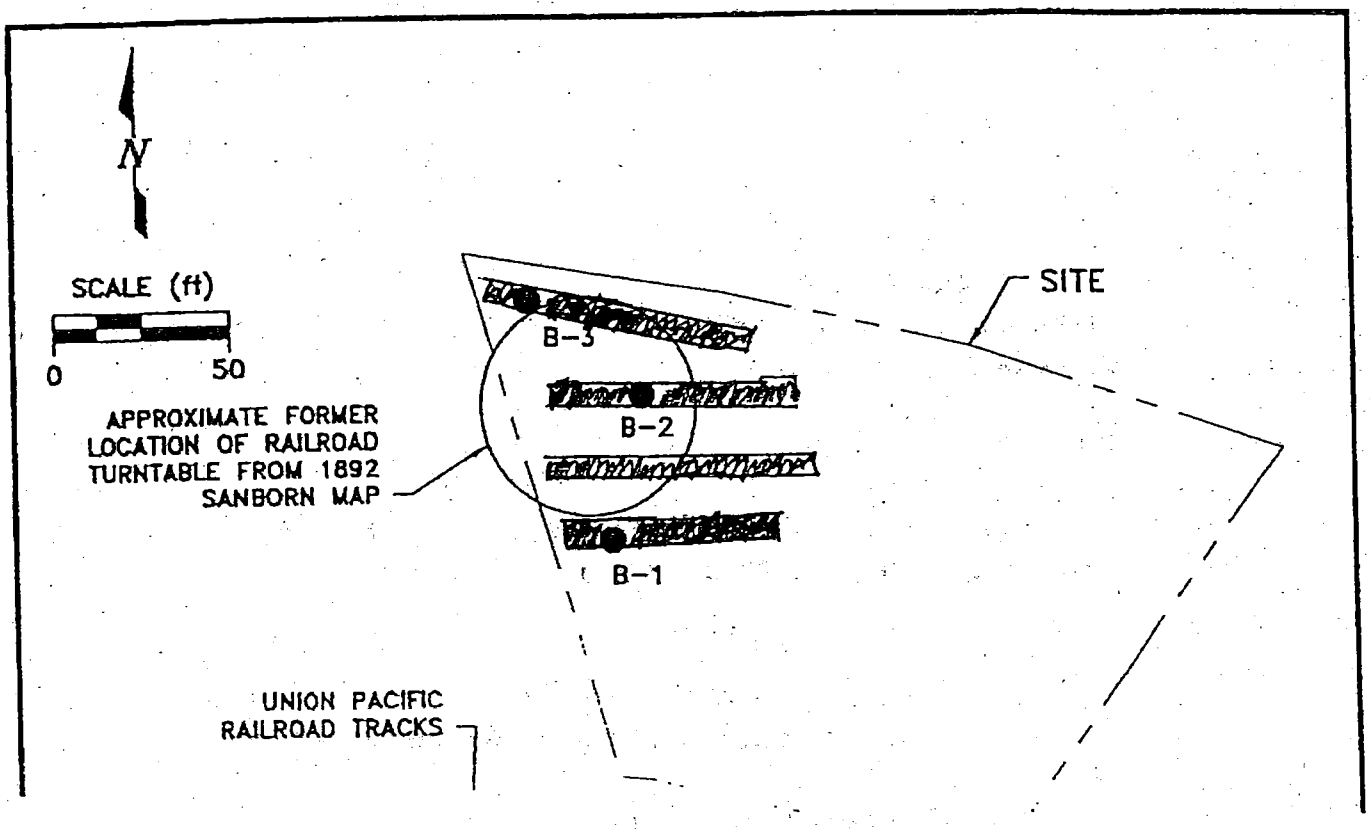
Joe Appenrodt
Aptos Ventures, Partner

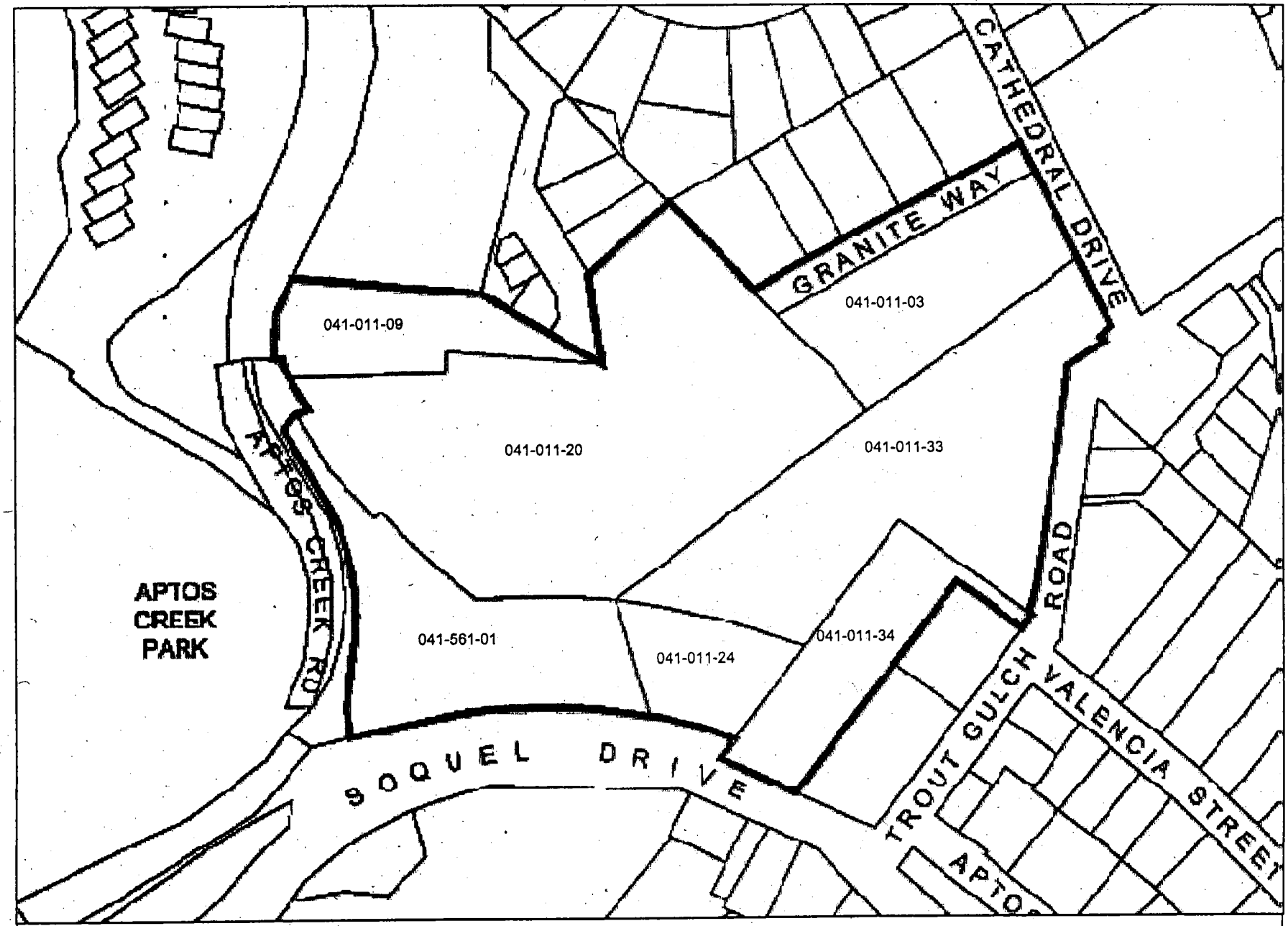
APPENRODT
COMMERCIAL
PROPERTIES

4375 Capitola Road
Capitola, CA 95010

831.465.9590 O
831.465.9195 F

www.AppenrodtCommercial.com

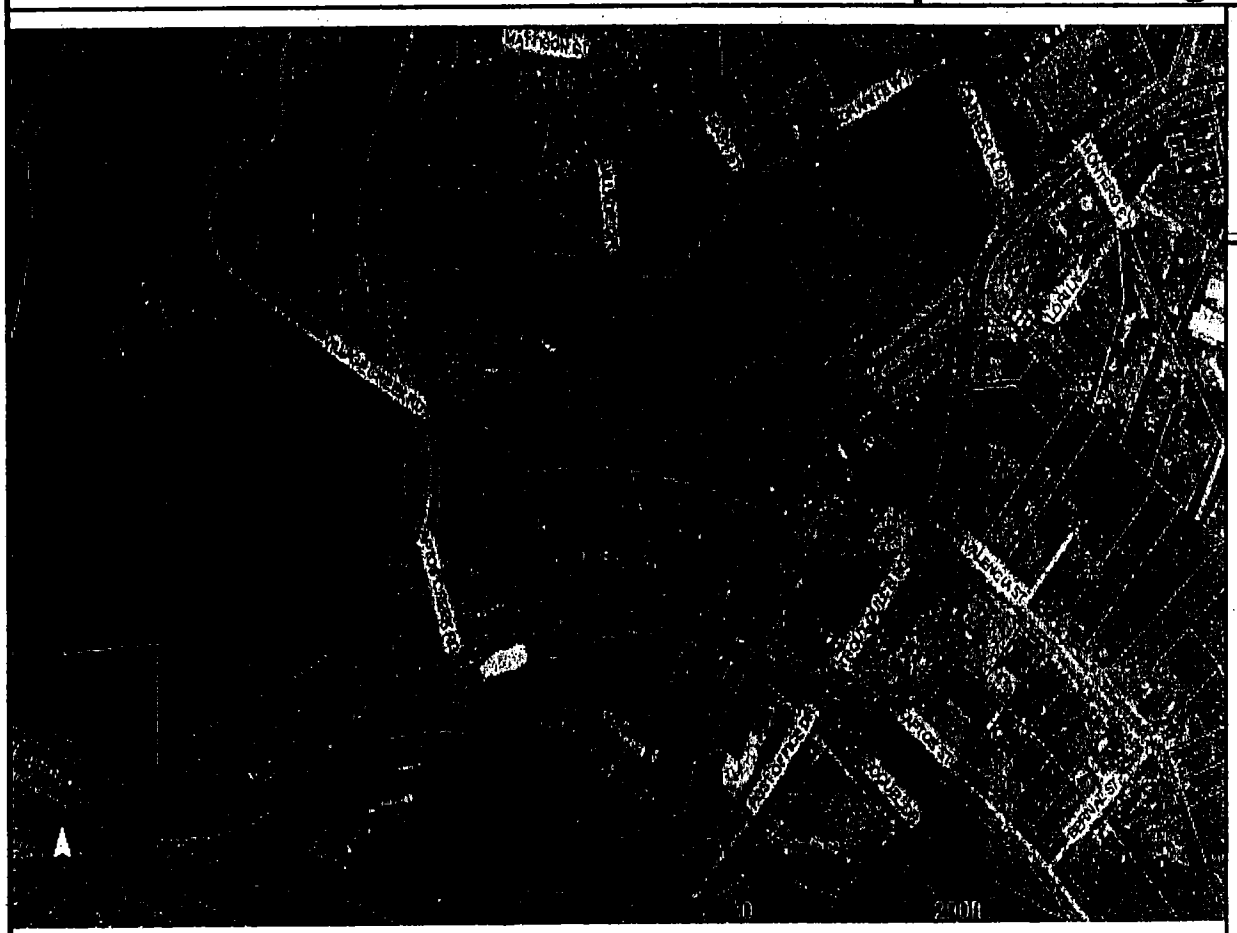

N
SCALE (ft)
0
50
APPROXIMATE FORMER LOCATION OF RAILROAD TURNTABLE FROM 1892 SANBORN MAP
B-3
B-2
B-1
SITE
UNION PACIFIC RAILROAD TRACKS




**APTOS VILLAGE**
**Exhibit L: Location Map**
Source: Ifland Engineers 2010.

Map Output

# Exhibit M: Aerial View of Aptos Village Area




Overview

Legend

Legend
Parcel (Assessor)
State Highways
STREETS
BR
MR
R
S
City Limits
Santa Cruz County Boundary

3in 2007

1FT 2008

# APTOS VILLAGE PRESERVATION PLAN - CONSIDERING A DEVELOPMENT PLAN SUBMITTED BY BARRY SWENSON BUILDER TO PRESERVE THE HISTORIC ELIGIBILITY RATINGS OF TWO HISTORIC BUILDINGS

## BAYVIEW HOTEL and HIHN APPLE BARN (Building 5-Apple Barn)

**Urban Programmers**

July 17, 2011

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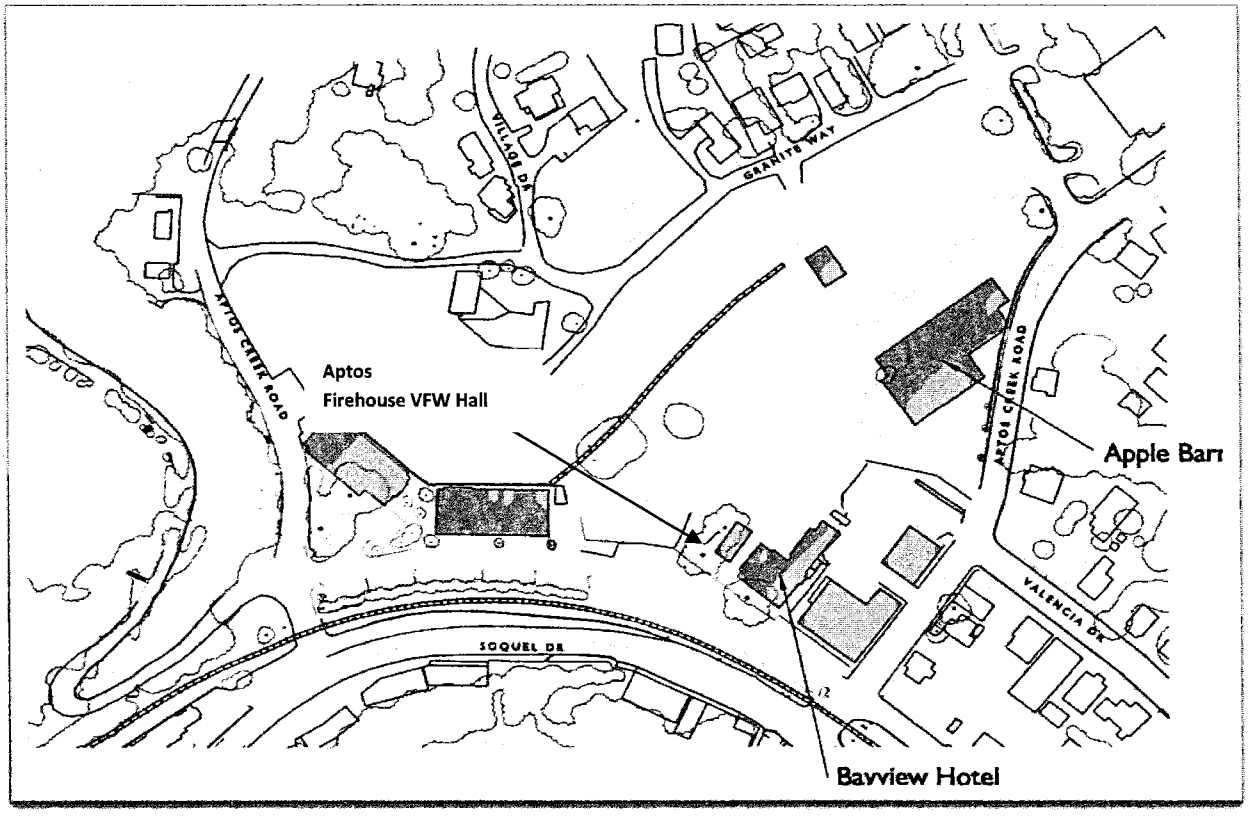
5.2 Rehabilitation Floor Plan

2 Existing Elevations

5.1 Rehabilitation Exterior Elevations

# PART 1 HISTORIC PRESERVATION PLAN - INTRODUCTION and BACKGROUND




Aptos Village Plan 2010

# PART 1. Introduction and Background

## 1.1 Introduction to the Historic Preservation Plan

A development proposal has been submitted to the Santa Cruz County Planning Department by Barry Swenson Builder for Aptos Village, one of the specific planning areas in Santa Cruz County. The following Historic Preservation Plan was created to evaluate and guide the proposed development plan in conformance with the Aptos Village Plan, *The Secretary of the Interior's Standards for Rehabilitation and Rehabilitating Historic Buildings and* Santa Cruz County Ordnance # 16.42.060.

On February 23, 2010 the Board of Supervisors adopted the Aptos Village Plan, a plan derived from many years of work between the Santa Cruz County Planning Department and the Community. The plan recognizes the historic development patterns and the heritage of Aptos Village and calls for new development, (residential and commercial), public open space, recreation areas, infrastructure improvements and improved circulation for automobiles, bicycles and pedestrians. The plan sets forth a set of guidelines and requirements for development within the plan area including a strong element of historic preservation that provides for maintaining the community's historic sense of place by preserving significant physical resources, the Bayview Hotel (NR-1), and the Hihn Apple Barn (Building #5) (NR-3 ) and the former Aptos Firehouse/VFW Hall (NR- 5). Because the Aptos Village Plan calls for constructing new roadways and buildings in locations that would conflict with the preservation of the historic the Hihn Apple Barn and the former Aptos Firehouse/VFW Hall, the plan also dictates the standards for the rehabilitation of historic buildings and where necessary, the relocation of historically important buildings. The standards for historic preservation are contained in the Santa Cruz County Code Section 16.42.060 and for preserving the buildings with commercial uses it cites *The Secretary of the Interior's Standards for the Treatment of Historic Properties*[1] and the California Environmental Quality Act- CEQA Guidelines.

Over the past four decades, the County, community and area landowners have attempted to agree on plans for improving and expanding the built environment of the Village. That effort resulted in the first community plan for the area, which was adopted in 1979, called the Aptos Village Design Framework. The plan was updated in 1985, to focus on providing a framework for the development of the area

[1] National Park Service, Cultural Resources, Secretary of the Interior's Standards for the Treatment of Historic Property, with Guidelines for Preserving, Rehabilitating, Restoring and Reconstructing Historic Buildings, 1995

around the Bayview Hotel and Aptos Station. Since the first County plan the "Village" has been the subject of several studies to identify and quantify the historical, architectural and archeological importance of the group of buildings and sites within the Village that represent the history and heritage of Aptos and Santa Cruz County. The first survey of the Village appears to have been Archival Background to the Aptos Village Project, in 1979 prepared by Archeological Resources. This study did not rate buildings; it presented a description of the development history of Aptos and identified the potential for archeological materials to be found. The next study was in the mid-1980, when the County of Santa Cruz commissioned The Firm of Bonnie L. Bamburg to conduct an intensive survey of the unincorporated areas of the County to identify historic resources and to categorize the resources using the National Register of Historic Places identification system. This survey rated then buildings in Aptos Village and concluded that the Bayview Hotel was eligible for listing in the National Register of Historic Places, the Hihn Apple Barn (warehouse & packing sheds) were found to be of local interest, as were many of the houses in the Hihn Subdivision. In 1998, the State of California adopted criteria for the California Register of Historic Resources (CRHR), thus, eligibility to the CRHR was not identified in the earlier surveys and studies. Subsequently, the Santa Cruz County Historical Trust nominated the Bayview Hotel to the National Register of Historic Places (listed 1992). The next study of the area was prepared for the Santa Cruz County Planning Department in 2003, by Dill Design Group. This study identified the potential for a local historic district that included several buildings in Aptos Village. The study found that in addition to the Bayview Hotel (Bayview), that the Hihn Apple Barn (Hihn Apple Packing Sheds), is potentially eligible for listing in the National Register of Historic Places when additional research would allow a stronger statement of significance under the National Register criteria A and/or C. The Aptos Firehouse/VFW Hall was found to have local historical interest for its longevity and associations with the Aptos Volunteer Fire Department and the civic organization, Veterans of Foreign Wars (VFW) and was eligible for listing as a contributing element in the proposed historic district (CRHR, NR-5D). [2] After consideration, the Board of Supervisors did not agree and the potential historic district was not approved.[3] Subsequently the Board of Supervisors approved the individual ratings for the Bayview Hotel, the Hihn Apple Barn and the former Aptos Firehouse/VFW Hall. A study was prepared by Albion Environmental Inc. "Cultural Resources Study for the Proposed Aptos Village Project, Santa Cruz County, California Final Draft February 2009", as part of the recent Aptos Village Planning process. This study referenced the previous studies and was tasked with

[2] Dill Design Group, Aptos Village Historic District, March 7, 2003 DPR D6 Significance
[3] ibid

considering the effects of a proposed development plan for Aptos Village that was prepared for Barry Swenson Builder by Thacher & Thompson Architects, dated 9/27/2010. To research the Aptos property holding of F. A. Hihn, Stanley D. Stevens was commissioned by Barry Swenson Builder to research the public documents relating to Hihn's property in Aptos Village and the Aptos Mill (Valencia Mill). This research appears to have located the specifications for the first section of the Apple Barn, a warehouse constructed in Aptos c. 1891-1899. [4] Subsequent to that study, Urban Programmers was commissioned to respond to questions put forth by the Santa Cruz County Historical Resources Commission regarding the historical status of buildings in the Aptos Village and how their status might be affected by the proposed plan. In the final report prior to adopting the Aptos Village Plan, the County of Santa Cruz commissioned Professor Emeritus Sandy Lydon to provide a historical context for the Aptos Village. These previous reports set the background for the Historic Preservation Plan (HPP) that will consider specific properties.

Barry Swenson Builder, Inc., the owner of the historically significant Hihn Apple Barn (NR 3) and several other parcels, has submitted an application to develop the proposed "Aptos Village Plan" and is including Mr. Joe Appenrodt, the owner of the former Aptos Firehouse/VFW Hall (NR-5D), within the development team. Due to the unstable condition of the building, Mr. Appenfodt has applied to demolish the former Aptos Firehouse/VFW Hall (NR-5). The owners of the Bayview Hotel have discussed rehabilitation plans for the hotel which is listed in the National Register of Historic Places (NR-1), but have not submitted an application.

Santa Cruz County Code Section 16.42.060 requires a Preservation Plan for the proposed development plan to describe how the significant historic buildings within the plan will be relocated and rehabilitated following the County Code and the *Secretary of the Interior's Standards for the Treatment of Historic Property* further defined to be the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.*

Urban Programmers was commissioned by Barry Swenson Builder and approved by the County Planning Department to prepare the Historic Preservation Plan to identify any impacts to the historic buildings and specifically the relocation and rehabilitation of the Apple Barn and the Aptos Firehouse/VFW Hall, and to consider the overall plan submitted by Barry Swenson Builder for changes that would affect the Bayview Hotel. The County Historic Preservation Planner, Annie Murphy

[4] Steven's Stanley D., research document summary "F. A. Hihn's Aptos Warehouse" June 10, 2008

reviewed the criteria with Bonnie Bamburg of Urban and provided comments on the scope of work (Email 4/28/10), further comments were submitted based upon a draft plan dated July 29, 2010. At the time the Preservation Plan was prepared, there were varying levels of information from each of the owners, and therefore the plan information varied for each property. As the plans have progressed they have been added into the revisions of the Historic Preservation Plan. During the process, the structural report for the former Aptos Firehouse/VFW Hall concluded the building would not survive relocation and the extent of new materials that would be required to reuse the building would not be in conformance with the Secretary of the Interior's Standards. Recently the Santa Cruz County Building Official issued a notice (Red Tag) that the building was dangerous and must be vacated. The owner has applied to demolish the building and thus the former Aptos Firehouse/VFW Hall was removed from this Historic Preservation Plan.

## 1.2 Justification for the Relocation of Historic Buildings in the Aptos Village Plan

The Aptos Village Plan describes the area as "a place where major transportation elements come together, where highways and railroads snake around and across a daunting natural landscape".[5] Indeed, the history of the area is based in large measure on transporting, lumber, apples and people. Circulation within Aptos Village has remained constrained by Valencia and Aptos Creeks and the early configurations for railroads and bridges that continue to serve the community.

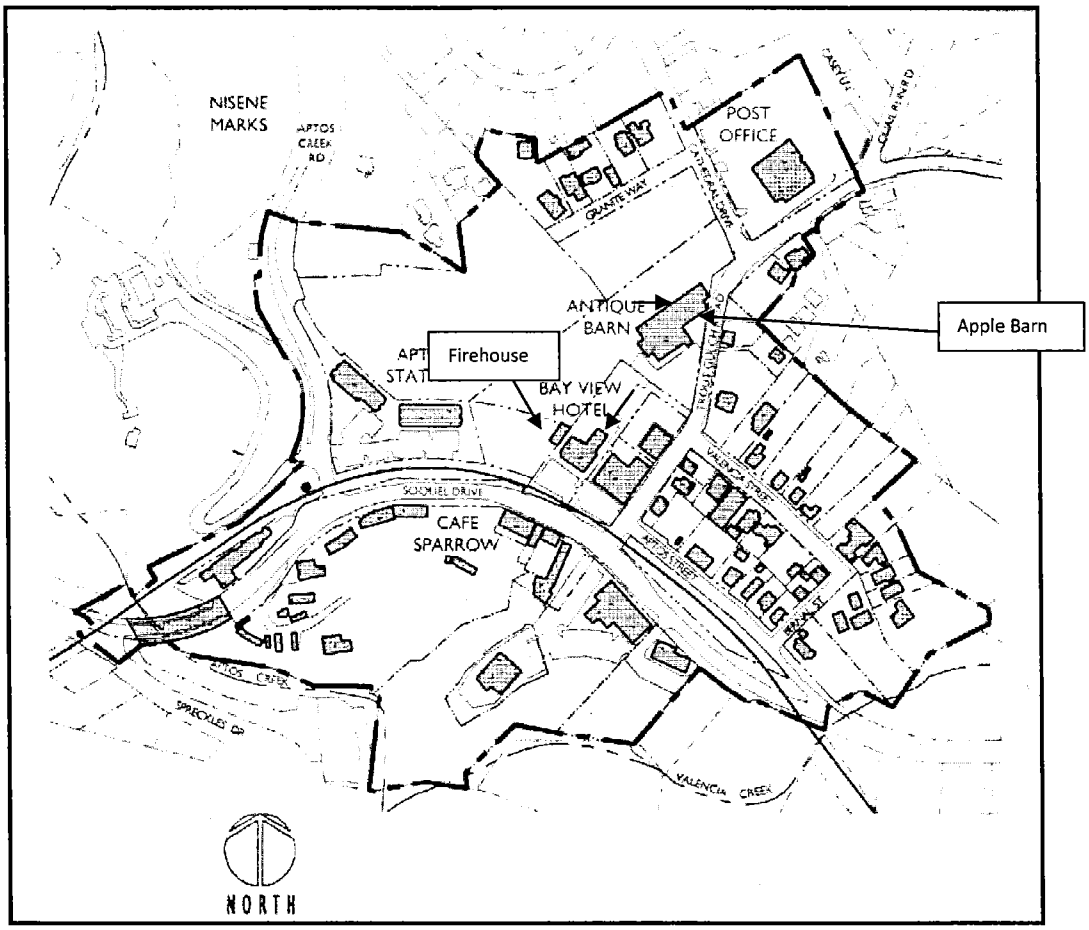



Figure #1A. Existing Development and Road Pattern. Historic buildings, Bayview Hotel and Antique Barn (Hihn Apple Barn) are identified. The former Aptos Firehouse/VFW Hall is the rectangular building (arrow) to the left of the Bayview Hotel Source. Aptos Village Plan, February 23, 2010

[5] County of Santa Cruz, Aptos Village Plan, 2010, page 4

### 1.2.1 Circulation within the Aptos Village Plan- Rational for relocating historic buildings.

The need for circulation and infrastructure improvements was a driving force behind the Aptos Village Plan approved February 23, 2010, by the Santa Cruz County Board of Supervisors. The existing circulation pattern does not connect through the center of the former industrial section of Aptos and does not allow for the level of safety and a comfortable environment that is desirable and necessary to maintain a healthy community. The Aptos Village Plan provides circulation on Parade Avenue, a new north/south street from Soquel Drive to Valencia Avenue, and a new east/west street between Trout Gulch Road and Aptos Creek Road. The need to provide improvements to Trout Gulch Road, has already impacted the Hihn Apple Barn (NR-3) by widening the road as it turns at the base of the building and cutting off the corner of the roof and porch. The Apple Barn currently exists with one truncated corner of the roof and the rest of the building sitting on the right of way line. Santa Cruz County Zoning requires a 10 foot setback for commercial buildings; however an exception is made for historically important buildings or existing buildings. Allowing for the exception, the building is in conformance with the regulations. While this does not create a zoning violation (existing buildings are "Grandfathered" from the 10 foot setback), the very close proximity to the traffic does create a threat to the building. Relocating the historic Hihn Apple Barn appears necessary to protect and preserve the building, while providing improved safety and access for the community. Parade Avenue (north/south) and Valencia (east/west) will improve circulation and provide new commercial frontage in the Village.

Parade Avenue requires land that is controlled by the owner of the former Aptos Firehouse/VFW Hall, a small building west of the Bayview Hotel. To implement this proposed plan the small building would need to be removed. As much as the current circulation has created safety issues and limited commercial access, so too it has limited access for commercial parcels slowing the community growth patterns and limiting the economic potential for the historic buildings and thus their potential for sustained preservation. The Aptos Village Plan provides new streets that will open the vacant land in the center of the Village to encourage commercial and multi-family development that will better balance the community.

This Historical Preservation Plan (HPP) evaluates the potential impacts of relocating and adaptive reuse of the Apple Barn and any conflicts with new buildings in close proximity to the Bayview Hotel. The Historic Preservation Plan follows the criteria and guidance of the *Secretary of the Interior's Standards and Guidelines for Rehabilitating Historic Buildings and* the U.S. Department of the Interior, CEQA and the County Code.

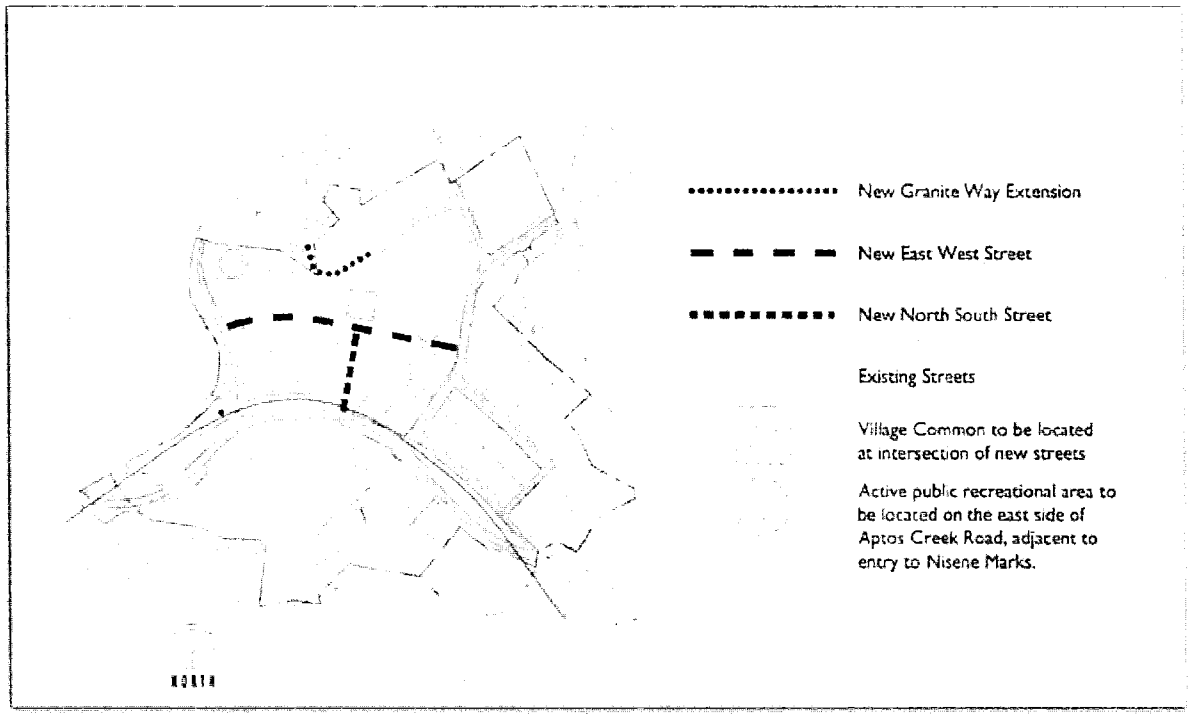



**Figure #1 B Key Features and Circulation of the Aptos Village Plan**
**Source: Aptos Village Plan, Santa Cruz County, February 13, 2010 page 30**

## 1.2.2 Historical Circulation Patterns and Context.

The entrance to Aptos Village from the north is constrained by the 1925 railroad overcrossing and on the south by the 1929 concrete arch bridge. However, before these bridges and before automobiles, early entrepreneurs saw the economic potential for lumber in the adjacent forested hills and began hauling with wagons and across modest bridges that formed the patterns that became railroads in the early 1870's. This pattern continues through Aptos Village further limiting the opportunities for efficient circulation planning. The large interior of the community, once industrial yards, is not served with roads, leaving the center of Aptos underutilized and mostly vacant. Adherence to the plan will

change the historical configuration of the area and likely change the setting and location of historic buildings.

In 1873, Fredrick Augustus Hihn, an important civic figure, an entrepreneur, and major land owner in Santa Cruz County, became President of the narrow gauge Santa Cruz Railroad, and through his influence the railroad was routed through Aptos to serve his lumber company on Valencia Creek. By 1882, the unprofitable railroad became the property of Southern Pacific in a transaction whereby Hihn paid $25,000 for Southern Pacific to take over the narrow gauge and change it to broad or standard gauge rails. The standard gauge allowed the products from Aptos, including Hihn's lumber and agricultural products, access to the nation's standard gauge rail system without the expense and time to reload rail cars in Watsonville.[6] Through the transaction, Hihn retained his redwood forest land and added 27 acres of land in and adjacent to Aptos. Here he used relatively flat land to build a lumber yard adjacent to the Southern Pacific Rails.[7] The remainder he leased to Samuel W. Springer to plant in oat hay. Railroads and the industry they serve generally spawn development and such was the case in Aptos as hotels, saloons and houses were constructed to serve lumber jacks, mill workers and the start of a community. The decades of 1880-1900 saw two major sawmills, Hihn's Valencia Mill (1883-1893) and Southern Pacific's Loma Prieta Lumber Company (1883-1899) sending a steady flow of logs and lumber through Aptos. Remaining from this era is the Bayview Hotel (Anchor House 1880) a building that architecturally dominates the community and is listed in the National Register of Historic Places. To the east, recent research suggests a section of the Hihn Apple Barn also remains from that era.[8] As the lumber mills closed in the 1890's, the community embraced the agricultural success of the Watsonville area, planting apple orchards to the north and east- often where the redwood trees had been cut. Although not a major agricultural area in the County, the apple era in Aptos is recognized as an important economic period for the community. Enough apples were shipped through Aptos Village using the Southern Pacific Railroad, that the Village was sustained with box makers, apple packers, apple dryers and vinegar works. The apple industry in Aptos Village waned in 1940, when the Lam-Mattison Dryer closed, although it was 1959, when the last apple packing ended.[9] It was not only the end of the apple industry that brought economic depression to Aptos Village, but the 1949, realignment of the "main road" State Highway 1. The new alignment abandoned the winding road through Aptos

[6] Koch, Margaret, Santa Cruz County Parade of the Past, Wild Tanager Press, Santa Cruz, 1973: 167
[7] Sanborn Map Publishing Company, Aptos 18
[8] County of Santa Cruz, Aptos Village Plan, 2010, page 7
[9] County of Santa Cruz, Aptos Village Plan, 2010, page 8

Village in favor of a straight road to the west completely bypassing Aptos Village. Not until 1962, and the opening of Cabrillo Junior College to the north of Aptos did the economy improve. Since that time the new commercial development has occurred primarily along Soquel Avenue. As the community continued to grow and change it was the desire of the Aptos residents and the County Administration to create and adopt the Aptos Village Plan as a tool to promote more efficient and safe circulation and to guide future development while maintaining a sense of the history that allows Aptos to exhibit such a rich heritage.

### 1.2.3 U.S. Department of the Interior Criteria for Relocating Historic Buildings.

The Aptos Village Plan (2010) demonstrates the need to relocate the Apple Barn to provide for its long term preservation. In the 1979 publication Moving Historic Buildings, by John Curtis[10], it states that "historic buildings should only be moved to preserve the building and as a last resort of demolition", and further in the publication it states that the "most common reason for moving historic buildings is to improve circulation or to widen roads." The guidance in this publication fits the situation in Aptos Village. The publication provides methodology for moving historic buildings that is consistent with the plans to brace and move the Apple Barn.

### 1.2.4 The California Environmental Quality Act (CEQA) and The National Register Requirements for Moving Historic Buildings;

The CEQA Guidelines state "Relocation of an historical resource may constitute an adverse impact to the resource. However, in situations where relocation is the only feasible alternative to demolition, relocation may mitigate below a level of significance provided that the new location is compatible with the original character and use of the historical resource and the resource retains eligibility for listing on the California register "(14 CCR Section 4852 (d) (1)).

The State Historical Resources Commission encourages the retention of historical resources on their original site and discourages the non-historic grouping of historic building into parks or districts. "However, it is recognized that moving an historic building, structure, or object is sometimes necessary to prevent its destruction. Therefore, a moved building, structure, or object that is otherwise eligible may

[10] Curtis, John, Moving Historic Buildings, Department of the Interior, Heritage Conservation and Recreation Service, Technical Preservation Services Division, Federal Printing Office, 1979

be listed in the California Register if it was moved to prevent its demolition at its former location and if the new location is compatible with the original character and use of the historical resource. An historical resource should retain its historic features and compatibility in orientation, setting, and general environment".[11] This also describes the situation in Aptos Village.

The 2010 Aptos Village Plan improves circulation, public safety for pedestrians and vehicles, and establishes the opportunity for enhanced economic development that is envisioned to benefit the economic viability of the historic buildings. The primary axis is created by a new north/south road (Parade Avenue) leading from Soquel Drive to Valencia Street and the "Village Green", open space. This creates an organized arrangement of buildings and open spaces that echoes the formal center of town with a village square, an organization that is missing from the industrial land use patterns of historic Aptos. Historically most traffic and commercial uses were relegated to Soquel Drive and Trout Gulch Road without a definable town center in Aptos. The circulation plan and organized parking areas will increase safety while providing better access and parking for the historic buildings. Currently parking is accommodated primarily on unpaved, undesignated, areas around the Village Fair Antique Emporium (Hihn Apple Barn), in areas between buildings, some of which do not connect, and in front of the Bayview Hotel.

To accomplish the goals of the Aptos Village Plan it is necessary to relocate the Hihn Apple Warehouse. The building has already been adversely affected by road improvements that threaten its preservation and it appears to lack sufficient financial resources to undertake substantial deferred maintenance, conditions that make demolition a possibility.

Relocating buildings eligible for listing in the California Register of Historic Resources creates a potential significant adverse impact under CEQA. However, the CEQA Guidelines referenced above, allow relocation to be mitigated to a level of less than significant impact when the buildings are relocated to provide for their preservation and as long as the resulting construction follows the *Secretary of the Interior's Standards for the Treatment of Historic Properties.*

The relocation of historic buildings listed in, or eligible for listing in the National Register of Historic Places is deemed acceptable when it is specifically necessary to preserve buildings. The Hihn Apple Barn will be relocated on the same parcel and rehabilitated in conformance with the *Secretary of the*

[11] California Environmental Quality Act (CEQA) and Historical Resources Technical Assistance Series, Page 32

*Interior's Standards for the Treatment of Historic Property*, and the Santa Cruz County Code Section 16.42.060, thus providing for the physical longevity while maintaining the County rating (NR-3) and the potential eligibility for listing in the National Register of Historic Places and/or the CRHR.

### 1.2.5 Integrity Issues and Maintaining the Integrity of the Historic Buildings

The Preservation Plan also considers how the changes might impact or benefit the Bayview Hotel, a building listed in the National Register of Historic Places and the most significant building in the history of Aptos village, as well as the visual focal point for the community.

The following sections will discuss the integrity and significance of each of the historic buildings and how they will be preserved as part of the Aptos Village Plan and the proposed Swenson development plan. Following the guidance in the *Secretary of the Interior's Standards for the Treatment of Historic Property*, the sequence is to identify character defining features (building and setting) and to provide methods for their protection and rehabilitation (when necessary).

Integrity is essential for a historic property to be considered eligible for listing in the registers. Prior to identifying potential impacts it is necessary to evaluate the integrity and understand the significance of the historic buildings. Properties eligible for the National Register will retain most, if not all aspects of integrity. Properties eligible for the California Register will retain some of the aspects. The National Register defines seven aspects that make-up integrity.

> *Location: the place where the historic property was constructed or where the historic event occurred.*
>
> *Design: The combination of elements that create the form, plan, space, structure, and style of a property.*
>
> *Setting: the physical environment of a historic property.*
>
> *Materials: the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.*
>
> *Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.*
>
> *Feeling: a property's expression of the aesthetic or historic sense of a particular period of time.*
>
> *Association: the direct link between an important historic event or person and a historic property.*

# PART 2 THE BAYVIEW HOTEL

# Part 2 Bayview Hotel (Bay View Hotel)

## 2.1 Introduction:

In 1992, the Bayview Hotel was listed into the National Register of Historic Places for its depiction of Second Empire architectural style and for its association with commerce and recreation/entertainment. It is the only building in Aptos Village listed in the National Register. The Aptos Village Plan, identifies the need to respect the integrity and the historic significance of the Bayview Hotel as paramount in any future plan. Originally set on a larger parcel with gardens and open areas on both sides, the site has been reduced by a contemporary commercial building has been constructed immediately to the east of the hotel and the former Aptos Firehouse/VFW Hall was moved to the west side. The hotel exists on a parcel that is 341.04 feet deep and 106.87 feet wide (including easements). The hotel has a 20 foot access easement between the commercial building to the west and a setback of approximately 15 feet to the east property line. Additions to the rear have created an "L" shaped building that extends along the west side with an open area behind the main portion of the building on the east.

The Hotel is a commanding building, the focal identity of Aptos Village where it is located on the north side of a curve and dominates Soquel Drive. The proposed development plan submitted by Barry Swenson Builder, does not contemplate alterations to the Bayview Hotel.

The proposed development plan includes a new building on the parcel adjacent to the west side of the Bayview Hotel that is occupied by the former Aptos Firehouse/VFW Hall, a small single-story building that was previously moved to this location. The proposed plan is to remove the small building and to develop a new two-story commercial building on the site. The new building would be aligned with the side set-back from the hotel that is 13 .4 feet the same as the small building (measured to the projecting bay of the hotel). To evaluate the change the new building would create, it is necessary to consider the context of the existing setting, including the circulation, existing buildings, and how the integrity of the Bayview Hotel may be affected.

The following section describes in detail the significance of the Bayview Hotel the setting of the historic building is compatible with the new development proposed for the Aptos Village.

## 2.2 Bayview Hotel Historic Significance - National Register Listing:

The Bayview Hotel was listed in the National Register of Historic Places (NRHP- NR-1) at the local level of significance as a good representation of the Second Empire style of architecture in a commercial building that was constructed in the 1870's, and for its association with economic expansion in commerce and tourism brought to Aptos by the railroad (NRHP Criteria A). The three-story wood frame

hotel was constructed in 1878 at the corner of Soquel Drive and Trout Road (Trout Gulch Road) and moved about 100 feet to the present location, west of Trout Gulch Road, in 1946.[12]

The National Register Registration (nomination) provides the following summary description "The Bayview Hotel is an imposing three story building that dominates the surrounding small commercial district of Aptos Village by both its size and its stately Italianate style. The arrangement of windows, dormers and brackets is extremely orderly on all sides, giving the building a dignified appearance form any view." The Bayview Hotel is little altered since it was listed in the National Register of Historic Places, and retains most of the attributes of integrity defined by the National Register of Historic Places that are listed on page 10. The aspects of integrity maintained by the hotel include: the Second Empire style (design), constructed in the historic materials of native wood and glazing (materials), crafted together by the original skilled carpenters (workmanship) that continue to give the sense of the importance in the community as when it was constructed (feeling), and it continues to communicate the relationship to commerce and tourism (association). Because the hotel has been relocated to the current site, and the once open area around the building has been reduced significantly to a small garden, the property does not retain the attributes of original location or of setting. However, these have not changed since the building was listed in the Register and the Bayview Hotel remains the focal point in the streetscape of Aptos.

The 2010 Aptos Village Plan identifies the hotel as the focal point of the community and the jewel of the community's historic buildings.[13] The plan was designed to preserve the historic building by adopting policies that will require any alteration to the hotel to conform to the *Secretary of the Interior's Standards for Rehabilitating Historic Buildings* and the Santa Cruz County requirement for creating a Historic Preservation Plan (HPP), in conformance with Chapter 16.42.060 of the County Code.

[12] Koch, Margaret, Santa Cruz County Parade of the Past, western Tanager Press 1981:159
[13] Aptos Village Plan, Santa Cruz County, 2010, p33

**Figure # 2-A Bayview Hotel c. 1946 after it was relocated 100 feet west. Source: Commissioner Carolyn Swift, Aptos Historical Museum**

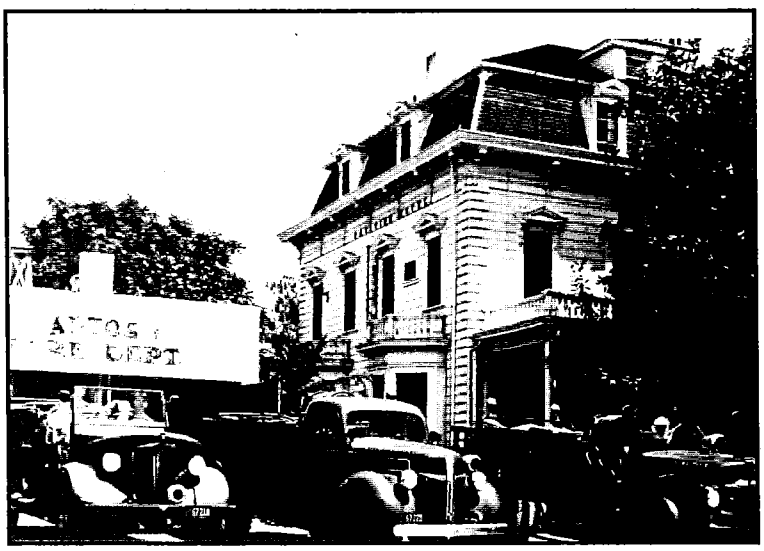


**Figure # 2-B The Bayview Hotel c.1950, after the hotel was relocated and with the Aptos Fire Dept. next door. Source: Commissioner Carolyn Swift, Aptos Historical Museum**

Since the early 1920's the setting for the hotel has been crowded by the relocation of the Aptos Firehouse/VFW Hall on the west side of the hotel and was further affected by the c. 1960's strip commercial building on the east. Historically the land on the west was a garden (open space), with a

fountain, to the east more open area or Trout Gulch Road.[14] The historic circulation elements around the hotel included the railroad in front of the hotel, Trout Gulch Road, and Soquel Drive with parking, or drop off areas, in front of the hotel.

The proposed development plan maintains the active circulation and parking in front of the hotel.

## 2.3 Removal of the former Aptos Firehouse/VFW Hall:

The former Aptos Firehouse is not included in this HPP due to the recent structural report that indicates the fragile building is not a candidate for rehabilitation. Therefore the building will be considered in a separate report. Although there has been a question of possible historic association between the hotel and the Aptos Firehouse/VFW Hall, research did not uncover information that would link the buildings in an unusual or significant relationship. It appears the relocation of the small building was a convenience to keep the fire equipment in the center of the Village and not because of a relationship with the owners of the Bayview Hotel.

The National Register Nomination for the Bayview Hotel does not cite the Aptos Firehouse/VFW Hall as a contributing feature to the significance of the hotel; in fact it does not mention the building. [15] Removing the small building will not diminish the historical significance or integrity of the Bayview Hotel.

## 2.4 New Construction Adjacent to the Bayview Hotel: - Area of Potential Effect (APE):

The National Historic Preservation Act of 1966 (as amended) defines the need for evaluating the effects of actions (undertakings) to historic resources when federal money is involved in the project (36 CFR 800). Other jurisdictions have applied the same principals to consider the effects of new development to historic resources even when federal money is not involved. Following this guidance, new development, in proximity to historic resources, is considered for any potential effect on historic resources. The area of study – Area of Potential Effect (APE) - is based upon the specific factors of the case. Factors include; the proximity to the historic resource, the proposed use, size (mass and height), design, and possible indirect effects. The effect may be adverse or beneficial.

The APE for the proposed new development extends to the east and the north between the Bayview Hotel and the c. 1960's commercial building (easement line), to the proposed east-west street and extending to the center of the proposed Parade Avenue on the west and to the south to the railroad

[14] Sanborn Map and Publishing Co.,Ltd, 1908 Aptos CAL
[15] Santa Cruz historical Trust, National Register of Historic Places, Registration Form for the Bayview Hotel, 1989

tracks. The APE does not extend further east because the proposed plan does not alter the existing buildings and proposes only infrastructure and parking areas beyond the parcel to Trout Gulch Road.

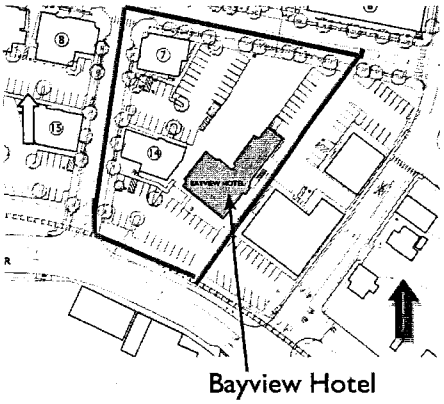



**Figure 2- C Area of Potential Effects Considering the Bayview Hotel**

The first consideration is the overall plan within the APE. The proposed development includes new infrastructure, multi-story buildings, parking and landscaping. Valencia Avenue, the new east-west street is at the rear edge of the Bayview Hotel parcel with urban style streets, sewers, utility trenches, and street trees. These do not create the potential for a negative effect to the historic building other than during construction when vibration, dirt and dust may be generated in higher than normal quantities. The same appears generally true for the Parade Avenue the north-south street. Although on Parade Avenue there is , the added concern for street trees at the corner and in the parking area in front of the proposed new building (#14), locations that have the potential to block the view of the historic hotel and reduce the dominance of the hotel on Soquel Drive. Regarding the proposed new building and its effect on the hotel, the National Register nomination describes the context for the building as part of a vibrant commercial area during a time of economic prosperity.[16] Historic Sanborn Maps show the hotel in the center of the commercial community on a large parcel with open space around it (figures 3-BB, 3-CC & 3-DD). Subsequent development has reduced that space to a parcel of less than one acre with the building occupying over half the area. The Aptos Village Plan set the parameters for new development and states that the Bayview Hotel is the most historically significant building in the community and "any new structures built adjacent to that site must be reviewed by the Santa Cruz County Historical Resources Commission to ensure that they do not compromise the historic context of this very important historic resource and center piece to the character of the Village." As part of the "Description of Development Potential of Sites" it shows Area 6 (hotel parcel) with 2,500 (additional square feet ) and states that " the undeveloped space in the rear of the hotel parcel must be improved to

[16] National Register of Historic Places Registration Form – Bayview Hotel, 1989, page 2

provide a welcoming presence along the new east-west street frontage." [17] Due to parcel lines, no accommodation is made to restore additional open space around the hotel. However, the density calculation shows that a new building in area 9 is limited to 6,000 (square feet) with a maximum of 4 residential units and a height of two-stories. Design considerations state "Buildings must present well to Soquel Drive and provide a "front" appearance on the new north-south street." [18] Thus, the proposed new building meets the criteria but is adjacent to the hotel and uses the set-back established by the former Aptos Firehouse/VFW Hall, of approximately 15 feet. While this is not optimal for the hotel, the setting has been reduced on the west for over 50 years, during which the hotel has continued to be the focal point in the community and was listed in the National Register of Historic Places.

Infrastructure improvements described in the Swenson plan may also have an indirect effect in preventing standing water or flooding around the hotel, and will achieve improved safety in the area. There is potential for beneficial economic effects if occupants of the new building, or others envisioned in the development plan, patronize the business in the hotel. Generally the proposed infrastructure and development plan does not have an adverse effect on the historic building.

## 2.5 The Setting and Historic Integrity

The concern is for changes to the setting of the historic hotel. The commercial office is not a use that will affect the hotel or its setting in an adverse manner. The Secretary of the Interior's Standards define setting as "the area or environment in which a historic property is found. It may be an urban or suburban neighborhood or a natural landscape in which a building has been constructed." The concern regards the proposed commercial office building and how it will affect the Bayview Hotel's setting.

The setting of the Bayview Hotel has changed over time. The Bayview Hotel lost the historic relationship with landscaping/open area when the property was subdivided in the 1960's and when the hotel was moved closer to the small Aptos Firehouse/VFW Hall. The subdivision of property has reduced the opportunity for the extensive landscaping on the sides of the hotel. *The Secretary of the Interior's Standards for the Treatment of Historic Property* provides in Standard # 10 the requirement to set the new buildings apart from the historic building and that it/they be designed in such a way that the historic relationship with (historic) landscape can be maintained. In this case, the space between must be sufficient to provide the historic building with a buffer separating it from the new construction. The width of set-back from the west side of the hotel's parcel line of 15.06 feet, measured from the body of the hotel to the parcel line (excluding the projecting slanted bays), is a minimum and should not be

[17] Aptos Village Plan, 2/23/2010, pages 62, 63,
[18] ibid

reduced. In order to be effectively used, the space must be designed with appropriate landscaping to maintain a buffer that benefits the hotel's setting. Narrow trees such as Italian Cypress close to the property line and low bushes and/ or walkway closer to the hotel, with taller trees behind the hotel is one approach. Trees should not be taller than the new building and should not block the view of the hotel from any view line. The set-back space is sufficient to allow view lines and the sense of "time and place" that create the setting around the building. Summarizing the intent of the standards the features of the setting include the primary historic roads and orientation of the Bayview Hotel, as well as the magnolia tree in the front of the hotel and new landscaping on the side of the hotel to buffer it from the new buildings and to maintain the Bayview Hotel's dominance over the Aptos Village Commercial area.

Eliminating windows on the east side of the new building provides the benefit of privacy to the hotel and the opportunity for landscaping directed toward the hotel (figure 2.I).

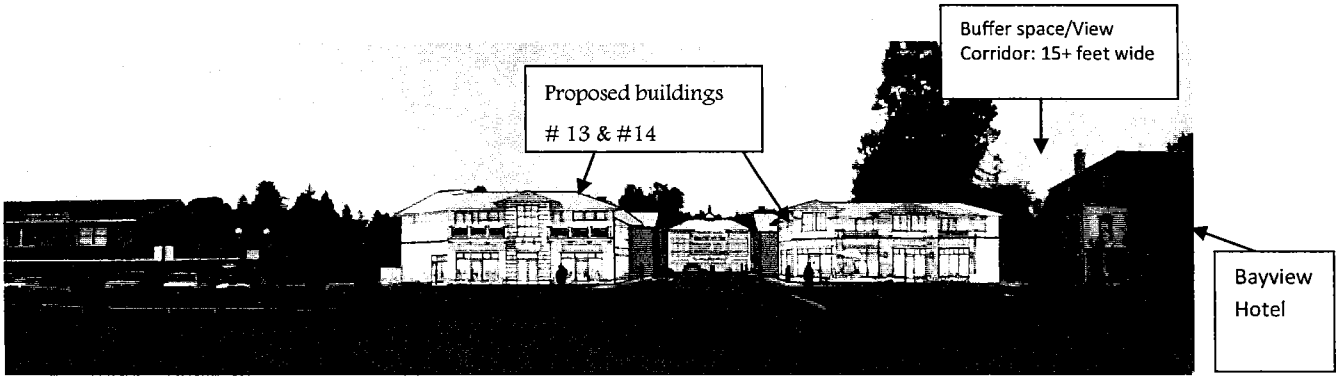



**Figure # 2-D Setting for the new building adjacent to the Bayview Hotel showing the height approximately 48 feet tall and the proposed building is 30 feet tall. The space between the buildings is 14.6 feet.**
**Source: Thacher and Thompson Architects.**

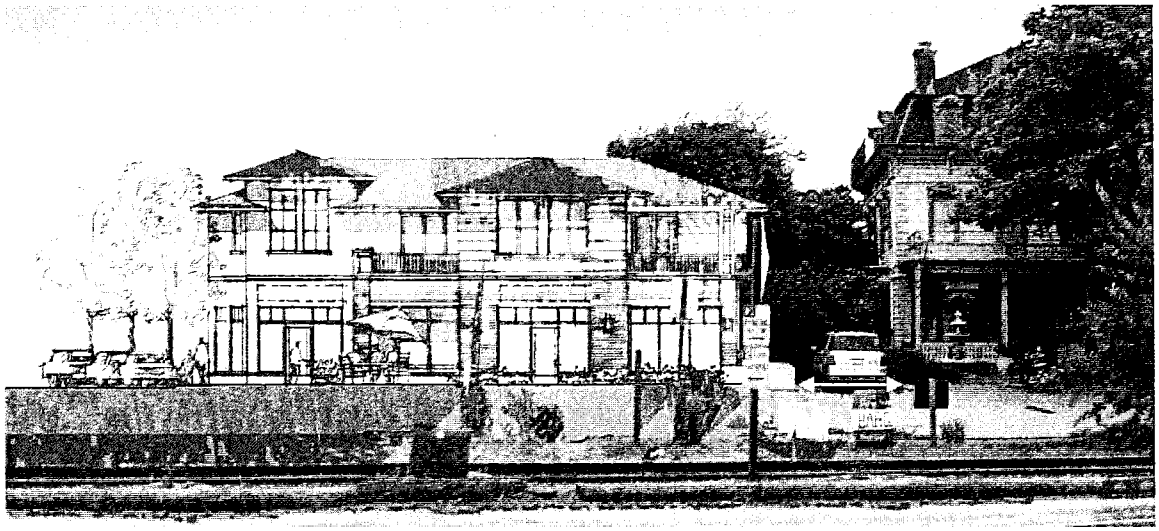


**Figure # 2- E Composite drawing showing the new building on the site next to the Bayview Hotel with 16.5 feet separation to the walls of the buildings.**
**Source: Thacher & Thompson Architects**

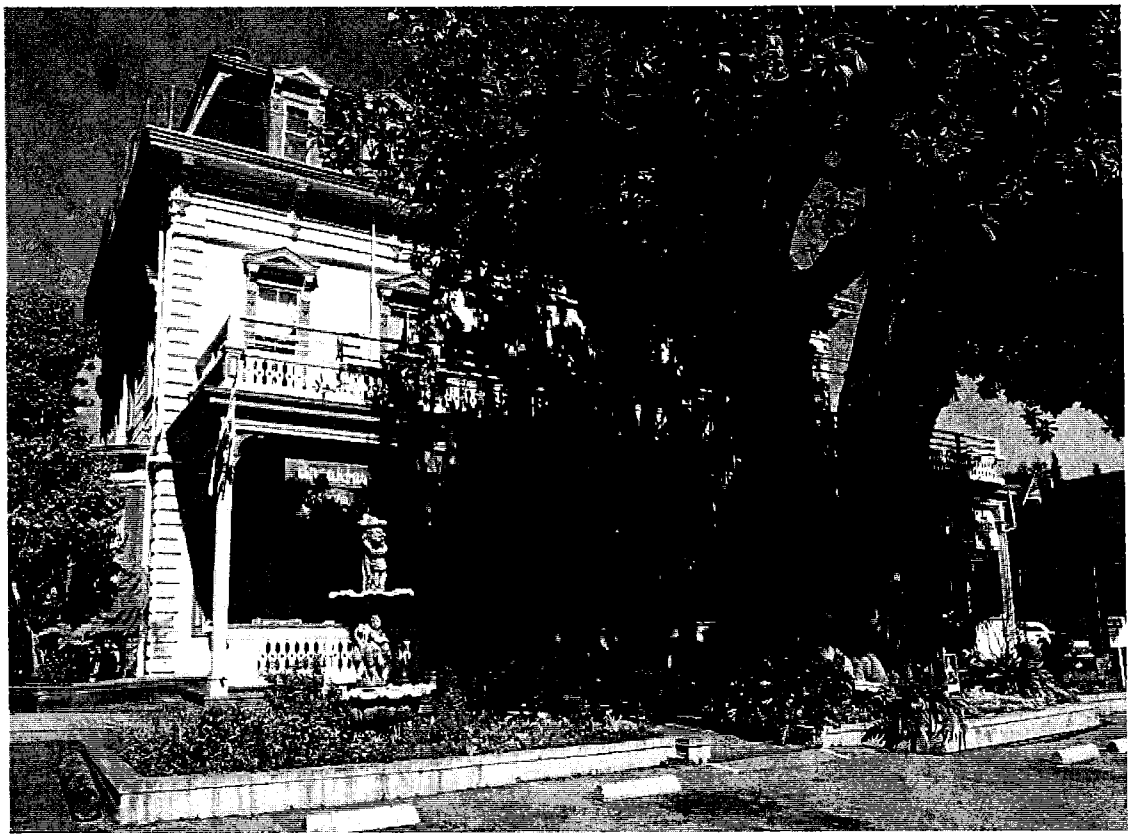


**Figure # 2-F Bayview Hotel showing the small landscape areas (planters) in the front, the magnolia tree and enclosed porch across the front (alteration),the slanted bay windows on the west side and commercial building on the east.**
**Source: Bayview Hotel Website, www.bayviewhotel . com**

Figure # 2 G East façade of the Bayview Hotel showing the rear of the three story building and the one story annex on the rear.
Date. 10/2010

**Figure # 2-H Bayview Hotel-Rear (north) Façade.**
**Date: 10/2010**

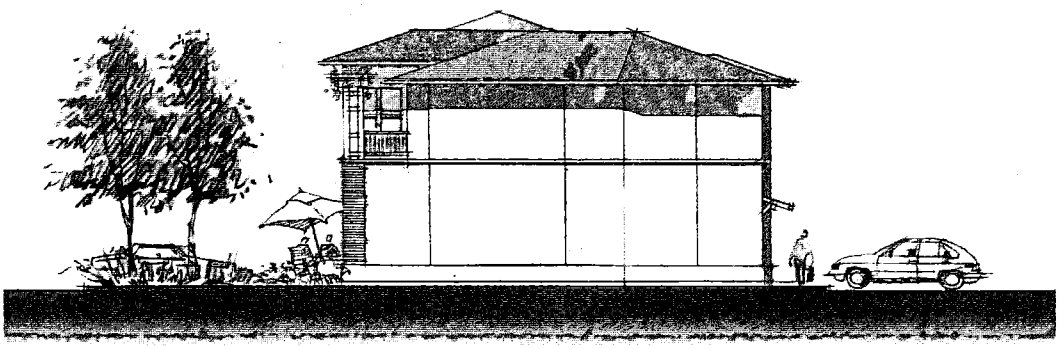


**Figure # 2- I Proposed Building #14 – East façade to be adjacent to the Bayview Hotel (no windows or access on this façade)**
**Source: Thacher & Thompson Architects 10/2010**

Bayview Hotel on this side of the proposed building

**Figure # 2- J Proposed Building #14, South façade next to Bayview Hotel, is a compatible design that does not copy the historic hotel.**
**Source: Thacher & Thompson Architects 10/2010**

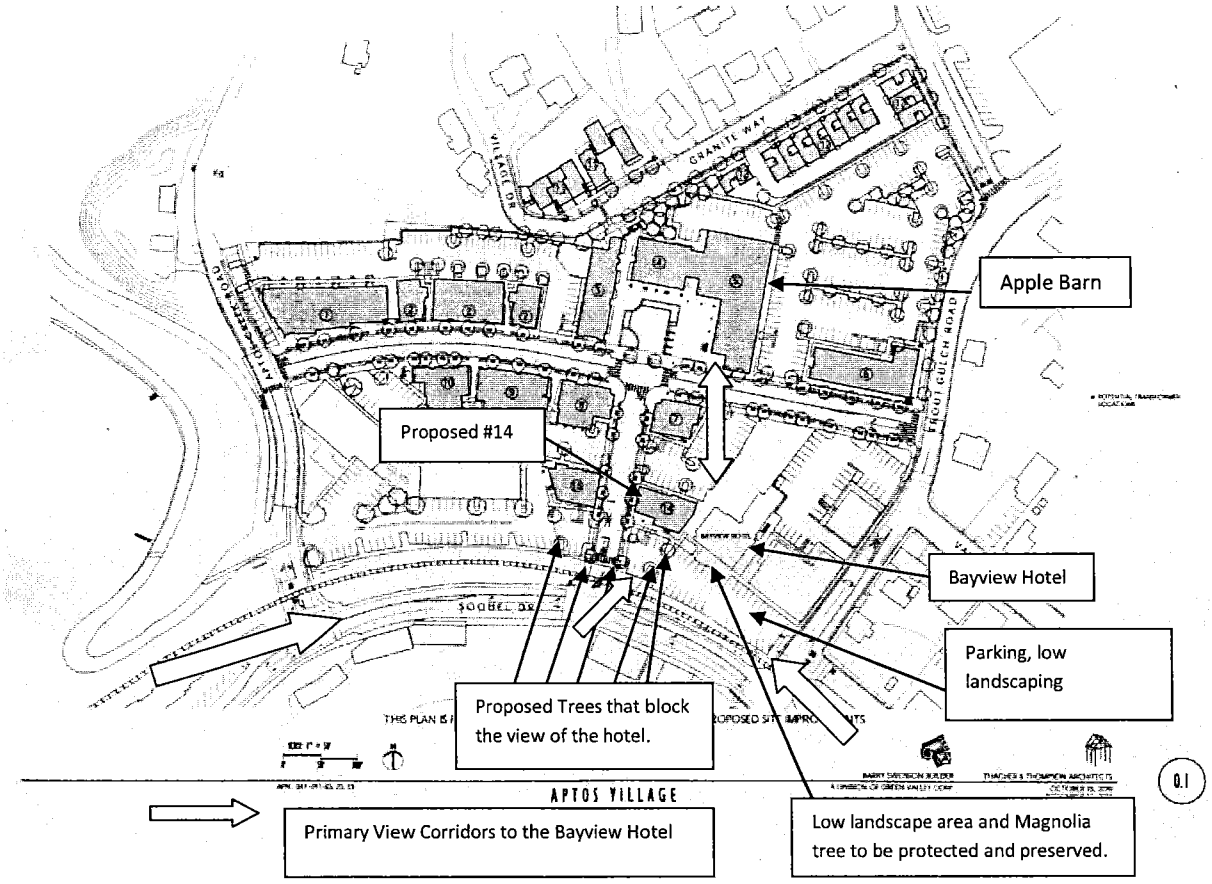



**Figure # 2-K Preliminary Site Plan showing the proposed new 2-story, building #14, next to the Bayview Hotel and where the site lines or view corridors must be retained.**
**Source: Thacher & Thompson Architects, November 11, 2009**

The important element in the hotel's setting is the prominent location and its dominance of the streetscape on Soquel Drive. This is enhanced by the curve in the street alignment that allows the hotel to appear forward of other buildings with the same set-back. This relationship is maintained by restricting new buildings adjacent to the hotel to the same or greater set-back from Soquel Drive than the historic hotel. The proposed building #14 is set at the same distance from Soquel Drive and positioned so that the curve in the road allows the Bayview Hotel to remain the dominate building when viewed from the east or west. As shown in Figure 2-K, the new building conforms to the Standards # 9

& #10. No buildings should be located in a way that intrudes into the views of the hotel from east or west on Soquel Drive.

The proposed plan shows parking is retained in front of the hotel, as well as on the south side with new parking designed for the northwest along the parcel line. The parking, a use that opens view lines, is beneficial by allowing the public to see the hotel from all sides. Because the hotel's historic orientation to Soquel Drive, the railroad and parking in the front these are part of its setting and feeling. As proposed, and with the conditions below the development plan does not adversely affect the Bayview Hotel.

A feature of the historic hotel's setting is the large Magnolia Tree in front of the hotel. This is the only landscape feature that has gained historic significance within the setting of the hotel. The Magnolia tree must be protected during infrastructure and other construction.

According to the United States National Arboretum, all magnolia trees form a unique shallow root system and removing sections may cause damage to the tree. Magnolia trees require moist, but well drained soil. To provide a healthy environment for the tree, pervious pavement should be used in close proximity to the tree and new grading must take water away from the front of the hotel and not allow ponds around the tree. This appears to be the design of the site plan, however grading and drainage plans are not available at this time.

If work is to occur within two-feet of the canopy line of the tree, an arborist may suggest preparing the tree several months in advance to minimize any shock to the tree. An arborists report should be provided at least 6 months in advance of any work in close proximity to the tree to provide time to prepare the tree.

## 2.6 Conditions to be applied to new development or infrastructure that will maintain the setting and integrity of the Bayview Hotel (NR-1) and allow a finding that the change is less than significant.

**Table 2-1 Conditions that allow a finding that the change is less than significant under CEQA**

| Issues that may cause adverse affects to the Bayview Hotel or its setting | Mitigation to eliminate or reduce adverse affects | Result of the mitigation |
|---|---|---|
| The new building must respect the design and use of the historic hotel | The facade facing the hotel is designed without windows or openings | Privacy is maintained for the hotel and landscaping can be designed to benefit the hotel. |

| Issues that may cause adverse affects to the Bayview Hotel or its setting | Mitigation to eliminate or reduce adverse affects | Result of the mitigation |
|---|---|---|
| New construction must be compatible and distinctively different than the style of the historic hotel | The architectural design of the proposed commercial building is distinct from and compatible with the hotel. It does not mimic or dominate the historic architecture. | The architecture of the hotel remains distinct without distraction from the new building |
| Maintain the historic dominance of the Bayview Hotel as seen from various locations in Aptos | The new building is one story lower than the hotel. | The views of the three-story hotel from most locations in Aptos are preserved. The hotel retains dominance on Soquel Drive |
| The landscaping on the west side must compliment the historic hotel and not obscure the building | Landscaping must be designed by a landscape architect to soften the blank wall and/or a mural painted on the wall to provide a creative appearance to the blank wall. | Provides appropriate landscaping / treatment in keeping with the aesthetic of the historic hotel |
| Landscaping must not block the view of the hotel including the slanted bays on the west façade. | Trees between the buildings must not be taller than the proposed new building. | Protects the views of the upper-story architecture of the historic hotel. Maintains the visual dominant setting of the hotel in Aptos. |
| To preserve the dominant setting of the historic hotel, new buildings must not block the view of the historic hotel on Soquel Drive by being set closer to the center of Soquel Drive. | Proposed buildings have the same set-back from Soquel Drive as the hotel, however, by virtue of their lower height and the curve in Soquel Drive, the hotel appears forward of the other buildings | The hotel remains the dominate focal point of the Village and view lines are protected. |
| New infrastructure must not intrude into the view lines of the historic hotel. Street landscaping or infrastructure improvements (bus shelters, etc) must not be located in front of the historic hotel or in ways that obscure view lines | Parking areas in front of Buildings #13 and #14, and the commercial building east of the Bayview Hotel should maintain low landscaping.<br><br>Trees shown on the site plan in front of Buildings 13 & 14 should be eliminated or if required they should not be taller than 8 feet | Preserves the hotel's setting<br><br>and protects the view lines to the hotel from east and west on Soquel Drive. Maintains the historic dominance of the hotel on Soquel Drive. |

| Issues that may cause adverse affects to the Bayview Hotel or its setting | Mitigation to eliminate or reduce adverse affects | Result of the mitigation |
|---|---|---|
| New infrastructure must not damage the hotel or its setting<br><br>Excavation for street improvements, sewers or other grading must not adversely affect the hotel setting | The plan proposed infrastructure improvements that appear to remove standing water or potential flooding around the hotel and grade away from the hotel parcel. | Protects the hotel's foundation and setting |
| The historic hotel must be protected from construction that can cause adverse affects | An area of protection must be established around the hotel parcel lines. Adjacent to the hotel, on the west, a protection fence at least 10 feet tall must be installed on the side of the parcel line where construction is to occur. The fence must be covered with a green fabric to provide a clean view for customers of the hotel. | Provide protection from construction activities that might damage the hotel. |
| The magnolia tree in front of the hotel must be protected during construction.<br><br>Magnolia trees require moist, but well drained soil.<br><br>Magnolia trees form a unique shallow root system and removing sections may cause damage to the tree | An area of protection must be established around the Magnolia tree in the front of the hotel. A qualified arborist must set the limits of work and provide direction for the construction of new infrastructure that occurs within two-feet of the outer limit of the drip line (canopy) of the tree.<br><br>Pervious pavement should be used in close proximity to the tree.<br><br>New grading must take water away from the front of the hotel and not allow water to collect around the base of the tree<br><br>An arborists report must be provided at least 6 months in advance of any work in close proximity to the tree. The report must be followed, including having the arborist oversee any work within the canopy line of the tree. | Protects the tree from damage during construction.<br><br>Provides professional standards for maintaining the tree during construction.<br><br>Pervious pavement allows moisture to penetrate and grading away from the tree allows water to be removed from around the tree-contributes to a healthy root system.<br><br>Magnolia trees are subject to shock if work damages their shallow root system. An Arborist may recommend steps to minimize the shock ahead of any required work that may damage the root system.<br><br>Preserves a healthy setting for the magnolia tree by allowing water to penetrate |

| Issues that may cause adverse affects to the Bayview Hotel or its setting | Mitigation to eliminate or reduce adverse affects | Result of the mitigation |
|---|---|---|
| | | the surface and providing drainage away from the tree (moist-well drained soil). |
| Excessive dust and dirt would harm the hotel and potentially the Magnolia Tree. | During construction follow best practices to minimize dust, dirt and disturbance to the historic building and tree. Provide solid construction fencing if excessive dust cannot be controlled at the site. | Protect the historic building for excessive dust and dirt collecting on the facades. |
| Repair, alteration or remodeling of the historic hotel may cause damage to the historic character of the building | Should rehabilitation or expansion of the hotel be proposed, the work must conform to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings*, Santa Cruz County Code Section 16.42.060, and be reviewed by the Santa Cruz County Historical Resources Commission. | Protect the character and historic features of the Bayview Hotel |

## 2.7 Conclusions and California Environmental Quality Act (CEQA) Status relating to the Bayview Hotel

The California Environmental Quality Act Title 14; Chapter 3; Article 5; Section 15064.5, establishes rules for analyzing historical resources, including archaeological resources, in order to determine whether a project may have a substantial adverse effect on the significance of the resource. A historic resource is one that is listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resource Code SS 5024.1, Title 14 CCR, Section 4850 et seq. Properties listed in the National Register of Historic Places are considered eligible for listing or are incorporated into the California Register of Historic Resources (PRC 5024.1 (d).1)

> A project that may cause a substantial adverse change in the significance of an historical resource is a considered to have a significant effect on the environment. Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (PRC 5020.1(q)).

The proposed development plan submitted by Barry Swenson Builder does not alter the Bayview Hotel building or the hotel parcel. What the HHP considered are changes in the setting around the Bayview Hotel on property belonging to others; the removal of the former Aptos Firehouse/VFW Hall, and the new two-story building in essentially the same location, landscaping shown in the plan, and the infrastructure improvements proposed for the front right of way on Soquel Drive. Additionally it considers protections for the hotel and the associated Magnolia tree in the front.

Removal of the former Aptos Firehouse/VFW Hall does not diminish the significance or impact the reasons the Bayview Hotel was listed in the National Register of Historic Places. As described above the small building does not have a significant relationship to the hotel that would diminish the significance or the integrity of the hotel. Under the CEQA Guidelines, removal of the small building does not create a substantial adverse impact to the hotel.

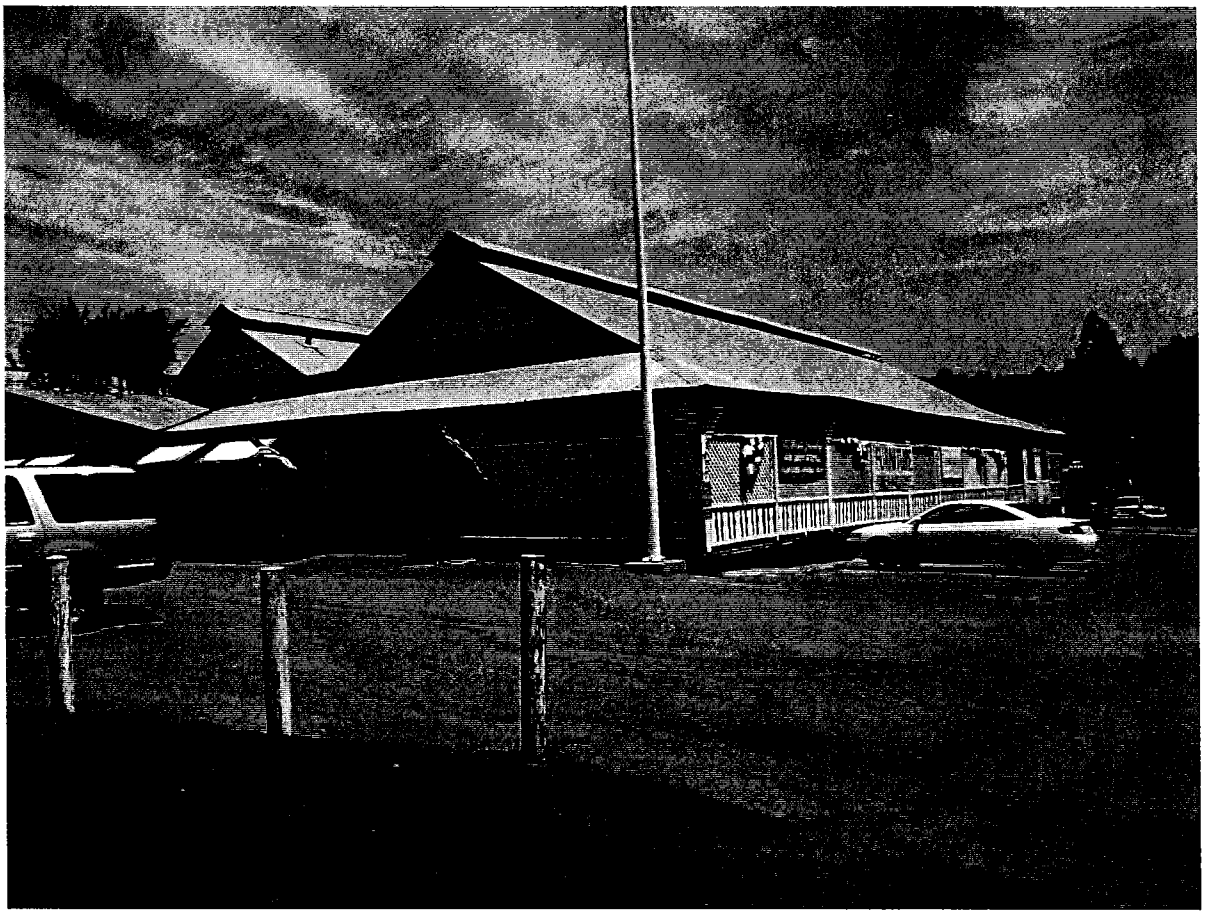
Development of the proposed two-story commercial building with the set-backs and landscaping conditions described above, conforms with the criteria of the Aptos Village Plan and the *Secretary of the Interior's Standards for the Rehabilitation of Historic Buildings*, Standards # 9 and #10 and the Guidelines regarding "setting", as they relate to new development in proximity to a historic building.

> Standard #9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and shall be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.
>
> Standard #10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

As proposed, the new development is designed in a compatible style that does not copy the historic features of the hotel. Sufficient distance is provided between the historic building and new development to allow landscaping that will set the historic building apart from the new development and the dominance of the historic building on Soquel Drive and within the Aptos community is preserved. With the conditions listed above the development of the two-story office building to the west of the Bayview

Hotel, infrastructure improvements and the over-all development plan would have a less than significant change (impact) to the National Register listed Bayview Hotel.

# PART 3: HIHN APPLE WAREHOUSE (APPLE BARN)



# Part 3-Hihn Apple Barn (Hihn Apple Packing Warehouse)

## 3.1 Introduction and Overview:

The Hihn Apple Barn is the only remaining building in Aptos that is associated with F. A. Hihn, an important business and civic leader in Santa Cruz County, and the economic era of the apple industry. Part of the building appears to have been constructed c.1891-1899, with substantial additions in 1915 and c. 1920, identified by Edna Kimbro, with the last bay (88 feet long by 36 feet wide) c.1929-1930. It does not show on the 1929 Sanborn map and the exact date was not identified. Many of the modifications visible on the building are typical of a rural fruit warehouse but alterations were intensified with the change to retail use when the building became the Village Fair Antique Emporium in the mid 1960's.

When the Aptos Village Plan was prepared it was acknowledged that to achieve the goals of the plan including the preservation of the Apple Barn, it would be necessary to relocate the historic building. A condition of the relocation plan requested by the Santa Cruz Historical Resource Commission is for the building to retain its eligibility for listing as a County Landmark, its eligibility for listing in the California Register of Historic Resources and the potential for nomination to the National Register of Historic Places. These aspects are discussed more fully under the corresponding headings.

In addition to historical associations with Aptos's history, to remain eligible for listing the building must retain physical integrity that demonstrates why it is significant to the history of Aptos. Currently it retains the character defining elements of the rural industrial warehouse (barn) expressed by the post and beam structure, roof trusses, form and building shape as well as rustic siding and single wall construction. The rustic siding and evidence of various openings and loading platform (porch) also define the historic use of the building. Located on the original site, the 3-bay building compensates for the uneven terrain by being over 4 feet taller on the east than on the west, and retains most of the aspects of integrity as defined by the National Register of Historic Places (page 13). However, recent improvements to Trout Gulch Road have adversely affected the Apple Barn by widening the road in the late 1990's, and removing a portion of the corner of the building's roof and platform (porch) from the center bay. The building sits on the Trout Gulch Road right-of-way line which is perilous for the building and potentially unsafe for pedestrians and vehicles. Relocating the building has been determined to be the way to preserve the historic building and to provide improved safety for travelers.

A development proposal to implement the Aptos Village Plan has been submitted by Barry Swenson Builder (Swenson). Consistent with the Aptos Village Plan, the Swenson plan proposes to relocate and rehabilitate the Apple Barn for use as a grocery/market, a use that is highly desired by the community. The proposed plan shows relocating the Apple Barn on the same parcel, approximately 50 feet southwest and rotating it 90 degrees to face onto a central open space ("Village Green"). In its current setting the building is surrounded by unstructured parking lots and open-space, a setting that maintains the identity of the industrial barn architecture, and allows the large building ("L" shaped with 181 feet in length and 90 feet wide) to be viewed from all sides. Although different, the proposed site creates a similar open setting where the building is set apart from most other buildings and can be viewed across parking lots and the open space (Village Square) on the west. Discussed further in this document, the Apple Barn will be linked to a new building through a 36 foot wide, 18 foot long linking element to provide the additional square footage required by the grocery/market tenant.

In important ways, the grocery/market is a compatible use for the Apple Barn because it uses the large open interior spaces; it retains the interior structure of post and beam with roof trusses, and the exterior siding complete with the remnants of former openings, hardware and rolling wood doors that show the industrial life of the building. The grocery/market does not require extensive alterations to the shape, size, structure, walls or roof. As a single tenant, the grocery market does not need banks of windows or multiple sets of doors that could diminish the rustic building's character. However, the new use requires alterations to the building resulting in the loss of the historic floor system and floor boards and changes the building's foundation system, a magnitude of change discouraged by the Secretary of the Interior's Standards.

The following sections describe the relocation and rehabilitation plans and their comparison to the *Secretary of the Interior's Standards and Guidelines for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.* The final section describes the qualifying criteria for maintaining eligibility for listing in the California Register of Historic Resources and the elements that provide potential for nomination to the National Register of Historic Places.

### 3.2 Relocation and Rehabilitation Plan Proposed for the Apple Barn

Following the community desire and developer's agreement to lease the building to a local grocery market, rehabilitation plans have been prepared by Thacher and Thompson Architects to balance the requirements of the grocery tenant with the guidance found in the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitation.* Sections of which appear below.

Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.

Rehabilitation emphasizes the retention and repair of historic materials, but latitude is provided for replacement because it is assumed the property is more deteriorated prior to work. Rehabilitation standards focus attention on the preservation of those materials, features, finishes, spaces, and spatial relationships that, together, give a property its historic character.

In Rehabilitation, historic building materials and character-defining features are protected and maintained however, an assumption is made prior to work that existing historic fabric has become damaged over time and, as a result, repair and replacement will be required. Thus, latitude is given in the *Standards for Rehabilitation and Guidelines for Rehabilitation* to replace extensively deteriorated, damaged, or missing features using either traditional or substitute materials. Rehabilitation includes an opportunity to make possible an efficient contemporary use through alterations and additions.[19]

**The Secretary of the Interior's Standards for Rehabilitation:**

(These standards and guidelines are not regulatory and do not set or interpret agency policy. They are intended to provide technical advice about archeological and historic preservation activities and methods.[20])

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

[19]National Park Service, The Secretary of the Interiors Standards for Rehabilitation., 1983 as amended
[20] Ibid

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

### 3.2.1 Relocation and Rehabilitation Plan Professional Participants:

The firm of McLucas Structural Engineers ( M.SE) prepared the structural report, relocation bracing and seismic strengthening plan. The structural rehabilitation plan appears to conform to the Historic Building Code sections within the California Code of Regulations Title 24 Section 8 mandated to all jurisdictions.[21]

Kelly Bros House Moving Company has studied the building and has submitted a preliminary bid and process to move the building. A final plan will be completed after the structural engineering report is available. The firm has extensive experience in successfully moving large historic buildings.

[21] 2007 California Historical Building Code, Title 24, Part 8

The relocation and rehabilitation methodology and plan was prepared by Matthew Thompson, Thacher & Thompson Architects. The plan has been guided by, and appears to conform to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines for Rehabilitating Historic Buildings.*[22]

The Santa Cruz County Building Inspector inspects the historic building to record its condition and comment on the physical condition. The Building Official also determines how it complies with the Santa Cruz County Code Section 16.42.060 A. Owner participation is required during the inspection.

## 3.3 Identifying the historic character defining features of the Apple Barn in its Setting:

The first step in preparing for the relocation and rehabilitation of the Apple Barn is to identify the character defining features that contribute to the building's significance. Because the building is proposed to be relocated, and remain eligible for registration, the character of the original setting and that of the proposed location must be compatible.

### 3.3.1 Historic Setting and Relocation Setting

The historic setting of the Hihn Apple Barn was amid an industrial setting of similar buildings and circulation space used by trains, wagons, and trucks. It was also attached to another industrial building on the west side, but that was removed many years ago. For the past 50 years or more, the setting has been open space without the railroad spurs or other buildings in close proximity and surrounded by unorganized surface parking (open space).

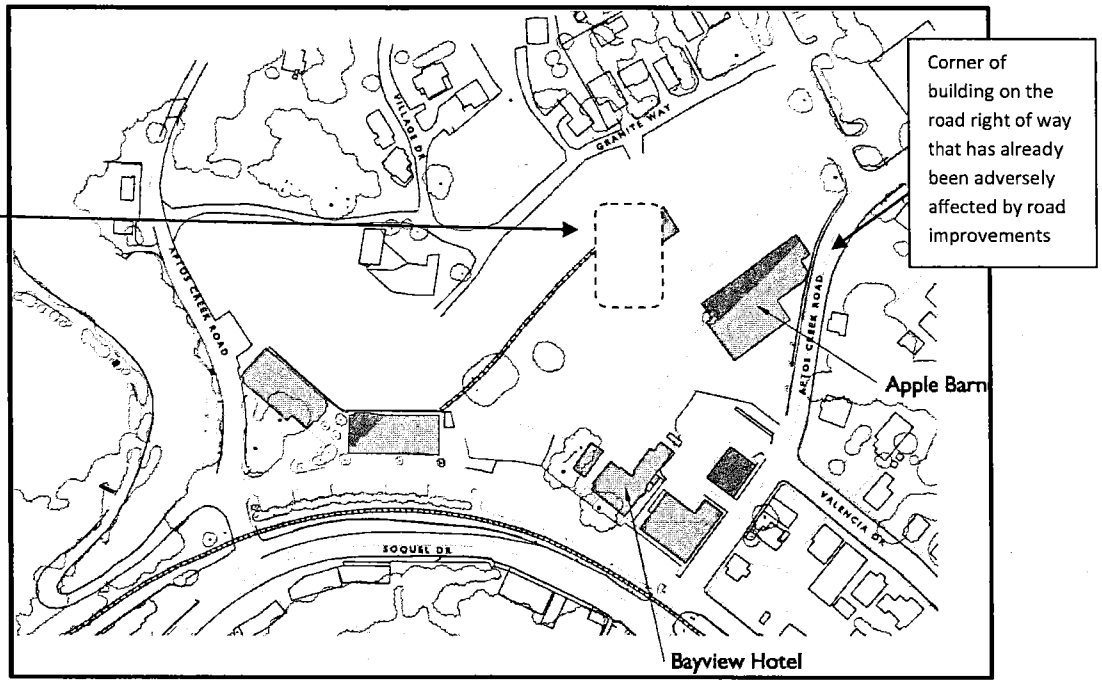
The Aptos Village Plan reorganized the area including the existing location of the Hihn Apple Barn. The plan shows relocation the Apple Barn and suggests locating it on the eastern side of a central open space with parking areas around it. The Swenson plan, locates the historic Apple Barn in approximately the same location, rotates the building and keeps it set away from most other buildings with parking on the on the north, south and east, while the west façade faces the "Village Green." The Apple Barn is shown linked on the north half of the west facade, via an independent new single-story corridor structure, to a new three-story mixed-use building. The new building will provide the additional interior square footage required by the grocery market adaptive-reuse. The proposed separation and the mix of building heights is in keeping with the historical pattern in Aptos Village with industrial and commercial buildings of varying heights, and the Bayview Hotel that is over three-stories. This setting

[22] Final determination cannot be made until the construction drawings and specifications are complete

allows the Apple Barn to be seen and appreciated for its rural industrial design, materials and large size. The proposed location complies with the Secretary of the Interior's Standards and Guidelines for a compatible relocation setting.

In summary, the proposed relocation is necessary to preserve the building and protect it from further damage or demolition. The proposed setting for the Apple Barn meets the criteria of being compatible with the original setting and the character of the historic resource is preserved. Thus, the resource meets this threshold to retain eligibility for listing on the CRHR. After relocation (CEQA Guidelines14 CCR Section 4852 (d) (1)).

**Figure # 3-A Site plan showing the existing location of the Apple Barn and approximately the proposed location.**



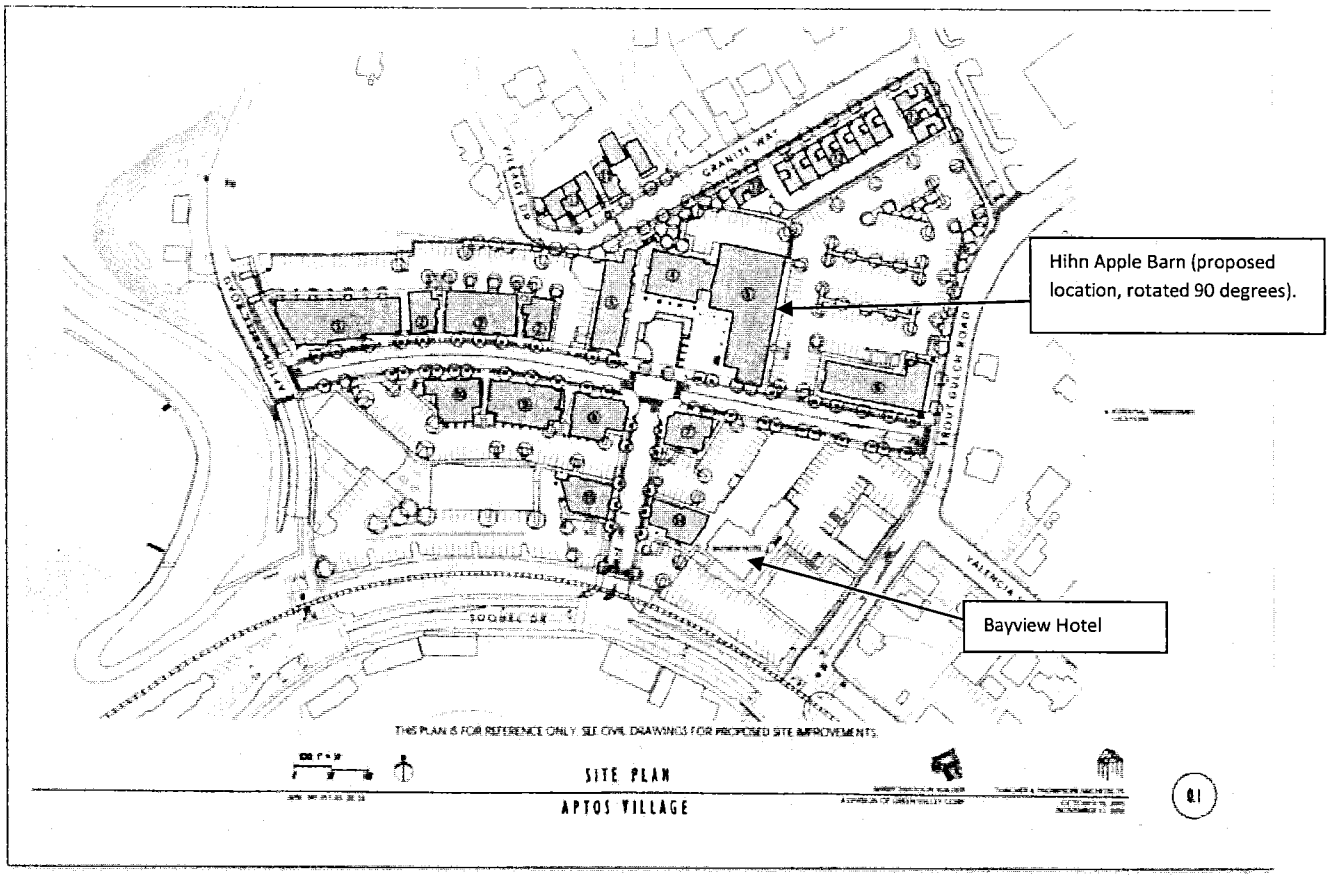



**Figure # 3-B Barry Swenson Builder Proposed Site Plan for the relocation of the Apple Barn away from Trout Gulch Road and rotate it 90 degrees. Other than the Apple Barn, all other shaded areas are new buildings.**

**Source: Aptos Village Plan, Thacher & Thompson Architect for Barry Swenson Builder December 2010**

### 3.3.2 Identifying the Character Defining Features of the Apple Barn Building

Once a location is identified and prior to starting any plans for relocation or rehabilitation it is necessary to determine the character defining features of the building, and to plan for their preservation. Character defining features are those elements that visually define why the building is significant. In the case of the Apple Barn the significance is derived from the period when it functioned as an apple packing and warehouse building- a rural industrial use. Character defining features are those that were part of the industrial use and without which the significance could not be understood. When considering rehabilitation as the preservation treatment, it is necessary to assign a priority to the features so that decisions may be made about retaining and preserving the features that are critical and important to understanding the significance of the historic building.[23]

The significant element in a rural warehouse (barn) is the basic structure of post and beam with trusses forming the roof and shape of the building. The building has undergone phases of additions and remodeling. However, the basic structure appears to be relatively intact although it is covered with paneling on the interior walls and ceiling that was added as part of the remodeling for retail use. These added interior surfaces obscure most of the interior structure. The exterior retains the siding that was part of the original building and the subsequent additions that were used for apple packing and shipping operations.

The exterior rustic siding tells the story of the industrial use. Openings on the north façade (rear), some of which are filled-in, retain the rolling industrial wood doors next to the openings and there is evidence of other openings that are now filled-in. On the east are three windows that are covered with lattice work. The south façade is similar to the north, although there are loading platforms that have been transformed into porches. These are separate structures from the basic building and that have been altered with decorative lattice work and sections have been enclosed as part of the remodeling for retail use in the 1970's . The date these were added to the building has not been identified although it is after the c. 1915 photograph was taken and after the third bay was constructed (c.1929). The low shed roof and posts to support it, may have been added in the 1950's or later. The posts to support the roof appear too close together to have allowed active loading from the platform. The roof may have been

[23] Architectural Character Identifying the Visual Aspects of Historic Buildings as an Aid to Preserving their Character, Technical Preservation Brief #17, National Park Service,1988

added when the alterations and additions were made to the west façade c/1950's or later. The west façade has the greatest extent of alterations with a shed addition to enclosed space that is c.1950's. This was added outside the exterior wall and uses existing doorways for connection into the main building. This façade is also the main entrance to the Village Fair where a contemporary glass retail style door was inserted into the wall. Like the south façade, lattice work and other decorative embellishments have been added to the façade.

The building was constructed on uneven terrain, and to maintain a level floor the building is over four feet taller at the east end than at the west where the original bay is at grade. Horizontal board skirting covers the gap between the floor elevation and the ground. The roof is sheathed in corrugated metal sheets that replaced the original shingles, although this may be the original roofing for the last bay to be constructed (c.1929-30).

The character and significance defining features of the industrial barn are listed in priority order. Significant features are critical to be retained; contributing elements are important and should be retained. Non- contributing may and in some cases should be removed.

Significant Character Defining features:

- The plan of three gable bays, pitched roofs with ridge pop-up venting ( style and form)
- The wood timber structural system of posts, beams and trusses
- Interior of open spaces with little enclosed space (office)
- Rustic and irregular width exterior vertical board siding and the board and batt (exterior of the single-wall construction)
- Historic hardware and industrial rolling door systems
- Evidence of historic openings, repair or alterations (1899-1940)
- Interior side of the single-wall system

Contributing Features:

- Corrugated metal roof material (alteration that has gained significance)
- Loading platform (separate structures added to the building after the last bay was constructed)
- Platform supporting floor structure (under floor)
- Rustic wood floor boards
- Modified window and door styles and patterns
- Horizontal boards covering the crawl space

Non Contributing:

- Remodeling for commercial use, glass entry doors
- Interior partitions, wall coverings, and suspended or placed ceilings
- Lattice porch walls/railings

Shed addition (north-west corner)
Enclosed section on the loading platform

## 3.4 Plan for Relocating the Historic Hihn Apple Barn.

The proposed relocation of the Hihn Apple Barn will keep the barn within the same parcel and area of Aptos where it was originally constructed. The plans for relocating the historic barn follow accepted methods for bracing and moving the sections of the barn that are recommended by the National Park Service.[24]

The structural engineering report by M.SE details the construction of the barn and how it can be braced and protected for relocation while maintaining the significant historical and character defining features of the building. The report is Exhibit 1 in the Appendix.

Kelly Bros House Movers, who have extensive experience in relocating historic buildings, have submitted a plan to the structural engineer for his approval. When final approval and permits are issued, Kelly Bros. will be responsible for physically moving the building.

The following relocation plan and sequencing description was prepared in conjunction with Matt Thompson, Architect and incorporates information provided by John Mc Lucas, Structural Engineer.

Relocation plan- step 1

The existing tenants will vacate the building and remove all contents. An assessment of the non-historic materials will be made and the non-historic construction will be removed using careful hand-labor techniques to protect adjacent historic construction. The elements to be removed will include the multiple false ceilings, partitions, and enclosed porches that characterize the present retail emporium. The later addition shed attached to the building will be removed to reveal the original siding of the building. During all phases, a photographic log (still and video) will record the work. The elements of the building that have been concealed will be documented in architectural drawings that will include:

- Existing floor construction including joists, girders, piers and floor boards

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- Existing perimeter wall construction (interior) including posts, horizontal purlins and plates, and exterior vertical board and batt siding.
- Existing roof construction including posts, 'carpenter' trusses, purlins, spaced sheathing, eaves, and barge boards
- Other distinctive elements uncovered by the removal of non-historic elements.

Relocation Plan Step 2

The existing building is composed of three parallel building elements (bays), each of which is expressed by one of the three gable roofs visible from the exterior. The historic building elements (structure, trusses, and walls) will be temporarily braced and shored up to protect the integrity of the wood structure during the relocation. This will include diagonal wood and cable braces for wind and earthquake safety as well as temporary walls and posts to strengthen the members supporting the roof. The loading platforms will be detached from the warehouse building. The post and roof system will be braced. Kelly Brothers House Movers is experienced in moving and bracing this type of building and will be working with the structural engineer to ensure satisfactory results.

Relocation Plan Step 3.

Long steel girders will be inserted below the existing floor structure. Carefully placed hydraulic jacks will lift the girders, and with them, the historic structure. Multi-wheeled 'trucks' will be placed below the girders and the structure will be lowered to rest on the carriage wheels. The building will move slowly to the new location.

Relocation Plan Step 4.

The relocation site will be prepared with a new slab on-grade concrete foundation embedded with mounts to receive/secure the historic posts.

The building will be moved in sections that correspond to the way the sections of the building were originally built. As each section is moved into place it will be reattached to the adjacent section. It is currently planned that the building will move in two main sections with porches moved separately.

Relocation Plan Step 5.

The hydraulic jacks will once again be placed under the girders supporting the building. The jacks will first lift the building so that the wheel trucks can be removed. Finally, the jacks will lower the building on to its new foundation and column bases. With the building sitting firmly on a new foundation, the steel girders can be removed.

Relocation Plan Step 6

The temporary bracing and shoring will be replaced with permanent structural support elements which will be distinctive from the original barn's system (Figure # 3-C M.SE Structural (Figure Plan S-1)

The posts of the historic structure will independently support the roof structure.

Plans prepared for the stabilizing (preparation) and relocation of the Apple Barn, show methods that are consistent with the National Park Service guidance for relocating historic buildings and *The Secretary of the Interior's Standards*, with the primary areas of concern removing loss of historic features and material in the loading platforms and the floor structure, and adding height to the building. These are discussed under the following section describing the rehabilitation plan.

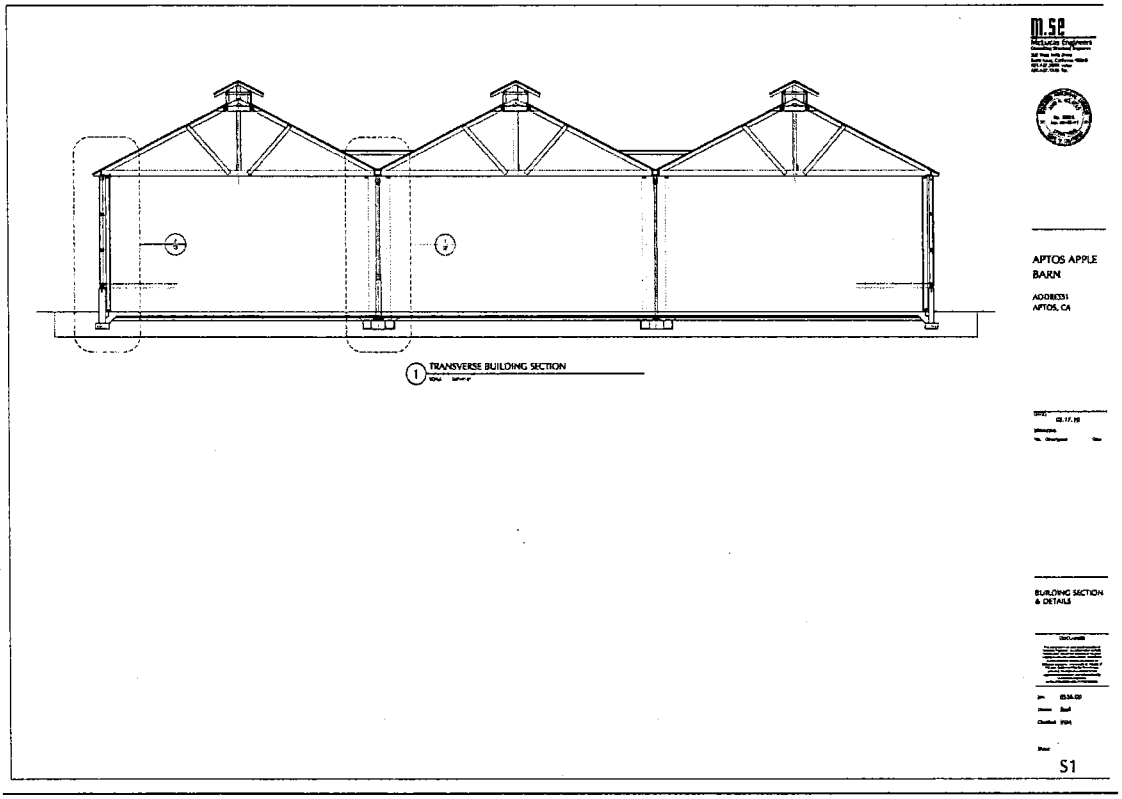
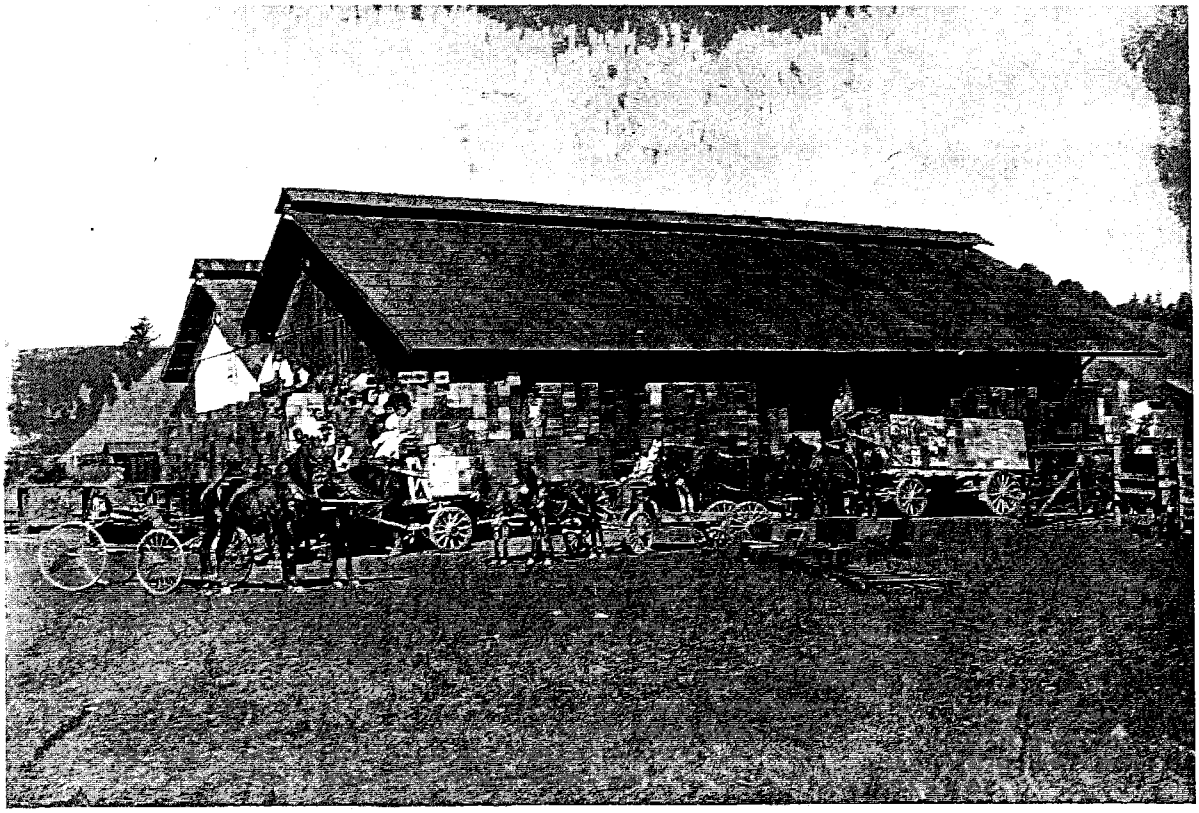



**Figure 3-C M.SE Structural Plan for shoring, stabilizing, and seismically strengthening the Apple Barn (Sheet S-1). Historic wall sections are shown to be preserved and a new wall of steel brace frames and ply-wood will be constructed inside the building to provide the necessary vertical and lateral seismic strengthening. The historic post, beam and roof trusses will be preserved. Historic posts in the center of the building will be set on a new metal base and anchored into the concrete floor. Those in the center of the building will be visible, those in the perimeter wall will be behind new structural wall. The overhead trusses will be visible.**

**Note: The appendix contains 11 X 17 copies of the plans shown in the HHP M.ES Structural report, March 2, 2011, is Exhibit 1 in the Appendix.**

## 3.5 Rehabilitation Plan for the Apple Barn:



HIHN APPLE PACKING PLANT. BUILT 1890
BEHIND BAYVIEW HOTEL

**Figure # 3-D Historic picture of the Hihn Apple Warehouse (packing plant) c.1915, prior to the addition of a third gabled bay. The photograph shows the façade without porches or the shed addition on the west end or attached building on the west that is shown in the Sanborn Map 1908-1929. The overhanging roof section appears to be supported by braces extending to the wall and not by posts. The roofing appears to be large shingles.**
**Source: Aptos History Museum**

The rehabilitation plan has gone through several iterations as the architect; engineer and owner work to retain the significant character defining elements of the Hihn Company's rural, industrial, apple packing barn and provide an adaptive reuse plan suitable for a grocery market. The rehabilitation plans up-dated March 9, 2011-July 16, 2011 will preserve the majority of character defining elements from the period when the barn was active and the apple industry in Aptos was the economic backbone of the community 1899-1940.

Thacher and Thompson Architects and John McLucas Structural Engineer have prepared plans for the rehabilitation of the barn that provide for the desired adaptive reuse as a grocery store while balancing the requirements of the *Secretary of the Interior's Standards for Rehabilitation.* The majority of the work is easily identified as conforming to the "Standards." However, four areas required further study and analysis;

(1) to accommodate the necessary live loads of the grocery store it is desirable to have a concrete floor system (discussed below),

(2) The building does not meet the seismic code requirements and must have a secondary structural system.

(3) to accommodate the case work and operations of the market it is necessary to add three feet of interior height to achieve 16 feet at the walls (industry standard is 20 feet in height) and,

(4) because the historic building is not large enough to house the grocery store, it will attach to a new building via an independent single-story corridor structure.

The rehabilitation plan is described below with corresponding reference to the *Secretary of the Interior's Standards for Rehabilitation and Guidelines.*

The character defining features and materials that are identified to be critical to the significance of the historic barn (pg. 40, 41 ) are to be retained, preserved, and protected during rehabilitation work. These include;

1) The over-all plan of three gable bays which are to remain in their entirety,
2) roofs with ridge venting that express the style and form of truss system in the building,
3) corrugated metal roofing in sheets ( although not original to the first sections of the building it appears to have been on the building since c.1930's and may be original to the last section to be constructed).
4) wood timber structural system of posts, beams and trusses inside the building,

5) exterior rustic vertical board siding and board and batt (exterior finishes -single -wall construction),
6) historic hardware and industrial rolling door systems,
7) Exterior loading platforms (porches)
8) interior open space (to be retained in the open plan of the grocery market), and
9) window, door and evidence of other openings in various styles and patterns.
10) Additionally because the single-wall construction is protected behind a new structural ply-wood wall and not visible, a section of single-wall construction will be visible to the public
11) Because the rustic floor is not an approved surface for most of the grocery market floor, rustic floor boards will be reused in a section close to the main door, away from the food stocks. In this same area the single-wall construction is visible and an area of historic display will be created.

### 3.5.1 Interior Rehabilitation and Alterations to Accommodate the Grocery/ Market Use;

The largest loss of historic materials is the decision that the under-floor structure will not be retained. The under floor structural system is not the primary system and acts as a platform, independent of and not supporting, the primary post and beam structural system which is to be retained and preserved. The existing platform floor structure attempts to level the interior floor because the building ranges from grade level on the northwest corner to over four feet above grade at the east end due to the sloping terrine (see Figure 3 N & 3-X). In his report dated March 2, 2011, John N. McLucas, Structural Engineer, of M.SE concluded that it would be "impractical to retain the floor structure because it lacks adequate capacity to support the live loads it will be subjected to by the new tenant; a significant amount of reinforcement would be required to make it capable of supporting a concrete topping slab as required by the tenant. Additionally, the existing floor structure is not suitable as a horizontal diaphragm due to the straight sheathing employed; from a seismic design standpoint, it is totally inadequate and must be replaced." The report continues; "It is also noted stated that in order to reuse the existing floor system, a completely new foundation system, aligning with each existing bean line would be required at a significant cost to the project. This would also prove to be difficult from a construction standpoint, as the existing framing geometry is neither straight nor regular in order- coordination of new and existing construction would be extremely awkward." The description for the option to retain the existing floor system would create a new structural system where the historic elements are retained while the new dominate system provides the structural support. This would significantly diminish the value of the historic system.

The relocation site is relatively flat and would be graded to allow a level surface for the proposed slab-on-grade foundation with a three foot tall concrete block stem wall and embedded metal bases for the interior historic columns. The concrete slab is designed provide a level floor with the structural capacity for the live loads required by the adaptive reuse as a grocery market.

It appears the Secretary's Guidelines have considered situations similar to the Apple Barn adaptive reuse and rehabilitation plan and provide the very guarded guidance below.

> "If features of the structural system are exposed such as loadbearing brick walls, cast iron columns, roof trusses, posts and beams, vigas, or stone foundation walls, they may be important in defining the building's overall historic character. Unexposed structural features that are not character-defining or an entire structural system may nonetheless be significant in the history of building technology. The structural system should always be examined and evaluated early in the project planning stage to determine its physical condition, its ability to support any proposed changes in use, and its importance to the building's historic character or historical significance "[25]
>
> Not Recommended :"Removing, covering, or radically changing features of structural systems which are important in defining the overall historic character of the building so that, as a result, the character is diminished."

The primary structural system, post beam and trusses that give the barn its form are considered to be significant character defining features and when evaluated it was determined that it must be preserved and augmented with a system to meet current seismic values. The under floor platform is not a part of that system and was constructed in sections as the building was altered or enlarged. Although an important element in the historic building, it is not unique or unusual construction and is considered a contributing character defining feature. After it was evaluated by M.SE and found to be inadequate for adaptive reuse without substantial reconstruction, the decision was made to remove the structure. However, the system, if it were left in place and unseen could be considered to have educational value in the future for the study of building methods. The guidelines for historic rehabilitation work contain the requirement to record any loss of historic materials or systems so that they may be available for research and study. The documentation by architectural drawings and photographs was referenced in the preparation for relocation to be performed by Thacher & Thompson Architects. Considering the

[25] National Park Service, Cultural Resources Division, Introduction to the Standards, Historical Overview, Interior Structural Systems, http://www.nps.gov/history/hps/tps/standguide/overview/overview_strucsys.htm

evaluation preformed by M.SE and described in their report of March 2, 2011, this guideline appears to hesitantly allow the removal of the under floor structure to be consistent with the "Standards."

Another aspect of the adaptive use is the need for additional interior height. Industry standard height for a grocery market is generally a minimum of 20 feet to the lowest point, in the case of the Apple Barn the wall height is approximately 13 feet, and must be increased to accommodate the needs of casework and related interior fixtures. The minimum of 16 feet or three additional feet of interior height has been proposed and agreed to by the prospective tenant. Additional interior height is gained by placing the historic wall structure (posts) on the 3 foot high perimeter concrete block stem wall foundation. The historic building's structural posts inside the building will be set on new bases engineered to meet structural requirements and to accommodate the additional height. This treatment preserves and retains the historic elements of the structural system and provides the interior height necessary for the grocery market.

To seismically strengthen the building, a new system of posts and girders, many of which will be part of the strengthening and bracing done in preparation for the relocation, will be placed adjacent to the interior side of the single-wall boards, with braced steel frames and ply-wood added after the relocation. The current wall covering - which is not related to the historic use as an apple barn - will be removed and the new ply-wood will be attached to the new post and girder system. This treatment protects the historic structural wood systems of the barn by leaving the siding in place on the exterior of the building, and does not damage historic materials. Additionally, it provides an adequate interior surface for the market walls to be hygienic and support casework or furnishings. The cavity created between the historic wall and the new panel board will allow for insulation and to conceal new utilities. The new braced steel frame and ply-wood system will be distinctly different from the historic posts, beams and trusses (Standard #3). Mr. McLucas (M.SE Engineers) states that only when a historic member is severely deteriorated will it be replaced with a member of the same type and size (in-kind replacement).[26] This conforms to the *Secretary of the Interior's Standards* to preserve the character defining features of the structure (Conformance with Standards: #1- compatible use, # 2- historic character will be preserved, #5- distinctive materials, features and finishes will be retained and preserved, and #6 - deteriorated features will be repaired, or if necessary to replace the new will be in-kind and the work documented). If in the future it would be possible to remove the reinforcing posts,

[26] M.SE letter/report March 2, 2011

girders and plywood wall surface without serious damage to the historic building, however to do so would leave the building venerable to collapse during a seismic or heavy wind event. The very reason the additional structural strengthening is necessary.

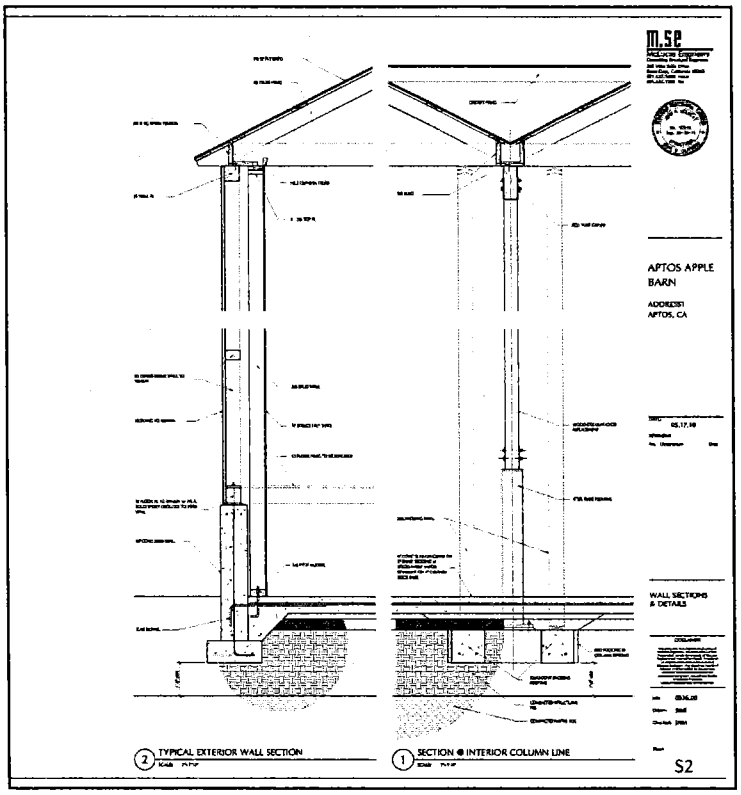



**Figure 3.E Section (S2-1 detail) to show how the perimeter historic columns will be set on a the stem wall and those in the center of the building on new steel bases (pedestal).**

**Source: M.SE March 10, 2011 ( large scale drawing in the appendix)**

Insulation was not installed in the historic warehouse. For the adaptive use insulation is desirable. Insulation is proposed to be placed between the ply-wood membrane and the metal roofing where it will not be visible or damage the historic fabric of the building. Although the product has not been specified, the type of wall insulation proposed is a fiber product that will not adhere to the historic building. The building does not have a moisture barrier on the walls, so the insulation product must not create moisture or dew collecting surfaces against the historic wood siding. Products are constantly changing so it will be necessary to verify with the manufacturers that the proposed product will not allow moisture build-up that can damage the building's wood walls. This process is in conformance with the Secretary of the Interior's Standards and Guidelines for Energy Conservation.

During the relocation bracing the existing ceiling material installed for the Village Fair retail use will be removed to expose the interior character defining elements of historic post and beam structure and

the roof trusses/structure that are to be retained and will remain uncovered and visible to those visiting the building.

Although the new structural system protects and preserves the historic fabric of the building it does not allow the interior of the historic wall to be visible. To mitigate the loss of not allowing the general public to see and understand the historic inner surface wall construction, materials and methods of the historic building, the plan includes a section where the historic single wall construction will be left uncovered ( visible ) and the floor slab will be covered with the rustic floor boards taken from the barn/warehouse. In this area a permanent interpretative display will acquaint visitors with a brief history of Aptos and the historical significance of F. A. Hihn and the apple industry. Hihn and the apple industry are both associated with the apple barn which is the last industrial building of that important economic era in Aptos. The display will show, through photographs and the open wall area, those features that are no longer visible, (See Figure 3-G).

Inside the historic building the view will include, the structural posts, beams and trusses which can be seen throughout the interior of the historic building. Walls will be the new structural surface, except for the historic area with rustic floor boards. The flooring for the rest of the building has not been chosen.

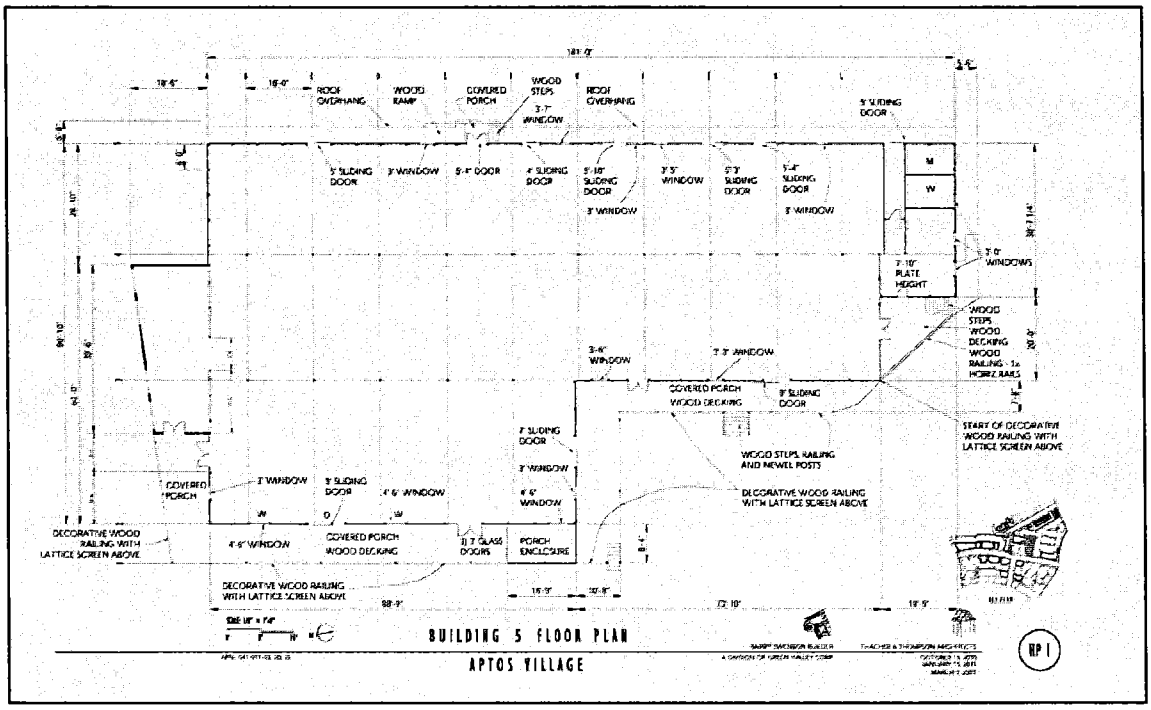



**Figure 3-F Existing floor plan of the Apple Barn showing the existing openings (doors & windows) and the columns.**
**Source: Thacher & Thompson**
**Note: Larger copies are folded into the Appendix**

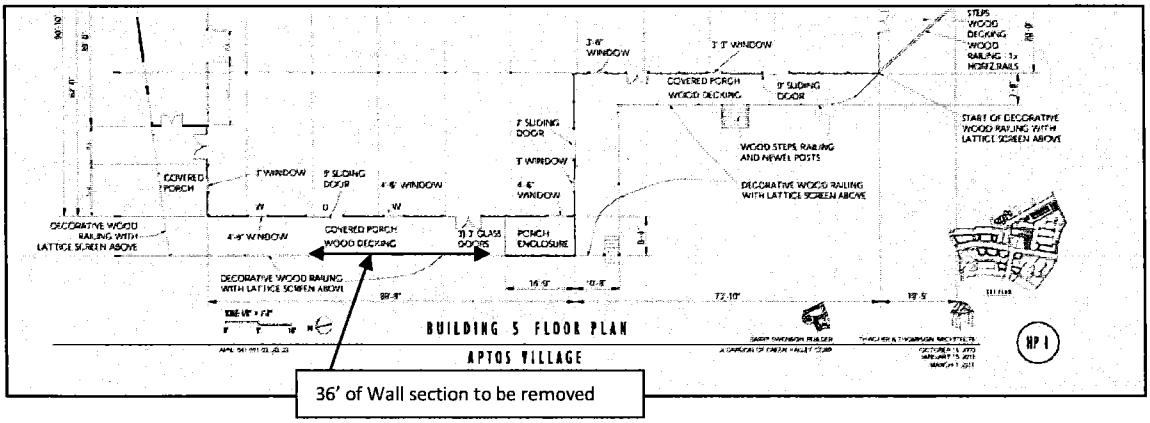



**Figure #3 –F.1 Section of the existing floor plan showing where the wall will be opened to the corridor connection.**

**Source: Thacher & Thompson Architects**

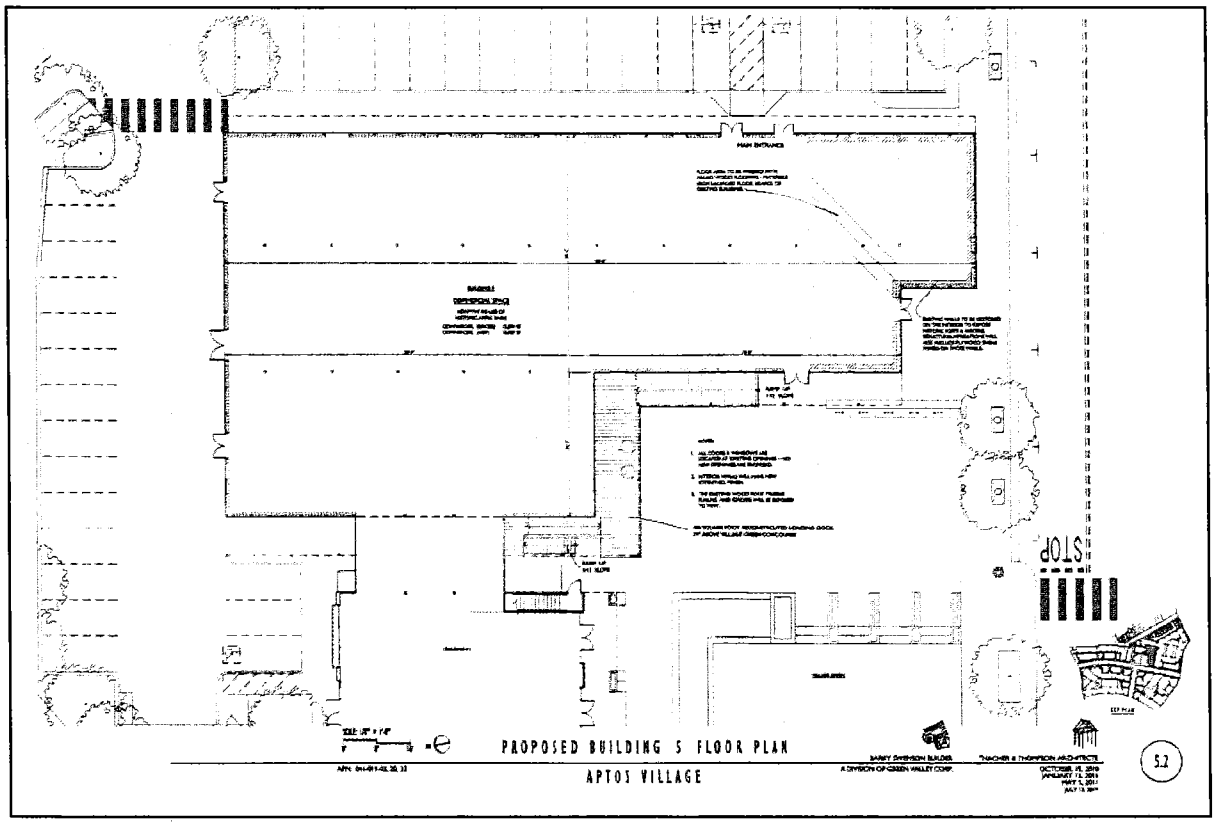



**Figure # 3-G The proposed rehabilitation floor plan for the three bays. Shown is the historic columns in the center of the building, reuse of historic flooring, and area where the historic interior walls will remain visible at the main entrance. Seven contemporary door/transom systems are shown in existing openings and the dashed line is the opening to connect to the corridor and Building #4. The reconstructed loading platform (porch) is shown on the exterior with a system of wood access ramps.**

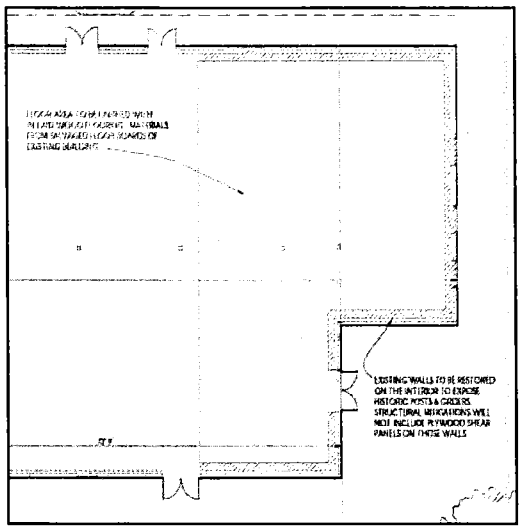


**Figure #3-H: Area where historic interior wall will be visible, historic floor boards will be installed and historic display will be installed.**
**Source: Thacher & Thompson, March 1, 2011**
**Note: Larger size drawings are folded into the Appendix**

## 3.5 2 Exterior Rehabilitation Plan

**Figure #3-I Village Fair Antique Stores, (Hihn's Apple Barn) Facing Trout Gulch Road Apple Barn is behind decorated porches. Note the differential foundation levels west to east. Date : September 2009**

The Apple Barn is three pitched roof sections (bays) that were constructed at different times. The overall form and shape of the building is a significant feature that will be preserved.

The architectural rehabilitation plans prepared by Thacher & Thompson Architects show the exterior of the building will retain the character defining rustic materials of siding and hardware that define the building as a turn-of-the-century rural industrial fruit packing warehouse. To the extent they were part of the historic building during the period of significance 1890-1940, functional openings and evidence of those closed in the past will be retained. Existing windows will be repaired or if necessary replaced in-kind. A compatible feature of the grocery/market use is that typically there are few windows and access is controlled through one entrance and exit doors. This allows retaining the character defining elements of the historic design, construction methods, and materials (Standard #1-compatible use). Using existing openings, new doors or windows will be simple contemporary commercial systems with metal frames. This style will be in juxtaposition to the rustic wood of the historic building. It is necessary to clearly differentiate the new from the historic materials to prevent future confusion over what is original and what is rehabilitation work, (Standard #3, # 9). Using existing openings, seven contemporary door/transom systems are proposed for the building. Using the random pattern of existing openings in the historic building will not form a new and potentially dominate design feature.

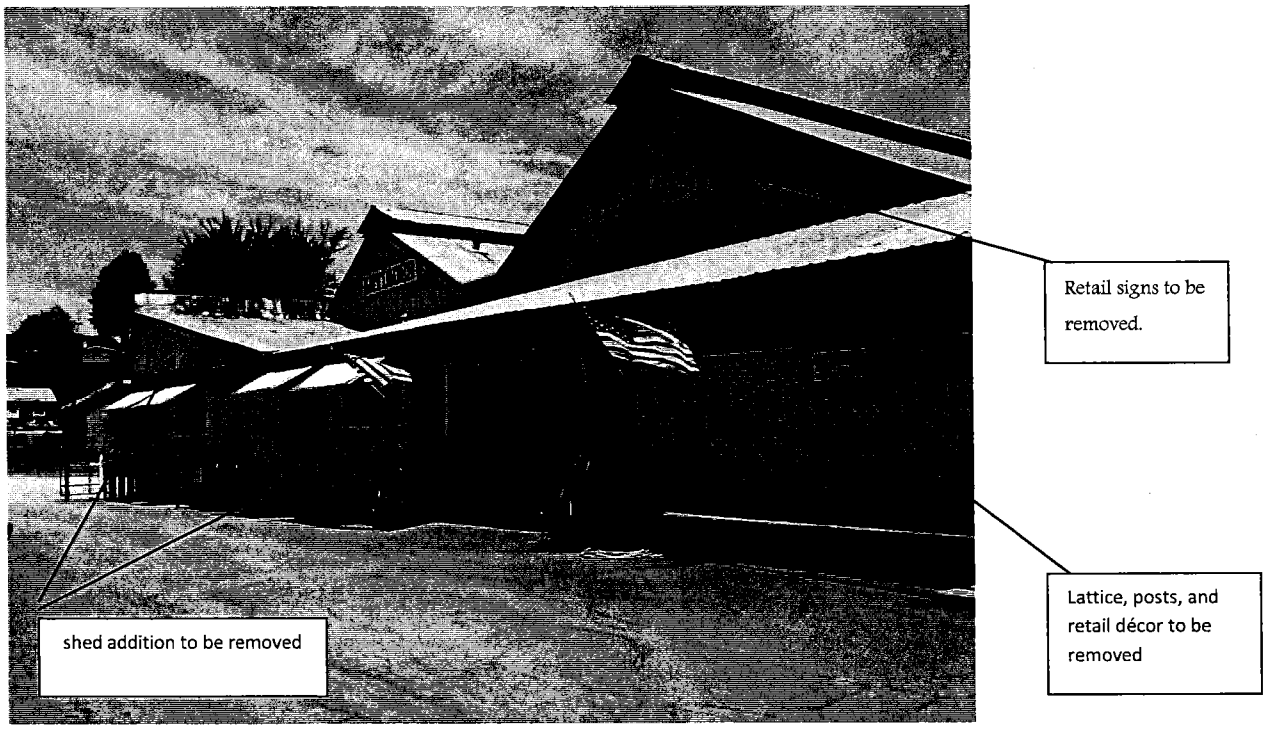



**Figure # 3-J West façade of the Hihn Apple Warehouse (Barn) showing three gable bays with ridge vents. Additions and décor to be removed. At this end (north/west), the building is at grade level.**
**Date: September 2009**

While the height is increased inside the building, the height of the building from the outside is not increased by the same amount because the east end of the building is over 4 feet taller than the west. The perimeter stem wall evens the height of the building. On the exterior, the concrete block stem wall will be covered with horizontal boards as can be seen in the existing treatment on the east end of the building. Boards that are not severely deteriorated will be reused. The old boards will cover a façade and will not be mixed with new boards on the same facade. This will show the difference in the boards and separate the historic from the new. New horizontal boards on the other facades will be differentiated from the historic by width and/or color to differentiate the new from the historic. Although the interior space is higher and the exterior of the west end is taller, overall the building is elevated at approximately the average of the existing uneven heights and retains the character defining features ensuring that it will be recognized as a rural industrial warehouse/barn.

Combined with the structural system, the most extensive historic feature is the rustic board siding that will be retained on all sides of the building. Part of the significant character defining elements to be preserved are the rolling doors and evidence of former openings and vernacular characteristics such as

knot-holes repaired with flattened tin cans which enhance the identity as a rustic, rural, industrial building.

### 3.5.2.1 West Facade (Front façade):

**Figure #3-K Photograph of the Village Fair entrance, lattice, historicist décor and covered porch to be removed.**

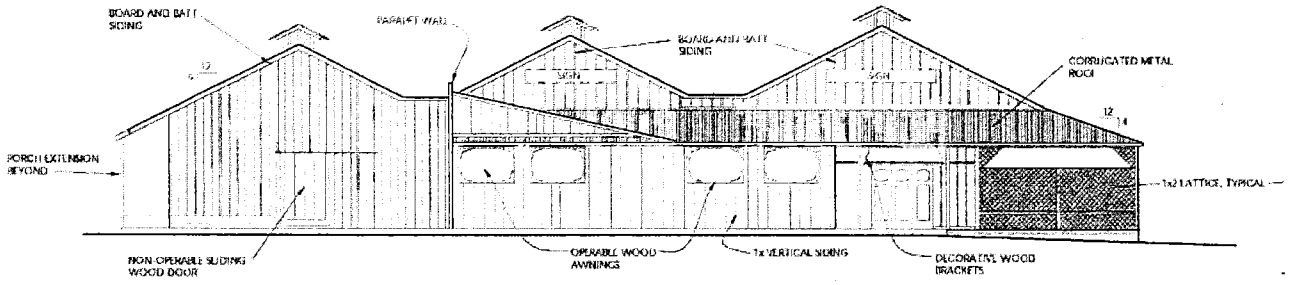
**Source: Thacher & Thompson 2010**

**Figure # 3-L Photograph of the front of the Village Fair Antiques (Apple Barn) taken October 2009**

Several later additions or alterations are proposed to be removed. The largest is the shed addition on the west façade of the building that appears to be c.1950 or later, and it detracts from the historic form of the building. It is sided with vertical board that is different from that on the rest of the barn and is not

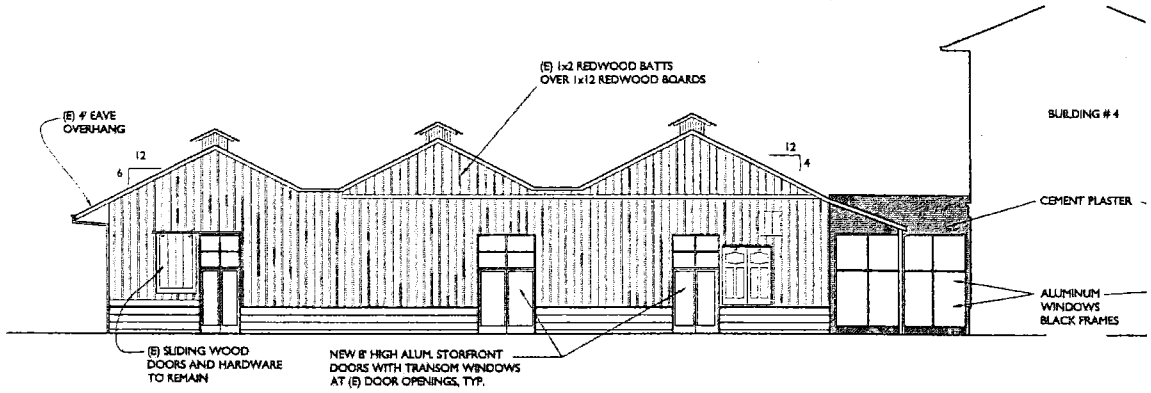
an alteration that contributed to the historical importance of the building or that has not gained historical significance. The addition has the effect of detracting from the simple, rural, industrial style of the apple packing warehouse shown in Figure # 3-D, page 45. The shed addition is to be removed to return the form and expose the exterior siding of the original building.

Also, the historicist lattice work and décor on the porches c.1968-98, retail signs, and alterations for the current retail use will be removed (Standard # 3 to preserve the historic building as an example of its historic period without conjectural or false historicism).




FRONT ELEVATION

**Figure # 3- M Apple Barn -existing elevation drawing showing types of vertical board siding, openings and additions.**
**Source: Thacher & Thompson Architects Existing Elevations Apple Barn Sheet 2**




NORTH ELEVATION
FORMERLY FRONT ELEVATION

**Figure # 3-N Proposed rehabilitation elevation drawing. Contemporary door & transom in existing openings. Note: Although the vertical siding in the drawing appears to be uniform, the rustic boards will be retained and preserved.**
**Source Thacher & Thompson Sheet 5-1 July 15, 2011**

Proposed for the North façade are three doors that will be inserted into existing openings. The style of the door/transom system is contemporary metal frame that does not attempt to replicate historic styles or materials that could confuse the public about what is historic and what is rehabilitation work (Standard #9 compatible simple designs and distinct material). Where historic elements remain such as, rolling door and hardware, evidence of small openings and rustic siding, they will be retained and preserved. The proposed rehabilitation plan for the North Elevation conforms with Standards #2, (historic character retained),#3 (removal of non-historic materials denoting a different era and the use of contemporary door & transom), # 5 (distinctive features that identify a rural industrial barn are preserved), #6 (repair or replacing deteriorated features in-kind), #9 (new work will be differentiated from the old), and it does not violate an of the other standards.

### 3.5.2.2 East Façade ( Rear Facade)

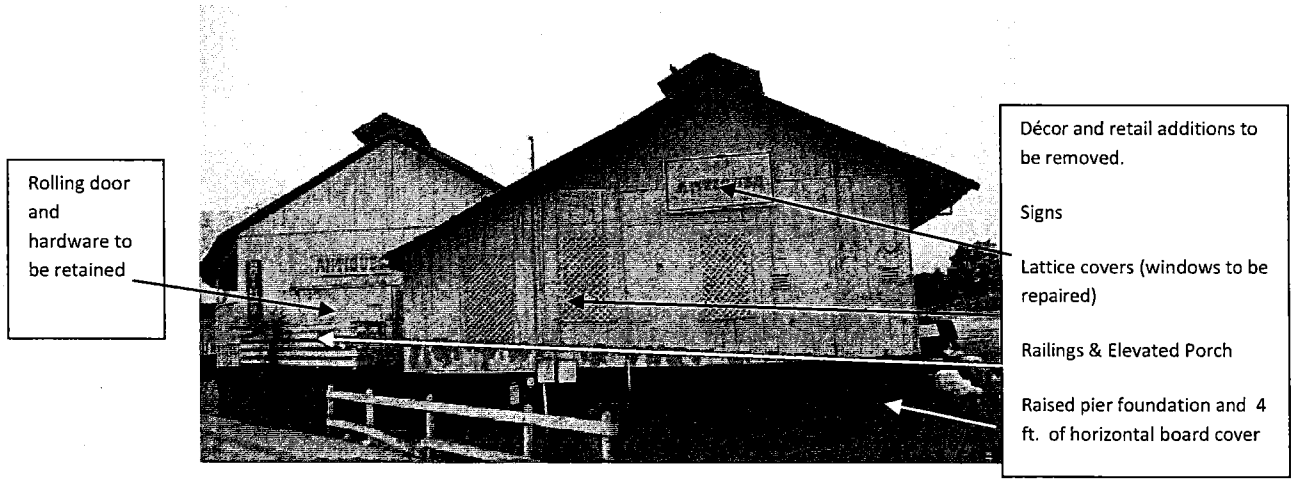



**Figure # 3-U East facades (north gable – right) of the Apple Barn showing the north and center bays raised approximately 4 feet above the ground level, decorative covers on the openings, railings, and signs that are to be removed. Openings in the east end will be rehabilitated as windows.**

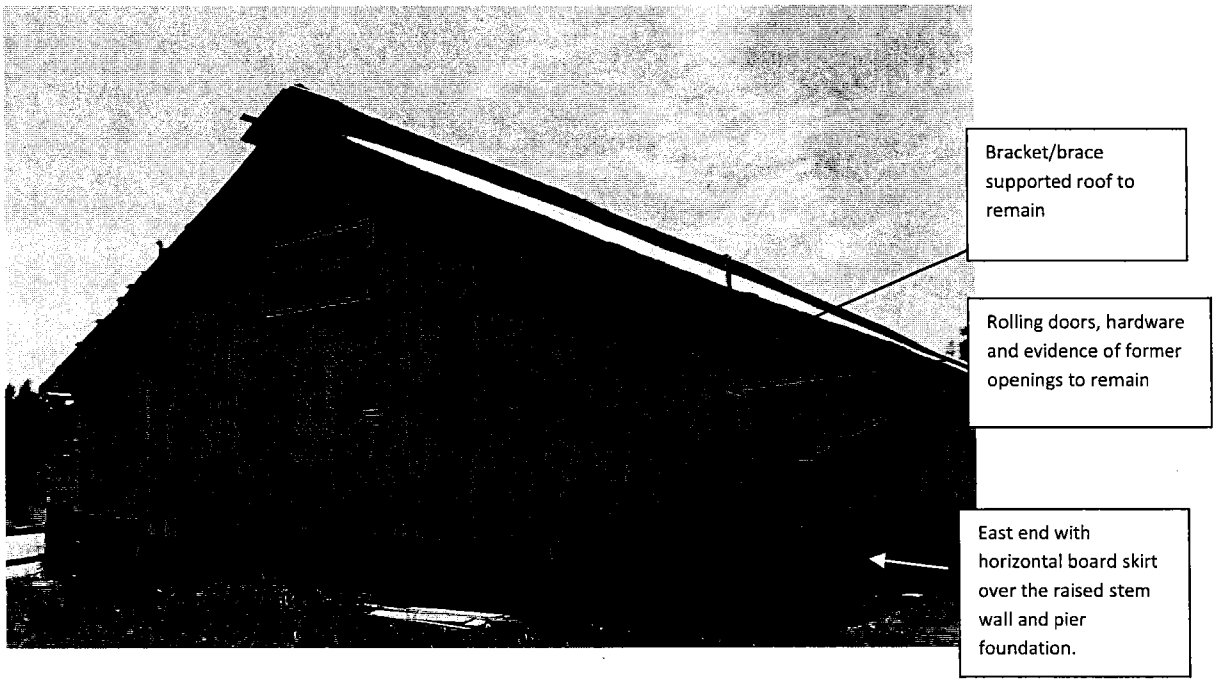



**Figure #3-P Photograph of the east and north façade of the north gable showing the variety of character elements that define a rural industrial barn that are to be retained.**
**Photograph date: October 2009**

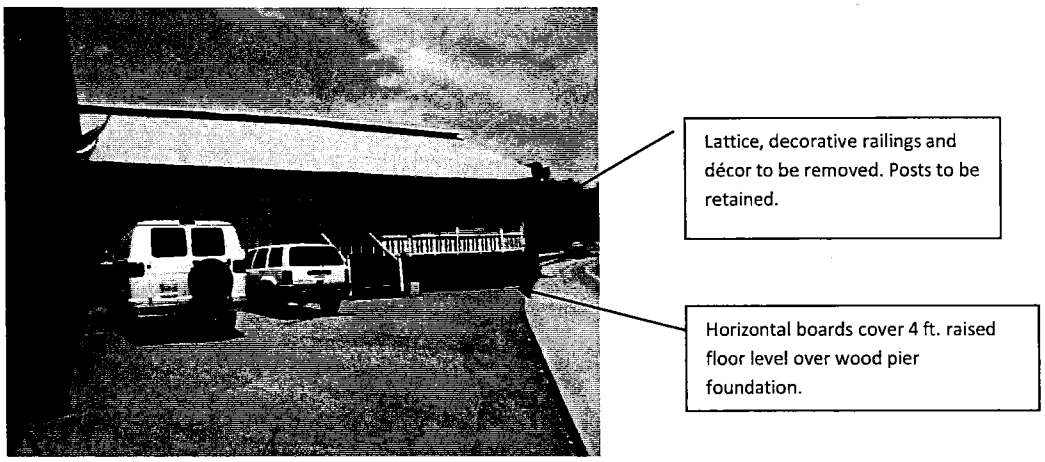



**Figure #3-Q Photograph of the north bay (south elevation) showing lattice porch décor to be removed.**
**Photograph date: October 2009**

The east end of the three gables has a variety of alterations and additions that are part of the Vintage Fair Antique Emporium or altered by road widening. The north section has three staggered window openings that are covered with lattice. The rehabilitation plans show the lattice to be removed and the

windows rehabilitated by repairing the wood frames and glazing, or if severely deteriorated they are to be replaced with the same material, type and style windows. This rehabilitation work conforms with Standard #2 ( retaining the historic character) and Standard #3 (removing non-historic materials that are from a time outside the period of significance and that denote a different era), and Standard #6 (to repair features or if severely deteriorated to replace the deteriorated features with in-kind material and design).

The second gable end has an existing opening that will become a new contemporary door. This will be the main access door for the grocery market. A deteriorated wood door on rolling hardware will be repaired and together with the hardware it will be kept in a fixed position on the wall. The existing vertical board and batt siding will be retained and repaired, or severely deteriorated, boards will be replaced with in-kind material. The porch posts and roof will be retained and installed after the building is relocated. As discussed elsewhere these will have a concrete base to achieve the length that is necessary given the additional height in the building.

This rehabilitation work conforms to Standards; #2 (historic character is retained), #5 (distinctive materials, and workmanship preserved), #9 (contemporary new door system is not conjecture or false historicism).

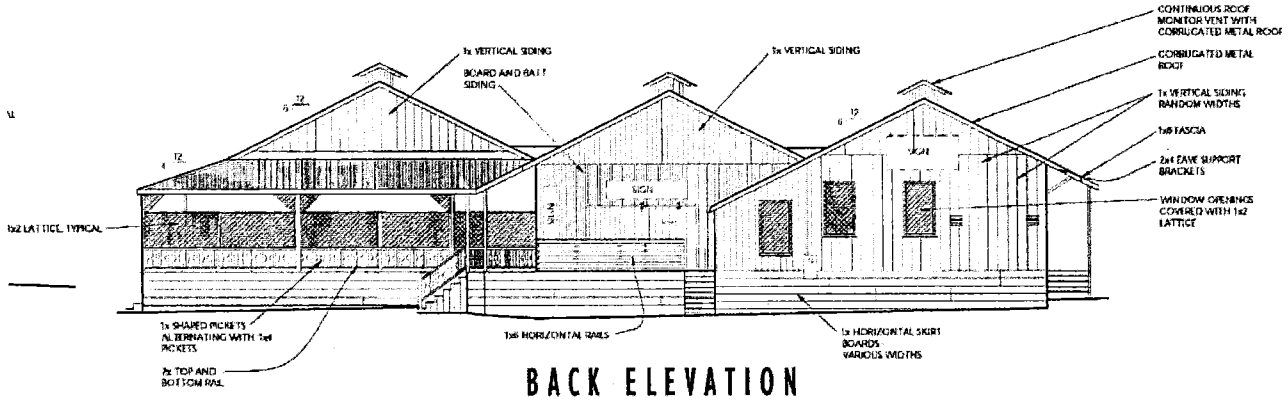



**Figure 3-R Existing elevation drawing Back (East gable ends)**
**Source: Thacher & Thompson Sheet 2 , March 2011**

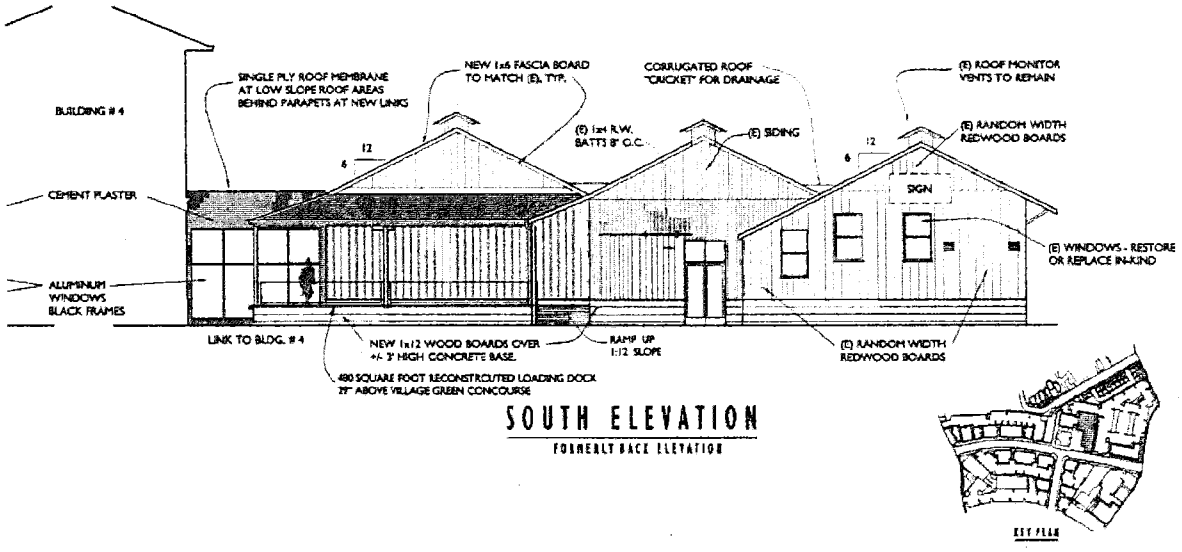
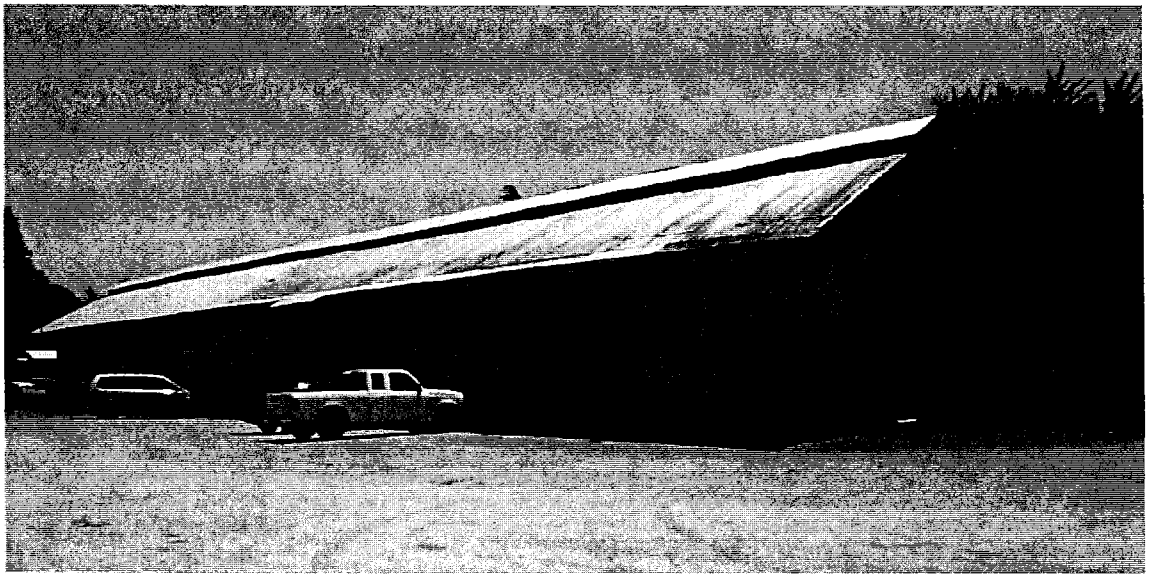



**Figure # 3-S Proposed rehabilitation plan. Source: Thacher & Thompson, Sheet 5-1(revised), July 15, 2011**

### 3.5.2.3 North Façade Rehabilitation Plan .



**Figure# 3 -T Hihn Apple Barn, north façade with historic vertical board siding, rolling doors with hardware that are to be retained and evidence of other openings in the wall now closed. A door for the retail use is installed in one of the historic openings. Photograph Date: April 2009**

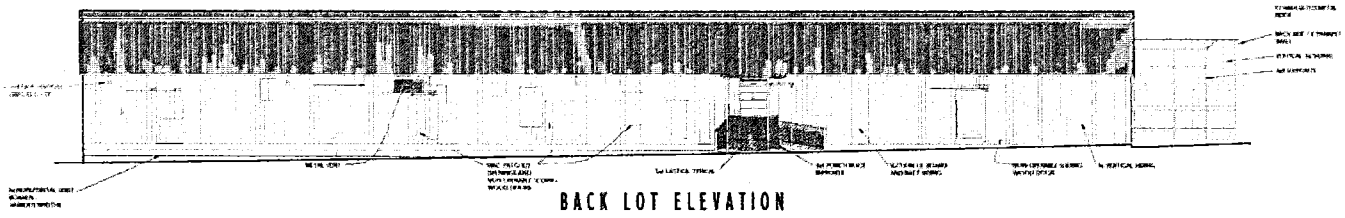



**Figure # *3*-U shows the existing elevation drawing as Back Elevation. Height at east end 27.5' and at west end 24' Source: Thacher & Thompson, Sheet 5- 1, March 1, 2011**

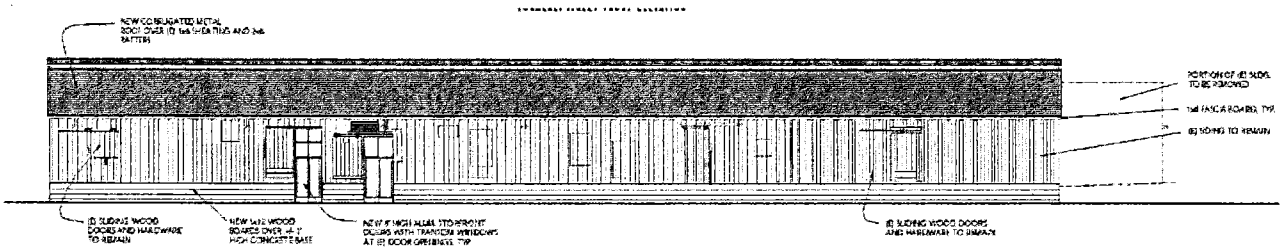


**Figure # 3-V Rehabilitation Elevation drawing shows the work that incorporates new door and transoms into existing openings. Source: Thacher & Thompson, Sheer 5-1, March 1, 2011**

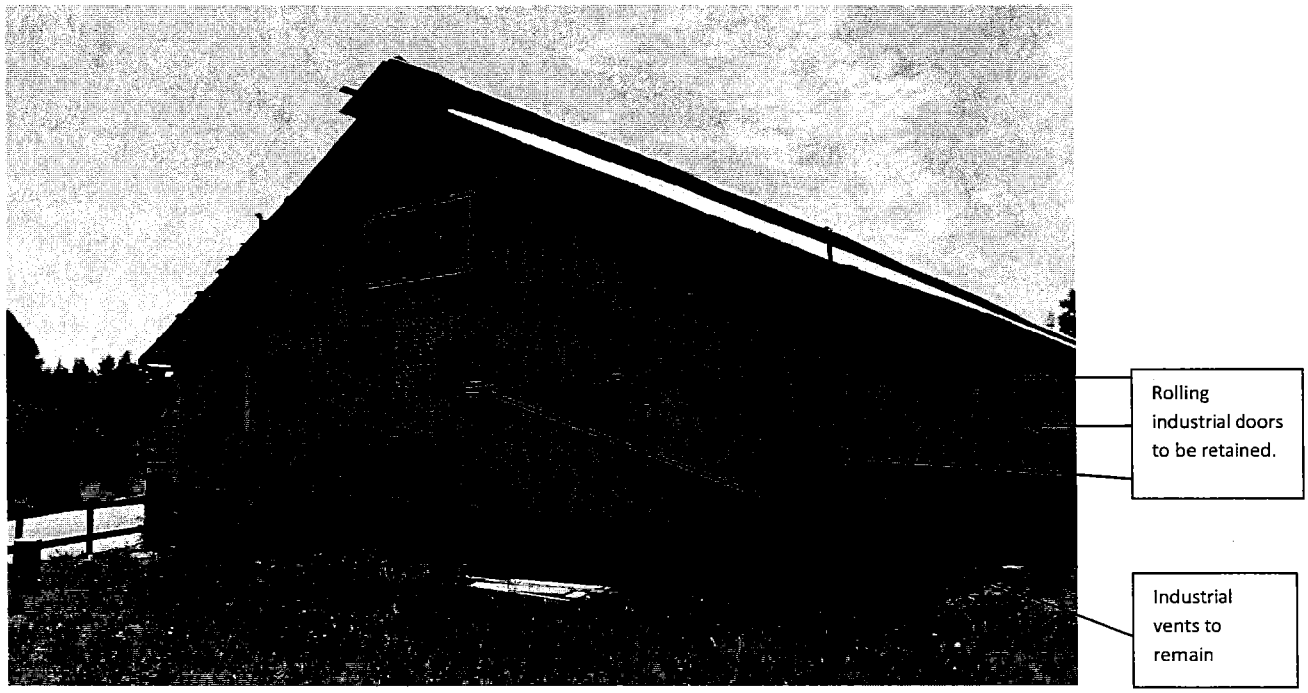



**Figure #3-W Photograph of the east end of the Apple Barn taken October 2009**

Existing Rear (North) façade: Two new contemporary, store front style aluminum frame door systems, will be installed in the existing openings at the east end (extended to reach new floor level). The existing rolling wood doors will be retained in their fixed locations next to the new doors. The other rolling industrial doors, patched openings, vents and mismatched vertical siding will be retained and repaired where necessary. The current non-historic door fills an historic opening. This will be removed and the rolling door closed over the opening (Figure 3-R, Existing back Lot Elevation- Rehabilitation drawing- East Elevation Figure 3-S). This work conforms with the Standards; #2, (historic character retained and preserved), #3 (removal of non-historic materials denoting a different era), # 5 (retain historic features that express the rural industrial barn), and #6 (repair and if necessary replace deteriorated features in-kind). None of the other standards are violated in this rehabilitation plan.

### 3.7.3.4 South Façade Rehabilitation Plan (street facing façade).

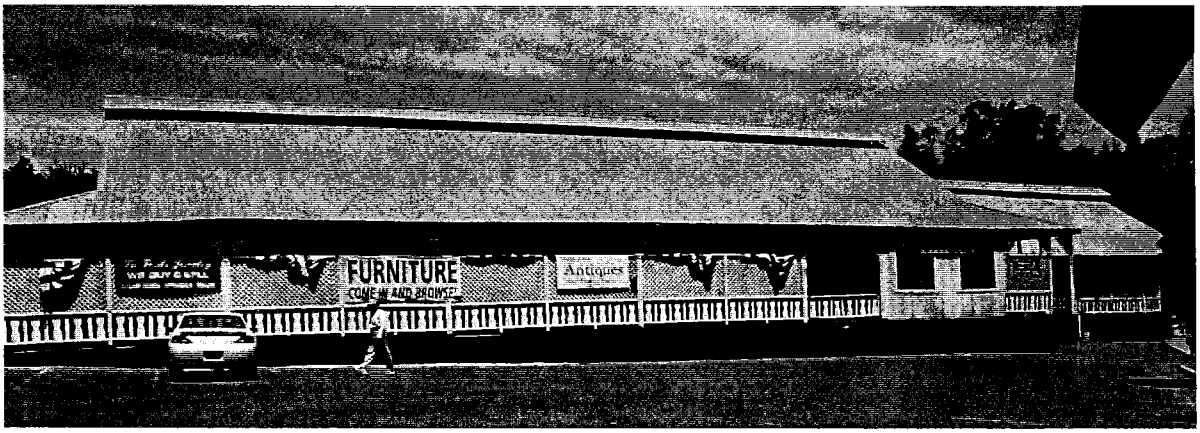



**Figure # 3-X Existing Street Front Facade (facing Trout Cultch Road) the rehabilitation plan is labeled as West Elevation.**

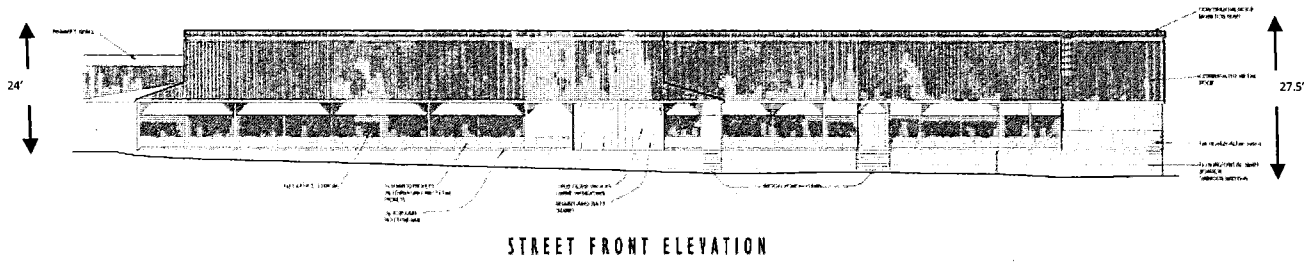



**Figure 3-Y Existing Street Front Elevation 24 ' at west end, 27.5 at the east end. Source: Thacher & Thompson Sheet 2**

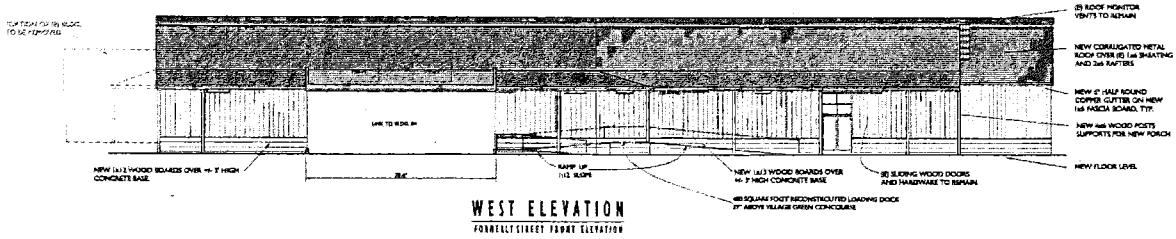



**Figure #3-Z Proposed Rehabilitation plan (former Street Front). Source Thacher & Thompson 5-1, July 15, 2011**

The decorative lattice, railings and other historicist décor added for the Village Fair Antique Stores will be removed. This includes the porch enclosure with two fixed windows. One contemporary door system will be framed into the existing opening on the east side of the façade. The existing industrial rolling doors and hardware will be retained and secured in place. The loading platforms (porches) along the south façade were additions to the original building and are constructed as independent structures.

These will be removed when the building is relocated. A section will be retained and reconstructed with access ramps along the west façade. The low shed roof and posts will be retained to provide a cover over the new at-grade walkway along the side of the building. The posts will have new concrete bases to provide the additional height of the stem wall. (Figure 3.H)

The plan conforms to the Standards; #2, (historic character retained), #3 (removal of non-historic materials denoting a different era), and #6 (repair or if necessary replacing deteriorated features in-kind).

### 3.5. 3 New Construction- Linking Corridor :

The historic Apple Barn is not large enough to house a modern grocery/ market. Because the use is highly desirable a single story, contemporary connecting element is proposed between the historic building and a new mixed use building (building #4) where additional space is available. This is shown on the proposed development plan (Figure 3-Z & 3-AA). The single-story, design is primarily glass panels in metal frames set into a wall covered with plastered wall. The proposed connection between the historic building and the new building is 18 feet long and 36.5 feet wide. The design of the connecting structure is not historicist, and uses distinctly different materials that will not be thought of as a historic element of the barn. Drawings show it joins the historic building by a "flashing" and remains an independent structure, not structurally connected into the historic building. To preserve the historic building's roof in the original appearance, the corridor's roof will hold the mechanical equipment required for the grocery/ market. To create the opening into the connecting corridor, 36.5 feet of surface wall will be removed. This wall boards exist between a 9 foot opening, a 4.6 foot window and a 3 foot (not historic) glass door. The actual amount of wall board to be removed is relatively little in comparison to the rest of the building. The structural posts that are in the wall are to remain in the center of the new corridor and be set on new bases where they will remain visible and part of the historic structural system. The structure of the historic barn will remain intact. To provide the opening it will also be necessary to remove the same length of porch. While removing or altering historic materials is discouraged, the standards for rehabilitation recognize the need to accommodate changes that do not destroy the character of the historic building and minimize the loss of historic materials. The opening and removal of the relatively small amount of wall and porch sections does not change the structure or the overall character of the historic building. It is recommended that the historic materials be used to repair other parts of the building's exterior and that unused material be stored for a period of at least 10 years to be used for repairs.

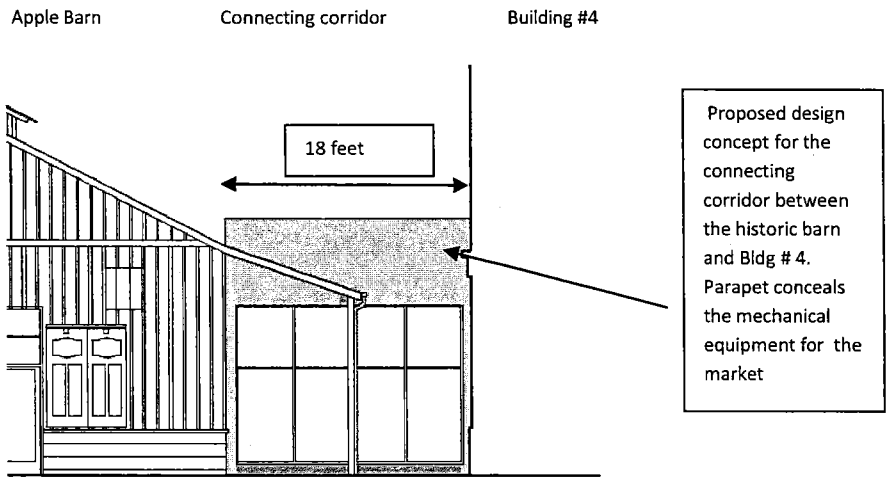



**Figure 3-AA: Drawing to show the style of the connecting structure between the historic building and the new building # 4 - façade concept design next to the Apple Barn. The connection will be a separate structure and will gently attach to the Apple Barn by a " flashing." Source: Thacher & Thompson Architects**

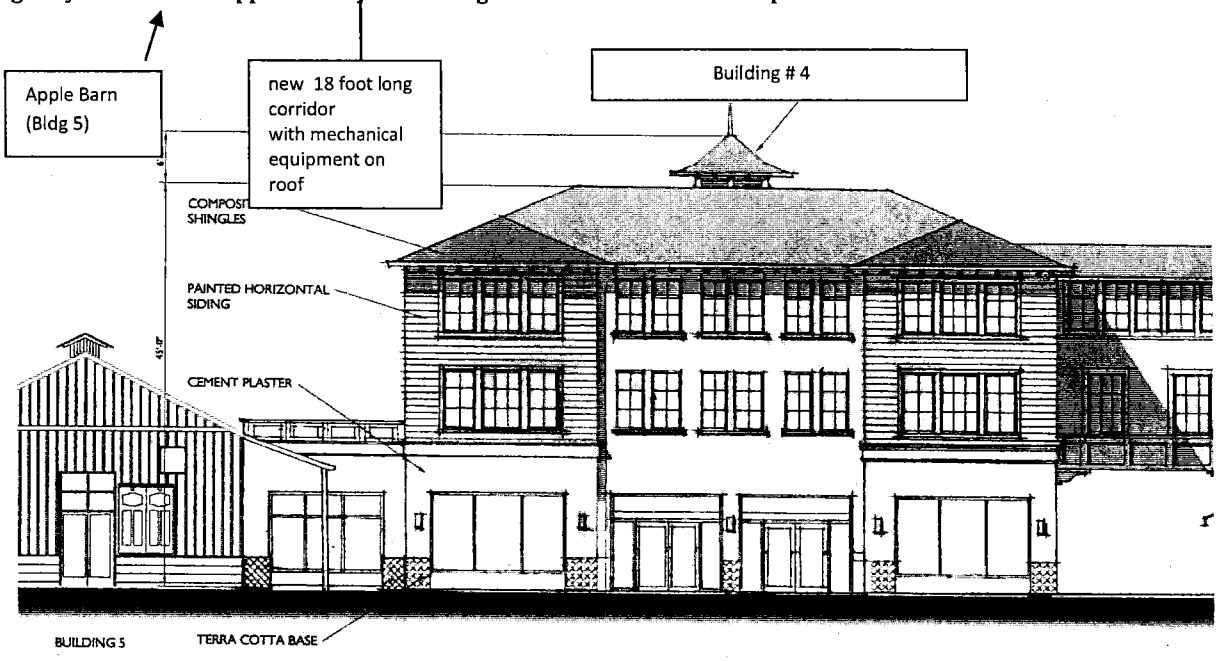



**Figure # 3- BB Historic barn on the left, connecting corridor and new building #4 on the right. The design for the connecting corridor has been simplified and will be industrial store glass panels without decoration as shown in Figure 3-AA.**
**Source: Thacher & Thompson Architects 3/2011**

The contemporary connecting element is designed in a style that will not be confused as part of the historic barn and does not rely upon the historic building for its structural support. The standards ask that secondary space in a historic building be considered usable, before the decision to add to the building. In the case of the Apple Barn, all interior space is already used in the plan for the grocery market. The rehabilitation plan to provide additional space for the grocery/market by connecting to a new building through a corridor rather than adding a larger addition to the historic barn is preferable and conforms to the Standards, # 9 and # 10.

## 3.6 A Summary of the Rehabilitation Plan for the Apple Barn and Comparison to the Secretary of the Interior's Standards for Rehabilitating Historic Buildings:

> Rehabilitation is defined as the act or process of making possible a compatible use for a property through repair, alterations, and additions while preserving those portions or features which convey its historical, cultural, or architectural values.[27]

*1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*

> The desire of the community and the developer is to retain the retail use and to solicit a food market to use the historic warehouse. The use is relatively compatible with the historic use and will provide the economic viability to maintain and preserve the historic building, something that has been missing for over 70 years. The use requires large open spaces for display and sales that are compatible with large open areas of the historic building. To preserve the character defining exterior walls (single- wall construction), the seismic strengthening will augment the post and beams with steel brace frames and ply-wood installed inside the interior wall, but attached to the new frames. This system has minor impact to historic materials and maintains the interior open space. It appears necessary to replace the floor structure, an independent platform constructed in sections, with a concrete slab foundation to provide for the live loads of the grocery market use. The loss of this amount of historic material is not desirable and is considered a significant loss; however, the unseen understructure is not a prime character defining element of the structural system and the rustic floor surface does not appear to be

[27] Secretary of the Interior's Standards for the Rehabilitation of Historic Buildings.

permitted in areas of food sales. To mitigate this loss, the entrance to the market will reuse rustic floor boards in a section away from the food, where it is in context with sections of the single-wall construction that will be visible. Also required for the adaptive use as a grocery market, is additional interior height that will be provided by using a 3 ft. stem wall to even the height of the barn. Because of the slop on the original site, the historic building is about 4 feet taller on the east than that on the west. The overall effect of the change in height does not detract from the character defining elements of the barn. The modifications that are necessary for the proposed use, retain and preserve the important character defining features of the rural wood warehouse (barn). The rehabilitation plan appears to meet the criteria of Standard #1 for a compatible use that gives the barn economic viability and preserves the vast majority of character defining aspects and historic material.

Interestingly, the history of grocery markets shows that they were often located in rural barns because they were compatible and closes to the source of food sources.

*2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.*

The historic character of the Hihn Apple Barn is that of a rural, utilitarian industrial warehouse with a structural system that created interior large spaces for sorting and packing tables, box making and shipping facilities. The rehabilitation plan retains and preserves the character defining features of the three-bay building including its form and mass, structural system with posts, beams and trusses, interior space, and the crude varied width board siding and metal roof that denote a rural barn. Where historic openings exist they will be reused for contemporary doors, with historic hardware rolling doors, or other evidence of the past use retained in their original location, A section of loading platform (porch) will be retained with ramp access. Openings for new doors or windows will be in the same places as historic openings to minimize intrusion into the historic building. Contemporary door and transom systems and metal brace frames are not historic styles or materials that might confuse the public. The new doors and windows are randomly located on each side of the building in historic openings and do not detract little from the character of the rustic historic barn. Portions of the loading platform will be retained and made accessible by wood ramps, as part of the Swenson rehabilitation plan. The rehabilitation plan retains all the primary historic character features of the rural barn building while incorporating the adaptive use requirements of a grocery market.

The adaptive reuse to the grocery/market requires a substantially stronger floor/foundation. This has been designed as a concrete slab foundation floor system that results in the loss of the under floor structural platform and the majority of the rustic floor boards. This loss is regrettable but the existing system does not appear as a primary character defining element and is secondary and independent to the post, beam and truss structure of the building. The floor structure will be documented in architectural drawings and photographs. Rustic floor boards will be reused in the entrance to the grocery/ market where a section will be devoted to the history of the building.

Considering the preservation of the building with the primary character defining elements, although the loss of the floor platform structure is unfortunate, the overall plan meets Standard #2.

*3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.*

The proposed rehabilitation plan removes historicism elements from the Village Fair Antique Emporium and retains the physical record of the Hihn Apple Barn in the structural system, exterior board siding and roof, loading platform and historic interpretative area and does not introduce elements of historicism that are foreign to the time period, late1890's through 1940. The rehabilitation plan retains the evidence of the rural industrial barn's use, vernacular design, and utilitarian construction and crude repairs. Where it is necessary to introduce contemporary elements for code compliance, security, access, or operations they are shown to be distinctly contemporary of the 2011 era, and not conjectural features of historicism.

The rehabilitation plan conforms to Standard #3.

*4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.*

The building was developed over a period of 40 years and will retain and preserve the sequence of the three bays, the change from shingle to metal roof, as well as the rustic modifications to the exterior siding. Remodeling after 1940, the time of decline in the apple industry, is not considered significant to the building's history and is outside the period of significance. The changes after 1940, altering openings, shed additions or porch infill, stairs, etc. do not represent features that have gained significance and will not be retained. Changes that reflect the inappropriate historicism associated with the Village Fair retail use will be removed be retained. However the truncated roof and porch, part of the street widening will be repaired with in-kind materials and will follow existing construction patterns.

*5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.*

The craftsmanship and materials that created the three sections of the Hihn Apple Barn, structure and siding will be retained. Timber center posts of the structure and roof trusses will be preserved and visible after the rehabilitation. The majority of the siding, post and beam and truss systems will be retained and preserved; severely deteriorated wood will be repaired or replaced in kind. The distinctive rustic materials and construction of the barn will be retained and preserved.

*6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.*

The plan shows that deteriorated historic features or materials will be repaired whenever possible and replaced in-kind only if severely deteriorated. Areas where materials are replaced will be documented in architectural drawings and photographs.

*7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.*

The rehabilitation plans do not propose chemical or other harsh treatments will be employed in this project. Should it be desirable to clean the building on a limited basis the gentlest methods of hand work, low pressure water, or other NPS approved method must be used. Should it be necessary to clean portions of the building or structure, only cleaning treatments approved by the National Park Service for the specific type of material will be used.

*8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.*

Archeological testing was conducted by Albion Environmental, Inc. The investigation included intensive survey and five backhoe trenches. Archeologists processed 21.5 cubic meters of excavated soil without encountering intact cultural features.[28] Should deposits be discovered during the rehabilitation of the Hihn Apple Warehouse, or excavating for the new

[28] Albion Environmental, Inc. *Cultural Resources Study for the Proposed Aptos Village Project, February 2009, P. A-1*

foundation, appropriate measures will follow state law and archeological best practices in conformance with Standard 8.

*9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.*

This standard often creates confusion by recommending "compatible with historic materials" yet specifies the new work shall be differentiated. The objective is not to confuse the general public now or in the future regarding what is new work and what is historic. Therefore new work or additions should be a simple design that is not replicating the historic building's features or materials is one that is not likely to be misinterpreted in the future. To gain additional square footage, an independent structure, a single-story enclosed corridor is proposed to connect the Apple Barn to the proposed new Building #4. The proposed design is a contemporary style element that is 18 feet long and lower in height than the barn. The plan shows glass panels in simple frames, with the corridor taking its cladding and ornamentation from Building #4, a design that does not mimic or diminish the feeling of the rustic features that characterize the Apple Barn and will to be confused as part of the barn in the future. To create the opening into the corridor and Building #4, 36.5 feet of exterior siding, including a non-historic a door opening, and a window will be removed. The structural posts that are part of the post and beam system will be retained in place. Siding that is removed will be used to replace deteriorated boards or stored. The section of porch that is removed will also provide materials for other deteriorated area of porch. The rehabilitation plan proposes limited alterations to the exterior (contemporary doors and transoms), and an even 3 feet base foundation that will not destroy the form, features, special relationships or rustic elements that characterize the rural, industrial barn.

Building #4 is a three-story, mixed use building designed in horizontal blocks that feature hipped roofs, painted horizontal siding, banks of windows and at the ground level, cement plaster. It is not a rustic style, nor does it use rustic materials. Although taller than the Apple Barn, the building's foot print is much smaller. The building is compatible, different, and does not detract from, or dominate the very large, rustic industrial barn.

The rehabilitation plan includes new interior plywood walls that will be painted or covered with a product appropriate to the grocery/ market use. It is also proposed to insulate the

building. The building has not been insulated and the single-wall system does not have a moisture barrier. The type of insulation to be used will be a fiber type that will be placed behind new ply-wood in the wall cavity. The product will be selected to avoid damage to the historic materials or systems. Ridged insulation is shown for under the metal roof, above the ply-wood membrane. These follow the guidance in the Standards for energy conservation. The interior truss system will remain, be preserved and visible from inside the barn. All new HVAC systems will be concealed or where visible as new construction. The rehabilitation work will be distinct and different from the historic building to avoid confusion of what is historic and what is new construction.

*10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.*

The proposed connecting corridor described above will be an independent structure and will not impact the structure of the historic building. The amount of wood siding, between non-historic openings is relatively small and will be stored for 10 years. At such time as it may be desirable to remove the connection only exterior repair, replacing the board siding, will be required. The proposed plan does not impact the structural post and beam system in the area of the connection.

The standards are designed to preserve historic character defining features and to the greatest extent, preserve historic materials and workmanship in original locations. It is not essential that all elements of a building be visible. The rehabilitation plans proposed for the Apple Barn, preserve the character defining elements of the building and keep most of the important elements in use and visible to the public.

When the National Park Service created the Secretary of the Interior's Standards for the Rehabilitation of Significant Historic Properties, it was recognized that Standards are to be interoperated to allow an adaptive-use that gives economic viability to a historic building. Generally, it is the first standard that determines if rehabilitation will comply with the rest of the Standards. Standard 1 states - *A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.*. In determining that the best adaptive-use for the community and one that is economically viable for the preservation of the Apple Barn, the amount of change to the building was considered and it was decided that the grocery/market was the best adaptive-use. The initial decision appeared to meet the criteria of Standard 1 -yet it would prove a

challenge requiring several iterations by the design team and agreement to non-traditional conditions by the tenant to comply with the over-all intent of the Standards.

In most instances the Standards are not proscriptive and guidelines have been developed to allow a spectrum of reasonable change to the historic building that is necessary for the intended use, to meet life safety codes, accessibility and energy standards and at the same time preserves the character defining features. The grocery/market use adds constraints to the rehabilitation plan for health code requirements to accommodate food storage and areas of food preparation and handling.

The review above summarizes how aspects of the rehabilitation plan meet the different Standards, and where rehabilitation for the grocery/market requires changes that are at the edge of compliance, but on balance, the rehabilitation plans meet the criteria of the various governmental agencies and the Secretary of the Interiors Standards for Rehabilitating Historic Buildings. When completed, the historic building will retain the design of a three bay utilitarian, rural warehouse, the vast majority of its historic material and the space relationships of the post and beam structure, open interior and the exterior original rustic wood siding with evidence of past openings, loading platform, and alterations. Viewed from the exterior, there will be immediate understanding that the historic use was as a rural warehouse that is somewhat crude in construction methods and utilitarian in structure and function. Viewed from the interior, the significant element of the building's structure will be visible in the post and beams and roof trusses. The section of the building that will remain with open walls and rustic floor boards will further inform the general public how the building was assembled, the utilitarian construction and its industrial function. Anywhere historic material is removed photographic and documentation drawings will be made and provided to the Aptos History Museum for future research into past construction methods and materials. The plan also appears to meet the criteria of providing an economically viable active reuse plan so that the building will be maintained gaining long term preservation for the community. When all aspects of the rehabilitation plan are considered, it can be concluded that the proposed plan conforms to the Secretary of the Interior's Standards for Rehabilitating Historic Buildings and the basic intent to provide for the preservation of the historic resource.

## 3.7 Defining Eligibility for Listing in the National Register of Historic Places

Retaining the Apple Barn's eligibility for listing in the California Register of Historic Resources, and the potential to be listed in the National Register of Historic Places has been a directive by the Santa Cruz County Historical Heritage Commission and is a goal for this Preservation Plan. Typically relocated buildings are not eligible for listing in the National Register of Historic Places, however exceptions are

made for those building that meet *Criteria Consideration B*, which address historically significant relocated buildings. Because the Hihn Apple Barn is being relocated to preserve the historic building it meets this criterion. To be eligible for consideration to either register, the building must also retain integrity and meet the criteria of significance.

### 3.7.1 Evaluation of Integrity After Relocation and Rehabilitation following the proposed plans (Thacher & Thompson 3/2010-7/15/2010)

The National Register defines seven aspects that create integrity. Eligible properties will retain most, if not all aspects.

*Location: the place where the historic property was constructed or where the historic event occurred.*

Current: the Hihn Apple Barn is located on the site where it was constructed, adjacent to a railroad spur that no longer exists and in an industrial area.

Proposed relocation: The barn will be moved to a location on the same parcel, also in close proximity to the former railroad, yet it would not meet this aspect in the new location,

*Design: The combination of elements that create the form, plan, space, structure, and style of a property.*

Current: The aspect of design remains in the basic structure of the building, siding and other historic features, although there are many alterations and additions that detract from the basic industrial, utilitarian design of an apple packing barn.

Proposed relocation: The aspect of design will be preserved in the new location by retaining the historic plan, form, interior spaces, structure and style. Inappropriate additions, retail décor and alterations that have been added after the period of significance (1890-1940) and are part of the Village Fair– antique emporium will be removed.

*Setting: the physical environment of a historic property.*

Current: The historic setting is similar to the current but is diminished by the loss of the railroad, that no longer exists by the side of the building. This was an important feature that defined the reason for the location and use as a apple warehouse. What remains is open space some of which was the circulation for the operations- wagons, trucks and pallets- that is now unstructured parking.

Proposed relocation: The building will be mostly surrounded with open space, parking and streets. The setting will be different from the historical setting by the lack of the railroad and the surrounding organized parking, landscaping, and village setting that is different from the industrial setting of the apple packing facility. The new setting retains visibility for the large building, but will be diminished by the relocation and by the development of infrastructure and the "Village Green" a land use pattern that is different from the original industrial setting.

*Materials: the physical elements that were combined or deposited during a particular period of time and in a particular pattern or configuration to form a historic property.*

Current: The Hihn Apple Barn retains the majority of original materials, timber wood structure, siding, flooring and roof trusses. Several pieces of hardware remain on the building as do industrial or rolling wood doors.

Proposed relocation: The building is to retain the historic materials, timber structure, siding, and trusses. Pieces of hardware and framing of historic doors or windows will be retained in the rehabilitation. The existing floor system is not shown to be retained.

The aspect of materials is diminished by the loss of the floor system, and loading platforms, however the character defining post and beam, truss structure and single-wall siding will be preserved.

*Workmanship: the physical evidence of the crafts of a particular culture or people during any given period in history or prehistory.*

Current: The workmanship is found in the structure of the building as well as in the siding, and hardware and sliding doors. Barns are often unrefined workmanship.

Proposed Relocation: The original workmanship will be preserved in the relocated building's timber structure, siding, trusses and hardware and industrial doors. The rehabilitation plan appears to follow the guidance by preserving the majority of historic workmanship in the structure and walls of the barn

*Feeling: a property's expression of the aesthetic or historic sense of a particular period of time.*

Current: The Hihn Apple Barn exhibits the feeling of an industrial warehouse type building from the early Twentieth-century.

Proposed relocation: The proposed plan follows guidance in the Secretary of the Interior's Standards and will not change the feeling that the building is a rural, industrial barn building from the early Twentieth-century. The urban setting will imply that the building has been relocated.

The building retains the feeling of the rural, industrial barn; however, the aspect of feeling is diminished by the organized urban setting.

*Association: the direct link between an important historic event or person and a historic property.*

Current: The association to F. A. Hihn and the apple industry relates to an important person and an important economic era in Aptos, and the building retains the simple utilitarian form of an industrial building, an apple packing barn. However, there are no distinctive elements that make the association to F. A. Hihn or the apple era clear to the public.

Proposed relocation: The relocation and rehabilitation will include a permanent interpretative display for the public to understand the association to F. A. Hihn and the apple shipping era in Aptos. Generic, utilitarian, industrial warehouse type buildings often lack a clearly defined association to a person, event or use, yet the association to the specific person or use is important if the public is to understand the building's history. Specifically created to describe the historic association, the aspect of association would be strengthened as it would be understood by the public.

The rehabilitation plans for the Hihn Apple Barn have had several iterations as the design team works through the difficult challenge of the Aptos Village Plan and accommodating a grocery/market use in the historic building. Although some aspects of integrity are diminished, it is only the aspects of location on the original site and the historic industrial setting that are not met in some fashion. The rest are maintained so that integrity – the ability of a historic resource to be recognized for the reason it is significant- is achieved. The Hihn Apple Barn, after relocation will be recognized as a turn- of- the-century, rural industrial warehouse. The building in its current location and after it is relocated will

retain most of the attributes of integrity and meet this threshold for eligibility to the California Register of Historic Resources and potentially to the National Register of Historic Places.

### 3.7.2 The Hihn Apple Barn eligibility for listing in the National Register – Meeting the Criteria of Historic Significance

As stated above, it is the desire of the Santa Cruz County Historical Resources Commission that the building remains eligible for designation after it is relocated and rehabilitated. To be eligible for listing in either the California Register or The National Register, it is necessary to retain integrity and to demonstrate historic significance that meets established criteria. The Hihn Apple Warehouse was determined eligible for listing in the California Register of Historic Resources and potentially eligible for listing in the National Register of Historic Places by Dill Design Group in the study "Aptos Village Historic District" March 7, 2003. This led to the County adopting a rating of NR-3 for the building. However, the study found that to be eligible for listing in the National Register of Historic Places, the documentation needed to demonstrate a stronger statement of historical significance than was included in the study. Since that time, the importance of the architecture and building methods, and the association to F. A. Hihn has been shown to provide the basis for a strong statement of significance. In summary, this is the last building in Aptos associated with the community's apple industry during the era when it was the economic sustenance of the village, and F. A. Hihn and his association with brining the railroad to Aptos and his local apple business. It appears the statement of significance can be made substantially stronger under criteria A, & C.

The National Register criteria for listing historic properties[29]:

A property is generally expected to be over 50 years old and must retain most, if not all of the seven aspects of integrity as well as meeting at least one of the following criteria:

a. are associated with events that have made a significant contribution to the broad patterns of our history; or
b. are associated with the lives of persons significant in our past; or
c. embody the distinctive characteristics of a type, period, or method that possess high artistic

[29] National Register Bulletin: How to Apply the National Register Criteria for Evaluation, 1995

values, or that represents a significant and distinguishable entity whose components may lack individual distinction; or

d. have yielded, or may be likely to yield, information important in prehistory or history.

After relocation, the Hihn Apple Barn appears eligible under Criteria A, and/or Criteria C.

Criteria a: *are associated with events that have made a significant contribution to the broad patterns of our history*

As the timber in the hills above Aptos was cut to the limit of easy access and the lumber mills that were the economic backbone of Aptos waned, the community slipped into economic depression. The area began to revive in the late 1890's when large land owners, including F. A. Hihn planted apple orchards on their property. Orchards were not new to Santa Cruz County they were already successfully established to the south in the Pajaro Valley outside of Wastsonville – "The Apple Center of the World" c. 1910.[30] As production increased the community found new economic vitality by creating a shipping center for the local apple crop. The railroads were already in service and many of the same skills were recaptured from the lumber yards as the local crops generated the need for apple box makers, apple packing warehouses, constructing apple dryers and vinegar works that were established making Aptos an apple shipping center, an important era that supported the community from 1900 through the late 1950's. During this period Watsonville was the apple center of the state sending Santa Cruz County apples and apple products throughout the world. Although the shipments from Aptos were only a small percentage, 5% of what was shipped from Santa Cruz County, the economic era based upon the apple was a significant and an important element in the history of Aptos Village.[31] The Hihn Apple Barn was directly associated with this era. The exact date the Hihn Apple Barn was constructed is not known. Recent documents indicate that the Hihn Apple Barn was possibly constructed c. 1891[32]. However, the Sanborn Map Publishing Company's Aptos map for 1892, (Figure 3 CC) shows a lumber shed (open sides with a roof) on the current location of the apple packing warehouses. When compared to the 1908 Sanborn Map (Figure 3 DD) none of the lumber sheds appear to be the right size to have been reused. The 1908 Sanborn Map shows the Hihn Apple Warehouse, although it is a smaller building appearing to be only one of the bays that exist today (Figure 3-DD). The 1908 updated to 1929 Sanborn

[30] Koch, M, Santa Cruz County-Parade of the Past, Western Tannerger Press, Santa Cruz, 1973:167
[31] Aptos Village Plan, County of Santa Cruz, February 23, 2010, page 7
[32] Lydon, S. Aptos Historical Context, Aptos Village Plan, 2010

Map shows the building with only two of the three bays seen today (Figure 3-DD). Research by Edna Kimbro identified modifications to the site in 1899, that may have created the first bay of the building. In 1915, and 1920, the building was further increased although the final bay appears to be after 1929, during the time when the Aptos Apple Industry was packing and shipping the most apples. Today the Hihn Apple Barn is the last industrial building associated with the apple packing and shipping industry in Aptos, a distinct and important economic era in the history of Aptos that lasted from, 1890-1959. However, the period of significance is 1899-1940, the period during which the apple industry was the significant economic factor in Aptos and contributed to the broad pattern of economic development in Aptos Village. After 1940, apple related business declined sharply with the large operations closing, due to market demand and labor issues. Small quantities of apples continued to be shipped until 1959, almost 20 years after the larger facilities had closed.[33] It appears that the Hihn Apple Barn was constructed c.1899 and ceased to be used for apple shipping in the 1950's. It appears there were temporary uses and long periods where the building was vacant until it was purchased by Fred and Babe Toney, c. 1965.[34] The period of significance for the Hihn Apple Barn is 1899-1940, the period that corresponds to the apple industries growth, and peak in Aptos. During WWII the apple industry in Aptos declined leaving only scant packing until even that ceased in 1959. Although the exact date the Hihn Apple Warehouse closed is not known, it is remembered as vacant for many years.

The Hihn Apple Barn is the only remaining industrial building in Aptos that was developed by the very significant historical figure, State Assemblyman, County Supervisor and very successful Santa Cruz County businessman, Frederick Augustus Hihn. Hihn initiated many of the businesses developed in the County, including the Aptos-Watsonville Railroad, the Valencia Lumber Mill in Aptos, and the Hihn Apple Packing and Shipping Warehouse. He was a significant influence in Aptos with both the lumber and apple industries. Hihn died in 1914, leaving his business interests to his children who expanded the apple packing business in Aptos.

Criteria c: *embody the distinctive characteristics of a type, period, or method that possess high artistic values, or that represents a significant and distinguishable entity whose components may lack individual distinction*

[33] Lydon, S. Aptos Historical Context, Aptos Village Plan , 2010
[34] Thompson,P.T. "Aptos California 1904-1979- A brief History", May 31,1981 (manuscript)

Although the building has lost most of the relationship to its historical setting; the railroad siding, loading and traffic patterns, the building retains the architectural design, with materials and construction that is distinct and representative of the large format industrial barn once prevalent in the Aptos area and now represented only by this turn-of-the-century building with additions in 1915, 1920, and later. The barn is constructed of primarily redwood harvested in the local hills and likely milled by the F. A. Hihn Company lumber mill. Constructed on a mudsill with the later additions having concrete piers, the building is constructed in three off- set bays (sections). The character defining elements of the barn are the structure, including the truss systems and pop up ventilation on the ridge of the roof, the open spaces inside the building and the single-wall construction with exterior siding of vertical board and board and batt of varying widths. Fenestration has also changed over the years, but the size and style of windows is a feature that is important to respect. Utility systems including water or electricity are minimal and are not considered significant features. Constructed in three phases and remodeled for commercial use in a fourth phase, the building exhibits a common truss system and post and beam construction using rough sawn heavy timbers. The historic industrial rolling doors are mostly maintained in a closed position with newer utility doors that are operable and a remodeled glass storefront entry door that is contemporary in design. The substantial structural construction, the primary feature of the barn, has preserved this building through changes in use. In the 1960's the building was remodeled for commercial use changing loading platforms to porches and adding lattice screens and other cosmetic additions to the building. For this use the inside walls and sections of the floor were covered with plywood, and other materials. These later additions are not part of the historically significant features of the historic building.

The Hihn Apple Barn is the last building in Aptos to embody the distinctive characteristics of a rural warehouse (barn), period (1890-1940), that retains the basic structural integrity of design, materials and construction.

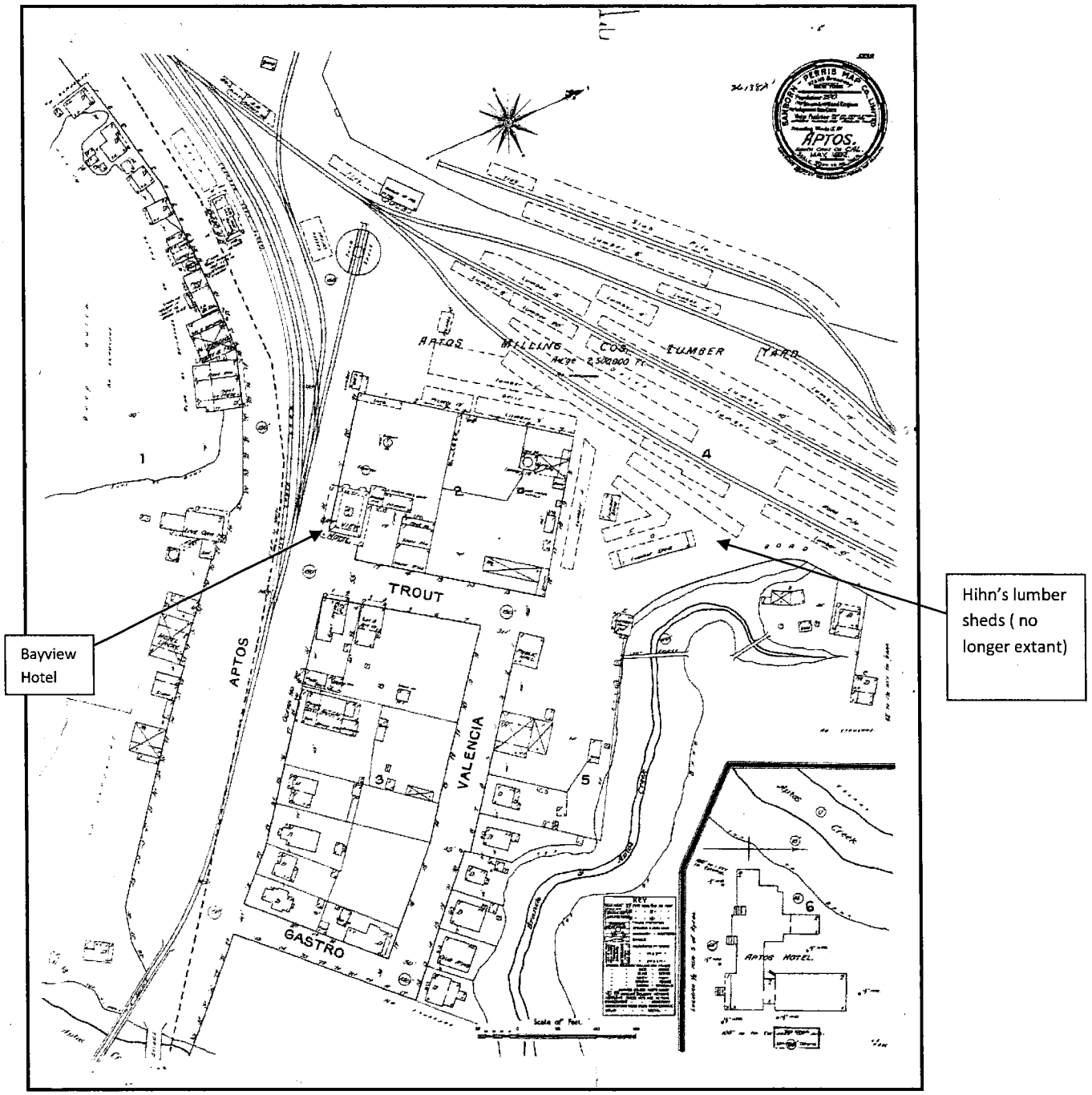



Figure 3-CC Sanborn-Perris Map Company Ltd, Aptos 1892, showing the lumber sheds on the Hihn property. Dashed lines indicate the structures were open on the sides.

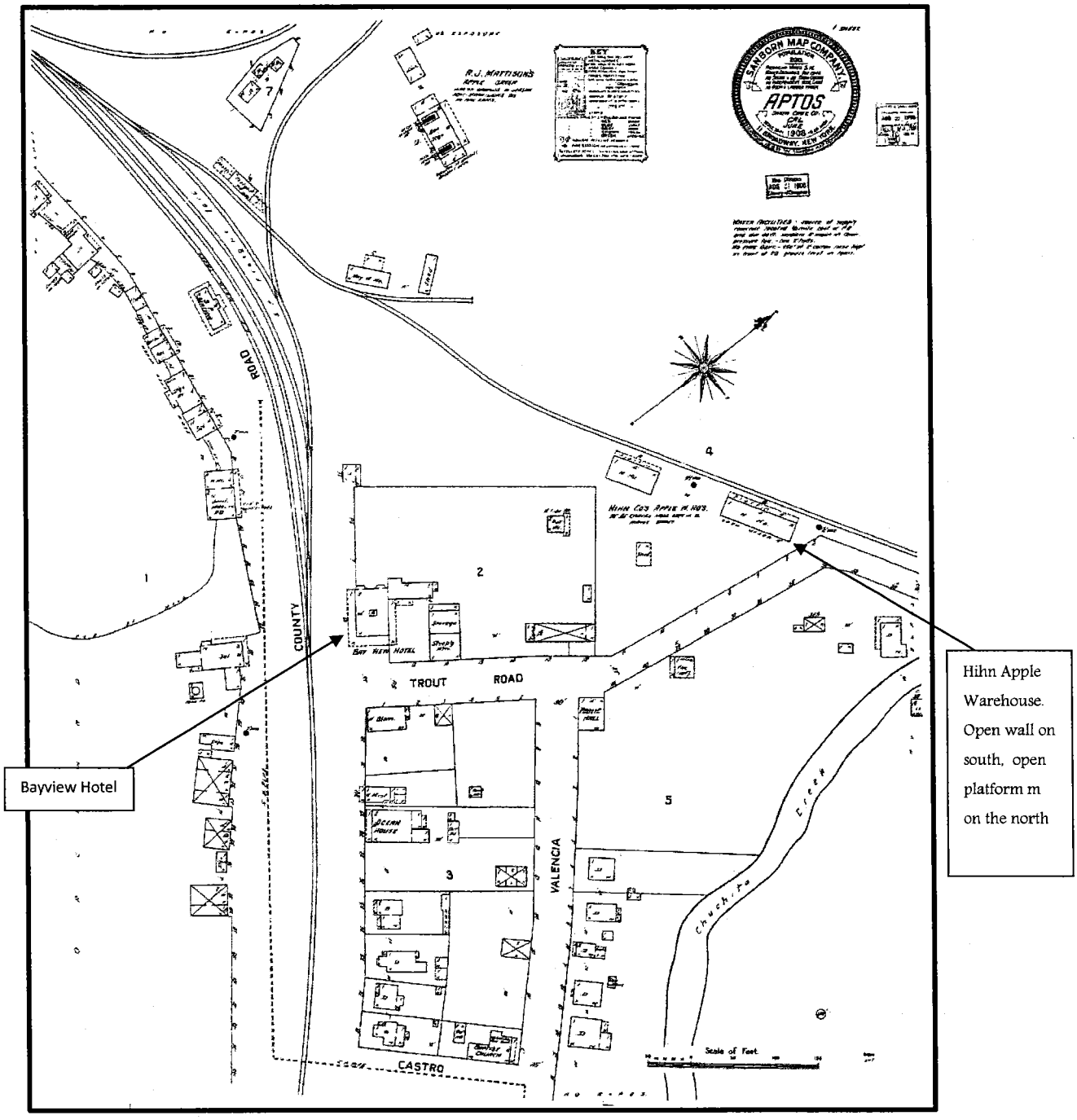



Figure # 3-DD Sanborn Map Company, Aptos 1908

The map drawing shows the first section of the Apple Warehouse, this is the north bay of the existing building. Note the orientation to the railroad and a loading dock that is no longer part of the building.

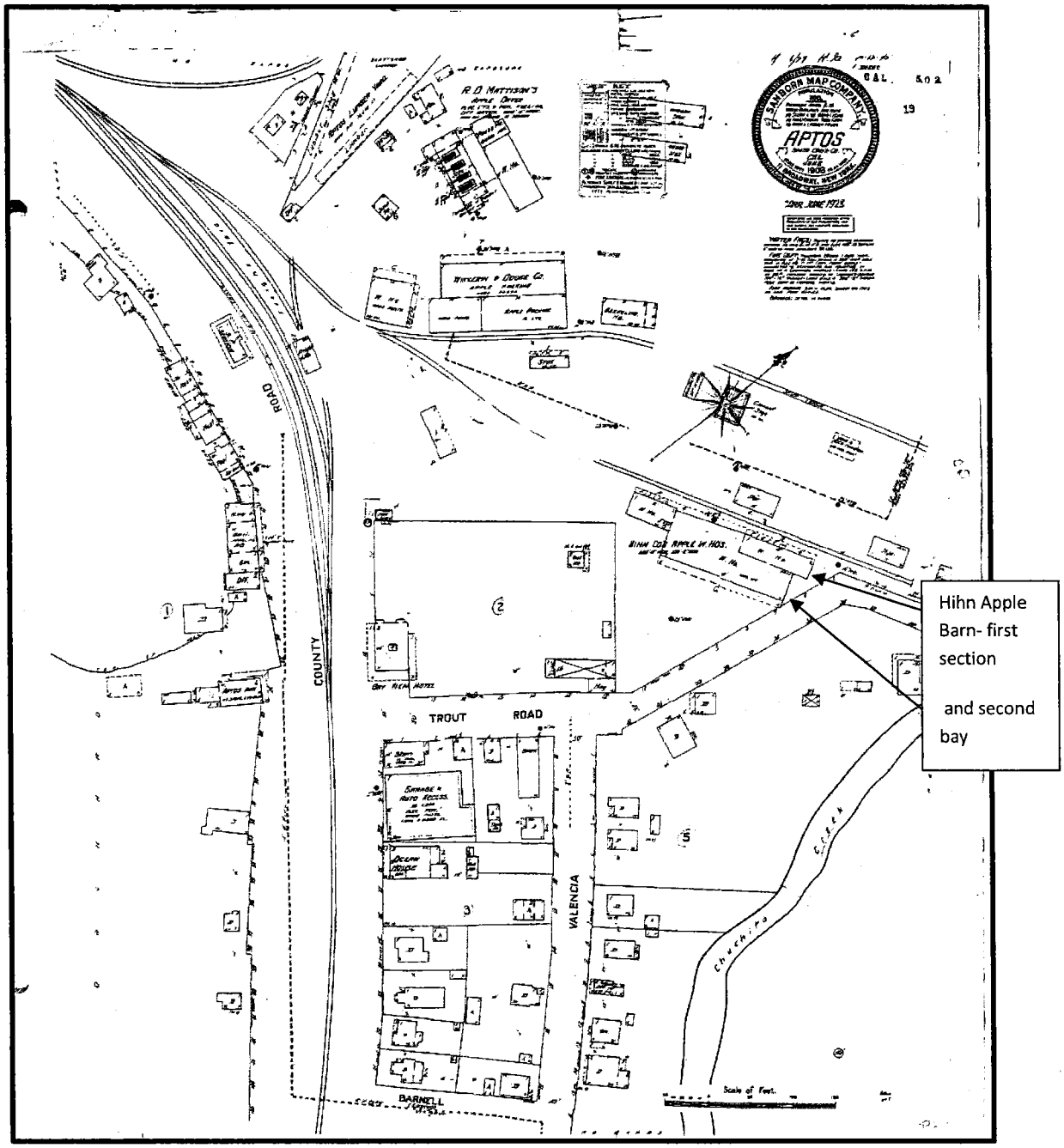



Figure # 3-EE Sanborn Map Company, Aptos 1908–1929 showing the Hihn Company Apple Warehouse as it expanded to two bays. The building on the north west is no longer present.

Criteria Consideration B.[35] Criteria Considerations give guidance for unusual situations; in this case Criteria Consideration "B" describes the facts that must be supported for a relocated building to be eligible for listing in the National Register (assuming it fully meets the criteria of significance). Buildings that are significant under criteria "C" for their architecture may retain eligibility after relocation. For buildings that are eligible under Criterion "A" the building must represent the sole remaining resource associated with a significant historical event or person. It appears that the Hihn Apple Warehouse meets Criteria Consideration "B" for its direct association the significant economic era of the apple industry in Aptos and it is the sole industrial building associated with Frederick A. Hihn and his apple business venture in Aptos.

## 3.8 Conclusions and CEQA Status

The California Environmental Quality Act Title 14; Chapter 3; Article 5; Section 15064.5, establishes rules for analyzing historical resources, including archaeological resources, in order to determine whether a project may have a substantial adverse effect on the significance of the resource. A resource listed in, or determined to be eligible by the State Historical Resources Commission, for listing in the California Register of Historical Resources (Public Resource Code SS 5024.1, Title 14 CCR, Section 4850 et seq. Properties listed in the National Register of Historic Places are considered eligible for listing or are incorporated into the California Register of Historic Resources (PRC 5024.1 (d).1)

> A project that may cause a substantial adverse change in the significance of an historical resource is a considered to have a significant effect on the environment. Substantial adverse change in the significance of an historical resource means physical demolition, destruction, relocation, or alteration of the resource or its immediate surroundings such that the significance of an historical resource would be materially impaired (PRC 5020.1(q)).

The following are cautions and conditions are necessary for the rehabilitation plans to conform to the Secretary of the Interior's Standards and the County ordinance #16.42.0060, which would allow a finding of less than a significant adverse impact.

Site and Setting: The Preliminary Site Plan (Thacher & Thompson 10/14/2009) preserves significant open areas around the Hihn Apple Barn that are circulation (roads, paths), parking area or landscape space. Historically the Hihn Apple Barn has other buildings in relatively close proximity but had

[35] U.S. Department of the Interior, National Park Service, Cultural Resources; National Register Bulleting- How to Apply the National Register Criteria for Evaluation,1997 p.29

expanses of open space for circulation around the building. Aspects of the original setting are present in the Preliminary Site Plan and in the Aptos Village Plan. Retaining the open areas and low landscaping around the building will allow the building to be viewed on all sides which is important in providing an appropriate setting. Landscaping should not be allowed to obscure the very large building.

Retaining character defining historic features and historic materials: The proposed relocation and adaptive reuse as a grocery market appears compatible with the historic building and retaining the integrity of the historic building. However, the rehabilitation plan removes the under floor structure and flooring. This loss of historic under floor material is necessary to accommodate a very desirable new use, and although the design is not unique, cannot be seen, it contributes to the overall character of the building and the loss is considered substantial requiring mitigation. The loading platform (porch) is also a contributing feature that is proposed to be removed. Retaining a section of the loading platform and reusing the shed roof and structural posts along the building is mitigation for the loss of the rest of platform structure.

With the conditions or mitigation described above and in the table below, the rehabilitation plan for the Apple Barn appears to conform to the *Secretary of the Interiors Standards for Rehabilitating Historic Buildings* and therefore would not create a substantial adverse impact.

**Table 3-1 Conditions and recommendations to amend the proposed plan to allow a less than significant change under the CEQA Guidelines**

| | Potential Impact | Mitigation | Result |
|---|---|---|---|
| 1 | Relocation of the Historic Apple Barn and potential damage to the historic building during a move | Relocation must conform with the National Park Service guidance for relocating historic buildings, as described in the structural report by M.SE and Kelly Brothers House Movers. | Preserves the historic building by protecting the building from vehicular damage and providing opportunity for increased economic viability. Provide improved community safety, |
| 2 | Provide record of existing location and existing building prior to and during relocation | Document the site and relocation with photographs. Document unseen under-floor or other elements with architectural drawings and photographs. To the extent possible determine and show the phases | Maintain historic record of the original location and existing construction. |

| | Potential Impact | Mitigation | Result |
|---|---|---|---|
| | | of construction. | |
| 3 | Loss of deteriorated historic materials | Architectural drawings are needed to document the location of deteriorated elements and if they are to be repaired or replaced in-kind | Replace the minimum historic materials; maintain record of the repair or replacements. |
| 4 | The Secretary's Guidelines do not recommend "Removing, covering, or radically changing features of structural systems which are important in defining the overall historic character of the building so that, as a result, the character is diminished". The floor platform is an important historic element, but not a primary character defining element. | Provide documentation leading to the structural decision not to retain the existing floor system. Provide engineering analysis showing the alternatives considered and the relative benefits to the preservation of the historic building considering the potential adaptive reuse as a grocery market. | Retain or determine the loss of the floor structure is required for the over-all benefit and preservation of the historic building. Provides in depth analysis of the choices as required by the Standards. |
| 5 | Loss of historic under floor platform structure (assumes removal) | Document floor platform with as- built architectural/engineering drawings and photographs. Donate information to Aptos History Museum and UCSC Special Collections Library | Provide for future study of construction methods and materials. |
| 6 | Raised foundation (stem wall) alters height of building | Increase in uniform height should not exceed 27 feet, the height at the east end of the historic building on the original site. | Maintains relationship of the existing height of the building when relocated to the new level site. Provides for interior height that is required for the adaptive reuse as a grocery market with minimal change in the character of the building. |
| 7 | Potential loss of historic posts in the existing structural system | Retain posts, repair if deteriorated, or document the need to replace the historic posts, and provide metal pedestal bases to retain the historic post and beam and truss structural system | Retain the existing historic character defining and primary structural system. Preserve historic posts. |
| 8 | Historic horizontal siding to be removed for the existing building. ( skirt over existing raised post/pier foundation ) | Replace historic horizontal siding to cover concrete block stem wall. Reuse the historic wood in complete sections (facades). Attach with allowance for air circulation. Do not mix new and old wood on the same facade. Paint or stain new wood differently from the historic wood. | Retain and preserve historic material in context. Different color will show new material as rehabilitation work. Does not confuse the public which is historic material. |
| 9 | Loss of rustic floor boards to accommodate | Install floor boards in the greatest | Preserve original |

| | Potential Impact | Mitigation | Result |
|---|---|---|---|
| | the grocery market adaptive reuse | quantity allowed by the health code, but no less than shown in Figure #3-G. Store floor boards equal to three times the amount installed for future repairs. | flooring material as part of the adaptive reuse in the rehabilitated building. |
| 10 | Structural strengthing system for the historic barn | Provide interior steel brace frames with ply-wood panels for lateral strength. Attach ply-wood to new posts and frames. | Maintain the exterior character defining shape and siding free of new structural system. |
| 11 | Roof insulation | Provide roof insulation between the wood under structure and the metal roofing. | Conceal new insulation, maintain historic appearance |
| 12 | Wall insulation | Determine need. If required, provide fiber insulation between new ply-wood and historic siding. Use product without backing or one that established the dew point toward the new material. Allow air circulation around the historic siding | Protect historic siding and structural posts from moisture collection that could damage the old wood. |
| 13 | Remove 36.5 ft. wall section to join proposed corridor to Bldg.#4 | Retain historic material for repairs or store. Preserve interior post structure using pedestals to lengthen the posts, and document the work. Retain siding and historic material for repair or store for 10 years. | Maintains the character defining post, beam and truss structure and allows required height for the grocery/market. |
| 14 | Relocation setting in the "Village" plan | Maintain parking and Village Green, as open areas around the barn. Create view corridors to the Bayview Hotel and maintain low landscaping around the Apple Barn | Preserve views of the large building from most vantages and view corridors similar to the historic setting |
| 15 | Landscaping irrigation | Keep landscaping &, sprinklers at least 18 inches from the wood building. Provide drip line gravel or other landscape material to absorb water from the building's gutterless roof and eliminate the need for sprinklers in close proximity to the historic building. | Preserve the historic wood building |
| 17 | Loss of historic association | Provide a permanent location in the market for a display of items and interpretation that tell about the history of the Apple Barn, F.A. Hihn and the apple era in Aptos. Coordinate the | Provides the general public with an understanding of the history of the Apple Barn and the |

| | Potential Impact | Mitigation | Result |
|---|---|---|---|
| | | display with the Aptos History Museum or other historians. | association to F.A. Hihn and Aptos Village. |
| 18 | Loss of All Loading platforms | Retain a section of loading platform as an icon on the building or as a usable, elevated platform without decoration | Maintain the understanding of the industrial operations of the building as a shipping warehouse |

This Historic Preservation Plan was prepared from plans dated June 26, 2011 or earlier and discussions with Matthew Thompson, Principal Architect, John McLucas Structural Engineer and Jon Lee, Project Manager, Barry Swenson Builder. At this stage in the development process detailed construction documents and specifications were not available. Changes may occur that should be considered and evaluated for conformance with the *Secretary of the Interior's Standards of Rehabilitation and Guidelines for Rehabilitating Historic Buildings*. Changes in the adaptive reuse, or to accommodate code issues that have not been included in the plans to date may also affect conformance with the Secretary of the Interior's Standards. As final designs and methods are available they must be evaluated for conformance with the "Standards". Final conformation will be necessary when construction documents and specifications detailing materials and the construction methods are completed for this building.

# APPENDIX

1. Apple Barn -Structural Assessment M.SE

   S1 Structural Bracing Plan (folded in the back of the HPP)

   S 2 Structural Details (folded in the back of the HPP)

2. Apple Barn- Kelly Bros House Movers- plan to move the building

3. Thacher & Thompson: Architectural drawing sheets (folded in the back of the HPP)

   HP 1 Existing floor plan

   5.2 Rehabilitation floor plan 3/1/2011

   2 Existing Elevations

   5.1 Rehabilitation Exterior Elevations

## Apple Barn – Exhibit 1 M.SE Structural Report March 2, 2011

M.SE McLucas Engineers

2 March, 2011

Ms. Jessie Thielen
Barry Swenson Builder
777 North First Street
San Jose, CA 95112

Subject: Hihn Apple Barn
Structural Report

Dear Jessie:

McLucas Engineers is pleased to submit this structural report detailing our findings regarding the building and a description of planned rehabilitation measures. Drawings documenting our preliminary design for the building have been submitted [Ref: Sheets S1 and S2].

Description of Building

The structure consists of three primary bays framed with exterior post and beam walls and heavy timber post and girder system running between the bays at the interior. Spanning between the exterior walls and interior girder lines are carpenter-built queen post trusses whose center post supports the ridge of a central clerestory that provides ventilation for the roof.

The exterior walls are comprised of post and beam configuration with a single wall construction cladding the framework. The exterior frame bears on the floor structure which is comprised of timber beams supporting 2x timber decking. The girders are primarily supported by posts that are resting on timber lagging, although, in some places, the posts are supported by concrete piers.

Moving the Building

The building is to be moved by Kelly Brothers who are very experienced in moving buildings of this size and vintage. Once the tenants have vacated the space and finishes have been removed to expose the basic structure of the building, we will devise a bracing scheme to facilitate the move. This will take the form of temporary bracing, struts, and wailer beams to stiffen the building and make it capable of being picked up and moved as a cohesive unit. The bracing scheme will be coordinated with Kelly Brothers to ensure a seamless move.

The building will be moved in two sections divided at an existing construction joint. The technical details of how Kelly Brothers plans to move the structure is contained in their letter of 1 September, 2010. Shop drawings detailing the moving strategy will be submitted to McLucas Engineers for review and approval prior to the commencement of the moving activities.

302 Vista Bella Drive
Santa Cruz, CA 95060
831.427.3800 voice
831.427.1555 fax

www.mclucasengineers.com

m.se

Site Preparation and Foundation

The site for the relocated building will be stripped and over-excavated to a minimum depth of 24 inches followed by replacement and re-compaction of the excavated soils. Once the building has been relocated to its final position, new perimeter and interior column footings will be constructed. At the perimeter wall, an approximately three foot high skirt wall will be constructed to align with the outside wall of the elevated barn structure [Ref: Section 2/S2]. At the interior columns, steel pedestals will be placed to align with the existing timber columns to make up the height differential between the new and existing foundations.

At the interior bearing lines, shoring will be installed on each side of the existing column lines to, where necessary due to rot, allow removal and replacement of the columns and girders [Ref: Section 1/S2]. It is the plan to maintain all wood columns and girders that are structurally sound as part of the renovated structure. Once any replacement girders and columns are installed, the building may be lowered onto the new foundation and secured.

With the building lowered onto the foundation, the existing floor structure, which will be temporarily supported on timber cribbing, will be removed and a new concrete slab poured at the base elevation of the exterior skirt walls.

It will be impractical to re-use the existing floor structure as it lacks adequate capacity to support the live loads it will be subjected to by the new tenant; a significant amount of reinforcement would be required to make it capable of supporting a concrete topping slab as required by the tenant. Additionally, the existing floor structure is not suitable as a horizontal diaphragm due to the straight sheathing employed; from a seismic design standpoint, it is totally inadequate and must be replaced.

It is also noted that, in order to re-use the existing floor system, a completely new foundation system, aligning with each existing beam line would be required at a significant cost to the project. This would also prove to be difficult from construction standpoint, as the existing framing geometry is neither straight or regular in order – coordination of new and existing construction would be extremely awkward.

Rehabilitation and Seismic Strengthening

The rehabilitation will follow the Secretary of the Interior's Standards for Rehabilitating Historic Buildings and the structural rehabilitation plan will conform to the California Code of Regulations, Title 24, Part 8: The California Historical Building Code.

Rehabilitation of the vertical load carrying systems will, for the most part, be achieved during the building move; however, there will be components of that system that will be installed subsequent to the move. As has already been described, the interior columns and some of the interior girders may be replaced.

Hihn Apple Barn
Structural Report
2 March, 2011
Page 3

m.se

After the move, new bearing walls will be erected at the perimeter wall locations to provide a direct load path for vertical and lateral loads that is independent of the original exterior wall system. This is key to the preservation of the existing wall, as it allows us to provide new strengthening elements to the building without removing the existing siding. New walls will be erected inside of the existing wall and will serve to vertically and laterally support the roof at the perimeter wall line. This will also serve a function as an architectural element as it provides for a straight surface for finishes and permits passing of electrical services.

The primary seismic force resisting system for the rehabilitated structure will be a mix of plywood sheathed shear walls and braced steel frames. The plywood walls will be formed from the new wall erected inside of the existing exterior walls [Ref: Section 2/S2]; however, where force levels exceed plywood capacity, braced frames will be introduced in line with the new walls. These braced frames will be all steel frames.

It will be paramount to successful seismic performance to ensure that all portions of the building are tied together well. We will design and detail complete chord, collector and diaphragm systems to achieve this end utilizing added blocking, straps, struts and tie rods.

Please advise if there is further explanation or clarification required regarding the above.

Sincerely,

McLucas Engineers

John N. McLucas, SE
Principal

## Apple Barn Exhibit 2– Kelly Bros House Movers Letter September 1, 2010

06/22/2010 19:57 14089990661 KELLY BROTHERS PAGE 02/02

**Kelly Bros. House Movers**
2179 Stone Ave.
San Jose, CA 95125
Contractor's License: 661719
kellybrothers@mail.com
Phone: 408-287-9755
Fax: 408-990-0661

September 1, 2010

Jessie Thielen
Barry Swenson Builders
777 North First Street
San Jose, CA 95112

Re: The Apple Farm

Ms. Thielen,

Upon reviewing the structure, the site and the structural plans, it is our opinion that the building can be moved in two sections. For each section, this would consist of installing steel beams under the floor joists, thereby creating a platform to secure the structure. Additional bracing would then be installed to secure the weight of the roof. Following that, the building would be raised and placed on a dolly system for relocation to the new site, and moved to the new site as per plan.

Upon completion of the foundation (to be built by others), Kelly Bros. will lower the building. At this time, the building would be reloaded so that the steel beams under the floor joists would be relocated above the floor, allowing the floor to be removed by others. Following removal of the floor, the building would be fully lowered onto the foundation and pier system.

Kelly Bros. recommends that its equipment be removed in stages, allowing the contractor to frame in support and shear walls to replace the support of the equipment as it is removed. Shop drawings will be provided to the contractor's structural engineer, showing a detailed plan of our shoring and bracing patterns. Upon the engineer's approval, Kelly Bros. will proceed with the work described above.

Sincerely,

Howard Kelly

Howard Kelly

CIRCA Historic Property Development

June 29, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

RE: Peer Review of "Aptos Village Preservation Plan"

County of Santa Cruz asked Circa to complete a peer review of the "Aptos Village Preservation Plan – Considering a Development Plan Submitted by Barry Swenson Builders to Preserve the Historic Eligibility of Two Historic Buildings" prepared by Urban Programmers. Additionally, Circa was asked to evaluate the proposed alterations to the Apple Barn for consistency with the Secretary of the Interior Standards "Rehabilitation" treatment. This request also included consideration of the proposed changes regarding any significant impacts under the California Environmental Quality Act (CEQA). CEQA provides the legal framework by which historical resources are identified and given consideration during the planning process [Public Resources Code §§21000-21177.] If there are potential significant impacts, Circa was asked to evaluate whether the proposed mitigations are adequate to mitigate to a less than significant impact and to recommend any appropriate mitigations. Santa Cruz County also requested a review of specific aspects of the proposed project. I have reviewed the Preservation Plan, and associated documents. In general, I find that the Preservation Plan to be consistent with the Secretary of the Interior Standards for Rehabilitation, and that the project, with the mitigations recommended below, would not result in significant impacts to historic resources under CEQA. My detailed evaluation is as follows.

According to CEQA, "Generally, a project that follows The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or The Secretary of the Interior's Standards for Rehabilitating Historic Buildings...shall be considered as mitigated to a level of less than a significant impact on the historical resource".[1]

*Rehabilitation* is defined as "the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values." Rehabilitation assumes that at least some repair or alteration of the historic building will need to take place in order to provide for an efficient contemporary use; however these repairs and alterations must not damage or destroy the materials and features - including their finishes - that are important in defining the building's historic character.

The proposed Aptos Village project proposes, but limited to, the demolition of the former Aptos Firehouse; relocation of the Apple Barn; removal of the loading docks and removal of interior floorboards; covering of interior single wall construction; increase in building height, and construction of a new linking passageway to adjoin the historic with an adjacent new building.

Questions from the County (numbered) and corresponding answers follow:

1. Loss of loading docks/ porches on the South (front) and east sides of the Apple Barn, and new entrances at ground level.

> Loss of the lattice/rail material is not an issue since they are not contributing character-defining features.
>
> The loading docks are important, contributing character-defining features (CDFs), though not identified as such in the Preservation Plan. The loading docks convey the building's historic use as a warehouse/packing plant (along with associated rail spur since removed) therefore are considered character-defining features.

[1] State CEQA Guidelines Section 15064.5 (b)(3)

Removal of the loading docks will be a significant impact and their removal will also contribute to the collective impacts of the overall project.

New entrances at the ground level but within the original openings will introduce a new proportion that never existed. This is neither an impact nor an asset that increases the building's physical integrity. It will help differentiate the new from the old. The original, existing sliding doors and other fenestration features are to remain.

2. Loss of wood planks on porches and replacement with concrete walkway.

The wood planks on the porches are not identified as contributing character-defining features in the Preservation Plan. Given the age of the building and the many years of heavy use it is likely that the majority of the boards have been replaced over time therefore their removal is not a significant impact.

The new concrete walkway will introduce a new material but will also help the building to comply to ADA standards. This is neither an impact nor an asset that increases the building's physical integrity. It will help differentiate the new from the old.

3. Loss of wood flooring materials, with reuse of a few floor boards at building entrance. Recommendation for appropriate flooring in the rest of the building?

The Rehabilitation standard allows for a building to be placed in a new use that requires minimal change to the character defining features. The proposed new use of a grocery store in the former apple barn will require certain upgrades to meet the appropriate code for this use. Among these upgrades is flooring material that is easy to maintain and meets food-related retail use standards. The most common grocery store flooring is polished concrete, however, laminated or coated flooring such as vinyl are also used. The new flooring for the grocery store should be appropriate and reflect the original utilitarian/warehouse use while differentiated from the historic.

The retention and reuse of the existing historic, interior floor boards is appropriate and should be maximized, and utilized not only in the entranceway but wherever the code allows such as non-refrigerated and/or passive display areas. However, removal of the boards will contribute to the collective impacts of the overall project. The remaining rustic boards should <u>not</u> be sanded, painted, finished in a high gloss clear coat or treated in anyway that will remove the texture and patina of the original. The boards should be cleaned and sealed with a sealer such as Penofin or similar wood protection treatment.

4. Increase in the building height on the interior and appearance at exterior.

The increase in building height, both interior and exterior, is based on the removal of the existing floor system. The floor system and platform structure are important character-defining features, however, in order to accommodate the needs of the grocery store their loss is less of an impact then the loss of other CDFs that are more significant. The existing height conveys the building's historic use as a warehouse/packing plant (along with associated loading dock) therefore are considered character-defining features. Removal of these are not significant in and of themselves, however, they will contribute to the collective impacts of the overall project.

5. Replacement of foundation system with a new type of foundation (concrete slab). Is mitigation #4 in the HPP (page 83) appropriate and necessary? Is mitigation #5 appropriate instead?

The replacement of the exiting foundation system with a new at-grade concrete foundation is necessary for the stabilization of the building and therefore protection of the overall building. This protection has greater benefit to the building than retention of the existing platform structure.

6. Mitigation #8, page 84: Is it necessary to stain new wood used for skirting a different color to differentiate it from the original materials?

Reuse of the existing, historic horizontal wood siding should be condensed and concentrated in an area (or areas) that provides the most visibility, rather then intermixing new with old throughout the building's skirting. Whether it's a stain or paint the new wood skirting should be differentiated from the historic as outlined in #9 of the Rehabilitation standard:

> "New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment."

7. Covering single wall construction at building interior with plywood walls.

As explained in #3 above the Rehabilitation standard allows for a building to be placed in a new use that requires minimal change to the character defining features. The proposed new use of a grocery store in the former apple barn will require certain upgrades to meet the appropriate code for this use. Among these upgrades is wall covering material that is easy to maintain and meets food-related retail use standards. The proposed plywood, insulation and sheetrock interior wall sheathing should only be installed where code requires and in non-public areas. The plywood and sheetrock should be applied in a way that is removable with the least amount of damage to the original, historic siding. The covering over (obscuring) the interior single wall construction will contribute to the collective impacts of the overall project.

The retention and exposure of the existing historic single wall construction is appropriate and should be maximized, and utilized not only in the entranceway but wherever the code allows. This is particularly appropriate in high traffic public areas such as, but not limited to, the entranceway. The original interior walls should <u>not</u> be sanded, painted, finished in a high gloss clear coat or treated in anyway that will remove the texture and patina of the original. The walls should be gently cleaned and maintained.

8. Use of steel pedestals at building interior at base of columns to support additional building height.

Strengthening of the historic columns to support the additional building height (if truly needed) is appropriate and the steel pedestals, if compatible and appropriate in design, will differentiate the historic from the new.

9. Appropriateness of new addition, including design, materials, and loss of historic materials required to install addition.

Revised draft plans (dated May 5, 2011) regarding the new "link" or hyphen section connecting the historic Apple Barn with the proposed new building #4 propose a 18' by 36' single storey 12 foot high (interior) passageway linking the historic Apple Barn (building #5) with the proposed new building #4. This will necessitate the removal of approximately 37' linear feet of original wall material on the west elevation of the Apple Barn. In proportion to the extent of the remaining exterior wall material of the entire barn, this is not a significant impact, however, removal of the wall material will contribute to the collective impacts of the overall project.

The exterior of the link will be sheathed in cement plaster to differentiate the historic from the new construction. Black framed aluminum, full height commercial windows on both elevations of the link and low display shelving/standards within the connecting link will allow for transparency and thereby minimize the impact of new, adjacent construction massing. It was understood during the consulting process that the parapet would be 3' 6" foot high continuing from the roofline for a total of just over 16 feet of wall plane height. However, the plans show a 5' parapet that will increase the height of the wall plane of the link. The height of the link's wall plane should be minimized as much as possible to meet the SIS.

In addition, the Preservation Plan states that the Apple Barn will be set apart from other buildings and able to be viewed on all sides (pg32). According to the plans reviewed this will not be the case. The Preservation Plan should correct this and all other statements that do not reflect the most current plans.

10. Relocation of Apple Barn.

The historic context of the site of the Apple Barn has been significantly changed over the years due to the demolition/removal of the other apple industry buildings, structures and objects, and road realignment. While relocation of buildings is generally not desired, except as a last resort to demolition, the barn's setting is not original. In this case, the relocation is not significant but will contribute to the collective impacts of the overall project. Its retention on the site is appropriate for this situation, however the Preservation Plan should correct statements about the visibility of the barn.

11. Review "Evaluation of Integrity" (page 70-73). Will the building retain sufficient integrity after relocation and alterations to remain eligible for listing? Note the conclusion on page 73 – does it really maintain most aspects of integrity, if several aspects are lost or diminished?

As discussed above, the historic context of the site of the Apple Barn has been significantly changed. What integrity that remains of the building itself will be retained/repaired to a sufficient level that it will maintain most aspects of integrity. Remember that there is no "magic number" or percentage defining what the National Park Service meant by "most". The rule of thumb is to weigh and prioritize the character defining features that convey its historic significance - in this case - that of the last industrial building related to the apple industry in Aptos.

B. Please evaluate approach for moving building – how can we ensure that building will not collapse when it is moved? Is peer review by another engineer warranted?

Kelly Bros. House Movers are highly regarded professionals. I am confident that the approach they plan will be protective. However, during the relocation, setting on the new foundation, etc. should be monitored by knowledgeable professionals.

C. Please recommend conditions to ensure that historic materials, including interior columns, siding, roof beams and rafters, are evaluated for retention, repair, or replacement only if they cannot be repaired, so that only those materials that cannot be repaired are replaced, and that replacement is with in-kind materials. Please recommend qualifications for an appropriate professional to make these assessments.

Careful analysis of true areas of decay must be identified so that any replacement and/or repairs are isolated and appropriate. A qualified architectural conservator should be consulted to ensure that historic materials are protected. This would include identification and recommendations of such repair/replacement, and monitoring.

In addition, the Preservation Plan states that the Bayview Hotel, which is on the National Register, will remain the focal point of the streetscape. The hotel is indeed a handsome, commanding building along the streetscape. To protect the hotel's integrity extensive precautions should be made both around the demolition zone (of the former Aptos Firehouse) and around the construction zone, including dust and vibration monitoring, and movement of construction equipment.

Summary:
The proposed Aptos Village project requires the demolition of the former Aptos Firehouse; relocation of the historic Apple Barn on site, including change in orientation of the building; removal of contributing character-defining features (CDFs) such as the loading docks and removal of interior floorboards; covering of interior single wall construction; increase in building height/new steel pedestals at building interior at base of columns; the removal of

wall material to construct a linking passageway; and construction of a new addition (the linking passageway) to adjoin the historic with an adjacent new building.

In general, Circa finds that the proposed changes/demolition and new construction/alterations, when added together, will have an effect on the historic resource (the Apple Barn). However, with the mitigations recommended below, the impacts of the project would be reduced to less than significant. The most significant impacts, both individually and collectively, are the proposed new "link" and the removal of the loading docks. The proposed new link will require removal of wall material and introduce a new element (addition) to the historic Apple Barn. To reduce the impact of the new construction, the new link should be of minimal massing and height, and of maximum transparency[2]. The Apple Barn's loading docks convey the building's historic use as a warehouse/packing plant and therefore its historic significance as a historic resource meeting the criteria as a County Landmark and listing on the California Register of Historic Resources, as well as potentially eligible for the National Register of Historic Places. For CEQA purposes (as discussed above), to reduce the proposed project impacts from Significant to Less-Than-Significant the loading docks must be retained.

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy
Principal, Circa: Historic Property Development

[2] See memo date June 6, 2011 from Circa to Annie Murphy.

CIRCA *Historic Property Development*

June 6, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

Re: Aptos Village - Apple Barn Link

Annie,

Circa: Historic Property Development (Circa) recently assisted the County of Santa Cruz with reviewing and recommending revisions to draft plans (dated May 5, 2011) for the proposed Aptos Village Apple Barn rehabilitation project, specifically the new "link" or hyphen section connecting the historic Apple Barn with the proposed new building #4.

Internally the linking of the Apple Barn and Building #4 will allow for a new use within the existing footprint of the historic Apple Barn while accommodating the full needs of a (planned) grocery store in the expanded area of the ground floor of building #4. The plans propose a 18' by 36' single storey 12 foot high (interior) passageway linking the historic Apple Barn (building #5) with the proposed new building #4, necessitating the removal of approximately 37' linear feet of original wall material on the west elevation of the Apple Barn. The exterior of the link will be sheathed in cement plaster to differentiate the historic from the new construction. Black framed aluminum, full height commercial windows on both elevations of the link and low display shelving/standards within the connecting link will allow for transparency and thereby minimize the impact of new, adjacent construction massing. It was understood during the consulting process that the parapet would be 3' 6" foot high continuing from the roofline for a total of just over 16 feet of wall plane height. However, the plans show a 5' parapet that will increase the height of the wall plane of the link. The height of the link's wall plane should be minimized as much as possible to meet the Secretary of Interior Standards (SIS).

In conclusion, the proposed "link" is generally consistent with the SIS for Rehabilitation; however, reduction of the link's roof and parapet height would further minimize the structure's overall presence and allow the historic Apple Barn to be interpreted as a separate building.

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy
Principal, Circa: Historic Property Development

# COUNTY OF SANTA CRUZ

HISTORIC RESOURCES COMMISSION
PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

July 20, 2011

**AGENDA: August 5, 2011**

## APPLICATION FOR DEMOLITION OF THE APTOS FIRE HOUSE/ VFW HALL

**Applicant:** .....Joe Appenrodt
**Owner:** .....Aptos Ventures
**Application No.:** .....111059
**APN:**.....041-011-24
**Situs:**.....8037 Soquel Drive, Aptos
**Location:** .....Area north of Soquel Drive in Aptos, between Trout Gulch Rd. on the east and Aptos Creek Road on the west. .
**Historic Name:** ..... Aptos Fire House/ VFW Hall
**Current Name:**..... Vacant
**Rating:** ..... NR-5

**Existing Site Conditions**
Parcel Size: .....Approximately .535 acres
Use:.....Vacant

**Planning Policies**
Planning Area: .....Aptos
Zone District: .....C-2-L
General Plan Land Use Designation:.....Community Commercial
Coastal Zone: .....No

### PROJECT DESCRIPTION

Application to demolish the Aptos Fire House/ VFW Hall, listed in the County's Historic Resources Inventory as an NR-5 resource (local historical significance) in accordance with Chapter 16.42 of the Santa Cruz County Code, based upon evidence provided in the Documentation Report that preservation of the structure is not feasible due to the deteriorated condition of the building, and due to the dangerous condition of the building. The application for demolition of an historic structure requires a public hearing and recommendation by the Historic Resources Commission, and a public hearing and final action by the Santa Cruz County Board of Supervisors.

**Introduction**

The Aptos Firehouse/ VFW Hall is an NR-5 rated building (of local historical significance), which was added to the County's Historic Resources Inventory in 2003. The building is located at 8037 Soquel Drive in Aptos Village, immediately to the west of the Bayview Hotel. The building is described in the Inventory record as "simplistic in design and detail and not representative of a particular architectural style" (Exhibit D). The inventory sheet notes that the building was used historically as a lumber office, a residence, a firehouse, again as a lumber office, a VFW Hall, and then for various commercial uses. The inventory sheet notes "there is no question that the building has been extensively altered throughout the years: however, it plays an important part in better understanding the history of the district." Although the historic district for this area was never designated, the comment could refer more generally to the role the building played in understanding the history of Aptos Village. The DPR form does not provide information regarding the structural integrity or overall condition of the building at the time of listing.

As a historic structure within Aptos Village, the Firehouse/VFW Hall was considered in the Aptos Village Specific Plan approved by the Board of Supervisors in February 2010.The Aptos Village Plan includes new circulation plans to facilitate development of Aptos Village, as well as plans for a larger commercial building at the site of the historic Aptos Firehouse/ VFW Hall. In order to preserve the building within the context of the overall development plan for the Village, the Plan proposes to relocate the building to another site within the village area, with the specific location to be determined when a development application is submitted for Aptos Village. The specific location and the rehabilitation plan for the building would require approval by the Historic Resources Commission.

As part of the application process for a development permit to develop portions of Aptos Village in accordance with the Aptos Village Plan, the owner of the Firehouse/ VFW Hall building had a structural engineer evaluate the building to determine an appropriate approach for relocation. Upon evaluation, Redwood Engineering determined that the building was in such deteriorated condition that relocation or rehabilitation of the building would not be possible. This determination was confirmed by the County Building Official, who furthermore determined that the building presented danger to occupants, and subsequently red-tagged the building as dangerous and unsafe to occupy. Consequently, the owner of the building has submitted an application to demolish the building. The application for demolition has been evaluated in accordance with requirements in Section 16.42.060 (b) of the Santa Cruz County Code for demolition of an historic resource, and has been determined to be consistent with these requirements. The remainder of this report examines the demolition application in detail, including the documentation report prepared by Urban Programmers, reports by Redwood Engineering, and Peer Review of the Documentation Report prepared by Circa, the County's historic consultant.

**Discussion**

Aptos Village Plan – Criteria for Firehouse

The Aptos Village Specific Plan (AVP) approved by the County in February 2010 includes proposals to relocate two historic resources – the Apple Barn and the Aptos Firehouse - to other locations on the site, in order to accommodate a new road alignment and allow the site to be more intensively developed for commercial and residential use. Based largely upon comments from your Commission, the AVP adopted by the Board of Supervisors includes conditions regarding future development proposals for the Firehouse/VFW Hall: "Any exterior changes must be sensitive to the historic significance of the building and any relocation must follow the Secretary of the Interior Standards for relocation such that the NR-5 rating is not compromised. If relocated, the building must be located on a prominent street within the Village and present to [face] the street in its current narrow-side configuration. Before moving this building, the County's Historic Resources Commission (HRC) must approve the relocation and associated reconstruction work." The Plan also states that if the HRC finds

and NR rating, then "the Aptos Village Plan will need to be amended to address the land use of the structures in their current location."

The Aptos Village Plan assumes that the Firehouse/ VFW Hall is structurally sound and physically capable of being moved and rehabilitated. Based upon this assumption, the Aptos Village Plan presents two options for the building: either relocate and rehabilitate the building in accordance with the Secretary of the Interior Standards and while protecting the NR-5 rating, or if that is not possible then keep the structure in its current location and amend the Aptos Village Plan accordingly.

**Condition of the Firehouse/ VFW Hall**

Redwood Engineering completed two inspections of the Firehouse/ VFW Hall, the first in September 2010 and the second in March 2011, evaluating the structural integrity of the building (Exhibit B). Additionally, the County Building Official completed two special inspection reports after two separate site visits in December 2010 and June 2011 evaluating the building (Exhibit B). Both Redwood Engineering and the County Building Official have determined that the building is structurally unsound, with the historic materials in a deteriorated condition. According to both the structural engineer and the County Building Official, it would not be possible to relocate and then rehabilitate the building. Instead, the relocation would require a complete reconstruction, with replacement of most of the historic materials with new materials. According to the County Building Official, reconstruction of the building would require "complete replacement of the foundation, structural frame", and other components, such that "the only potentially salvageable portion of the structure would be the old 16-gauge corrugated siding and roofing material" ( Exhibit B). The March 22nd report from Redwood Engineering also notes, "should the Building Official find it necessary to require that the structure be refurbished to current construction standards, the resultant structure would be a recreation, not a restoration" (Exhibit B). Not only is relocation not feasible, but according to the June 21, 2011 report from the Building Official, even rehabilitation in place is not feasible "due to the age, lack of maintenance, and degree of structural degradation."

In addition to determining that the building lacks structural integrity and cannot be rehabilitated or relocated, after the June 2011 site visit the Building Official determined that the building presents a danger to occupants due to the deteriorated condition of structural components. Consequently, the Building Official red-tagged the building as unsafe to occupy and determined that the building is dangerous. The June 21st report by the Building Official notes that "the structure presents an imminent danger to the safety of occupants". The dangerous condition of the building must be addressed, and the building cannot remain in its current unsafe condition.

Secretary of the Interior Standards: Treatment Options

As noted in the Aptos Village Plan, the relocation of the building must be consistent with the Secretary of the Interior Standards and maintain the NR-5 rating for the building. Based upon the reports from both Redwood Engineering and the County Building Official, it appears that relocation of the building would require a "recreation" with new building components. Although this would no longer be considered "Rehabilitation" under the Secretary of the Interior Standards, as noted in the Documentation Report (Exhibit C), reconstruction is considered a preservation treatment in the broadest sense under the Secretary of the Interior Standards. Therefore, reconstruction could conceivably be considered as a way to preserve historic building, if it could be done in accordance with the Secretary of the Interior Standards and in a manner that would allow the building to retain its status as a building with local historic significance (NR-5).

Under the Secretary of the Interior Standards, reconstruction can be considered only "when sufficient historical documentation exists to ensure an accurate reproduction." Further guidance on reconstruction provided by the National Park Service Technical Preservation Services, as noted in the Documentation report, states that for reconstruction "only one period of significance is generally identified; a building, as it evolved, is rarely recreated (Documentation Report, Attachment F).

Unfortunately, the Aptos Firehouse/ VFW Hall as it exists today has been significantly altered over the past 50 years. Alterations include: new window and door openings and new vinyl windows and doors on the west side of the building; additions on the rear (north side) of the building; and replacement of the false front (south side of the building) after the 1950's (see Attachment D of the Documentation report). Given the extensive alterations, reconstruction of the building as it exists today would not accurately represent how the building appeared during its period of significance, which was specified for the proposed historic district as 1875 – 1959. And there is not sufficiently detailed information or documentation available about the how the building appeared during its period of significance as a firehouse, lumber office, residence or VFW hall to be able to reconstruct it in a historically accurate manner. Given the extent of recent alterations to the building and lack of documentation regarding the appearance of the building during its period of significance, it does not appear that reconstruction in a manner consistent with the Secretary of the Interior Standards is possible for this building.

Based upon analysis by Redwood Engineering and the County Building Official, as outlined in the Documentation report, it appears that it would not be possible to relocate the Aptos Firehouse/ VFW Hall as an intact building, or to relocate and reconstruct the building, in a manner that would be consistent with the Secretary of the Interior Standards. Another option that must be considered under the Aptos Village Plan is retaining and rehabilitating the firehouse in its present location, and amending the Village Plan accordingly. However, as noted above, even rehabilitation of the structure in its current location is not feasible, but would instead require reconstruction, since almost all of the historic materials would require replacement with new materials in order to provide a safe and structurally sound building. As discussed earlier, reconstruction of the building in a manner that is consistent with the Secretary of the Interior Standards is not feasible.

Circa's peer review noted that although it would certainly be technically feasible to reconstruct the Firehouse/ VFW building with new materials and components and return the building to its current appearance, such a building would no longer be historic, and would therefore not be eligible for listing on the local register as an NR-5 building (Exhibit E).

Santa Cruz County Code Requirements for Demolition of an Historic Resource

The main purpose of the County's Historic Preservation Ordinance is to protect and preserve historic resources. However, recognizing that under some extraordinary circumstances this may not be feasible, the Ordinance provides a process for considering demolition of an historic resource. An application for demolition requires a public hearing and recommendation by the Historic Resources Commission, with a public hearing and final determination by the Board of Supervisors.

As outlined in Section 16.42.060(b) of the County Code, application for demolition requires a special inspection report by the Planning Department to evaluate the condition of the structure, and a historical documentation report. The documentation report must contain information supporting one or more of the following:

1. Preservation is not feasible due to the deteriorated condition of the structure or object, or
2. Preservation would create an exceptional hardship, or
3. Demolition is necessary to alleviate a dangerous condition.

As discussed below, the documentation report supports two of these criteria; that preservation is not feasible due to the deteriorated condition of the structure or object, and that demolition is necessary to alleviate a dangerous condition.

As noted in the previous section of this staff report, the reports by Redwood Engineering and two evaluations by the County Building Official have determined that the building is extremely deteriorated, such that relocation of the building, or relocation in conjunction with rehabilitation, in accordance with the Aptos Village Plan is not feasible. As noted in the previous discussion, reconstructing the building either in place or with relocation in a manner that would be consistent with the Secretary of the Interior

Standards is also not feasible, given both the extensive recent alterations to the building, and the lack of sufficiently detailed information regarding the appearance of the building during its periods of significance. Given that neither reconstruction nor rehabilitation are options for preserving this building as a historic structure, it would appear that preservation is not feasible for this building.

In addition to the deteriorated condition of the building, the Building Official on June 9th determined that the building "presents an imminent danger to the safety of occupants." The building has been red-tagged to prevent it from being occupied. As the building presents a potential danger to the public, it cannot remain indefinitely in its current condition. The reports by the engineer and the Building Official, as well as information in the Documentation Report, have documented that due to the deteriorated condition of the building it is not possible to relocate the building as an intact structure, nor is it feasible to rehabilitate the building in place. From a historic standpoint, it would appear that demolition is the only feasible option for this building. Although demolition with recreation/ reconstruction would in some cases be a means to preserve a historic structure, in this case as discussed earlier it would not be possible to preserve the historic value of the building through reconstruction.

Section 16.42.060 (b) also requires that the Historical Documentation Report include "Provisions to preserve the historic values of the structure or object by documentation and/or preservation of artifacts and building materials." In the recommended project conditions below, the applicant would be required to document the history of the building based upon the Historic American Buildings Survey (HABS) documentation process, providing detailed photos of the current building, and completing additional archival research regarding the history of the building. Additionally, the applicant would be required to provide an interpretive display for the public in an outdoor area highly visible to the public illustrating the history of the building in the development of Aptos Village. The display would include historical data and photos obtained from the required documentation process, or other cited archival sources. A historic marker would also be required to mark the historic location of the building.

As is consistent with Santa Cruz County Code Chapter 16.42, the recommended conditions require the applicant to offer the structure to the general public for removal or dismantling for salvage at no cost or remuneration to the applicant, prior to issuance of the demolition permit.

**CEQA Review**

Environmental Review will be completed for this project. The environmental review documents will include mitigation measures as necessary to address any potentially significant impacts that may result from the proposed project. Your Commission will be provided with copies of the environmental review documents during the comment period, and will be provided with the opportunity to review and comment on the document.

**Conclusions and Recommendations**

This report has evaluated the application to demolish the historic Aptos Firehouse/ VFW Hall for consistency with the requirements in Section 16.42.060 (b) regarding demolition of an historic resource. Information provided in the documentation report, including information from Redwood Engineering as well as reports from the County Building Official, demonstrated that preservation is not feasible due to the deteriorated condition of the building, and that demolition is necessary to alleviate a dangerous condition. Therefore, the demolition application complies with requirements in Section 16.42.060 (b) for demolition of historic resources.

The application has also been evaluated for consistency with the Aptos Village Specific Plan (AVP). The AVP requires either that the building be relocated in a manner consistent with the Secretary of the Interior Standards, or that the building remain in place and that the AVP be amended accordingly. Unfortunately, it does not appear that either option is feasible for the building. Therefore, the AVP should be amended to recognize the deteriorated condition of the building and allow for the demolition

of the Aptos Firehouse/ VFW Hall.

Therefore, staff is recommending that your Commission take the following actions:

1. Recommend that the Board of Supervisors accept the Documentation Report (Exhibit C) and approve the application to demolish the Aptos Firehouse/ VFW Hall (Exhibit B), subject to the conditions recommended below, and based upon the attached findings (Exhibit A).

2. Recommend that the Board of Supervisors amend the Aptos Village Plan to note the following: Based upon several inspections by the County Building Official and engineering reports determining that the Firehouse/ VFW Hall is in a deteriorated condition such that relocation, or rehabilitation in place, is not feasible, and that the building presents a danger to future occupants, the County has authorized demolition of the structure. The history of the building will be documented through an interpretive display within Aptos Village, including historic photographs that illustrate the historic role of the building within the history of Aptos Village.

**Recommended Conditions of Approval – Aptos Firehouse/ VFW Hall**

Provisions to offer the structure to the general public:
Consistent with County Code Section 16.42.060(b) 1(C), provisions shall be made to offer the structure to the general public for removal or dismantling for salvage at no cost or remuneration to the applicant. The availability of the structure shall be advertised by means of a 1/8 page display ad in a paper of general circulation in the County of Santa Cruz, at least twice during a thirty-day period. The advertisement shall include the address at which the structure proposed for demolition is located, information as to how arrangements can be made for relocation (through moving or dismantling) of the structure proposed for demolition, and the date after which a Demolition Permit may be issued. Evidence of this publication must be submitted prior to issuance of a Demolition Permit.

Protection of Bayview Hotel:
Prior to construction and demolition on any parcel adjacent to the Bayview Hotel, the applicant shall consult with a structural engineer to ensure that the proposed demolition and construction methods shall not negatively impact the Bayview Hotel. If any impacts are anticipated by the engineer, the proposed construction and demolition methods shall be modified as needed to protect the Bayview Hotel Building. A report from a structural engineer reviewing the proposed demolition and construction methods shall be required prior to issuance of demolition or building permits for parcels adjacent to the Bayview Hotel.

Interpretive Display:
Consistent with the recommendations in the documentation report prepared for the project and with County Code Section 16.42.060 to preserve the historic value of structures that are demolished, one or more interpretive displays shall be installed on the property that will provide information to the public regarding the history of the Firehouse/ VFW Hall in the context of the history and development of Aptos Village. The display shall include photographs of the building as it existed before demolition, as well as historic photos documenting the use of the building as a firehouse, residence, lumber office and VFW Hall, obtained during the documentation process noted below. These displays will be integrated into the design of Aptos Village, near the current location of the firehouse building, or included as part of a larger interpretive display involving the Apple Barn, and will be installed outdoors in highly visible areas. The display will include historical data from the documentation requirement, or other cited archival sources. Interpretive displays and the signage/ plaques installed on this property will be sufficiently durable to withstand typical weather conditions. Displays and signage/ plaques will be of adequate size to attract the public. Submittal of a contract with a qualified professional with experience preparing similar types of interpretative displays for historic purposes shall be required

prior to issuance of the demolition permit. Installation of the interpretive display shall be required prior to final inspection for the demolition permit.

Historical Marker:
A permanent plaque will be installed at the existing location of the firehouse, describing the firehouse and its history as part of Aptos Village. Plans for the historic marker shall be submitted prior to the issuance of the demolition. Installation of the marker shall be required prior to the final inspection for the demolition permit.

Documentation:
HABS-like documentation shall be required to document the historic building prior to demolition. The documentation should approximate HABS Level II documentation and include: a) selected drawings, if available, that would be photographed; b) photos following the NPS photo policy, of exterior and interior views, along with historic views, if available and c) additional archival research providing written data regarding the history and description of the property. For the photographs, either HABS standard large format or digital photography may be used. If digital, the size of each digital image will be 1600x1200 pixels at 300 pixels per inch, or larger, color format, and printed in black and white or color. Documentation shall include preservation of significant historic materials or objects uncovered as part of the demolition process. The applicant shall submit a documentation plan prepared by a qualified historian/ architectural historian (according to the Secretary of the Interior's professional qualification standards) prior to the approval of the demolition permit. Completion of the documentation shall be required prior to the final building permit inspection.

The distribution of the documentation will include: the Aptos Chamber of Commerce and History Museum, the Museum of Art and History in Santa Cruz, the Santa Cruz Public Library's local history collection; and UC Santa Cruz.

**Action Date:** _____

**ACTION:** **Ayes:** _____

**Noes** _____

**Absent** _____

**Date:** _____

_____
Annie Murphy
Secretary to the Commission

Exhibits

A. Findings
B. Copy of Application, including reports from Redwood Engineering and the Special Inspection Reports from the County Building Official, site plans, elevations of existing building, and photographs

C. Documentation Report: Urban Programmers

D. DPR form (Inventory Sheet) for the Aptos Firehouse/ VFW Hall

E. Peer Review of the Documentation Report: Circa

F. Aptos Village Plan, sections relating to historic resources

G. Location Map

H. Aerial Photograph

## Historic Development Findings

1. *The Historic Resource Preservation Plan is consistent with the purposes and goals of County Code Chapter 16.42 and the County General Plan.*

The Historic Resource Preservation Plan submitted is consistent with the policies of the General Plan and Chapter 16.42 of the County Code in that the application is consistent with the requirements for applications involving the demolition of an historic resource.

2. *The Historic Resource Preservation Plan is in conformance with the requirements of Chapter 16.42 of the County Code.*

The Application for demolition is in conformance with the requirements contained in the ordinance, including the provision of evidence that preservation of the structure is not feasible due to its deteriorated condition, and that demolition is necessary due to the dangerous condition of the structure.

3. *The Historic Preservation Plan will preserve and maintain the cultural and historical heritage of the County and/or further cultivate the knowledge of the past.*

As conditioned, the application for demolition would require documentation of the resource, including submission of photographs of the current condition of the resource, as well as archival research to provide historic photographs and additional historic information regarding the history of the Aptos Firehouse/ VFW Hall building in the development of Aptos Village. Project conditions also require the applicant to provide an interpretive display for the public, including both photographs and text informing the public of the history of the building in the context of Aptos Village. This display would be required in an outdoor highly visible location within Aptos Village. Although the demolition of the Aptos Firehouse/ VFW Hall would be a loss to the community, the provision of a detailed interpretive display would help to educate the public regarding the history of the Firehouse/ VFW Hall building within Aptos Village.

EXHIBIT D

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
PRIMARY RECORD

Primary #
HRI #
Trinomial
NRHP Status Code 5
Other Listings
Review Code Reviewer Date

Page 1 of 3 *Resource Name or #: (Assigned by recorder) 8037 Soquel Drive

P1. Other Identifier: Aptos Fire House/VFW Hall

*P2. Location: ☐ Not for Publication ☒ Unrestricted a. County: Santa Cruz

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

b. USGS 7.5' Quad Soquel Date 1994 Revised T 11S R 1E B.M. Mt. Diablo

c. Address 8037 Soquel Drive City Aptos Zip 95003

d. UTM: (Give more than one for large and/or linear resources) Zone 10S 597936mE 4092763mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Assessor's Parcel Number: 041 011 24

*P3a Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

CONTRIBUTING BUILDING (NR 5D)

The Aptos Fire House/VFW Hall building is located at 8037 Soquel Drive. Constructed pre 1889, this building is simplistic in design and detail and is not representative an particular architectural style.

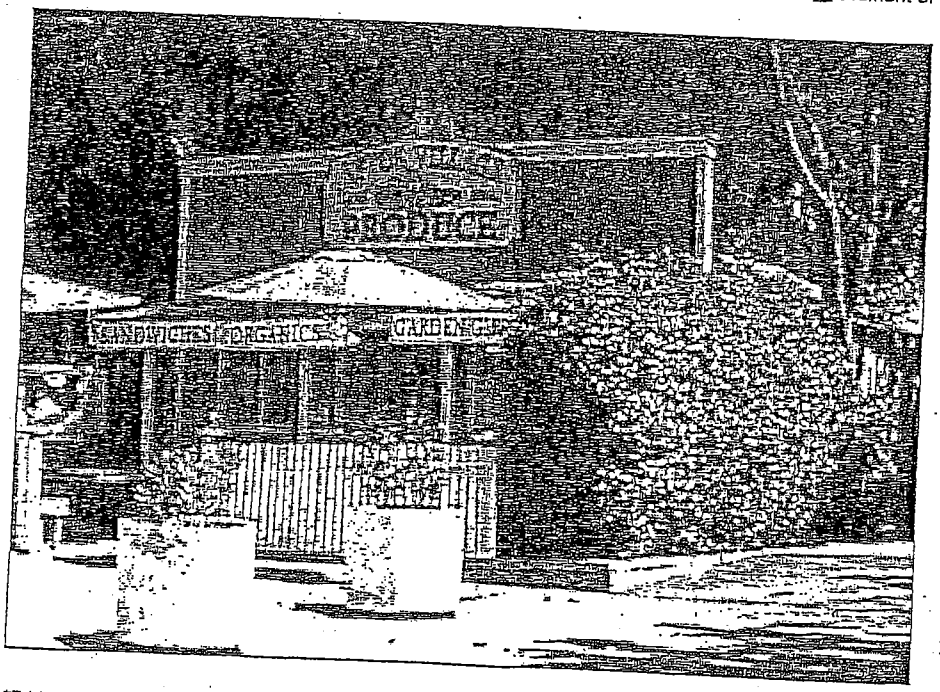
This small building with front-facing gable roof and false front is a simple structure. It sits atop what appears to be a concrete perimeter foundation. The front of this building, which is of frame construction, is covered in V-groove siding. The sides are covered in corrugated metal [which likely conceals V-groove siding]. A raised parapet of recent construction, clad in vertically applied V-groove siding, conceals the front-facing gable from view. A front porch, supported by square posts and topped with a shed roof, spans the front of the store and two ribbons of three windows flank the centrally located entrance.

According to the owner, the framing is of redwood timber and a garage door is located on the northeast elevation.

(Continued page 2).

*P3b. Resource Attributes: (List attributes and codes) HP6, HP39-Fire House & Library, HP13-VFW

*P4 Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☒ Element of District ☐ Other (Isolates, etc.)




P5b. Description of Photo: (View, date, accession #)
Photo of the south elevation.
June 2002, K. Oosterhous

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both

pre 1889

*P7. Owner and Address:
Edward W. Newman
3331 Capitola Ave.
Capitola, CA 95010

*P8. Recorded by: (Name, affiliation, and address)
Kara Oosterhous
Dill Design Group
110 N Santa Cruz Ave
Los Gatos, CA 95030
Charlene Duval (Consultant)

*P9. Date Recorded: 06/02 Rev 3/7/03

*P10. Survey Type: (Describe)
Reconnaissance

*P11. Report Citation: (Cite survey report and other sources or enter none) None

*Attachments: ☐ NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☐ Building, Structure and Object Record ☐ Archaeological Record ☒ District Record ☐ Linear Feature Record ☐ Milling State Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

There is no question that the building has been extensively altered throughout the years; however, it plays an important part in better understanding the history of the district.

This building is set in the commercial center of Aptos, which is comprised of both historic and non-historic income producing businesses. It is also a contributing resource to the Aptos Village Historic District. Despite the new construction, this area of Aptos still possesses a sense of place. Overall, this building possesses integrity of location, setting, design, feeling, association, workmanship, and materials as it remains true to its historic design and appearance.

History

The original building located on this site was constructed by 1888 and was identified at the office of the Loma Prieta Lumber Company. By 1892, it appeared to be associated with the Aptos Milling Company lumberyard, and still identified as a "lumber office." The 1908 Sanborn Map shows the building as being used as a dwelling. By 1923, the property was donated by Joe Arano for use as a firehouse. It was rotated 90 degrees on the lot and remodeled with materials donated by Norton-Phillips Lumber Company. The 1929 Sanborn Map shows a fire alarm/bell was out front of the building. In 1952, the firehouse moved to its new location at on Aptos Street, and the building once again was used as a lumber office. This time it was used by Lester Toney the son of George Toney who was stationmaster at the Southern Pacific Depot for many years. In the early 1950s, Mrs. Helen Wikkerink opened a small library in the building. Later, it was enlarged and served as the VFW (Veterans of the Foreign Wars) Hall, Monterey Bay Post No. 778, American Legion, a use that continued until at least 1979. In recent years it has been an antique store. It is currently a fruit stand.

Sources

Johnston, P.
1973 *Aptos and the Mid Santa Cruz County Area, 1890 to World War II.* Edited by Elizabeth Spedding Calciano. UCSC Regional History Project.

Leonard, V.
1971 Fire-Fighting in Aptos has come a long way since bucket brigades. *Green Sheet.* 25 March.

Sanborn Fire Insurance Maps
1888-1929 Aptos.

Santa Cruz Sentinel
1929 Interesting History of Aptos and Its Development. 17 May.

Swift, C.
1993 Aptos Neighbors honor David McFadden, the man who brought Books to Town. *Mid County Post.* 1 June.

Polk's Watsonville City Directory
1967 Soquel Drive.

State of California – The Resources Agency
DEPARTMENT OF PARKS AND RECREATION
CONTINUATION SHEET

Primary #
HRI #
Trinomial



Resource Name or # (Assigned by Recorder) 8037 Soquel Drive

Recorded By: K. Oosterhous & C. Duval

Date: 8/31/02 Rev 3/7/03 X Continuation ___ Update

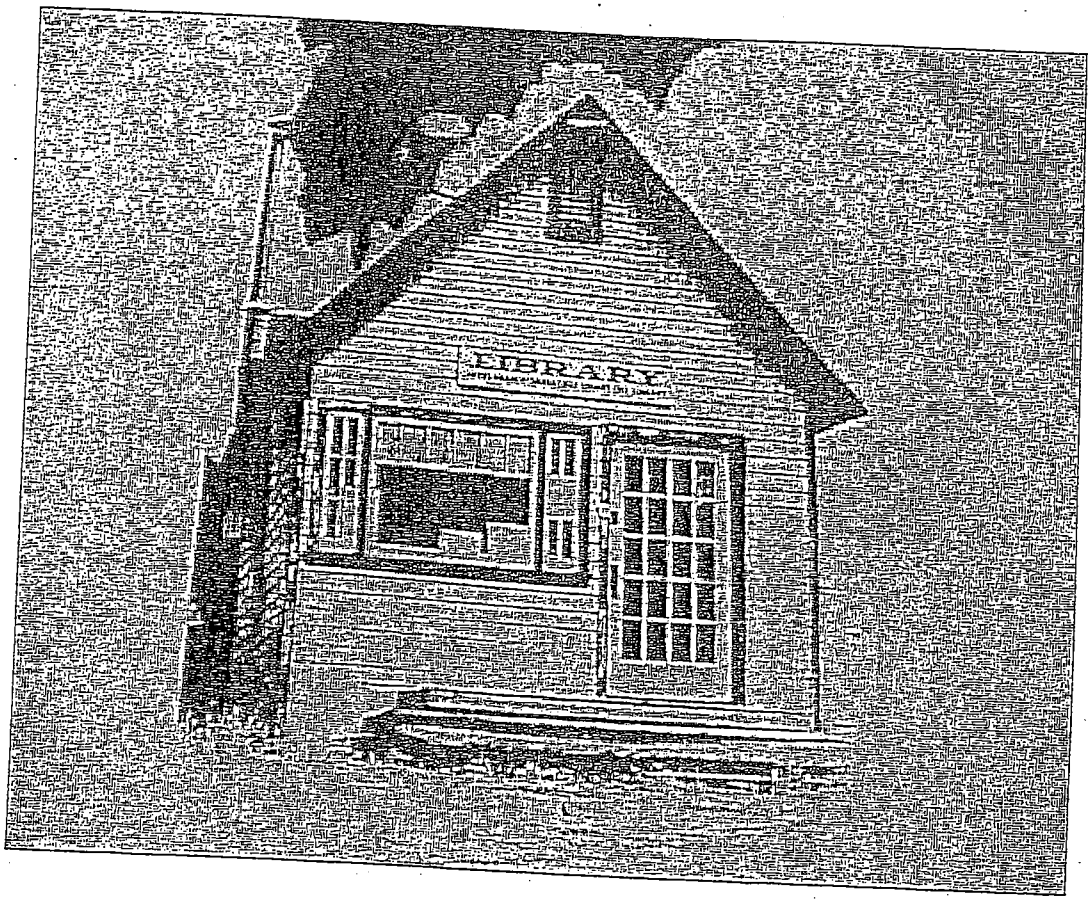



Photo circa 1950s, Aptos Museum.

EXHIBIT E

CIRCA Historic Property Development

July 22, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

RE: Peer Review of Documentation Report for the Former Aptos Firehouse/VFW Hall

The County of Santa Cruz (County) asked Circa to conduct a peer review of the *Documentation Report for the Former Aptos Firehouse/VFW Hall* [Urban Programmers, April 2011] for consistency with the Secretary of the Interior Standards (SIS) for the Treatment of Historic Properties, and for consistency with the County's local regulations. The SIS review appropriately focused on the two most potential Treatments applications: Relocation and Reconstruction. Due to the extensive physical alterations over time the former Aptos Firehouse/VFW Hall no longer retains physical integrity. In addition, substantiated documentation is lacking to support the argument for historic significance associated with a person(s) or event.

While Circa does not opine on issues of structural soundness we concur with the findings of the *Documentation Report* prepared by Urban Programmers (April 2011), the report from Redwood Engineering (March 2011), and the reports from the County Building Official (December 2010 and June 2011) concluding the following:

a) Relocation, or relocation and reconstruction, of the Aptos Firehouse in a manner consistent with the Secretary of the Interior Standards is not feasible, and that
b) Demolition of the structure is consistent with local regulations regarding demolition of historic resources.

In addition, Circa agrees with the County Staff's recommendation that the Historic Resources Commission approve the demolition of the former Aptos Firehouse/VFW Hall. The application of the Relocation Standard approach does rely on structural soundness and therefore brings up issues of material replacement, location, orientation and context. Likewise, the Reconstruction Standard approach relies on substantiated documentation so as to avoid the pitfall of communicating false history. It should be noted that retention of the building in situ is *technically* feasible, however, the extensive replacement of deteriorated materials and reproduction of the limited remaining character defining features would be so extensive that the property would most likely not be able to retain eligibility for listing on the local register. The use of original character defining features/artifacts and/or historic photographs, maps etc for a permanent interpretive display is appropriate and should be seriously considered as part of the Conditions of Approval. Such elements, as well as photo-documentation, should also be conducted for archival purposes as part of the Conditions of Approval.

In summary, Circa: Historic Property Development agrees with the findings and recommendation in the *Documentation Report for the Former Aptos Firehouse/VFW Hall.*

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy

Sheila McElroy
Principal, Circa: Historic Property Development

# CHAPTER 1: THE VILLAGE OVERVIEW

## INTRODUCTION

Aptos Village, located in the Aptos Planning area within the unincorporated portion of Santa Cruz County, lies about six miles east of the City of Santa Cruz and about eight miles northwest of the City of Watsonville. It is located just north of Highway 1 between the State Park Drive and Rio Del Mar Boulevard interchanges. The Village is 80 feet above the confluence of Aptos and Valencia Creeks and about one-half mile inland from the Monterey Bay.

The surrounding area is mainly developed with residential uses, and the Village serves as the gateway to the 10,000-acre Forest of Nisene Marks State Park. The main access to and from the Village is Soquel Drive, a major east-west arterial that parallels Highway 1. There are both commercial and residential uses to the east and west of the Village, with the major existing commercial development being the Rancho del Mar Shopping Center, just west of the Village.

There are 65 existing parcels within the boundaries of the Aptos Village Plan with a variety of land uses. These parcels range in size from 2,400 square feet to 4 acres. Previous patterns of development are reinforced by the various parcel sizes, especially in the Village Core, with the large parcels behind the Bay View Hotel and Aptos Station reflecting their previous industrial uses related to the lumber and fruit packing industries.

Most of the parcels that lie south of Soquel Drive are either small or have potentially severe development constraints such as steep slopes, riparian corridors, and floodplains.

The small parcels that front on Valencia Street, Bernal Street, and Aptos Street are part of the Hihn subdivision, laid out in the late 1800s for residences. These parcels are mostly developed and have a mix of commercial and residential uses.

Figure 1 below provides an overview of land uses in the area, while Figure 2 provides an illustration of the current development pattern in the Village.

**FIGURE 1: SUMMARY OF CURRENT USES IN APTOS VILLAGE AREA (2008)**

| Category of Development | Number of uses in category | Bldg Area Sq. Ft. | % of Bldg. Area |
|---|---|---|---|
| Retail | 9 | 25,118 | 19.0 |
| Office | 20 | 29, 707 | 22.4 |
| Dining and Hospitality | 7 | 22,799 | 17.2 |
| Government | 3 | 19,010 | 14.3 |
| Commercial Service | 3 | 10,158 | 7.7 |
| Grooming/Fitness | 8 | 6,358 | 4.8 |
| Subtotal | *50* | *113,150* | *85.4* |
| Residential | 32 units | 19,398 | 14.6 |
| TOTAL | 82 | 132,548 | 100.0 |

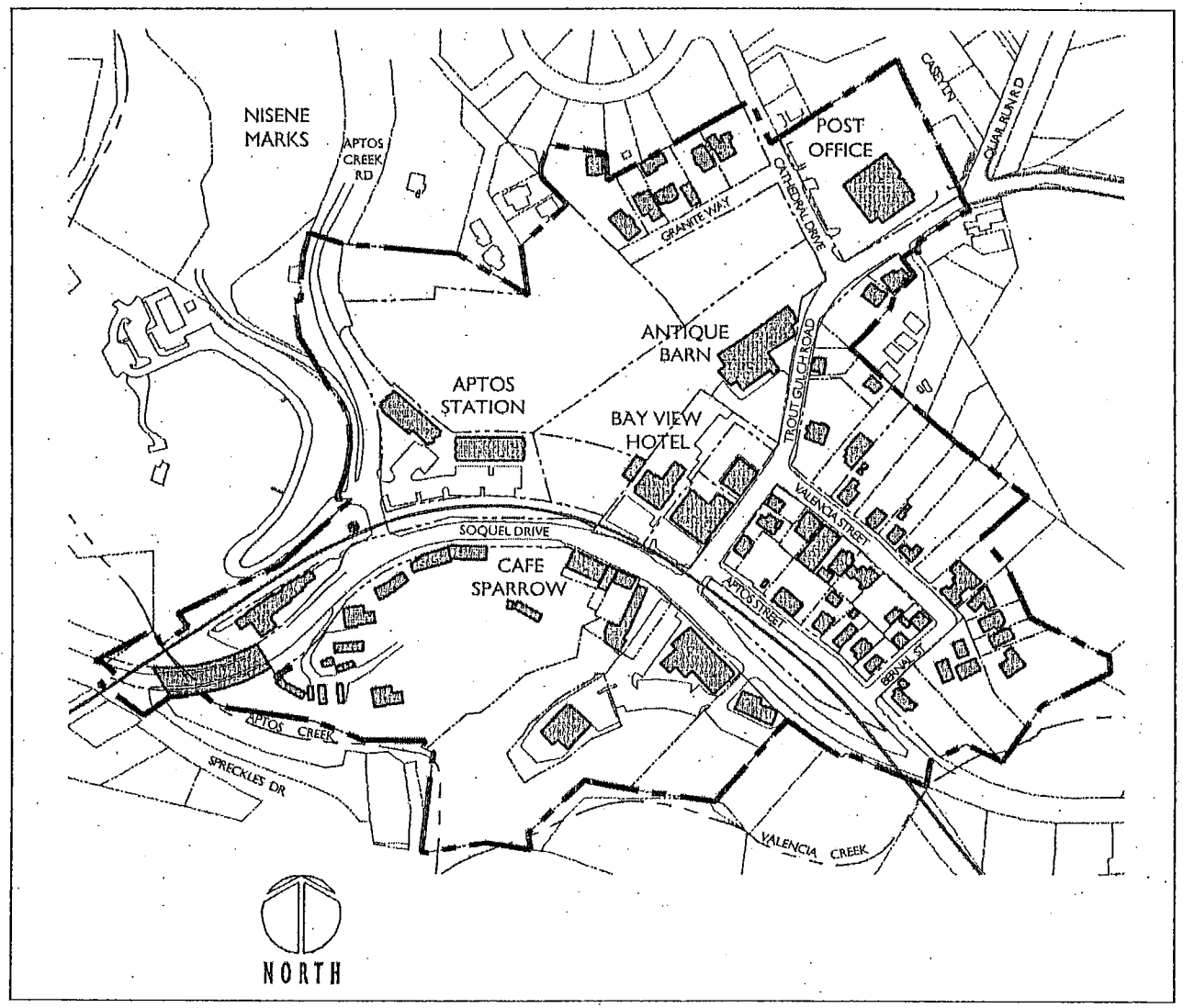



FIGURE 2: EXISTING DEVELOPMENT MAP

# Village Plan History

## Past Planning Efforts

Since 1979, land use in Aptos Village has been governed by the Aptos Village Community Design Framework, a Specific Plan which was originally adopted by the Board of Supervisors on April 17, 1979 and amended on June 18, 1985. The only major new buildings constructed since the late 1960s include the Aptos Station (APN 041-561-01) in 1981, the Founders Title Building (APN 041-042-39) in 1985, and the Appenrodt building (APN 041-042-47) at the southeast corner of Soquel Drive and Post Office Drive in 2006. There were several previous attempts to develop the vacant parcels adjacent to Aptos Station, the Bayview Hotel, and the Hihn apple packing shed (Apple Barn), but for a variety of reasons (including parcel configuration and lack of coordinated planning among all parties regarding development) none of those ever came to fruition.

The Aptos Village Community Design Framework covered an area of about 80 acres, including the area covered by this Village Plan. Even though the Framework covered an area larger than the Village, its primary focus was on future development of the Village core area. Due to the lack of progress over the years following approval of the Framework, members of the community felt that a more detailed plan would encourage the Framework vision to be realized. In addition to updating the Framework and re-evaluating the mix of land uses, it was critical to review parcel configuration and infrastructure planning. Therefore, this Plan, which builds upon the Framework, is structured to provide more clarity to guide possible new development. It is intended that, upon adoption of this Plan by the Board of Supervisors, it will replace the Aptos Village Community Design Framework Specific Plan, focusing on the Village Core area.

## Setting the Stage for a New Plan

In 2001, the Aptos business community and the County began discussing the possibilities of coordinated development of the vacant parcels in the context of the overall development of Aptos Village. In mid-2002, the County conducted two public meetings to elicit comments from area residents, business owners, and other interested parties about what future development, if any, should occur in the Village.

On a parallel track to that process, the County has, through its Capital Improvement Program (CIP), established a plan for upgrading infrastructure in the Village area. Those efforts will serve to complement the activities called for in this Plan.

# Historic Issues

## A Brief History of Aptos Village - Linking Santa Cruz County Together

On a foggy Sunday morning in May of 1929, two men representing opposite ends of Santa Cruz County met in the middle of the concrete bridge over Aptos Creek and shook hands at the dedication of the bridge. Prohibition required that a bottle of non-

alcoholic sparkling apple cider be used in the ceremonial christening. The ceremony emphasized the historic role that Aptos had played as the main transportation connection within Santa Cruz County. Aptos was and is a place where the major transportation elements come together, where highways and railroad snake around and across a daunting natural landscape.

## THE DOMINANT GEOGRAPHY—*DOS MALOS PASOS*

The Aptos Village site is triangle bounded on the north by foothills, on the east by a ravine cut by Valencia Creek and on the west by a steeper canyon carved by Aptos Creek. The two streams meet at the tip of the triangle, join, and flow to Monterey Bay. This junction of the two creeks was such a dominant feature that many early residents believed the name "Aptos" to be an Indian word meaning "the joining of two waters." There is little evidence in early literature to support that definition, however, and as Donald T. Clark notes in his classic *Santa Cruz County Place Names*, the source of the name Aptos is "uncertain."

There is nothing uncertain, however, about the transportation challenge posed by those two canyons, and beginning with that first crossing of the *"dos malos pasos"* Aptos was a challenge for those wishing to travel through it.

## THE APTOS TRIBE AND VILLAGE

The prehistoric past of the region is represented by numerous archaeological deposits in Santa Cruz County, and it is doubtless that the ancestors of the historical and present-day Ohlone communities have occupied the county for at least 6,000 years, and likely longer. The Aptos group of Ohlone lived along the shores of Monterey Bay from the present location of Aptos and eastward about half way to the mouth of the Pajaro River. The Aptos peoples were one of four early groups converted at Mission Santa Cruz, but were actually the last of those four nearby groups to be completely absorbed into the mission in 1796. Although they did marry with their neighbors the Cotoni, Sayanta, and Uypi, they were completely mixed together with the Cajastaca people of the Corralitos area. So much mixing occurred within the nuclear family groups that the idea arises that the Aptos and the Cajastaca were a single tribal group (Milliken 1995).

Several early references from the early Spanish explorers and Spanish Missionary records describe the presence of Indians in the Aptos area when a 1769 exploratory land expedition led by Don Gaspar de Portola saw an Indian village at the confluence of the Valencia and Aptos creeks. The Spaniards recorded the site as "Aptos". In 1791, the Santa Cruz Mission was established west of the San Lorenzo River. Indians from the Aptos area were brought into the Mission compound. Records of Father Crespi in 1769, Father Palou in 1774, and the Santa Cruz Mission in 1791 describe the Aptos region, with some mention of the Native Americans who called their area "Aptos". (Brown, 2001). The first recorded contact came in 1774 when the Rivera Expedition encountered residents of the village at Aptos and offered gifts. The accounts mention seven (or eleven) grass huts and a population that added up to the diarists' estimation of a 'medium sized village" (Brown, 2001)

## THE SPANISH ERA—1769-1822

The Spanish found traveling across the coastal terrace so "difficult" and "tiresome" that in 1774 they chose the more level and direct route through the Santa Clara Valley connecting Monterey and San Francisco. (Present-day Highway 101.) Santa Cruz and Aptos were on a dead end and the easiest access was by sea. The Indians living in the Aptos area provided most of the converts for the Mission Santa Cruz between 1791 and 1797, and once they were gathered at the mission, except for cattle grazing on the coastal terrace, there is very little activity in Aptos. The road was little traveled, and most access was by sea.

## THE CASTRO ERA—1833-1876

In 1833 Rafael Castro, a retired soldier and native of the Villa de Branciforte was awarded a private land grant named Rancho Aptos. The original 4,486 rancho was bounded on the west by Aptos Creek, but in 1840 Castro was granted an additional 2,200 acres extending the boundaries west to Borregas Gulch. Castro built his home on the western bank overlooking Aptos Creek and began raising cattle, shipping the hides off the beach at the mouth of Aptos Creek.

## APTOS WHARVES AND THE FIRST APTOS VILLAGE - SHIPPING BY SEA

Rafael Castro took his Rancho Aptos land title papers to the Land Commission in the early 1850s and in 1860 he received confirmation. Even before he had clear title, Castro received numerous offers to sell his property, but he declined, preferring instead to negotiate leases with the various sawyers and loggers who were interested in the redwood trees growing in the canyons to the north. To ship the products coming off his own property and those land grants to the east, in 1850 Castro built a relatively short five hundred-foot wharf just west of the creek mouth and during the next twenty-five years, hides, lumber, flour and agricultural products were shipped out across what became known as Aptos Landing. (Collins 1995)

Castro's wharf inspired a small commercial development at the intersection of the County road and the road to the wharf (present-day Wharf Road and Soquel Drive) while several of Castro's adult children built homes along the road to the west. The wharf was improved and extended in the 1860s and lumber, firewood, and agricultural products were shipped off it to San Francisco.

Meanwhile, efforts to create a dependable crossing of Aptos Creek continued. The first bridge built in 1860 was washed out in the 1862 flood and eventually replaced with a covered wagon bridge.

Finally, in 1872 beset with marital difficulties and declining health, sixty-nine year old Rafael Castro sold the bulk of his property to sugar magnate Claus Spreckels for $71,900 in gold coin. The Castro era of Aptos Village on the western banks of Aptos creek ended in the 1870s with the coming of Claus Spreckels (1872), the arrival of Frederick Augustus Hihn and incorporation of the Santa Cruz Rail Road (1873) and the death of Rafael Castro (1878).

## APTOS VILLAGE MOVES EAST: THE LUMBER ERA—1876-1900

Frederick Augustus Hihn had long held a dream of a dependable trans-county railroad and, as the president of the Santa Cruz Rail Road (incorporated, 1873), he led the construction of a narrow gauge railroad between Santa Cruz and the Southern Pacific Railroad junction south of Watsonville. Claus Spreckels was a major stockholder in Hihn's railroad. All of the construction of the Santa Cruz Rail Road was done by Chinese railroad workers. Their conical shaped hats, quilted blue coats and Cantonese work songs were a regular part of the Santa Cruz County landscape during the 1870s and 1880s.

Seeing the potential for his own properties located up Valencia Creek, Hihn guided the route of the Santa Cruz Rail Road into the Aptos Village site even though it required two trestles compared to an easier route downstream that would need but one. Hihn's bringing of the Santa Cruz Rail Road into the present-day Aptos Village set off a boom the results of which are still visible today.

## SALOONS AND HOTELS

Before the Santa Cruz Railroad crossed Aptos Creek into Aptos Village in 1876, there was only one small hotel in Aptos Village, but by 1880 there were three hotels and several saloons. One of those hotels, the Anchor House (present-day Bayview) was built beside the railroad track in 1878 by Basque immigrant, Jose Arano. Aptos historians have counted up to 15 saloons in the area by the mid 1880s, serving the needs of the lumbermen and loggers who came into the forests to the north.

## ENTER THE SOUTHERN PACIFIC RAILROAD: THE LUMBER BOOM—1883-1900

Though the 1870s were busy in Aptos, the Santa Cruz Rail Road operated at a loss, and in 1882 was sold at a bankruptcy auction to the Southern Pacific Railroad. The entry of the Southern Pacific into Aptos Village brought the fledgling railroad era to its maturity. Almost immediately after acquiring the narrow gauge Santa Cruz Rail Road, the Southern Pacific announced it would broad gauge the line, and in the fall of 1883, the first standard gauge locomotive made the trip between Santa Cruz and the SP mainline south of Watsonville. Products could be loaded onto a railroad car and shipped directly anywhere in the United States without having to be re-loaded.

## THE LOMA PRIETA LUMBER COMPANY—1883

The Southern Pacific Railroad Company then purchased a 7,000-acre tract of uncut redwood up in the Aptos Canyon and punched a standard gauge railroad up the canyon to get it. Once the Chinese railroad crew had the first three miles of line built, the largest lumber mill in Santa Cruz County in the 1880s began to send a torrent of lumber, railroad ties, shakes and shingles down into Aptos and out to markets all over California.

## THE HIHN VALENCIA MILL—1883-1892

Undaunted by losing the Santa Cruz Rail Road and quite willing to take advantage of the Southern Pacific standard gauge railroad connection in the now bustling Aptos Village, in 1883 Hihn built a medium-sized sawmill in Aptos and began cutting, milling and shipping part of what he estimated to be hundred million board feet of lumber to his lumberyard in Santa Cruz. The following year Chinese crews built a two-mile narrow gauge track into Valencia Canyon, and over the next eight years redwood lumber flowed out of the Valencia down to Aptos Village. Echoing the paths of the two creeks that framed the village, redwood lumber flowed down into Aptos Village and was shipped out to markets all over the Pacific.

During the 1880s and into the early 1890s, Aptos Village was a major transportation hub, the area criss-crossed with railroad lines, a depot, and a turntable. One of the legacies of this era is that the land comprising today's Aptos Village was a puzzle of parcels and rights of way. The many parcels, disparate owners and old railroad rights of way became a formidable barrier to later development of the village.

The closing of Hihn's Valencia Mill in 1893 and the Loma Prieta mill in 1899 marked the decline of the Aptos Lumber Boom. Though there were smaller episodic lumber operations into the twentieth century, in 1893 Hihn shut down his Valencia Mill, and in 1899 the Loma Prieta mill was closed, marking the end of the Aptos Lumber Boom. Smaller episodic lumber operations continued north of the village, but when the Loma Prieta tracks up Aptos Canyon were removed in 1926, the lumber era was over.

## THE WAREHOUSE—PRESENT-DAY VILLAGE FAIR

In early 1881, in anticipation of opening up his lumber operations in the Valencia watershed, Hihn purchased 27 acres on the Aptos Village site from the Bernals. He used part of the property as a lumber yard and leased some of it to a local farmer to grow hay. There is evidence that he had a barn on the property by the mid-1880s. A series of recently found Hihn documents leads one to conclude that the main building of the present-day Village Fair (referred to as the Apple Barn in this document) was constructed in 1891.

## APTOS VILLAGE: THE APPLE ERA—1900-1959

By the late 1890s, paralleling the agricultural trend going on in the Pajaro Valley, apples became the focus of activities on the Apple Village Site. The same railroad that carried lumber to the far corners of the country now began carrying railroad cars filled with apples. Most of the orchards were located north and east of Aptos Village and Frederick Hihn was one of the leaders of this new Aptos industry.

By the 1920s Aptos was the second most important apple shipping location in Santa Cruz County. Over 90% of the apples shipped in the 1920s came from Watsonville, and though only 5% of the county's apple crop went through Aptos each year, it was enough to create a microcosm of the apple industry in the Aptos Village. Box making, apple packing, an apple dryer and vinegar works were

represented in what became a small apple-centered industrial park.

## THE LAM-MATTISON DRYER—1905-1940

While Hihn built the first apple dryer in the Aptos Village, it was not as successful as the Lam-Mattison apple dryer founded in 1905. Lam Pon, an immigrant from China, became a partner with Ralph Mattison and their dryer became a landmark in the village. Each fall a large group of Chinese laborers came into the village to work in the dryer, and in later years Filipino laborers were the primary laborers. The Lam family continued its partnership with the Mattisons up to 1940. The last of the Aptos apple packing facilities closed in 1959.

## A DIVERSE MULTI-CULTURAL AND MULTI-ETHNIC COMMUNITY

In 1920, the U.S. Census taker went from door to door in the Aptos Village, and the surviving manuscript census shows a diverse population living in and around it. Along with those born in California and elsewhere in the United States, nearby farmers included immigrants from Russia, Germany, Spain, Sweden, Denmark, Portugal (Azores), Ireland and England. There was a crew of Italian loggers up in the Aptos Canyon (with their Chinese cook) along with a small crew of woodchoppers from Japan. Croatian apple farmers lived up along Valencia Creek, and that fall the Chinese apple dryer crew would move in to begin working on some of the apples grown up there.

## TRANSPORTATION - IMPROVING THE BRIDGES - THE 1920S

Over the years, as automobiles replaced horse-drawn wagons on county roads, the road bridges at the edges of Aptos Village proved to be too narrow for the ever-increasing automobile speeds. In 1925, Santa Cruz County approved and paid for a realignment on the eastern side of Aptos Village, replacing what heretofore had been a bridge at the end of Valencia Street, rerouting the road to the south and replacing the railroad overcrossing with an undercrossing. Valencia Creek was diverted into a large concrete culvert to allow for the road to cross without building an expensive bridge. That is still the configuration of the Valencia Creek crossing at this writing.

Meanwhile, the approaches at the Aptos Creek road bridge were so abrupt and prone to accidents that by the mid 1920s the first turn was known as the "death curve." In May 1929 a two-lane curved concrete arch replaced the older bridge, and at the dedication representatives from Santa Cruz and Watsonville shook hands at the center of the bridge to signify the unity of the entire county. That bridge continues to be the only western access to the Aptos Village site.

## RE-ROUTING HIGHWAY 1—1949

As part of a county-wide effort to straighten and widen the old-fashioned, narrow state Highway 1, in 1949 the State constructed a new throughway that completely by-passed the original Santa Cruz-Watsonville Road and Aptos Village. As a result, the Village

slipped into what several old-timers termed "the doldrums." Even the venerable Bayview Hotel closed for a time. The Aptos Village site continued to have the look of an industrial park, but one by one the businesses closed and the buildings grew empty.

## Aptos Renaissance: 1962-1979—The Coming of Cabrillo College

In 1958, Santa Cruz County voters approved the formation of a junior college with the understanding that the site of a new campus would be located somewhere in or near Aptos. Eventually the site committee selected the Porter-Sesnon property located about two miles west of the Aptos Village site. The coming of Cabrillo Junior College campus in 1962 had an immediate effect on the Aptos area. Resurrection Church opened, Rancho del Mar shopping center opened and Soquel Drive was widened between Porter Gulch and State Park Drive. Also in 1962, the old Loma Prieta Lumber Company property up Aptos Canyon was dedicated as the Forest of Nisene Marks State Park. Surrounding residential neighborhoods which had been primarily dedicated to seasonal, vacation homes slowly changed into permanent housing.

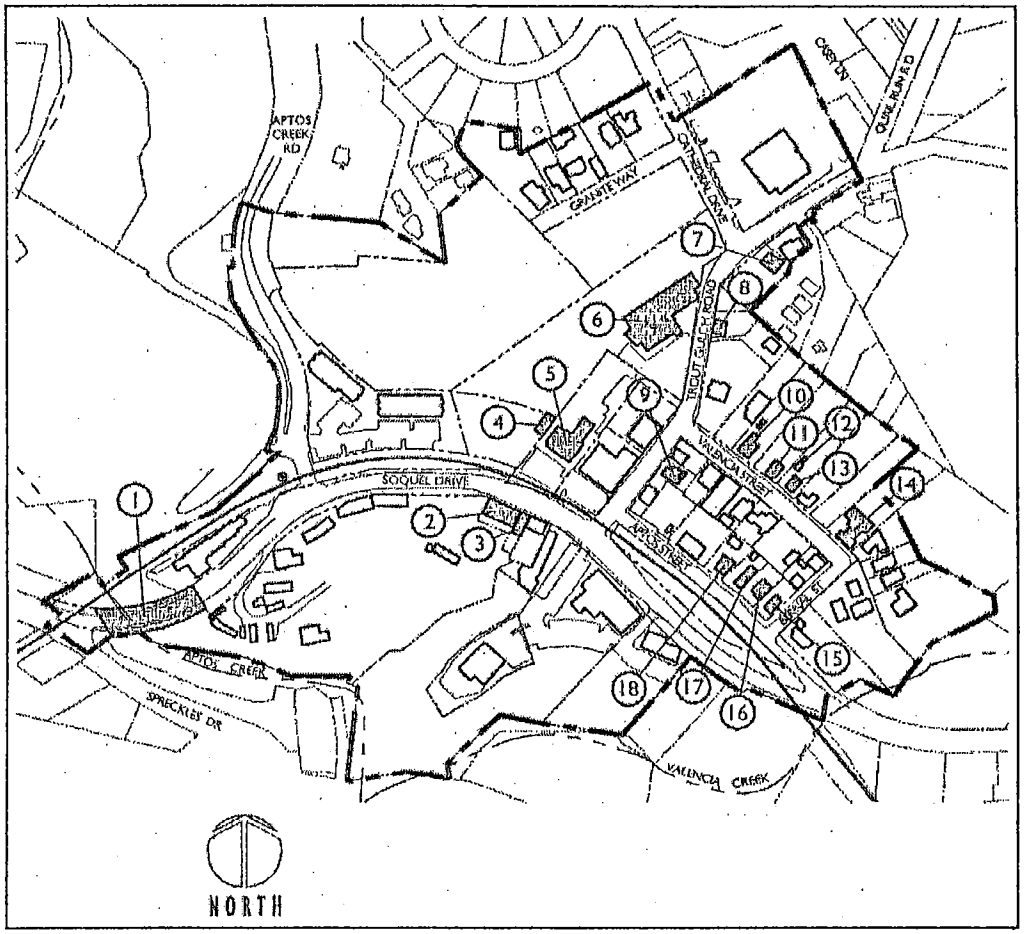
But the Aptos Village site saw few direct effects from this 1960s Aptos renaissance. Many of the older industrial buildings were razed during the 1960s and the lumber-apple industrial history slowly faded away. A strip of older businesses remained on the south side of Soquel Drive, but building activity on the Aptos Village site was sporadic. Efforts to connect with Aptos' history were mostly cosmetic - the naming of the Aptos Station development, for example, in 1974.

Today, there are few visible reminders of Aptos' rich history, save for two notable exceptions: the Apple Barn building representing the lumber and apple industries and the influence of Frederick Augustus Hihn, and the Bayview Hotel, a reminder of the time when Aptos was one of the major redwood labor hubs in Northern California. Perhaps the most visible historical theme is that of transportation - the various pairs of wagon bridge abutments still visible along both Aptos and Valencia Creeks, with Soquel Drive (the old Santa Cruz-Watsonville Road) and the Union Pacific tracks slicing through it all.

## Historic Resources

Since the creation of the County's first historic preservation ordinance in the 1970s, a significant number of buildings have been designated as historically significant and have been protected. These buildings add to the character of the Village and County policies require that they be respected by new development in terms of design and scale. The following list contains the sites currently identified in the County's Historic Inventory as historically significant in the Village area, which are illustrated on Figure 3.

1. Aptos Creek Bridge - Soquel Dr. at Spreckles Dr.
2. General Store and Post Office - 8040, 8042 Soquel Dr.
3. Village House - 8044 Soquel Dr.
4. Aptos Firehouse/VFW Hall - 8037 Soquel Dr.
5. Anchor Hotel - Bay View - 8041 Soquel Dr.
6. Apple Barn - 417 Trout Gulch Rd.
7. - 502 Trout Gulch Rd.
8. Bonner House - 420a Trout Gulch Rd.
9. Ray McCawley Real Estate - 408 Trout Gulch Rd.
10. Hihn - Aptos Subdivision - 140 Summa Court
11. Hihn - Aptos Subdivision - 140 Summa Court
12. Hihn - Aptos Subdivision - 8059 Valencia Street
13. Somerset House - 8061 Valencia Street
14. Calvary Chapel - 8065 Valencia Street
15. Hihn - Aptos Subdivision - 8067 Aptos Street
16. Hihn - Aptos Subdivision - 8065 Aptos Street
17. Hihn - Aptos Subdivision - 8063 Aptos Street
18. Twitchell House - 8061 Aptos Street



# CHAPTER 2: CONTEXT FOR VILLAGE PLAN

## GENERAL PLAN CONTEXT

The Village Plan is intended to comply with General Plan Objective 2.24 and specifically with Program "b", which relates to Aptos Village. Objective 2.24 of the General Plan calls for the continued use of:

> Village, town, community and specific plans to provide a planning framework to guide future public and private improvements in town centers.... to provide a higher level of planning detail and public involvement; and to promote economic viability, coherent community design and enhancement of the unique characteristics of the village areas.... as focal points for living, working, shopping and visiting.

Program "b" of Objective 2.24 recommends that the County "[r]eview and update the Aptos Village Community Design Framework to develop a more specific plan governing land use, circulation, design, and improvements in the village area."

## OPPORTUNITIES FOR CHANGE

### UNDERUTILIZED PROPERTIES

As mentioned previously, there are several relatively large vacant parcels in the Village Core. These parcels have remained vacant since the demolition of the apple packing related buildings some 40 years ago. Even the Apple Barn property is underutilized, with only about 25 percent of its area developed with buildings and parking. If more fully developed, these sites could significantly add to the vitality and character of the Village in the future.

### MARKET STUDY - COMMERCIAL OPPORTUNITIES

A market study to evaluate the market and financial feasibility of future commercial and residential development in Aptos Village was commissioned by the County and completed by Keyser Marston Associates Inc. in early 2003.

The market study looked first at the Aptos trade area, which the study defined generally as including "all or portions of the communities of Aptos, Seacliff, Rio del Mar, La Selva Beach, and Freedom..." According to the market study "there appears to be sufficient market support for an additional 235,000 square feet of comparison retail, 90,000 square feet of convenience retail and 50,000 square feet of eating and drinking space in the Aptos trade area." The square footages mentioned are net, or leasable, square feet.

The 2003 market study generally described a range of possible mixed- use developments that could occur in the Village to address the market demand. By way of example, they described a mixed-use commercial/housing project that contained 30,000 to 40,000 square feet of retail uses, with office space totaling from 5,000 to 7,500 square feet.

## RESIDENTIAL USES

Residential uses developed in conjunction with commercial uses enhance the economic viability of commercial uses. Having people living in the Village helps create a more vibrant and livable community. New housing is clearly indicated as a component of new development in the Village Core.

Recognizing that the amount of new residential development must be limited so as not to overwhelm the Village commercial activities, this Plan limits the number of new residential units in the Village Core to not exceed 63 units (this figure includes transitional residential units at the north of the Village Core). As well, the total unit sizes should not exceed 50% of the square footage of the mixed-use and commercial buildings so that they do not overwhelm the scale of the commercial uses in the Village.

The Village Core is adjacent to an established Urban Low density residential neighborhood to the north. In order to provide an orderly transition from this area to the commercial areas in the Village Core, the existing area designated Urban Medium density residential on the north side of Granite Way will remain residential and, in addition, a portion of the area on the south side of Granite Way (at the corner with Cathedral Drive) may be used for exclusive attached housing residential purposes.

Like all projects containing residential development, residences built in the Village Core will be required to meet the housing affordability requirements of the County. An allowance for clustering required affordable units may be considered as part of a Planned Unit Development application for the Village Core.

## KEY HISTORIC STRUCTURES

As noted previously, the Village Core was the site of lumber milling and several apple processing and packing operations. One building from the area's past use of apple processing remains: the Apple Barn at the corner of Trout Gulch Road and Cathedral Drive (given an historic rating of NR-3—a designation that recognizes its nomination by the County for national designation). Also located in the Village Core is the Bayview Hotel (rated NR-1 - a nationally recognized structure) and the old Aptos Firehouse/VFW Hall just west of the Bayview Hotel (rated NR-5 - of local interest).

New buildings proposed adjacent to the Apple Barn building shall be architecturally compatible with the Apple Barn. It is envisioned that the Apple Barn could be used as an anchor store. This Plan envisions that the Apple Barn will be relocated to allow its presence on the Village Common and properly interact with the other new buildings. Any such movement will likely require some reconstruction. Because it is an historic resource of significance, any movement, exterior change, or reconstruction of the Apple Barn will require special review and approval by the County's Historic Resources Commission. Available technical information suggests that a minor change in location will not adversely affect the significance of the Apple Barn, given the condition of the surrounding setting. The Plan assumes that the small warehouse, a non-historic building adjacent to the Apple Barn, will be demolished. Any exterior changes must be sensitive to the historic

significance and architectural features of the building and any relocation must follow the Secretary of the Interior standards for relocation such that the NR 3 rating of the Apple Barn is not compromised.

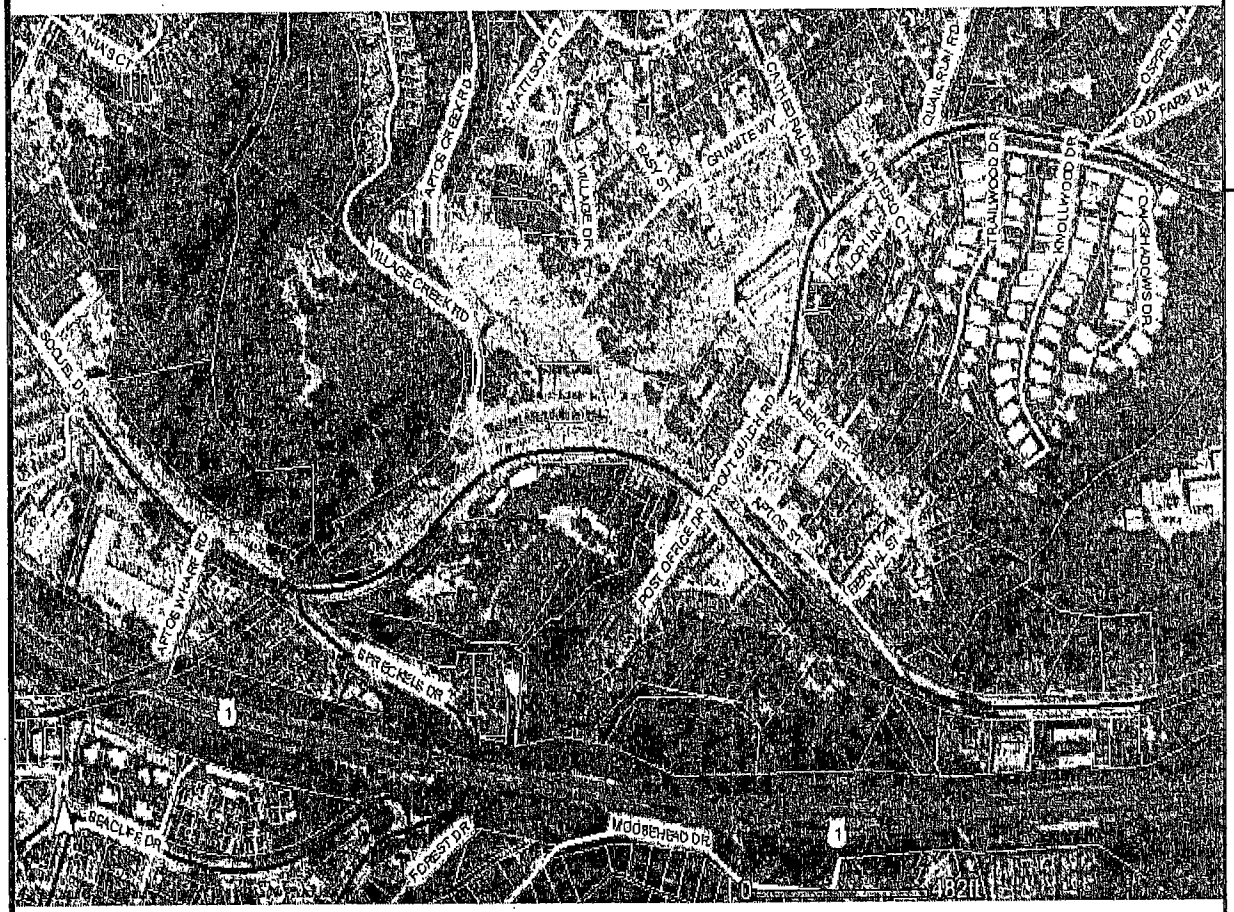
To facilitate the new north-south street and the development of additional buildings, the historic Aptos Firehouse/VFW Hall will need to be relocated within the Village Plan area. Technical studies have determined that a portion of the rear of the building has been added since its period of significance. This Plan assumes that this newer area will be removed to restore the structure to its more original size. Any exterior changes must be sensitive to the historic significance and architectural features of the building and any relocation must follow the Secretary of the Interior standards for relocation such that the NR 5 rating is not compromised. If relocated, the building must be located on a prominent street within the Village and present to the street in its current narrow-side configuration. Before moving this building, the County's Historic Resources Commission must approve the relocation and associated reconstruction work.

When future developers submit Historic Resource Preservation Plan applications to relocate the Apple Barn and/or Aptos Firehouse/VFW Hall, the Historic Resources Commission will determine if the relocations can be accomplished in a manner that preserves the buildings' historic integrity and NR ratings and impose appropriate conditions. If the Historic Resources Commission finds that this cannot be accomplished, the Aptos Village Plan will need to be amended to address the land use of the structures in their current location.

Finally, given the highest rating of historic significance assigned to the Bayview Hotel, any new structures built adjacent to that site must be reviewed by the Historic Resources Commission to ensure that they do not compromise the historic context of this very important historic resource and centerpiece to the character of the Village.

Figure 12 illustrates in one place the key elements proposed by this Chapter for the Village Core. In addition to new roadways and private and public open spaces, it suggests the likely relocation of historic structures and possible footprints for new residential, commercial and mixed-use buildings. Figures 23 & 24 in Chapter 6 provide more detailed requirements for these possible buildings.

# Exhibit G - Location Map



## Legend

**Legend**

Selected Features

Parcel (Assessor)

State Highways

STREETS

BR

MR

R

S

City Limits

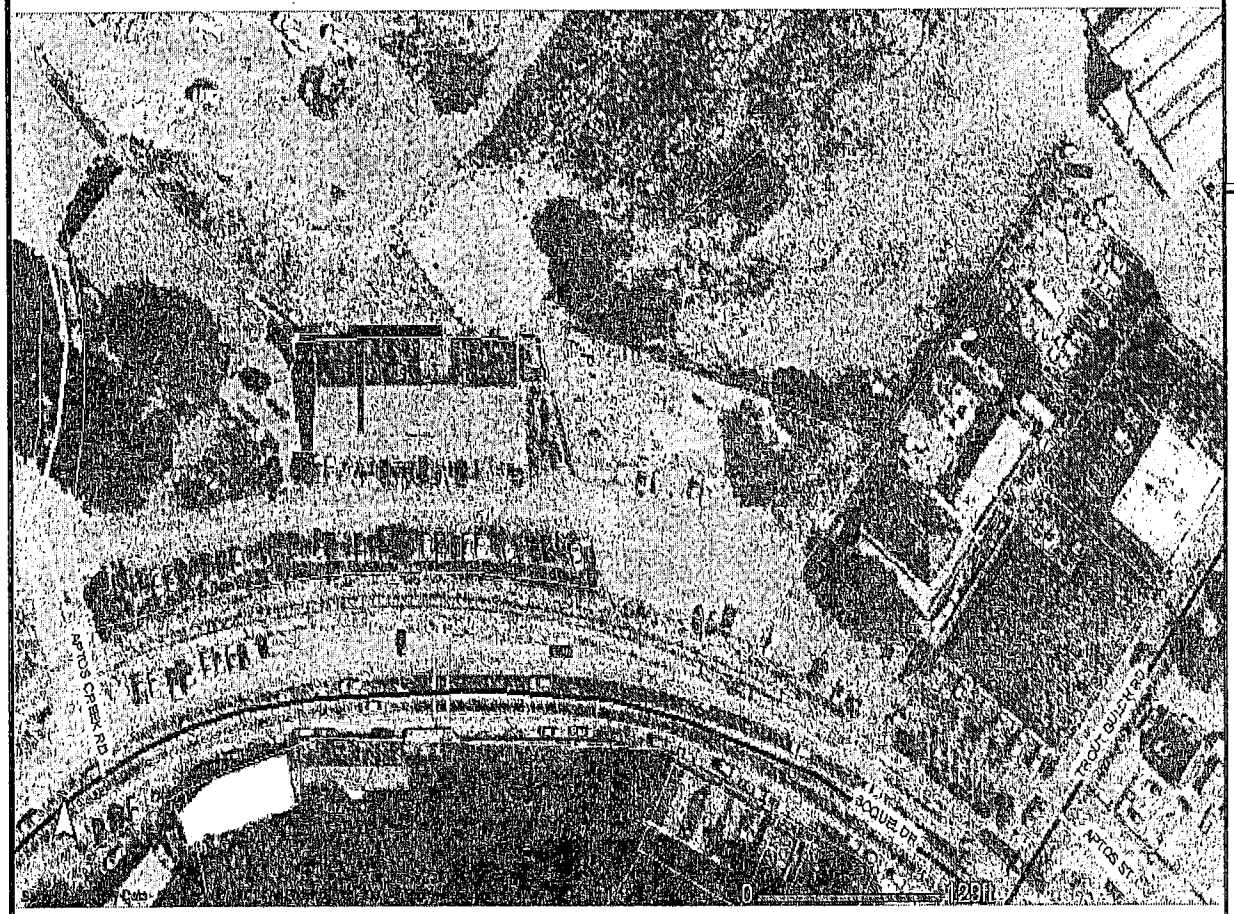
Santa Cruz County Boundary

3in 2007

1FT 2008

Map Output

# Exhibit H - Aerial Photograph




Overview

## Legend

Legend

Selected Features

Parcel (Assessor)

State Highways

STREETS

BR

MR

R

S

City Limits

Santa Cruz County Boundary

3in 2007

1FT 2008

EXHIBIT B

# APPLICATION FOR DEMOLITION OF AN HISTORICAL RESOURCE WITHOUT RECONSTRUCTION

Please complete this application regarding your proposed demolition project and call (831) 454-3111 to schedule an appointment to submit the application. An application for demolition of an historic resource without reconstruction requires review by the Historic Resources Commission and the Board of Supervisors. According to the Planning Department Fee Schedule the fee for this type of review is "at cost." The Fee Schedule states that "A deposit equal to 100 percent of the estimated processing cost shall be required at the time any application for an 'AT COST' project is submitted...." **The deposit for an application for demolition of an historical resource without reconstruction is $3,750.00, which is due upon application submittal.** Staff time is billed against the deposit.

**Please be clear, complete, and concise. This information, plus that listed on the application requirements sheet, will be used to evaluate your project. Use additional sheets if necessary.**
**FAILURE TO PROVIDE THE REQUIRED INFORMATION WILL DELAY THE PROCESSING OF YOUR APPLICATION.**

**Owner**
Name: Aptos Ventures, LLC
Address: 4375 Capitola Rd
Capitola, Ca 95010
Phone Number: 831-234-8554

**Applicant**
Name: Joe Appenrodt
Address: Same
Phone Number: Same

Assessor's Parcel Number(s): _____

Site Address: 8037 Soquel Dr, Aptos Ca 95003

Historic and/or Common Name: Firehouse / VFW

Present Use: Retail Store Space

1. Please explain the reason for the proposed demolition.

See Reports

**SANTA CRUZ COUNTY HISTORICAL RESOURCE PRESERVATION**
**PLAN APPLICATION FORM (con't)**

2. Please describe the proposed use of the site after demolition.

Part of the Aptos Village development

3. Please include all of the items on the list of required information with your application.
**Your application cannot be accepted without ALL of the required information.**

Signature of Owner or Authorized Agent

Date 4/12/11

# COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

Date: December 17, 2010

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

On December 10, 2010 a special inspection was performed by County Building Inspectors at 8037 Soquel Drive, Aptos CA 95003. The purpose of this inspection was to determine the structural integrity/condition of the structure and if it is a candidate for relocation and rehabilitation.

Previously, a structural evaluation was performed by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, resulting in the generation of a comprehensive and detailed report. This report addresses the existing overall conditions of the structure including; roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality, lacks a perimeter foundation, the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

The inspection and investigation performed by myself and Inspector Sean Livingston found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity. In addition, occupancy of this structure in its current state should be closely monitored as it is close to being considered structurally unsafe for use.

# COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

Date: June 21, 2011

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

A structural evaluation was performed on the building at 8037 Soquel Drive, Aptos, CA 95003 ("Aptos Firehouse") by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, which resulted in the generation of a comprehensive and detailed report. This report addressed the existing overall conditions of the structure including; roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality and lacks a perimeter foundation. His report points out that the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

On December 17, 2011, Inspector Sean Livingston and I conducted a thorough inspection and found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity.

At the request of the building owner concerned about the safety of the building, Mr. Willis performed an additional inspection on March 10th, 2011. At that time, Mr. Willis noted that due to the deficiencies and the deteriorated condition of the building, the building presented potential safety issues to the public.

On June 9th, 2011, a follow up inspection was initiated by the County. During that inspection, it was observed that the structure had been vacated by the tenant. Based upon the structural report by Mr. Willis and our inspections, I determined that the structure presents an imminent danger to the safety of occupants and should be red-tagged to prevent its use by another tenant. The structure was then posted with a dangerous and unsafe building placard to protect the public and future tenants from potential fire, seismic and structural hazards/dangers that this structure presents.

Rehabilitation of this structure would require complete replacement of the foundation, structural frame, outdated plumbing, electrical and mechanical systems, front porch and decking. We determined that the only potentially salvageable portion of the structure would be the old 16 gage corrugated siding and roofing material. Due to the age, lack of maintenance and degree of structural degradation, we determined that the relocation and/ or rehabilitation of this structure is not feasible.

REDWOOD ENGINEERING
716-A SOQUEL AVENUE, SANTA CRUZ, CA. (831) 426-8444

COPY

November 2, 2010

Mr. Pete Testorff
Mr. Joseph Appenrodt
Aptos Ventures, LLC

ATTN: JESSIE O'NEILL

Reference: Structural Evaluation of Existing Structure
8057 Soquel Drive, Aptos CA 95003

Mr. Testorff and Mr. Appenrodt,

At your request Redwood Engineering performed a site visit to the above-mentioned commercial building on September 20, 2010. The purpose of our visit was to evaluate the overall structural integrity of the existing structure to address the feasibility of moving and rehabilitating the structure. After discussion with the building owners and observation of the existing structure, it appears that this building is not a strong candidate for relocation or rehabilitation. The following items are noted:

1. Existing Overall Conditions: The existing structure appears to have originally been used as a storage or work shed, with several additions having been constructed at various times over the years. In it's current state the structure possesses an extremely low level of structural integrity; no continuity exists between horizontal or vertical framing members, no foundation is present, and no lateral bracing exists. All framing members that are visible from the exterior exhibit moderate to severe weather damage. Corrugated metal siding appears to be aged yet serviceable, although seams are not weather-tight. Roof insulation is visible from the exterior where closure pieces are missing. Rodent and insect infestation appears to be an ongoing problem. Roofing materials appear to be at the end of their service life.

2. Roof and Ceiling Structure: Roof consists of corrugated metal roofing over 2x purlins. These are supported by 2x4 rafters spaced randomly at 24 - 48" o.c. No ridge beam exists, and collar tie spacing is random. A front facade has been added at some time in the past, and it's roof framing exhibits severe degradation due to weather exposure.

3. Exterior and Interior Walls: Wall framing consists of 2x studs spaced at random intervals (approximately 24" o.c.). No continuous top or bottom plates exist. Wall finish is corrugated metal on the exterior, gypsum drywall on the interior.

4. Foundation and Floor Elements: Parts of the building rest on concrete slab, while the majority consists of framed floors resting on redwood mudsill. No perimeter footings exist. There is no connection of the walls to the bearing material.

5. Hazardous Materials: The possible existence of hazardous materials within the building has not been evaluated and is beyond the scope of this report. It is recommended that a licensed professional firm experienced in the identification and

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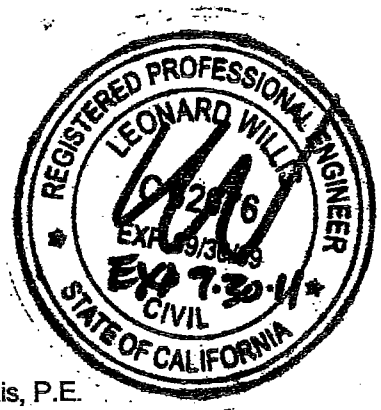
removal of such substances be consulted prior to demolition or removal of any materials thought to possibly contain hazardous materials.

6. Building Relocation: Due to the lack of structural continuity, relocation of the building structure to a new site is not feasible. No foundation or floor system will make lifting of the structure extremely difficult, requiring an almost complete dismantling of the building shell. After relocation, the same lack of structural integrity and continuity would still need to be addressed, as mentioned in item #1. Relocation would, in effect require construction of a new building with very little of the historic wood suitable for reuse. The building would be a reconstruction, not a historic resource.

In conclusion, the existing building structure is of marginal quality and has likely outlived it's service life. Structural elements have suffered years of water damage due to lack of flashing and waterproofing. The lack of perimeter foundation has contributed to structural settlement and foundation degradation. It seems unlikely that this structure would survive relocation efforts without a complete dismantling and reconstruction. In it's current state, the structure does not meet the current minimum code safety requirements; rehabilitation of the structure in it's current site would result in a complete reconstruction, prohibiting the re-use of any historic components.

Please feel free to contact me if you require further assistance.

Thank You,




Leonard Willis, P.E.
Redwood Engineering
CA P.E. #62076 exp. 09-30-11

Aus 264 0964

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March 22, 2011

Mr. Pete Testorff
Mr. Joseph Appenrodt
Aptos Ventures, LLC

Reference: Condition Report of Existing Structure
8057 Soquel Drive, Aptos CA 95003

Mr. Testorff and Mr. Appenrodt,

At your request Redwood Engineering performed several site visits to the above-mentioned commercial building between September 2010 and March 2011. The purpose of our visit was to initially evaluate the overall structural integrity of the existing structure and to address the feasibility of moving and rehabilitating the structure. After initial visits to the site and discussion with the building owners and local building officials, it was determined that the structure was in an extremely dilapidated state and not a candidate for relocation or rehabilitation.

A subsequent visit to the site was made on March 10, 2011 to specifically investigate the current structural integrity of the structure as it relates to the personal safety of it's occupants. After careful review, observation and analysis, the following items are noted:

1. Roof Framing:

The existing roof framing consists of 2x4 rafters spaced at approximately 4'-0" o.c. The results of engineering analysis suggest that these members are significantly over spanned for current code design loads of 20psf live load. No pressure blocking is present at bearing locations; rafters are free to "roll" and buckle when subjected to loads. Roofing consists of corrugated tin sheets spanning from the exterior walls to the ridge, with a purlin located at top, bottom, and approximately at mid-span. No other direct support is being provided to the roofing; sheet edges are not supported along edges parallel to roof framing. No roof diaphragm is present; tin roofing panels are not adequately connected to framing members or each other in a manner that would provide diaphragm action. The roof structure is such that it will likely not even safely support the weight of a maintenance worker.

2. Wall Framing:

Exterior and interior bearing walls are constructed from 2x4 studs spaced at approximately 24" o.c. A single top plate runs along the top of the wall framing; no splice has been provided at the plate joints or corners. The bottom of the studs are connected to a mudsill that is bearing directly on soil. The mudsill is in such a state of decay that size determination was not possible, and any connection that once existed between the studs and mudsill is now gone. No concrete foundation is present, therefore no connection of the building walls to the foundation exists. The wood studs are essentially "floating" at various points around the building perimeter, and do not provide support for ceiling and roof loads.

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3. Foundation System:

The original foundation system appears to have been provided by laying a redwood mudsill directly onto exposed native soils, which would provide an attachment point for the wall framing members. Currently the original mudsill exhibits extreme levels of decay; it's size could not be determined at the time of our investigation. Any bearing support that once might have existed has certainly eroded to near nothing at this point. The exterior wall studs are not bearing at many locations; the tin siding appears to be "bridging" between studs that are in contact with remnants of the original mudsill, or directly with exposed soils.

4. Lateral Force Resisting System:

The original building construction did not consider lateral bracing among it's requirements. No lateral bracing is present at this time, nor is there evidence that any was planned or provided in the past. Deficiencies (when compared to current building standards of practice) include: lack of roof diaphragm; lack of diaphragm transfer to supporting walls; lack of shear walls at all sides of structure; lack of connection between walls and foundation; lack of foundation to transmit lateral forces to soil.

5. Weatherproofing:

The exterior of the building has many openings at which wood framing is directly exposed to weather. The roof-to-wall intersection is of particular note; roof and ceiling joist ends are exposed and the top of the wall studs and to plate are visible. Years of exposure to water and insects has resulted in severe decay to some of these members. Also of note is the condition of the wall at the bottom; direct contact with exposed soils has resulted in significant decay at the bottom of these exterior load-carrying members. Additionally, exterior grading is such that soil levels along the east side are approximately 18" above the bottom of the wall studs.

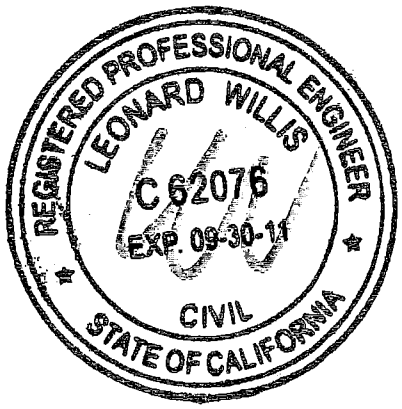
In conclusion, the existing building structure is of limited structural integrity and has likely outlived it's service life. From an engineering design standpoint, the building has no redeeming merit;: it is impossible to state that the structure will perform adequately to provide public safety when subjected to even the most moderate seismic or wind loads.

It should be taken into consideration that should the Building Official find it necessary to require that the structure be refurbished to current construction standards, the resultant structure would be a recreation, not a restoration.

Please feel free to contact me if you require further assistance.

REDWOOD ENGINEERING
716-A SOQUEL AVENUE, SANTA CRUZ, CA. (831) 426-8444

Thank You,




Leonard Willis, P.E.
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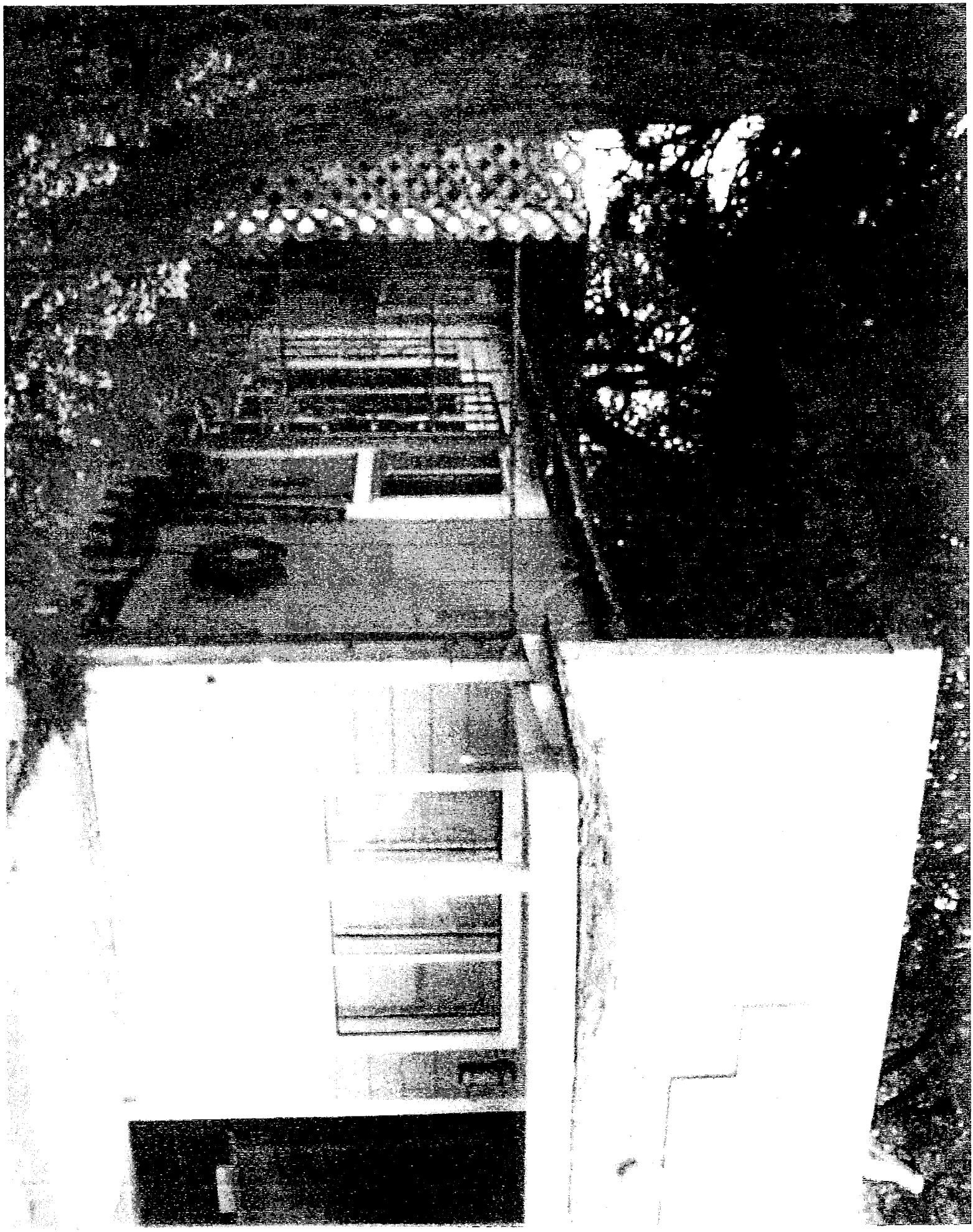
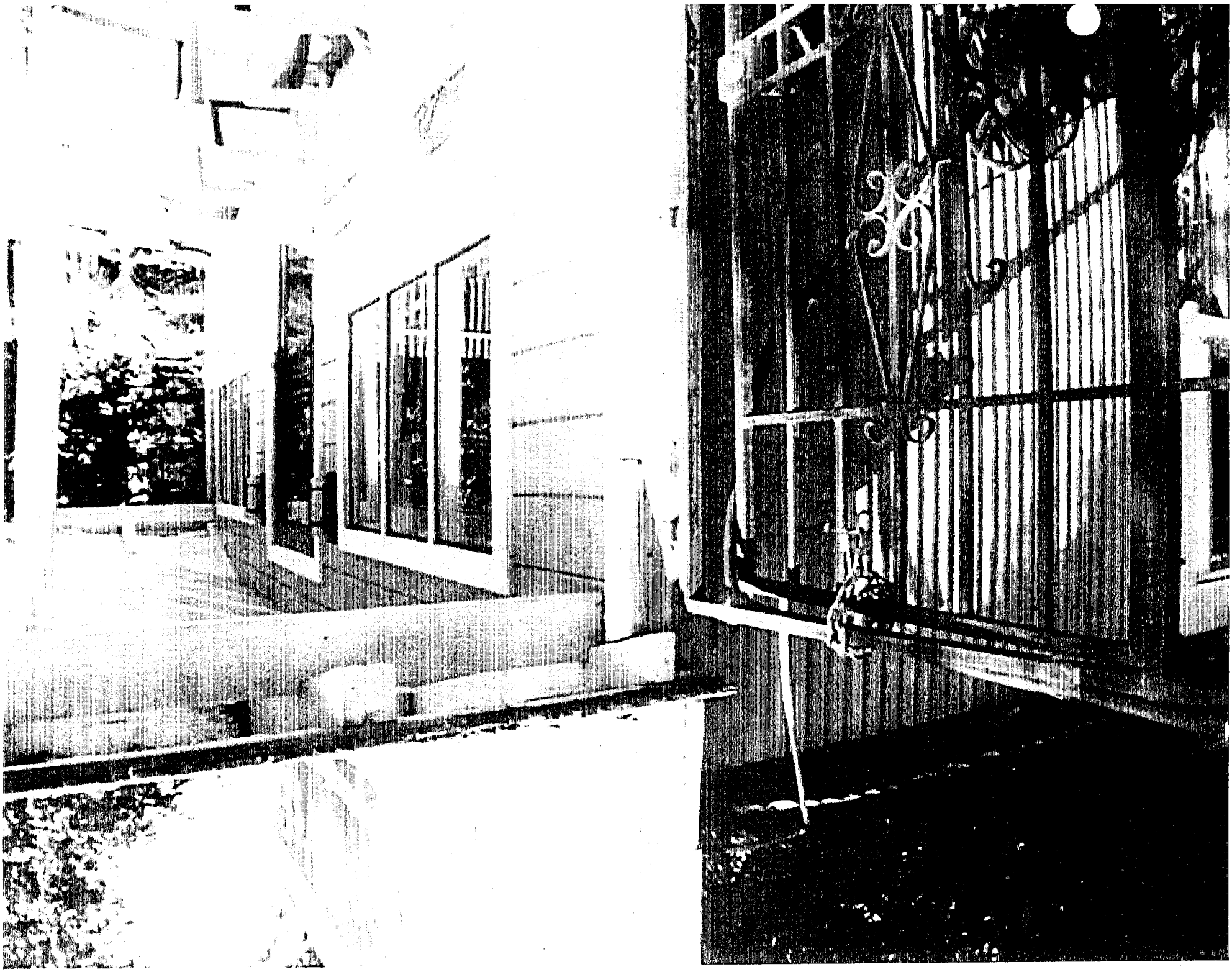
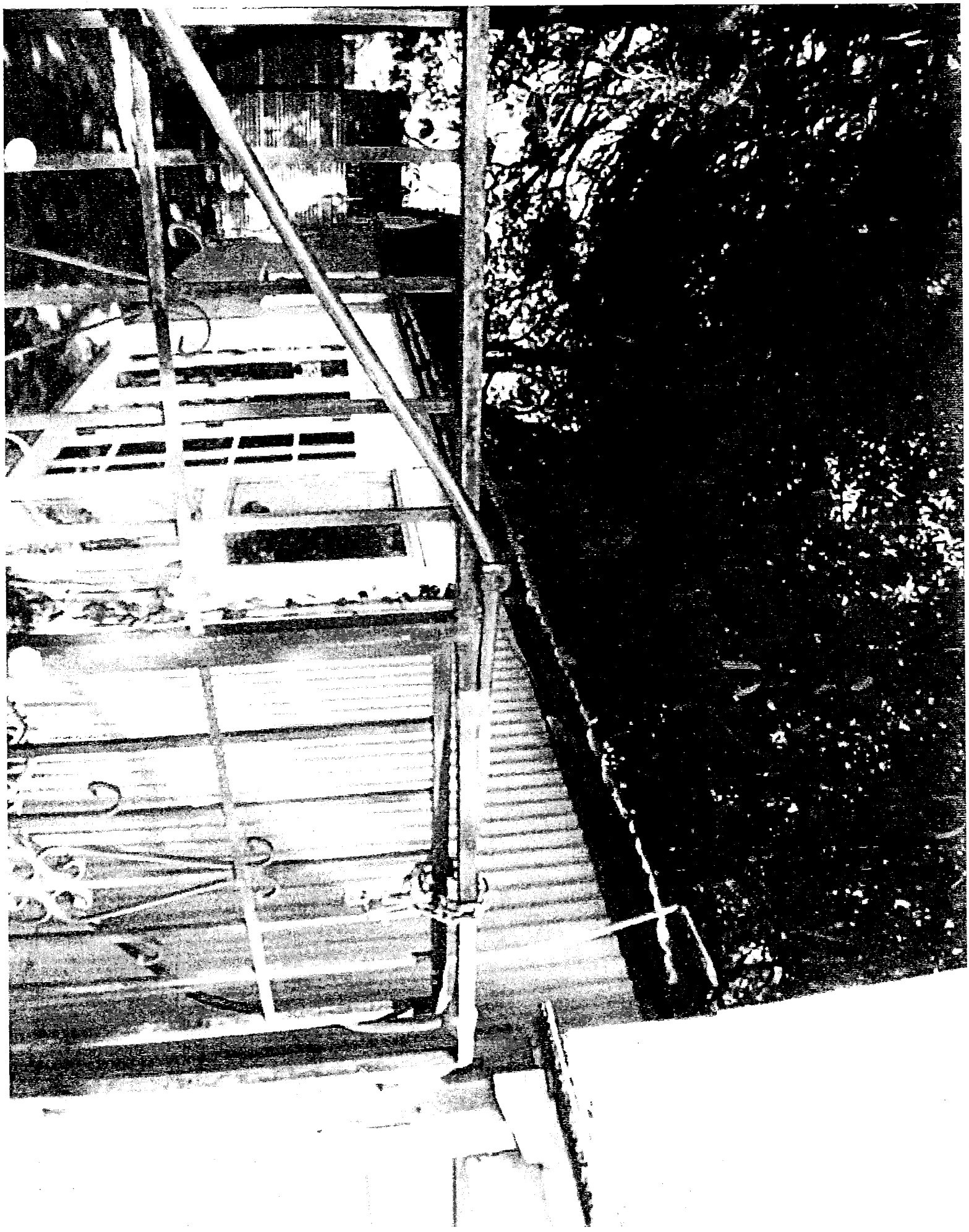
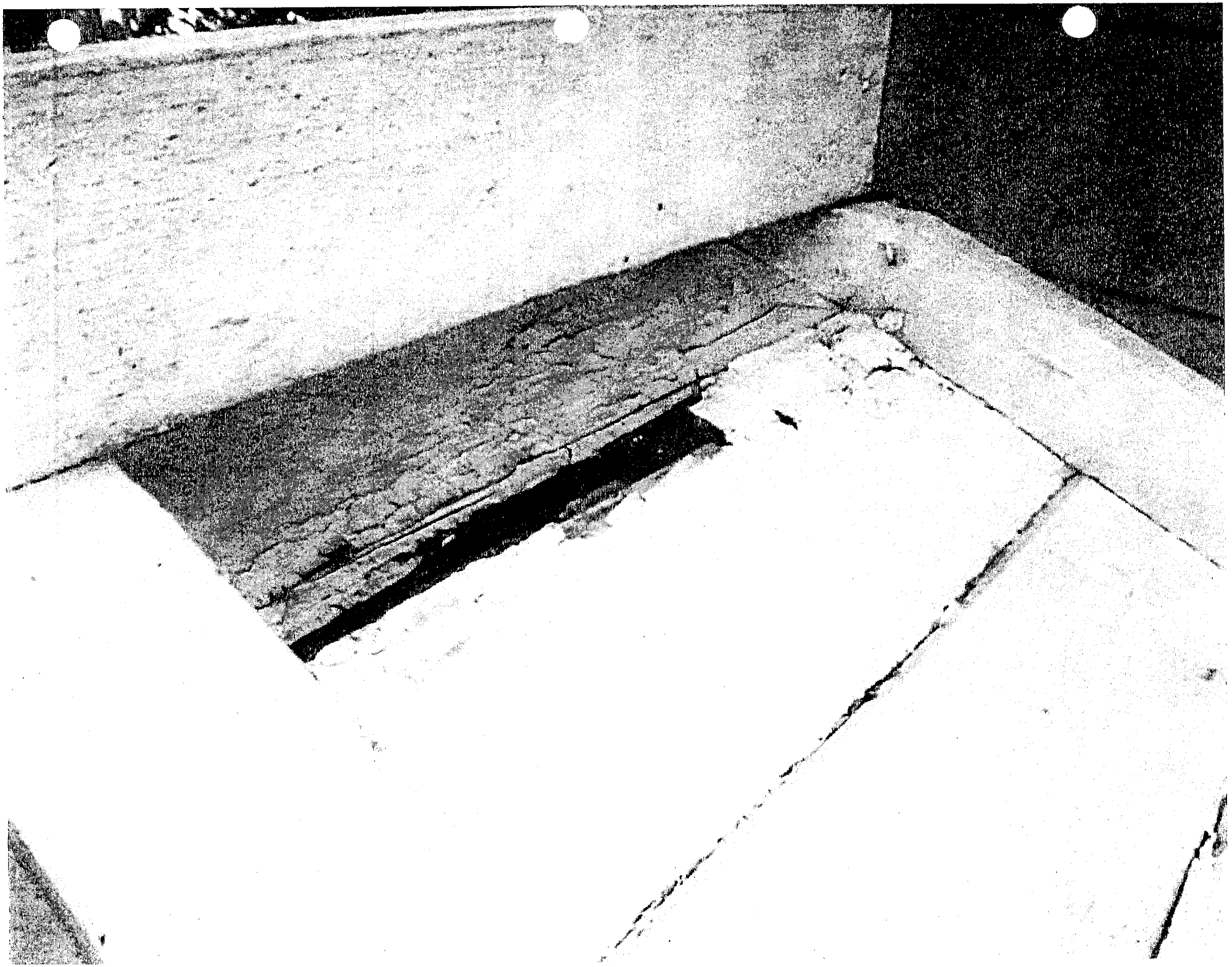
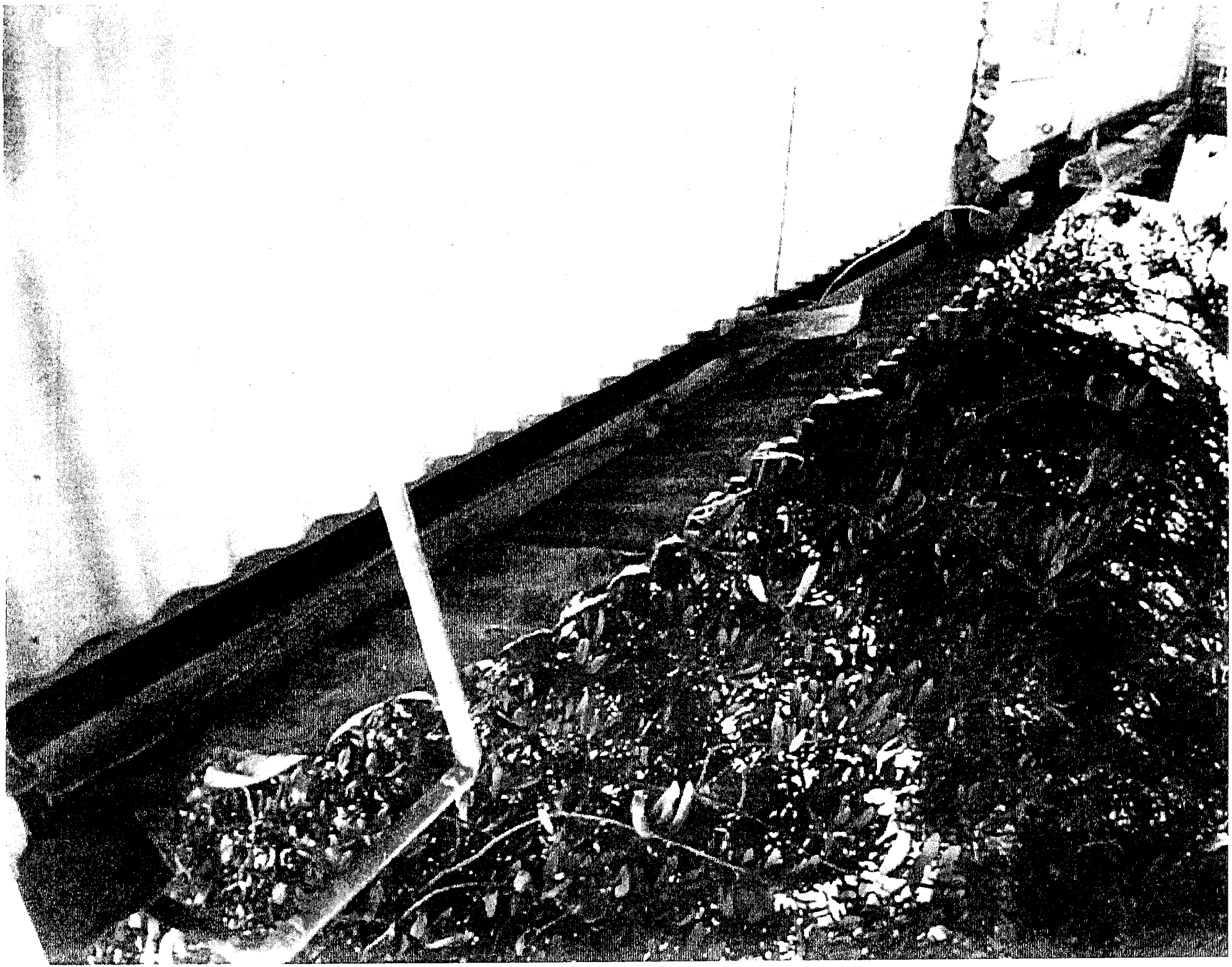
CA P.E. #62076 exp. 09-30-11

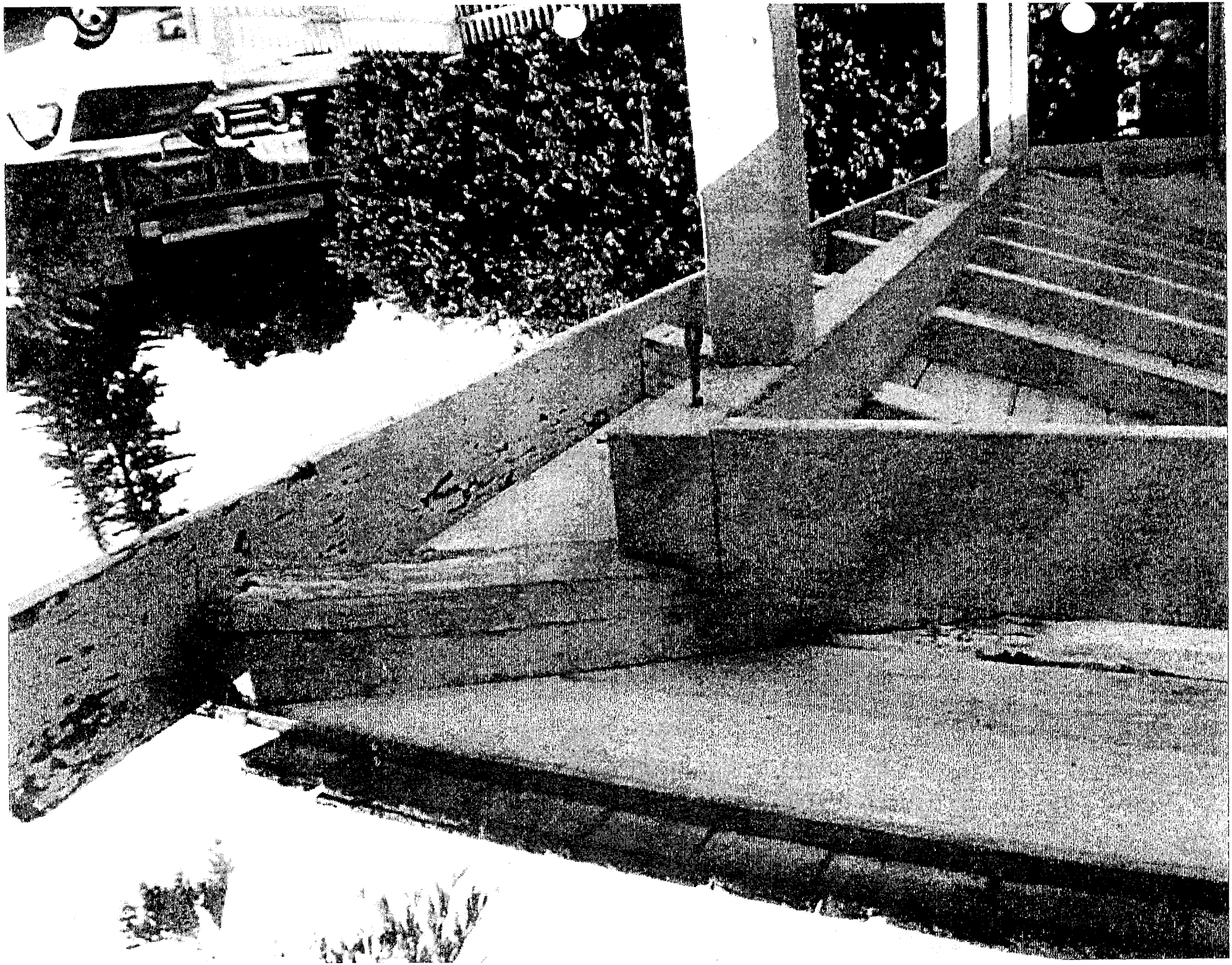












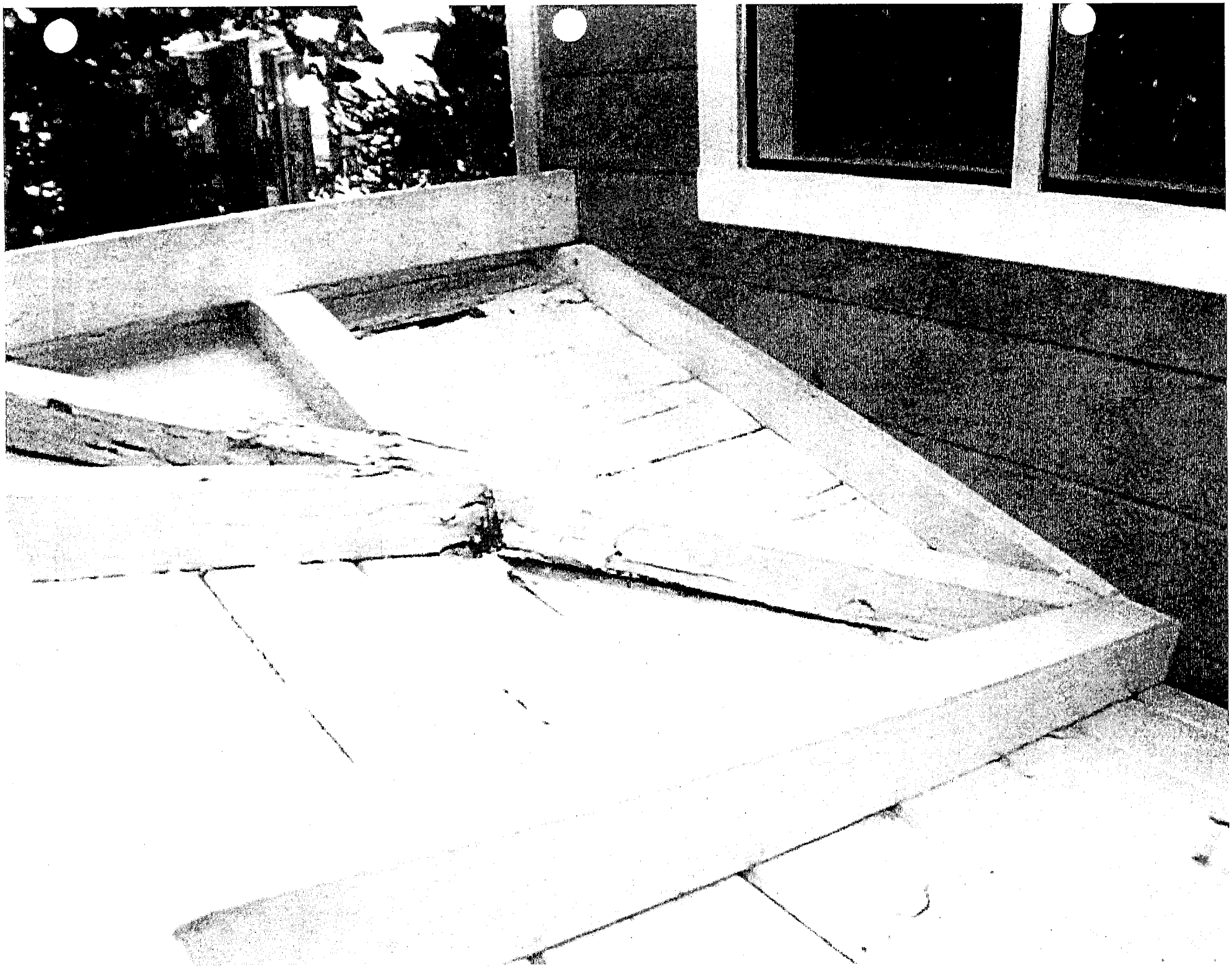


Exhibit C

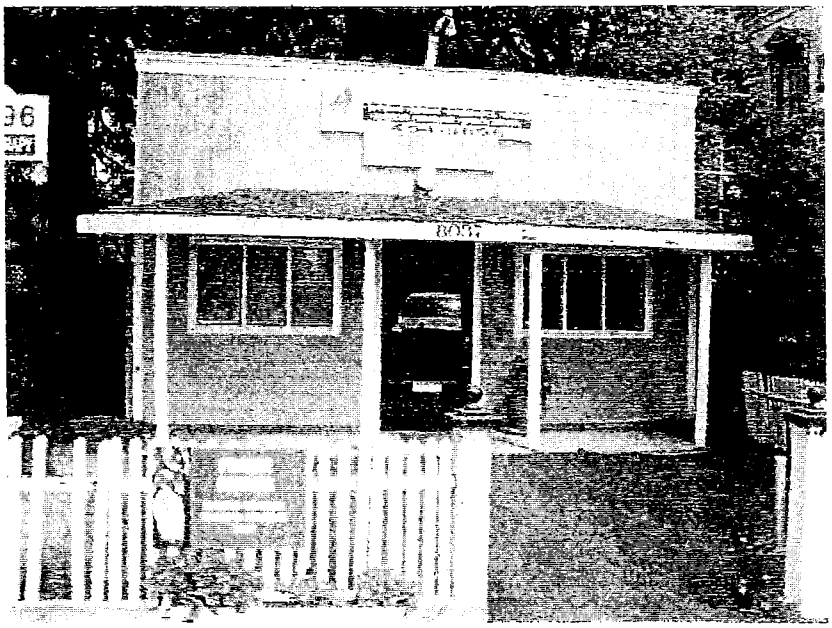
# Documentation Report

# The Former Aptos Firehouse/VFW Hall

# 8037 Soquel Drive
# Aptos, Santa Cruz County, California

## Supplement to an

## Application for Demolition



Prepared for use by: Santa Cruz County Planning Department
701 Ocean Street Fl 4
Santa Cruz, CA 95060

Prepared by: Urban Programmers
10710 Ridgeview Ave
San Jose CA 95127
408-254-7171

Date: July 8, 2011
Revised July 18, 2011

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| **Section V** | Permanent Display (SCC Section 16.42.060 (b)(i)) | 8 |
| **Section VI** | Recommendations | 9 |

**Appendix** 10

Exhibit A Redwood Engineering March 22, 2011

Exhibit B Special Inspection Report- County of Santa Cruz December

Exhibit C Dill Designs - Aptos Firehouse/VFW Hall DPR 523, March 7, 2003

Exhibit D Photographs

Exhibit E Secretary of the Interior's Standards for Rehabilitation

Exhibit F Secretary of the Interior's Standards for Reconstruction.

## Section 1 Introduction:

After adoption of the Aptos Village Plan in February of 2010, Barry Swenson Builder and Aptos Ventures, LLC (Joe Appenrodt), proposed a plan that would relocate two historic buildings as part of a reorganization of property to accommodate the approved circulation and land use contained in the plan. In compliance with the County code Section 16.42.060, the developers commissioned Urban Programmers to prepare the Historic Resources Preservation Plan encompassing the Hihn Apple Barn and the former Aptos Firehouse/VFW Hall which are proposed to be relocated and the Bayview Hotel, which although not part of the plan will have the setting altered by the proposed development. During the process of preparing a the Historic Resources Preservation Plan, structural reports were obtained for the two building that were proposed to be moved. A Historic Resources Preservation Plan was completed considering the relocation and new setting for the Hihn Apple Barn ; This also considered how the setting of the Bayview Hotel would be different amid new development. The structural report for the former Aptos Firehouse/VFW Hall was prepared by Leonard P. Willis P.E., of Redwood Engineering initially to provide a bracing plan for the relocation. However, the report showed building was poorly constructed and was described as severely deteriorated and in such fragile condition that it would not withstand relocation. [1] In addition to the report by Mr. Willis, the County code requires an inspection by the County Inspector to determine the structural integrity of historic buildings under consideration to be relocated or altered. After conducting and inspection Santa Cruz Building Official, Tony Falcone, concurred with Mr. Willis in finding the deterioration to be substantial and stated that any reuse would require reconstruction using new materials to meet current codes[2] On June 9, 2011, Mr. Falcone conducted a follow-up inspection which led to the building being identified as a dangerous building and was red-tagged to prevent any occupancy.[3]

If relocation and rehabilitation consistent with the Secretary of the Interior's Standards is not possible, the Aptos Village Plan provides the alternative to modify the Aptos Village Plan and circulation system and consider retaining and rehabilitating the building in place. However, it was stated in the structural report, that due to the extremely deteriorated condition any reuse of the building would require reconstruction to the level of a new building. [4]

---

[1] Redwood Engineering Structural Evaluation of Existing Structure, 80057 Soquel Drive, Aptos Ca 95003; 3/22/2011

[2] Santa Cruz County Special Inspection Report, December 17, 2010

[3] Santa Cruz County Special Inspection Report, June 21, 2011

[4] Redwood Engineering Structural Evaluation of Existing Structure, 80057 Soquel Drive, Aptos Ca 95003; 3/22/2011

The following report analyses the alternatives that have been reviewed with the Santa Cruz County Planning staff, and how they would affect the NR5 rating of the building and compliance with the County Code Sections, 16.42.060 and 16.42.050.

## Section II Relocation and Rehabilitation of the former Aptos Firehouse/VFW Hall

Section 16.42.060(b) of the Santa Cruz County Code requires that a historic documentation report be submitted for projects involving the demolition of an historic resource, which includes

1) Information which supports the claim that preservation is not feasible due to the deteriorated condition of the structure of object, or would create exceptional hardship, or is necessary to alleviate a dangerous condition

The NR5 rating for the former Aptos Firehouse/VFW Hall requires that all options to preserve the building be investigated and evaluated for feasibility and/or appropriateness.

As a component of the Historic Preservation Plan for the building, Mr. Joe Appenrodt, owner of the building, was asked to provide a report prepared by a licensed structural engineer to show a bracing plan to secure the building while it is being moved and an assessment of the structural work that would be necessary for the building to be reused for storage (the least demanding use that has been discussed). Leonard Willis, P.E. from Redwood Engineering provided information that the building was in very poor structural condition, and over-all it was in such deteriorated condition that it would not survive a move without dismantling the building. According to the report by Mr. Willis, reuse will require that the building be reconstructed with new materials, creating a new building. Bonnie Bamburg questioned Mr. Willis about his report and the extent of new material and contemporary methods of construction that he described explaining that this would not meet the criteria for conformance with the Secretary of the Interior's Standards for Rehabilitation and Rehabilitating Historic Buildings. Mr. Willis was adamant that the deteriorated condition of the materials and how they are used in the building left no choice but to rebuild the building if it is to me relocated or used for any purpose. According to Mr. Willis, only a small amount of the wood might be reused and the corrugated metal sheets could be reused. Subsequent to Mr. Willis' report the County Inspector confirmed the conclusions after an inspection on December 17, 2010. On June 9, 2011 County Building Official, Mr. Tony Falcone conducted a follow-up inspection. After that inspection he issued a memo on June 21, 2011 stating that the "the structure presents an imminent danger to the safety of occupants and should be red-tagged to prevent its use by another tenant". The letter report from Redwood Engineering may be found in the Appendix as Exhibit "A". The memo report from the Santa Cruz County Building Official 12/17/2010 is Exhibit "B" and the Memo Report 6/21/2011 is exhibit "C" in the Appendix.

The Secretary of the Interiors Standards for the Treatment of Historic Property, recognizes four treatments for historic buildings; Restoration, Preservation, Rehabilitation and Reconstruction. Because the former Aptos Firehouse/VFW Hall could not be rehabilitated in conformance with the "Standards" the other treatment to be considered is reconstruction. Reconstruction may be

considered as a treatment "when a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site ); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction. Reconstruction is considered appropriate when a significant historic building has been partially or completely demolished" Reconstruction requires the building be "accurately executed, in a suitable environment and presented in a dignified manner as part of a restoration master plan when no other building or structure with the same association has survived."[5] To meet the criteria of accuracy, it is necessary to have good quality photographs of all sides and features of the building or other documents that show how the building was constructed and how it looked during its period of significance. In the case of the former Aptos Firehouse/VFW Hall, complete photographs, architectural drawings or other documents describing the building prior to the structural report in 2010, have not been found.

Therefore, due to the lack of documentation from which to develop accurate reconstruction plans, the reconstruction could not be in conformance with the Secretary of the Interior's Standards.

Reconstructing the building as it is today with all the remodeling and mix of materials that are not part of its pre-1970 history, would create a new building with many elements of the 1970-2011 period of commercial use. This period is outside the "Period of Significance" and does not reflect important historic associations. Recreating architecture that is outside the "Period of Significance " would not meet the Secretary of the Interior's Standards for the Treatment of Historic Property.

Considering the deteriorated condition and lack of historical documentation the building would could not be rehabilitated or reconstructed in conformance with the "Standards" as required by the Aptos Village Plan.

The structural report and that of the special inspection by the county form the basis for the conclusion that for the former Aptos Firehouse/VFW Hall, there are no provisions to provide a safe and usable building within in the Secretary of the Interiors Standards for the Treatment of Historic Property. The County Building Inspector noted the building is close to being considered structurally unsafe for use, and if it were to be rehabilitated it would require "complete replacement of the; foundation, structural frame, plumbing, electrical and mechanical systems, roofing, front porch and decking. The only salvageable portion of the structure would be the old 16 gage corrugated siding."[6] Creating a new building that is not done in conformance with the "Standards for Reconstruction"[7] is false historicism and should not be undertaken. False historicism is denounced by the National Park Service, National Register of Historic Places and the California Office of Historic Preservation as confusing the public about our authentic history and diminishing the public's understanding of history.

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[5] Secretary of the Interior's Standards for Reconstructing Historic Buildings
http://www.nps.gov/hps/tps/standards/reconstruction.htm

[6] Santa Cruz County Special Inspection Report, December 17, 2010

[7] Department of the Interior, Secretary of the Interior' Standards for Reconstruction

## Section III. Aptos Village Plan:

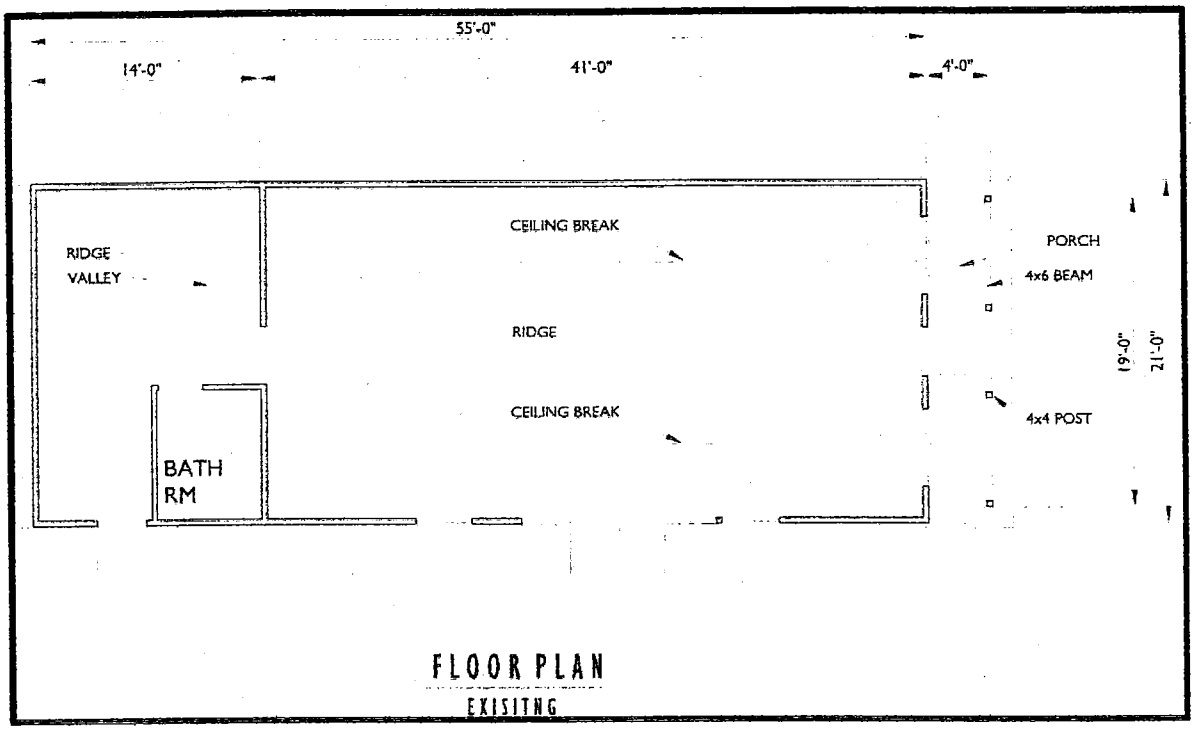
The Aptos Village Plan states on page 34 the following regarding relocation of historic buildings:

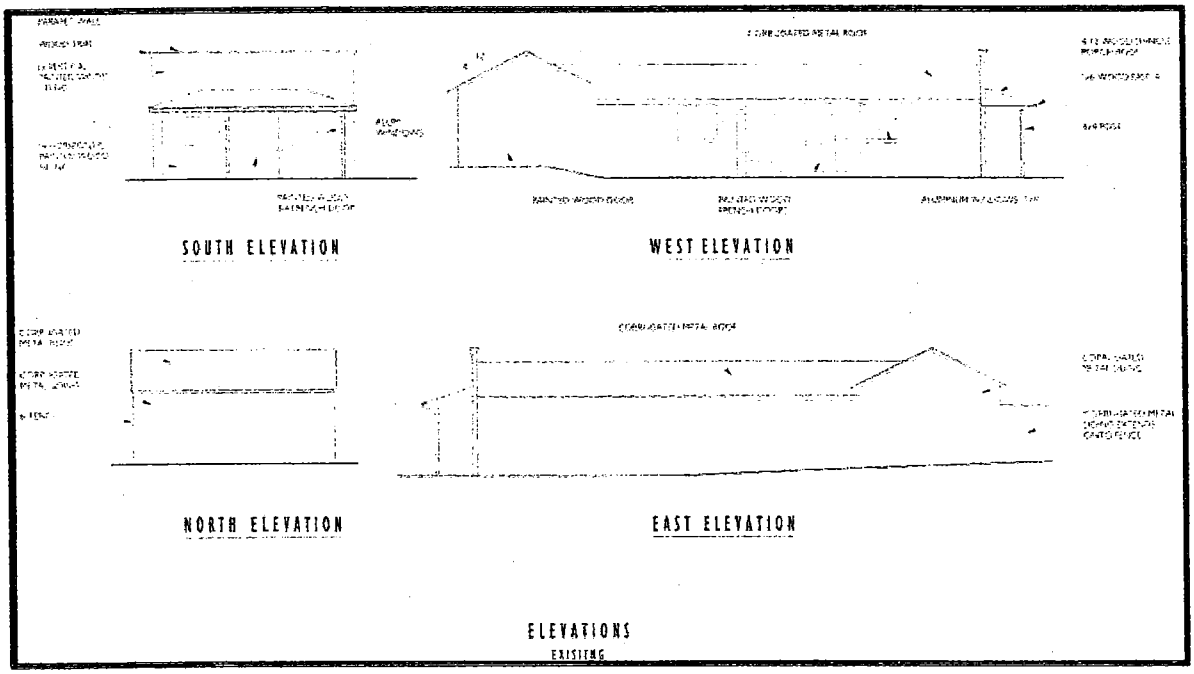
> *"When future developers submit Historic Resource Preservation Plan application to relocate the Apple Barn and/or Aptos Firehouse/VFW Hall, the Historic Resources Commission will determine if the relocations can be accomplished in a manner that preserves the buildings' historic integrity and NR ratings and impose appropriate conditions. If the Historic Resources Commission finds that this cannot be accomplished, the Aptos Village Plan will need to be amended to address the land use of the structures in their current location."* [8]

As written, the Aptos Village Plan does not consider the possibility that a building is too deteriorated to relocate and/or that rehabilitation would result in constructing a new building that does not meet the Secretary of the Interior's Standards. Amending the circulation plan to provide for a reconstructed building in the location of the former Aptos Firehouse/ VFW Hall does not seem to coincide with the intent of the plan. Given the circumstances, it appears that an amendment may be necessary to consider the severely deteriorated condition of the building.

[8] Aptos Village Plan, County of Santa Cruz, adopted February 27, 2010

**Existing floor plan and elevation drawings of the former Aptos Firehouse.VFW Hall**
**Source: Thacher & Thompson Architects prepared in 2010**



## Section IV. Offering Structure to be relocated

Santa Cruz Code Section 16.42.060 (C) Provisions to offer the structure to the general public for removal or dismantling for salvage at no cost or remuneration to the applicant. The availability of the structure shall be advertised by means of a 1/8 page display ad in a paper of general circulation in the County of Santa Cruz, at least twice during a thirty-day period. The advertisement shall include the address at which the structure proposed for demolition is located, information as to how arrangements can be made for relocation (through moving or dismantling) of the structure proposed for demolition, and the date after which a Demolition Permit may be issued. Evidence of this publication must be submitted prior to issuance of a Demolition Permit. This is not applicable to projects involving the relocation of the historic resource on the same site.

## Section V. Permanent Display

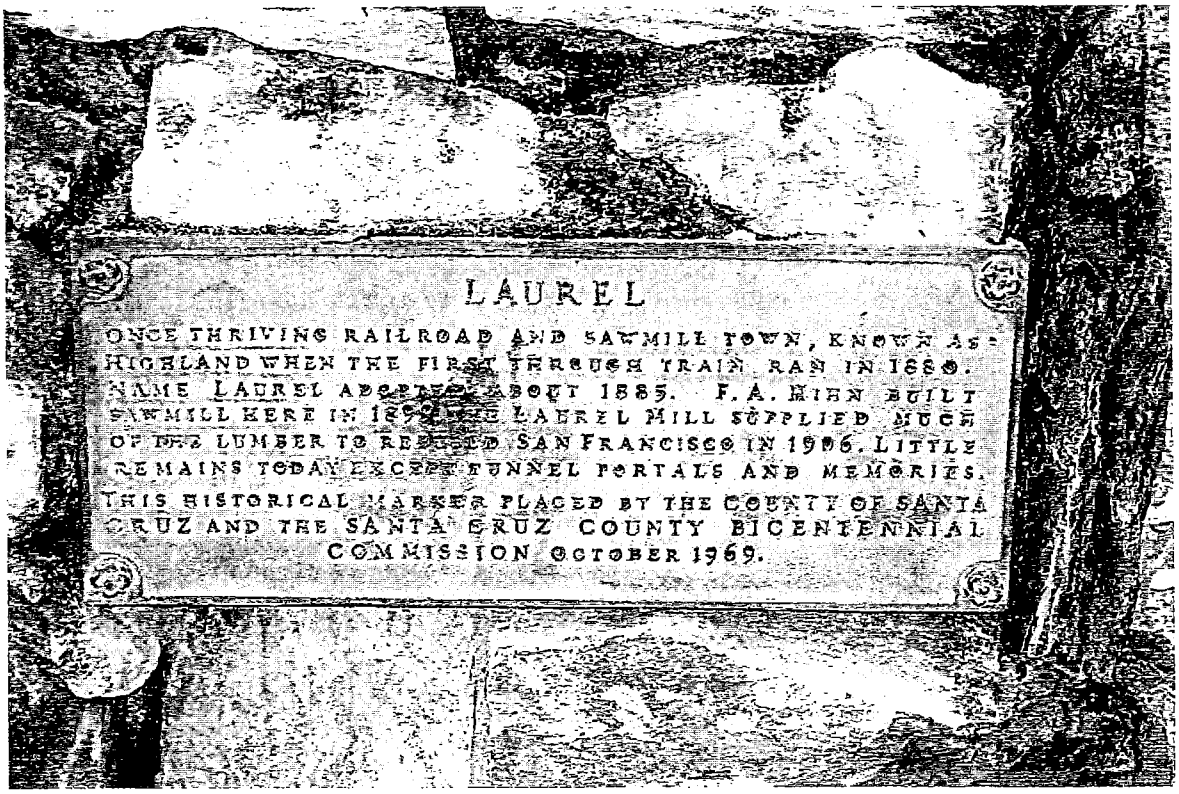
Santa Cruz County Code Section 16.42.060 (b) (ii) Provisions to preserve the historic values of the structure or object by documentation and/or preservation of artifacts and building materials.

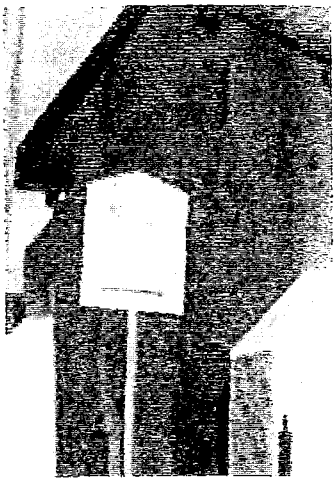
Conceptual Plans for a permanent display on site documenting the location of the building and including text and photographs explaining the history of the building and the role of the firehouse in the history of Aptos Village. Detailed plans for this display may be submitted prior to demolition of the structure.[9]

1. An office building with a lobby is proposed for the site. A permanent display will be included in the lobby. The display will be prepared by professionals with interpretative display experience and will describe the history of the building and its various uses.

2.An exterior sign will be included in the landscape plan in the location of the former Aptos Firehouse/VFW Hall. The sign will be compatible with other historical markers in Aptos or Santa Cruz County.

[9] Annie Murphy, memo to Bonnie Bamburg February 23, 2011



Examples of historical markers in Santa Cruz County.

Exhibit A

## Section VI. Recommendations:

1. Amend the Aptos Village Plan to include consideration for historic buildings that are severely deteriorated and cannot be relocated or rehabilitated in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Property.

2. The former Aptos Firehouse/VFW Hall should be documented in a photographic survey, keyed to the existing conditions architectural drawings with copies given to the Aptos Historical Museum and to the Santa Cruz County Planning Department.

3. The Aptos History Museum should be given architectural drawings to show the building as currently exists and copies of any drawings and reports prepared by Redwood Engineering

## APPENDIX

Exhibit A Redwood Engineering March 22, 2011

Exhibit B Special Inspection Report- County of Santa Cruz December 2010

Exhibit C Dill Designs - Aptos Firehouse/VFW Hall DPR 523, March 7, 2003

Exhibit D Inspection Report – County of Santa Cruz June 21, 2011

Exhibit E Photographs

Exhibit F Secretary of the Interior's Standards for Rehabilitation

Exhibit G Secretary of the Interior's Standards for Reconstruction.

REDWOOD ENGINEERING
716-A SOQUEL AVENUE SANTA CRUZ, CA. (831) 426-8444

March 22, 2011

Mr. Pete Testorff
Mr. Joseph Appenrodt
Aptos Ventures, LLC

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8057 Soquel Drive, Aptos CA 95003

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The existing roof framing consists of 2x4 rafters spaced at approximately 4'-0" o.c. The results of engineering analysis suggest that these members are significantly over spanned for current code design loads of 20psf live load. No pressure blocking is present at bearing locations; rafters are free to "roll" and buckle when subjected to loads. Roofing consists of corrugated tin sheets spanning from the exterior walls to the ridge, with a purlin located at top, bottom, and approximately at mid-span. No other direct support is being provided to the roofing; sheet edges are not supported along edges parallel to roof framing. No roof diaphragm is present; tin roofing panels are not adequately connected to framing members or each other in a manner that would provide diaphragm action. The roof structure is such that it will likely not even safely support the weight of a maintenance worker.

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The original foundation system appears to have been provided by laying a redwood mudsill directly onto exposed native soils, which would provide an attachment point for the wall framing members. Currently the original mudsill exhibits extreme levels of decay; it's size could not be determined at the time of our investigation. Any bearing support that once might have existed has certainly eroded to near nothing at this point. The exterior wall studs are not bearing at many locations; the tin siding appears to be "bridging" between studs that are in contact with remnants of the original mudsill, or directly with exposed soils.

4. Lateral Force Resisting System:

The original building construction did not consider lateral bracing among it's requirements. No lateral bracing is present at this time, nor is there evidence that any was planned or provided in the past. Deficiencies (when compared to current building standards of practice) include: lack of roof diaphragm; lack of diaphragm transfer to supporting walls; lack of shear walls at all sides of structure; lack of connection between walls and foundation; lack of foundation to transmit lateral forces to soil.

5. Weatherproofing:

The exterior of the building has many openings at which wood framing is directly exposed to weather. The roof-to-wall intersection is of particular note; roof and ceiling joist ends are exposed and the top of the wall studs and to plate are visible. Years of exposure to water and insects has resulted in severe decay to some of these members. Also of note is the condition of the wall at the bottom; direct contact with exposed soils has resulted in significant decay at the bottom of these exterior load-carrying members. Additionally, exterior grading is such that soil levels along the east side are approximately 18" above the bottom of the wall studs.

In conclusion, the existing building structure is of limited structural integrity and has likely outlived it's service life. From an engineering design standpoint, the building has no redeeming merit; it is impossible to state that the structure will perform adequately to provide public safety when subjected to even the most moderate seismic or wind loads.

It should be taken into consideration that should the Building Official find it necessary to require that the structure be refurbished to current construction standards, the resultant structure would be a recreation, not a restoration.

Please feel free to contact me if you require further assistance.

Thank You,

Leonard Willis, P.E.
Redwood Engineering
CA P.E. #62076 exp. 09-30-11

Exhibit B

# COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR

Date: December 17, 2010

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

On December 10, 2010 a special inspection was performed by County Building Inspectors at 8037 Soquel Drive, Aptos CA 95003. The purpose of this inspection was to determine the structural integrity/condition of the structure and if it is a candidate for relocation and rehabilitation.

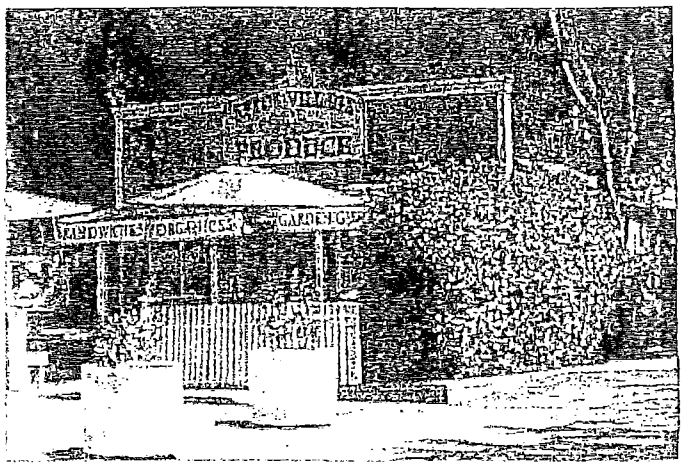
Previously, a structural evaluation was performed by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, resulting in the generation of a comprehensive and detailed report. This report addresses the existing overall conditions of the structure including: roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality, lacks a perimeter foundation, the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

The inspection and investigation performed by myself and Inspector Sean Livingston found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity. In addition, occupancy of this structure in its current state should be closely monitored as it is close to being considered structurally unsafe for use.

PRIMARY RECORD

NRHP Status Code 5



ATTACHMENT 5

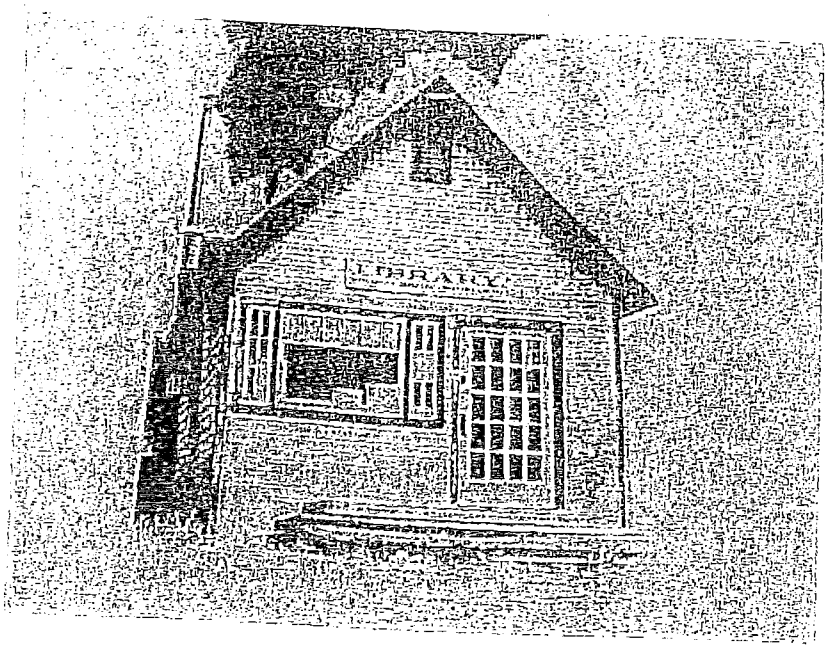


**Exhibit D**

County of Santa Cruz

**PLANNING DEPARTMENT**

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060

(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

Date: June 21, 2011

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

A structural evaluation was performed on the building at 8037 Soquel Drive, Aptos, CA 95003 ("Aptos Firehouse") by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, which resulted in the generation of a comprehensive and detailed report. This report addressed the existing overall conditions of the structure including; roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality and lacks a perimeter foundation. His report points out that the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

On December 17, 2011, Inspector Sean Livingston and I conducted a thorough inspection and found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity.

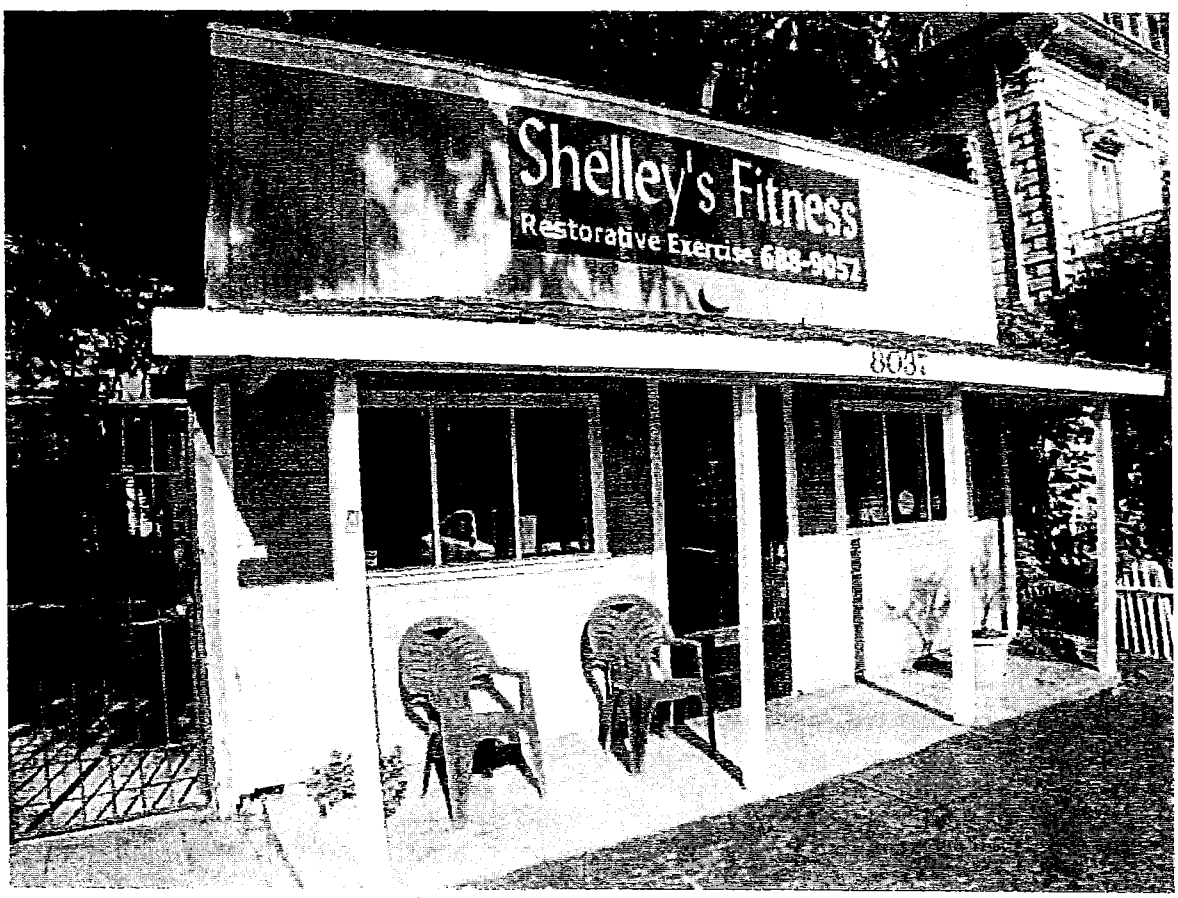
At the request of the building owner concerned about the safety of the building, Mr. Willis performed an additional inspection on March 10th, 2011. At that time, Mr. Willis noted that due to the deficiencies and the deteriorated condition of the building, the building presented potential safety issues to the public.

On June 9th, 2011, a follow up inspection was initiated by the County. During that inspection, it was observed that the structure had been vacated by the tenant. Based upon the structural report by Mr. Willis and our inspections, I determined that the structure presents an imminent danger to the safety of occupants and should be red-tagged to prevent its use by another tenant. The structure was then posted with a dangerous and unsafe building placard to protect the public and future tenants from potential fire, seismic and structural hazards/dangers that this structure presents.

Rehabilitation of this structure would require complete replacement of the foundation, structural frame, outdated plumbing, electrical and mechanical systems, front porch and decking. We determined that the only potentially salvageable portion of the structure would be the old 16 gage corrugated siding and roofing material. Due to the age, lack of maintenance and degree of structural degradation, we determined that the relocation and/ or rehabilitation of this structure is not feasible.

**Photograph: Front façade of the former Aptos Firehouse/VFW Hall**

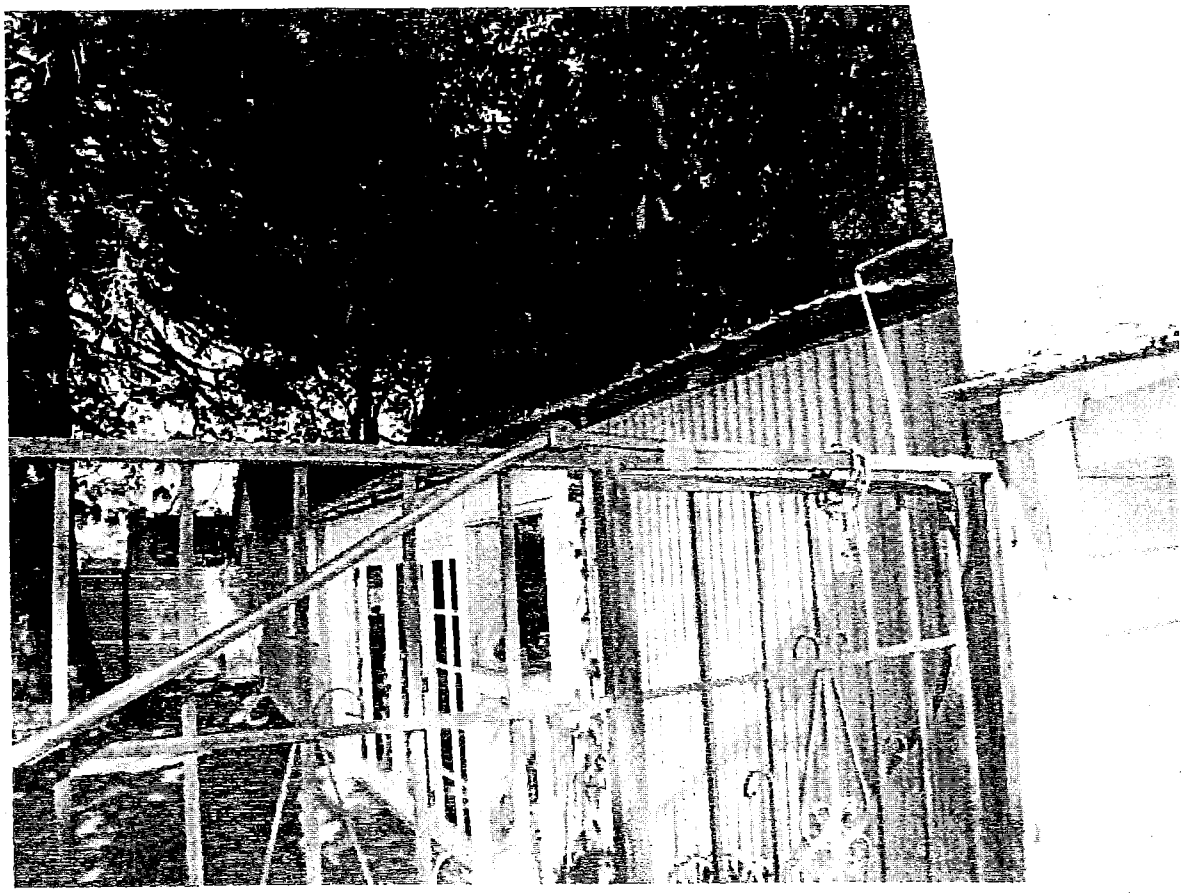
**Date: October 2010**



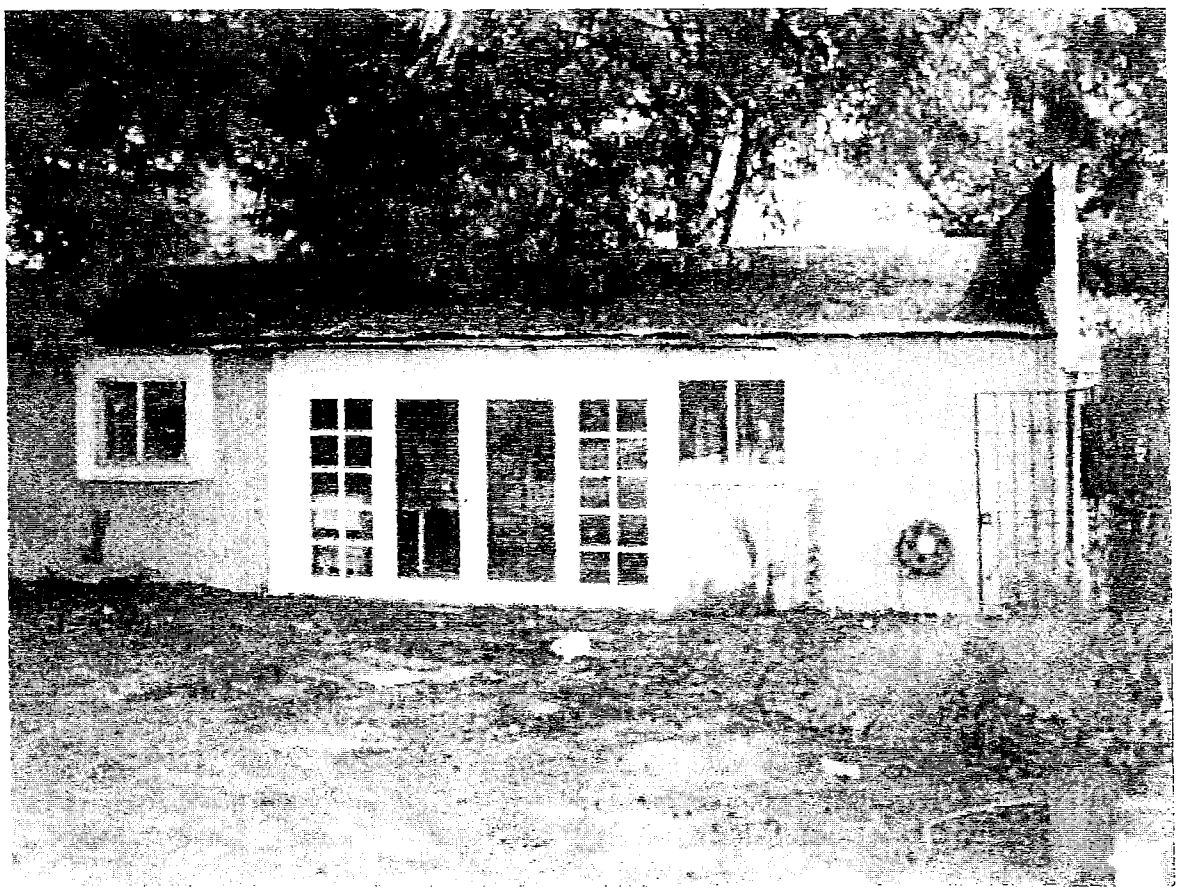

Note: Different orientation of wood boards between the building façade and the false front, replaced window systems, and door and the addition of a porch with a concrete slab.

**Photograph: Side of the former Aptos Firehouse/VFW Hall**

**Date: October 2010**



Note: Deteriorated materials and gaps between the roof and the frame of the building. The false front appears to be resting upon the bracing for the porch, indicating it was replaced sometime after the mid 1950's.



Note: mix of materials, wood to corrugated metal, replaced or created windows, double doors. The doors and windows are contemporary.

## Secretary of the Interior's Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Note: Prior to beginning rehabilitation plans, identify the character defining features to be protected, repaired or replaced. A feature is defined as an element of a building, cornice, porch, roof, windows, etc. When the extent of replacing historic material exceeds 60% it is likely that rehabilitation is not suitable.

## Secretary of the Interior's Standards for Reconstruction

**Reconstruction** is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture, and such reconstruction is essential to the public understanding of the property.

2. Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.

3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.

4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.

5. A reconstruction will be clearly identified as a contemporary re-creation.

6. Designs that were never executed historically will not be constructed.

## Guidelines:

## Research and Document Historical Significance

Guidance for the treatment Reconstruction begins with ***researching and documenting*** the building's historical significance to ascertain that its re-creation is essential to the public understanding of the property. Often, another extant historic building on the site or in a setting can adequately explain the property, together with other interpretive aids. Justifying a reconstruction requires detailed physical and documentary evidence to minimize or eliminate conjecture and ensure that the reconstruction is as accurate as possible. Only one period of significance is generally identified; a building, as it evolved, is rarely re-created. During this important fact-finding stage, if research does not provide adequate documentation for an accurate reconstruction, other interpretive methods should be considered, such as an explanatory marker.

The above was copied from the National Parks, Technical Preservation ServicesWebsite http://www.nps.gov/hps/tps/standards_guidelines.htm

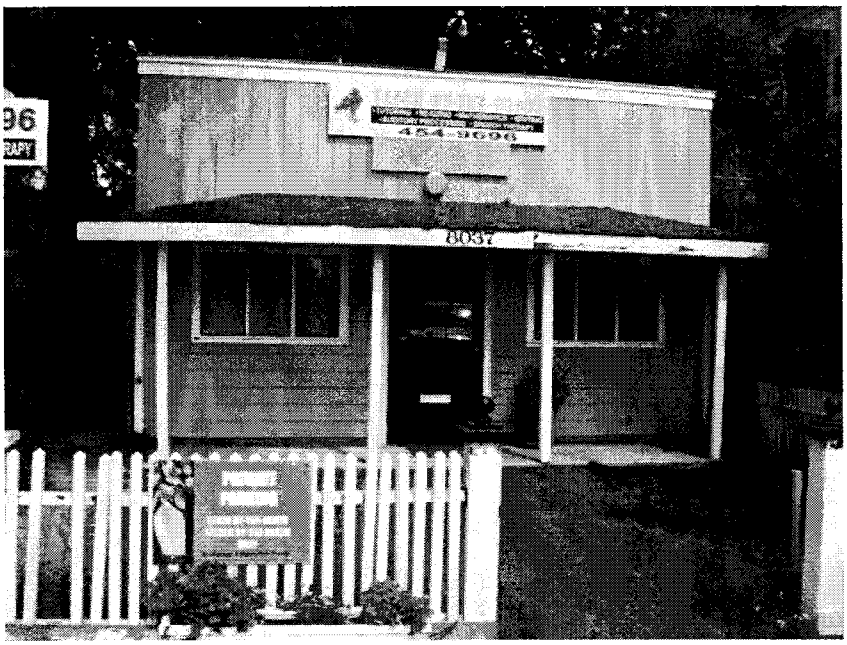
# Documentation Report

# The Former Aptos Firehouse/VFW Hall

# 8037 Soquel Drive
# Aptos, Santa Cruz County, California

## Supplement to an

## Application for Demolition




Prepared for use by: Santa Cruz County Planning Department
701 Ocean Street Fl 4
Santa Cruz, CA 95060

Prepared by: Urban Programmers
10710 Ridgeview Ave
San Jose CA 95127
408-254-7171

Date: July 8, 2011
Revised July 18, 2011

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**Appendix** 10

Exhibit A Redwood Engineering March 22, 2011

Exhibit B Special Inspection Report- County of Santa Cruz December

Exhibit C Dill Designs - Aptos Firehouse/VFW Hall DPR 523, March 7, 2003

Exhibit D Photographs

Exhibit E Secretary of the Interior's Standards for Rehabilitation

Exhibit F Secretary of the Interior's Standards for Reconstruction.

## Section 1 Introduction:

After adoption of the Aptos Village Plan in February of 2010, Barry Swenson Builder and Aptos Ventures, LLC (Joe Appenrodt), proposed a plan that would relocate two historic buildings as part of a reorganization of property to accommodate the approved circulation and land use contained in the plan. In compliance with the County code Section 16.42.060, the developers commissioned Urban Programmers to prepare the Historic Resources Preservation Plan encompassing the Hihn Apple Barn and the former Aptos Firehouse/VFW Hall which are proposed to be relocated and the Bayview Hotel, which although not part of the plan will have the setting altered by the proposed development. During the process of preparing a the Historic Resources Preservation Plan, structural reports were obtained for the two building that were proposed to be moved. A Historic Resources Preservation Plan was completed considering the relocation and new setting for the Hihn Apple Barn ; This also considered how the setting of the Bayview Hotel would be different amid new development. The structural report for the former Aptos Firehouse/VFW Hall was prepared by Leonard P. Willis P.E., of Redwood Engineering initially to provide a bracing plan for the relocation. However, the report showed building was poorly constructed and was described as severely deteriorated and in such fragile condition that it would not withstand relocation. [1] In addition to the report by Mr. Willis, the County code requires an inspection by the County Inspector to determine the structural integrity of historic buildings under consideration to be relocated or altered. After conducting and inspection Santa Cruz Building Official, Tony Falcone, concurred with Mr. Willis in finding the deterioration to be substantial and stated that any reuse would require reconstruction using new materials to meet current codes[2] On June 9, 2011, Mr. Falcone conducted a follow-up inspection which led to the building being identified as a dangerous building and was red-tagged to prevent any occupancy.[3]

If relocation and rehabilitation consistent with the Secretary of the Interior's Standards is not possible, the Aptos Village Plan provides the alternative to modify the Aptos Village Plan and circulation system and consider retaining and rehabilitating the building in place. However, it was stated in the structural report, that due to the extremely deteriorated condition any reuse of the building would require reconstruction to the level of a new building. [4]

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[1] Redwood Engineering Structural Evaluation of Existing Structure, 80057 Soquel Drive, Aptos Ca 95003; 3/22/2011

[2] Santa Cruz County Special Inspection Report, December 17, 2010

[3] Santa Cruz County Special Inspection Report, June 21, 2011

[4] Redwood Engineering Structural Evaluation of Existing Structure, 80057 Soquel Drive, Aptos Ca 95003; 3/22/2011

The following report analyses the alternatives that have been reviewed with the Santa Cruz County Planning staff, and how they would affect the NR5 rating of the building and compliance with the County Code Sections, 16.42.060 and 16.42.050.

## Section II Relocation and Rehabilitation of the former Aptos Firehouse/VFW Hall

Section 16.42.060(b) of the Santa Cruz County Code requires that a historic documentation report be submitted for projects involving the demolition of an historic resource, which includes

1) Information which supports the claim that preservation is not feasible due to the deteriorated condition of the structure of object, or would create exceptional hardship, or is necessary to alleviate a dangerous condition

The NR5 rating for the former Aptos Firehouse/VFW Hall requires that all options to preserve the building be investigated and evaluated for feasibility and/or appropriateness.

As a component of the Historic Preservation Plan for the building, Mr. Joe Appenrodt, owner of the building, was asked to provide a report prepared by a licensed structural engineer to show a bracing plan to secure the building while it is being moved and an assessment of the structural work that would be necessary for the building to be reused for storage (the least demanding use that has been discussed). Leonard Willis, P.E. from Redwood Engineering provided information that the building was in very poor structural condition, and over-all it was in such deteriorated condition that it would not survive a move without dismantling the building. According to the report by Mr. Willis, reuse will require that the building be reconstructed with new materials, creating a new building. Bonnie Bamburg questioned Mr. Willis about his report and the extent of new material and contemporary methods of construction that he described explaining that this would not meet the criteria for conformance with the Secretary of the Interior's Standards for Rehabilitation and Rehabilitating Historic Buildings. Mr. Willis was adamant that the deteriorated condition of the materials and how they are used in the building left no choice but to rebuild the building if it is to me relocated or used for any purpose. According to Mr. Willis, only a small amount of the wood might be reused and the corrugated metal sheets could be reused. Subsequent to Mr. Willis' report the County Inspector confirmed the conclusions after an inspection on December 17, 2010. On June 9, 2011 County Building Official, Mr. Tony Falcone conducted a follow-up inspection. After that inspection he issued a memo on June 21, 2011 stating that the "the structure presents an imminent danger to the safety of occupants and should be red-tagged to prevent its use by another tenant". The letter report from Redwood Engineering may be found in the Appendix as Exhibit "A". The memo report from the Santa Cruz County Building Official 12/17/2010 is Exhibit "B" and the Memo Report 6/21/2011 is exhibit "C" in the Appendix.

The Secretary of the Interiors Standards for the Treatment of Historic Property, recognizes four treatments for historic buildings; Restoration, Preservation, Rehabilitation and Reconstruction. Because the former Aptos Firehouse/VFW Hall could not be rehabilitated in conformance with the "Standards" the other treatment to be considered is reconstruction. Reconstruction may be

considered as a treatment "when a contemporary depiction is required to understand and interpret a property's historic value (including the re-creation of missing components in a historic district or site ); when no other property with the same associative value has survived; and when sufficient historical documentation exists to ensure an accurate reproduction. Reconstruction is considered appropriate when a significant historic building has been partially or completely demolished" Reconstruction requires the building be "accurately executed, in a suitable environment and presented in a dignified manner as part of a restoration master plan when no other building or structure with the same association has survived."[5] To meet the criteria of accuracy, it is necessary to have good quality photographs of all sides and features of the building or other documents that show how the building was constructed and how it looked during its period of significance. In the case of the former Aptos Firehouse/VFW Hall, complete photographs, architectural drawings or other documents describing the building prior to the structural report in 2010, have not been found.

Therefore, due to the lack of documentation from which to develop accurate reconstruction plans, the reconstruction could not be in conformance with the Secretary of the Interior's Standards.

Reconstructing the building as it is today with all the remodeling and mix of materials that are not part of its pre-1970 history, would create a new building with many elements of the 1970-2011 period of commercial use. This period is outside the "Period of Significance" and does not reflect important historic associations. Recreating architecture that is outside the "Period of Significance " would not meet the Secretary of the Interior's Standards for the Treatment of Historic Property.

Considering the deteriorated condition and lack of historical documentation the building would could not be rehabilitated or reconstructed in conformance with the "Standards" as required by the Aptos Village Plan.

The structural report and that of the special inspection by the county form the basis for the conclusion that for the former Aptos Firehouse/VFW Hall, there are no provisions to provide a safe and usable building within in the Secretary of the Interiors Standards for the Treatment of Historic Property. The County Building Inspector noted the building is close to being considered structurally unsafe for use, and if it were to be rehabilitated it would require "complete replacement of the; foundation, structural frame, plumbing, electrical and mechanical systems, roofing, front porch and decking. The only salvageable portion of the structure would be the old 16 gage corrugated siding."[6] Creating a new building that is not done in conformance with the "Standards for Reconstruction"[7] is false historicism and should not be undertaken. False historicism is denounced by the National Park Service, National Register of Historic Places and the California Office of Historic Preservation as confusing the public about our authentic history and diminishing the public's understanding of history.

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[5]Secretary of the Interior's Standards for Reconstructing Historic Buildings
http://www.nps.gov/hps/tps/standards/reconstruction.htm

[6] Santa Cruz County Special Inspection Report, December 17, 2010

[7] Department of the Interior, Secretary of the Interior' Standards for Reconstruction

## Section III. Aptos Village Plan:

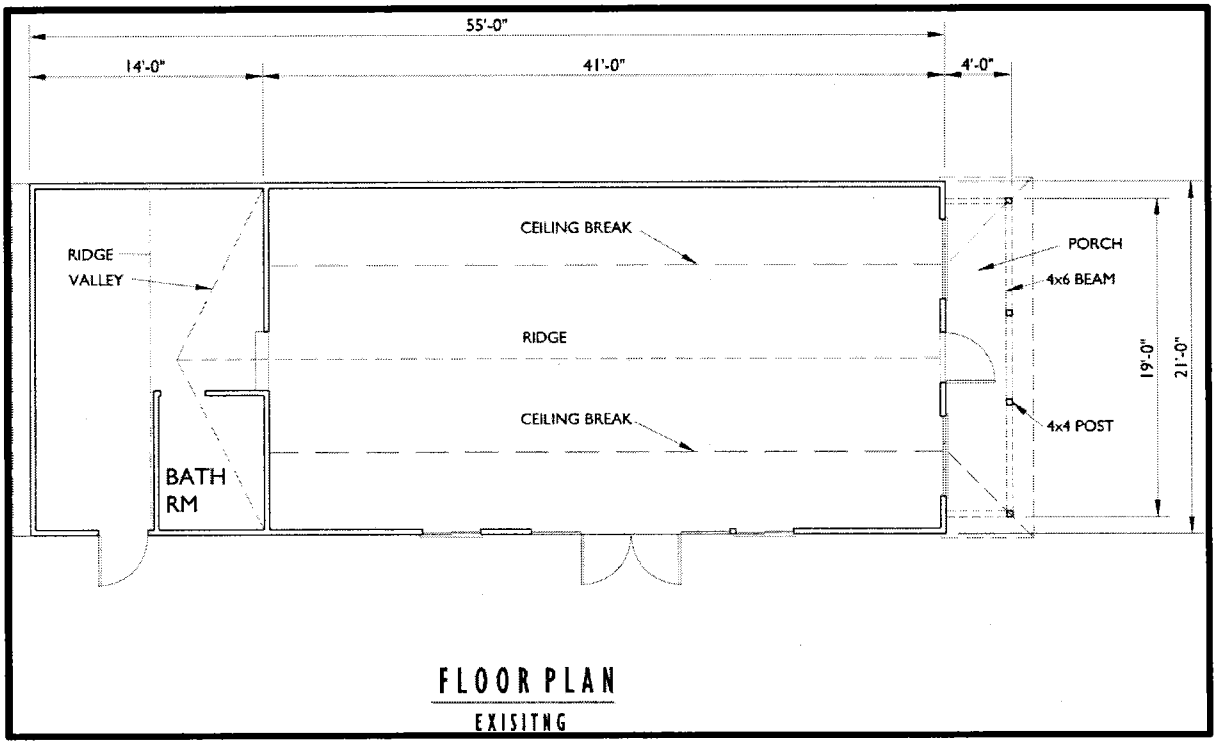
The Aptos Village Plan states on page 34 the following regarding relocation of historic buildings:

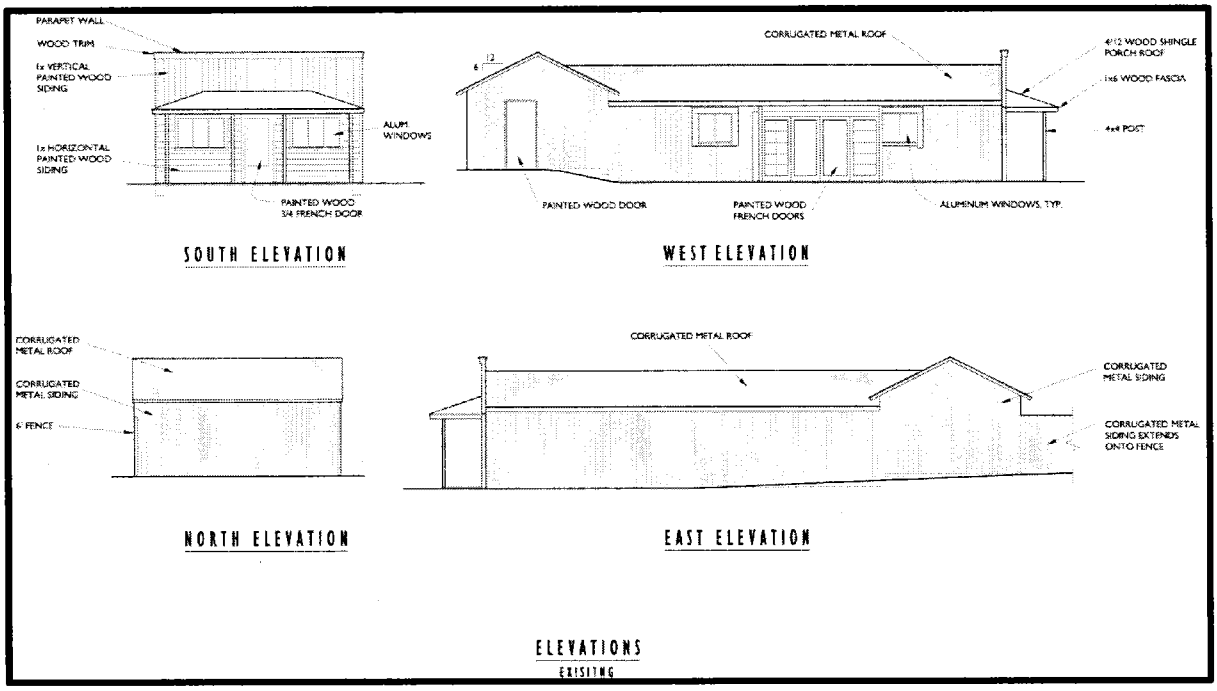
> *"When future developers submit Historic Resource Preservation Plan application to relocate the Apple Barn and/or Aptos Firehouse/VFW Hall, the Historic Resources Commission will determine if the relocations can be accomplished in a manner that preserves the buildings' historic integrity and NR ratings and impose appropriate conditions. If the Historic Resources Commission finds that this cannot be accomplished, the Aptos Village Plan will need to be amended to address the land use of the structures in their current location."* [8]

As written, the Aptos Village Plan does not consider the possibility that a building is too deteriorated to relocate and/or that rehabilitation would result in constructing a new building that does not meet the Secretary of the Interior's Standards. Amending the circulation plan to provide for a reconstructed building in the location of the former Aptos Firehouse/ VFW Hall does not seem to coincide with the intent of the plan. Given the circumstances, it appears that an amendment may be necessary to consider the severely deteriorated condition of the building.

[8] Aptos Village Plan, County of Santa Cruz, adopted February 27, 2010

**Existing floor plan and elevation drawings of the former Aptos Firehouse.VFW Hall**
**Source: Thacher & Thompson Architects prepared in 2010**



## Section IV. Offering Structure to be relocated

Santa Cruz Code Section 16.42.060 (C) Provisions to offer the structure to the general public for removal or dismantling for salvage at no cost or remuneration to the applicant. The availability of the structure shall be advertised by means of a 1/8 page display ad in a paper of general circulation in the County of Santa Cruz, at least twice during a thirty-day period. The advertisement shall include the address at which the structure proposed for demolition is located, information as to how arrangements can be made for relocation (through moving or dismantling) of the structure proposed for demolition, and the date after which a Demolition Permit may be issued. Evidence of this publication must be submitted prior to issuance of a Demolition Permit. This is not applicable to projects involving the relocation of the historic resource on the same site.

## Section V. Permanent Display

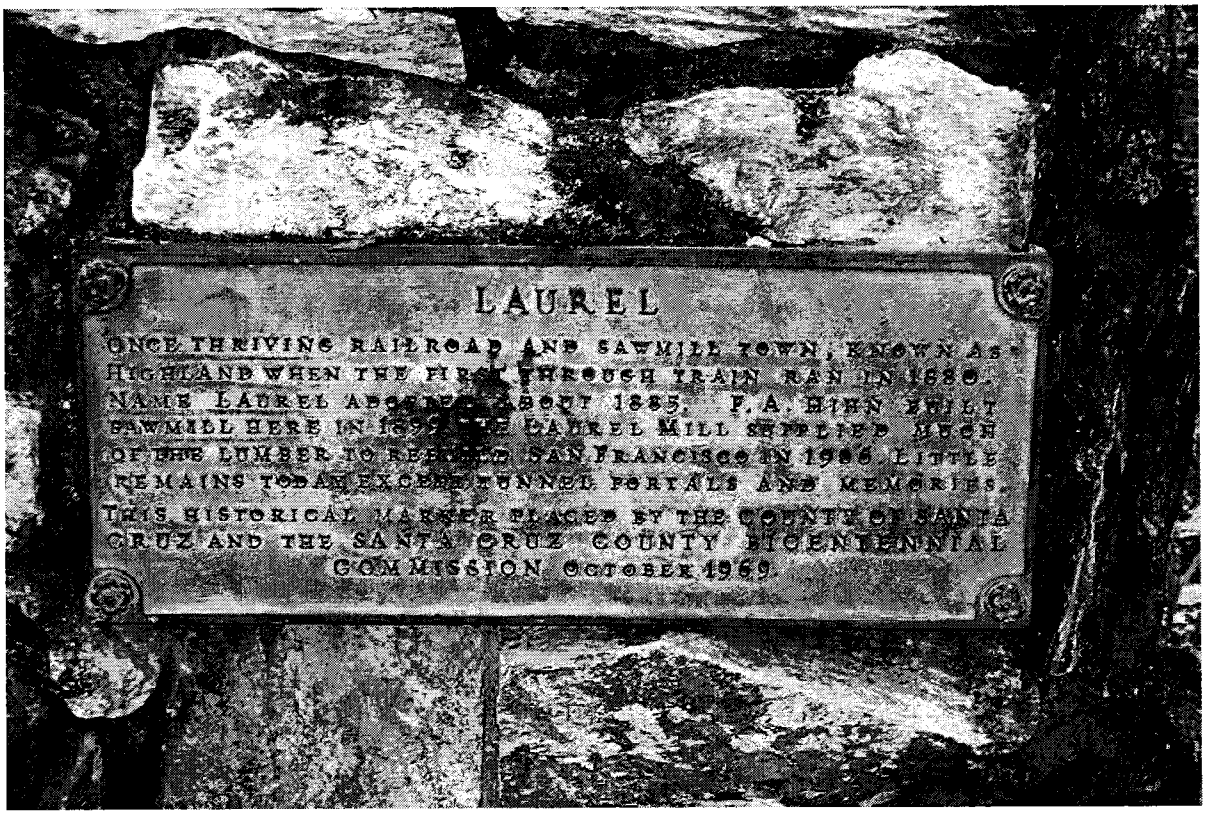
Santa Cruz County Code Section 16.42.060 (b) (ii) Provisions to preserve the historic values of the structure or object by documentation and/or preservation of artifacts and building materials.

Conceptual Plans for a permanent display on site documenting the location of the building and including text and photographs explaining the history of the building and the role of the firehouse in the history of Aptos Village. Detailed plans for this display may be submitted prior to demolition of the structure.[9]

1. An office building with a lobby is proposed for the site. A permanent display will be included in the lobby. The display will be prepared by professionals with interpretative display experience and will describe the history of the building and its various uses.

2.An exterior sign will be included in the landscape plan in the location of the former Aptos Firehouse/VFW Hall. The sign will be compatible with other historical markers in Aptos or Santa Cruz County.

[9] Annie Murphy, memo to Bonnie Bamburg February 23, 2011



Examples of historical markers in Santa Cruz County.

Exhibit A

## Section VI. Recommendations:

1. Amend the Aptos Village Plan to include consideration for historic buildings that are severely deteriorated and cannot be relocated or rehabilitated in conformance with the Secretary of the Interior's Standards for the Treatment of Historic Property.

2. The former Aptos Firehouse/VFW Hall should be documented in a photographic survey, keyed to the existing conditions architectural drawings with copies given to the Aptos Historical Museum and to the Santa Cruz County Planning Department.

3. The Aptos History Museum should be given architectural drawings to show the building as currently exists and copies of any drawings and reports prepared by Redwood Engineering

## APPENDIX

Exhibit A Redwood Engineering March 22, 2011

Exhibit B Special Inspection Report- County of Santa Cruz December 2010

Exhibit C Dill Designs - Aptos Firehouse/VFW Hall DPR 523, March 7, 2003

Exhibit D Inspection Report – County of Santa Cruz June 21, 2011

Exhibit E Photographs

Exhibit F Secretary of the Interior's Standards for Rehabilitation

Exhibit G Secretary of the Interior's Standards for Reconstruction.

REDWOOD ENGINEERING
716-A SOQUEL AVENUE, SANTA CRUZ, CA. (831) 426-8444

March 22, 2011

Mr. Pete Testorff
Mr. Joseph Appenrodt
Aptos Ventures, LLC

Reference: Condition Report of Existing Structure
8057 Soquel Drive, Aptos CA 95003

Mr. Testorff and Mr. Appenrodt,

At your request Redwood Engineering performed several site visits to the above-mentioned commercial building between September 2010 and March 2011. The purpose of our visit was to initially evaluate the overall structural integrity of the existing structure and to address the feasibility of moving and rehabilitating the structure. After initial visits to the site and discussion with the building owners and local building officials, it was determined that the structure was in an extremely dilapidated state and not a candidate for relocation or rehabilitation.

A subsequent visit to the site was made on March 10, 2011 to specifically investigate the current structural integrity of the structure as it relates to the personal safety of it's occupants. After careful review, observation and analysis, the following items are noted:

1. Roof Framing:

The existing roof framing consists of 2x4 rafters spaced at approximately 4'-0" o.c. The results of engineering analysis suggest that these members are significantly over spanned for current code design loads of 20psf live load. No pressure blocking is present at bearing locations; rafters are free to "roll" and buckle when subjected to loads. Roofing consists of corrugated tin sheets spanning from the exterior walls to the ridge, with a purlin located at top, bottom, and approximately at mid-span. No other direct support is being provided to the roofing; sheet edges are not supported along edges parallel to roof framing. No roof diaphragm is present; tin roofing panels are not adequately connected to framing members or each other in a manner that would provide diaphragm action. The roof structure is such that it will likely not even safely support the weight of a maintenance worker.

2. Wall Framing:

Exterior and interior bearing walls are constructed from 2x4 studs spaced at approximately 24" o.c. A single top plate runs along the top of the wall framing; no splice has been provided at the plate joints or corners. The bottom of the studs are connected to a mudsill that is bearing directly on soil. The mudsill is in such a state of decay that size determination was not possible, and any connection that once existed between the studs and mudsill is now gone. No concrete foundation is present, therefore no connection of the building walls to the foundation exists. The wood studs are essentially "floating" at various points around the building perimeter, and do not provide support for ceiling and roof loads.

3. Foundation System:

The original foundation system appears to have been provided by laying a redwood mudsill directly onto exposed native soils, which would provide an attachment point for the wall framing members. Currently the original mudsill exhibits extreme levels of decay; it's size could not be determined at the time of our investigation. Any bearing support that once might have existed has certainly eroded to near nothing at this point. The exterior wall studs are not bearing at many locations; the tin siding appears to be "bridging" between studs that are in contact with remnants of the original mudsill, or directly with exposed soils.

4. Lateral Force Resisting System:

The original building construction did not consider lateral bracing among it's requirements. No lateral bracing is present at this time, nor is there evidence that any was planned or provided in the past. Deficiencies (when compared to current building standards of practice) include: lack of roof diaphragm; lack of diaphragm transfer to supporting walls; lack of shear walls at all sides of structure; lack of connection between walls and foundation; lack of foundation to transmit lateral forces to soil.

5. Weatherproofing:

The exterior of the building has many openings at which wood framing is directly exposed to weather. The roof-to-wall intersection is of particular note; roof and ceiling joist ends are exposed and the top of the wall studs and to plate are visible. Years of exposure to water and insects has resulted in severe decay to some of these members. Also of note is the condition of the wall at the bottom; direct contact with exposed soils has resulted in significant decay at the bottom of these exterior load-carrying members. Additionally, exterior grading is such that soil levels along the east side are approximately 18" above the bottom of the wall studs.

In conclusion, the existing building structure is of limited structural integrity and has likely outlived it's service life. From an engineering design standpoint, the building has no redeeming merit;: it is impossible to state that the structure will perform adequately to provide public safety when subjected to even the most moderate seismic or wind loads.

It should be taken into consideration that should the Building Official find it necessary to require that the structure be refurbished to current construction standards, the resultant structure would be a recreation, not a restoration.

Please feel free to contact me if you require further assistance.

REDWOOD ENGINEERING
716-A SOQUEL AVENUE, SANTA CRUZ, CA. (831) 426-5444

Thank You,

Leonard Willis, P.E.
Redwood Engineering
CA P.E. #62076 exp. 09-30-11

Exhibit B

# COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

Date: December 17, 2010

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

On December 10, 2010 a special inspection was performed by County Building Inspectors at 8037 Soquel Drive, Aptos CA 95003. The purpose of this inspection was to determine the structural integrity/condition of the structure and if it is a candidate for relocation and rehabilitation.

Previously, a structural evaluation was performed by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, resulting in the generation of a comprehensive and detailed report. This report addresses the existing overall conditions of the structure including; roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality, lacks a perimeter foundation, the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

The inspection and investigation performed by myself and Inspector Sean Livingston found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity. In addition, occupancy of this structure in its current state should be closely monitored as it is close to being considered structurally unsafe for use.

*State of California -- The Resources Agency  Primary #
DEPARTMENT OF PARKS AND RECREATION  HRI #
PRIMARY RECORD  Trinomial
NRHP Status Code 5
Other Listings
Review Code  Reviewer  Date

Page 1 of 1  *Resource Name or #: (Assigned by recorder) 6037 Soquel Drive

P1. Other Identifier: Aptos Fire House/VFW Hall

*P2. Location: ☐ Not for Publication ☒ Unrestricted  a. County: Santa Cruz

and (P2b and P2c or P2d. Attach a Location Map as necessary.)

b. USGS 7.5' Quad Soquel  Date 1994 Revised  T 11S  R 1E  B.M. Mt. Diablo

c. Address 6037 Soquel Drive  City Aptos  Zip 95003

d. UTM: (Give more than one for large and/or linear resources)  Zone 10S  597936mE  4085763mN

e. Other Locational Data: (e.g., parcel #, directions to resource, elevation, etc., as appropriate)

Assessor's Parcel Number: 041 011 26

*P3a. Description: (Describe resource and its major elements. Include design, materials, condition, alterations, size, setting, and boundaries)

CONTRIBUTING BUILDING (HR 5D)

The Aptos Fire House/VFW Hall building is located at 6037 Soquel Drive. Constructed pre 1889, this building is simplistic in design and detail and is not representative an particular architectural style.

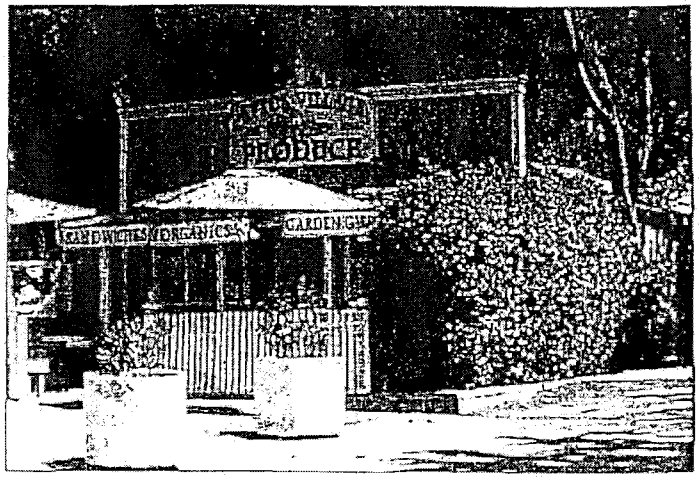
This small building with front-facing gable roof and false front is a simple structure. It sits atop what appears to be a concrete perimeter foundation. The front of this building, which is of frame construction, is covered in V-groove siding. The sides are covered in corrugated metal (which likely conceals V-groove siding). A raised parapet of recent construction, clad in vertically applied V-groove siding, conceals the front-facing gable from view. A front porch, supported by square posts and topped with a shed roof, spans the front of the store and two ribbons of three windows flank the centrally located entrance.

According to the owner, the framing is of redwood timber and a garage door is located on the northeast elevation.

(Continued page 2)

*P3b. Resource Attributes: (list attributes and codes) HP6, HP39-Fire House & Library, HP12-VFW

*P4 Resources Present: ☒ Building ☐ Structure ☐ Object ☐ Site ☐ District ☒ Element of District ☐ Other (Isolates, etc.)




P5b. Description of Photo (View, date, accession #)
Photo of the south elevation.
June 2002, K. Oosterhous

*P6. Date Constructed/Age and Sources:
☒ Historic ☐ Prehistoric ☐ Both

pre 1889

*P7. Owner and Address:
Edward W. Newman
3331 Capitola Ave.
Capitola, CA 95010

*P8. Recorded by (Name, affiliation, and address)
Kara Oosterhous
Dill Design Group
110 N Santa Cruz Ave
Los Gatos, CA 95030
Charlene Duval (Consultant)

*P9. Date Recorded: 06/02 Rev 3/7/03

*P10. Survey Type: (Describe)
Reconnaissance

*P11. Report Citation: (Cite survey report and other sources, or enter none) None

*Attachments: ☐ NONE ☐ Location Map ☐ Sketch Map ☒ Continuation Sheet ☐ Building, Structure and Object Record ☐ Archaeological Record ☒ District Record ☐ Linear Feature Record ☐ Milling Station Record ☐ Rock Art Record ☐ Artifact Record ☐ Photograph Record ☐ Other (List)

DPR 523A (1/95)  *Required Information

State of California – The Resources Agency — Primary #
DEPARTMENT OF PARKS AND RECREATION — HRI #
CONTINUATION SHEET — Trinomial

Page 2 of 3 — Resource Name or # (Assigned by Recorder) 8021 Soquel Drive

Recorded by K. Easterbrook & C. Duval — Date 6/15/07 Rev 3/7/08 — X Continuation — Update

There is no question that the building has been extensively altered throughout the years; however, it plays an important part in better understanding the history of the district.

This building is set in the commercial center of Aptos, which is comprised of both historic and non-historic income producing businesses. It is also a contributing resource to the Aptos Village Historic District. Despite the new construction, this area of Aptos still possesses a sense of place. Overall, this building possesses integrity of location, setting, design, feeling, association, workmanship, and materials as it remains true to its historic design and appearance.

History

The original building located on this site was constructed by 1888 and was identified at the office of the Loma Prieta Lumber Company. By 1892, it appeared to be associated with the Aptos Milling Company lumberyard, and still identified as a "lumber office." The 1908 Sanborn Map shows the building as being used as a dwelling. By 1913, the property was donated by Joe Arano for use as a firehouse. It was rotated 90 degrees on the lot and remodeled with materials donated by Norton-Phillips Lumber Company. The 1929 Sanborn Map shows a fire alarm/bell was out front of the building. In 1951, the firehouse moved to its new location at on Aptos Street and the building once again was used as a lumber office. This time it was used by Lester Toney the son of George Toney who was stationmaster at the Southern Pacific Depot for many years. In the early 1950s, Mrs. Helen Wikkerink opened a small library in the building. Later, it was enlarged and served as the VFW (Veterans of the Foreign Wars) Hall, Monterey Bay Post No. 776, American Legion. I use that continued until at least 1975. In recent years it has been an antique store. It is currently a fruit stand.

Sources

Johnston, P.
1993 *Aptos and the Mid Santa Cruz County Area, 1850 to World War II*. Edited by Elizabeth Spedding Calciano. UCSC Regional History Project.

Leonard, V.
1971 Fire-Fighting in Aptos has come a long way since bucket brigades. *Green Sheet*. 25 March.

Sanborn Fire Insurance Maps
1888 Aptos.
1929

Santa Cruz Sentinel
1929 Interesting History of Aptos and its Development. 17 May.

Swift, C.
1993 Aptos Neighbors honor David McFadden, the man who brought Books to Town. *Mid County Post*. 3 June.

Polk's Watsonville City Directory
1967 Soquel Drive.

DPR 523A (1/95) — *Required Information

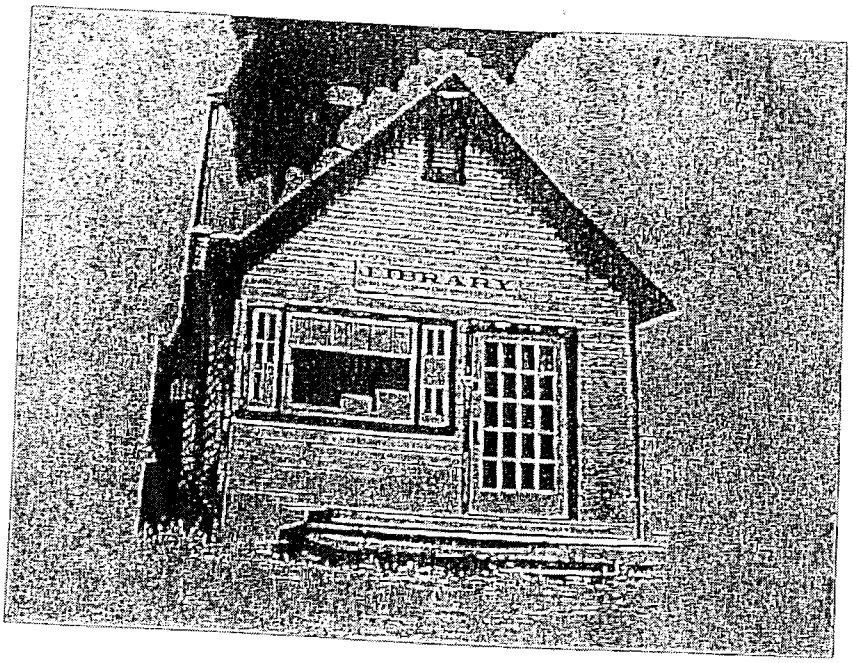



Photo circa 1950s, Aptos Museum.

**Exhibit D**


**County of Santa Cruz**

**PLANNING DEPARTMENT**

701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060

(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123

**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**


Date: June 21, 2011

To: Randall Adams, Planner

From: Tony Falcone, Building Official

Re: 8037 Soquel Drive, Aptos, CA 95003

A structural evaluation was performed on the building at 8037 Soquel Drive, Aptos, CA 95003 ("Aptos Firehouse") by Leonard Willis, P.E. of Redwood Engineering on September 20, 2010, which resulted in the generation of a comprehensive and detailed report. This report addressed the existing overall conditions of the structure including; roof and ceiling, exterior and interior walls, foundation and floor elements and hazardous materials.

In his report Mr. Willis determined that the structure was of marginal quality and lacks a perimeter foundation. His report points out that the structural elements have suffered years of water damage, settlement and degradation, and that the structure has likely outlived its service life. Mr. Willis also states in his report that the structure would probably not survive relocation efforts without a complete dismantling and reconstruction, it does not meet current minimum code requirements and any relocation or use would require complete reconstruction, prohibiting the re-use of any historic components.

On December 17, 2011, Inspector Sean Livingston and I conducted a thorough inspection and found no disagreements or contrary findings to those reported by Mr. Willis. This structure exists in a sub-standard dilapidated state and is not a candidate for relocation due to its lack of a foundation and structural integrity.

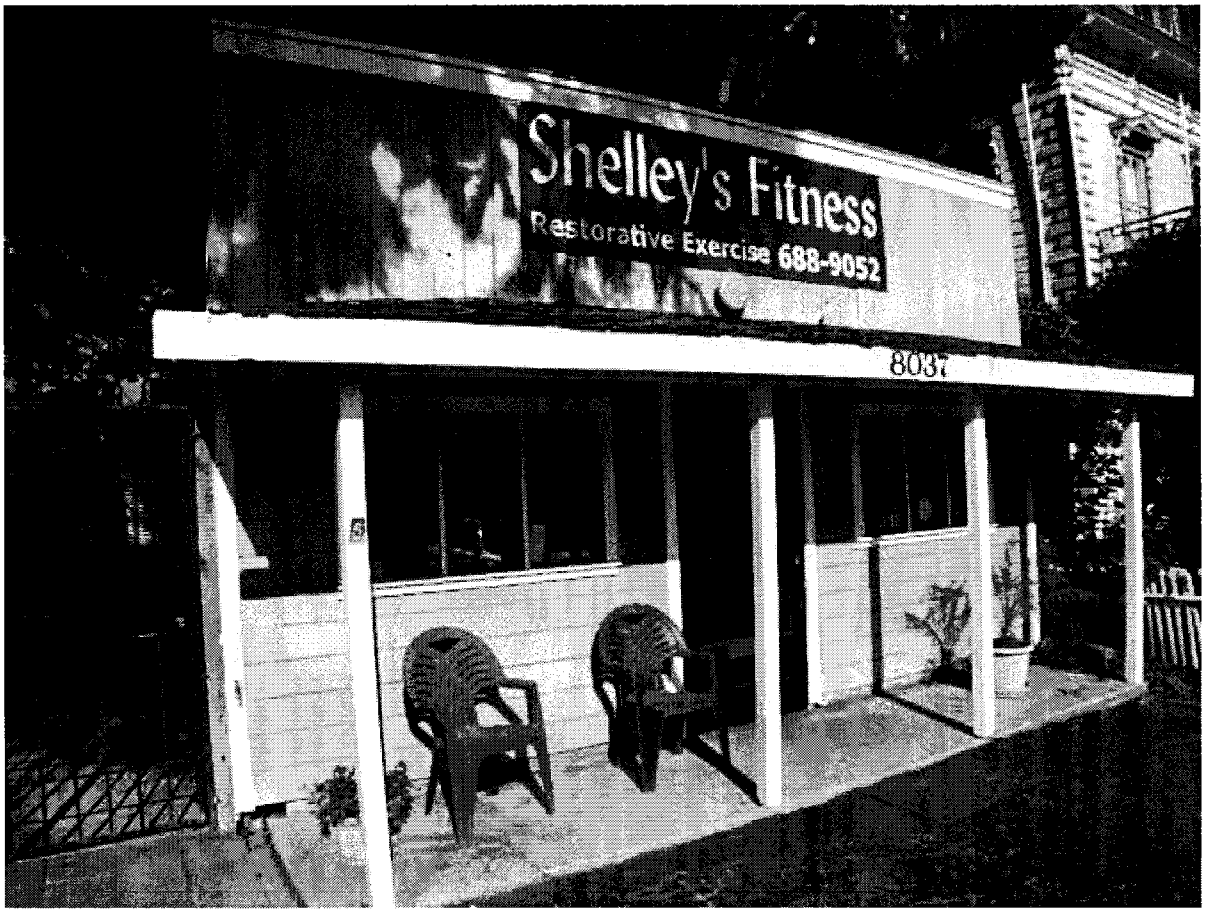
At the request of the building owner concerned about the safety of the building, Mr. Willis performed an additional inspection on March 10th, 2011. At that time, Mr. Willis noted that due to the deficiencies and the deteriorated condition of the building, the building presented potential safety issues to the public.

On June 9th, 2011, a follow up inspection was initiated by the County. During that inspection, it was observed that the structure had been vacated by the tenant. Based upon the structural report by Mr. Willis and our inspections, I determined that the structure presents an imminent danger to the safety of occupants and should be red-tagged to prevent its use by another tenant. The structure was then posted with a dangerous and unsafe building placard to protect the public and future tenants from potential fire, seismic and structural hazards/dangers that this structure presents.

Rehabilitation of this structure would require complete replacement of the foundation, structural frame, outdated plumbing, electrical and mechanical systems, front porch and decking. We determined that the only potentially salvageable portion of the structure would be the old 16 gage corrugated siding and roofing material. Due to the age, lack of maintenance and degree of structural degradation, we determined that the relocation and/ or rehabilitation of this structure is not feasible.

**Photograph: Front façade of the former Aptos Firehouse/VFW Hall**

**Date: October 2010**

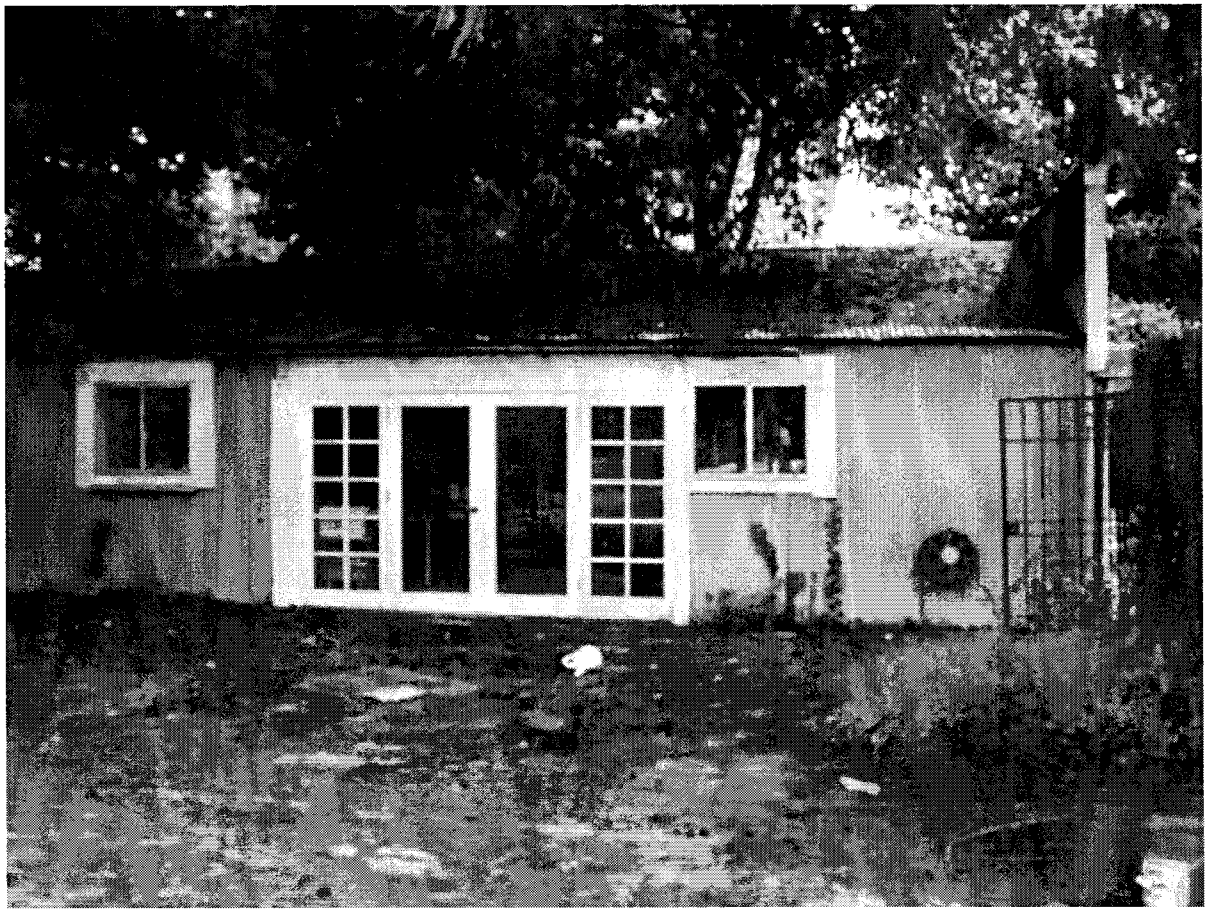



Note: Different orientation of wood boards between the building façade and the false front, replaced window systems, and door and the addition of a porch with a concrete slab.

**Photograph: Side of the former Aptos Firehouse/VFW Hall**

**Date: October 2010**

Note: Deteriorated materials and gaps between the roof and the frame of the building. The false front appears to be resting upon the bracing for the porch, indicating it was replaced sometime after the mid 1950's.



Note: mix of materials, wood to corrugated metal, replaced or created windows, double doors. The doors and windows are contemporary.

## Secretary of the Interior's Standards for Rehabilitation

1. A property will be used as it was historically or be given a new use that requires minimal change to its distinctive materials, features, spaces, and spatial relationships.

2. The historic character of a property will be retained and preserved. The removal of distinctive materials or alteration of features, spaces, and spatial relationships that characterize a property will be avoided.

3. Each property will be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or elements from other historic properties, will not be undertaken.

4. Changes to a property that have acquired historic significance in their own right will be retained and preserved.

5. Distinctive materials, features, finishes, and construction techniques or examples of craftsmanship that characterize a property will be preserved.

6. Deteriorated historic features will be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature will match the old in design, color, texture, and, where possible, materials. Replacement of missing features will be substantiated by documentary and physical evidence.

7. Chemical or physical treatments, if appropriate, will be undertaken using the gentlest means possible. Treatments that cause damage to historic materials will not be used.

8. Archeological resources will be protected and preserved in place. If such resources must be disturbed, mitigation measures will be undertaken.

9. New additions, exterior alterations, or related new construction will not destroy historic materials, features, and spatial relationships that characterize the property. The new work shall be differentiated from the old and will be compatible with the historic materials, features, size, scale and proportion, and massing to protect the integrity of the property and its environment.

10. New additions and adjacent or related new construction will be undertaken in a such a manner that, if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

Note: Prior to beginning rehabilitation plans, identify the character defining features to be protected, repaired or replaced. A feature is defined as an element of a building, cornice, porch, roof, windows, etc. When the extent of replacing historic material exceeds 60% it is likely that rehabilitation is not suitable.

## Secretary of the Interior's Standards for Reconstruction

**Reconstruction** is defined as the act or process of depicting, by means of new construction, the form, features, and detailing of a non-surviving site, landscape, building, structure, or object for the purpose of replicating its appearance at a specific period of time and in its historic location.

1. Reconstruction will be used to depict vanished or non-surviving portions of a property when documentary and physical evidence is available to permit accurate reconstruction with minimal conjecture, and such reconstruction is essential to the public understanding of the property.

2. Reconstruction of a landscape, building, structure, or object in its historic location will be preceded by a thorough archeological investigation to identify and evaluate those features and artifacts which are essential to an accurate reconstruction. If such resources must be disturbed, mitigation measures will be undertaken.

3. Reconstruction will include measures to preserve any remaining historic materials, features, and spatial relationships.

4. Reconstruction will be based on the accurate duplication of historic features and elements substantiated by documentary or physical evidence rather than on conjectural designs or the availability of different features from other historic properties. A reconstructed property will re-create the appearance of the non-surviving historic property in materials, design, color, and texture.

5. A reconstruction will be clearly identified as a contemporary re-creation.

6. Designs that were never executed historically will not be constructed.

# Guidelines:

## Research and Document Historical Significance

Guidance for the treatment Reconstruction begins with ***researching and documenting*** the building's historical significance to ascertain that its re-creation is essential to the public understanding of the property. Often, another extant historic building on the site or in a setting can adequately explain the property, together with other interpretive aids. Justifying a reconstruction requires detailed physical and documentary evidence to minimize or eliminate conjecture and ensure that the reconstruction is as accurate as possible. Only one period of significance is generally identified; a building, as it evolved, is rarely re-created. During this important fact-finding stage, if research does not provide adequate documentation for an accurate reconstruction, other interpretive methods should be considered, such as an explanatory marker.

The above was copied from the National Parks, Technical Preservation ServicesWebsite http://www.nps.gov/hps/tps/standards_guidelines.htm

CIRCA *Historic Property Development*

July 19, 2011

Annie Murphy, Planner
County of Santa Cruz
Planning Department
701 Ocean Street
Santa Cruz CA 95060

RE: Peer Review of Documentation Report for the Former Aptos Firehouse/VFW Hall

The County of Santa Cruz asked Circa to conduct a peer review of the *Documentation Report for the Former Aptos Firehouse/VFW Hall* [Urban Programmers, April 2011] for consistency with the Secretary of the Interior Standards (SIS) for the Treatment of Historic Properties. The SIS review appropriately focused on the two most potential Treatments applications: Relocation and Reconstruction. Due to the extensive physical alterations over time the former Aptos Firehouse/VFW Hall no longer retains physical integrity. In addition, substantiated documentation is lacking to support the argument for historic significance associated with a person(s) or event.

While Circa does not opine on issues of structural soundness we concur with the findings of the *Documentation Report* prepared by Urban Programmers (April 2011), the report from Redwood Engineering (March 2011), and the reports from the County Building Official (December 2010 and June 2011) concluding the following:

a) Relocation, or relocation and reconstruction, of the Aptos Firehouse in a manner consistent with the Secretary of the Interior Standards is not feasible, and that
b) Demolition of the structure is consistent with local regulations regarding demolition of historic resources.

In addition, Circa agrees with the County Staff's recommendation that the Historic Resources Commission approve the demolition of the former Aptos Firehouse/VFW Hall. The application of the Relocation Standard approach does rely on structural soundness and therefore brings up issues of material replacement, location, orientation and context. Likewise, the Reconstruction Standard approach relies on substantiated documentation so as to avoid the pitfall of communicating false history. It should be noted that retention of the building in situ is *technically* feasible, however, the extensive replacement of deteriorated materials and reproduction of the limited remaining character defining features would be so extensive that the property would most likely not be able to retain eligibility for listing on the local register. The use of original character defining features/artifacts and/or historic photographs, maps etc for a permanent interpretive display is appropriate and should be seriously considered as part of the Conditions of Approval. Such elements, as well as photo-documentation, should also be conducted for archival purposes as part of the Conditions of Approval.

In summary, Circa: Historic Property Development agrees with the findings and recommendation in the *Documentation Report for the Former Aptos Firehouse/VFW Hall.*

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy

Principal, Circa: Historic Property Development

BARRY SWENSON BUILDER

# CULTURAL RESOURCES STUDY FOR THE PROPOSED APTOS VILLAGE PROJECT

SANTA CRUZ COUNTY, CALIFORNIA

FINAL DRAFT

FEBRUARY 2009


PREPARED FOR:

BARRY SWENSON BUILDER
777 NORTH FIRST STREET, 5TH FLOOR
SAN JOSE, CALIFORNIA 95112-6303

PREPARED BY:

ALBION ENVIRONMENTAL, INC.
1414 SOQUEL AVENUE, SUITE 205
SANTA CRUZ, CALIFORNIA 95062

AND

SANDY L. LYDON
CONSULTING HISTORIAN
2255 REDWOOD DRIVE
APTOS, CALIFORNIA 95003


J2008-018

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Appendix A. Phase 1 Investigations at CA-SCR-222/H (Albion Environmental Inc., 2009)

## PROJECT DESCRIPTION

Barry Swenson Builder (BSB) is proposing development in Aptos Village, an unincorporated historic hamlet in the geographic midpoint of Santa Cruz County, California. The project area is located along the northern side of Soquel Drive, the southeastern side of Granite Way, the western side of Trout Gulch Road, and the eastern side of Aptos Creek Road (Figures 1, 2). The project proposes to construct a total of 17 new buildings for mixed residential and retail/commercial use. Residential space will include townhouses, cottages and a hotel. The proposed commercial building area encompasses approximately 113,180 square feet, with an additional 19,400 square feet to be used for 32 dwellings. Land for a skate park is also a part of the planned development.

The proposed project will require a significant level of ground disturbance to install appropriate infrastructure for the development. Water management will be important because the project lies near the confluence of two watersheds (Aptos and Valencia Creeks), necessitating control of natural runoff to the proper drainage. The project will also require transportation access from Trout Gulch Road and potentially from Soquel Drive.

BSB contracted with Albion Environmental, Inc., (Albion) in May 2008 to prepare a cultural resources sensitivity study of the project area and to provide recommendations for identifying and assessing cultural resources in this area for purposes of CEQA compliance. This study was submitted to BSB in July 2008 (Albion Environmental Inc. 2008a). Subsequently, Albion conducted limited (Phase 1) geoarchaeological test excavations in the project area to determine the presence or absence of native soil surfaces or intact archaeological deposits, particularly any containing evidence of CA-SCR-222/H (SCR-222/H), a large prehistoric habitation site and historic industrial complex coincident with Aptos Village. A summary of results from the Phase 1 investigations, along with an updated cultural resources sensitivity study for the overall project area, was submitted to BSB in November 2008 (Albion Environmental Inc., 2008b).

The following report is responsive to review requirements according to CEQA. It documents the conclusions of the archaeological investigations, updates previous evaluations of the project area's "built" environment (historic architecture and landscape), and provides final recommendations regarding the overall potential for encountering additional archaeological deposits during project construction. It does not include consultation with Native American tribes or individuals who may have concerns or input regarding cultural resources in or near the project area. The County of Santa Cruz has assumed the responsibility of initial and ongoing consultation with Native Americans under the guidelines of Senate Bill 18 (SB 18) (personal communication between Mark Deming, Santa Cruz County Planning Department, and Clinton Blount, Albion, August 2008).

## PROJECT METHODS AND STAFF

In June 2008, Albion contracted with the Northwest Information Center at Sonoma State University to perform a cultural resources records search for the project area and a ½-mile surrounding radius. This search indicated that 35 cultural resource studies have been conducted within ½ mile of the project, five of which included the project area itself.

To date, 31 prehistoric and historic archaeological sites have been recorded within ½ mile of the project. Of these, two cultural resources sites have been recorded within the current project area: prehistoric habitation site SCR-222 (now -222/H), and historic buildings associated with the Aptos Village Historic District (PR-44-000514). Most of the existing cultural resources documentation for the project area was produced in conjunction with an earlier (late 1970s) plan to develop Aptos Village property (Cartier 1979; Cartier et al. 1979).

Additionally, detailed information regarding the proposed project's construction and adaptive reuse plans was collected from BSB project managers (Jessie Thielen and Ricardo de la Cruz), BSB Vice President Jesse Nickell, and Matthew Thompson of Thatcher & Thompson Architects in Santa Cruz.

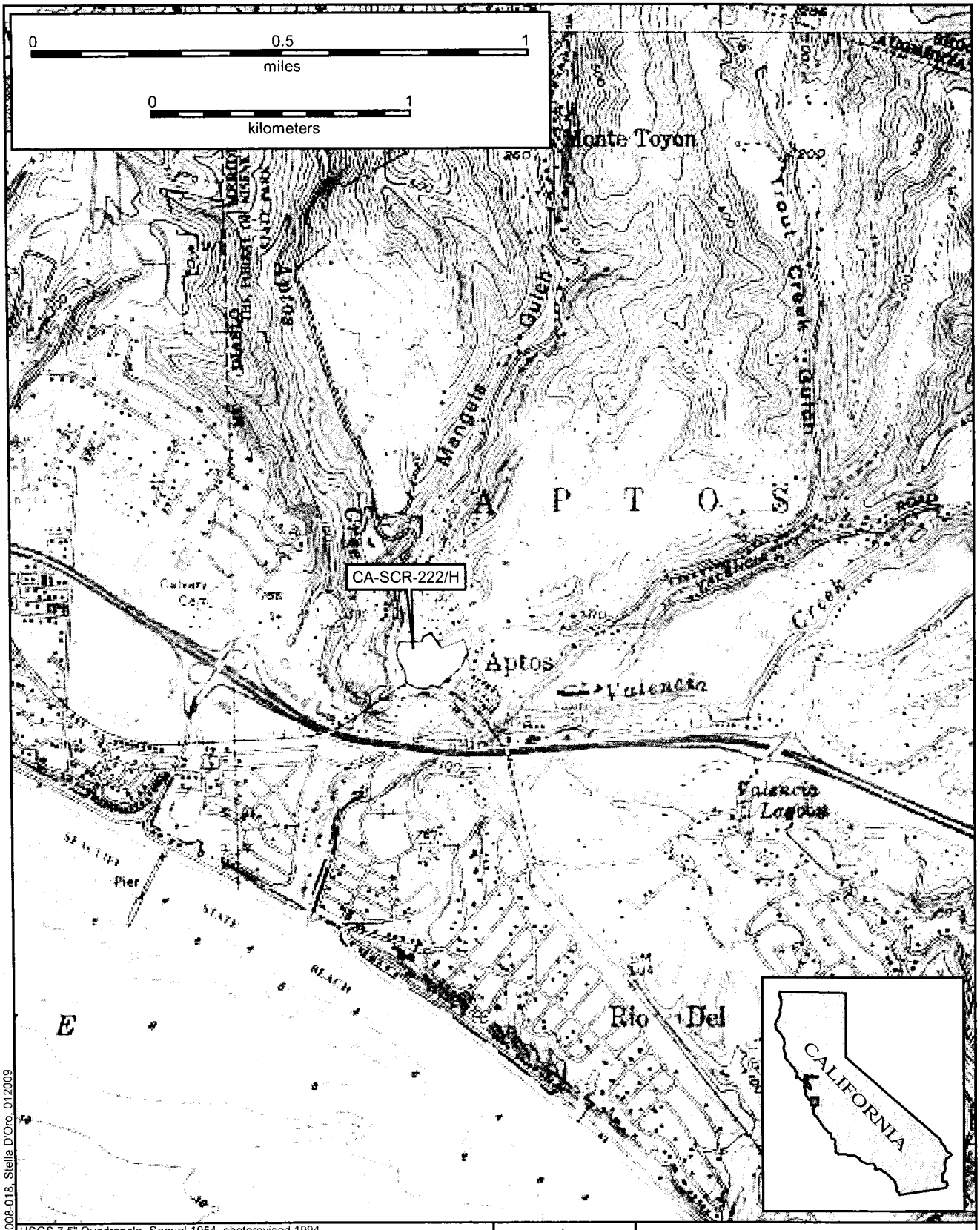
The initial sensitivity study for this project included a summary of the records search, an overview of Aptos Village history, and preliminary recommendations regarding the potential for the project to impact significant historic (built environment) resources (Albion Environmental Inc. 2008a). Subsequently, BSB requested that these recommendations be summarized in a letter (dated August 1, 2008) to Glenda Hill, Principal Planner for the County of Santa Cruz Planning Department, in order to facilitate preparation of the Area Plan for Aptos Village.

### Prehistoric Research

Albion's preliminary recommendations for further work to assess prehistoric site potential at SCR-222/H included:

- a pedestrian survey of entire project area;
- recording of any new cultural resources and/or isolates;
- updating the existing site record for SCR-222/H using standard DPR forms;
- conducting limited test excavations in the project area to determine, minimally, the presence or absence of intact cultural deposits; and
- geoarchaeological investigation in the project area to assess its sensitivity for buried land surfaces that may harbor deeply buried prehistoric sites.

An intensive pedestrian survey of the project area was conducted September 10, 2008 by Albion archaeologists. The surface inspection identified small quantities of shell and other potential artifacts corresponding to the previously recorded location of SCR-222/H. During September 23-25, Albion archaeologists oversaw the excavation of five backhoe trenches and two hand-excavated test units at judgmentally placed locations in the project area (Appendix A). Trenches and test units were excavated to sterile soils, and bucket samples from stratigraphic contexts throughout the trenches were screened through 6mm mesh to identify cultural materials. The geoarchaeological assessment was also conducted during mechanical trenching of deeper soils.




USGS 7.5" Quadrangle, Soquel 1954, photorevised 1994

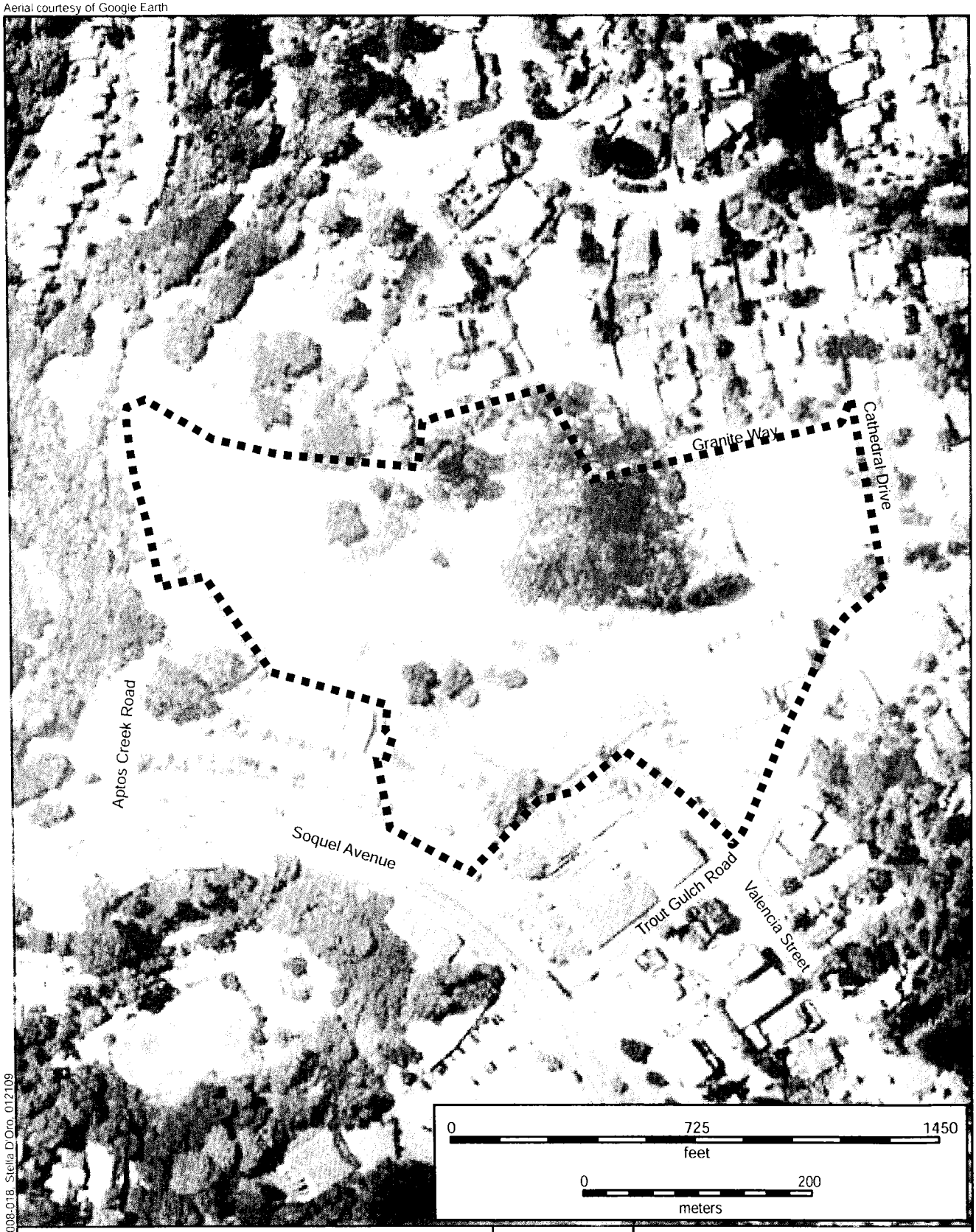
N

Albion Environmental, Inc.

Figure 1. Project location map.

File name: Figure 1.ai, J2008-018, Stella D'Oro, 012009

Aerial courtesy of Google Earth




Legend

Area of potential effects

N

Albion Environmental, Inc.

Figure 2. Aptos Village project site.

File name: Figure_2.ai, J2008-018, Stella D'Oro, 012109

prehistoric habitation site SCR-222 (now -222/H), and historic buildings associated with the Aptos Village Historic District (PR-44-000514). Most of the existing cultural resources documentation for the project area was produced in conjunction with an earlier (late 1970s) plan to develop Aptos Village property (Cartier 1979; Cartier et al. 1979).

Additionally, detailed information regarding the proposed project's construction and adaptive reuse plans was collected from BSB project managers (Jessie Thielen and Ricardo de la Cruz), BSB Vice President Jesse Nickell, and Matthew Thompson of Thatcher & Thompson Architects in Santa Cruz.

The initial sensitivity study for this project included a summary of the records search, an overview of Aptos Village history, and preliminary recommendations regarding the potential for the project to impact significant historic (built environment) resources (Albion Environmental Inc. 2008a). Subsequently, BSB requested that these recommendations be summarized in a letter (dated August 1, 2008) to Glenda Hill, Principal Planner for the County of Santa Cruz Planning Department, in order to facilitate preparation of the Area Plan for Aptos Village.

## Prehistoric Research

Albion's preliminary recommendations for further work to assess prehistoric site potential at SCR-222/H included:

- a pedestrian survey of entire project area;
- recording of any new cultural resources and/or isolates;
- updating the existing site record for SCR-222/H using standard DPR forms;
- conducting limited test excavations in the project area to determine, minimally, the presence or absence of intact cultural deposits; and
- geoarchaeological investigation in the project area to assess its sensitivity for buried land surfaces that may harbor deeply buried prehistoric sites.

An intensive pedestrian survey of the project area was conducted September 10, 2008 by Albion archaeologists. The surface inspection identified small quantities of shell and other potential artifacts corresponding to the previously recorded location of SCR-222/H. During September 23-25, Albion archaeologists oversaw the excavation of five backhoe trenches and two hand-excavated test units at judgmentally placed locations in the project area (Appendix A). Trenches and test units were excavated to sterile soils, and bucket samples from stratigraphic contexts throughout the trenches were screened through 6mm mesh to identify cultural materials. The geoarchaeological assessment was also conducted during mechanical trenching of deeper soils.

Because of the diverse resources associated with the project area, Albion employed a multidisciplinary team to address them. Clinton Blount, Albion Principal and anthropologist, acted as project manager. Leslie Fryman, staff historian and archaeologist, addressed built environment resources in the project area as well as historical archaeology. The prehistoric archaeology review and subsequent Phase 1 investigation was led by Albion Principal and senior archaeologist Jennifer Farquhar and staff archaeologist Ryan Brady. The project staff is qualified for work in archaeology, history and architectural history in accordance with the professional qualifications standards put forth by the U.S. Secretary of the Interior (36CFR Part 61). Additionally, consulting historian Sandy Lydon provided local history research and expertise.

## PREHISTORIC AND HISTORIC CONTEXT

### Regional Prehistory

While the ethnographic record of the central coast is relatively rich, with accounts from early explorers describing certain aspects of Native American lifeways, research investigating prehistoric lifeways and the culture history of native inhabitants of the Monterey Bay was not undertaken until the past few decades (Hylkema 1991; Jones et al. 2007). Interpretation of Monterey Bay prehistory has been developed through both local and regional archaeological investigations. Through these projects, general patterns of prehistoric lifeways along the central California coast have been developed and the most common taxonomic framework used today involves six distinct temporal periods, viewed to represent differences in the organization of past subsistence and settlement patterns of the region's inhabitants.

Prehistoric Periods

| | |
|---|---|
| Paleo-Indian | (pre-10,000 B.P.) |
| Millingstone | (10,000-5500 B.P.) |
| Early | (5500-2600 B.P.) |
| Middle | (2600-1000 B.P.) |
| Middle/Late Transition | (1000-850 B.P.) |
| Late | (850-Historic) |

The periods are characterized by either specific artifact types or suites of artifacts and site locations that typify the particular lifeway that each period is seen to represent. The patterns may reflect one or a few aspects of the past manner of living and are generally not understood as a holistic representation of how Central Coast populations were living at a particular point in time. The Paleo-Indian Period is generally viewed as a time where people were focusing their subsistence pursuits on large Pleistocene mammals, such as mammoths, and were highly mobile in search of game, though associations between the animal bones and archaeological sites are spotty at best. Two sites located in San Luis Obispo County are reported to have contained fluted points (Gibson 1996, Mills et al. 2005), the main marker of this time period, though their archaeological context is difficult to interpret. Artifacts associated with sites of this antiquity are suggested to be scrapers, scraper-planes, bifaces, and the lack of milling equipment. More locally, the Scotts Valley site (CA-SCR-177) may have association with the Paleo-Indian Period, containing leaf and lanceolate projectile points/knives, flake tools, hammerstones, and ochre (Cartier 1993; Fenenga 1993: 245-254); though similar to the other sites, its integrity is suspect (Jones et al. 2007:130).

The Millingstone Period is typified by an abundance of milling equipment that includes handstones and millingstone, along with a sparse flaked stone assemblage that lacks formalized tools. Millingstone Period sites are present in the Monterey Bay near the mouth of Elkhorn Slough (CA-MNT-229) (Jones et al. 1996) and Moss Landing (CA-MNT-234) (Milliken et al. 1999). These sites contained cobble and core tools fabricated form chert and quartzite, grinding stones, estuary shellfish and small terrestrial mammal bone.

The Early Period is recognized by a change in artifact assemblages, signifying a shift in subsistence and settlement practices during this timeframe. It is recognized by an increased abundance of bifacially flaked projectile points, along with the presence of mortar and pestle technology. Projectile

points dating to this time period are Rossi Square-stemmed and Side-notched points, large Side-notched, and Año Nuevo Long-stemmed varieties. This may be a time when hunting came to dominate the more generalized plant and small game focused economy of the Millingstone Period. Early Period sites are more abundant in the Monterey Bay area than earlier ones and are represented by CA-MNT-108 near Fisherman's Wharf in Monterey (Breschini and Haversat 1992a), CA-MNT-831 in Pacific Grove (Breschini and Haversat 2008), and CA-SCR-38/123 at Wilder Ranch (D. Jones and Hildebrandt 1994). The sites are typified by dark midden soils, abundant shellfish, mortars and pestles along with flaked stone tools and chipping debris, and certain shell bead types (Bennyhoff and Hughes 1987).

The Middle Period is understood to be a time when the use of shellfish declines relative to earlier times, and the exploitation of more mobile small game such as rabbits and otters increases. Artifact assemblages contain contracting stemmed projectile points, mortars and pestles, along with in increased presence of fishing equipment, including grooved and notched net weights and circular shell fish hooks. Handstones, millingstones, and pitted stones may also be present at sites dating to this period (Jones et al. 2007:138-139). In the Monterey Bay, Middle Period components are present at CA-MNT-229 and -234 as well as CA-SCR-7 (Jones and Hildebrandt 1990) and CA-SCR-9 (Hylkema 1991:141-183).

The Middle/Late Transition reflects a short period of time where rapid culture change is argued to have occurred. This may have been influenced by a time of rapid climate change that has been identified at various locations in the Western United States (Jones et al. 1999) as well as in Patagonia (Stine 1994). It is suggested that occupants of the central coast underwent a dramatic reorganization of their social structure and subsistence practices. Sites dating to this period in Monterey County are restricted to the Big Sur locality (Jones 1995).

The Late Period is better represented in the Monterey Bay, yet these sites are most often short term, task-specific sites. Occupation sites are located at inland areas such as the Upper Carmel Valley (Breschini and Haversat 1992b) and Santa Clara Valley (Hildebrandt and Mikkelson 1993). Late Period sites in the Monterey Bay area include CA-MNT-1765 at Moro Cojo Slough, which appears to represent a collection station and field camp (Fitzgerald et al. 1995), and CA-MNT-143 at Asilomar State Beach (Brady et al. 2008), which is a site that was used for the short term acquisition of shellfish. Concentrations of abalone shell are commonly present at Late Period coastal sites in the Monterey Bay (Breschini and Haversat 1991), signifying the importance of the acquisition of this resource, though more long-term occupation is generally not found to co-occur.

## The Aptos Tribe and Village

The current project site lies within a territory once inhabited by speakers of Costanoan languages, a domain which extended from San Francisco Bay, along coast and west-central California, to just south of Monterey Bay. The word "Costanoan" derives from the Spanish word *Costaños* meaning 'coast people' (Levy 1978:485). The Costanoan language family contained eight distinct but related languages, each of which was spoken by several different groups or "tribelets" (Levy 1978). During the Mission Period (1770-1830s) there were many tribelets in what is now Santa Cruz County.

The Aptos tribelet was located along the shores of Monterey Bay from the present location of Aptos and eastward about half way to the mouth of the Pajaro River. The Aptos peoples were one of four early groups converted at Mission Santa Cruz, but were actually the last of those four nearby groups to be completely absorbed into the mission in 1796. Although they did marry with their neighbors, the Cotoni, Sayanta, and Uypi, they were completely mixed together with the Cajastaca people of the

Corralitos area. So much mixing occurred within the nuclear family groups that the idea arises that the Aptos and the Cajastaca were a single tribal group (Milliken 1995).

Several early references from early Spanish explorers and missionaries describe the presence of Native Americans in the Aptos area at the time of contact. An exploratory land expedition led by Don Gaspar de Portolá in 1769 is said to have come upon an Indian village at the confluence of the Valencia and Aptos creeks. The Spaniards recorded the site as "Aptos". In 1791, the Santa Cruz Mission was established west of the San Lorenzo River. Indians from the Aptos area were brought into the mission compound. Records of Father Crespi in 1769, Father Palou in 1774, and the Santa Cruz Mission in 1791 describe the Aptos region, with some mention of the Native Americans who called their area "Aptos" (Brown 2001). The first recorded contact came in 1774 when the Rivera Expedition encountered residents of the village at Aptos and offered gifts. The accounts mention seven (or eleven) grass huts and a population that added up to the diarists estimation of a 'medium sized village" (Brown 2001).

In 1872 it was reported that Claus Spreckels, who owned 3,500 acres of the Old Aptos Rancho, had the major Indian village site and the cemetery enclosed with large bamboo (*Santa Cruz Sentinel* 1872). These sites have been interpreted as being the recorded sites CA-SCR-1 and CA-SCR-2 (Cartier et al. 1979).

Native inhabitants of the region were first encountered by Spanish explorers in 1602 (Vizcaino) and again between 1769-1776 (Portola, Fages, Riviera, and Anza). During the Mission Period (1770-1835), devastating changes occurred for the Costanoan people. Over the following several decades, the population was recruited into nearby missions and their traditional subsistence economy was replaced by an agricultural economy. Analyses of mission baptismal records demonstrate that the last Costanoan tribelets living a traditional existence had disappeared by 1810 (Levy 1978). The population experienced dramatic decline due to the introduction of European diseases, which consequently caused higher death rates and lower birth rates. The secularization or abandonment of the missions by the Mexican government in 1832 caused people to relocate to different areas and establish small settlements, thus, separating them farther away from their cultural heritage. Levy (1978) believes that Costanoan languages were probably not spoken after the year 1935.

On a final note, the use of the term "Ohlone" has recently gained favor in reference to prehistoric Costanoan populations (Levy 1978; Munoz in Hildebrandt 1983; Milliken 1993). Originally appearing in F.W. Beechey's description of his 1826 encounter with native populations in San Francisco Bay (Beechey 1941), this term has also been adopted by many Costanoan descendants. Levy (1978) states that in 1971 a group of Costanoan descendants formed a corporate entity, the Ohlone Indian Tribe, and gained title to the Ohlone Indian Cemetery at Mission San Jose. Today, the term Ohlone is basically synonymous with Costanoan and is preferred by contemporary Native American people (Bean 1994; Margolin 1978).

## Aptos Village History

The Aptos Village site is triangular, bounded on the north by foothills, on the east by the canyon cut by Valencia Creek and on the west by a steeper canyon carved by Aptos Creek. The two streams meet at the tip of the triangle, join, and flow to Monterey Bay as Aptos Creek. This junction of the two creeks was such a dominant feature that many early residents believed the name "Aptos" to be an Indian word based on that intersection, leading to the legend that the name meant "the joining of two waters." There is little evidence in early literature to support that definition, however, and as Donald T. Clark notes in his classic *Santa Cruz County Place Names*, the source of the name Aptos is "uncertain" (Clark 2008). There is nothing uncertain, however, about the transportation challenge

posed by those two canyons, and beginning with the first passage through the area by the Portolá expedition in October, 1769, Aptos has proved difficult for those wishing to travel across the coastal terrace.

### The Spanish Era, 1769-1822

The Spanish found traveling across the coastal terrace so "difficult" and "tiresome" that in 1774 they chose the more level and direct route through the Santa Clara Valley connecting Monterey and San Francisco (present-day Highway 101). When the mission was established at Santa Cruz in 1791 and the pueblo of Villa de Branciforte six years later, the road through Aptos ended at the mission. Santa Cruz and Aptos were on a dead end and the easiest access was by sea. The Indians living in the Aptos area provided most of the converts for the Mission Santa Cruz between 1791 and 1797, and once they were gone, except for cattle grazing on the coastal terrace, there was very little activity in Aptos.

### The Castro Era, 1833-1876

In 1833 Rafael Castro, a retired soldier and native of Villa de Branciforte was awarded a private land grant named Rancho Aptos. The original 4,486 rancho was bounded on the west by Aptos Creek, but in 1840 Castro was granted an additional 2,200 acres extending the boundaries west to Boreas Gulch. Castro built his home on the western bank overlooking Aptos Creek and began raising cattle, shipping the hides off the beach at the mouth of Aptos Creek (Waid 1984).

### Aptos Wharves

Rafael Castro took his Rancho Aptos land title papers to the Land Commission in the early 1850s, and in 1860 he received confirmation. Even before he had clear title, Castro received numerous offers to sell his property, but he declined, preferring instead to negotiate leases with the various sawyers and loggers who were interested in the redwood trees growing in the canyons to the north. To ship the products coming from his property and from land grants to the east, in 1850 Castro built a relatively short 500-foot wharf just west of the creek mouth. Over the next 25 years, hides, lumber, flour and agricultural products were shipped from what became known as Aptos Landing (Collins 1995).

### The First Aptos Village

Castro's wharf inspired a small commercial development at the intersection of the County road and the road to the wharf (present-day Wharf Road and Soquel Drive), while several of Castro's adult children built homes along the road to the west. The wharf was improved and extended in the 1860s for use in shipping lumber, firewood, and agricultural products to San Francisco. Meanwhile, efforts to create a dependable crossing of Aptos Creek continued. The first bridge, built in 1860, was washed out in the 1862 flood and eventually replaced with a covered bridge.

In 1872, beset with marital difficulties and declining health, 69 year-old Rafael Castro sold the bulk of his property to sugar magnate Claus Spreckels for $71,900 in gold coin. The Castro era of Aptos Village on the western banks of Aptos creek ended in the 1870s with the coming of Claus Spreckels (1872), the arrival of Frederick Augustus Hihn and incorporation of the Santa Cruz Rail Road in 1873, and the death of Rafael Castro in 1878 (Waid 1984).

### Aptos Village Moves East

Frederick Augustus Hihn had long held a dream of a dependable trans-county railroad, and following the entry of the SPRR into the region in 1872, he transformed his vision into reality. As the president of the Santa Cruz Railroad (incorporated in 1873), he led the construction of a narrow gauge railroad

between Santa Cruz and the SPRR junction south of Watsonville. Claus Spreckels was a major stockholder in the railroad. All of the construction of the Santa Cruz Railroad (SCRR) was done by Chinese railroad workers. Their conical hats, quilted blue coats and Cantonese work songs were a regular part of the Santa Cruz County landscape during the 1870s and 1880s (Hamman 2002; Lydon 2008).

Seeing the potential for his own properties located up Valencia Creek, Hihn guided the route of the SCRR into the Aptos Village site even though it required two trestles compared to an easier route downstream that would need but one. Hihn's bringing the Santa Cruz Rail Road into the present-day Aptos Village set off a boom, the results of which are still visible today (MacGregor 2003).

By 1879 Aptos had three good hotels, where before the coming of the railroad, there was only one small establishment owned by Irish immigrant Patrick Walsh. Basque storekeeper Jose Arano built the Anchor House (present-day Bay View Hotel) beside the railroad tracks in 1878. Aptos historians have counted up to 15 saloons in the area by the mid 1880s, serving the needs of the lumbermen and loggers who worked in the forests to the north (*Watsonville Pajaronian* 1879).

### The Lumber Boom, 1883-1899

Though the 1870s were busy in Aptos, the SCRR operated at a loss, and in 1882 was sold at a bankruptcy auction to the SPRR. The entry of SPRR into Aptos Village brought the fledgling railroad era to its maturity. Almost immediately after acquiring the narrow gauge SCRR, Southern Pacific (SPRR) announced it would broad-gauge the line, and in the fall of 1883, the first standard gauge locomotive made the trip between Santa Cruz and the SPRR mainline south of Watsonville. Products could be loaded onto a railroad car and shipped anywhere in the United States without having to be reloaded (Hamman 2002).

In 1883, Southern Pacific purchased a 7,000 acre tract of uncut redwood up in Aptos Canyon, containing an estimated 200,000,000 board feet of lumber, and punched a standard gauge railroad up the canyon to get it. Once the Chinese railroad crew had the first three miles of line built, the largest lumber mill in 1880s Santa Cruz County began sending a torrent of lumber, railroad ties, shakes and shingles down into Aptos and out to markets all over California (Lydon 2008).

Undaunted by losing the SCRR and quite willing to take advantage of the SPRR connection in the now bustling Aptos Village, in 1891 Hihn purchased 27 acres of the Aptos Village site from the Bernals. By 1883 he had built a medium-sized sawmill and from there, he began moving part of what he estimated to be 100,000,000 board feet of lumber to his yard in Santa Cruz. The following year Chinese crews built a two-mile narrow gauge track into Valencia Canyon, and over the next eight years, redwood lumber flowed out of the Valencia down to Hihn's Valencia Mill in Aptos Village (Hamman 2002; Lydon 2008).

These two streams of redwood lumber converged in Aptos, just as the two creeks did south of the village. In 1893 Hihn shut down his Valencia Mill, and in 1899 the Loma Prieta Mill was closed, marking the end of the Aptos lumber boom. Smaller episodic lumber operations continued north of the village, but by the 1920s, that too had ended.

### The Apple Era, 1900-1959

By the late 1890s, paralleling the agricultural trend going on in the Pajaro Valley, apples became the focus of activities at Aptos Village. The same railroad that carried lumber to the far corners of the

country now began carrying railroad cars filled with apples. Most of the orchards were located north and east of Aptos Village, and Frederick Hihn was one of the leaders of this new Aptos industry.

By the 1920s Aptos was the second most important apple shipping location in Santa Cruz County. Over 90 percent of the apples shipped in the 1920s came from Watsonville, and though only five percent of the county's apple crop went through Aptos each year, it was enough to create a microcosm of the apple industry in Aptos Village. Box making, apple packing, an apple dryer and vinegar works were represented in what became a small apple-centered industrial park.

One of the most prominent of these businesses was the Lam-Mattison apple dryer founded in 1905. Lam Pon, an immigrant from China, became a partner with Ralph Mattison and their dryer became a landmark in the village. Each fall a large group of Chinese laborers would move into the village and work in the dryer well into the winter. In later years Filipino laborers were the dominant laborers. The Lam family continued its partnership with the Mattisons up to 1940. The last of the Aptos apple packing facilities closed in 1959 (Lydon 2008).

## KNOWN AND POTENTIAL RESOURCES IN THE PROJECT AREA

### CA-SCR-222/H, Prehistoric Component

First recorded in 1979, the prehistoric component of SCR-222/H is located in the open field west of the Bay View Hotel, on both sides of Soquel Drive, and east of Aptos Creek Road. Its boundaries, as initially recorded, measure approximately 550 by 300 meters (1,800 by 985 feet), or largely the western half of the current project area (Figure 3). The prehistoric component is described in the original record as an extensive occupation site with a midden deposit, including fire-cracked rock, large mammal bone, and shellfish remains (Morris 1979).

Also in 1979, a general surface reconnaissance of SCR-222/H was conducted by Robert Cartier, Principal Investigator for Archaeological Resource Management, and C. Detlefs, a historic specialist. Areas that were clear of vegetation and soil brought to the surface by rodent activity contained fire-altered rock, chipped lithics, shellfish remains, and charcoal. Historic resources in the form of glassware, ceramics, and other artifacts, possibly dating as early as the mid-1800s, were also found on the surface. Cartier (1979) noted that the site had been impacted in historic times by roads, railroad tracks, and several building sites.

### Survey, 2008

Between 1979 and 2008, it does not appear that SCR-222/H was documented further. In September 2008, Albion archaeologists conducted an intensive pedestrian survey of the proposed Aptos Village project area and discovered far fewer surface artifacts than the quantities noted in 1979, suggesting that SCR-222/H has since been further impacted by ongoing building demolition and interim use, and probably also by illicit artifact collecting. Nevertheless, Albion's survey revealed small quantities of shell, a piece of fire-affected rock, a possible ground stone artifact, and a piece of cryptocrystalline silicate stone material in the western portion of the project area. The location of these items appears to match the initial plotted location of SCR-222/H. Additionally, some fragments of clam and abalone shell were identified in the bike jump park at the eastern extent of the project area.

### Phase 1 Investigations, 2008

Following the survey, Albion archaeologists conducted Phase 1 archaeological investigations in the project area in an effort to further assess the spatial extent, depth, and integrity of SCR-222/H (Appendix A). Based on the previous survey results, five trench locations in the project area were identified for mechanical excavation (Figure 3). Trenches were approximately 2m x 1m, and were excavated to sterile yellow or gray soils (180-220cm). Bucket samples from stratigraphic contexts throughout the trenches were screened through 6mm mesh to identify cultural materials. Only two trenches (1 and 2) produced prehistoric cultural materials, and this was limited to four flakes in the first trench and five in the second, along with a ground stone artifact. The material recovered was in a disturbed context with apparent prehistoric, historic, and modern materials all found in association with one another. Items such as metal, glass, and ceramics were encountered as deep, if not deeper in the deposit, than the stone and shell cultural materials.

Two 1m x 0.5m STUs (surface transect units) were hand excavated to 1m in depth. The overburden at both unit locations was removed by a backhoe until the initial contact with darker sediments. These were still within disturbed stratigraphic contexts. STU 1 was located near Trench 2, and STU 2 was located between Trench 1 and Trench 2. After overburden was removed, STU 1 was hand excavated from 40cm below the present surface to 100cm. STU 2 was hand excavated from 25cm below the

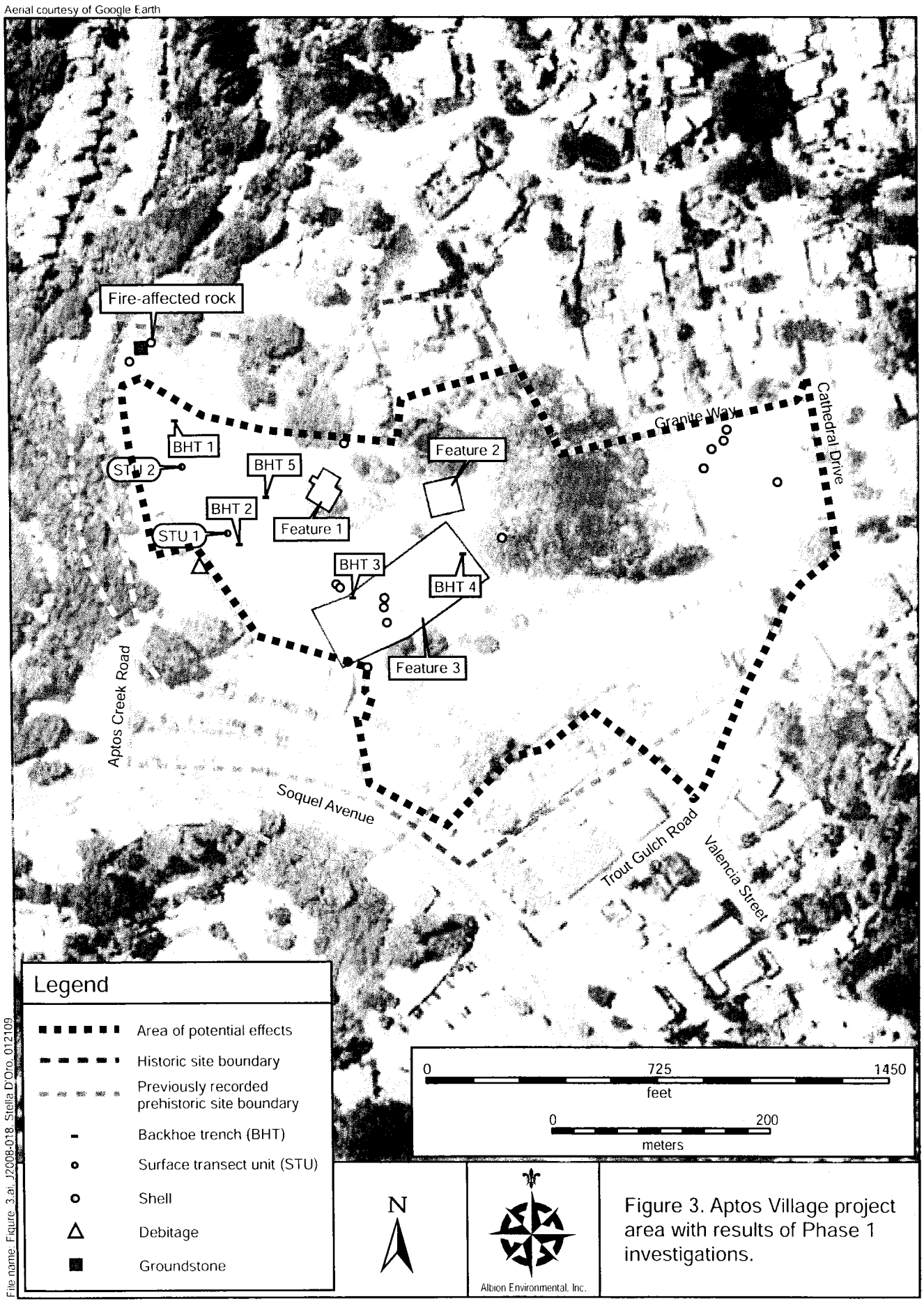



Figure 3. Aptos Village project area with results of Phase 1 investigations.

present surface to 100cm. Similar to Trenches 1 and 2, a small amount of lithic material and shell was recovered, along with a greater quantity of historic and modern debris.

Additionally, a geoarchaeological investigation was performed during mechanical trenching of select areas to assess sensitivity for buried land surfaces that may harbor deeply buried archaeological sites. Identification of these landforms prior to construction (as opposed to discovery during construction) is an integral part of the larger resource identification effort, and can reduce the likelihood that the project is delayed due to unanticipated cultural resource discoveries. The investigation showed disturbances from modern activities from the surface to the bottom of each of the trenches.

Based on the results of the Phase 1 investigations, several conclusions were drawn:

- The prehistoric component of SCR-222/H is present in the western and southwestern portion of the current project area,
- Shell debris present at the bike jump park may be related to redeposited site matrix as the easternmost backhoe trenches did not produce more than modern and historic materials,
- The prehistoric component of SCR-222/H does not appear to provide evidence for intensive prehistoric occupation, and
- Site integrity appears to have been severely impacted by historic and modern activities.

## Historic Archaeological Resources

Research addressing the sensitivity of the project area for historic archaeological deposits was conducted as early as 1979 by Archaeological Resource Management in conjunction with three small "project areas," all of which are overlaid by the current, larger project area (Cartier et al. 1979). This "archival" study evidently followed a surface survey of one parcel east of Aptos Creek, on which was found a significant quantity of glassware and ceramic fragments, and other historic artifacts in addition to prehistoric materials (Cartier 1979). The archival research identified two locations sensitive for historic archaeological deposits associated with nineteenth-century occupation of the area by railroad workers, specifically Asian laborers (Cartier et al. 1979).

It does not appear that any test excavations or other confirmation of this sensitivity analysis was undertaken, and 30 years later, the presence or absence of intact historic archaeological deposits in the project area remains unknown. Additionally, due to the age of the 1979 sensitivity study, the potential for early twentieth century archaeological deposits in the project area was apparently not addressed. Such deposits may include refuse-filled features associated with domestic occupation of the project area by apple industry workers, who were also largely of Asian descent (Cartier et al. 1979).

### Research, 2008

A review of historic maps and archival material indicates that the current project area is located within the former boundaries of a historic industrial complex (1880s-1940s) containing various railroad facilities (SPRR) and a lumber mill (1880s-1900) that later evolved into a center for apple processing, packing and shipping (1900-1960. Though primarily industrial, secondary domestic use of the complex is clearly demonstrated in conjunction with railroad, lumber and apple-processing workers' quarters, at least one owner-operators residence, and more than one hotel for visitors.

The historic locations of buildings and structures, both residential and industrial, in this complex are illustrated in Figure 4. Remnant concrete foundations for several buildings, mostly those that were in

operation well into the twentieth century, are still visible in the project area. Only three of the buildings and structures depicted in Figure 4 are still standing: the Bay View Hotel (19), the Hihn Apple-Packing Warehouse (21) and the Loma Prieta Lumber Yard Office (16) (see Built Environment Resources below).

Most of the nineteenth century railroad buildings and structures located in Aptos Village have since been removed or demolished. This includes several sets of spur tracks that traversed the industrial complex and to which large packing buildings (13, 21) were oriented. At present, only the main track of the 1880s SPRR remains along Soquel Drive, at the southern end of the project area (see Built Environment Resources below).

Additionally, a railroad turntable (14), constructed as early as 1883, was located in the southern part of the project area. Turntables are typically semi-subterranean structures constructed with circular walls and a central column or pedestal of mortared brick. Circular track was mounted on top of the brick walls, and an iron pivot anchored in the center on which the locomotives were turned. Though the iron is generally removed from turntables after they are no longer in use, the brick-walled pit is often buried intact when surrounding rail houses are demolished. Several of these unique historic railroad features have been unearthed and restored for interpretive history purposes. If the SPRR turntable in the project area is intact or even partly intact, it would potentially be an important historical resource associated with SPRR engineering and early Aptos railroad history.

Other locations potentially sensitive for historic archaeological deposits are in the northern part of the current project area: the Chinese Bunkhouse (7), Lam Pon's house/office (6); as well as the earliest apple processing facilities in the complex: the Lam/Mattison apple dryer (8a), the vinegar press/warehouse (8b), and the vinegar barreling house (17). Filled features or buried remains associated with any of the above buildings may contain important archaeological data.

Surface surveys and recent Phase 1 investigations strongly suggest that historic archaeological deposits in the project area have been disturbed or possibly obliterated by ongoing demolition and historic redevelopment of the complex, which began as early as 1900 and continued through the 1970s. Without extensive excavation (data recovery), it is difficult to identify and assess the integrity of any remaining features within this relatively large area. However, the types of historic archaeological deposits that may exist in the project area have the potential to contain important data. Since 1980, archaeological studies of 1910s–1940s Asian neighborhoods, agricultural communities and industrial sites throughout California and the western states (Schulz and Allen 2004; Voss 2005) have established a larger base of comparative data from which important twentieth-century archaeological research issues can now be addressed.

## Built Environment Resources

Two historic buildings are located in the current project area, the Hihn Apple Packing House and the Aptos Fire House/VFW Hall, which may have originally served as the office for the Loma Prieta Lumber Mill.

The Hihn Apple Packing House is currently located at 417 Trout Gulch Road. This property, constructed in the mid 1880s or early 1890s for Frederick Hihn, previously served as an apple-packing barn (Oosterhous 2003a). Mid-County historian Vincent Leonard noted that additions to Hihn's packing shed were made in 1899, 1915, and 1920 (Leonard 1975). The business employed Aptos area women during the fall through the winter, grading and packing apples for shipment. Local men made pinewood apple boxes for shipping until the 1920s and 1930s, when lug hauling by truck

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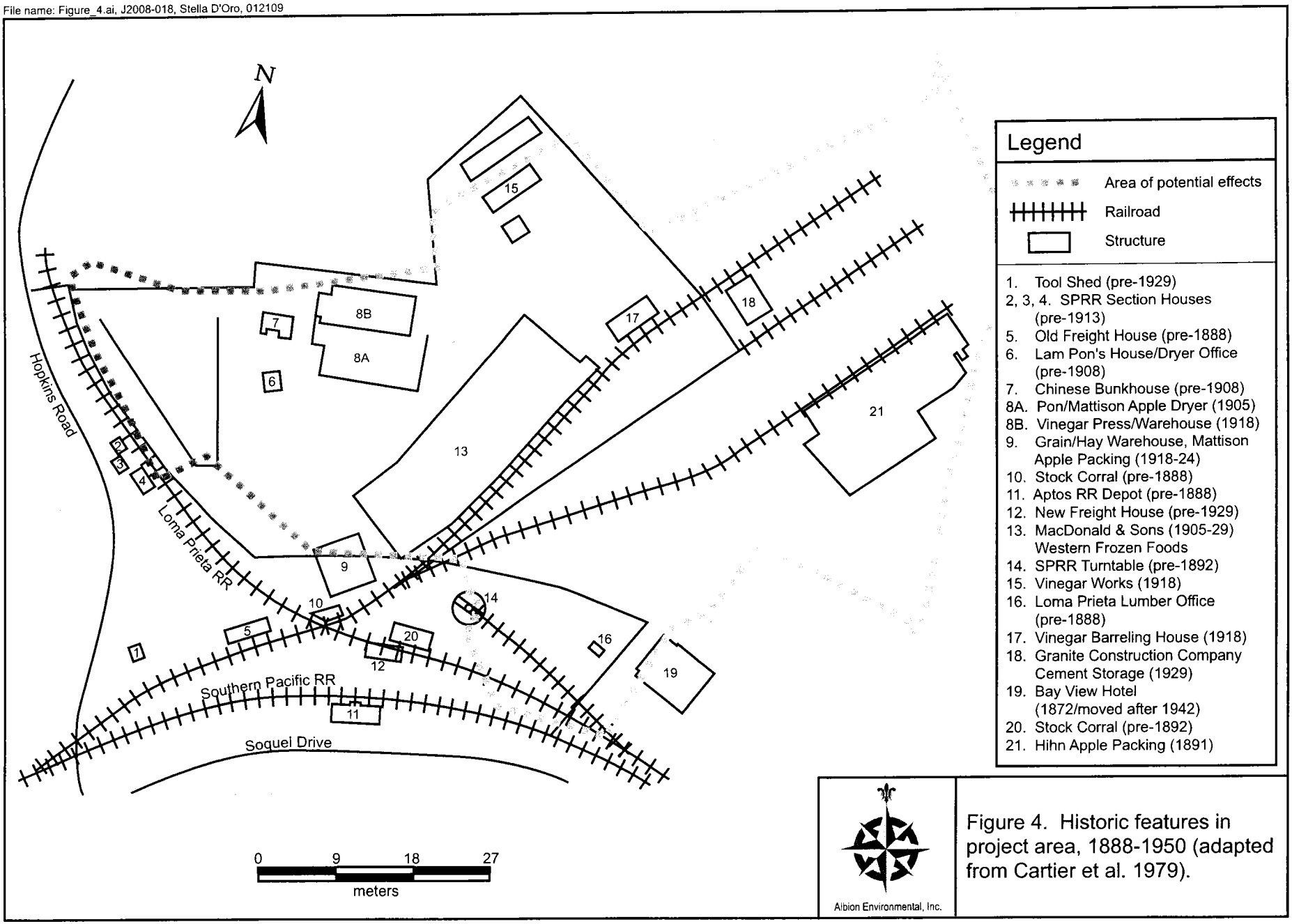


## Legend

- Area of potential effects
- Railroad
- Structure

1. Tool Shed (pre-1929)
2, 3, 4. SPRR Section Houses (pre-1913)
5. Old Freight House (pre-1888)
6. Lam Pon's House/Dryer Office (pre-1908)
7. Chinese Bunkhouse (pre-1908)
8A. Pon/Mattison Apple Dryer (1905)
8B. Vinegar Press/Warehouse (1918)
9. Grain/Hay Warehouse, Mattison Apple Packing (1918-24)
10. Stock Corral (pre-1888)
11. Aptos RR Depot (pre-1888)
12. New Freight House (pre-1929)
13. MacDonald & Sons (1905-29) Western Frozen Foods
14. SPRR Turntable (pre-1892)
15. Vinegar Works (1918)
16. Loma Prieta Lumber Office (pre-1888)
17. Vinegar Barreling House (1918)
18. Granite Construction Company Cement Storage (1929)
19. Bay View Hotel (1872/moved after 1942)
20. Stock Corral (pre-1892)
21. Hihn Apple Packing (1891)

Albion Environmental, Inc.

Figure 4. Historic features in project area, 1888-1950 (adapted from Cartier et al. 1979).

caused the Aptos packing industry to decline. The Hihn Apple Packing House is currently in use as a collection of antique shops called Village Fair.

The Aptos Fire House/VFW Hall is located at 8037 Soquel Drive, adjacent to the western side of the Bay View Hotel. The building was constructed in 1889 to serve as the office of the Loma Prieta Lumber Company, but it was highly modified or entirely rebuilt in subsequent years. By 1892, it appeared to be associated with the Aptos Milling Company lumberyard. A 1908 Sanborn Fire Insurance map indicates the structure had been converted to a residence. By 1923, the property was donated by Joe Arano for use as a firehouse. The building was rotated 90 degrees and remodeled. In 1952, the firehouse moved to its new location on Aptos Street, and the building again became a lumber office, this time used by Lester Toney. In the early 1950s, Mrs. Helen Wikkerink opened a small library in the building. Later, it was enlarged and served as the VFW Hall, Monterey Bay Post No. 7778, American Legion. It continued to be used in this capacity until 1979 (Oosterhous 2003b). In later years it was used as an antique store, fruit stand, and currently as a gift shop, "Fleur Gifts."

Two other historic resources are located directly adjacent to the project area and may be affected by the proposed development. These are the Bay View Hotel and the historic SPRR track along Soquel Drive.

The Bay View Hotel, located at 8041 Soquel Drive, is situated adjacent to the southeastern boundary of the proposed area of development. Proposed development will not impact the historic structure. The building was constructed in 1878 at the corner of Soquel Drive and Trout Gulch Road, and was originally named the Anchor House (Oosterhous 2003c). The hotel was owned by Jose Arano and Augustia Castro, who operated a grocery store onto the main floor of the hotel. In 1929, Edward Arano, the son of Joe and Augustia Arano, renovated the hotel. In 1942, the hotel was sold to Fred and Elma Toney, and in 1946 the hotel was moved to its present location.

The historic SPRR line (1883-circa 1960) through Aptos Village is immediately adjacent to the project area along its southern end. This railroad, currently under private ownership and still in regular operation, is central to Aptos and regional history. The current railroad was the main SPRR route through Aptos, forming its essential landscape and morphology. Originating as a shipping point on this railroad, all buildings and roads in Aptos Village were, and still are, oriented to the historic SPRR line.

## CONCLUSIONS AND SIGNFICANCE EVALUATIONS

### California Register of Historical Resources Criteria

Section 15064.5 of CEQA provides that, in general, a resource not listed on state or local registers of historical resources shall be considered by the lead agency to be historically significant if the resource meets the criteria for listing on the California Register of Historical Resources (CRHR) (Public Resources Code [PRC] Section 5024.1, California Code of Regulations Section 4852). This section also provides standards for determining what constitutes a "substantial adverse change" that must be considered a significant impact on archaeological or historic resources.

When a project will impact a historical resource, it must be determined whether or not that resource:

a) Is historically or archaeologically significant, or is significant in the architectural, engineering, scientific, economic, agricultural, educational, social, political or cultural annals of California; *and*

b) Meets any of the following criteria:

1. Is associated with events that have made a significant contribution to the broad patterns of California's history and cultural heritage;

2. Is associated with the lives of persons important in our past;

3. Embodies the distinctive characteristics of a type, period, region, or method of construction, or represents the work of an important creative individual, or possesses high artistic values; or

4. Has yielded, or may be likely to yield, information important in prehistory or history.

CEQA also requires lead agencies to consider whether projects will impact "unique archaeological resources." PRC Section 21083.2(g) states that "unique archaeological resource" means an archaeological artifact, object, or site about which it can be clearly demonstrated that, without merely adding to the current body of knowledge, there is a high probability that it meets any of the following criteria:

1. Contains information needed to answer important scientific research questions and that there is a demonstrable public interest in that information.

2. Has a special and particular quality such as being the oldest of its type or the best available example of its type.

3. Is directly associated with a scientifically recognized important prehistoric or historic event or person.

### Archaeological Resources Evaluation

Should intact subsurface deposits, either prehistoric or historic, be identified at SCR-222/H, such deposits would have potential to yield information important in prehistory or history. Therefore, SCR-222/H is a potentially significant archaeological site (a), and also has the potential to meet

CRHR Criterion 4 above. Both prehistoric and historic components of SCR-222/H would also be likely to meet the CEQA definition of a "unique archaeological resource" as outlined above.

While results of recent test excavations at CA-SCR-222/H suggest that site components are highly disturbed and lack subsurface integrity, this cannot be determined for certainty without further investigation. Therefore, it is Albion's recommendation that all ground-disturbing activity in the project area be monitored by a qualified archaeologist in the event that a substantial intact deposit is found within the property.

### Built Environment Resources Evaluation

In 2002–2003, Aptos Village was documented as a mixed commercial-residential historic district by Dill Design Group (Los Gatos), in response to an earlier cultural resources analysis for the proposed Aptos Station Development (Dill et al. 2003). Dill Design Group found the Aptos Village Historic District to be historically and architecturally significant for listing in a local (County) historic register. The 2002–2003 documentation established boundaries for the district as well as a period of significance spanning nearly 85 years, from the arrival of the SCRR in Aptos (1874/75) to the last phase of historic development following World War II (ending in 1959).

A total of 32 properties were inventoried and evaluated as contributing (or non-contributing) elements of a local historic district; 25 buildings were deemed contributing to the district's integrity, and 7 buildings within the district boundaries were designated as non-contributors.

Contributing buildings include the Bay View Hotel, which is also listed individually in the National Register of Historic Places (NRHP); the Aptos Fire Hall; and the Hihn Apple Packinghouse. However, the documentation clearly states that, though eligible for the County's List of Historic Resources, the district as a whole lacks the level of significance and integrity necessary to meet criteria for inclusion in the CRHR or the NRHP (Dill et al. 2003).

Subsequently, the County assigned the Aptos Fire Hall a County significance rating of NR 5, "a property determined to have local significance," and the Hihn Apple Packinghouse a rating of NR 3, "a property eligible, in the opinion of the County Historical Resources Commission, to be listed on the National Register of Historic Places" (Section 16.42.080[e]). The fact remains, however, that neither building meets the criteria for inclusion in the CRHR, and would not be considered important historical resources for purposes of CEQA compliance.

Due to the County's local significance rating, as well as community interest in the dwindling architectural remnants of historic Aptos Village, the current project proposes to relocate the Aptos Fire Hall and the Hihn Apple Packinghouse. The Fire Hall will be relocated outside of the project area and continue to be used. The Packinghouse will be moved slightly north within the project area, reoriented to a new street location and adapted for new commercial use. The defining characteristics of both historic buildings will remain unaltered.

The Bay View Hotel was placed on the National Register of Historic Places in 1992 (Oosterhous 2003c), regardless of the fact that it was relocated in 1946, and that much of the railroad/lumber mill/apple processing complex with which it was historically associated has long been gone. It is significant largely for its architectural style and elements, and currently has no aspects of setting (other than the railroad) that contribute to its significance. Its NRHP status automatically qualifies it for listing in the CRHR, and it is has a local (County) significance rating of NR1, "a property listed in the National Register of Historic Places" (Section 16.42.080[e]). It will not be directly impacted by

the proposed Project, nor will its integrity and/or significance be indirectly (visually) affected by surrounding new development.

The historic SPRR line (1883-circa 1960) through Aptos Village has not been formally evaluated for its historical significance. Forming the basis of Aptos history and its landscape, the current railroad route is potentially eligible for inclusion in the CRHR under Criteria 1, for its major geographical and economical contribution to the Monterey Bay region. It would also be eligible for a local (County) significance designation.

## POTENTIAL IMPACTS AND RECOMMENDED MITIGATION MEASURES

### CEQA Guidelines for Finding of Effect

Section 15064.5 of CEQA states that a project will have significant adverse impacts to cultural resources if the project will:

- Cause a substantial adverse change in the significance of a historical resource as defined in Section 15064.5;
- Cause a substantial adverse change in the significance of a unique archaeological resource pursuant to Section 15064.5;
- Directly or indirectly destroy a unique paleontological resource or site or unique geologic feature;
- Disturb any human remains, including those interred outside of formal cemeteries.

### Archaeological Resources

*Impact 1.* Construction of the proposed project could result in the disturbance of buried prehistoric and/or historic archaeological resources at site CA-SCR-222/H that potentially meet CRHR criteria and may also constitute "unique archaeological resources" under CEQA. There is also potential for the proposed project to disturb human remains within the prehistoric component of CA-SCR-222/H.

*Mitigation Measure 1.* The potential for impacts to occur at CA-SCR-222/H may be mitigated to less than significant by having all ground-disturbing activity in the project area monitored by a qualified archaeologist, in the event that a substantial intact deposit is found during construction. If this occurs, all work within 50 feet of the find shall be halted, and the find shall be investigated and assessed by professional archaeologists working under the stipulations of a monitoring/treatment plan approved in advance by the County.

### Built Environment Resources

Relocation and reuse of the Hihn Apple Packinghouse at 417 Trout Gulch Road will not result in a substantial adverse change to a historical resource as defined by CEQA. In accordance with Santa Cruz County criteria for historic preservation (SCC16.42.070), a Historical Resource Preservation Plan will be prepared and approved by the County Historic Resources Commission prior to relocation of the Packinghouse. No further action is recommended.

Relocation of the Aptos Fire Hall at 8037 Soquel Drive will not result in a substantial adverse change to a historical resource as defined by CEQA. In accordance with Santa Cruz County criteria for historic preservation (SCC16.42.070), a Historical Resource Preservation Plan will be prepared and approved by the County Historic Resources Commission prior to relocation of the Fire Hall. No further action is recommended.

The proximity of the Bay View Hotel (8041 Soquel Drive) to the proposed project will not result a substantial adverse change to a historical resource as defined by CEQA. No further action is recommended.

Construction of the project to include an additional crossing of the historic SPRR line along Soquel Drive will not result in a substantial adverse change to a historical resource as defined by CEQA. No further action is recommended.

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APPENDIX A

# PHASE 1 INVESTIGATIONS AT CA-SCR-222/H

## EXECUTIVE SUMMARY

On September 2, 2008, Barry Swenson Builder (BSB) contracted with Albion Environmental, Inc. to undertake Phase 1A investigations at CA-SCR-222/H. The purpose of the investigation was to ascertain the presence of the site CA-SCR-222/H, its horizontal and vertical distribution, as well as the site's integrity for purposes of CEQA evaluation. The site is located in a parcel proposed by BSB to be developed for the Aptos Village Project. The parcel located in the hamlet of Aptos, California, and is bounded to the south and north by Soquel Ave. and Granite Way, and by Aptos Creek Rd. and Cathedral Dr. to the west and east, respectively.

Albion conducted an intensive pedestrian survey of the parcel, excavated five backhoe trenches for geoarcharchaeological investigation, and excavated two surface transect units (STU) for further information regarding the integrity of the cultural deposit. Samples totaling 1.55 cubic meters were processed through ¼" mesh screen from stratigraphic contexts in the backhoe trenches, and all sediments were processed through ¼" mesh in the STUs, totaling 0.68 cubic meters. A total of 21.5 cubic meters was excavated at the site without encountering intact cultural features.

While some prehistoric cultural materials were recovered from two of the trenches and both of the STUs, all contexts were heavily mixed with historic and modern debris. Furthermore, subsurface investigation suggests that a greater density of prehistoric resources within the site is located in the western portion of the parcel. Although the site appears to be largely disturbed in the areas tested, it is possible that other locations with intact stratigraphy and a richer cultural deposit may be present within the site boundaries.

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# INTRODUCTION

On September 10, and between September 23 and 25, 2008 archaeologists from Albion Environmental Inc. (Albion) conducted an evaluation of the parcel intended to be developed for the Aptos Village Project. The purpose of the examination was to identify the presence or absence of a prehistoric archaeological site, CA-SCR-222/H[1]. This site has been identified within the parcel's boundary (Figure 1).

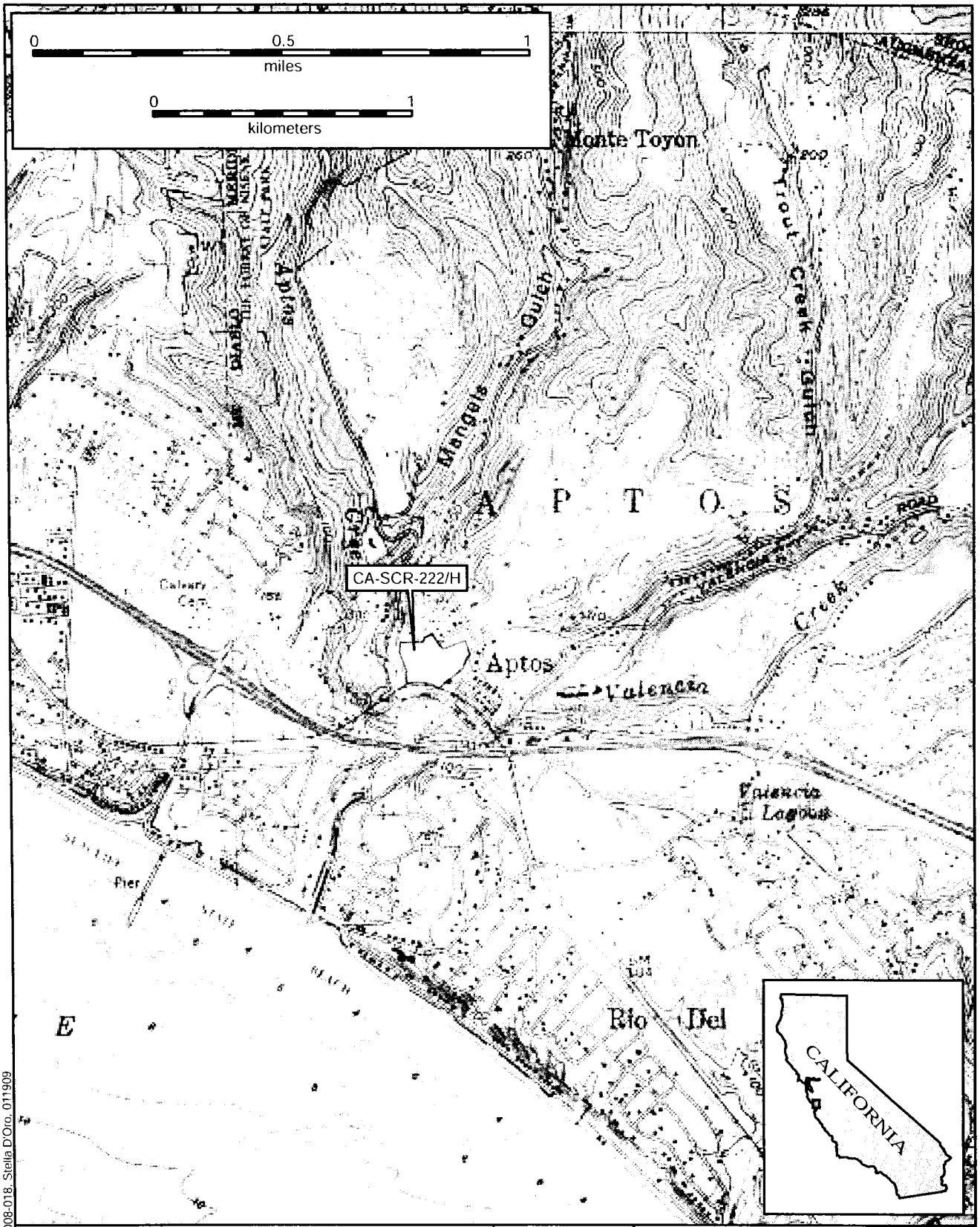
The investigation was carried out on behalf of Barry Swenson Builder (BSB), the project developer, and was intended to identify the location of CA-SCR-222/H. Work includes a geoarchaeological investigation that focused on the depth, distribution, and integrity of the site to provide preliminary findings for project compliance with CEQA regarding prehistoric cultural resources. The premise of a CEQA evaluation is that an archaeological site will be considered significant (a historical resource) if it can be demonstrated that it has the potential to contribute important information pertinent to prehistory or history (important regional or local archaeological issues [i.e., criterion "d" of the California Register criteria for evaluation, Section 15064.5 (a) (3) of the CEQA Guidelines]). If it is determined that a site is significant and that the project will cause a substantial adverse change in the significance of the resource, it is necessary to develop mitigation measures to reduce the impacts to a level of less than significant (CEQA Guidelines, Section 15064.5 [c]). Under CEQA, avoidance is the preferred mitigation for archaeological sites, however, other mitigation measures are provided in the Guidelines (Section 15126.4 [b] [3]). The present work is not intended to evaluate site significance, rather to identify the presence and location of prehistoric materials.

In order to successfully accomplish the goals of the current effort, three stages of fieldwork were conducted. The first was an intensive pedestrian survey of the parcel. The second was the supervision of backhoe trenches within the subject parcel to identify buried locations of the site deposit. Furthermore, this effort was intended to expose stratigraphic profiles to better identify site boundaries and assess the site's integrity. Finally, two surface transect units (STUs) were excavated within the identified site deposit in a preliminary attempt to recover data from the site. This last stage was undertaken to provide a finer grained, controlled sample of excavated material from the site than is possible to recover through backhoe trenching alone.

The report is organized into six main sections. Following the introduction is the project location and description, which discusses the development in question and potential impacts to the prehistoric resource. This is followed by the contextual background, which establishes the environmental, prehistoric, ethnographic and historic contexts for the project area. A description of the site based on prior work is then provided. The following section outlines the field methods used to investigate the site. The site structure as identified through the backhoe trenches is discussed, followed by the results of the subsurface investigations including a description of the cultural materials that were recovered. Finally the report is concluded with a summary of the work and conclusions derived from the findings. Appendix A is the DPR site record update forms. Appendix B provides a more detailed discussion of the geoarchaeological study, and depiction of the stratigraphic profiles from the five backhoe trenches and one of the STUs. Appendix C is the catalog of artifacts collected during the excavation.

## Project Location and Description

The parcel planned to be developed as the Aptos Village project by Barry Swenson Builder (BSB) is located in Aptos Village, a historic hamlet approximately 1 mile inland from the Monterey Bay. The




USGS 7.5" Quadrangle, Soquel 1954, photorevised 1994

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Figure 1. Project location map.

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proposed development is north of Soquel Drive and between Aptos Creek Rd. to the west and Cathedral Drive to the east (Figure 1). The proposed development encompasses approximately 3

acres and comprises the movement of historic structures and the construction of new buildings that will create a high density mixed use residential/commercial area. Presently, the southern edge of the parcel contains storefronts housing a variety of small businesses. Other buildings are present on the subject parcel; however the built environment will not be discussed in this document.

Presently, much of the proposed development area is an open field littered with historic and modern debris, along with foundations from historic structures. In the northeastern portion of the parcel, a dirt bike jump park has been constructed. The previously recorded prehistoric site CA-SCR-222/H falls within the western and central portions of the subject parcel. Since historic features have been identified within the site boundary, the site designation has been changed to CA-SCR222/H. This document focuses on the previously recorded prehistoric component of the site.

## CONTEXTUAL BACKGROUND

### Environment

#### Geology

The project area is located near the foot of the southern Coast Range. The mountains are composed largely of sedimentary rocks, though, the Salinan Block, which is largely batholithic granitics and metamorphics is a major geologic formation in the area. Uplift of the Coast Range in this area took place relatively recently when compared to the northern Coast Ranges (Schoenherr1992:267-9).

#### Climate

The hamlet of Aptos is characterized by a Mediterranean climate and receives most of its rainfall between the months of November and April. Annual high temperatures range between 70°F to upwards of 100° F, with lows rarely dropping below 20°F and generally being above freezing.

#### Vegetation

Vegetation zones in the project vicinity include coastal scrub, prairie/grassland, riparian, coastal dune, and oak woodland/redwood forest (Barbour and Major 1977). The immediate project area is adjacent to the Aptos Creek riparian corridor, and is in a prairie/woodland habitat.

### Cultural Context

The Monterey Bay area has a long history of human use, dating back perhaps as much as 10,000 years. Early exploration of coastal California by Europeans encountered populations of Native Americans living near the coast. Subsequent populating of the area by people of European descent displaced and marginalized the earlier Native inhabitants, and provides for a rich prehistoric, ethnographic, and historical record in the vicinity of Aptos Village and further afield along the Central Coast.

## Prehistoric Context

While the ethnographic record of the central coast is relatively rich, with accounts from early explorers describing certain aspects of Native American lifeways, research investigating prehistoric lifeways and the culture history of Native inhabitants of the Monterey Bay has not been undertaken until the past few decades (Hylkema 1991; Jones et al. 2007). Interpretation of Monterey Bay prehistory has been developed through both local and regional archaeological investigations. Through these projects, general patterns of prehistoric lifeways along the central California coast have been developed and the most common taxonomic framework used today involves six distinct temporal periods that are viewed to represent differences in the organization of past subsistence and settlement patterns of the region's inhabitants.

Prehistoric Periods

| | |
|---|---|
| Paleo-Indian | (pre-10,000 B.P.) |
| Millingstone | (10,000-5500 B.P.) |
| Early | (5500-2600 B.P.) |
| Middle | (2600-1000 B.P.) |
| Middle/Late Transition | (1000-850 B.P.) |
| Late | (850-Historic) |

The Periods are characterized by either specific artifact types or suites of artifacts and site locations that typify the particular lifeway that each period is seen to represent. The patterns may reflect one or a few aspects of the past manner of living and are generally not understood as a holistic representation of how people on the Central Coast were living at a particular point in time. The Paleo-Indian Period is generally viewed as a time where people were focusing their subsistence pursuits on large Pleistocene mammals and were highly mobile in search of game. Unfortunately, associations between the animal bones and archaeological sites are spotty at best. Two sites located in San Luis Obispo County contained fluted points (Gibson 1996, Mills et al. 2005), the main marker of this time period, though their archaeological context is difficult to interpret. Associated artifacts with sites of this antiquity are suggested to be scrapers, scraper-planes, bifaces, and to lack milling equipment. More locally, the Scotts Valley site (CA-SCR-177) has been argued to represesent the Paleo-Indian Period and contained leaf and lanceolate projectile points/knives, flake tools, hammerstones, and ochre (Cartier 1993, Fenenga 1993: 245-254), though similar to the other sites, its integrity is suspect (Jones et al. 2007:130).

The Millingstone Period is typified by an abundance of milling equipment that includes handstones and millingstone, along with a sparse flaked stone assemblage that lacks formalized tools. Millingstone Period sites are present in the Monterey Bay near the mouth of Elkhorn Slough (CA-MNT-229) (Jones et al. 1996) and Moss Landing (CA-MNT-234) (Milliken et al. 1999). These sites contained cobble and core tools fabricated form chert and quartzite, grinding stones, estuary shellfish and small terrestrial mammal bone. Millingstone components on the central coast provide the earliest well dated Native American occupation (cf. Jones et al. 2001)

The Early Period is recognized by a change in artifact assemblages, signifying a shift in subsistence and settlement practices at this time. It is recognized by an increased abundance of bifacially flaked projectile points, along with the presence of mortar and pestle technology. Projectile points dating to this time period include Rossi Square-stemmed and side notched points, large Side-notched, and Año Nuevo Long-stemmed varieties. This may be a time when hunting became more important over the generalized plant and small game focused economy of the Millingstone Period. Early Period sites are more abundant in the Monterey Bay area than earlier ones and are represented by CA-MNT-108 near

Fisherman's Wharf in Monterey (Breschini and Haversat 1992a), CA-MNT-831 in Pacific Grove (Breschini and Haversat 2008), and CA-SCR-38/123 at Wilder Ranch (D. Jones and Hildebrandt 1994). The sites are typified by dark midden soils, abundant shellfish, mortars and pestles along with flaked stone tools and chipping debris, and certain shell bead types (Bennyhoff and Hughes 1987).

The Middle Period is understood to be a time when the use of shellfish declined relative to earlier Periods, and the exploitation of more mobile and elusive small game such as rabbits and otters increased. Artifact assemblages contain contracting stemmed projectile points, mortars and pestles. Additionally, there is an increased presence of fishing equipment that includes grooved and notched net weights and circular shell fish hooks. Handstones, millingstones, and pitted stones may also be present at sites dating to this period (Jones et al. 2007:138-139). In the Monterey Bay, Middle Period components are present at CA-MNT-229 and -234 as well as CA-SCR-7 (D. Jones and Hildebrandt 1990) and CA-SCR-9 (Hylkema 1991:141-183).

The Middle/Late Transition reflects at short period of time when rapid culture change is argued to have occurred. This is suggested to have been influenced by a time of rapid climate change that has been identified at various locations in the Western United States (Jones et al. 1999) as well as in Patagonia (Stine 1994). It is suggested that occupants of the central coast underwent a dramatic reorganization of their social structure and subsistence practices. Sites dating to this period in Monterey County are restricted to the Big Sur locality (Jones 1995).

The Late Period is better represented in the Monterey Bay, yet these sites are most often short term task specific sites. Occupation sites are believed to be located at inland areas such as the Upper Carmel Valley (Breschini and Haversat 1992b) and Santa Clara Valley (Hildebrandt and Mikkelson 1993). Late Period sites in the Monterey Bay area include CA-MNT-1765 at Moro Cojo Slough, which appears to represent a collection station and field camp (Fitzgerald et al. 1995), and CA-MNT-143 at Asilomar State Beach (Brady et al. 2008), which is a site that was used for the short term shellfish acquisition. Concentrations of abalone shell are common at late period coastal sites in the Monterey Bay (Breschini and Haversat 1991), signifying the importance of the acquisition of this resource, though more long-term occupation is generally not found to co-occur.

*Local Prehistoric Context*

Several sites are recorded within the vicinity of the Aptos Village project, and suggest that the vicinity has been subject to human occupation for several millennia, though the location of particularly dense and rich archaeological deposits has yet to be systematically determined.

Archaeological sites in the vicinity include CA-SCR-1 on the eastern bank of Aptos Creek which contained a human burial, along with mussel and clam shell (Riddell 1949). CA-SCR-221 is located north of Aptos County Park and was identified by its surface manifestation that is similar to the prehistoric component of CA-SCR-222/H. Marine shell, fire cracked rock, a hammerstone, and large mammal bone were present on its surface (Morris 1979b). CA-SCR-2 is located 0.1 miles north of the project area and contained flaked stone tools, ground stone artifacts, fire affected rock, and ashy midden soils (Riddell and Pilling 1949). Much of the site's integrity appears to have been compromised by historic activities, though subsurface augering identified a deeper intact component of the site (Gmoser and Hylkema 1996). CA-SCR-52 is located near the confluence of Aptos and Valencia Creeks and contained burials along with flaked and ground stone tools (Baumhoff 1954). Other nearby sites include CA-SCR-135 (Wardill 1975), CA-SCR-233 (Archaeological Consulting and Research Service 1980), and CA-SCR-353/H (King et al. 2004). These sites contained limited amounts of flaked and ground stone tools along with marine shell and are also noted to have been disturbed through modern and historic development activities.

## Ethnographic Context (Albion Environmental)

The current project site lies within a territory once inhabited by speakers of Costanoan languages, a domain which extended from San Francisco Bay along the coast and west-central California to just south of Monterey Bay. The word "Costanoan" derives from the Spanish word *Costaños* meaning 'coast people' (Levy 1978:485). The Costanoan language family contained eight distinct but related languages, each of which was spoken by several different groups or "tribelets" (Levy 1978). During the Mission Period (1770-1830s) there were many tribelets in what is now Santa Cruz County.

Within Costanoan territory there were approximately 50 autonomous villages (tribelets) (Kroeber 1925), although populations moved throughout the year depending on the season and available resources. Winter was a time of greater residential stability when people made use of food stores and partook in ceremonial activities (Broadbent 1972; Margolin 1978; Milliken 1995). Since the Costanoan inhabited both coastal and interior habitats, subsistence practices varied by season and by residential location. Acorn was reportedly a staple food, though other seeds, berries, roots, and kelp were also regularly eaten. Fish, waterfowl and varied species of shellfish along with sea lions, seals and sea otters were also important resources (Baumhoff 1963; Levy 1978).

The Aptos tribelet was located along the shores of Monterey Bay from the present location of Aptos and eastward about half way to the mouth of the Pajaro River. The Aptos peoples were one of four early groups converted at Mission Santa Cruz, but were actually the last of those four nearby groups to be completely absorbed into the mission in 1796. Although they did marry with their neighbors the Cotoni, Sayanta, and Uypi, they were completely mixed together with the Cajastaca people of the Corralitos area. So much mixing occurred within the nuclear family groups that the idea arises that the Aptos and the Cajastaca were a single tribal group (Milliken 1995).

Several references from Spanish explorers and missionaries describe the presence of Native Americans in the Aptos area at the time of contact. An exploratory land expedition led by Don Gaspar de Portolá in 1769 is said to have come upon an Indian village at the confluence of the Valencia and Aptos creeks. The Spaniards recorded the site as "Aptos". In 1791, the Santa Cruz Mission was established west of the San Lorenzo River. Indians from the Aptos area were brought into the mission compound. Records of Father Crespi in 1769, Father Palou in 1774, and the Santa Cruz Mission in 1791 describe the Aptos region, with some mention of the Native Americans who called their area "Aptos" (Brown 2001). The first recorded contact came in 1774 when the Rivera Expedition encountered residents of the village at Aptos and offered gifts. The accounts mention seven (or eleven) grass huts and a population that added up to the diarists estimation of a 'medium sized village" (Brown 2001).

In 1872 it was reported that Claus Spreckels, who owned 3,500 acres of the Old Aptos Rancho, had the major Indian village site and the cemetery enclosed with large bamboo (Santa Cruz Sentinel 1872). These sites have been interpreted as being the recorded sites CA-SCR-1 and CA-SCR-2 (Cartier et al. 1979).

Native inhabitants of the region were first encountered by Spanish explorers in 1602 (Vizcaino) and again between 1769-1776 (Portola, Fages, Riviera, and Anza). During the Mission period, AD 1770-1835, devastating changes occurred for the Costanoan people. Over the following several decades, the population was recruited into nearby missions and their traditional subsistence economy was replaced by an agricultural economy. Analyses of mission baptismal records demonstrate that the last Costanoan tribelets living a traditional existence had disappeared by 1810 (Levy 1978). The population experienced dramatic decline due to the introduction of European diseases, which consequently caused higher death rates and lower birth rates. The secularization or abandonment of

the missions by the Mexican government in 1832 caused people to relocate to different areas and establish small settlements, thus, separating them farther away from their cultural heritage. Levy (1978) believes that Costanoan languages were probably not spoken after the year 1935.

On a final note, the use of the term "Ohlone" has recently gained favor in reference to prehistoric Costanoan populations (Levy 1978; Munoz in Hildebrandt 1983; Milliken 1993). Originally appearing in F.W. Beechey's description of his 1826 encounter with native populations in San Francisco Bay (Beechey 1968), this term has also been adopted by many Costanoan descendants. Levy (1978) states that in 1971 a group of Costanoan descendants formed a corporate entity, the Ohlone Indian Tribe, and gained title to the Ohlone Indian Cemetery at Mission San Jose. Today, the term Ohlone is basically synonymous with Costanoan and is preferred by contemporary Native Americans (Bean 1994; Margolin 1978).

**Historic Context**

The Aptos Village site is triangular, bounded on the north by foothills, on the east by the canyon cut by Valencia Creek and on the west by a steeper canyon carved by Aptos Creek. The two streams meet at the tip of the triangle, join, and flow to Monterey Bay as Aptos Creek. This junction of the two creeks was such a dominant feature that many early residents believed the name "Aptos" to be an Indian word based on that intersection, leading to the legend that the name meant "the joining of two waters." There is little evidence in early literature to support that definition, however, and as Donald T. Clark notes in his classic *Santa Cruz County Place Names*, the source of the name Aptos is "uncertain" (Clark 2008).

There is nothing uncertain, however, about the transportation challenge posed by those two canyons, and beginning with the first passage through the area by the Portolá expedition in October, 1769, Aptos has proved difficult for those wishing to travel across the coastal terrace.

*The Spanish Era, 1769-1822*

The Spanish found traveling across the coastal terrace so "difficult" and "tiresome" that in 1774 they chose the more level and direct route through the Santa Clara Valley connecting Monterey and San Francisco (present-day Highway 101). When the mission was established at Santa Cruz in 1791 and the pueblo of Villa de Branciforte six years later, the road going through Aptos ended at the mission. Santa Cruz and Aptos were on a dead end and the easiest access was by sea. The Indians living in the Aptos area provided most of the converts for the Mission Santa Cruz between 1791 and 1797, and once they were gone, except for cattle grazing on the coastal terrace, there was very little activity in Aptos.

*The Castro Era, 1833-1876*

In 1833 Rafael Castro, a retired soldier and native of Villa de Branciforte was awarded a private land grant named Rancho Aptos. The original 4,486 rancho was bounded on the west by Aptos Creek, but in 1840 Castro was granted an additional 2,200 acres extending the boundaries west to Boreas Gulch. Castro built his home on the western bank overlooking Aptos Creek and began raising cattle, shipping the hides off the beach at the mouth of Aptos Creek (Waid 1984).

*Aptos Wharves*

Rafael Castro took his Rancho Aptos land title papers to the Land Commission in the early 1850s and in 1860 he received confirmation. Even before he had clear title, Castro received numerous offers to sell his property, but he declined, preferring instead to negotiate leases with the various sawyers and loggers who were interested in the redwood trees growing in the canyons to the north. To ship the products coming from his property and from land grants to the east, in 1850 Castro built a relatively

short 500-foot wharf just west of the creek mouth. Over the next 25 years, hides, lumber, flour and agricultural products were shipped from what became known as Aptos Landing (Collins 1995).

*The First Aptos Village*
Castro's wharf inspired a small commercial development at the intersection of the County road and the road to the wharf (present-day Wharf Road and Soquel Drive) while several of Castro's adult children built homes along the road to the west. The wharf was improved and extended in the 1860s for use in shipping lumber, firewood, and agricultural products to San Francisco.

Meanwhile, efforts to create a dependable crossing of Aptos Creek continued. The first bridge, built in 1860, was washed out in the 1862 flood and eventually replaced with a covered bridge.

In 1872, beset with marital difficulties and declining health, 69 year-old Rafael Castro sold the bulk of his property to sugar magnate Claus Spreckels for $71,900 in gold coin. The Castro era of Aptos Village on the western banks of Aptos creek ended in the 1870s with the coming of Claus Spreckels (1872), the arrival of Frederick Augustus Hihn and incorporation of the Santa Cruz Rail Road in 1873, and the death of Rafael Castro in 1878 (Waid 1984).

*Aptos Village Moves East*
Frederick Augustus Hihn had long held a dream of a dependable trans-county railroad, and following the entry of the SPRR into the region in 1872, he transformed his vision into reality. As the president of the Santa Cruz Railroad (incorporated in 1873), he led the construction of a narrow gauge railroad between Santa Cruz and the SPRR junction south of Watsonville. Claus Spreckels was a major stockholder in the railroad. All of the construction of the Santa Cruz Railroad (SCRR) was done by Chinese railroad workers. Their conical hats, quilted blue coats and Cantonese work songs were a regular part of the Santa Cruz County landscape during the 1870s and 1880s (Hamman 2002; Lydon 2008).

Seeing the potential for his own properties located up Valencia Creek, Hihn guided the route of the SCRR into the Aptos Village site even though it required two trestles compared to an easier route downstream that would need but one. Hihn's bringing the Santa Cruz Rail Road into the present-day Aptos Village set off a boom, the results of which are still visible today (MacGregor 2003).

By 1879 Aptos had three good hotels, where before the coming of the railroad, there was only one small establishment owned by Irish immigrant Patrick Walsh. Basque storekeeper Jose Arano built the Anchor House (present-day Bay View Hotel) beside the railroad tracks in 1878. Aptos historians have counted up to 15 saloons in the area by the mid 1880s, serving the needs of the lumbermen and loggers who worked in the forests to the north (Watsonville Pajaronian 1879).

*The Lumber Boom, 1883-1899*
Though the 1870s were busy in Aptos, the SCRR operated at a loss, and in 1882 was sold at a bankruptcy auction to the SPRR. The entry of SPRR into Aptos Village brought the fledgling railroad era to its maturity. Almost immediately after acquiring the narrow gauge SCRR, Southern Pacific announced it would broad-gauge the line, and in the fall of 1883, the first standard gauge locomotive made the trip between Santa Cruz and the SPRR mainline south of Watsonville. Products could be loaded onto a railroad car and shipped anywhere in the United States without having to be reloaded (Hamman 2002).

In 1883, Southern Pacific purchased a 7,000 acre tract of uncut redwood up in Aptos Canyon, containing an estimated 200,000,000 board feet of lumber, and punched a standard gauge railroad up the canyon to get it. Once the Chinese railroad crew had the first three miles of line built, the largest

lumber mill in 1880s Santa Cruz County began to send a torrent of lumber, railroad ties, shakes and shingles down into Aptos and out to markets all over California (Lydon 2008).

Undaunted by losing the SCRR and quite willing to take advantage of the SPRR connection in the now bustling Aptos Village, in 1891 Hihn purchased 27 acres of the Aptos Village site from the Bernals. By 1883 he had built a medium-sized sawmill and from there, he began moving part of what he estimated to be 100,000,000 board feet of lumber to his yard in Santa Cruz. The following year Chinese crews built a two-mile narrow gauge track into Valencia Canyon, and over the next eight years, redwood lumber flowed out of the Valencia down to Hihn's Valencia Mill in Aptos Village (Hamman 2002; Lydon 2008).

These two streams of redwood lumber converged in Aptos, just as the two creeks did south of the village. In 1893 Hihn shut down his Valencia Mill, and in 1899 the Loma Prieta Mill was closed, marking the end of the Aptos lumber boom. Smaller episodic lumber operations continued north of the village, but by the 1920s, that too had ended.

*The Apple Era, 1900-1959*

By the late 1890s, paralleling the agricultural trend going on in the Pajaro Valley, apples became the focus of activities at Aptos Village. The same railroad that carried lumber to the far corners of the country now began carrying railroad cars filled with apples. Most of the orchards were located north and east of Aptos Village, and Frederick Hihn was one of the leaders of this new Aptos industry.

By the 1920s Aptos was the second most important apple shipping location in Santa Cruz County. Over 90 percent of the apples shipped in the 1920s came from Watsonville, and though only five percent of the county's apple crop went through Aptos each year, it was enough to create a microcosm of the apple industry in Aptos Village. Box making, apple packing, an apple dryer and vinegar works were represented in what became a small apple-centered industrial park.

One of the most prominent of these businesses was the Lam-Mattison apple dryer founded in 1905. Lam Pon, an immigrant from China, became a partner with Ralph Mattison and their dryer became a landmark in the village. Each fall a large group of Chinese laborers would move into the village and work in the dryer well into the winter. In later years Filipino laborers were the dominant laborers. The Lam family continued its partnership with the Mattisons up to 1940. The last of the Aptos apple packing facilities closed in 1959 (Lydon 2008).

**Previous Investigations at CA-SCR-222/H**

The site CA-SCR-222/H was initially recorded in 1979 as an extensive occupation site with midden deposit with fire affected rock, large animal bone, and shellfish remains (Morris 1979). The site was described to be located in a large open field west of the Bay View Hotel and to cover a 300 x 200 meter area. The site was revisited later in the year and chipped stone was also noted to on the surface (Cartier 1979).

Due to the high number of prehistoric archaeological sites in the vicinity of CA-SCR-222/H, and the intensive ethnographic occupation in the local area, it seems important to view the site as one part of a larger prehistoric complex that is located in the vicinity of the confluence of Aptos and Valencia Creeks.

## FIELD AND LABORAOTRY METHODS

### Field Methods

As noted previously, fieldwork was undertaken in three stages: 1. Surface survey, 2. backhoe trench excavation, and 3. STU excavation (Figure 2). The first involved surface inspection by walking the entire parcel with archaeologists spaced 10 meters apart. Where potential cultural materials were identified, closer inspection of the area was undertaken. Surface finds were recorded using a handheld GPS.

The second phase of fieldwork involved the supervision of backhoe trench excavations in order to expose stratigraphic profiles, identify the spatial extent of the site, and to use the exposed profiles to conduct a geoarchaeological study of the prehistoric site and its context within the project parcel. The backhoe excavation was undertaken by a backhoe equipped with a three foot wide bucket that initially had a flat plate fixed across the teeth; however, the compact nature of the soils continued to break the plate off of the bucket during the excavation of Backhoe Trench (BHT) 1, so the remaining trenches were excavated with the teeth exposed. The excavation was closely monitored by two Albion archaeologists and proceeded in approximately 10 centimeter levels, with spoils piles being separated at visible stratigraphic changes in the deposit. Bucket samples were screened using ¼" from each stratigraphic unit in the trench (Table 1). Trench locations were placed to sample the area of the previously recorded site and in proximity to surface finds.

Table 1. Backhoe trench depth and volume sampled.

| BHT 1 | | BHT 2 | | BHT 3 | | BHT 4 | | BHT 5 | |
|---|---|---|---|---|---|---|---|---|---|
| Depth | Volume Sampled | Depth | Volume Sampled | Depth | Volume Sampled | Depth | Volume Sampled | Depth | Volume Sampled |
| 0-90 | 0.156 | 0-20 | OB | 0-58 | 0.078 | 0-50 | 0.078 | 0-30 | 0.052 |
| 90-150 | 0.078 | 20-100 | 0.156 | 58-90 | Base Rock | 50-100 | 0.078 | 30-100 | 0.104 |
| 150-200 | 0.078 | 100-150 | 0.078 | 90-150 | 0.156 | 100-140 | 0.052 | 100-140 | 0.104 |
| | | 150-190 | 0.078 | 150-200 | .078 | 140-180 | 0.052 | 140-180 | 0.052 |
| | | 190-220 | 0.052 | | | | | | |
| **Total** | **0.31** | | **0.36** | | **0.31** | | **0.26** | | **0.31** |

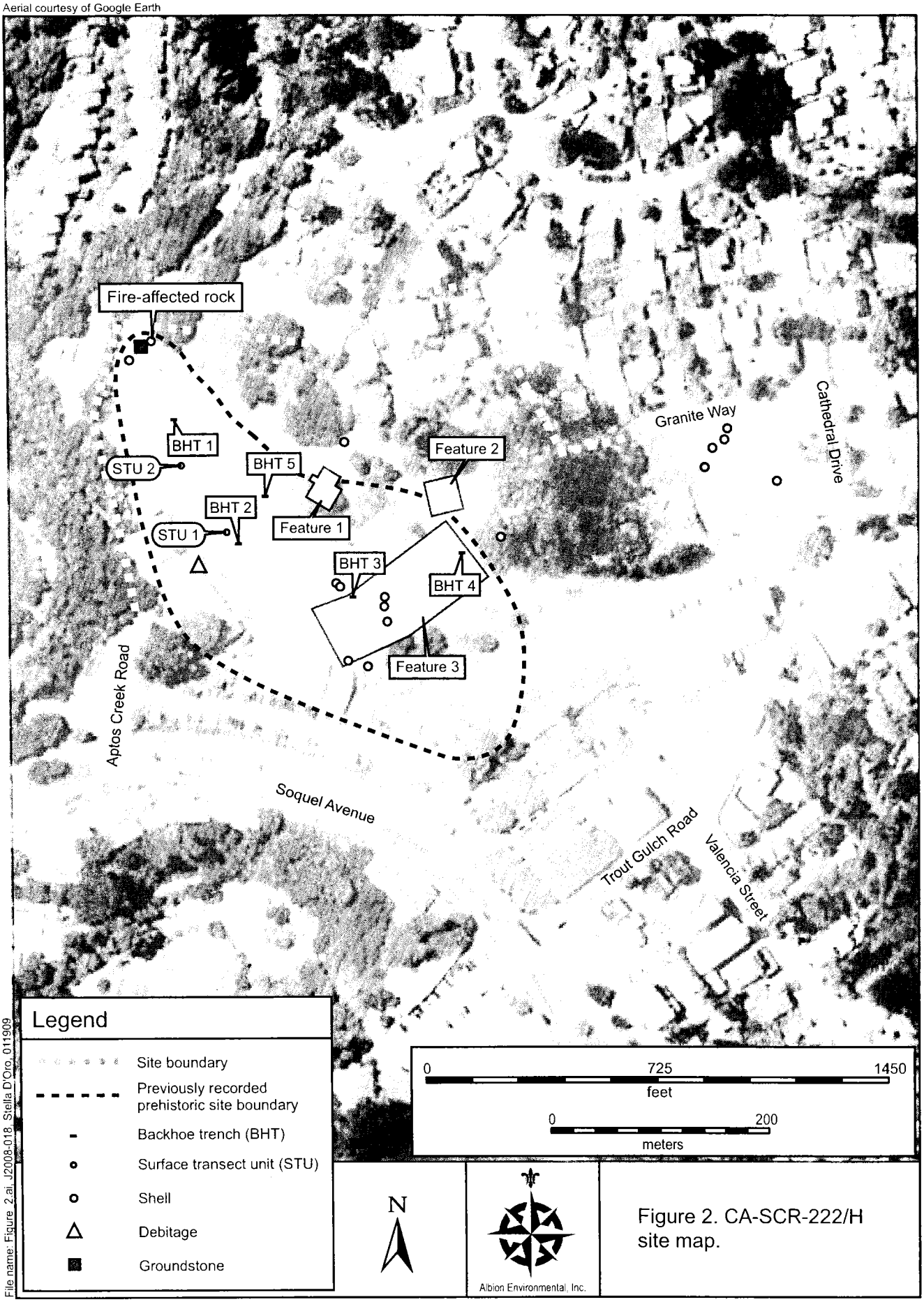
OB= overburden; Depth in centimeters; volume sampled in cubic meters, screened through 6mm mesh. Total volume= 1.55$m^3$.

The exposures ranged from 1.7 to 2.2 meters deep and measured 1 meter north to south and between 1.7 and 3.3 meters east to west. In general, three to four stratigraphic units were identified during the excavation of each trench. Excavation of each unit was halted when lighter colored, sandy sediments were encountered. These were presumed to be sterile. Additionally, the depth attained was generally below the level of impact identified by the project design.

A total of 20.5 cubic meters of deposit was excavated in the backhoe trenches. Buried features, human remains, or dense artifact concentrations were not encountered in the trenches. They did illuminate the generally disturbed nature of the site deposit and its limited subsurface manifestation.

Following the backhoe trenches, two surface transect units (STU) measuring 1 x 0.5 meters were excavated to one meter below the surface. The STUs were placed in areas with high likelihood of encountering the prehistoric cultural deposit. STU 1 was located west and north of BHT 2, and STU 2

Aerial courtesy of Google Earth




File name: Figure_2.ai, J2008-018, Stella D'Oro, 011909

Figure 2. CA-SCR-222/H site map.

was placed in between BHT 1 and BHT 2, in order to identify continuity of the deposit as the two backhoe trenches were the only ones to contain prehistoric items. These were intended to provide a more fine-grained sample of the site deposit and were excavated in 20 centimeters arbitrary levels. Due to the high level of surface disturbance, the backhoe removed the upper light colored soils until darker sediments, indicative of the cultural deposit were encountered. Hand excavation commenced in STU 1 at 40 centimeters below surface, and in STU 2 at 25 centimeters below surface. All sediments from these hand excavated units were processed through ¼" mesh screens and comprise 0.68 cubic meters of sampled sediments from STU contexts.

A total of 21.5 cubic meters of sediments was excavated during the Phase 1A investigation of the prehistoric deposit at CA-SCR-222/H, 2.23 cubic meters of which was processed through ¼" mesh screen.

### Laboratory Methods

All recovered materials from the field investigation were returned to the Albion laboratory in Santa Cruz. The materials were washed and cataloged according to standard Albion procedures. The catalog appears as Appendix A in this report. Further analysis was not conducted at this time.

## SITE STRUCTURE

The surface survey failed to identify much in the way of prehistoric cultural material. The site record (Morris 1979) describes the site sediments as dark brown sandy midden, and the surface manifestation to be fire cracked rock, large mammal bone, and shellfish remains. No flaked stone tools were noted at that time, though "chipped stone" was later reported to be present on the surface (Cartier 1979). Additionally, general historic impacts were described.

Today, much of the site surface is covered with historic and modern disturbances. These include a gravel parking lot, locations were sand and other excess soil materials were deposited on the surface, and foundations of historic structures along with assorted junk piles. As a result of these disturbances, the presence and distribution of the site by its surface manifestations is inconclusive.

Sediment profiles and samples screened from the backhoe trenches as well as from the STUs indicate a high degree of subsurface mixing (Appendix B). The trenches did appear to retain some degree of stratigraphic integrity, but intrusion of modern and historic material to 70 centimeters below surface in the profiles indicates that the stratigraphic layers identified likely represent episodes of site matrix redeposition. Furthermore, because modern/historic items were recovered in contexts associated, or even below prehistoric items suggests that much of the prehistoric site component lacks structural integrity.

Excavation of the backhoe trenches provides further information regarding the horizontal extent of the site. The surface survey identified abalone (*Haliotis* sp.) and clam (*Saxidomus* sp.) shells associated with dark soils in the bike jump park at the northeastern portion of the project area, suggesting that the site may be larger than previously recorded. However, prehistoric cultural materials were only identified in BHT 1 and 2 and one piece of apparently old shell was recovered in BHT 5. The lack of prehistoric material in BHT 3 and 4 suggest that the eastern boundary of the site may not extend as far as originally recorded, though the small sample from this portion of the site may simply reflect a more sparse deposit. The shells encountered in the bike jump park likely represent redeposited matrix from the prehistoric component of CA-SCR-222/H.

## RESULTS

Information recovered from the backhoe trenches and STUs indicates that the prehistoric component of CA-SCR-222/H is indeed located within the project parcel. The surface manifestation of the site is obscured through modern and historic disturbances, necessitating subsurface investigations to properly define the site boundaries. The present effort may be used to gain a rudimentary understanding of the site location, and its cultural constituents.

Table 2 describes the findings from the site excavation. One biface, 22 pieces of lithic debitage, one handstone fragment, and one piece of miscellaneous ground stone (MGS) comprise the stone tools recovered in the sediments sampled. Additionally one small crystal fragment, four pieces of faunal bone and 10 shell fragments were recovered. The faunal bone was too fragmented to identify, though it may derive from large and medium sized mammal. The 10 shell fragments appear to all be clam. The remaining four shell fragments from BHT 3 seem to be modern in origin and likely derive from nearby beach sand fill that had been deposited on the surface nearby. This is true of the other shell noted in the vicinity of BHT 3 on the surface survey.

Table 2. Artifacts recovered from excavation units.

| | BHT 1 | BHT 2 | BHT 3 | BHT 4 | BHT 5 | STU 1 | STU 2 | |
|---|---|---|---|---|---|---|---|---|
| **Artifact** | | | | | | | | **Total** |
| Biface | - | - | - | - | - | 1 | - | **1** |
| Debitage | 4 | 5 | - | - | - | 4 | 9 | **22** |
| Handstone | - | 1 | - | - | - | - | - | **1** |
| MGS | - | - | - | - | - | - | 1 | **1** |
| Crystal | - | - | - | - | - | - | 1 | **1** |
| Bone | - | - | - | - | - | - | 4 | **4** |
| Shell (arch.) | 2 | 1 | - | - | 1 | 1 | 5 | **10** |
| Shell (modern) | - | - | 4 | - | - | - | - | **4** |
| Nails | 6 | 22 | 7 | 4 | 10 | 45 | 60 | **154** |
| Glass | 9 | 6 | - | 3 | 26 | 25 | 101 | **170** |
| Misc. Metal | - | 16 | - | - | - | 10 | 22 | **48** |
| Other Historic | 1 | 1 | 1 | - | 8 | 11 | 63 | **85** |
| Plastic | - | 2 | 1 | - | 1 | 3 | 1 | **8** |
| **Total** | **22** | **54** | **13** | **7** | **46** | **100** | **267** | **509** |

MGS= miscellaneous ground stone.

The prehistoric component of CA-SCR222/H is located on the project parcel as initially recorded with densities of prehistoric materials greater in the western and northwestern portions of the site. Prehistoric materials recovered were restricted to BHT 1, 2, and STU 1, 2. With the single piece of apparently culturally derived shell present in BHT 5, and the similarity of the soil types (Appendix

B), it is likely that the area with greater densities of prehistoric material extend to the vicinity of BHT 5.

Subsurface integrity of the site appears to be lacking from all of the areas presently sampled. A brief review of Table 2 shows that the bulk of material recovered from each unit represents historic and/or modern activities. Not only were these materials more numerous than the prehistoric items, but they were also always found in association with the prehistoric items. While STU 1 and STU 2 did not reach the bottom of the cultural deposit, the lowest level of STU 1 contained nails, ceramic, glass, and plastic, along with one piece of Monterey chert debitage. The lowest level of STU 2 contained nails, metal and glass with no prehistoric materials. Prehistoric materials were restricted to 25-80 centimeters below surface in this unit. Similarly BHT 2 contained one nail at 150-180 centimeters with prehistoric materials being found only above 150 centimeters.

## SUMMARY AND CONCLUSIONS

The site was initially recorded as an "extensive occupation site" though information gained through this investigation suggests that it may be a short term task area due to the low levels of prehistoric artifacts and lack of residential features. Interpretation of the site is complicated by the level of historic disturbance that has greatly affected the site's integrity. It is possible that more substantial portions of the site have been removed during various grading and construction activities within and around the subject parcel. The portions of the site currently investigated have been compromised as to their integrity to provide information about the past; however, that does not preclude that a more substantial intact portion of the site may still remain.

It is recommended that further earth disturbance within the boundaries of the prehistoric site CA-SCR-222/H be monitored by a qualified archaeologist in the event that an area with a more substantial, intact prehistoric deposit be uncovered. In the event that this should occur, a cultural resources treatment plan should be developed and further archaeological testing and possibly data recovery may be required. This effort should be undertaken in concert with the treatment of any archaeological deposits from the historic period.

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[1] During the course of this research, the site designation was changed from CA-SCR-222 to CA-SCR-222/H in order to address the presence of historic resources within and adjacent to the previously recorded site boundary.

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March 24, 2009

Re: Peer review for Aptos Village Plan

Glenda,

I have recently reviewed the *Cultural Resources Study for the Proposed Aptos Village Project* (*Study*, Albion Environmental, Inc, January 2009) regarding the proposed Aptos Village Plan, Santa Cruz County, California. Three properties within or immediately adjacent to the proposed Aptos Village Plan project area were previously surveyed and found to be historic resources (DPR A&B Dill Design Group 2003). They are therefore considered historic resources for purposes of the California Environmental Quality Act (CEQA).

> "Properties of local significance that have been designated under a local preservation ordinance (local landmarks or landmark districts) or that have been identified in a local historical resources inventory may be eligible for listing in the California Register and are presumed to be significant resources for purposes of CEQA unless a preponderance of evidence indicates otherwise (PRC § 5024.1, 14 CCR § 4850)."[1]

In the Impacts and Mitigation Measures section of the *Study*, relocation and reuse of two properties is mentioned and a statement that there will be no substantial adverse change, however, there is no discussion as to how that conclusion was arrived at. Both the Hihn Apple Packinghouse and the Aptos Fire Hall are considered historic resources. Relocation of an historic resource is always an impact, the level of which is concluded through analysis. The Secretary of the Interior Standards and National Register Bulletin 15, specifically the section on Aspects of Integrity and Criterion Consideration B-Moved Properties, should be utilized for such an analysis. Also in the Impacts and Mitigation Measures section of the *Study* new construction adjacent to the Bayview Hotel is also concluded as not having a substantial adverse change. Again, impact levels must be concluded through analysis using the Secretary of the Interior Standards and Aspects of Integrity. Conclusions that there will be no substantial adverse change may remain the same but the discussion must be thorough enough to be defensible under CEQA.

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[1] California Office of Historic Preservation Technical Assistance Series, *California Environmental Quality Act (CEQA) & Historical Resources*, pg 8.

Additionally, I have reviewed the *January 2009 Draft Aptos Village Plan* (the *Plan*). The project proposes the relocation of both the Antique Barn and the Aptos Firehouse/VFW Hall within the project area; demolition of several, non-historic buildings; retention of the historic Bayview Hotel and surrounding landscaped parcel; construction of residential and commercial buildings on what is currently 66 parcels. In the Plan chapters 4 & 6 (Core Elements and Design, respectively) the historic resources are acknowledged directly and indirectly. Discussion of the proposed relocation of the Hihn Apple Packinghouse and the Aptos Fire Hall states that prior to the relocations special review and approval by the County's Historic Resources Commission must be acquired. The chapter also mentions that "...it will be essential that any new structures built adjacent to [the Bayview Hotel] will need to be reviewed by the Historic Resources Commission". These are appropriate directives, however, the Plan should specifically state that the review would be for consistency with the Secretary of the Interior's Standards for Rehabilitation and the seven Aspects of Integrity to avoid arbitrary and/or personal taste influencing the review.

The Architectural Design section* of the Plan should specify that the Secretary of the Interior's Standards for Rehabilitation will be utilized for all rehabilitation. The Standards also apply to new construction adjacent to historic resources to avoid creating a false sense of history (see Standard 3) and to differentiate the new from the historic (see Standard 9). The ten Secretary of the Interior's Standards for Rehabilitation are attached for your reference.

According to CEQA "Generally, a project that follows The Secretary of the Interior's Standards for the Treatment of Historic Properties with Guidelines for Preserving, Rehabilitating, Restoring, and Reconstructing Historic Buildings or The Secretary of the Interior's Standards for Rehabilitating Historic Buildings...shall be considered as mitigated to a level of less than a significant impact on the historical resource". (State CEQA Guidelines Section 15064.5 (b)(3) )

> "The Secretary of the Interior is responsible for establishing standards for all programs under Departmental authority and for advising Federal agencies on the preservation of historic properties listed or eligible for listing in the National Register of Historic Places. In partial fulfillment of this responsibility, the Secretary of the Interior's Standards for Historic Preservation Projects have been developed to guide work undertaken on historic buildings...
>
> The Standards for Rehabilitation (36 CFR 67) comprise that section of the overall historic preservation project standards and addresses the most prevalent treatment. 'Rehabilitation' is defined as 'the process of returning a property to a state of utility, through repair or alteration, which makes possible an efficient contemporary use while preserving those portions and features of the property which are significant to its historic, architectural, and cultural values.
>
> The intent of the Standards is to assist the long-term preservation of a property's significance through the preservation of historic materials, features [and spaces]. The Standards pertain to historic buildings of all materials, construction types, sizes, and occupancy and encompass the exterior and interior of the buildings. **They also encompass related landscape features**

**and the building's site and environment, as well as attached, adjacent, or related new construction**"[2] [emphasis added].

In summary, the *Cultural Resources Study for the Proposed Aptos Village Project* report should thoroughly discuss potential impacts (relocation, new construction etc) and proposed mitigation measures (utilizing Secretary of the Interior's Standards, Aspects of Integrity, etc.), and the *January 2009 Draft Aptos Village Plan* should direct rehabilitation and new construction to follow the Secretary of the Interior's Standards for Rehabilitation.

Should there be any questions please contact me 415 362 7711.

Sincerely,

Sheila McElroy

Sheila McElroy

* Footers on pages 41 - 58 of the Plan alternatively identify the chapters as Chapter 6: Design and Chapter 7: Conclusion and Plan Implementation. This should be corrected for the final report.

[2] Secretary of the Interior Standards for Rehabilitation and Illustrated Guidelines for Applying the Standards, NPS, 1992

Secretary of Interior's Standards for Rehabilitation

1. A property shall be used for its historic purpose or be placed in a new use that requires minimal change to the defining characteristics of the building and its site and environment.

2. The historic character of a property shall be retained and preserved. The removal of historic materials or alteration of features and spaces that characterize a property shall be avoided.

3. Each property shall be recognized as a physical record of its time, place, and use. Changes that create a false sense of historical development, such as adding conjectural features or architectural elements from other buildings, shall not be undertaken.

4. Most properties change over time; changes that have acquired historic significance in their own right shall be retained and preserved.

5. Distinctive features, finishes, and construction techniques or examples of craftsmanship that characterize a property shall be preserved.

6. Deteriorated historic features shall be repaired rather than replaced. Where the severity of deterioration requires replacement of a distinctive feature, the new feature shall match the old in design, color, texture, and other visual qualities and, where possible, materials. Replacement of missing features shall be substantiated by documentary, physical, and pictorial evidence.

7. Chemical or physical treatments, such as sandblasting, that cause damage to historic materials shall not be used. The surface cleaning of structures, if appropriate, shall be undertaken using the gentlest means possible.

8. Significant archeological resources affected by a project shall be protected and preserved. If such resources must be disturbed, mitigation measures shall be undertaken.

9. New additions, exterior alterations, or related new construction shall not destroy historic materials that characterize the property. The new work shall be differentiated from the old and be compatible with the massing, size, scale, and architectural features to protect the historic integrity of the property and its environment.

10. New additions and adjacent or related new construction shall be undertaken in such a manner that if removed in the future, the essential form and integrity of the historic property and its environment would be unimpaired.

# Attachment 4

APPENRODT COMMERCIAL properties

July 22, 2011

Todd Sexauer
Environmental Planner
County of Santa Cruz
701 Ocean Street, 4th Floor
Santa Cruz, CA 95060

Dear Todd,

In response to your request I have listed the salient points related to the excavation done on 2/26/09.

- APN: 041-011-24
- Date of Excavation: 2/26/09
- Purpose: locate turntable mentioned in various reports
- Contractor: Jeff Taylor
- People Present: Christine & George Mead (Toxichem), Pete Testorff, Joe Appenrodt & Jeff Taylor
- Scope of Excavation: 4 trenches: 3-4' wide/5-5.5' deep/40-50' long
- Location of Excavation: See Attached Sheet
- Findings: Occasional rocks, some particles of concrete, & pieces of glass.

There was no evidence of a turntable or any other items of historical significance. Please let me know if any additional information needed.

Sincerely,

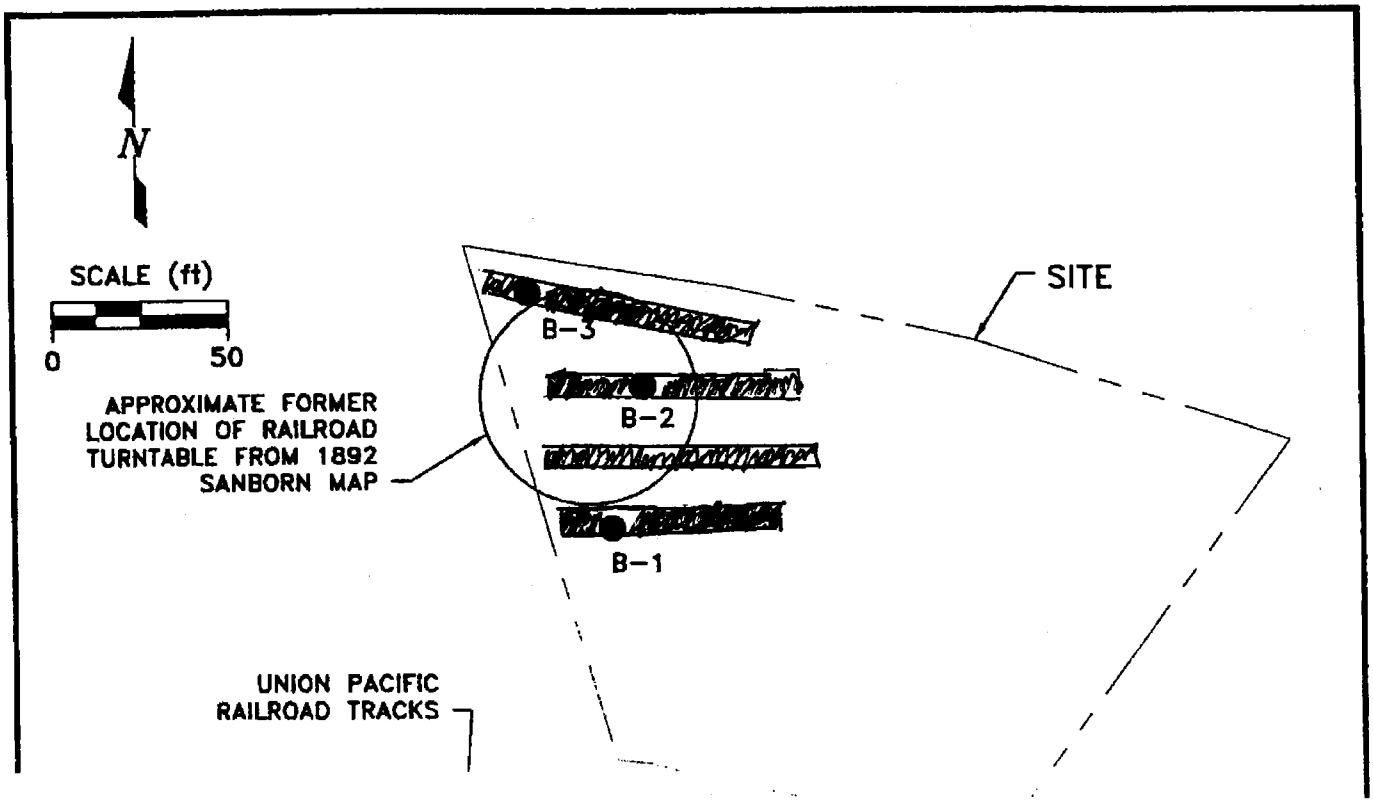
Joe Appenrodt
Aptos Ventures, Partner

APPENRODT
COMMERCIAL
PROPERTIES

4375 Capitola Road
Capitola, CA 95010

831.465.9590 O
831.465.9195 F

www.AppenrodtCommercial.com


N
SCALE (ft)
0
50
APPROXIMATE FORMER LOCATION OF RAILROAD TURNTABLE FROM 1892 SANBORN MAP
B-3
B-2
B-1
SITE
UNION PACIFIC RAILROAD TRACKS

# Attachment 5

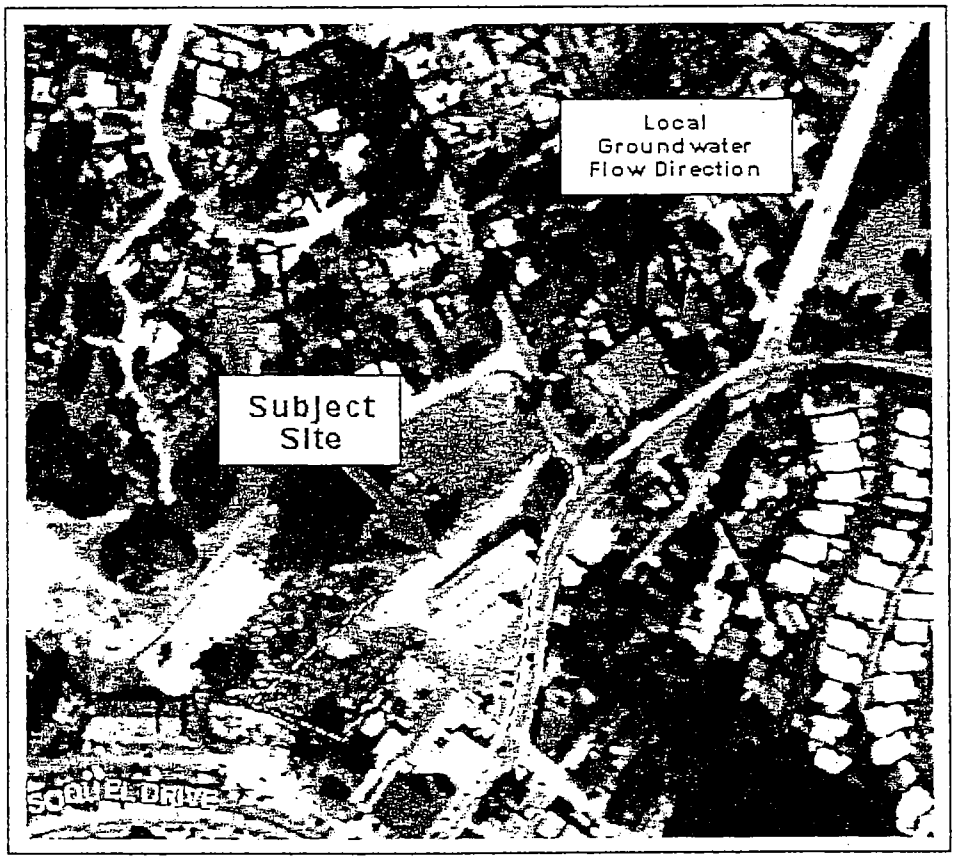
Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Dr., Watsonville, CA 95076
(831) 722-3580 (831) 662-3100
Fax: (831) 722-1159

# Phase I Environmental Site Assessment

## Village Fair Antiques Property

417 Trout Gulch Road
Aptos, California

July 31, 2001




Prepared for:

Ms. Gail Costello
Ms. Patricia Toney Thompson
c/o: Thunderbird Real Estate (Mr. Jim Crawley)
3555 Clares Street, Suite WW
Capitola, California 95010

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FIGURES

FIGURE 1 Location Map
FIGURE 2 Vicinity Map (2001 aerial photo base map)
FIGURE 3 Site Map

APPENDICES

APPENDIX A Historical Information and Maps
- Aerial Photographs: (1982, 1963, & 1948)
- Sanborn Historical Maps (1929, 1926, 1892, & 1888)
- Tax Assessor's Map (1998); Historic Resources Inventory
- Reverse Telephone Directory Data (1926-1977)

APPENDIX B *Site Inspection Checklist* with Site Photo Sheets
*Property Owner Interview*

APPENDIX C Database Research Report (regulatory database listings)

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Dr., Watsonville, CA 95076
(831) 722-3580 (831) 662-3100
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## 1.0 EXECUTIVE SUMMARY

This report contains results of a *Phase I Environmental Site Assessment* (ESA) which has been conducted to review potential environmental risks of a 2.5-acre property located at 417 Trout Gulch Road, in Aptos (see Vicinity Map, Figure 2). The site contains a large, one-story, historic warehouse, an asphalt parking lot, and open lands (see Site Map, Figure 3). The wooded warehouse structure was reportedly built in 1890 as an apple-packing and distribution warehouse. The warehouse is currently used for retail sale of antique furniture. The vicinity is zoned for multiple uses and generally contains residential neighborhoods beyond adjoining commercial properties (see aerial).

Phase I assessments provide limited assurances of risk since they rely on current site conditions (site inspection), a cooperative and candid interviewee, and a limited database of regulatory and historical documentation. **Given these limitations, Phase I ESA field work and research summarized below, have revealed limited *recognized environmental conditions*[1] at the subject property.** The following is a summary of our findings:

- Review of Historic Maps and Photographs: This review was completed to document notable changes to the property and provide potential clues of hazardous material storage since it was developed. No on-site land use activities were noted which would indicate a significant environmental concern. Specifically, there was no evidence of chemical storage, including aboveground and underground storage tanks on the site. Businesses which have been documented to operate at the site (apple packing, retail sale of antiques) are typically not associated with high risk industries which use large quantities of chemicals or have a common history of chemical spills. Copies of the historical records are included in Appendix A.

- Site Inspection and Property Owner Interview: The inspection and interview revealed no evidence of chemical releases, or recognized environmental conditions warranting Phase II sampling. The site inspection did reveal the following two housekeeping items of concern:
  1) the presence of mounded dirt and debris (mostly old metal piping, photos 9-11, Appendix B)), and
  2) an open-air, small-quantity storage of oils associated with an on-site wood chopping business (photos 7 and 8, Appendix B).

  It should be noted that there was no apparent evidence of chemicals or spills (ie. soil staining, distressed vegetation, rusted drums or chemical containers within the debris mounds). However, to be assured that no significant environmental liability is associated with these

[1]: ASTM Standard E 1527-93:definition, *recognized environmental conditions*: the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property.

items, and effort should be addressed by removal, proper disposal, and physical inspection of underlying soils by trenching. Copies of the *Site Inspection Checklist* and site photographs are included in Appendix B.

- Regulatory Agency Research: A search of 38 regulatory databases which monitor sites having documented chemical releases, storage of fuels and chemicals, generation of hazardous waste, or landfills has shown that there have been no monitored sites within a quarter-mile radius of the subject property. The review of regulatory agency records did not uncover an on-site or off-site environmental liability having a reasonable potential to impact the subject site.

## 2.0 PURPOSE AND SCOPE

This report contains results of a *Phase I Environmental Site Assessment* (ESA) which has been conducted to review environmental liabilities resulting from historic or existing environmental hazards for the subject property. Completed work tasks conformed with recommended guidelines established by the American Society for Testing and Materials (ASTM)[2].

The purpose of this ESA is to provide a professional opinion regarding recognized environmental conditions at the site, including potential impacts from known problems in the surrounding area. The term "*recognized environmental conditions*", is defined as "the presence or likely presence of any hazardous substances or petroleum products on a property under conditions that indicate an existing release, a past release, or a material threat of a release of any hazardous substances or petroleum products into structures on the property or into the ground, groundwater, or surface water of the property" (ASTM Standard E 1527-00). Limitations and Exceptions of Assessment are listed at the end of this report.

**2.1 Defined Scope and Methodology:** Our scope of services for this investigation was defined in our proposal authorized on June 4, 2001 by the property owners (Ms. Gail Costello and Ms. Patricia Toney Thompson).

- We reviewed historical maps, and aerial photographs, available geologic, topographic and groundwater data of the subject site and vicinity (Appendix A).

- We completed a visual inspection of the subject property to assess existing conditions at the site and interviewed the current property owner regarding current and historical uses of the site (Appendix B).

---

[2]: ASTM Standard: *Standard Practice for Environmental Site Assessments: Phase I Environmental Site Assessment Process*, Designation E 1527-00

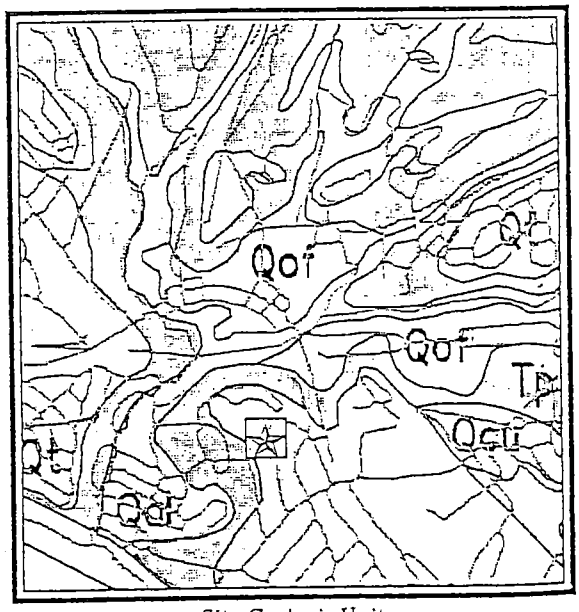
- We contracted with EDR, an information research firm specializing in environmental data collection, to conduct a regulatory list search of known underground fuel storage tanks (UST's), subsurface contaminated sites, hazardous waste generation or treatment-storage-and disposal facilities, and landfills located within ASTM survey radius. We evaluated the locations of all identified sites relative to the subject site (see Appendix C for a copy of EDR's radius report).

- We evaluated the collected information and prepared this summary report.

## 3.0 LOCATION AND DESCRIPTION

The approximate 2.5-acre, irregularly-shaped subject property is located at 417 Trout Gulch Road in Aptos (County of Santa Cruz, California). It is located at the western corner of Trout Gulch Road and Cathedral Drive and is one block north of Soquel Drive, a major east-west commercial thoroughfare through the area. The general vicinity is zoned for multiple uses and generally contains residential neighborhoods beyond adjoining commercial properties (see aerial vicinity map, Figure 2).

The site itself contains a large historic warehouse used solely for retail sale of antique furniture, an asphalt parking lot, and open lands (see Site Map, Figure 2). The one-story, wooded warehouse structure was reportedly built in 1890 by Frederick Hihn as an apple-packing distribution warehouse (see Appendix B for a historical photograph). Mr. Hihn has been credited with constructing the narrow gauge "Santa Cruz-Pajaro Railway" line which connected the site warehouse with apple orchards in the region. Antique shops replaced the apple warehousing business with the advent of the truck hauling industry in the 1930s.




Site Geologic Units
Qof, Older Flood Plain Deposits;
Qal, Alluvial deposits;
Tp, Purisima Formation

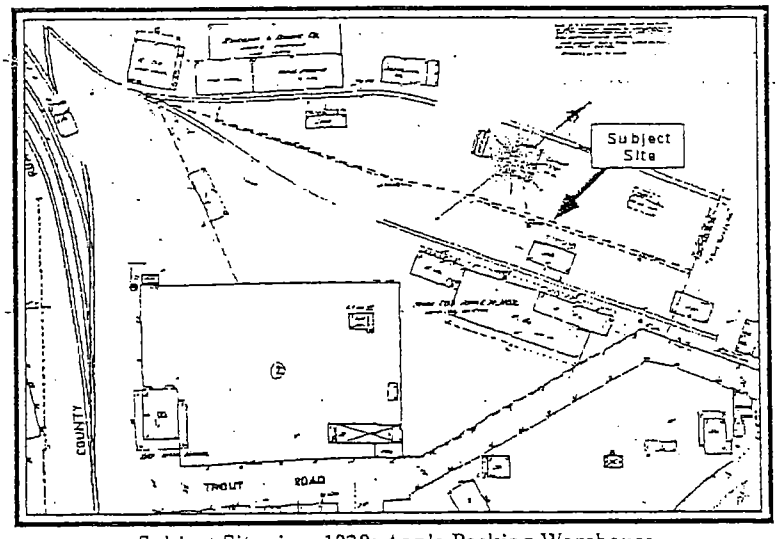
3.1 Hydrogeologic Setting: The site is located on a broad, coastal marine terrace at an elevation of approximately 100 feet above Mean Sea Level (Figure 1). Regional topography dips gently to the southwest. Southwesterly flowing drainages are located both east and west of the site (Aptos Creek, 1,000 feet to the west and Trout Gulch Creek, 1,000 feet to the east). Locally, these drainages have incised through the overlying older flood plain deposits (Qof) and into the underlying Purisima siltstone (Tp, see Geologic Map, right).

Sediments beneath the site have been mapped as older flood plain deposits (Qof) which are documented to contain unconsolidated, generally fine-grained silt, sand, and clay. These flood plain deposits are likely to be relatively thin and are underlain by the Pliocene age Purisima Formation (bedrock), a very thickly-bedded, yellowish-gray siltstone having fine-grained sandstone interbeds and can be as much as 3,000 feet thick[3].

First groundwater in the area is generally found under unconfined conditions at the base of the terrace deposits and above the relatively impermeable bedrock siltstone (depth of 10-15 feet). Shallow groundwater flow direction in the area is likely to be southeasterly-to-southwesterly, toward the local creeks and the Monterey Bay.

## 4.0 HISTORICAL REVIEW

Historical research tools reviewed for this site included fire insurance maps, aerial photographs, and telephone directories. These tools can provide a glimpse of historic land use and are valuable resources for detecting property development and obvious land uses. The Sanborn™ Insurance Company has historically prepared detailed insurance maps for business districts and can provide evidence of land use and potential locations of hazardous material storage. Sanborn Maps were reviewed for the years 1888, 1890, 1926 and 1929 (Appendix A). Aerial photographs can also provide evidence of notable land use changes to the property and potential clues of hazardous material storage. Aerial photographs were reviewed for the years 1948, 1963, 1982 and 2000. Reverse telephone directories provide a listing of site occupants over time and were reviewed in 5-year intervals from 1926 through 1977. Land use observations from these historical data sources are summarized below and copies are included as Appendix A.



Subject Site circa 1929: Apple Packing Warehouse
(see Appendix A for additional maps)

4.1 Sanborn Maps: The earliest Sanborn map showed the subject parcel to be a portion of a large lumber and milling operation (*"Loma Prienta Lumber Co."* and the *"Aptos Milling Co."*, see 1888 Sanborn Map, Appendix A). The 1888 insurance map showed the site to be primarily used for lumber storage (*"lumber piles"*) and

[3]: Brabb, Earl (USGS Miscellaneous Investigations Series Map I-1905,: *Geologic Map of Santa Cruz County*, dated 1989.

had one small structure near the center of the yard (*'lumber house"*). Two railway spurs bisected lumber piles on-site. No apparent evidence hazardous material storage or underground tanks were noted. The adjoining parcel to the south contained the *"Bay View Hotel"* and associated hotel grounds/sheds. *"Southern Pacific RR"* tracks and railway depot were present just beyond the Bay View Hotel complex and a *"branch of Aptos Creek"* was shown just east of the site.

The 1892 Sanborn map shows little on-site change except an increase in the number and size of the lumber piles. There were no significant changes to adjoining property use except for an expansion of the railroad depot (platform, turn table).

The 1926 Sanborn map showed the on-site lumber yard to be replaced by the *Hihn Co. Apple Warehouse* and associated outbuildings. This warehouse is the same one present at the site today. Out buildings were identified as smaller warehouses, storage sheds and auto parking garages. A single railway spur extends up to the northwest side of the main warehouse and an underground water line and hydrants are shown along the northwestern property boundary. There were no significant changes to adjoining property use except for the presence of another *apple packing warehouse* to the west. The waterway formerly identified as a *"branch of Aptos Creek"* is now *"Chuchita Creek"*.

The remaining Sanborn map dated 1929, showed no significant change. The set of Sanborn Maps does not show evidence of chemical storage, including aboveground or underground storage tanks, on the site itself or on adjoining properties (see Appendix A for details).

4.2 Aerial Photographs: The earliest aerial photo, dated 1948, has poor resolution but appears to agree with the on- and off-site information provided in the 1929 Sanborn Insurance map (above). The site warehouse and a few adjoining sheds/outbuildings can be distinguished. The southern portion of the site appears undeveloped, as it is today. The layout of the adjoining streets and access roadways also appears as it is today (ie. Cathedral Drive, Trout Gulch Road, parking lots).

The 1963 aerial photo also has fairly poor resolution but does not appear to show any significant changes to the site layout.

The 1982 aerial photo shows a clear picture of on and off-site developments. The air photo shows the site layout to be as it is today including the warehouse, access driveways, parking lot, and the undeveloped southwestern portion. There appears to be significant off-site development since the 1963 photo which appears to be primarily residential in nature.

The most recent air photo was taken in early 2001 (see Figure 2), shows little change since the 1982 aerial, both on and off-site.

**4.3 Telephone Directories:** Polk Reverse Telephone directories, which list occupants by street address, were reviewed for commercial property use in five year intervals for the years spanning 1926 through 1977 (see Appendix A). Trout Gulch Road addresses were reportedly first listed by address in 1967. The subject site (417 Trout Gulch Road) was first identified in 1972 as the Village Fair of Aptos. Subsequently, the site was identified as the Village Fair of Antique (1977). The adjoining property to the south (415 Trout Gulch Road) was not listed in 1967 and 1972 but was occupied by "*On the Spot Cleaners & Laundry*" in 1977.

**4.4 Summary of Collected Historical Data:** In summary, no negative environmental land use issues were identified in the historical review. The research revealed no evidence of chemical storage, including aboveground and underground storage tanks on the site. The businesses which have been documented to operate at the site (apple packing, retail sale of antiques) are not commonly associated with chemical storage, use, or spills.

## 5.0 PROPERTY MANAGER INTERVIEW

An interview form was completed by the current property owner (Ms. Gail Costello) as the person most knowledgeable of current and historical land use at the site. A copy of the completed interview in included in Appendix B. The following points summarize Ms. Costello's interview responses regarding site use:

- The only current business operation documented at the site was the Village Fair Antiques, for the sale of antiques (open Thursday through Sunday). Ms. Costello had no knowledge of knowledge of previous industrial uses or landfilling at the site.
- Ms. Costello indicated she has been associated with the site for approximately 30 years and has no knowledge of any chemical use or storage on the property, including
  - underground storage tanks or hydraulic hoists;
  - small and bulk quantity storage;
  - previous chemical releases, regulatory-required investigations, or reports;
- Property water, sewer and heating are supplied by municipal utilities. There are no known water wells on the property.

In summary, no negative environmental land use issues were disclosed by the interview.

## 6.0 SITE INSPECTION

A site inspection was conducted on July 25, 2001, to note potential sources of contamination associated with on-site activities. A copy of a completed *Site Inspection Checklist,* which contains detailed documentation of the site survey and a photographic record of the inspection, is presented as Appendix B. The following describes observations of site structures and operations:

- The site contains a one-story, wooded warehouse structure which was reportedly built in 1890 as an apple-packing distribution warehouse (see photos #1-5). The Village Fair Antiques warehouse is clean and well maintained. The business is occupied by a number of independent dealers who sell antique furniture and items to the public (*Village Fair Antiques*). No significant furniture repair or refinishing operations were noted at the warehouse.

- A large portion of the property is open space and is used for customer parking (both asphalt and dirt), access, and rental space. A small portion of land along the southeast corner of the property is used by an adjoining property for their flower cooler and dry storage (Aptos Village Produce). The southwestern corner of the irregularly-shaped lot is used by another adjoining business for wood chopping and wood storage (see photos 6-8).

- Only minor quantities of chemicals were observed at the site:
  - ½-gallon to 1-gallon cans of wood varnish were observed on an exterior deck of the Village Fair Antiques warehouse and appear to be used for furniture touch up.
  - Four, 5-gallon pails of motor oil, and hydraulic oil were observed alongside the wood chopper's large cargo container. The oils were apparently generated from chopping machinery maintenance. The cargo container stored parts, and fuel for the individual wood chopping machines (see photos #7 and #8).

- An assortment of abandoned equipment was observed at a number of locations on the property (see Photos #9-11) most of which were partially covered with vegetation. Metal pipe and debris were observed within a 2-to-3 foot high mound of soil and bushes located along the western edge of the property (see Site Map -Figure 3, and photo #11). The mound contains thick bushes so close inspection was not possible. An additional thicket of dense bushes was present at the southwest corner of the property.

- A reconnaissance of the vicinity around the site showed lands to the north and east are primarily residential while lands to the south are commercial (see aerial vicinity map, Figure 2). The following is a summary of vicinity land uses on adjoining sites based on direction and groundwater flow direction:

  - North (up-gradient lands): Cathedral Drive, the Aptos Post Office, and residential neighborhood.
  - West (side-gradient lands): a) northwest: vacant, dirt lot, Granite Way and residential neighborhood; b) west: masonry contractor storage yard; and c) southwest: wood chopping business.
  - South (down-gradient lands): Restaurant-hotel; retail shops and offices (Aptos Village Produce: groceries-flowers; coffee shop); beyond shops is a railway line and Soquel Drive.

- East (side-gradient lands): a) east: Trout Gulch Road and residential neighborhood; southeast: Coin wash and cleaner drop-off.

In summary, the site inspection revealed the following two items of concern: 1) the presence of mounded dirt and debris (mostly metal piping), and 2) the open-air small-quantity storage of oils associated with the wood chopping business. Although there was no apparent evidence of chemicals (ie. soil staining, distressed vegetation, rusted drums and chemical containers within the debris mounds), these two items should be removed and/or physically inspected by trenching to be assured that no associated environmental liability.

## 7.0 REGULATORY AGENCY RESEARCH

**7.1 Review of Regulatory Lists:** Records of hazardous material storage and releases are required to be kept by Federal and State regulatory agencies overseeing environmental issues. An information research firm specializing in environmental data collection prepared a *Radius Map Report* for the site, dated June 28, 2001 (included as Appendix C). The *Radius Map Report* identifies sites listed in the selected regulatory databases, presents location maps and details on identified sites, provides a description of the 20 Federal and 16 State agency databases reviewed, and limitations to the search. It should be noted that the database search documents only those sites having a regulatory paper trail. Listed sites include those locations having registered underground fuel storage tanks (UST's), documented disposal of hazardous waste generation, permitted hazardous waste treatment-storage-disposal facilities, and regulatory-required subsurface contamination investigations (a field check was completed to confirm the locations of

| Database | Target Property | Search Distance (Miles) | < 1/8 | 1/8 - 1/4 |
|---|---|---|---|---|
| **FEDERAL ASTM STANDARD** | | | | |
| NPL | | 1.000 | 0 | 0 |
| Proposed NPL | | 1.000 | 0 | 0 |
| CERCLIS | | 0.500 | 0 | 0 |
| CERC-NFRAP | | 0.250 | 0 | 0 |
| CORRACTS | | 1.000 | 0 | 0 |
| RCRIS-TSD | | 0.500 | 0 | 0 |
| RCRIS Lg. Quan. Gen. | | 0.250 | 0 | 0 |
| RCRIS Sm. Quan. Gen. | | 0.250 | 1 | 0 |
| ERNS | | TP | NR | NR |
| **STATE ASTM STANDARD** | | | | |
| AWP | | 1.000 | 0 | 0 |
| Cal-Sites | | 1.000 | 0 | 0 |
| CHMIRS | | 1.000 | 0 | 0 |
| Cortese | | 1.000 | 0 | 0 |
| Notify 65 | | 1.000 | 0 | 0 |
| Toxic Pits | | 1.000 | 0 | 0 |
| State Landfill | | 0.500 | 0 | 0 |
| WMUDS/SWAT | | 0.500 | 0 | 0 |
| LUST | | 0.500 | 1 | 0 |
| UST | | 0.250 | 2 | 1 |
| CA Scrd Exp. Plan | | 1.000 | 0 | 0 |
| CA FID UST | | 0.250 | 2 | 2 |
| **FEDERAL ASTM SUPPLEMENTAL** | | | | |
| CONSENT | | 1.000 | 0 | 0 |
| ROD | | 1.000 | 0 | 0 |
| Delistec NPL | | TP | NR | NR |
| FINDS | | TP | NR | NR |
| HMIRS | | TP | NR | NR |
| MLTS | | 0.250 | 0 | 0 |
| MINES | | TP | NR | NR |
| NPL Liens | | TP | NR | NR |
| PADS | | TP | NR | NR |
| RAATS | | TP | NR | NR |
| TRIS | | TP | NR | NR |
| TSCA | | TP | NR | NR |
| FTTS | | TP | NR | NR |
| **STATE OR LOCAL ASTM SUPPLEMENTAL** | | | | |
| AST | | TP | NR | NR |
| CA WDS | | TP | NR | NR |
| CA SLIC | | 0.500 | 0 | 0 |

List of Sites within a Quarter-Mile Having a Regulatory Database Record (see Appendix C for details)

identified spill sites relative to the subject site). Search distances are per ASTM's E1527-97 standard.

- The subject parcel ("target property") was not listed on any of the Federal and State databases.
- The records search identified a total of four sites located within a ¼-mile radius having a current or historical record of permitted UST's, and six sites having records showing generation and proper disposal hazardous waste, typically a waste oil or oily waste.
- The report lists six unmapped sites ("orphans") obtained from the list of 38 databases, for which EDR was not able to determine an exact location. A further check of these locations indicates that none of these sites is located within a ¼-mile radius of the subject site.
- The records search identified one site located within a ¼-mile radius having a record of a release of contamination to soil and/or groundwater (Advanced Tire at 8026 Soquel Drive). The use of the ¼-mile radius is an arbitrary distance used to judge the potential impact to the subject site from an off-site source. It should be noted that chemical releases (ie. particularly solvents) can travel a great deal further than ¼-mile but this distance has been selected based on extent of contamination records for various magnitudes of fuel leak sites (additional sites are identified up to a 1 mile radius in Appendix C). Field reconnaissance showed this fuel leak to be located approximately 700 feet from the subject property in the downgradient groundwater flow direction sites and as such, is not expected to be an environmental liability to the subject site.

7.2 Review of Local Regulatory Agency Files: The local Certified Unified Program Agency (CUPA) having management jurisdiction for hazardous material use is the Santa Cruz County Health Services Agency (SC-HSA). SC-HSA did not have a file for the subject parcel indicating there has been no record of hazardous material use or releases at the site.

7.3 Summary of Regulatory Document Review: In summary, the review of regulatory agency records did not uncover an on-site or off-site environmental liability having a reasonable potential to impact the subject site.

## 8.0 LIMITATIONS AND EXCEPTIONS OF ASSESSMENT

This report and the associated work have been provided in accordance with the principles and practices generally employed by the local environmental consulting profession. This is in lieu of all other warranties, express or implied. This report has been prepared solely for our client, the current property owners (Ms. Gail Costello, Ms. Patricia Toney Thompson). The assessment is provided so the client may make a more informed decision as to site conditions. This report shall not be relied upon by or transferred to any other party, or used for any other purpose, without the express written authorization of Weber, Hayes and Associates.

This ESA is not a regulatory compliance audit or an evaluation of the efficiency of the use of any hazardous materials at the site. No evaluation for the presence of asbestos-containing building materials, lead-based paint, urea-formaldehyde foam insulation, or other potentially hazardous building materials; methane; radon gas; lead in drinking water; or wetlands, is included in our assessment.

Our findings and opinions are based on information collected from regulatory agency files and lists, interviews, and site conditions at the time of our site reconnaissance on June 28, 2001. Note that our findings and opinions are based on information that we obtained on specific dates through records review, site reconnaissance, and related activities. It is possible that other information exists or subsequently has become known, just as it is possible for conditions we observed to have changed after our observations.

The accuracy and thoroughness of any environmental assessment depend on a variety of factors and optimally will include soil and groundwater sampling. Weber, Hayes and Associates cannot and will not provide guarantees, certifications or warranties that the investigated property is or is not free of environmental impairment. Any person who is aware of any recognized environmental conditions of the site or surrounding areas that are different from those described in the report should report them immediately to this office for evaluation as part of an additional scope of work.

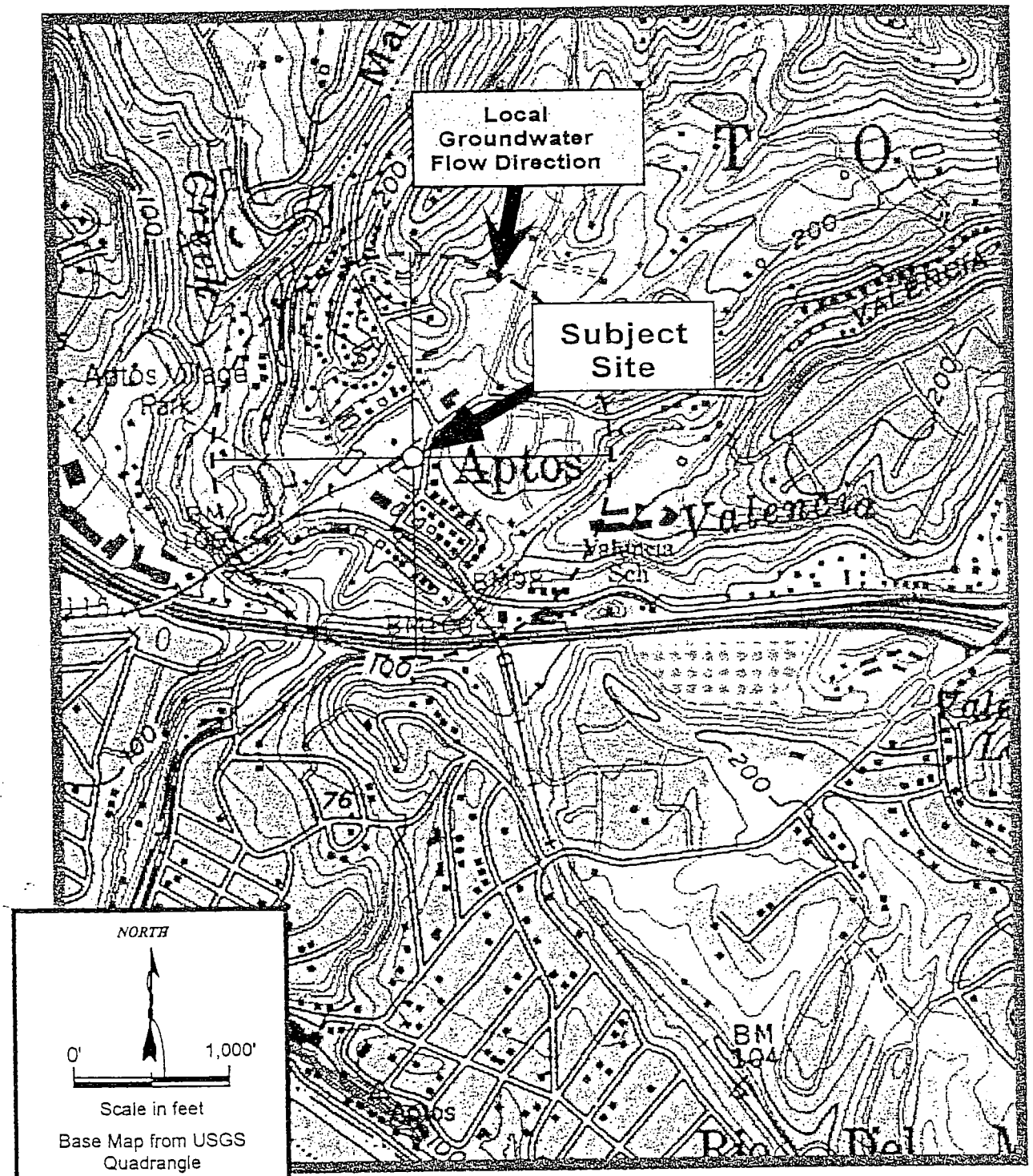
Thank you for this opportunity to be of service. Should you have any questions or comments regarding this project, please contact us at our offices.

Respectfully submitted,

WEBER, HAYES AND ASSOCIATES
A California Corporation

By: _____
Patrick Hoban
Project Geologist

And: _____
Joseph Hayes
Certified Engineering Geologist #1629
Certified Hydrogeologist #373



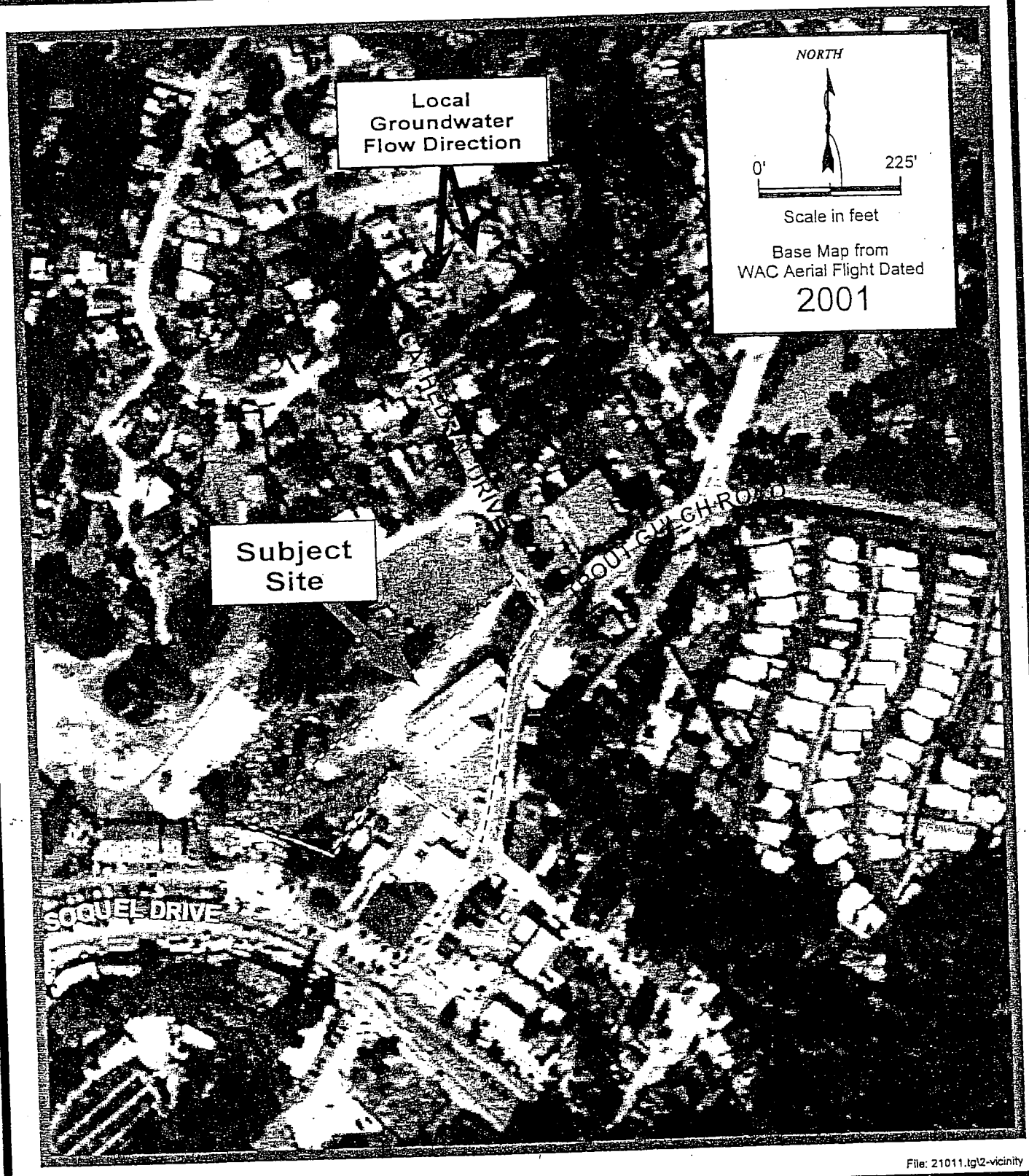

G\20051.mbl\1-locate

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, Ca. 95076
(831) 722 - 3580 (831) 662 - 3100

## Location Map

Phase I Environmental Site Assessment
417 Trout Gulch Road
Aptos, California

FIGURE
1
Job #
21011

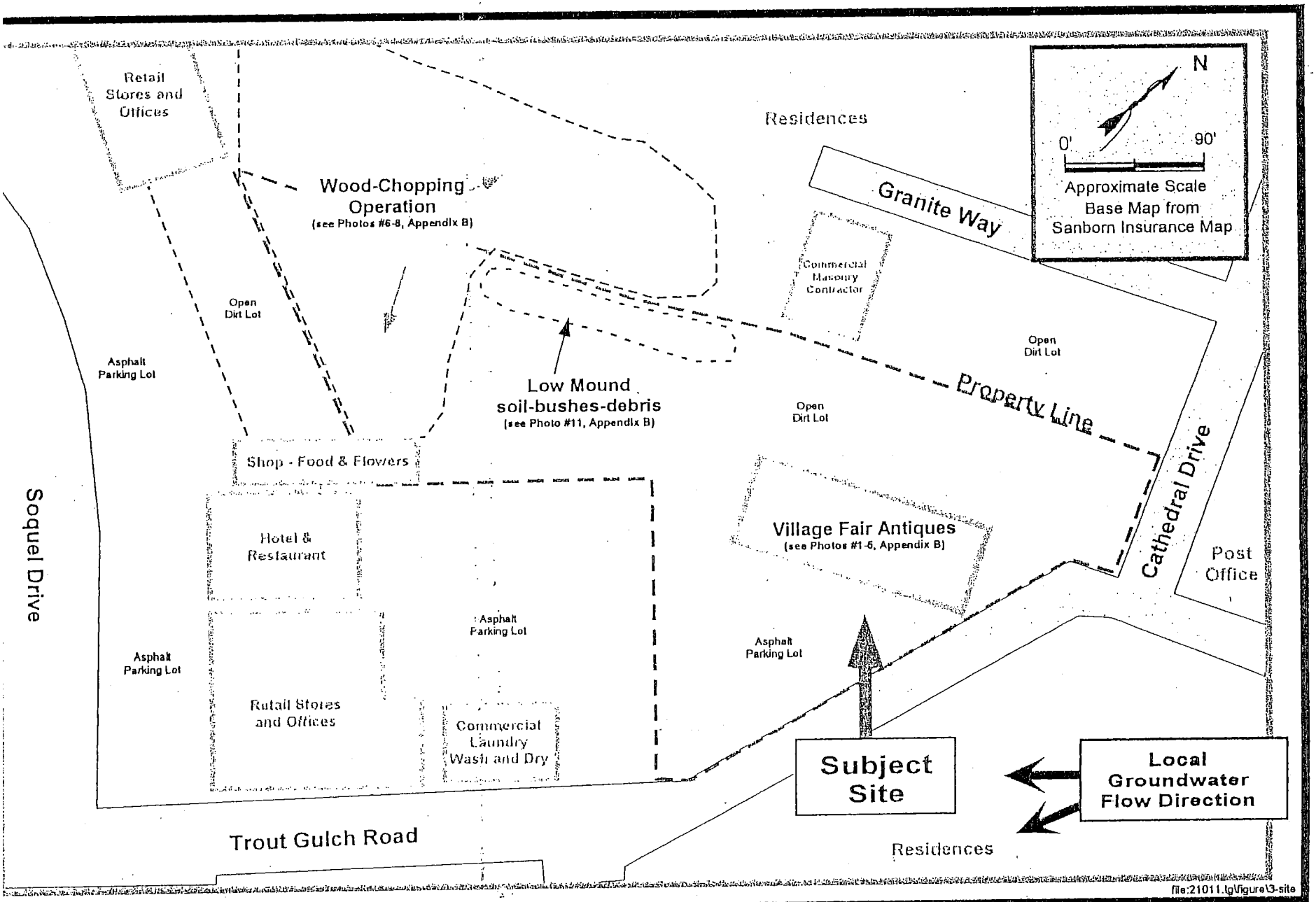



File: 21011.tg\2-vicinity

Weber, Hayes & Associates
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, Ca. 95076
(831) 722 - 3580 (831) 662 - 3100

**Vicinity Map**
Phase I Environmental Site Assessment
417 Trout Gulch Road
Aptos, California

FIGURE
2
Job #
21011





**Weber, Hayes & Associates**
Hydrogeology and Environmental Engineering
120 Westgate Drive, Watsonville, Ca. 95076
(831) 722 - 3580 (831) 662 - 3100


**Site Map**
Phase I Environmental Site Assessment
417 Trout Gulch Road
Aptos, California

FIGURE
3
Job #
21011

# Attachment 6

**TOXICHEM**
**Management Systems, Inc.**
Environmental & Occupational Health Services
343 Soquel Avenue #180, Santa Cruz, CA 95062
(831) 423-7673 / (831) 401-2332 FAX

(650) 218-3766

(650) ~~551-0112~~

July 12, 2005

Mr. Peter Testorff
263 Aptos School Road
Aptos, California 95003

Subject: **Soil Sampling and Testing Summary Letter**
Gateway Property
8037 Soquel Drive, Aptos, California
APN 041-01-124

Dear Mr. Testorff:

This letter summarizes the soil sampling and testing work conducted by Toxichem Management Systems, Inc. (TOXICHEM) that you requested for the property at 8037 Soquel Drive in Aptos, California (Santa Cruz County Assessor's Parcel Number 041-01-124) (subject site). The subject site consists of an approximately 23,310-square-foot lot, developed with a small commercial structure along the eastern boundary. The remainder of the parcel includes a fenced, non-paved area, and a parking area paved with asphalt that is noticeably deteriorated.

You requested that soil samples be collected from three locations on the site, all in the vicinity of the former railroad turntable, as depicted on a Sanborn fire insurance map from 1892. We selected certain laboratory tests be performed on the soil samples to detect toxic compounds that are commonly associated with former rail yards. We performed the work described in the section below.

## SUMMARY OF WORK PERFORMED

1. Retained a private underground utility locator service to scan the proposed sampling locations for buried utilities and metallic objects. At least 2 business days before the commencement of field work, we also delineated in white paint and flagged the proposed exploration locations and notified Underground Service Alert of the start date, time, and location of the field work.
2. Prepared a site-specific Health and Safety Plan for the field work.
3. As required, notified Rebecca Supplee, the area hazardous materials caseworker with the Santa Cruz County Environmental Health Services, of the intended field work.
4. Advanced three, 2-inch-diameter borings (B-1, B-2 and B-3) at the locations depicted on Figure 1. The boring locations were measured from the northwest corner of the fence, which was assumed to be the northwest corner of the site. The borings were advanced to 8 feet below ground surface using a truck-mounted Geoprobe™ rig equipped with hydraulic direct-push equipment.

A TOXICHEM geologist provided professional guidance to the sampling contractor and prepared logs of encountered subsurface conditions. Soil cores were collected in two new, 4-foot-long polyethylene liners from each boring. After the cores were collected, the borings were sealed to ground surface with neat cement. All down-hole tools were pre-cleaned. The excess generated soil was stored in a sealed and labeled 5-gallon bucket on the subject site pending laboratory analysis.

Soil samples from the cores from depths of 1, 4 and 7 feet were appropriately packaged, labeled and transported on ice to a State-certified analytical laboratory (McCampbell Analytical, Inc. of Pacheco) under chain-of-custody documentation.

5. Instructed the laboratory to analyze the shallow and mid-depth samples from each boring. The deepest samples were held by the laboratory pending initial results. The six soil samples (from depths of 1 and 4 feet) were tested discretely for lead, cadmium and arsenic by EPA Method 6020A under TTLC conditions. Sample sets consisting of the three 1-foot samples and the three 4-foot samples were each composited by the laboratory into two aggregate samples and analyzed for polyaromatic hydrocarbons (PAHs) by EPA Method SW8270D and hexavalent chromium by Method E218.6m under TTLC conditions. Included in the hexavalent chromium tests was a measurement of the pH by Method SW9045C and chemical oxygen demand by Method SM5220D.
6. Prepared this letter summarizing the work performed and including our findings, a discussion and our limitations.

## FINDINGS

The professional utility locator detected small metallic objects in the subsurface throughout the area of investigation.

In all three borings, a silty sand or silty sand with gravel fill was encountered to depths of 5 to 6 feet. In boring B-1, brick fragments were observed at a depth of approximately 4 feet. In boring B-2, glass fragments were observed in the upper 2 to 3 feet. In boring B-3, what appeared to be rail ballast was observed in the upper 2 to 3 feet of soil. A faint hydrocarbon odor was noted in soil from depths of approximately 4 feet from borings B-2 and B-3.

The fill layer was underlain by silty sand, poorly graded sand with silt or sandy silt interpreted to be flood plain deposits. These deposits extended to the termination of the borings at 8 feet. No groundwater was encountered in any of the borings. Copies of the exploratory boring logs are presented in Attachment A.

Table 1 summarizes the soil analytical data, and Attachment B includes the certified analytical report and chain-of-custody document.

Lead concentrations ranged from 49 milligrams per kilogram (mg/kg) to 99 mg/kg in the three 1-foot samples and ranged from 4.0 to 4.4 mg/kg in the three 4-foot samples. Arsenic concentrations ranged from 6.1 to 9.0 mg/kg in the 1-foot samples and from 3.1 to 3.5 mg/kg in the 4-foot samples. Cadmium concentrations ranged from 0.30 to 0.37 mg/kg in the 1-foot samples and was not detected in any of the 4-foot samples above the standard detection limit.

No PAHs were detected in either of the two composited soil samples at or above the elevated detection limits. The detection limits for the 1-foot composited sample were elevated by five times and the limits

for the 4-foot composited sample were elevated by 20 times due to "high organic content/matrix interference." Hexavalent chromium was also not detected in the two composited samples at or above the standard detection limit.

## DISCUSSION

The concentrations of the three heavy metals detected in the site soil were compared to the San Francisco Bay Regional Water Quality Control Board's Environmental Screening Levels (ESLs) for both commercial and residential shallow soil where underlying groundwater is a potential drinking water source.[1] ESLs are health risk-based tools for evaluating properties for potential cleanup. Levels below ESLs are generally considered protective of humans over a lifetime. In cases where the naturally occurring, background concentration of a compound exceeds the ESL, it is generally acceptable to use that background concentration as the screening level instead of the ESL.

The metal concentrations were also compared to the Region 9 U.S. Environmental Protection Agency's (EPA's) Preliminary Remediation Goals (PRGs) for both industrial and residential soil, which are health-risk based goals for direct human exposure. Also compared were the U.S. EPA's Soil Screening Levels (SSLs) which are protective of groundwater.[2] The U.S. EPA also does not generally require cleanups to below natural background levels where background levels exceed PRGs or SSLs.

The detected concentrations of lead and cadmium were all below their respective ESLs, PRGs and SSLs (see Table 1). The detection limit of hexavalent chromium is also below the respective ESLs, PRGs and SSLs (no hexavalent chromium was detected in the six samples).

The arsenic concentrations in all six samples exceeded the PRGs and SSL (with a dilution attenuation factor of 1). The arsenic levels in the three shallowest samples also exceeded the ESLs. However, arsenic is naturally occurring in soils. The U.S. EPA presents a range of naturally occurring arsenic concentrations in California soil of 0.59 – 11 mg/kg.[3] The California EPA determined a concentration of 18 mg/kg to represent the high end of the range of naturally occurring arsenic at a site in nearby Watsonville.[4] The maximum concentration detected in the six samples collected from the site, 9.0 mg/kg, is below both the 11 mg/kg and 18 mg/kg cited for maximum background concentrations.

The detection limits for PAHs for the 1-foot composited sample were below their respective ESLs, PRGs and SSLs, however, the detection limits for the 4-foot sample exceeded the residential ESL and PRG for the most toxic PAHs. Note that no PAHs were detected in the two composited samples.

---

[1] California Regional Water Quality Control Board, San Francisco Bay Region, February 2005, Screening for Environmental Concerns at Sites With Contaminated Groundwater, Interim Final.

[2] United States Environmental Protection Agency, Region 9, October 2004, User's Guide and Background Technical Document and PRG Table.

[3] Ibid.

[4] California Environmental Protection Agency, Department of Toxic Substances Control, June 26, 2002, News Release, Former California Spray and Chemical Site, T – 15 - 02.

## LIMITATIONS AND USER RELIANCE

This work was performed in a manner consistent with the standards of care and skill ordinarily exercised by members of the profession practicing under similar conditions in the geographic vicinity at the time the services were performed. This is in lieu of all warranties, or guarantees, express or implied.

The work scope was limited by you and your request for three sampling locations in the vicinity of the former turntable. This limited work was not intended to identify any other potential concerns or to eliminate the possibility of environmental problems. It does not include any other services not described. TOXICHEM cannot offer a certification that the property is clear of environmental liability; however, no amount of investigative effort could yield that. TOXICHEM will assume no responsibility or liability whatsoever for any claim, loss of property value, damage, or injury which results from pre-existing hazardous materials being encountered or present on the subject site, or from the discovery of such hazardous materials. Opinions and judgments expressed herein, which are based on our understanding and interpretation of current regulatory standards, should not be construed as legal opinions.

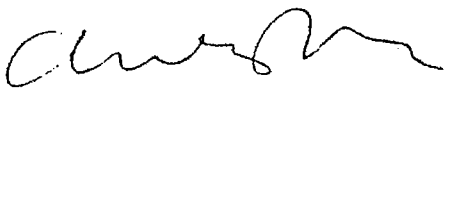
The former location of the turntable was estimated using the 1892 Sanborn map and Santa Cruz County parcel map. Soil boring location measurements were made using the northwest fence corner as a reference and it was assumed this fence corner is at the northwest property corner.

This letter has been prepared for use solely by you, Peter Testorff, in purchasing the subject site. This letter shall not be relied upon by or transferred to any other party, or used for any other purpose, without the express written authorization of TOXICHEM.

If you have any questions regarding this report, please call the undersigned in our Monterey Bay office at 831-423-7673.

Sincerely,

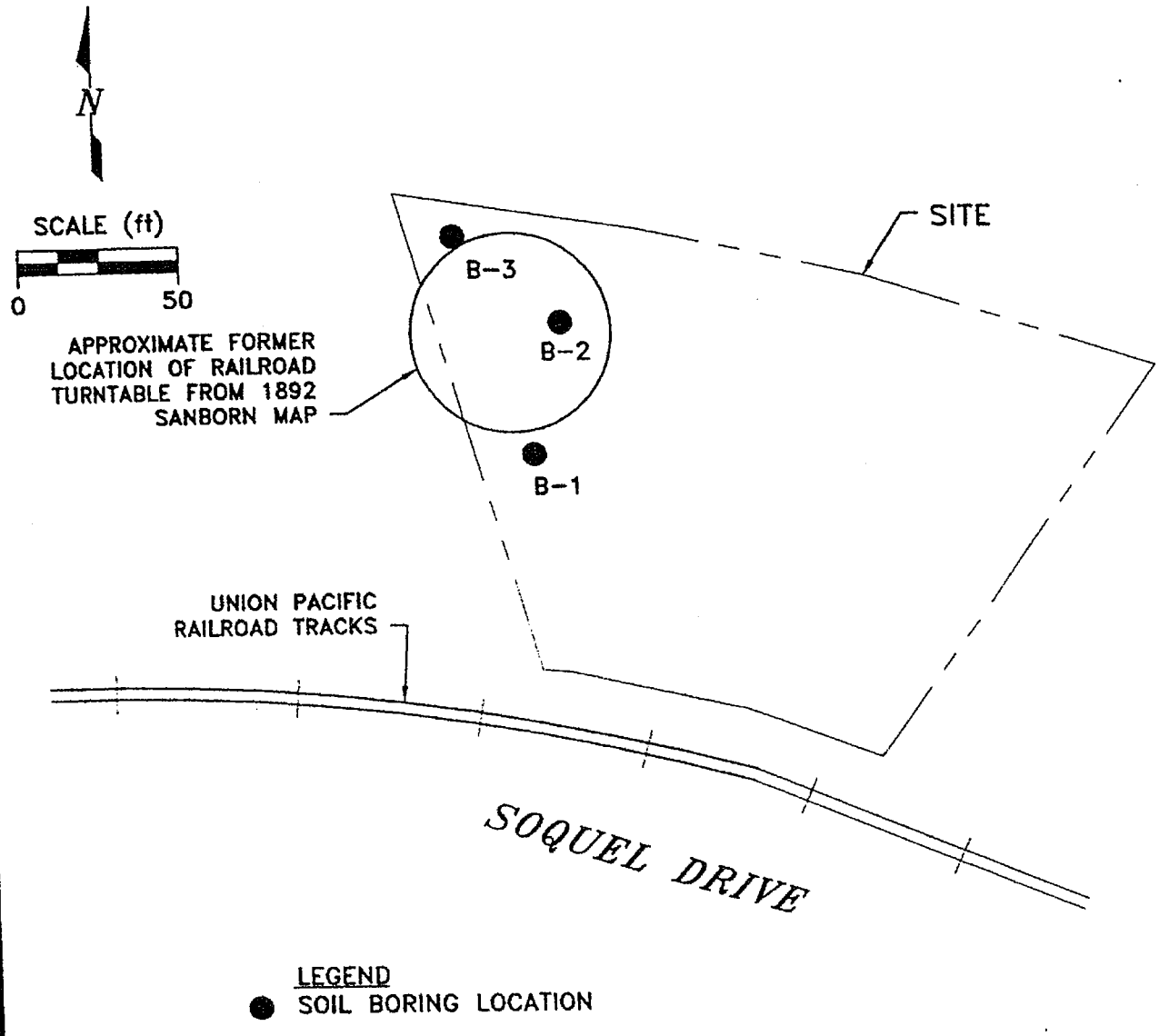
**Toxichem Management Systems, Inc.**



Christine L.H. Mead, PG 5884, REA II 20077
Senior Geologist

CLHM/ERL

Attachments: Table 1 – Soil Analytical Data
Figure 1 – Site Plan
Attachment A – Exploratory Boring Logs
Attachment B – Certified Analytical Report and Chain-of-Custody Document




Ref. PT-01/SITEMAP.DWG
Basemap from Santa Cruz County Assessor's Parcel Map #41-01 and 1892 Sanborn Fire Insurance map.

Note: All measurements are based on the assumption that the Northwest property corner is demarcated by the fence corner.

PREPARED BY
**TOXICHEM Management Systems, Inc.**
Environmental & Occupational Health Services

8037 Soquel Drive
Aptos, California

SOIL BORING LOCATIONS

FIGURE: 1
PROJECT: PT-01

# Attachment 7

Ceres Associates
Sustaining Environments Worldwide

424 First Street, Benicia, CA 94510
(707) 748-3170 / fax (707) 748-3171

February 5, 2007
Project: CA1643-3

Jeff Major
Barry Swenson Builder
777 North First Street, 5th Floor
San Jose, California

**Report of Field Activities**
APN 041-011-20
Aptos, California (Property)

Dear Mr. Major:

Ceres Associates is pleased to present this report of our field activities associated with the planned removal of one underground storage tank (UST) from APN 041-011-20, Aptos, California (Property) *(refer to Figure 1 - Property Map).*

## Background

Ceres Associates conducted a Phase I ESA for the Property in December 2006. The consultant indicated that historic uses of the Property suggested the potential presence of historic underground storage tanks (USTs) on the Property and recommended conducting a geophysical survey as well as soil and groundwater sampling in the area of the former press house and ovens building on the Property.

Ceres Associates conducted a geophysical survey in early January 2007 and the geophysicist identified a subsurface metal object consistent with a UST to the northwest of the former press house, within 10 feet of the building. Barry Swenson Builder authorized Ceres Associates to conduct the UST removal process.

## Activities

*USA Notifications*
Ceres Associates notified Underground Service Alert (USA) of our anticipated excavation in an area previously identified by a geophysicist as a likely UST. This alert was made more than 72 hours prior to on-site activities.

*Permit*
Ceres Associates obtained a UST removal permit from the Santa Cruz County Environmental Health

Department (EHD). The permit was for the planned removal of one 1,000-gallon UST, likely containing diesel fuel.

Ceres Associates prepared a Health and Safety Plan, sampling plan, and other pertinent data forms as part of the permit process. These materials were submitted to Ms. Rebecca Supplee of the EHD and a permit was approved.

*US EPA ID Number*

The anticipated UST was to be manifested as non-RCRA waste according to EHD guidelines. As part of this process, Ceres Associates obtained a temporary US EPA ID Number: CAC 002612733. This number will expire on April 29, 2007.

Should future activities on the Property require the disposal of hazardous waste, this EPA ID can be utilized on a temporary basis.

*Field Work*

Ceres Associates conducted field activities on February 2, 2007. After arriving on-site and meeting with the UST removal contractor (Jim Ruble with Petrotek), a Health and Safety Meeting was conducted.

After the Health and Safety Meeting, Ceres Associates supervised as Petrotek uncovered the area identified by the geophysicist as being a potential UST. Soil was removed from the marked area and placed to the side of the anticipated excavation pit *(refer to Figure 2 - Excavation Map)*.

As soil was removed, Ceres Associates observed metal pipes buried within two (2) feet of the surface. The pipes were approximately two (2) feet in diameter, approximately three (3) feet in length, filled with soil, and appeared to be made of steel. It appeared that four pipe sections were laying length wise in the excavation. This would be consistent with what a geophysicist would observe with their subsurface instrumentation as well as it could be construed to be a UST.

The excavation was conducted to a depth of approximately seven (7) feet, a width of approximately four (4) feet, and a length of approximately 14 feet. The pipe did not appear to continue either toward or away from the former building. Further, physical evidence of a UST was not encountered.

The EHD was on-site during the majority of the excavation work and inspected the excavation. After it was found that no UST was identified in the excavation pit, the EHD did not require sampling, but did instruct that the pit be backfilled with the excavated material. Ceres Associates complied with this request.

The pipe materials that were removed were placed adjacent to the former building foundation and the excavation pit was backfilled with removed materials *(refer to Appendix - Property Photographs)*. The EHD requested a report of field activities and indicated a No Further Action letter would be issued. Ms. Supplee noted that if during future redevelopment of the Property, subsurface features associated with USTs are encountered, her agency should be notified.

**Conclusions and Recommendations**

It appears that the subsurface feature consistent with a UST identified by the geophysicist during an earlier assessment was the metal pipe lengths observed during the excavation process.

Ceres Associates does not recommend further assessment of the potential UST at this time because the EHD is not requiring further assessment, and a UST was not observed. Should future redevelopment activities identify a potential UST or similar subsurface feature, both the EHD and Ceres Associates should be notified.

If you have questions regarding this project, please contact me at (707) 748-3170 or via email at ryanmeyer@ceresassociates.com.

Sincerely,
Ceres Associates

Ryan Meyer, REA 07936
Project Manager

cc: Rebecca Supplee
Santa Cruz County Environmental Health
701 Ocean Street, Room 312
Santa Cruz, California 95060

Ceres Associates
Sustaining Environments Worldwide

424 First Street, Benicia, CA 94510
(707) 748-3170 / fax (707) 748-3171

January 12, 2007
Project: CA1643-2

Jeff Major
Barry Swenson Builder
777 North First Street, 5th Floor
San Jose, California

**Soil Sampling**
**and**
**Geophysical Survey**
417 Trout Gulch Road
Aptos, California

Dear Mr. Major:

Ceres Associates is pleased to provide this report of soil sampling and geophysical survey work conducted at 417 Trout Gulch Road, Aptos, California (Property). The work was conducted entirely on APN 04101120.

## Background

From at least 1888 to 1892 the Property was developed with two lumber sheds and lumber piles for the Aptos Milling Company. From at least 1908 to the present the Property has been developed with the antique store building as well as several other associated buildings (including residences, apple drying buildings, and an apple packing building). From at least 1908 to approximately 1969 the building was in use as an apple warehouse. Since approximately 1970 the building has been in use as an antique store. The Property is currently in use as an antique store and undeveloped land. The antique store is currently occupied by Village Fair Antiques and La Font's Antique & Estate Jewelry.

*Apple Drying Facility*
The apple drying facility operated between two and four drying ovens as well as a press house between at least the early 1900s to around the 1960s. Sanborn maps from this era note that these facilities used oil and diesel for power. Although underground storage tanks (USTs) were not clearly identified on the map, it is possible that such tanks were used in coordination with the apple plant operations. Further, even where above ground storage tanks (ASTs) were used, the presence of these compounds for as many as 60 years suggest the potential for subsurface contamination.

The consultant made the following recommendation: "Based upon the historic use of petroleum hydrocarbons for fuel between the 1900s and the 1960s, Ceres Associates recommends collecting soil and groundwater samples from the former apple drying buildings containing ovens and the diesel powered press house. Further, a geophysical survey of these building areas should be conducted."

## Scope of Work

Ceres Associates conducted the following scope of work:

- Notified USA of subsurface work and prepared a Health and Safety Plan for the work on the Property.
- Advanced seven soil borings in the vicinity of the former drying ovens and the identified potential UST.
- Collected soil samples and submitted them for analysis to a state-certified laboratory.
- Supervised a geophysical survey of the former apple drying building and press house.
- Prepared this report.

*Pre-field Activities*

Prior to sampling, individual boring locations were cleared using USA notification processes as well as a private utility locating service. Underground pipelines and conduits which were identified within the boring area were marked on the surface.

A Health and Safety Plan, prepared by Ceres Associates, was used to facilitate a pre-drilling safety meeting prior to conducting work. Signatures of attendees were collected at the meeting indicating an understanding of the risks and hazards involved in the drilling process. A copy of this document was kept on site during the drilling process.

*Soil Sampling*

Ceres Associates advanced seven soil borings on the Property on January 5, 2007 *(refer to Figure 2 - Soil Boring Location Map)*. Four borings were advanced in the vicinity of an identified potential underground storage tank (UST); and three other borings were advanced in the vicinity of the former apple drying ovens. Both of these locations were identified on historic Sanborn Fire Insurance Maps as using petroleum based fuels for operations.

Soil samples were collected using Geoprobe® sampling equipment provided by Vironex of San Leandro, California. The Geoprobe® sampler utilizes direct-push technology to collect soil and groundwater samples from specific subsurface depths without generating soil cuttings. The Geoprobe® sampling system consists of a series of 1.5-inch diameter hollow stainless steel rods which are hydraulically driven into the ground using a pneumatic hammer attached to the Geoprobe® assembly.

Soil samples were collected by driving a four-foot long stainless steel sample sleeve attached to the end of the steel rods into soil at a specified sample depth. Soil samples were then collected in acetate sample tubes installed inside the sample sleeve. After the rod assembly was hydraulically extended to the target sample depth, the sample sleeve was retrieved to ground surface and the acetate sample tube containing soil from the appropriate sample interval was capped with Teflon®-lined plastic end caps, labeled, placed in a Ziplock® bag, and stored in a chest cooled with crushed ice.

*Laboratory Analysis*

Ceres Associates, following chain of custody protocols, submitted soil samples to McCampbell Analytical, a state-certified laboratory, for analysis of petroleum hydrocarbons as diesel, motor oil, and kerosene, as well as benzene, toluene, ethylbenzene, and xylenes (BTEX) using US EPA methods 8015/8020. Ceres Associates requested that the 10 foot samples be analyzed, while other samples were archived for future analysis, if necessary. Additionally, the 15 foot sample from SB-7 (near the identified possible UST) was analyzed.

*Geophysical Survey*

Ceres Associates supervised a professional geophysicist from Nor-Cal Geophysical. The survey area encompassed the former apple press house and oven area as well as a margin of approximately 10 to 15 feet around the former building *(refer to Figure 3 - Geophysical Survey Area)*. The geophysical survey consisted of utilizing ground penetrating radar (GPR), an electromagnetic line locator, and a magnetometer (EM).

**Results**

*Soil Sampling*

The results of the laboratory analyses indicated that all submitted samples were not reported above the method reporting limits (ND) for target compounds.

*Geophysical Survey*

The geophysical survey revealed a subsurface anomaly consistent with a UST. The anomaly was identified to the east-northeast of the former apple press house *(refer to Appendix - Geophysical Survey Report and Map)*. According to the field drawing, the UST is anticipated to be approximately 1,000 gallons in size.

The survey did not identify other anomalies consistent with additional USTs or piping. Some subsurface utility lines were identified and presumed to be inactive; however, these lines did not appear to be connected to the identified possible UST.

## Conclusions

It appears that a UST is located within 10 feet of the outside the former apple press house. Historic maps of this building indicated that it was diesel powered; however specific tanks or locations were not noted. The presence of a UST in the identified location is consistent with these historic maps.

Several soil samples were obtained within 10 feet of the identified UST; however, laboratory analyses did not reveal evidence of target compounds above method reporting limits. This suggests that even if the potential UST did leak, it has not significantly impacted the sampled soil. Still, additional sampling will be necessary in the tank pit during UST removal to assess for potential leaking from the tank.

## Recommendations

Based upon the findings of this assessment, Ceres Associates recommends the following:

- A possible UST was identified on the Property near to the former apple packing facility. This UST should be removed and disposed of properly. During removal soil samples should be obtained from the excavation pit to assess for the potential that the UST has leaked.

## Limitations

This Environmental Site Assessment (ESA) was conducted according to accepted industry standards and guidelines for similar assessments conducted in this geographic region at this time.

This assessment cannot fully eliminate the possibility of the Property having environmental impairments. In today's technology, no amount of assessment can certify that the Property is completely free of environmental concern. It is possible undocumented or concealed conditions of the Property could exist beyond what was found during this ESA. This report does not cover any Property conditions beyond the date the Property survey was conducted.

If you have questions regarding this or other projects, please don't hesitate to contact me at (707) 748-3170 or via email at ryanmeyer@ceresassociates.com.

Sincerely,
Ceres Associates

Ryan Meyer
Project Manager

# Figures

**Taken from:**
USGS Topographic Map
Soquel, California Quadrangle

N

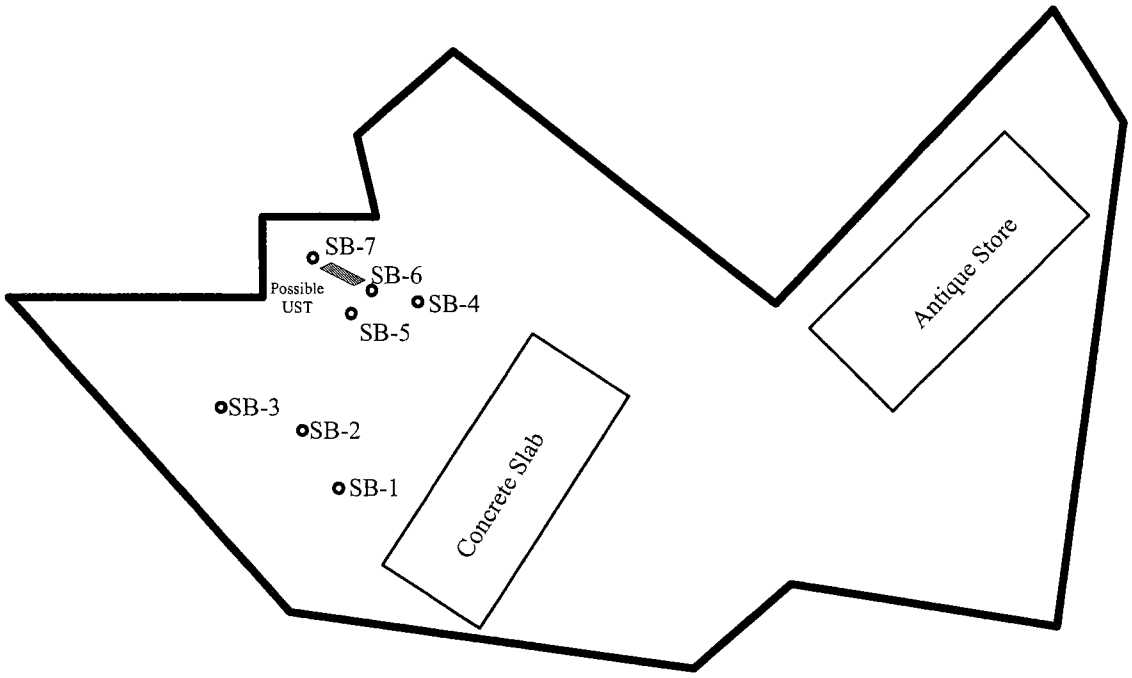
Ceres Associates

Project CA1643-2

Antique Store & Undeveloped Land
417 Trout Gulch Road
Aptos, California

**PROPERTY LOCATION MAP**

**FIGURE 1**




Property Boundary

Soil Boring Locations

N

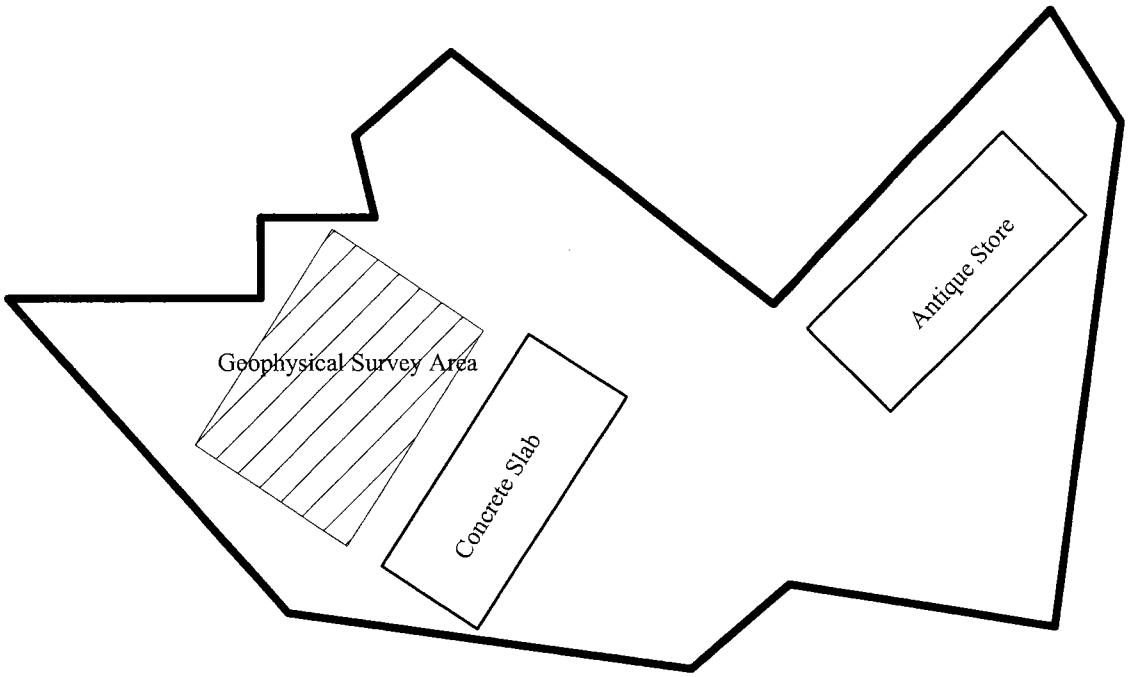
Ceres Associates

Project CA1643-2

Antique Store & Undeveloped Land
417 Trout Gulch Road
Aptos, California

**SOIL BORING LOCATION MAP**

**FIGURE 2**




Property Boundary

Geophysical Survey Boundary

N

Ceres Associates

Project CA1643-2

Antique Store & Undeveloped Land
417 Trout Gulch Road
Aptos, California

**GEOPHYSICAL SURVEY AREA**

**FIGURE 3**

# Laboratory Data Sheets

**McCampbell Analytical, Inc.**
"When Quality Counts"

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Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

| | | |
|---|---|---|
| Ceres Associates | Client Project ID: CA 1643-1;CA 1643-2 | Date Sampled: 01/05/07 |
| 424 First Street | | Date Received: 01/05/07 |
| Benicia, CA 94510 | Client Contact: Ryan Meyer | Date Reported: 01/09/07 |
| | Client P.O.: | Date Completed: 01/09/07 |

**WorkOrder: 0701131**

January 09, 2007

Dear Ryan:

Enclosed are:

1). the results of **8** analyzed samples from your **CA 1643-1;CA 1643-2 project,**

2). a QC report for the above samples

3). a copy of the chain of custody, and

4). a bill for analytical services.

All analyses were completed satisfactorily and all QC samples were found to be within our control limits. If you have any questions please contact me. McCampbell Analytical Laboratories strives for excellence in quality, service and cost. Thank you for your business and I look forward to working with you again.

Best regards,

Angela Rydelius, Lab Manager

cab 0701131

RUSH

# McCAMPBELL ANALYTICAL, INC.

1534 WILLOW PASS ROAD
PITTSBURG, CA 94565-1701
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Telephone: (877) 252-9262 Fax: (925) 252-9269

# CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☐ 72 HR ☐ 5 DAY
GeoTracker EDF ☐ PDF ☐ Excel ☐ Write On (DW) ☐
☐ Check if sample is effluent and "J" flag is required

Report To: Ryan Meyer Bill To:
Company: Cerco Associates
E-Mail: RMeyer@cercoassociates.com
Tele: (707) 798-3170 Fax: (707) 778-3171
Project #: CA 1643-1 Project Name: CA 1643-2
Project Location: Arbuckle, CA
Sampler Signature: Ryan Meyer

| SAMPLE ID | LOCATION/ Field Point Name | SAMPLING Date | SAMPLING Time | # Containers | Type Containers | MATRIX Water | MATRIX Soil | MATRIX Air | MATRIX Sludge | MATRIX Other | METHOD PRESERVED ICE | HCL | HNO3 | Other |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB1-5 | | 1/5/07 | | 1 | | | X | | | | X | | | |
| SB1-10 | | | | | | | | | | | | | | |
| SB1-15 | | | | | | | | | | | | | | |
| SB2-5 | | | | | | | | | | | | | | |
| SB2-10 | | | | | | | | | | | | | | |
| SB2-15 | | | | | | | | | | | | | | |
| SB3-5 | | | | | | | | | | | | | | |
| SB3-10 | | | | | | | | | | | | | | |
| SB3-15 | | | | | | | | | | | | | | |
| SB4-5 | | | | | | | | | | | | | | |
| SB4-10 | | | | | | | | | | | | | | |
| SB4-15 | | | | | | | | | | | | | | |
| SB1-20 | | | | | | | | | | | | | | |
| SB1-25 | | | | | | | | | | | | | | |

Analysis Request

| (BTEX & MTBE by 8260B / 8021) | TPH as Diesel (8015) | Total Petroleum Oil & Grease (1664 / 5520 E&F) | Total Petroleum Hydrocarbons (418.1) | EPA 502.2 / 601 / 8010 / 8021 (HVOCs) | MTBE / BTEX ONLY (EPA 602 / 8021) | EPA 608 / 8081 (Cl Pesticides) | EPA 608 / 8082 PCB's ONLY | Aroclors / Congeners | EPA 507 / 8141 (NP Pesticides) | EPA 515 / 8151 (Acidic Cl Herbicides) | EPA 524.2 / 624 / 8260 (VOCs) | EPA 525.2 / 625 / 8270 (SVOCs) | EPA 8270 SIM / 8310 (PAHs / PNAs) | CAM 17 Metals (200.7 / 200.8 / 6010 / 6020) | LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020) | Lead (200.7 / 200.8 / 6010 / 6020) | Other | Other | Other | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| X | | | | | | | | | | | | | | | | | | | | Filter Samples for Metals analysis: Yes / No |
| X | X | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | hold |
| X | X | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | hold |
| X | X | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | hold |
| X | X | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | hold |
| | | | | | | | | | | | | | | | | | | | | |

| | Relinquished By: | Date: | Time: | Received By: |
|---|---|---|---|---|
| 1 | | 1/5/07 | 15:10 | |
| 2 | Environtech | 1/5/07 | 17:30 | ADIL |
| 3 | ADIL | 1-5 | 6:05 | |

ICE/P °C: ✓
GOOD CONDITION
HEAD SPACE ABSENT
DECHLORINATED IN LAB
APPROPRIATE CONTAINERS ✓
PRESERVED IN LAB

COMMENTS:

| | VOAS | O&G | METALS | OTHER |
|---|---|---|---|---|
| PRESERVATION | | | pH<2 | |

# McCAMPBELL ANALYTICAL, INC.

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PITTSBURG, CA 94565-1701
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Telephone: (877) 252-9262 Fax: (925) 252-9269

# CHAIN OF CUSTODY RECORD

TURN AROUND TIME ☐ RUSH ☐ 24 HR ☐ 48 HR ☒ 72 HR ☐ 5 DAY
GeoTracker EDF ☒ PDF ☒ Excel ☐ Write On (DW) ☐
☐ Check if sample is effluent and "J" flag is required

| | |
|---|---|
| Report To: Ryan Meyer | Bill To: |
| Company: Ceres Associates | |
| | E-Mail: RyanMeyer@ceres Associates.com |
| Tele: (707) 798-3870 | Fax: (707) 798-3871 |
| Project #: CA1693-1 | Project Name: CA1693-1 |
| Project Location: Acres | |
| Sampler Signature: Justin Meyer | |

| SAMPLE ID | LOCATION/ Field Point Name | SAMPLING Date | SAMPLING Time | # Containers | Type Containers | MATRIX Water | MATRIX Soil | MATRIX Air | MATRIX Sludge | MATRIX Other | METHOD PRESERVED ICE | METHOD PRESERVED HCL | METHOD PRESERVED HNO3 | METHOD PRESERVED Other | Analysis Request: TPH as Diesel (8015) | Analysis Request: Total Petroleum Oil & Grease (1664 / 5520 E/B&F) | Analysis Request: Total Petroleum Hydrocarbons (418.1) | Analysis Request: EPA 502.2 / 601 / 8010 / 8021 (HVOCs) | Analysis Request: MTBE / BTEX ONLY (EPA 602 / 8021) | Analysis Request: EPA 505 / 608 / 8081 (Cl Pesticides) | Analysis Request: EPA 508 / 8082 PCB's ONLY; Aroclors / Congeners | Analysis Request: EPA 507 / 8141 (NP Pesticides) | Analysis Request: EPA 515 / 8151 (Acidic Cl Herbicides) | Analysis Request: EPA 524.2 / 624 / 8260 (VOCs) | Analysis Request: EPA 525.2 / 625 / 8270 (SVOCs) | Analysis Request: EPA 8270 SIM / 8310 (PAHs / PNAs) | Analysis Request: CAM 17 Metals (200.7 / 200.8 / 6010 / 6020) | Analysis Request: LUFT 5 Metals (200.7 / 200.8 / 6010 / 6020) | Analysis Request: Lead (200.7 / 200.8 / 6010 / 6020) | Other | Comments |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| SB5-5 | | 1/5/07 | | 1 | | | X | | | | X | | | | | | | | | hold | | | | | | | | | | | | |
| SB5-10 | | | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | |
| SB5-15 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB9-20 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB9-25 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB6-5 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB6-10 | | | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | |
| SB6-15 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB7-5 | | | | | | | | | | | | | | | | | | | | hold | | | | | | | | | | | | |
| SB7-10 | | | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | |
| SB7-15 | | | | | | | | | | | | | | | X | X | | | | | | | | | | | | | | | | |

| | | | | |
|---|---|---|---|---|
| Relinquished By: | Date: | Time: | Received By: | ICE/t COMMENTS: |
| | 1/5/07 | 15:10 | | GOOD CONDITION |
| Relinquished By: | Date: | Time: | Received By: | HEAD SPACE ABSENT |
| Environtech | 1/5/07 | 17:39 | ADIL | DECHLORINATED IN LAB |
| Relinquished By: | Date: | Time: | Received By: | APPROPRIATE CONTAINERS |
| ADIL | 1-5-07 | 6:05 | | PRESERVED IN LAB |
| | | | | VOAS O&G METALS OTHER |
| | | | | PRESERVATION pH<2 |

**McCampbell Analytical, Inc.**
1534 Willow Pass Rd
Pittsburg, CA 94565-1701
(925) 252-9262

# CHAIN-OF-CUSTODY RECORD



**WorkOrder: 0701131** **ClientID: CAB**

☐ EDF ☐ Fax ☑ Email ☐ HardCopy ☐ ThirdParty

**Report to:**
Ryan Meyer
Ceres Associates
424 First Street
Benicia, CA 94510

Email: ryanmeyer@ceresassociates.com
TEL: (707) 748-3170 FAX: (707) 748-3171
ProjectNo: CA 1643-1;CA 1643-2
PO:

**Bill to:**
Chwania Mejia cmejia@ceresassociat
Ceres Associates
424 First Street
Benicia, CA 94510

**Requested TAT:** 3 days

***Date Received:*** 01/05/2007
***Date Printed:*** 01/05/2007

| Sample ID | ClientSampID | Matrix | Collection Date | Hold | Requested Tests (See legend below) | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 |
| 0701131-002 | SB1-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-005 | SB2-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-008 | SB3-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-011 | SB4-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-016 | SB5-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-021 | SB6-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-024 | SB7-10 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |
| 0701131-025 | SB7-15 | Soil | 01/05/2007 | ☐ | A | A | | | | | | | | | | |

**Test Legend:**

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | G-MBTEX_S | 2 | TPH(DKMO)_S | 3 | | 4 | | 5 | |
| 6 | | 7 | | 8 | | 9 | | 10 | |
| 11 | | 12 | | | | | | | |

**Prepared by: Melissa Valles**

**Comments:**

NOTE: Samples are discarded 60 days after results are reported unless other arrangements are made. Hazardous samples will be returned to client or disposed of at client expense.

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Telephone: 877-252-9262 Fax: 925-252-9269

| | | |
|---|---|---|
| Ceres Associates | Client Project ID: CA 1643-1;CA 1643-2 | Date Sampled: 01/05/07 |
| 424 First Street | | Date Received: 01/05/07 |
| Benicia, CA 94510 | Client Contact: Ryan Meyer | Date Extracted: 01/05/07 |
| | Client P.O.: | Date Analyzed 01/06/07-01/08/07 |

**Gasoline Range (C6-C12) Volatile Hydrocarbons as Gasoline with BTEX and MTBE***

Extraction method SW5030B Analytical methods SW8021B/8015Cm Work Order: 0701131

| Lab ID | Client ID | Matrix | TPH(g) | MTBE | Benzene | Toluene | Ethylbenzene | Xylenes | DF | % SS |
|---|---|---|---|---|---|---|---|---|---|---|
| 002A | SB1-10 | S | --- | --- | ND | ND | ND | ND | 1 | 96 |
| 005A | SB2-10 | S | --- | --- | ND | ND | ND | ND | 1 | 92 |
| 008A | SB3-10 | S | --- | --- | ND | ND | ND | ND | 1 | 99 |
| 011A | SB4-10 | S | --- | --- | ND | ND | ND | ND | 1 | 91 |
| 016A | SB5-10 | S | --- | --- | ND | ND | ND | ND | 1 | 90 |
| 021A | SB6-10 | S | --- | --- | ND | ND | ND | ND | 1 | 90 |
| 024A | SB7-10 | S | --- | --- | ND | ND | ND | ND | 1 | 92 |
| 025A | SB7-15 | S | --- | --- | ND | ND | ND | ND | 1 | 90 |
| | | | | | | | | | | |
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| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Reporting Limit for DF =1; ND means not detected at or above the reporting limit | W | NA | NA | NA | NA | NA | NA | 1 | ug/L |
| | S | 1.0 | 0.05 | 0.005 | 0.005 | 0.005 | 0.005 | 1 | mg/Kg |

* water and vapor samples and all TCLP & SPLP extracts are reported in µg/L, soil/sludge/solid samples in mg/kg, wipe samples in µg/wipe, product/oil/non-aqueous liquid samples in mg/L.

# cluttered chromatogram; sample peak coelutes with surrogate peak.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified gasoline is significant; b) heavier gasoline range compounds are significant(aged gasoline?); c) lighter gasoline range compounds (the most mobile fraction) are significant; d) gasoline range compounds having broad chromatographic peaks are significant; biologically altered gasoline?; e) TPH pattern that does not appear to be derived from gasoline (stoddard solvent / mineral spirit?); f) one to a few isolated non-target peaks present; g) strongly aged gasoline or diesel range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; j) reporting limit raised due to high MTBE content; k) TPH pattern that does not appear to be derived from gasoline (aviation gas). m) no recognizable pattern; n) TPH(g) value derived using a client specified carbon range; o) results are reported on a dry weight basis; p) see attached narrative.

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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Web: www.mccampbell.com E-mail: main@mccampbell.com
Telephone: 877-252-9262 Fax: 925-252-9269

| | | |
|---|---|---|
| Ceres Associates | Client Project ID: CA 1643-1;CA 1643-2 | Date Sampled: 01/05/07 |
| 424 First Street | | Date Received: 01/05/07 |
| Benicia, CA 94510 | Client Contact: Ryan Meyer | Date Extracted: 01/05/07 |
| | Client P.O.: | Date Analyzed 01/07/07-01/08/07 |

**Diesel (C10-C23), Kerosene (C9-C18) & Oil (C18+) Range Extractable Hydrocarbons as Diesel, Kerosene & Motor Oil***

Extraction method SW3550C Analytical methods SW8015C Work Order: 0701131

| Lab ID | Client ID | Matrix | TPH(d) | TPH(k) | TPH(mo) | DF | % SS |
|---|---|---|---|---|---|---|---|
| 002A | SB1-10 | S | ND | ND | ND | 1 | 103 |
| 005A | SB2-10 | S | ND | ND | ND | 1 | 103 |
| 008A | SB3-10 | S | ND | ND | ND | 1 | 102 |
| 011A | SB4-10 | S | ND | ND | ND | 1 | 94 |
| 016A | SB5-10 | S | ND | ND | ND | 1 | 97 |
| 021A | SB6-10 | S | ND | ND | ND | 1 | 100 |
| 024A | SB7-10 | S | ND | ND | ND | 1 | 98 |
| 025A | SB7-15 | S | ND | ND | ND | 1 | 114 |
| | | | | | | | |
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| | | | | | |
|---|---|---|---|---|---|
| Reporting Limit for DF =1; ND means not detected at or above the reporting limit | W | NA | NA | NA | ug/L |
| | S | 1.0 | 1.0 | 5.0 | mg/Kg |

* water samples are reported in µg/L, wipe samples in µg/wipe, soil/solid/sludge samples in mg/kg, product/oil/non-aqueous liquid samples in mg/L, and all DISTLC / STLC / SPLP / TCLP extracts are reported in µg/L.

# cluttered chromatogram resulting in coeluted surrogate and sample peaks, or; surrogate peak is on elevated baseline, or; surrogate has been diminished by dilution of original extract.

+The following descriptions of the TPH chromatogram are cursory in nature and McCampbell Analytical is not responsible for their interpretation: a) unmodified or weakly modified diesel is significant; b) diesel range compounds are significant; no recognizable pattern; c) aged diesel? is significant); d) gasoline range compounds are significant; e) unknown medium boiling point pattern that does not appear to be derived from diesel; f) one to a few isolated peaks present; g) oil range compounds are significant; h) lighter than water immiscible sheen/product is present; i) liquid sample that contains greater than ~1 vol. % sediment; k) kerosene/kerosene range; l) bunker oil; m) fuel oil;

DHS ELAP Certification N° 1644

Angela Rydelius, Lab Manager

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# QC SUMMARY REPORT FOR SW8021B/8015Cm

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0701131

**EPA Method SW8021B/8015Cm** **Extraction SW5030B** **BatchID: 25578** **Spiked Sample ID: 0701131-011A**

| Analyte | Sample | Spiked | MS | MSD | MS-MSD | LCS | LCSD | LCS-LCSD | Acceptance Criteria (%) | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | mg/Kg | mg/Kg | % Rec. | % Rec. | % RPD | % Rec. | % Rec. | % RPD | MS / MSD | RPD | LCS/LCSD | RPD |
| TPH(btex)£ | ND | 0.60 | 107 | 103 | 3.84 | 107 | 111 | 3.46 | 70 - 130 | 30 | 70 - 130 | 30 |
| MTBE | ND | 0.10 | 96.6 | 89.8 | 7.27 | 104 | 103 | 0.655 | 70 - 130 | 30 | 70 - 130 | 30 |
| Benzene | ND | 0.10 | 102 | 111 | 8.40 | 102 | 100 | 1.55 | 70 - 130 | 30 | 70 - 130 | 30 |
| Toluene | ND | 0.10 | 92.4 | 101 | 8.98 | 90.3 | 91.1 | 0.946 | 70 - 130 | 30 | 70 - 130 | 30 |
| Ethylbenzene | ND | 0.10 | 102 | 112 | 9.23 | 98.3 | 100 | 1.82 | 70 - 130 | 30 | 70 - 130 | 30 |
| Xylenes | ND | 0.30 | 96.7 | 107 | 9.84 | 95.3 | 99.7 | 4.44 | 70 - 130 | 30 | 70 - 130 | 30 |
| %SS: | 91 | 0.10 | 93 | 105 | 12.1 | 96 | 96 | 0 | 70 - 130 | 30 | 70 - 130 | 30 |

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 25578 SUMMARY

| Sample ID | Date Sampled | Date Extracted | Date Analyzed | Sample ID | Date Sampled | Date Extracted | Date Analyzed |
|---|---|---|---|---|---|---|---|
| 0701131-002 | 1/05/07 | 1/05/07 | 1/06/07 1:48 PM | 0701131-005 | 1/05/07 | 1/05/07 | 1/06/07 2:48 PM |
| 0701131-008 | 1/05/07 | 1/05/07 | 1/06/07 5:46 PM | 0701131-011 | 1/05/07 | 1/05/07 | 1/06/07 6:16 PM |

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

£ TPH(btex) = sum of BTEX areas from the FID.

DHS ELAP Certification N° 1644

JR QA/QC Officer

**McCampbell Analytical, Inc.**
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# QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0701131

| EPA Method SW8015C | Extraction SW3550C | | | | BatchID: 25558 | | | Spiked Sample ID: 0701131-005a | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte | Sample | Spiked | MS | MSD | MS-MSD | LCS | LCSD | LCS-LCSD | Acceptance Criteria (%) | | | |
| | mg/Kg | mg/Kg | % Rec. | % Rec. | % RPD | % Rec. | % Rec. | % RPD | MS / MSD | RPD | LCS/LCSD | RPD |
| TPH(d) | ND | 20 | 112 | 107 | 4.40 | 93.6 | 93 | 0.618 | 70 - 130 | 30 | 70 - 130 | 30 |
| %SS: | 103 | 50 | 105 | 102 | 2.34 | 105 | 107 | 1.78 | 70 - 130 | 30 | 70 - 130 | 30 |

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 25558 SUMMARY

| Sample ID | Date Sampled | Date Extracted | Date Analyzed | Sample ID | Date Sampled | Date Extracted | Date Analyzed |
|---|---|---|---|---|---|---|---|
| 0701131-002 | 1/05/07 | 1/05/07 | 1/07/07 5:18 AM | 0701131-005 | 1/05/07 | 1/05/07 | 1/07/07 3:02 AM |

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

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# QC SUMMARY REPORT FOR SW8015C

W.O. Sample Matrix: Soil QC Matrix: Soil WorkOrder: 0701131

| EPA Method SW8015C | Extraction SW3550C | | | | BatchID: 25596 | | | Spiked Sample ID: 0701131-025A | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Analyte | Sample | Spiked | MS | MSD | MS-MSD | LCS | LCSD | LCS-LCSD | Acceptance Criteria (%) | | | |
| | mg/Kg | mg/Kg | % Rec. | % Rec. | % RPD | % Rec. | % Rec. | % RPD | MS / MSD | RPD | LCS/LCSD | RPD |
| TPH(d) | ND | 20 | 112 | 111 | 1.11 | 114 | 105 | 7.49 | 70 - 130 | 30 | 70 - 130 | 30 |
| %SS: | 114 | 50 | 115 | 115 | 0 | 105 | 95 | 9.78 | 70 - 130 | 30 | 70 - 130 | 30 |

All target compounds in the Method Blank of this extraction batch were ND less than the method RL with the following exceptions:

NONE

BATCH 25596 SUMMARY

| Sample ID | Date Sampled | Date Extracted | Date Analyzed | Sample ID | Date Sampled | Date Extracted | Date Analyzed |
|---|---|---|---|---|---|---|---|
| 0701131-008 | 1/05/07 | 1/05/07 | 1/07/07 4:10 AM | 0701131-011 | 1/05/07 | 1/05/07 | 1/08/07 12:56 PM |
| 0701131-016 | 1/05/07 | 1/05/07 | 1/08/07 11:30 AM | 0701131-021 | 1/05/07 | 1/05/07 | 1/08/07 12:38 PM |
| 0701131-024 | 1/05/07 | 1/05/07 | 1/08/07 1:47 PM | 0701131-025 | 1/05/07 | 1/05/07 | 1/08/07 12:38 PM |

MS = Matrix Spike; MSD = Matrix Spike Duplicate; LCS = Laboratory Control Sample; LCSD = Laboratory Control Sample Duplicate; RPD = Relative Percent Deviation.

% Recovery = 100 * (MS-Sample) / (Amount Spiked); RPD = 100 * (MS - MSD) / ((MS + MSD) / 2).

MS / MSD spike recoveries and / or %RPD may fall outside of laboratory acceptance criteria due to one or more of the following reasons: a) the sample is inhomogenous AND contains significant concentrations of analyte relative to the amount spiked, or b) the spiked sample's matrix interferes with the spike recovery.

N/A = not enough sample to perform matrix spike and matrix spike duplicate.

# APPENDIX - GEOPHYSICAL SURVEY

NORCAL GEOPHYSICAL CONSULTANTS, INC.

# LETTER OF TRANSMITTAL

**TO:** Ceres Associates
555 First Street, Suite 303
Benicia, CA 94510

**ATTN:** Mr. Ryan Meyer

**REF:** Geophysical Investigation
Vacant Lot, Granite Way, Aptos, CA

**NORCAL JOB: #** 07-445.06

**VIA:** FAX () MAIL:() PRIORITY:() EXP:() UPS: RED.() 2ND:() GRD:() FED.EXP:(X)

## ENCLOSED PLEASE FIND THE FOLLOWING FOR THE ABOVE REFERENCED:

Two (2) Original Reports;

One (1) Bound
One (1) Unbound

**BY:** Tanya Taylor

**DATE:** January 12, 2007

321A BLODGETT STREET • COTATI, CA 94931 • TELEPHONE (707) 796-7170 • FAX (707) 796-7175
www.norcalgeophysical.com

NORCAL GEOPHYSICAL CONSULTANTS, INC.

January 11, 2007

Mr. Ryan Meyer
Ceres Associates
555 First Street, Suite 303
Benicia, CA 94510

Subject: Geophysical Investigation
Vacant Lot, Granite Way, Aptos, CA
NORCAL Job No. 07-445.06

Dear Mr. Meyer:

This report presents the findings of the geophysical investigation performed by NORCAL Geophysical Consultants, Inc. along Granite Way in Aptos, CA. The field survey was conducted on January 5, 2007 by NORCAL Professional Geophysicist Donald J. Kirker and geophysicist Sierra Boyd. Logistical support and background information was provided by Katie McCulloch of Ceres Associates.

## SITE DESCRIPTION AND PURPOSE

The geophysical investigation, as specified by Ceres Associates, was performed in two separate areas within the subject property. We refer to these as Areas 1 and 2, as shown on Plate 1. Area 1 measures 50 by 90 feet and covers portions of a former building, as evidenced by concrete foundations, walls, and slabs. The remaining area is soil covered and generally free from above ground structures. Area 2 measures 60 by 60 feet and is located in the center of a soil covered lot. There are no above ground structures in this area. However, recent rains created muddy conditions and numerous puddles of standing water.

Ceres Associates indicates that the subject property was previously occupied by facilities that may have used underground storage tanks (USTs). However, records are incomplete as to where USTs may have been located, or whether or not they were removed. Therefore, the purpose of the geophysical investigation is to obtain subsurface information that will aid in determining if USTs exist within the designated limits of each survey area.

## FIELD INVESTIGATION

### Equipment

Our approach in both areas was to use the vertical magnetic gradient (VMG), electromagnetic line locating/metal detection (EMLL), and ground penetrating radar (GPR) methods. The VMG method was used to identify the location of buried ferrous metal that may indicate the presence of a UST.

The EMLL method was used to detect shallow subsurface metal objects such as USTs, utilities, and/or shallow metal debris. The GPR method was used to provide images that represent variations in the electrical properties of the shallow subsurface. Depending upon reflection characteristics, these images may indicate possible locations and dimensions of USTs, buried objects, and fill boundaries. Descriptions of the VMG, EMLL, and GPR methods are provided in Appendix A.

**Geophysical Surveys**

Prior to proceeding with the geophysical investigation, we established a survey grid at both areas based on a rectangular coordinate system, to provide horizontal control. The limits of each respective survey area are shown on Plate 1.

At Area 1, VMG data were collected at five foot intervals (stations) along south-north trending traverses spaced five feet apart. Magnetic interference from the steel rails and isolated rebar in the concrete precluded use of the VMG over the concrete foundations. At Area 2, VMG data were collected at five foot intervals (stations) along south-north trending traverses spaced five feet apart over the entire survey area.

Following data acquisition, we transferred the VMG data to a personal computer and created Area 1 and Area 2 VMG contour maps. These maps were analyzed to identify anomalies that may represent potential UST locations. Where possible, we then obtained GPR data over these anomalies along west-east and/or south-north trending traverses. In Area 1, vegetation and concrete structures precluded the use of GPR over most of the east half. In Area 2, GPR could not be used because of mud and numerous puddles of standing water. The GPR records were examined for reflection patterns characteristic of USTs and other buried debris. The EMLL equipment was subsequently operated over each VMG anomaly, and over the remaining survey areas.

## RESULTS

The results of the geophysical investigation at Areas 1 and 2 are presented on the Geophysical Survey Map, Plate 1. This map shows the limits of each survey area, site features, and the locations of detected subsurface features and utility alignments. Since a utility search was not the primary objective of this survey, there may be additional utilities that are not shown. Also shown on this map are the respective VMG contour maps. The contour maps represent the variations in the vertical magnetic gradient both areas.

**Area 1**

The VMG Contour Map of Area 1 (Plate 1) indicates a highly variable magnetic gradient throughout the south-central portion and the northwest corner. Some of these contour closures represent effects from the rebar and anchor bolts in the concrete foundations. However, most can not be attributed to known above/below ground features. Therefore, we refer to these as Anomalies A and B on Plate 1.

Anomaly A is characterized by multiple circular contours that extend out of the survey area and are typical of small USTs or similarly sized metal objects (see Appendix A). Over this anomaly, the EMLL defined the location of a near surface buried metal object. The response over this object is consistent with effects typically associated with a small UST. The GPR defined hyperbolic reflection patterns typical of a small UST that measures approximately 4 by 11 feet. It is buried at a depth of approximately 3 to 4 feet and has an approximate volume (based on the above dimensions) of 1,000 gallons.

Anomaly B represents an accumulation of numerous small contour closures that cover most of the south half of the survey area. Large groups of multiple contour closures such as these are indicative of accumulations of smaller isolated metal objects, utilities, and/or reinforced concrete debris. Over this anomaly, we detected portions of two truncated utility alignments using the EMLL. The EMLL did not detect any other near surface metal objects within this area. Therefore, the source of these multiple closures (Anomaly B) is probably buried deeper than the detection capabilities of the EMLL, or too small to detect, such as isolated anchor bolts and/or isolated rebar in the concrete. Since this group of closures is in line with and extends south of the concrete curbs and building foundation, it is possible that these closures may represent additional curbing and concrete structures that are buried or covered with vegetation.

Over the remaining survey area (northeast corner), the EMLL technique did not define additional buried near surface metal. However, while investigating Anomaly A, a small buried metal object, measuring approximately 5 by 4 feet, was detected outside of the survey limits approximately 12 feet to the west. The response from this object was typical of a small UST or similarly sized object. However, GPR data obtained over this object defined relatively flat continuous reflections that suggest a vault or other buried debris. The GPR did not define reflections indicative of a UST.

**Area 2**

In Area 2, a reconnaissance scan was performed using the EMLL equipment. The results of this survey defined the location of three undifferentiated utility lines, as shown on Plate 1, that each trend in a southeast to northwest direction.

The VMG Contour Map of Area 2 (Plate 1) indicates a magnetic gradient that is manifested by isolated contour closures scattered throughout the area. Some of these closures represent effects from the detected utility alignments. Others exhibit an aerial extent and magnitude that are indicative of very small, isolated metal. There is only one anomaly evident that may represent effects from a small UST. It is located in the northwest corner and is referred to as Anomaly C. The EMLL did not detect any near surface metal at this location. Therefore, the source of Anomaly C is probably buried deeper than the detection capabilities of the EMLL. GPR could not be used over this anomaly because the northwest corner was covered by a large puddle of standing water. Since the source of this anomaly could not be determined by the GPR and EMLL equipment, further investigations by invasive techniques should be considered.

## LIMITATIONS

In general, there are limitations unique to the geophysical methods used for this investigation. For example, USTs may be buried deeper than the detection capabilities of the geophysical method. There may be a lack of contrast in physical properties between native soils and buried objects. Above or below ground cultural features, such as utilities, and debris, may cause interference that limits or masks the detection of a nearby buried UST. Since the accuracy of our findings is subject to these limitations, it should be noted that not all USTs and buried objects or features can be detected or characterized by the geophysical techniques used for this investigation.

## STANDARD CARE AND WARRANTY

The scope of NORCAL's services for this project consisted of using geophysical methods to characterize the shallow subsurface. The accuracy of our findings is subject to specific site conditions and limitations inherent to the techniques used. We performed our services in a manner consistent with the standard of care ordinarily exercised by members of the profession currently employing similar methods. No warranty, with respect to the performance of services or products delivered under this agreement, expressed or implied, is made by NORCAL.

Respectfully,

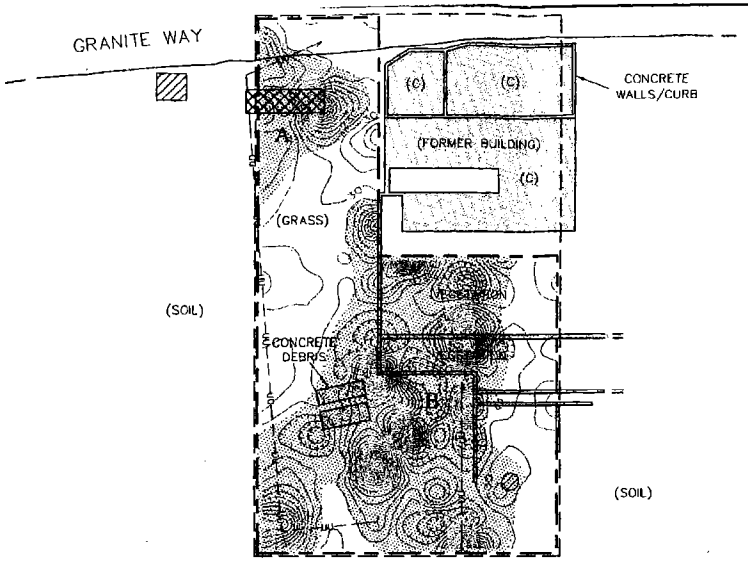
NORCAL Geophysical Consultants, Inc.

Donald J. Kirker

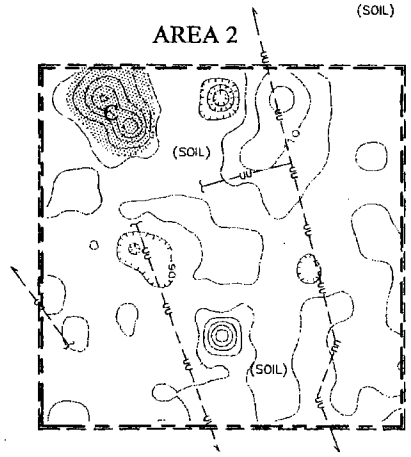
Donald J. Kirker
Geophysicist, GP-997

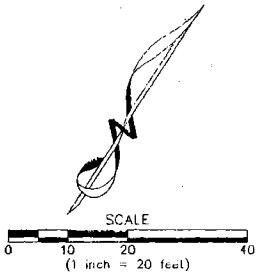
DJK/tt

Enclosure: Plate 1
Appendix A GEOPHYSICAL METHODS




AREA 1




| LEGEND | |
|---|---|
| — — — | DESIGNATED LIMITS OF GEOPHYSICAL SURVEY AREA |
| — — — | LIMITS OF VERTICAL MAGNETIC GRADIENT SURVEY AREA |
| | VERTICAL MAGNETIC GRADIENT CONTOUR (CONTOUR INTERVAL = 100 nT/m) |
| | MD (METAL DETECTION) ANOMALY REPRESENTING BURIED METAL |
| | POSSIBLE UST BASED ON MD AND GPR METHODS |
| A | VERTICAL MAGNETIC GRADIENT ANOMALY |
| — —UU— — | UNDIFFERENTIATED UTILITY LINE |
| (C) | CONCRETE |

NORCAL

# GEOPHYSICAL SURVEY MAP VACANT LOT

LOCATION: APTOS, CALIFORNIA

CLIENT: CERES

PLATE 1

JOB #: 07-445.06

NORCAL GEOPHYSICAL CONSULTANTS INC.

DATE: JAN. 2007

DRAWN BY: G.RANDALL

APPROVED BY: DJK

# Appendix A

# GEOPHYSICAL METHODOLOGY

## Appendix A

## ELECTROMAGNETIC LINE LOCATION/METAL DETECTION (EMLL/MD)

### Methodology

Electromagnetic line location techniques (EMLL) are used to locate the magnetic field resulting from an electric current flowing on a line. These magnetic fields can arise from currents already on the line (passive) or currents applied to a line with a transmitter (active). The most common passive signals are generated by live electric lines and re-radiated radio signals. Active signals can be introduced by connecting the transmitter to the line at accessible locations or by induction.

The detection of underground utilities is affected by the composition and construction of the line in question. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless the utilities carry a passive current, they must be exposed at the surface or in accessible utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that are not detectable using standard electromagnetic line location techniques include those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and pipes with insulated connections.

Buried objects can also be detected, without direct contact, by using the metal detection technique (MD). This is used to detect buried near surface metal objects such as rebar, manhole covers, USTs, and various metallic debris. The MD transmitter-receiver unit is held above the ground and continuously scanned over the surface. The unit utilizes two orthogonal coils that are separated by a specified distance. One of the coils transmits an electromagnetic signal (primary magnetic field) which in turn produces a secondary magnetic field about the subsurface metal object. Since the receiver coil is orthogonal to the transmitter coil, it is unaffected by the primary field. Therefore, the secondary magnetic fields produced by buried metal object will generate an audible response from the unit. The peak of this response indicates when the unit is directly over the metal object.

The instrumentation we used for the EMLL and MD survey consists of a Radio Detection RD-400 and a Fisher TW-6 inductive pipe and cable locator.

### Data Analysis

The EMLL/MD instrumentation indicates the presence of buried metal by emitting an audible tone; there are no recorded data to analyze. Therefore, the locations of buried objects detected with these methods are marked on the ground surface during the survey.

## Limitations

The detection of underground utilities is dependent upon the composition and construction of the line of interest, as well as depth. Utilities detectable with standard line location techniques include any continuously connected metal pipes, cables/wires or utilities with tracer wires. Unless carrying a passive current these utilities must be exposed at the surface or accessible in an utility vaults. These generally include water, electric, natural gas, telephone, and other conduits related to facility operations. Utilities that may not be detectable using standard electromagnetic line location techniques include certain abandoned utilities, utilities not exposed at the ground surface, or those made of non-electrically conductive materials such as PVC, fiberglass, vitrified clay, and metal pipes with insulating joints. Pipes generally deeper than about five to seven feet may not be detected.

## GROUND PENETRATING RADAR (GPR)

### Methodology

Ground penetrating radar is a method that provides a continuous, high resolution cross-section depicting variations in the electrical properties of the shallow subsurface. The method is particularly sensitive to variations in electrical conductivity and electrical permittivity (the ability of a material to hold a charge when an electrical field is applied).

The GPR system operates by radiating electromagnetic pulses into the ground from a transducer (antenna) as it is moved along a traverse. Since most earth materials are transparent to electromagnetic energy, the signal spreads downward into the subsurface. However, when the signal encounters a variation in electrical permittivity, a portion of the electromagnetic energy is reflected back to the surface. When the signal encounters a metal object, all of the incident energy is reflected. The reflected signals are received by the same transducer and are printed in cross-section form on a graphical recorder. Changes in subsurface reflection character on the GPR records can provide information regarding the location of USTs, sumps, buried debris, underground utilities, and variations in the shallow stratigraphy.

The GPR system used was a Geophysical Survey Systems, Inc. SIR-2 Subsurface Interface Radar Systems equipped with a 500 megahertz (MHz) transducer. This transducer is near the center of the available frequency range and is used to provide high resolution at shallow depths.

### Data Analysis

GPR records are examined to identify reflection patterns characteristic of USTs, utilities, and other buried debris. Typically, USTs are manifested by broad localized hyperbolic (upside-down "U" shape) reflection patterns that vary in intensity. The intensity of a reflection pattern is usually dependent upon the condition of the respective UST, its burial depth, and the type of fill over the UST. Utilities and other buried debris are typically manifested by narrow localized hyperbolic reflections that also vary in intensity.

### Limitations

The ability to detect subsurface targets is dependent on site specific conditions. These conditions include depth of burial, the size or diameter of the target, the condition of the specific target in question, the type of backfill material associated with the target, and the surface conditions over the target. Under ideal conditions, the GPR can generally detect objects buried to approximately six feet. However, as the clay content in the subsurface increases, the GPR depth of detection decreases. Therefore, it is possible that on-site soil conditions and target features may limit the depth of detection to the upper one to two feet below ground surface.

# Attachment 8

# PHASE I ENVIRONMENTAL SITE ASSESSMENT

*Subject Property Address*

**APN 041-011-03**

**Aptos, CA**

*Odic Project Number*

**6350988ESAI**

*Report Date*

**8/31/2011**

*Prepared for*

**Jesse Nickell**
**Barry Swenson Builder**

**2400 Chanticleer Avenue, Suite H**

**Santa Cruz, CA 95060**

**Odic Environmental**

*Environmental Consulting and Real Estate Due Diligence*
*3255 Wilshire Blvd. Suite 1510, Los Angeles, CA 90010*
*888.634.2368, 888.ODICENV, Fax 213-380-0505*

**Odic Environmental**

***Environmental Consulting and Real Estate Due Diligence***

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*888.634.2368, 888.ODICENV, Fax 213-380-0505*

8/31/2011

Jesse Nickell

Barry Swenson Builder

2400 Chanticleer Avenue, Suite H

Santa Cruz, CA 95060

Phone: 831-475-7100

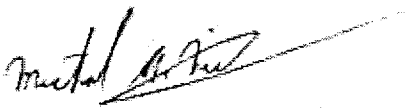
Fax: 831-475-4544

Attached please find our PHASE I ENVIRONMENTAL SITE ASSESSMENT, ("the Report") for the above-mentioned Subject Property. This report has been prepared by Odic for the Client under the professional supervision of the principal and/or senior staff whose seal(s) and signatures appear hereon. Neither Odic, nor any staff member assigned to this investigation has any interest or contemplated interest, financial or otherwise, in the subject or surrounding properties, or in any entity which owns, leases, or occupies the subject or surrounding properties , and has no personal bias with respect to the parties involved.

The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The Report speaks only as of its date, in the absence of a specific written update of the Report, signed and delivered by Odic.

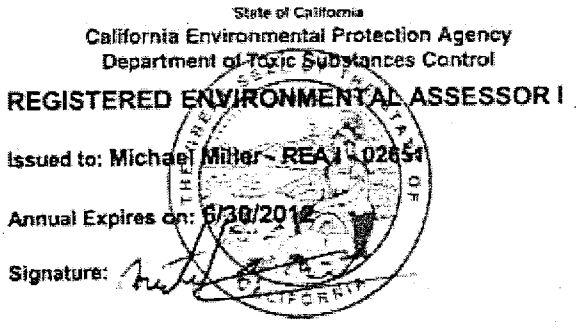
There are no intended or unintended third party beneficiaries to this Report, unless specifically named. Odic is an independent contractor, not an employee of either the issuer or the borrower, and its compensation was not based on the findings or recommendations made in the Report or on the closing of any business transaction. Thank you for the opportunity to prepare this Report, and assist you with this project. Please call us if you have any questions or if we may be of further assistance.

Respectfully Submitted,



Mike Miller

Environmental Consultant, M.S., REA 02651



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**APPENDIX F –QUALIFICATION OF ENVIRONMENTAL PROFESSIONAL / LIABILITY INSURANCE**

## EXECUTIVE SUMMARY

ODIC Environmental (ODIC) performed a Phase I Environmental Site Assessment of the Subject Property in conformance with the scope and limitations of ASTM Practice E1527-05. Any exceptions to, or deletions from, this practice are described in Section 1.0 of this Report.

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Subject Property Characteristics**<br><br>**(Current Tenant and Site Description)** | The subject property address is 448 Granite Way, Aptos, California 95003. The Assessor's Parcel Number is 041-011-03. The property is located on the southwestern corner of the intersection of Granite Way and Cathedral Drive. Based on Santa Cruz County Assessor records, the property has 355.48 feet of frontage along Granite Way and 132.60 feet of frontage along Cathedral Drive. The subject site consists of an irregularly shaped parcel of land comprising 1.09 acres, and is improved with a rectangular-shaped metal-sided warehouse building near the southwestern boundary. A gravel-paved outdoor storage yard and parking area is northeast of the building. A bicycle motocross park, including dirt jumps and berms, comprises roughly the northeastern half of the property. Fencing encloses the warehouse building and storage area. The building is currently occupied by Jay Howe Masonry, which utilizes the warehouse for the storage of tools, equipment and materials associated with its business (concrete block building construction). No manufacturing is conducted by Jay Howe Masonry. |
| **Summary of Property Reconnaissance** | Small containers (mostly 1-gallon and less) of paints, oils, fuel, bonders and other materials were observed on shelves and on the floor inside the warehouse building. No spills or leaks were observed associated with any of these containers.<br><br>Located just beyond the extreme southwestern boundary of the site, and partially on the subject property, ODIC observed the outline of what appeared to be a former concrete sump. The location and shape of the sump matches a feature shown in historical Sanborn fire insurance maps (see Section 4.3) which is labeled "concrete oil tank in ground." See Section 7.0, Recommendations and Opinions. |

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Historical Use of Subject Property and Vicinity** | Summary of Historical Property Use:<br><br>Based on review of historical topographical maps, aerial photographs and Sanborn fire insurance maps, the subject property was part of the Aptos Milling Company site in the late 1800s. Developments during that time included two railroad spurs traversing the site from southwest to northeast. Stacks of lumber were present on the site. By the 1920s, Aptos Milling Company appeared to have vacated the property and surrounding properties. In historical Sanborn maps from 1926 to 1929, a warehouse building or other storage enclosure used to store concrete was present on the southwestern portion of the site. Also, in 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was drawn on the western portion of the site. A sand and rock conveyor was located on the eastern area of the site. These developments, together with a water pipeline and two hydrants along the southern boundary suggest a use of concrete manufacturing. They continued to be observed on the subject property in historical aerial photographs through the 1950s. Historical building department records showed the site was owned by Granite Rock Company and improved with a warehouse building in the 1980s. The building was apparently rented out by Granite and was used for the storage of boxes and hardware associated with a furniture business (possibly a historical antique store on the south-adjacent property). The use of the onsite building possibly included both storage of boxes, hardware, and pottery by 1982. Redevelopment of the property with mixed-use commercial and residential buildings was proposed in 1990, but did not occur. The subject property address was listed in historical city directories as John's Antiques and Lilly Wallace Antiques in 2008.<br><br>Summary of Vicinity Use:<br><br>The subject property vicinity was developed with the Aptos Milling Company (lumber milling) in the late 1880s. Railroad spurs and stacks of lumber were observed on adjacent properties toward the south and southwest in historical Sanborn fire insurance maps during this era. From the 1920s through the 1950s, these adjoining properties were developed with warehouses and other buildings used for fruit packing. Some of these buildings remain today and are used for commercial purposes, including the retail sales of antique furniture (southern adjacent property). Northern adjoining and surrounding properties were industrial-developed in the 1930s. They became residential-developed in the 1950s. |
| **Federal, State and Local Agency Concerns** | The subject property address of 448 Granite Way, Aptos, CA is not listed on any state or federal environmental databases.<br><br>The Santa Cruz County Environmental Health Department is the local regulatory agency for hazardous materials, industrial wastes and underground storage tanks. A search of the SCDEH files revealed that no records exist for the property address of 448 Granite Way, Aptos, California. |
| **Potential Off-site Sources** | No RECs (Recognized Environmental Conditions) were identified. |
| **Non-CERCLA Items** | No concerns were identified for non-CERCLA items. However, unless *Client* contracted ODIC to investigate specific non-CERCLA items, these items were generally not included in the scope of services for this Phase I Environmental Site Assessment. |
| **Inaccessible or Un-surveyed Portions of Subject Property** | Full access to the entire property was provided to ODIC, and there were no notable portions of the Subject Property excluded from the survey and field inspection. |

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Data Gap** | In 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was located just beyond the extreme southwestern boundary and partially on the subject site. ODIC searched files at the Santa Cruz County Department of Environmental Health, the local regulatory agency for underground storage tanks. No records were found indicating that the former oil UST was removed from the subject property or that any soil sampling has been conducted in this area to determine whether or not the subsurface environment has been impacted by a potential releases from the UST. The absence of such documentation represents a significant data gap and is assessed to represent a Recognized Environmental Condition (REC) pursuant to ASTM Practice E1527-05. |

## 1.0 SCOPE OF WORK & LIMITATIONS

The primary purpose of this *Phase I Environmental Site Assessment Report* (the *Report*) is to assist *Client,* in its underwriting of a proposed mortgage loan on the Subject Property, and to identify *Recognized Environmental Conditions (RECs)* in connection with the Subject Property described in this *Report.* The investigation was conducted in accordance with the *Client's* Environmental Site Assessment scope of work for the use and benefit of the *Client*, its successors, and assignees and the U.S. Small Business Administration (U.S. SBA) if financing is to be authorized by U.S. SBA. It is based, in part, upon documents, writings, and information owned, possessed, or secured by the *Client.* Neither this report, nor any information contained herein, shall be used or relied upon for any purpose by any other person or entity without the express written permission of the *Client.*

This report has been prepared by ODIC Environmental (ODIC) for the *Client* under the professional supervision of the principal and/or senior staff whose seal(s) and signature(s) appear hereon. Neither ODIC, nor any staff member assigned to this investigation has any interest or contemplated interest, financial or otherwise, in the subject or surrounding properties, or in any entity which owns, leases, or occupies the subject or surrounding properties or which may be responsible for environmental issues identified during the course of this investigation, and has no personal bias with respect to the parties involved.

The purpose of this practice is to define good commercial and customary practice for conducting an *environmental site assessment* of a parcel(s) of *commercial real estate* with respect to the range of contaminants within the scope of Comprehensive Environmental Response, Compensation and Liability Act (CERCLA) (42 U.S.C. §9601) and *petroleum products*. As such, this practice is intended to permit a *user (Client, Purchaser, Lender, Owner)* to satisfy one of the requirements to qualify for the *innocent landowner*, *contiguous property owner*, or *bona fide prospective purchaser* limitations on CERCLA liability (hereinafter, the "*landowner liability protections*," or "*LLPs*"): that is, the practice that constitutes "*all appropriate inquiry* into the previous ownership and uses of the *property* consistent with good commercial or customary practice" as defined at 42 U.S.C. §9601(35)(B).

Controlled substances are not included within the scope of this standard. Persons conducting an *environmental site assessment* as part of an EPA Brownfields Assessment and Characterization Grant awarded under CERCLA 42 U.S.C. §9604(k)(2)(B) must include controlled substances as defined in the Controlled Substances Act (21 U.S.C. §802) within the scope of the assessment investigations to the extent directed in the terms and conditions of the specific grant or cooperative agreement. Additionally, an evaluation of *business environmental risk* associated with a parcel of *commercial real estate* may necessitate investigation beyond that identified in this practice.

In defining a standard of good commercial and customary practice for conducting an *environmental site assessment* of a parcel of *property*, the goal of the processes established by this practice is to identify *recognized environmental conditions (RECs)*. The term *recognized environmental conditions (RECs)* means the presence or likely presence of any *hazardous substances* or *petroleum products* on a *property* under conditions that indicate an existing release, a past release, or a material threat of a release of any *hazardous substances* or *petroleum products* into structures on the *property* or into the ground, groundwater, or surface water of the *property*. The term includes *hazardous substances* or *petroleum products* even under conditions in compliance with laws. The term is not intended to include *de minimis* conditions that generally do not present a material risk of harm to public health or the environment and that generally would not be the subject of an enforcement action if brought to the attention of appropriate governmental agencies. Conditions determined to be *de minimis* are not *RECs*.

ODIC has performed this *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Practice E1527-05.

SCOPE OF WORK

This *Report* was prepared for the exclusive use of *Client.* This *Report* has been prepared in accordance with our *Standard Conditions For Engagement* and *Authorization Letter* and *Agreement for Environmental Services* approved and signed by *Client*, and with the limitations described below, all of which are integral parts of this *Report.* A copy of the signed *Standard Conditions For Engagement* and *Authorization Letter* and *Agreement for Environmental Services* is maintained at the ODIC Environmental, Los Angeles, California office.

The information reported was obtained through sources deemed reasonably ascertainable, as defined in ASTM E1527-05; a visual site survey of areas readily observable, easily accessible or made accessible by the property contact and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property. Municipal information was obtained through file reviews of reasonably ascertainable standard government record sources, and interviews with the authorities having jurisdiction over the *property*. Findings, conclusions and recommendations included in the *Report* are based on our visual observations in the field, the municipal information reasonably obtained, information provided by the *Client*, and/or a review of readily available and supplied documents.

ODIC renders no opinion as to the *property* condition at un-surveyed and/or inaccessible portions of the Subject Property, which are described below. ODIC relies completely on the information, whether written, graphic or verbal, provided by the property contact or as shown on any documents reviewed or received from the property contact, owner or agent, or municipal source, and assumes that information to be true and correct. The observations in this *Report* are valid on the date of the survey. Where access to portions of the Subject Property or to structures on the Subject Property was unavailable or limited, ODIC renders no opinion as to the presence of petroleum products or hazardous substances in that portion of the Subject Property or structure. In addition, ODIC renders no opinion as to the presence of, or indirect evidence relating to, petroleum products or hazardous substances where direct observation of the interior walls, floor, or ceiling of a structure was obstructed by objects or coverings on or over these surfaces.

The conclusions provided by ODIC are based on the information obtained by visual survey of the Subject Property, and information provided by agents representing the Subject Property, or agents of the owner. In addition, ODIC has relied on certain information provided by state and other referenced parties, and on information contained in the files of federal, state and/or local agencies available to ODIC at the time of the assessment. Although there may have been some degree of overlap in the information provided by these various sources, ODIC did not attempt to independently verify the accuracy or completeness of all information reviewed or received during the course of these *Environmental Services*.

CERCLA Requirements Other Than *All Appropriate Inquiry* (ASTM E1527-05 1.1.3) - This practice does not address whether requirements in addition to *All Appropriate Inquiries* have been met in order to qualify for the *LLPs* (specified in 42 U.S.C. §9607(b)(3)(a) and (b) including the continuing obligation not to impede the integrity and effectiveness of *Activity and Use Limitations*), or the duty to take reasonable steps to prevent releases, or the duty to comply with legally required release reporting obligations).

It is acknowledged that ODIC's judgments shall not be based on scientific or technical tests or procedures beyond the Scope of Services or beyond the time and budgetary constraints imposed by the *Client*. It is acknowledged further that ODIC's conclusions shall not rest on pure science but on such considerations as economic feasibility and available alternatives. *Client* also acknowledges that, because geologic and soil formations are inherently random, variable, and indeterminate in nature, the Services and opinions provided under this Agreement with respect to such Services, are not guaranteed to be a representation of actual conditions on the Subject Property, which are also subject to change with time as a result of natural or man-made processes, including water permeation. In performing the Services, ODIC shall use that degree of care and skill ordinarily exercised by environmental consultants or engineers performing similar services in the same or similar locality. The standard of care shall be determined solely at the time the Services are rendered and not according to standards utilized at a later date. The Services shall be rendered without any other warranty, expressed or implied, including, without limitation, the warranty of merchantability and the warranty of fitness for a particular purpose.

The ASTM Standard E1527-05 does not encompass analytical testing to evaluate Asbestos Containing Materials (ACM), radon, lead-based paint (LBP), drinking water quality, lead in drinking water, wetlands, regulatory compliance, cultural and historical resources, industrial hygiene, health and safety, ecological resources, endangered species, indoor air quality, biological agents, mold, stored chemicals, debris, fill materials, surface water, or subsurface samples (soil and groundwater) as part of a Phase I ESA. Such additional information regarding non-ASTM E1527-05 issues may be provided merely for the *User's* convenience, and cannot be used to bind this report as a whole to the compliance and conformance with ASTM guidelines. No disassembly of systems or building components or physical or invasive testing is to be performed unless Contract Engagement specifically calls for such testing as an additional scope of work. ODIC has performed this *Phase I Environmental Site Assessment* in conformance with the scope and limitations of ASTM Practice E1527-05. This *Report* may not include all

environmental conditions which can materially impact the Subject Property other than those defined as RECs in ASTM E1527-05.

As our standard procedure and scope of work defined by ASTM E1527-05, ODIC is not contracted to perform *Environmental Liens* and *Activity and Use Limitations (AULs)* searches via title records, and such is beyond the scope of services included in this report.

This *Phase I Environmental Site Assessment* did not necessarily comply with the ASTM "Standard Practice for Assessment of Vapor Intrusion into Structures on Property" (Standard Practice E 2600 - 08). For assessment of potential vapor intrusion in the subject building(s) and to determine if a "vapor intrusion condition" (VIC) exists on-site, additional investigation beyond ASTM E1527-05 is required.

Business Environmental Risk is defined as a risk, which can have material environmental impact, or environmentally driven impact on the business associated with the current or planned use of a parcel of commercial real estate, not necessarily limited to the issues requiring investigation. Activity and Use Restrictions arising from Business Environmental Risk or Compliance Violation are defined as restrictions on the use of, or access to, a site/facility to (1) reduce or eliminate exposure to hazardous substance onsite, or (2) prevent activities that could interfere with a response action either as Engineering Controls or Institutional Controls. Evaluation of Business Environmental Risks was not within the scope of services included in this report.

The assessment was conducted in a manner consistent with the level of care and skill ordinarily exercised by members of the profession, and in accordance with generally accepted practices of other consultants currently practicing in the same locality under similar conditions. No other representation, expressed or implied, and no warranty or guarantee is included or intended. The *Report* speaks only as of its date, in the absence of a specific written update of the *Report*, signed and delivered by ODIC.

Additional information that becomes available after our survey and report submission concerning the Subject Property should be provided to ODIC so that our conclusions may be revised and modified if necessary, at additional cost. This *Report* has been prepared in accordance with our *Standard Conditions for Engagement*, which is an integral part of this *Report.*

Adjoining sites, neighboring sites or surrounding properties mentioned in this *Report* are defined only up to one parcel immediately next to the Subject Property, and ODIC will only check immediately adjoining properties to identify historical use of the surrounding areas via historical sources or data on such adjoining properties, and/or walk-through visual inspection along Subject Property's perimeters to identify obvious signs of environmental concerns.

It is often not possible (under "*reasonably ascertainable*" clause of ASTM guideline) to identify every single historical business tenants or occupants of the Subject Property. ODIC cannot be liable for not identifying all such past tenants or occupants of the project site.

INDEPENDENT CONTRACTOR STATUS / PROFESSIONAL RESPONSIBILITY

In performing Services under the mutually agreed contractual agreement and verbal engagement, ODIC operates as, and has the status of, an independent contractor. Subject to any limitations established by the *Client* as to the degree of care and amount of time and expenses to be incurred and any other limitations contained in the mutually agreed contractual agreement and verbal engagement, ODIC performs the Services consistent with that level of care and skill ordinarily exercised by other professional consultants under similar circumstances at the time the Services are performed. *Client* hereby acknowledges that whenever a Project involves hazardous or toxic materials there are certain inherent risk factors involved (such as limitations on laboratory analytical methods, variations in subsurface conditions, economic loss to *Client* or property owner, a potential obligation for disclosure to regulatory agencies, a potential for a decrease in market value of real property, and the like) that may adversely affect the results of the Project, even though the Services are performed with such skill and care. No other representation, warranty, or guarantee, express or implied, is included or intended by the mutually agreed contractual agreement and verbal engagement.

## QUALIFICATION STATEMENT OF ENVIRONMENTAL PROFESSIONAL

ODIC states that this *Phase I Environmental Site Assessment* was performed under *Environmental Professional (EP)'s* direct supervision, that he/she has prepared and/or reviewed and approved the report, and that the methods and procedures utilized in the development of this report conform to minimum industry standards using both the American Society for Testing Methods (ASTM) Standard E1527-05 and the United States – Environmental Protection Agency Standards and Practices for All Appropriate Inquiries (40 CFR Part 312) as guidelines. ODIC certifies that ODIC's *Environmental Professionals* and Subcontractors are properly licensed and/or certified to conduct *Phase I Environmental Site Assessments*.

ODIC's EP declares that, to the best of his/her professional knowledge and belief, he/she meets the definition of *Environmental Professional* as defined in 40 CFR Part 312. ODIC's EP who prepared this assessment possesses the specific qualifications based upon education, training and experience to assess a property of the nature, history, and setting of the subject Property. ODIC has developed and performed the "*All Appropriate Inquiries*" in accordance with the standards and practices as defined in 40 CFR Part 312.

ABBREVIATIONS:

ODIC may use various abbreviations to describe various site, building, or system components or legal descriptions. Not all abbreviations may be applicable to all reports. Abbreviations most often used are defined below.

| | |
|---|---|
| AAI | All Appropriate Inquiries |
| ACM | Asbestos-Containing Material |
| ACT | Acoustic Ceiling Tile |
| ADA | Americans with Disabilities Act |
| AHERA | Asbestos Hazard Emergency Response Act |
| AHU | Air Handling Unit |
| AMSL | Above Mean Sea Level |
| APA | American Plywood Association |
| APCD | Air Pollution Control District |
| AQMD | Air Quality Management District |
| AS | Air Sparging |
| AST | Aboveground Storage Tank |
| ASTM | American Society for Testing and Materials |
| AUL | Activity and Use Limitation |
| bgs | Below Ground Surface |
| BOD | Biochemical (or Biological) Oxygen Demand |
| BTEX | Benzene-Toluene-Ethylbenzene-Xylene |
| BTU | British Thermal Unit (a measurement of heat) |
| BTUH | British Thermal Units per Hour |
| CERCLA | Comprehensive Environmental Response Compensation and Liability Act |
| CESQG | Conditionally Exempt Small Quantity Generator |
| CFR | Code of Federal Regulations |
| CMU | Concrete Masonry Unit |
| COCs | Chemicals of Concern |
| DEP | Department for Environmental Protection |
| DEQ | Department of Environmental Quality |
| DOE | Department of Ecology (WA) |
| DOT | Department of Transportation |
| DTSC | Department of Toxic Substances Control (CA) |
| EIFS | Exterior Insulating Finishing System |
| EP | Environmental Professional |
| EPA | Environmental Protection Agency |
| EPDM | Ethylene Propylene Diene Monomer (rubber membrane roof) |
| ESA | Environmental Site Assessment |
| EUL | Expected Useful Life, Effective Useful Life |
| MCL | Maximum Contaminant Level |
| MDP | Main Distribution Panel |
| mg/L | Milligrams per Liter |
| MSDS | Material Safety Data Sheet |
| MSL | Mean Sea Level |
| MSSL | Maximum Soil Concentration Limit |
| MTBE | Methyl Tertiary Butyl Ether |
| ND | None Detected |
| NFA | No Further Action (letter) |
| NPDES | National Pollutant Discharge Elimination System |
| NPL | National Priorities List |
| O&M | Operations and Maintenance |
| OVA | Organic Vapor Analyzer |
| PCB | Polychlorinated Biphenyl |
| PCE | Perchloroethylene |
| PEC | Potential Environmental Concern |
| PEL | Permissible airborne Exposure Level |
| PERC | Perchloroethylene |
| PID | Photoionization Detector |
| POTW | Publicly Owned Treatment Works |
| Ppb | Parts per Billion |
| Ppm | Parts per Million |
| PRG | Preliminary Remedial Goal |
| PRP | Potentially Responsible Parties |
| PTAC | Packaged Through-wall Air Conditioning (Unit) |
| QAQC | Quality Assurance Quality Control |
| RAP | Remedial Action Plan |
| RCRA | Resource Conservation and Recovery Act |
| REC | Recognized Environmental Condition |
| RI/FS | Remedial Investigation & Feasibility Study |
| RQ | Reportable Quantity |
| RTU | Roof Top Unit |
| RWQCB | Regional Water Quality Control Board (CA) |
| SBA | Small Business Association |
| SPCC | Spill Prevention Control and Countermeasure Plan |
| SQG | Small Quantity Generator (of hazardous wastes) |

| | |
|---|---|
| FCU | Fan Coil Unit |
| FEMA | Federal Emergency Management Agency |
| FHA | Forced Hot Air |
| FHW | Forced Hot Water |
| FID | Flame ionization detector |
| FIRM | Flood Insurance Rate Map |
| FOIA | Freedom Of Information Act |
| FRT | Fire Retardant Treated plywood |
| GC/MS | Gas Chromatography/Mass Spectrometry |
| GFI | Ground Fault Interrupter (circuit) |
| GPR | Ground-Penetrating Radar |
| GWB | Gypsum Wall Board |
| HCP | Handicapped Person |
| HID | High Intensity Discharge (lighting) |
| HMTA | Hazardous Materials Transportation Act |
| HVAC | Heating, Ventilating and Air Conditioning |
| HWH | Hot Water Heater |
| LBP | Lead-Based Paint |
| LDL | Laboratory Detection Limit |
| LEL | Lower Explosive Limit |
| LLP | Landowner Liability Protection |
| LQG | Large Quantity Generator (of hazardous wastes) |
| LUST | Leaking Underground Storage Tank |
| SVE | Soil Vapor Extraction |
| SVOC | Semi-Volatile Organic Compound |
| SWPPP | Storm Water Pollution Prevention Plan |
| SWRCB | State Water Resource Control Board (CA) |
| TAT | Turn-around time |
| TCE | Trichloroethylene |
| TCEQ | Texas Commission of Environmental Quality (TX) |
| TCLP | Toxicity Characteristic Leaching Procedure |
| TOC | Total Organic Carbon |
| TPH | Total Petroleum Hydrocarbons<br>Note: TPHg = TPH as gasoline.<br>TPHd = TPH as diesel fuel |
| TSA | Transaction Screen Assessment |
| UBC | Uniform Building Code |
| UEL | Upper Explosive Limit |
| ug/L | Micrograms per Liter |
| USGS | United States Geological Survey |
| UST | Underground Storage Tank |
| VAV | Variable Air Volume box |
| VCT | Vinyl Composition Tile |
| VOC | Volatile Organic Compound |
| VWC | Vinyl Wall Covering |

## 2.0 SUBJECT PROPERTY CHARACTERISTICS

### *2.1 PROJECT INFORMATION & PROPERTY LOCATION*

| Project Information | |
|---|---|
| **ITEM** | |
| ODIC Project Number | 6350988-ESAI |
| Client Project Number | N/A |
| Subject Property Address | 448 Granite Way, Aptos, Santa Cruz County, California 95003<br>APN #: 041-011-03 |
| Subject Property Name | N/A |
| Property Inspection Date | August 30, 2011 |
| Weather Condition | Foggy, approximately 60 degrees F |
| ODIC's Field Assessor | Jason Smith, Environmental Consultant |
| ODIC's Environmental Consultant / QAQC Reviewer | Michael A. Miller, Senior Reviewer, M.S., REA |
| Property Location | The property is located on the southwestern corner of the intersection of Granite Way and Cathedral Drive in Aptos, California. Based on Santa Cruz County Assessor records, the property has 355.48 feet of frontage along Granite Way and 132.60 feet of frontage along Cathedral Drive. |
| General Setting | Mixed commercial and residential |
| Property Type | Commercial |

### *2.2 PROPERTY IMPROVEMENT & BUILDING/LAND DESCRIPTION*

| Property Improvements & Building/Land Description | |
|---|---|
| **ITEM** | |
| Subject Property Description | The subject site consists of an irregularly shaped parcel of land comprising 1.09 acres, and is improved with a rectangular-shaped metal-sided warehouse building near the southwestern boundary. A gravel-paved outdoor storage yard and parking area is northeast of the building. A bicycle motocross park, including dirt jumps and berms, comprises roughly the northeastern half of the property. Fencing encloses the warehouse building and storage area. The building is currently occupied by Jay Howe Masonry, which utilizes the warehouse for the storage of tools, equipment and materials associated with its business (concrete block building construction). No manufacturing is conducted by Jay Howe Masonry. |
| Estimated year of construction | Based on historical Sanborn fire insurance maps, the current warehouse building has been present on the site since sometime between 1908 and 1926. However, portions of the building (corrugated metal siding and interior partition office/warehouse space) appear to have been constructed more recently. |
| Improvement Description | The subject building is wood-framed with corrugated metal siding walls and roof. An interior office/warehouse partition is made of plywood. The floor inside the warehouse is elevated approximately four feet from the ground and constructed of wood planks. |
| Other Improvements & Features including description of Unimproved Areas | The majority of the subject property is devoid of building structures. Concrete and asphalt debris were observed in many of the unimproved areas, as were old fence posts and iron piping. See Section 3.3 for more information. |

## *2.3 CURRENT OCCUPANTS & USE OF THE PROPERTY*

| **Current Occupants & Use of the Property** | |
|---|---|
| **ITEM** | |
| Present Occupant | Jay Howe Masonry<br><br>Unnamed bicycle motocross park |
| Business Operation(s) | The subject building is currently occupied by Jay Howe Masonry, which utilizes the warehouse for the storage of tools, equipment and materials associated with the business (concrete block building construction). No manufacturing is conducted by Jay Howe Masonry.<br><br>The bicycle motocross park is utilized for recreation purposes. |
| Number of Occupants/Units | 2 / 1 |

## *2.4 MUNICIPAL SERVICES & UTILITIES*

| **Municipal Services & Utilities** | |
|---|---|
| **ITEM** | |
| Potable Water | Soquel Creek Water District |
| Gas/Oil Source for Heating | PG&E |
| Electrical | PG&E |
| Sewage Disposal System | None |
| Solid Waste Disposal | Local Contractor |

## 3.0 SUBJECT PROPERTY RECONNAISSANCE

### *3.1 LIMITING CONDITIONS*

The information reported herein was obtained through sources deemed reliable, a visual site survey of areas readily observable, easily accessible or made accessible by the property contact, and interviews with owners, agents, occupants, or other appropriate persons involved with the Subject Property.

No disassembly of systems or building components or physical or invasive testing was performed. ODIC renders no opinion as to the property condition at un-surveyed and/or inaccessible portions of the Subject Property. ODIC relies completely on the information, whether written, graphic or verbal, provided by the property contact or as shown on any documents reviewed or received from the property contact, owner or agent, or municipal source, and assumes that information to be true and correct. The observations in this *Report* are valid on the date of the survey. Note: Typically lenders have environmental policies where due diligence reports are valid for one year from the report date. However, such policies and standards can vary from each lender or user. For CERCLA landowner liability protection, Phase I ESA reports are valid for 180 days, per ASTM E1527-05, Section 4.6.

### *3.2 SUBJECT PROPERTY RECONNAISSANCE*

| **Subject Property Reconnaissance** | |
|---|---|
| ITEM | |
| Processes that generate or handle Petroleum Products or Hazardous Substances | None observed |
| Underground Storage Tanks (USTs) | None observed |
| Aboveground Storage Tanks (ASTs) | None observed |
| Fuel Islands / Dispensers | None observed |
| Any type of fueling systems | None observed |
| Containers of Hazardous Materials and/or Petroleum Products related to subject property's operations/processes | Small containers (mostly 1-gallon and less) of paints, oils, fuel, bonders and other materials were observed on shelves and on the floor inside the subject warehouse building. No spills or leaks were observed associated with any of these containers. |
| Other containers of suspect hazardous materials in drums, barrels, or other storage, or unlabeled/unidentified containers on site | None observed |
| Containers not attributed to current use of the Subject Property | None observed |
| Significant surface staining either on unpaved or paved land | No significant staining was observed. Minor staining, ostensibly by oils, was observed on the elevated wooden floor inside the warehouse building. Based on the elevation of the floor surface, these stains are not indicative of environmental concerns at the subject site. |
| Unusual areas of asphalt/cement patch or surface depressions | Located at the extreme southwestern boundary of the site (possibly on the property line), ODIC observed the outline of what appeared to be a former concrete sump. The location and shape of the sump matches a feature shown in historical Sanborn fire insurance maps (see Section 4.3) which is labeled "concrete oil tank in ground." See Section 7.0, Recommendations and Opinions. |
| Stockpiled soils with visual contamination | None observed |

| Subject Property Reconnaissance | |
|---|---|
| ITEM | |
| Fill material of questionable origin / Piles | The northeastern portion of the subject property is currently occupied by a bicycle motocross track, including jumps and berms constructed of soil fill material of an unknown origin. |
| Stressed vegetation | None observed |
| Any type of heavy equipment or machinery of environmental concern on site | The following equipments was observed being stored onsite: cement mixer, mobile generators, forklifts and saws. |
| Hydraulic equipment or machinery of environmental concern (PCB-oil / hydraulic oil) such as hydraulic lifts, compactors, etc. | None observed |
| Drains for machinery/equipment cleaning or flushing | None observed |
| Wastewater treatment units & clarifiers | None observed |
| Evidence of onsite surface water impoundment, pits, dry wells or illegal dumping, stormwater removal and sensitive surface water features such as lagoons, ponds, and other water bodies | None observed |
| Drains and sumps | None observed |
| Any regulated surface wastewater discharges | None observed |
| Storm water or surface-water drainage system having any abnormal accumulation of petroleum or chemical run-off or foreign materials, any unusual blockage of the storm-water control system | None observed |
| Any stained catch basins, drip pads, or sumps | None observed |
| Herbicide and/or & pesticide use which poses environmental concern | None observed |
| Septic systems or cesspools | None observed |
| Wells (any irrigation wells, injection wells, abandoned wells, groundwater-monitoring wells, dry wells, septic wells, oil wells, gas wells, domestic water wells, vapor recovery wells or other-monitoring wells) | None observed |
| Railroad tracks or spurs | None observed |
| Visual evidence of improper handling/disposal or solid wastes | None observed |
| Other visual evidence of spills, leakage, staining, corrosion, soil/groundwater contamination | None observed |
| Dry-cleaning operation on site | None observed |

### *3.3 DETAILED DESCRIPTION OF SITE RECONNAISSANCE AND ENVIRONMENTAL CONDITIONS*

The subject site consists of an irregularly shaped parcel of land comprising 1.09 acres. The property is improved with a rectangular-shaped wood- and metal-framed warehouse building near the southwestern boundary. A gravel outdoor storage yard and parking area is northeast of the building. A bicycle motocross park, including dirt jumps and berms, comprises roughly the northeastern half of the property. Fencing encloses the warehouse building and storage area. The building is currently occupied by Jay Howe Masonry, which utilizes the warehouse for the storage of tools, equipment and materials associated with its business (concrete block building construction). No manufacturing is conducted by Jay Howe Masonry.

Small containers (mostly 1-gallon and less) of paints, oils, fuel, bonders and other materials were observed on shelves and on the floor inside the subject warehouse building. No spills or leaks were observed associated with any of these containers.

Located just beyond the extreme southwestern boundary of the site, and partially on the subject property, ODIC observed the outline of what appeared to be a former concrete sump. The location and shape of the sump matches a feature shown in historical Sanborn fire insurance maps which is labeled "concrete oil tank in ground." See Section 7.0 for recommendations.

The majority of the subject property is devoid of building structures. Concrete and asphalt debris were observed in many of the unimproved areas, as were old fence posts and iron piping. The following equipment was observed stored onsite by Jaw Howe Masonry: cement mixer, mobile generators, forklifts and saws.

The eastern portion of the subject property is currently occupied by a bicycle motocross track, including jumps and berms constructed of soil fill material of an unknown origin.

### *3.4 NON-CERCLA ITEMS*

The following table summarizes non-CERCLA issues for which the survey of interior areas of the Subject Property focused, if requested by the Client as an addition to ODIC's standard Scope of Services. No implication is intended as to the relative importance of inquiry into such non-scope considerations, and this list of non-scope considerations is not intended to be all-inclusive.

| NON-CERCLA ITEMS | |
|---|---|
| **ITEM** | **LOCATION AND DESCRIPTION** |
| Suspect asbestos-containing building materials in damaged condition if the structure is built prior to 1978 | Based on the construction date, asbestos-containing building materials could be present. An asbestos survey was not included in the current scope of services. |
| Suspect lead-based paint in damaged condition if the structure is residential and was built prior to 1978 | Based on the construction date, lead-based paints could be present. A lead survey was not included in the current scope of services. |
| Lead in drinking water | A lead in drinking water survey was not included in the current scope of services. |
| Radon gas concern | A radon survey was not included in the current scope of services.<br><br>Source: http://www.epa.gov/radon/zonemap.html |
| Visual evidence of Urea Formaldehyde | The sale and installation of Urea Formaldehyde Foam Insulation (UFFI) as thermal insulation began in approximately 1970, and continued until December 1980 when it was banned under the federal *Hazardous Products Act*. UFFI was installed in both new and existing buildings during this period. UFFI was not commonly used in industrial or commercial buildings. A UFFI survey was not included in the current scope of services. |
| Suspect PCB-oil concern with hydraulic equipment, ballasts, transformers, etc. | A PCB survey was not included in the current scope of services. |
| Wetland, creeks, swale, pits, ponds, lagoons, or any other water bodies | Not applicable. However, based on a review of the EDR Radius Report, the site is not within a mapped National Wetland Inventory location. A wetlands survey was not included in the current scope of services. |

| NON-CERCLA ITEMS | |
|---|---|
| **ITEM** | **LOCATION AND DESCRIPTION** |
| Visual evidence of mold problems from wet areas, roof leaks, moisture around air conditioning or plumbing units | A mold survey was not included in the current scope of services. |
| Air quality problems (unusual smells, noxious odors, or visual emissions, air emission stacks) | Not applicable. None observed. |
| Is the property within a flood zone (Federal Emergency Management Agency Flood Insurance Rate Map) | Not applicable. However, based on a review of a flood zone map contained in an EDR Radius Map Report, the subject property is not within a 100-year or 500-year flood zone. |
| Regulatory compliance,<br>Cultural and historical resources,<br>Industrial hygiene,<br>Health and safety,<br>Ecological resources,<br>Endangered species,<br>Business Environmental Risk | These items were not included in the current scope of services. |

## *3.5 ADJACENT PROPERTIES*

*For the scope of this assessment, properties are defined and categorized based upon their physical proximity to the Subject Property. An adjoining property is any real estate property whose border is contiguous or partially contiguous with the subject property, or that would be if the property was not separated by a roadway, street, public thoroughfare, river, or stream.*

| Adjacent Properties | |
|---|---|
| **ITEM** | |
| North | Residential dwellings at 445, 449 and 453 Granite Way |
| South | Village Fair Antiques at 417 Trout Gulch Road |
| West | Vacant land and residential dwellings |
| East | United States Postal Service office at 500 Cathedral Drive |

## *3.6 PHYSICAL SETTING*

TOPOGRAPHY

The Subject Property's physical location was researched employing a United States Geological Survey (USGS) 7.5 Minute Topographic Quadrangle (Quad) Map relevant to the Subject Property. The USGS 7.5 Minute Quad Map has an approximate scale of 1 inch to 2,000 feet, and may show physical features with environmental significance such as wetlands, water bodies, roadways, mines, and buildings.

Physical and natural features illustrated on the Quad Map served as areas of visual emphasis when conducting the site inspection of the Subject Property. The USGS 7.5 Minute Quad Map was used as the only Standard Physical Setting Source, and is sufficient as a single reference.

The Subject Quad Map shows no physical features that may have environmentally impacted the subject property. The subject property and general area are identified as urban developed. No mines, wells, or aboveground tanks were mapped in the general area of the subject property. The elevation of the property is approximately 120 feet above mean sea level. The property slopes to the southwest.

HYDROGEOLOGY

Depth to groundwater in the vicinity of the site measures 91 to 100 feet below ground surface (bgs), based on gauging done at the Department of Water Resources, well number 11S01E8E001M. Groundwater flow direction is anticipated to be toward the southwest.

While groundwater flow direction at the subject property cannot be confirmed without survey measurement of static groundwater level at triangulated points, it is expected to flow in the direction of surface topographical contour, or toward the wetland or nearest water body or discharge basin (percolation channel).

It is important to note that groundwater flow direction can be influenced locally and regionally by the presence of local wetland features, surface topography, recharge and discharge areas, horizontal and vertical inconsistencies in the types and location of subsurface soils, and proximity to water pumping wells. Depth and gradient of the water table can change seasonally in response to variation in precipitation and recharge, and over time, in response to urban development such as storm water controls, impervious surfaces, pumping wells, cleanup activities, dewatering, seawater intrusion barrier projects near the coast, and other factors.

SOURCES OF DATA

Current USGS 7.5 Minute Topographical Map
EDR Radius Map Report
*Phase I Environmental Site Assessment*, December 2006, by Ceres Associates (Ceres)

## 4.0 SUBJECT PROPERTY AND VICINITY HISTORY

### *4.1 HISTORICAL RECORDS SEARCH RESOURCES*

| HISTORICAL RECORDS RESEARCH RESOURCES | |
|---|---|
| **ITEM** | **REFERENCE SOURCE** |
| Previous Reports | 1.) *Phase I Environmental Site Assessment* (ESA), July 1989, by Steven Raas & Associates (SRA)<br><br>2.) *Preliminary Archaeological Mitigation Plan*, January 1980, by Breschini, Haversat and Whitlow (BHW)<br><br>3.) *Phase I Environmental Site Assessment*, December 2006, by Ceres Associates (Ceres) |
| Sanborn Map Company Fire Insurance Maps | EDR-supplied Sanborn Map Company fire insurance maps for the years 1888, 1892, 1908, 1926 and 1929 |
| Historical Aerial Photographs | EDR-supplied aerial photographs |
| Historical City Directories | EDR City Directory Abstract |
| Building/Planning Department Zoning/Land Use Records | County of Santa Cruz Planning Department |
| Recorded Land Title Records | N/A |
| Historical Topographic Maps | EDR-supplied historical topographical maps for the years 1914, 1954, 1968, 1980, 1987 and 1994 |
| Oil & Gas Maps | Department of Conservation, Division of Oil, Gas & Geothermal Resources, corresponding Wildcat and District Maps for the subject property and immediate vicinity |
| Interviews | Mr. Joseph Mathieu, Clerk, Santa Cruz County Planning Department<br>Mr. Jay Howe, tenant<br>Mr. John Ifland, local engineer |
| Property Tax Files | N/A |
| Other Historical Records | Office of the Santa Cruz County Assessor |

### *4.2 PREVIOUS ENVIRONMENTAL REPORTS*

ODIC reviewed the following reports on the subject property during this assessment:

***Phase I Environmental Site Assessment* (ESA), July 1989, by Steven Raas & Associates (SRA):**

The 1989 Phase I ESA by SRA was obtained during records review at the County of Santa Cruz Planning Department. The ESA was conducted for Steve Mills of Aptos, California as part of the pre-improvement due diligence for a planned development known as Aptos Junction. The scope of work for this assessment included the subject property (APN 041-011-03) and the adjacent parcel to the south (APN 041-011-20).

At the time of SRA's reconnaissance, the site was vacant land except for an elevated barn on the southeastern portion of the property. Several concrete slabs from old warehouse buildings were observed on the southern part of the Aptos Junction site (current southern adjacent property). Visual inspection of the area around the barn revealed various pieces of equipment, vehicles and several empty 50-gallon drums. No evidence of contamination such as odors, staining of the ground or distressed vegetation was present observed on the property.

SRA stated that soils beneath the subject property consist of fine and coarse-grained alluvial deposits, underlain by ancient sand dune deposits. No depth to groundwater data was provided for the site or the surrounding vicinity.

Properties surrounding the subject property toward the southeast were commercially-developed, including small retail centers, the Bayview Hotel and Restaurant, and the Aptos Village Fair Antiques store. Properties toward the northwest were residential. The Southern Pacific Railroad was observed along the north side of Soquel Avenue. No sites located within one mile of the subject property and listed on state and government databases were deemed likely to adversely impact the site.

The concrete slabs observed on the southern adjacent property reportedly supported warehouse buildings occupied by an apple packing facility during the 1950s. The buildings had been demolished by the early 1960s.

Mr. Sherman Avila, Station Master at the South Pacific Railroad was interviewed by SRA. Mr. Avila recalled no releases of hazardous materials or other environmental hazards related to the railroads in the vicinity of the subject site. Approved herbicides are used to reduce weed growth along the track ballasts.

SRA concluded that no obvious sources of environmental hazards existed at the Aptos Junction site. Several sites, including two gas stations and one drycleaners were deemed innocuous based on their locations downgradient with respect to assumed groundwater flow in the vicinity. The potential existed for underground storage tanks was noted associated with the former apple packing facility south of the subject site. SRA recommended that during removal of the concrete slabs and any other excavation at the site, an environmental engineer be present to identify and sample any potential sources of contamination.

***Preliminary Archaeological Mitigation Plan* (PAMP), January 1980, by Breschini, Haversat and Whitlow (BHW):**

The PAMP report by BHW was obtained during review of County of Santa Cruz Planning Department records. In November of 1979, archaeologists BHW conducted a secondary test at the subject property for the Aptos Village Development. The scope of work completed included the subject property and several adjacent parcels to be included in the proposed development. The test involved the augering of six operable units (Units A-F) at the site and adjacent sites to determine the potential presence of important archaeological materials. Archival research by BHW revealed the Aptos Village site was occupied by a foreman's office and residence, and two bunkhouses occupied by Chinese laborers. No site map was available to identify the locations of the six archaeological units.

Among various cultural materials found in the shallow soil at the site, two trash pits were identified (Unit D). Trash found in the shallow soil (to 1.5 meters) included glass Chinese medicine, beer and other beverage bottles and bottle fragments, pots, bowls and jars dating back to the 1880s.

Asphalt debris were encountered in other units, and BHW suggested that remnants of a former rail yard including tracks, ties, spikes and other such materials might be encountered during excavation of the subject property.

***Phase I Environmental Site Assessment*, December 2006, by Ceres Associates (Ceres):**

The scope of work for Ceres' assessment included two properties adjacent the subject property to the south and to the southwest (APNs 041-011-033 and 041-011-020, respectively). This property was addressed 417 Trout Gulch Road. However, historical use information pertaining to the subject property was available within this report, therefore Ceres' findings relating to the site are summarized below.

The current commercial retail building located adjacent to the southeast of the subject property was constructed in the early 1900s as an apple warehouse. The building has been used for retail purposes since the 1970s (antique store). During site reconnaissance, Ceres observed one of the concrete slabs noted by previous consultant SRA in 1989, which was left over from an apple packing plant present in the 1950s.

Ceres indicated that the subject property and vicinity were part of the Aptos Milling Company in the late 1800s. Lumber piles were stacked on the property during this time. Several railroad spurs traversed the site from southwest to northeast. Residences were observed on the property during Ceres' reconnaissance in 2006.

Depth to groundwater in the vicinity of the site measures 91 to 100 feet below ground surface (bgs), based on gauging done at the Department of Water Resources, well number 11S01E8E001M. Groundwater flow direction is anticipated to be toward the southwest.

### *4.3 SANBORN MAP COMPANY FIRE INSURANCE MAPS*

Sanborn Map Company maps were created for insurance underwriters from 1867 to 1970, and often contain information regarding the uses of individual structures, and the locations of fuel and/or chemical storage tanks that may have been on a particular property. ODIC subcontracted with EDR to provide copies of Sanborn Map Company maps.

ODIC reviewed historical Sanborn Map Company fire insurance maps supplied by EDR. A summary of findings is provided below:

| **Sanborn Map Company Fire Insurance Maps** | |
|---|---|
| DATE | DESCRIPTION |
| 1888 | **Subject site**: The subject site was part of the Aptos Milling Company property. Two railroad spurs traversed the site from southwest to northeast. A stack of lumber was located between the spurs. No building structures were drawn on the subject property. |
| | Adjacent North: Vacant land |
| | Adjacent South: Aptos Milling Company (railroad spurs and stacked lumber) |
| | Adjacent West: Vacant land |
| | Adjacent East: Aptos Milling Company (railroad spurs and stacked lumber) |
| 1892 | **Subject site**: The property remained generally unchanged from the previous Sanborn Fire Insurance map, except two additional stacks of lumber were depicted on the northern and southwestern portions of the property. |
| | Adjacent North: Aptos Milling Company (railroad spurs and stacked lumber) |
| | Adjacent South: Aptos Milling Company (railroad spurs and stacked lumber) |
| | Adjacent West: Aptos Milling Company (railroad spurs and stacked lumber) |
| | Adjacent East: Aptos Milling Company (railroad spurs and stacked lumber) |
| 1908 | **Subject property**: No developments were shown on the subject property. |
| | Adjacent North: No developments shown. |
| | Adjacent South: Railroad spur followed by several warehouse structures associated with Hihn Company. |
| | Adjacent West: Undeveloped followed by a warehouse used for box storage. |
| | Adjacent East: Railroad spur followed by Trout Gulch Road. |
| 1926 | **Subject property**: A railroad spur traversed the central portion of the property from southwest to northeast. A square warehouse building or storage enclosure was located on the southwestern area of the property. A sand and rock conveyor was near the eastern boundary. A water pipeline and two hydrants were present along the southern property boundary. In the southwest, near the western property boundary, a rectangular feature labeled "concrete oil tk (tank) in ground" was drawn. |
| | Adjacent North: No developments shown. |
| | Adjacent South: Railroad spur followed by several warehouse structures associated with Hihn Company. |
| | Adjacent West: Undeveloped followed by a warehouse used for box storage. |
| | Adjacent East: Railroad spur followed by Trout Gulch Road. |
| 1929 | **Subject property**: The property remained generally unchanged from the previous Sanborn Fire Insurance map. |
| | Adjacent North: No developments shown. |
| | Adjacent South: Railroad spur followed by several warehouse structures associated with Hihn |

| Sanborn Map Company Fire Insurance Maps | |
|---|---|
| DATE | DESCRIPTION |
| | Company. |
| | Adjacent West: Wikkerw & Dodge Company (apple packing) including railroad spurs and warehouse structures used for barreling and packing of apples. |
| | Adjacent East: Railroad spurs and warehouse structures followed by Trout Gulch Road. |

### *4.4 HISTORICAL AERIAL PHOTOGRAPHS*

ODIC reviewed aerial photographs supplied by EDR. A summary of findings is provided below:

| Historical Aerial Photographs | |
|---|---|
| DATE | DESCRIPTION |
| 1939 | **Subject Property**: The property was improved with a rectangular warehouse building on the southwestern corner. An unpaved path led from the building to a second feature, possibly a building or more likely the sand and rock conveyor identified in the 1926 and 1929 Sanborn maps. A third structure, apparently a shed, was observed on the southeastern corner of the subject site. The remainder of the property was unpaved. A railroad spur appeared to run along the southern property boundary. A second spur may have traversed the northern portion of the property, southwest to northeast. A rectangular feature was observed located just beyond the southwestern boundary which was likely the oil tank and concrete sump noted in the 1926 and 1929 Sanborn maps. |
| | Adjacent North: Vacant land toward the northwest, and industrial buildings toward the northeast. |
| | Adjacent South: Immediately by a railroad spur followed by two small warehouse buildings followed by a larger warehouse or industrial building (current Village Fair Antique store building). |
| | Adjacent West: Multiple industrial buildings and two railroad spurs. |
| | Adjacent East: Vacant land and unidentifiable buildings |
| 1948 | **Subject Property**: The railroad spur previously observed on the northern portion of the site appeared to have been removed. The warehouse building remained on the southwest corner of the site, as did the conveyor building and the shed in the southeastern areas of the property. The concrete sump was visible at the southwestern boundary of the site. The northern half of the property appeared to be vacant and undeveloped. |
| | Adjacent North: Vacant land toward the northwest, and industrial buildings toward the northeast. |
| | Adjacent South: Immediately by a railroad spur followed by two small warehouse buildings followed by a larger warehouse or industrial building (current Village Fair Antique store building). |
| | Adjacent West: Multiple industrial buildings and two railroad spurs. |
| | Adjacent East: Vacant land and unidentifiable buildings. |
| 1956 | **Subject Property**: The property remained generally unchanged from the previous aerial photograph. |
| | Adjacent North: Remained unchanged, except for the addition of residential dwellings across Granite Way. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Generally unchanged from the previous aerial photograph. |
| | Adjacent East: Generally unchanged from the previous aerial photograph. |
| 1964 | **Subject property**: The property was improved with a rectangular warehouse building the southwestern corner. The remainder of the property appeared to be vacant, undeveloped land. |
| | Adjacent North: Immediately by the unpaved Granite Way followed by residential dwellings. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Large industrial building or slab for a former industrial building and unpaved land. |
| | Adjacent East: Vacant, undeveloped land. |
| 1977 | **Subject property**: The property remained generally unchanged from the previous aerial photograph. |
| | Adjacent North: Generally unchanged from the previous aerial photograph. |
| | ~~Adjacent South: Generally unchanged from the previous aerial photograph, except the two~~ |

| Historical Aerial Photographs | |
|---|---|
| DATE | DESCRIPTION |
| | warehouse buildings directly across the southern subject property boundary had been removed. |
| | Adjacent West: Generally unchanged from the previous aerial photograph. |
| | Adjacent East: Commercial building (ostensibly the current post office building). |
| 1982 | **Subject property**: The property remained generally unchanged from the previous aerial photograph. |
| | Adjacent North: The previous concrete flood channel had been converted to a commercial or industrial building. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Generally unchanged from the previous aerial photograph. |
| | Adjacent East: Generally unchanged from the previous aerial photograph. |
| 1993 | **Subject property**: The property remained generally unchanged from the previous aerial photograph. |
| | Adjacent North: Generally unchanged from the previous aerial photograph. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Vacant land and a large rectangular concrete foundation for a former industrial building. |
| | Adjacent East: Generally unchanged from the previous aerial photograph. |
| 1998 | **Subject property**: The property remains generally unchanged from the previous aerial photograph. |
| | Adjacent North: Generally unchanged from the previous aerial photograph. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Generally unchanged from the previous aerial photograph. |
| | Adjacent East: Generally unchanged from the previous aerial photograph. |
| 2005/2006 | **Subject property**: The property remains generally unchanged from the previous aerial photograph. |
| | Adjacent North: Generally unchanged from the previous aerial photograph. |
| | Adjacent South: Generally unchanged from the previous aerial photograph. |
| | Adjacent West: Generally unchanged from the previous aerial photograph. |
| | Adjacent East: Generally unchanged from the previous aerial photograph. |

### *4.5 CITY DIRECTORIES*

ODIC reviewed an EDR City Directory Abstract for the years spanning 1920 through 2006. These years are not necessarily inclusive. A summary of the information obtained is provided below.

| Subject Property | |
|---|---|
| YEAR | BUSINESS LISTING |
| 2008 | John's Antiques, Lilly Wallace Antiques |

ODIC also searched historical city directories at the City of Santa Cruz Public Library for the subject property address. Granite Way was not listed in available directories from 1924 to 1978. It was listed beginning in 1978. However, at that time, only the following odd number addresses were listed: 445, 449 and 453 Granite Way.

Granite Rock Company (owner of the subject property during the 1980s, based on historical building records) was found listed in a city directory from 1948 at the address 411 Walker Street, Santa Cruz, CA.

Granite Construction Company was listed at multiple addresses within the city and county of Santa Cruz, but not at the subject property address, from 1926 to at least 1985.

Review of historical city directory listings for surrounding properties indicated they have been used for a combination of commercial and residential purposes since the 1970s.

## *4.6 BUILDING RECORDS / PROPERTY PROFILE*

ODIC reviewed records pertaining to the subject property address of 448 Granite Way, Aptos, California at the County of Santa Cruz Planning Department. Included among these records were the previous reports summarized in Section 4.2 above. A summary of historical building and other permit records found for the subject property is below:

| **Building & Planning Department Records** | | |
|---|---|---|
| DATE | DESCRIPTION | OWNER/APPLICANT |
| 2-11-81 | Agreement from site owner Granite Rock Company to rent to Pat Thompson for use as a pottery shop including kiln. | Granite Rock Company |
| 4-3-81 | Change use from box and hardware storage related to furniture to pottery shop. Proposal for ceramics manufacturing withdrawn due to cost. Retained pottery storage use. | Pat Thompson |
| 4-13-82 | Special Planned Development Use Permit to continue use as box construction and storage warehouse. Must upgrade electrical. | Unspecified |
| 1982 (date illegible) | Inspection Report: Warehouse building on site used to make pottery. Rusty kiln observed onsite (not in use). | |
| 12-27-89 | Geotechnical Report by Steven Raas & Associates. One boring advanced at subject property. No contamination noted. Soils consist of loose, increasing to dense, sands to 43 feet bgs. | Aptos Village Partnership |
| 1-26-1990 | Permit application to develop APNs 041-011-03 (subject property), 041-011-09 and 041-011-20 with buildings housing 25,000 square feet of retail space, 25,000 square feet of offices, 26 multi-family residential units and 14 live/work units. Zone C-2 (community and commercial). | Aptos Village Partnership |
| 12-4-2000 | Application to replace existing electrical service panel with new 60A service panel and install new wiring to service new lighting and outlets and existing warehouse/storage structure | Richard Moe & Ruth N CP et al |
| 7-15-2010 | Proposal to construct a mixed-use commercial and residential development. | Jesse Thielen |
| 1-16-2011 | Replace existing electrical service panel with new 60A service panel and install new wiring to service new lighting and outlets and existing warehouse/storage structure – EXPIRED | Richard Moe & Ruth N CP et al |

ODIC also reviewed records at the Santa Cruz County Assessor's office. These records indicated that ownership changes occurred at the site in 1997, 2002 and 2006. The current owner is Scarpelli Constance Lobue and Craig Trustees.

## *4.7 USER PROVIDED INFORMATION*

| **USER/CUSTOMER QUESTIONNAIRE** | |
|---|---|
| QUESTION | CUSTOMER TO ANSWER |
| **(1.) Environmental cleanup liens that are filed or recorded against the site (40 CFR 312.25).** Are you aware of any environmental cleanup liens against the *property* that are filed or recorded under federal, tribal, state or local law? | The User has not informed ODIC of any knowledge of cleanup liens filed or recorded against the property. |

| | |
|---|---|
| **(2.) Activity and land use limitations (AULs) that are in place on the site or that have been filed or recorded in a registry (40 CFR 312.26).**<br>Are you aware of any AULs, such as *engineering controls*, land use restrictions or *institutional controls* that are in place at the site and/or have been filed or recorded in a registry under federal, tribal, state or local law? | The User has not informed ODIC of any knowledge of activity or land use limitations associated with the property. |
| **(3.) Specialized knowledge or experience of the person seeking to qualify for the LLP (40 CFR 312.28).**<br>As the *user* of this *ESA* do you have any specialized knowledge or experience related to the *property* or nearby properties? For example, are you involved in the same line of business as the current or former *occupants* of the *property* or an adjoining *property* so that you would have specialized knowledge of the chemicals and processes used by this type of business? | The User has not informed ODIC of any specialized knowledge or experience related to the property or nearby properties. |
| **(4.) Relationship of the purchase price to the fair market value of the *property* if it were not contaminated (40 CFR 312.29).**<br>Does the purchase price being paid for this *property* reasonably reflect the fair market value of the *property*? If you conclude that there is a difference, have you considered whether the lower purchase price is because contamination is known or believed to be present at the *property*? | The User has not informed ODIC of any information pertaining to the purchase price with respect to the fair market value of the property. |
| **(5.) Commonly known or *reasonably ascertainable* information about the *property* (40 CFR 312.30).**<br>Are you aware of commonly known or *reasonably ascertainable* information about the *property* that would help the *Environmental Professional(EP)* to identify conditions indicative of releases or threatened releases? For example, as *user*,<br>(a.) Do you know the past uses of the *property*?<br>(b.) Do you know of specific chemicals that are present or once were present at the *property*?<br>(c.) Do you know of spills or other chemical releases that have taken place at the *property*?<br>(d.) Do you know of any environmental cleanups that have taken place at the *property*? | The User has not informed ODIC of any commonly known or reasonably ascertainable information about the property that would identify conditions indicative of releases or threatened releases, other than as described in Section 4.10 (Interviews), if applicable. |
| **(6.) The degree of obviousness of the presence of likely presence of contamination at the *property*, and the ability to detect the contamination by appropriate investigation (40 CFR 312.31).**<br>As the *User* of this *ESA*, based on your knowledge and experience related to the *property* are there any *obvious* indicators that point to the presence or likely presence of contamination at the *property*? | The User has not informed ODIC of any obvious indicators that point to the presence or likely presence of contamination at the property, other than as described in Section 4.10 (Interviews), if applicable. |

The User has not informed ODIC of any specific prior knowledge of cleanup liens, activity or land use limitations, specialized user knowledge, information about the fair market value, site history, or current site activities. Valuation and environmental information is being collected as part of due diligence measures for the associated transaction. An environmental cleanup lien/AUL search is not required from the environmental consultant as part of this investigation. Title searches shall be conducted by the User, concurrently with environmental due diligence work.

### *4.8 HISTORICAL TOPOGRAPHIC MAPS*

ODIC reviewed historical USGS 7.5 Topographic Maps during the course of this site assessment. Maps reviewed including those from the following years: 1914, 1954, 1968, 1980, 1987 and 1994. A railroad spur traversed the property from southwest to northeast and a structure was located in the southwestern portion of the site in the 1914 map. In the 1954, 1968, 1980 and 1987 maps, the property was shown as vacant, undeveloped land. The southwestern corner of the site was improved with a structure in 1994.

### *4.9 OIL & GAS MAPS*

ODIC reviewed California Department of Conservation, Division of Oil, Gas & Geothermal Resources, corresponding Wildcat and District Maps for the subject property and immediate vicinity, but found no active or abandoned oil and/or gas wells on the subject property or in the immediate vicinity.

### *4.10 INTERVIEWS*

| **Interview with Key Site Manager, Property Owner or Occupant** | |
|---|---|
| | **INTERVIEW DETAILS** |
| Name | Mr. Joseph Mathieu |
| Title | Records Clerk |
| Firm | Santa Cruz County Planning Department |
| Telephone | N/A |
| Role in business | N/A |
| Summary | Mr. Mathieu was interviewed during this assessment. He indicated that his department keeps records dating back to the 1950s. Mr. Mathieu provided ODIC with the historical building permits summarized in Section 4.6. |

| **Interview with Key Site Manager, Property Owner or Occupant** | |
|---|---|
| | **INTERVIEW DETAILS** |
| Name | Mr. Jay Howe |
| Title | Tenant |
| Firm | Jay Howe Masonry |
| Telephone | (831) 429-9700 |
| Role in business | Owner/operator |
| Summary | Mr. Howe was interviewed during the site reconnaissance. He has leased the subject property for the last ten years. He did not know when the warehouse building located on the western portion of the site was constructed. It was vacant when he took occupancy of the property in approximately 2000. The bicycle motocross course was constructed on the eastern portion of the site approximately three years ago. Mr. Howe put up the fence around the western side of the subject building. He stated that the fence line does not represent the western property boundary. Mr. Howe's business does not store significant amounts of hazardous materials or generate hazardous wastes. No environmental concerns exist associated with the property, according to Mr. Howe. |

| **Interview with Key Site Manager, Property Owner or Occupant** | |
|---|---|
| | **INTERVIEW DETAILS** |
| Name | Mr. John Ifland |
| Title | Engineer |
| Firm | Ifland Engineering |
| Telephone | (831) 426-5313 |
| Role in business | Client of property owner Barry Swenson Buildings |

| | |
|---|---|
| Summary | Mr. Ifland was interviewed by telephone following the site reconnaissance. He indicated that the property was part of the former apple production facilities documented in the area around the turn of the century. These operations were terminated in the 1940s and 1950s. The site has been vacant since that time, to his knowledge. Several railroad spurs were removed from the property and vicinity several decades ago. No demolition of buildings has occurred in recent years. |

### *4.11 OTHER HISTORICAL RECORDS*

ODIC reviewed records pertaining to the subject property at the Santa Cruz County Assessor's office. These records indicated the property measures 1.09 acres or 47,349 square feet. The Assessor's Parcel Number is 041-011-03. A summary of recent parcel transfers indicated transfers occurred in 1997, 2002 and 2006. The owner information was not provided. No other addresses have been assigned the property except for 448 Granite Way, according to the assessor's office.

### *4.12 SUMMARY OF HISTORICAL PROPERTY AND VICINITY USE*

Summary of Historical Property Use:

Based on review of historical topographical maps, aerial photographs and Sanborn fire insurance maps, the subject property was part of the Aptos Milling Company site in the late 1800s. Developments during that time included two railroad spurs traversing the site from southwest to northeast. Stacks of lumber were present on the site. By the 1920s, Aptos Milling Company appeared to have vacated the property and surrounding properties. In historical Sanborn maps from 1926 to 1929, a warehouse building or other storage enclosure used to store concrete was present on the southwestern portion of the site. Also, in 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was drawn on the western portion of the site. A sand and rock conveyor was located on the eastern area of the site. These developments, together with a water pipeline and two hydrants along the southern boundary suggest a use of concrete manufacturing. They continued to be observed on the subject property in historical aerial photographs through the 1950s. Historical building department records showed the site was owned by Granite Rock Company and improved with a warehouse building in the 1980s. The building was apparently rented out by Granite and was used for the storage of boxes and hardware associated with a furniture business (possibly a historical antique store on the south-adjacent property). The use of the onsite building possibly included both storage of boxes, hardware, and pottery by 1982. Redevelopment of the property with mixed-use commercial and residential buildings was proposed in 1990, but did not occur. The subject property address was listed in historical city directories as John's Antiques and Lilly Wallace Antiques in 2008.

Summary of Vicinity Use:

The subject property vicinity was developed with the Aptos Milling Company (lumber milling) in the late 1880s. Railroad spurs and stacks of lumber were observed on adjacent properties toward the south and southwest in historical Sanborn fire insurance maps during this era. From the 1920s through the 1950s, these adjoining properties were developed with warehouses and other buildings used for fruit packing. Some of these buildings remain today and are used for commercial purposes, including the retail sales of antique furniture (southern adjacent property). Northern adjoining and surrounding properties were industrial-developed in the 1930s. They became residential-developed in the 1950s.

### *4.13 DATA GAPS*

ASTM E1527-05 and the US-EPA AAIs require that the report identify and comment on significant data gaps that affect the ability of the *environmental professional* to identify *Recognized Environmental Conditions.*

In the 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was located just beyond the extreme southwestern boundary and partially on the subject site. ODIC searched files at the Santa Cruz County Department of Environmental Health, the local regulatory agency for underground storage tanks. No records were found indicating that the former oil UST was removed from the subject property or that any soil sampling has been conducted in this area to determine whether or not the subsurface environment has been impacted by a potential releases from the UST. The absence of such documentation represents a significant data gap and is assessed to represent a Recognized Environmental Condition (REC) pursuant to ASTM Practice E1527-05. See Section 7.0, Recommendations and Opinions.

## 5.0 REGULATORY RECORD SEARCH

### *5.1 PROCEDURE*

The most current databases sources maintained by state and federal offices were provided by governmental record search database suppliers. Such databases were searched for properties with reported environmental issues within radii specified by ASTM Standard E1527-05, either by using geocoding information that identified the coordinates of the properties in the databases or by checking the street addresses of practically reviewable non-geocoded "orphan" properties within the same zip code. The database report is included as an appendix to this *Report*. The database report may identify a certain "orphan sites" which are those facilities that could not be mapped or geocoded due to inadequate address information. We attempted to locate the facilities via various mapping programs, but cannot be held liable for not correctly locating these orphan sites to determine their impact to the Subject Property.

The subject property address of 448 Granite Way, Aptos, CA is not listed on any state or federal environmental databases.

### *5.2 FEDERAL AGENCY RECORDS*

| FEDERAL AGENCY RECORDS | | |
|---|---|---|
| SOURCE | CRITERIA FOR MINIMUM SEARCH DISTANCE (MILES) | NO. OF PROPERTIES WITHIN SEARCH DISTANCE |
| NPL | 1.0 | 0 |
| De-listed NPL | 0.5 | 0 |
| CERCLIS | 0.5 | 0 |
| CERCLIS-NFRAP | 0.5 | 0 |
| RCRA-CORRACTS | 1.0 | 0 |
| RCRA-TSDF | 0.5 | 0 |
| RCRA-Generator | Subject Property and Adjoining Properties | 0 |
| ERNS | Subject Property Only | 0 |
| Federal IC/EC Registries | Subject Property Only | 0 |
| Other Federal List | Subject Property Only | 0 |

There were no sites identified in Federal Agency database records within the minimum specified search distances of the subject property.

### *5.3 STATE AGENCY RECORDS*

| STATE AGENCY RECORDS | | |
|---|---|---|
| SOURCE | CRITERIA FOR MINIMUM SEARCH DISTANCE (MILES) | NO. OF PROPERTIES WITHIN SEARCH DISTANCE |
| State/Tribal Equivalent NPL | 1.0 | 0 |
| State/Tribal Equivalent CERCLIS | 0.5 | 1 |
| State/Tribal SWLF | 0.5 | 0 |
| State/Tribal LUST | 0.5 | 6 |
| State/Tribal UST | Subject Property and Adjoining | 0 |

| STATE AGENCY RECORDS | | |
|---|---|---|
| **SOURCE** | **CRITERIA FOR MINIMUM SEARCH DISTANCE (MILES)** | **NO. OF PROPERTIES WITHIN SEARCH DISTANCE** |
| | Properties | |
| State/Tribal IC/EC Registries | Subject Property Only | 0 |
| State/Tribal Voluntary Cleanup Sites | 0.5 | 0 |
| State/Tribal Brownfield Sites | 0.5 | 0 |
| Other State List | Subject Property Only | 0 |
| SLIC | 0.5 | 0 |

**State/Tribal Equivalent CERCLIS:**

ENVIROSTOR: The Department of Toxic Substances Control's (DTSC's) Site Mitigation and Brownfields Reuse Program's (SMBRP's) EnviroStor database identifies sites that have known contamination or sites for which there may be reasons to investigate further. The database includes the following site types: Federal Superfund sites (National Priorities List (NPL)); State Response (RESPONSE), including Military Facilities and State Superfund; Voluntary Cleanup; and School sites. EnviroStor provides similar information to the information that was available in CalSites, and provides additional site information, including, but not limited to, identification of formerly-contaminated properties that have been released for reuse, properties where environmental deed restrictions have been recorded to prevent inappropriate land uses, and risk characterization information that is used to assess potential impacts to public health and the environment at contaminated sites.

One ENVIROSTOR site was identified within the specified search radius:

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| CALIFORNIA DEPT OF PARKS AND R<br>Status: Refer: RWQCB | 7500 SOQUEL DRIVE | WNW 1/2 - 1 (0.639 mi.) | 15 | 42 |

The site listed above is not suspected to have an adverse environmental impact on the Subject Property based on one or more of the following rationale: a) horizontal distance from the Subject Property; b) down/cross-gradient location with respect to the assumed shallow groundwater flow direction; c) the nature of the reported release (e.g., contamination confined only within soil media, absence of groundwater impact, lack of transporting media such as groundwater); and/or d) regulatory status (e.g., case closed, remediation action underway).

**State/Tribal LUST:**

LUST: State/Tribal Leaking Underground Storage Tanks: This is a list of state sites that have reported leaking underground storage tanks. A site may be placed on a LUST list by reporting that the tank system(s) failed tank testing, that routine monitoring of tank's system(s) showed evidence of leakage, or that verification sampling during tank removal showed subsurface contamination.

6 LUST sites were identified within the specified search radius (many LUST sites have multiple/duplicate listings):

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| ***RENZEL PROPERTY***<br>Status: Completed - Case Closed | ***214 SHOREVIEW DR*** | ***S 1/4 - 1/2 (0.377 mi.)*** | ***10*** | ***20*** |
| ***SHELL STATION***<br>Status: Open - Verification Monitoring | ***18 RANCHO DEL MAR*** | ***W 1/4 - 1/2 (0.476 mi.)*** | ***C12*** | ***27*** |

| Equal/Higher Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| SHELL BRANDED SERVICE STATION | 18 RANCHO DEL MAR | W 1/4 - 1/2 (0.476 mi.) | C13 | 39 |
| CHEVRON SERVICE STATION #9-427<br>Status: Completed - Case Closed | 7719 SOQUEL DR | W 1/4 - 1/2 (0.477 mi.) | 14 | 40 |

| Lower Elevation | Address | Direction / Distance | Map ID | Page |
|---|---|---|---|---|
| *APTOS VILLAGE GARAGE*<br>Status: Completed - Case Closed | *8028 SOQUEL DR* | *SW 1/8 - 1/4 (0.220 mi.)* | *B7* | *14* |
| ADVANCED TIRE<br>Status: Completed - Case Closed | 8026 SOQUEL DR | SW 1/8 - 1/4 (0.232 mi.) | B9 | 18 |

None of the LUST sites listed above are suspected to have an adverse environmental impact on the Subject Property based on one or more of the following rationale: a) horizontal distance from the Subject Property; b) down/cross-gradient location with respect to the assumed shallow groundwater flow direction; c) the nature of the reported release (e.g., contamination confined only within soil media, absence of groundwater impact, lack of transporting media such as groundwater); and/or d) regulatory status (e.g., case closed, remediation action underway, no reported violations).

If sites are listed on the LUST/SLIC databases with a "case closed" (no further remedial actions required) status, it shall be interpreted as "the identified contamination at such sites was mitigated to a degree that the governing agency believes that these sites do not pose apparent concern/threat to the subsurface environment of the neighboring area".

### *5.4 LOCAL AGENCY RECORDS*

**Santa Cruz County Environmental Health Department (SCDEH) :**

The Santa Cruz County Environmental Health Department is the local regulatory agency for hazardous materials, industrial wastes and underground storage tanks. A search of the SCDEH files revealed that no records exist for the property address of 448 Granite Way, Aptos, California.

## 6.0 FINDINGS AND CONCLUSIONS

ODIC performed a Phase I Environmental Site Assessment in conformance with the scope and limitations of ASTM Practice E1527-05 of the Subject Property. Any exceptions to, or deletions from, this practice are described in Section 1.0 of this Report.

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Subject Property Characteristics**<br><br>**(Current Tenant and Site Description)** | The subject property address is 448 Granite Way, Aptos, California 95003. The Assessor's Parcel Number is 041-011-03. The property is located on the southwestern corner of the intersection of Granite Way and Cathedral Drive. Based on Santa Cruz County Assessor records, the property has 355.48 feet of frontage along Granite Way and 132.60 feet of frontage along Cathedral Drive. The subject site consists of an irregularly shaped parcel of land comprising 1.09 acres, and is improved with a rectangular-shaped metal-sided warehouse building near the southwestern boundary. A gravel-paved outdoor storage yard and parking area is northeast of the building. A bicycle motocross park, including dirt jumps and berms, comprises roughly the northeastern half of the property. Fencing encloses the warehouse building and storage area. The building is currently occupied by Jay Howe Masonry, which utilizes the warehouse for the storage of tools, equipment and materials associated with its business (concrete block building construction). No manufacturing is conducted by Jay Howe Masonry. |
| **Summary of Property Reconnaissance** | Small containers (mostly 1-gallon and less) of paints, oils, fuel, bonders and other materials were observed on shelves and on the floor inside the warehouse building. No spills or leaks were observed associated with any of these containers.<br><br>Located just beyond the extreme southwestern boundary of the site, and partially on the subject property, ODIC observed the outline of what appeared to be a former concrete sump. The location and shape of the sump matches a feature shown in historical Sanborn fire insurance maps (see Section 4.3) which is labeled "concrete oil tank in ground." See Section 7.0, Recommendations and Opinions. |

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Historical Use of Subject Property and Vicinity** | Summary of Historical Property Use:<br><br>Based on review of historical topographical maps, aerial photographs and Sanborn fire insurance maps, the subject property was part of the Aptos Milling Company site in the late 1800s. Developments during that time included two railroad spurs traversing the site from southwest to northeast. Stacks of lumber were present on the site. By the 1920s, Aptos Milling Company appeared to have vacated the property and surrounding properties. In historical Sanborn maps from 1926 to 1929, a warehouse building or other storage enclosure used to store concrete was present on the southwestern portion of the site. Also, in 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was drawn on the western portion of the site. A sand and rock conveyor was located on the eastern area of the site. These developments, together with a water pipeline and two hydrants along the southern boundary suggest a use of concrete manufacturing. They continued to be observed on the subject property in historical aerial photographs through the 1950s. Historical building department records showed the site was owned by Granite Rock Company and improved with a warehouse building in the 1980s. The building was apparently rented out by Granite and was used for the storage of boxes and hardware associated with a furniture business (possibly a historical antique store on the south-adjacent property). The use of the onsite building possibly included both storage of boxes, hardware, and pottery by 1982. Redevelopment of the property with mixed-use commercial and residential buildings was proposed in 1990, but did not occur. The subject property address was listed in historical city directories as John's Antiques and Lilly Wallace Antiques in 2008.<br><br>Summary of Vicinity Use:<br><br>The subject property vicinity was developed with the Aptos Milling Company (lumber milling) in the late 1880s. Railroad spurs and stacks of lumber were observed on adjacent properties toward the south and southwest in historical Sanborn fire insurance maps during this era. From the 1920s through the 1950s, these adjoining properties were developed with warehouses and other buildings used for fruit packing. Some of these buildings remain today and are used for commercial purposes, including the retail sales of antique furniture (southern adjacent property). Northern adjoining and surrounding properties were industrial-developed in the 1930s. They became residential-developed in the 1950s. |
| **Federal, State and Local Agency Concerns** | The subject property address of 448 Granite Way, Aptos, CA is not listed on any state or federal environmental databases.<br><br>The Santa Cruz County Environmental Health Department is the local regulatory agency for hazardous materials, industrial wastes and underground storage tanks. A search of the SCDEH files revealed that no records exist for the property address of 448 Granite Way, Aptos, California. |
| **Potential Off-site Sources** | No RECs (Recognized Environmental Conditions) were identified. |
| **Non-CERCLA Items** | No concerns were identified for non-CERCLA items. However, unless *Client* contracted ODIC to investigate specific non-CERCLA items, these items were generally not included in the scope of services for this Phase I Environmental Site Assessment. |
| **Inaccessible or Un-surveyed Portions of Subject Property** | Full access to the entire property was provided to ODIC, and there were no notable portions of the Subject Property excluded from the survey and field inspection. |

| REPORT COMPONENT | SUMMARY OF FINDINGS |
|---|---|
| **Data Gap** | In 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was located just beyond the extreme southwestern boundary and partially on the subject site. ODIC searched files at the Santa Cruz County Department of Environmental Health, the local regulatory agency for underground storage tanks. No records were found indicating that the former oil UST was removed from the subject property or that any soil sampling has been conducted in this area to determine whether or not the subsurface environment has been impacted by a potential releases from the UST. The absence of such documentation represents a significant data gap and is assessed to represent a Recognized Environmental Condition (REC) pursuant to ASTM Practice E1527-05. |

## 7.0 RECOMMENDATIONS AND OPINIONS

ODIC Environmental (ODIC) performed a Phase I Environmental Site Assessment of the Subject Property in conformance with the scope and limitations of ASTM Practice E1527-05. Recognized Environmental Conditions were identified with respect to current or historical usages of the subject property:

1.) Based on review of historical topographical maps, aerial photographs and Sanborn fire insurance maps, the subject property was part of the Aptos Milling Company site in the late 1800s. Developments during that time included two railroad spurs traversing the site from southwest to northeast. Railroad properties may be impacted by a wide variety of contaminants, including petroleum hydrocarbons, creosote, PBCs, and metals. ODIC was not provided with any evidence that soils at the site have been sampled and tested for any potential contaminants. Therefore, the former railroad spurs on the site may represent environmental concern.

2.) In historical Sanborn maps from 1926 and 1929, a warehouse building or other storage enclosure used to store concrete was present on the southwestern portion of the site. A sand and rock conveyor was located on the eastern area of the site. These developments, together with a water pipeline and two hydrants along the southern boundary suggest a use of concrete manufacturing. Historical building department records showed the site was owned by Granite Rock Company in the 1980s. Therefore it appears that Granite may have owned the site and operated it to manufacture concrete from the 1920s to sometime prior to the 1980s. Concrete batch manufacturing can involve wastewater generation, and support services such as truck fueling and maintenance can involve the storage of petroleum products onsite. Therefore an environmental concern may be present related to the former onsite concrete manufacturing.

3.) n 1926 and 1929 Sanborn maps, a rectangular feature labeled "concrete oil tk (tank) in ground" was located just beyond the extreme southwestern boundary and partially on the subject site. ODIC searched files at the Santa Cruz County Department of Environmental Health, the local regulatory agency for underground storage tanks. No records were found indicating that the former oil UST was removed from the subject property or that any soil sampling has been conducted in this area to determine whether or not the subsurface environment has been impacted by a potential releases from the UST. The absence of such documentation represents a significant data gap and is assessed to represent a Recognized Environmental Condition (REC) pursuant to ASTM Practice E1527-05.

4) The eastern portion of the subject property is currently occupied by a bicycle motocross track, including jumps and berms constructed of soil fill material of an unknown origin.

ODIC recommends that a subsurface investigation be conducted in the vicinity of the site identified as containing an oil underground storage tank in 1926 and 1929 Sanborn fire insurance maps. In addition, it is recommended that soils across the site be sampled and evaluated for potential contaminants based on the former presence of a cement plant and railroad spurs, as well as the presence of imported soils of unknown origin.

## 8.0 REFERENCES

During the preparation of this Report, a number of sources were contacted, individuals were interviewed, and various federal, state, county or local municipal agencies were consulted. Documentation applicable to the Subject Property in those departments and agencies was requested and reviewed when and where reasonably ascertainable, as detailed in ASTM E1527-05. Individuals listed without phone numbers were contacted in person or by e-mail. Reference sources for site-specific information, hydrogeologic setting, technical data, historical research data, environmental reports and other records used are identified throughout this Report in corresponding sections. Any additional reference sources not cited in the preceding sections in this report, if applicable, are disclosed in this section.

# Attachment 9

TJKM
Transportation
Consultants

Vision That Moves Your Community

Revised Final Report

# Traffic Impact Study for Aptos Village Mixed-Use Development

In Santa Cruz County

November 3, 2009

Pleasanton
Fresno
Sacramento
Santa Rosa

www.tjkm.com

TJKM
Transportation
Consultants

Vision That Moves Your Community

# Revised Final Report

## Traffic Impact Study for Aptos Village Mixed-Use Development

In Santa Cruz County

November 3, 2009

www.tjkm.com

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## Introduction and Summary

### Introduction

This report presents the results of TJKM's traffic impact study for the proposed Aptos Village mixed-use development in Santa Cruz County. The project consists of 74,950 square feet of neighborhood commercial retail and 63 multi-family residential units on three lots with assessor's parcel numbers (APNs) 041-011-20 (4.02 acres), 041-011-03 (1.1 acres), and 041-011-33 (2.5 acres). Lot number 041-011-33 already includes other existing development, with approximately 1.5 acres (60 percent of the area) remaining available for development. Overall, the proposed project would be developed on a combined vacant land area of approximately 6.62 acres.

Previously for this project, TJKM analyzed a proposed mixed-use development at the same location with different land uses and sizes (Refer to *Draft – Aptos Village Traffic Impact Study, February 23, 2004*) as part of a planning study for the County of Santa Cruz. The previous study analyzed weekday a.m., mid-day, and p.m. peak hour conditions. This 2004 study found that the p.m. peak was the critical peak period at most study intersections. The proposed mitigations in the 2004 study were found to result in acceptable operations, even for the few intersections where a.m. or midday peaks were the critical periods. Therefore, since the p.m. peak was previously found to be the critical traffic period for the overall study area and given that expected p.m. peak hour trip generation (documented in this 2009 study) for the proposed development is about three times the expected a.m. peak hour project trip generation, TJKM is evaluating the current proposed project only for the p.m. peak hour conditions. The one exception is the Soquel Drive/State Park Drive/ Sunset Way intersection, where the recommended mitigation was also analyzed for a.m. peak conditions and the detailed discussion is provided under Cumulative Conditions (see page 27).

The purpose of this traffic study is to evaluate the proposed project for potential traffic impacts during p.m. peak hour conditions, identify short-term roadway and circulation needs, determine potential mitigation measures, and identify any critical traffic issues that should be addressed in the on-going planning process. The study primarily focuses on traffic conditions at 13 study intersections in the vicinity that the proposed project may potentially impact. Figure 1 (Page 4) in the report illustrates the project site location and the ten existing study intersections. Figure 7 (Page 19) shows the preliminary site plan of the proposed project, and Figure 8 shows the additional three study intersections created by the project.

### Summary

Based on Institute of Transportation Engineers' (ITE) trip generation rates, it is expected that the proposed Aptos Village project would generate approximately 3,650 daily trips, with 113 trips (52 inbound and 61 outbound) occurring during the a.m. peak hour and 322 trips (162 inbound and 160 outbound) during the p.m. peak hour.

Under Existing Conditions, eight out of ten study intersections operate at acceptable service levels during the p.m. peak hour. The following two intersections operate unacceptably during the p.m. peak hour:

- *Soquel Drive/Trout Gulch Road:* This all-way stop controlled intersection currently operates at level of service (LOS) D during the p.m. peak hour. Signalization and installation of an exclusive westbound left-turn lane is expected to improve intersection operating conditions to acceptable County LOS standards.
- *Soquel Drive/Aptos Creek Road:* This one-way stop controlled intersection operates at LOS E during the p.m. peak hour. The recommended mitigation is to install a traffic signal and an

exclusive eastbound left-turn lane on Soquel Drive. This mitigation is expected to improve intersection operating conditions to acceptable County LOS standards.

The above recommended mitigations are part of the County's current capital improvement program and are currently under design. The traffic signals are expected to become functional prior to full occupancy of the proposed project.

Under Existing plus Approved Conditions, the same two intersections identified under Existing Conditions are expected to continue operating unacceptably with the addition of traffic from nearby approved projects. The mitigations identified under the previous scenario (Existing Conditions) are expected to improve operating conditions at these intersections to acceptable County LOS standards.

Under Existing plus Approved plus Project Conditions, ten of 13 study intersections are expected to operate acceptably during the p.m. peak hour. The same two existing intersections that currently operate unacceptably plus one additional existing intersection are expected to operate at unacceptable service levels:

- Soquel Drive/Trout Gulch Road
- Soquel Drive/Aptos Creek Road
- Soquel Drive/Aptos Rancho Road

The mitigations identified at the first two intersections above in the previous scenarios (Existing and Existing plus Approved) are expected to result in acceptable operations under Existing plus Approved plus Project Conditions. At the Soquel Drive / Aptos Rancho Road intersection, LOS is expected to decrease from C to D due to traffic added from the project. As mitigation, TJKM recommends converting the existing Aptos Rancho Road signal split phasing to permissive left-turn phasing. With this mitigation, the intersection is expected to operate at an acceptable LOS C. There is sufficient capacity for left turns, and no protected left turn phasing is necessary on the minor street.

Although the new intersection of Parade Avenue and Soquel Drive would operate acceptably with installation of a signal, it does not meet signal warrants. Signal installation is also problematic in terms of interaction with other nearby signalized intersections. Therefore, TJKM recommends one-way stop control on Parade Avenue, with only right turns permitted onto Soquel Drive during all hours. This is because even during off peak hours, left turns from Parade Avenue are expected to operate at an unacceptable LOS. Motorists desiring to travel east on Soquel Drive can be rerouted easily to the Valencia/Trout Gulch intersection, then south to the Trout Gulch/Soquel Drive intersection.

Under Cumulative (2025) Conditions, all of the study intersections are expected to continue operating acceptably except the following two intersections:

- *Soquel Drive/Aptos Rancho Road:* This intersection is expected to operate unacceptably at LOS E due to forecasted cumulative year traffic conditions. With the recommended conversion of Aptos Rancho Road split phasing to permissive left-turn phasing, the intersection is expected to operate at an acceptable LOS D. There is sufficient capacity for left turns, and no protected left turn arrow is required for the minor street.
- *Soquel Drive/State Park Drive/Sunset Way:* This intersection is expected to operate at unacceptable LOS E due to forecasted cumulative year traffic conditions. Installing an exclusive eastbound right-turn lane on Soquel Drive is expected to improve intersection service levels to an acceptable LOS D. Since a full-width lane may provide right-of-way issues on the southwest corner of the intersection, TJKM recommends that the County

consider a narrower lane. Under a.m. peak hour conditions, this mitigation would also yield an acceptable LOS D.

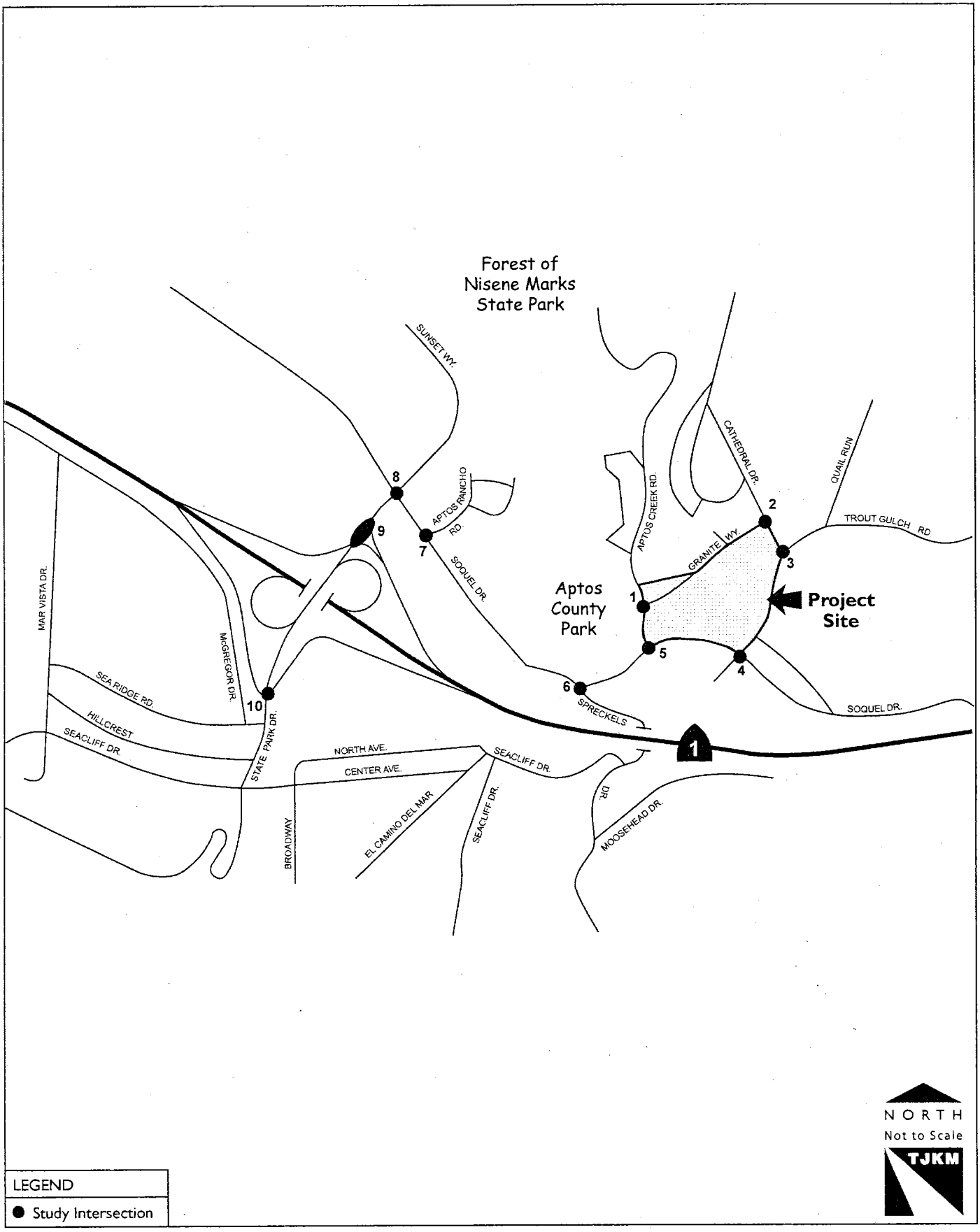
Under Cumulative (2025) plus Project Conditions, three of the thirteen study intersections are expected to operate unacceptably with the addition of Aptos Village project traffic (Soquel Drive/ Aptos Rancho Road, Soquel Drive/State Park Drive/Sunset Way, and Soquel Drive/Parade Avenue). The mitigations identified under the previous scenario (Cumulative Conditions) are expected to yield acceptable LOS at the two existing intersections. Additionally, although the new intersection of Soquel Drive/ Parade Avenue would operate acceptably with a signal, it is not warranted. Instead, TJKM recommends one-way stop control and right turns only on southbound Parade Avenue, due to lack of signal warrants and potential traffic pattern problems at the nearby intersection of Soquel Drive and Trout Gulch Road.

In conclusion, with the above recommended mitigations needed to address unacceptable operations under either Existing or Cumulative Conditions without the project, added traffic from the Aptos Village Mixed-Use Development is not expected to result in any unacceptable traffic operations.

Santa Cruz County – Aptos Village Update

Figure 1

## Vicinity Map

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## Intersection Analysis Methodology

### Study Intersections and Scenarios

The traffic study focused on evaluating traffic conditions at 10 existing and 3 future study intersections in the vicinity that proposed project may potentially impact. The study intersections were selected by County staff, and are listed below:

1. Aptos Creek Road/Granite Way (existing intersection) or Aptos Creek Road/Valencia Street (future intersection)
2. Cathedral Drive/Granite Way
3. Cathedral Drive/Trout Gulch Road
4. Soquel Drive/Trout Gulch Road
5. Soquel Drive/Aptos Creek Road
6. Soquel Drive/Spreckels Drive
7. Soquel Drive/Aptos Rancho Road/Rancho Aptos Drive
8. Soquel Drive/State Park Drive/Sunset Way
9. State Park Drive/Highway 1 Northbound Ramps
10. State Park Drive/Highway 1 Southbound Ramps
11. Valencia Street/Parade Avenue (future intersection)
12. Valencia Street/Trout Gulch Road (future intersection)
13. Soquel Drive/Parade Avenue (future intersection)

The following five scenarios were addressed in this traffic study:

1. *Existing Conditions* – This scenario evaluates existing traffic volumes and roadway conditions based on the current traffic counts and the field surveys.
2. *Existing plus Approved Conditions* – Same as the previous scenario, but with the addition of the trips from approved projects.
3. *Existing plus Approved plus Proposed Project Conditions* – This scenario is similar to Existing plus Approved Conditions, but with the expected trips to be generated by the proposed Aptos Village Mixed-Use Development.
4. *Cumulative (Year 2025) Conditions* – Cumulative (year 2025) traffic volumes were forecasted based on an annual growth rate of 1.3 percent per year as directed by County staff.
5. *Cumulative (Year 2025) plus Proposed Project Conditions* – This scenario is similar to Cumulative Conditions, but with the added project generated trips.

### Level of Service Analysis Methodology

Level of service (LOS) is a qualitative description of traffic operating conditions, including expected traffic conflicts and delay. Levels of service describe these conditions in terms of such factors as speed, travel time, delays, freedom to maneuver, traffic interruptions, comfort, convenience and safety. Levels of service are given letter designations ranging from A to F. LOS A indicates free-flow conditions with little or no delay and LOS F indicates congested conditions with excessive delays and long backups. Various methodologies are used to determine LOS at specific roadway facilities, including signalized and unsignalized intersections, rural two-lane and multi-lane highways, urban arterials and freeways.

Unsignalized study intersections were evaluated using the appropriate methodologies for One-, Two-and All-Way STOP-controlled intersections contained in the *2000 Highway Capacity Manual.* These methodologies report peak hour operating conditions based on average control delay (length of time a vehicle waits to pass through the intersection from the end of a queue) for all vehicles entering the intersection for All-Way STOP-controlled intersections, and based on average control delay of the critical movements (stopping and yielding movements) for One- and Two-Way STOP controlled intersections.

Signalized intersections were evaluated using the corresponding methodology contained in the *2000 Highway Capacity Manual.* This methodology reports peak hour operating conditions based on average control delay for all vehicles entering the intersection.

Appendix A contains detailed descriptions of all the LOS methodologies.

**Significant Impact Criteria**

The County of Santa Cruz's LOS standard is LOS C. Intersections that fall below LOS D are considered impacted and should be considered for mitigation. The County will accept LOS D if there are valid constraints, such as right-of-way, geography, financial, or others.

## Existing Traffic Conditions

### Roadway Network

The project site and surrounding study area are illustrated in Figure 1. Important roadways serving the project site are discussed below.

*Highway 1* is a north-south freeway extending along the coast of California. In the project vicinity, Highway 1 runs east-west and carries approximately 83,000 vehicles per day near its interchange with State Park Drive. This highway provides regional access to the project area, and serves as the connector to State Route 17 in Santa Cruz and to State Route 156 in Castroville.

*Soquel Drive* is a two-to-six-lane roadway that serves as a major arterial in the area. The road runs parallel to Highway 1, extending from just west of Freedom Boulevard in Aptos Village westerly to the City of Santa Cruz. Abutting land uses are primarily commercial, office and light industrial.

*State Park Drive* is a two-lane arterial that runs north-south and is approximately half a mile west of the project site. The road also extends from Soquel Drive southerly to Seacliff State Beach at the south end.

*Aptos Creek Road* runs north-south and is located adjacent and to the west of the project site. It is a two-lane road providing access to the Aptos County Park and the Forest of Nisene Marks State Park.

*Cathedral Drive* runs north-south and is located to the east of the project site. It is generally a two-lane road that extends northerly from Soquel Drive. It provides access to residents along both sides of the street.

*Granite Way* is an east-west road connecting Aptos Creek Road on its west end and Cathedral Drive on its east end.

*Trout Gulch Road* is a north-south two-lane collector that provides access to residential uses north of Highway 1.

### Intersection Level of Service Analysis

Figure 2 shows the current peak hour turning movement volumes at the study intersections. The traffic counts were conducted during October 2006 and December 2007 for nine of the ten study intersections (except for State Park Drive/Soquel Drive intersection) and they are provided in Appendix B.

For the intersection of State Park Drive/Sunset Way/Soquel Drive, the turning movement counts were obtained from the Poor Clares Senior Residential Housing Project traffic study dated February 14, 2009 performed by Fehr & Peers, and the counts were conducted during April 2008. It should be noted that the counts collected during April 2008 showed significantly lower volumes on northbound State Park Drive approach compared to the traffic counts collected during December 2007. It appears that the significantly higher traffic counts recorded during December 2007 at this intersection are likely due to event related traffic or holiday season peak. Thus, the traffic study conducted by Fehr & Peers for Poor Clares project balanced the traffic volume by reducing the peak hour data reasonably at the State Park Drive/Highway 1 ramp intersections. To be consistent, TJKM utilized the traffic data from the Poor Clares traffic study report for the

intersection State Park Drive/Sunset Way/Soquel Drive and the two ramp intersections with Highway 1.

Figure 3 illustrates the existing intersection lane configurations. It should be noted that the left-turn movement from westbound Soquel Drive onto southbound Spreckels Drive (Intersection 6) is currently prohibited during the a.m. and the p.m. peak hours. The analysis assumes this left-turn prohibition remains effective for all future scenarios analyzed. Table I summarizes the results of the intersection LOS analysis for existing conditions. Detailed calculations are contained in Appendix C.

**Table I: Intersection LOS – Existing Conditions**

| *ID* | *Intersection* | *Control* | *P.M. Peak Hour* | |
|---|---|---|---|---|
| | | | *Delay* | *LOS* |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 9.6 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 12.6 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **26.9** | **D** |
| | *Recommended Mitigation: Install a signal and a westbound left-turn lane* | *Signal* | *27.7* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | **47.2** | **E** |
| | *Recommended Mitigation: Install a signal and an eastbound left-turn lane* | *Signal* | *10.3* | *B* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 12.8 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 30.1 | C |
| 8 | Soquel Drive/ State Park Drive/Sunset Way | Signal | 35.6 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 8.6 | A |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 6.8 | A |

Note: Delay = Overall average intersection delay for Signalized/All-way Stop control intersections or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service

Under Existing Conditions, eight out of ten study intersections operate at acceptable service levels during the p.m. peak hour. The following two intersections operate unacceptably during the p.m. peak hour:

- *Soquel Drive/Trout Gulch Road:* This all-way stop controlled intersection currently operates at LOS D during the p.m. peak hour. Signalization and installation of an exclusive westbound left-turn lane is expected to improve the intersection operating condition to an acceptable level.
- *Soquel Drive/Aptos Creek Road:* This one-way stop control intersection operates at LOS E during the p.m. peak hour. The recommended mitigation is to install a traffic signal and an exclusive eastbound left-turn lane on Soquel Drive.

The recommended mitigations are expected to improve the operation of the above intersections to acceptable County LOS standards of LOS C or better. These mitigations are part of the current County capital improvement program and are currently under design. Figure 4 summarizes the recommended mitigations for Existing Conditions.

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# Existing Turning Movement Volumes

Figure 2

| Intersection #1<br>Aptos Creek/Valencia | Intersection #2<br>Granite/Cathedral | Intersection #3<br>Trout Gulch/Cathedral | Intersection #4<br>Soquel/Trout Gulch | Intersection #5<br>Soquel/Aptos Creek |
|---|---|---|---|---|
| 102, 10, 5, 15, 34, 72 | 1, 76, 1, 26, 6, 137 | 9, 264, 14, 178, 198, 339 | 301, 19, 175, 11, 169, 76, 345, 305, 46, 45, 17, 20 | 86, 31, 27, 414, 79, 655 |

| Intersection #6<br>Soquel/Spreckels | Intersection #7<br>Soquel/Aptos Rancho | Intersection #8<br>Sunset/Soquel | Intersection #9<br>State Park/NB Hwy. 1 Ramps | Intersection #10<br>State Park/SB Hwy. 1 Ramps |
|---|---|---|---|---|
| 531, 4, 700, 201, 139, 73 | 16, 2, 7, 835, 8, 131, 11, 660, 90, 174, 2, 98 | 7, 66, 57, 613, 9, 355, 23, 257, 592, 274, 67, 182 | 455, 638, 373, 141, 443, 149 | 545, 234, 371, 2, 298, 221, 270 |

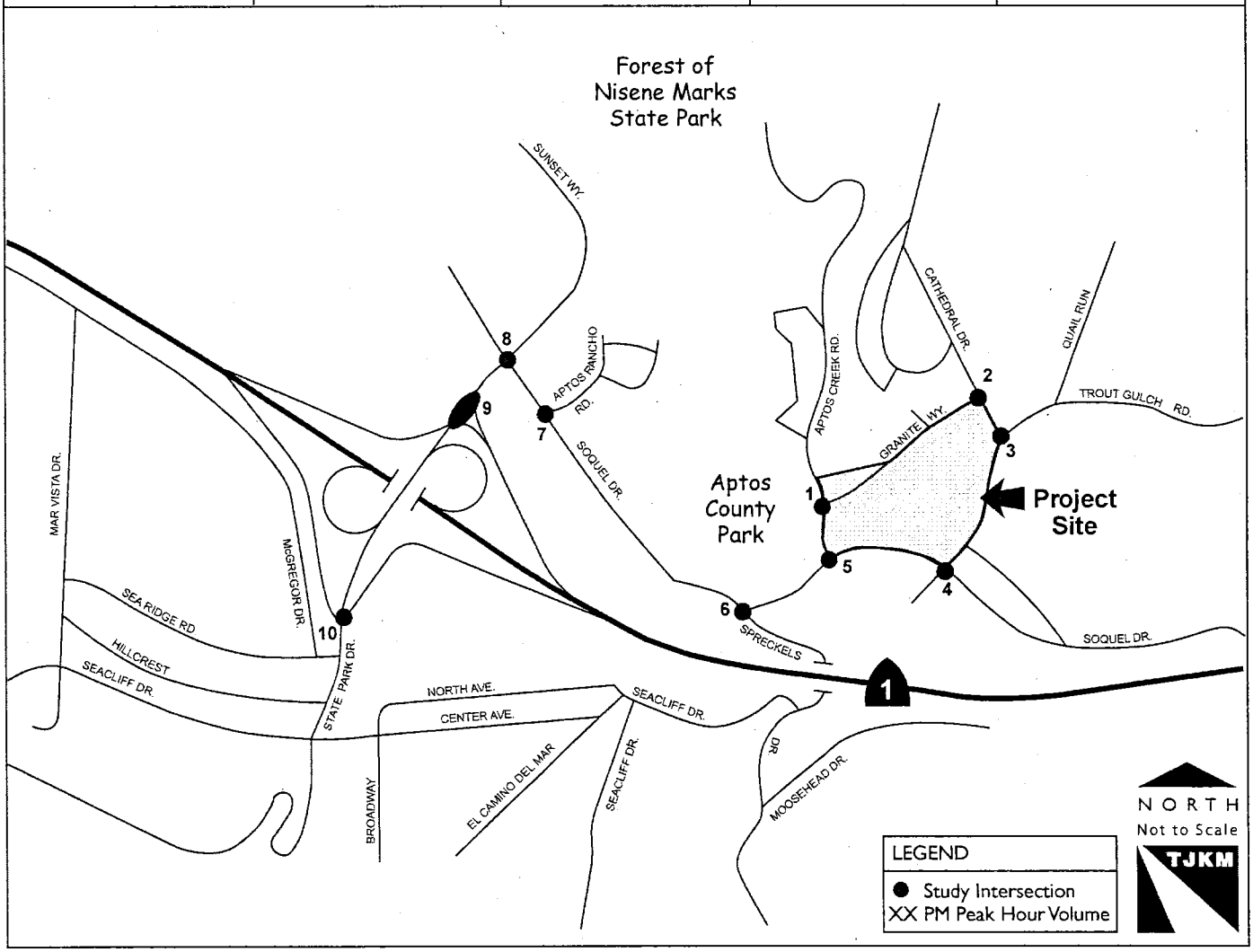


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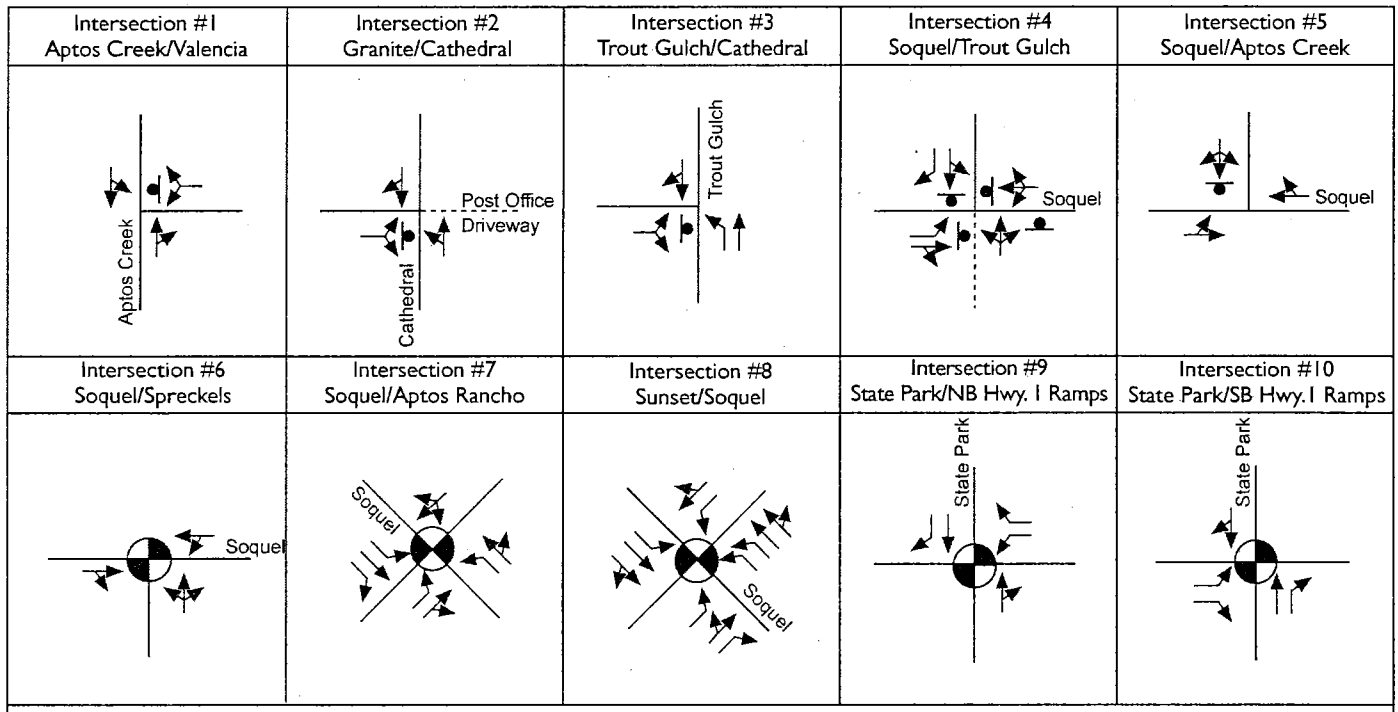
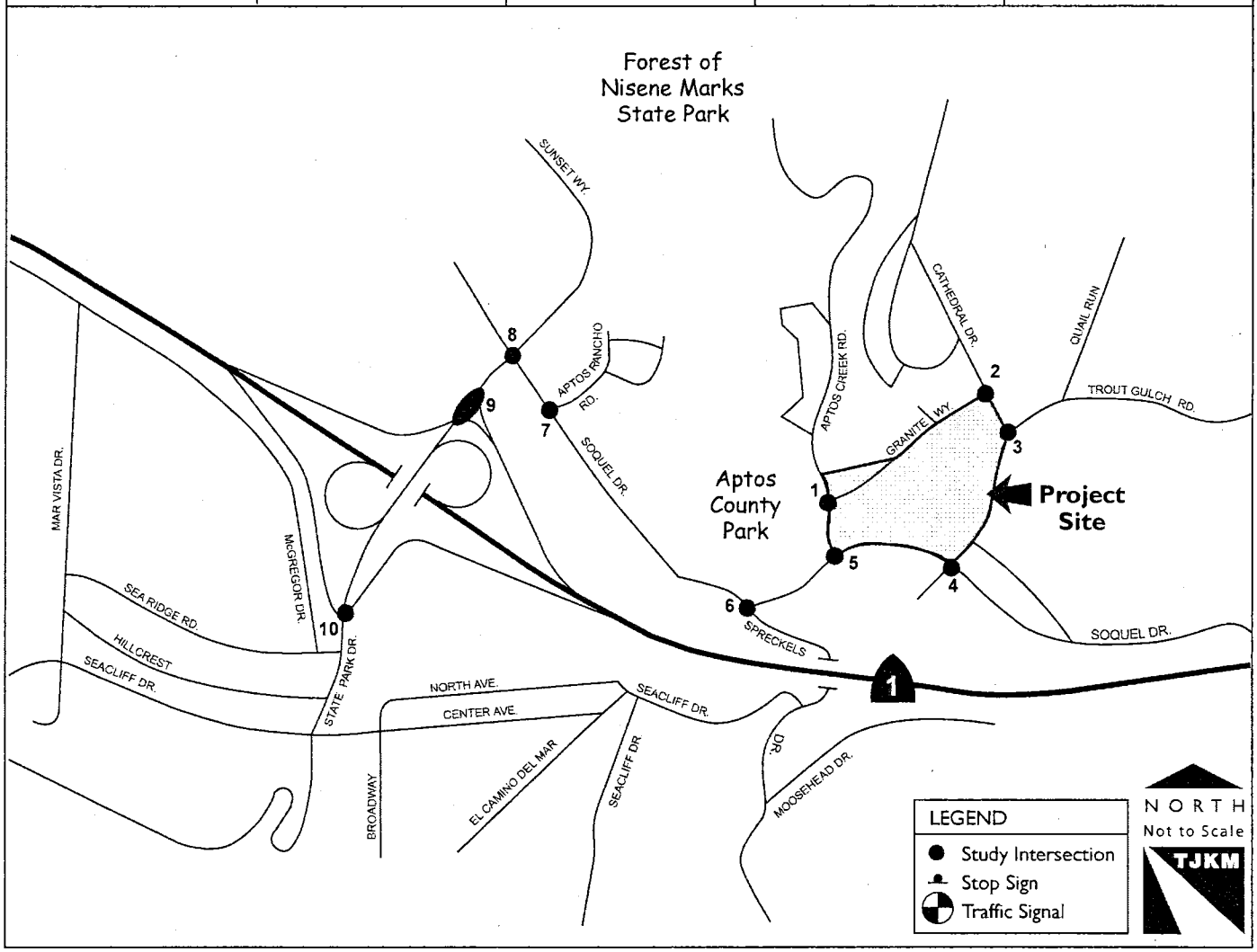
Figure 3

## Existing Lane Geometry

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# Recommended Mitigations for Existing Lane Geometry

Figure 4

| Intersection #1 Aptos Creek/Granite | Intersection #2 Granite/Cathedral | Intersection #3 Trout Gulch/Cathedral | Intersection #4 Soquel/Trout Gulch | Intersection #5 Soquel/Aptos Creek |
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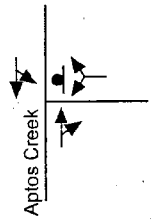
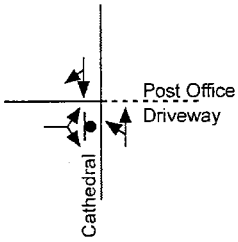
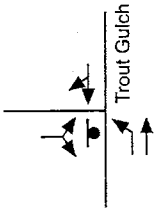
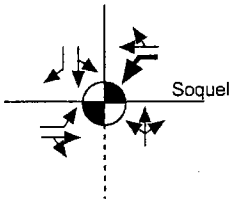
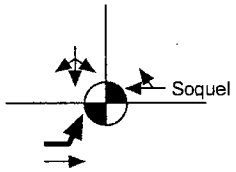
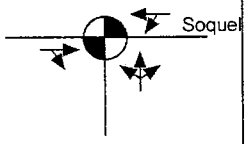
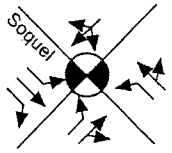
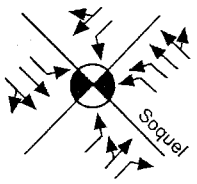
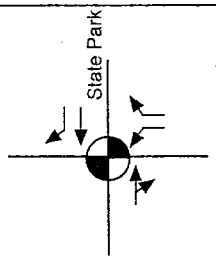
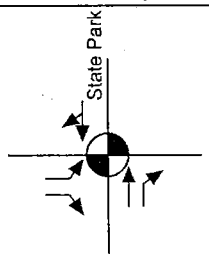
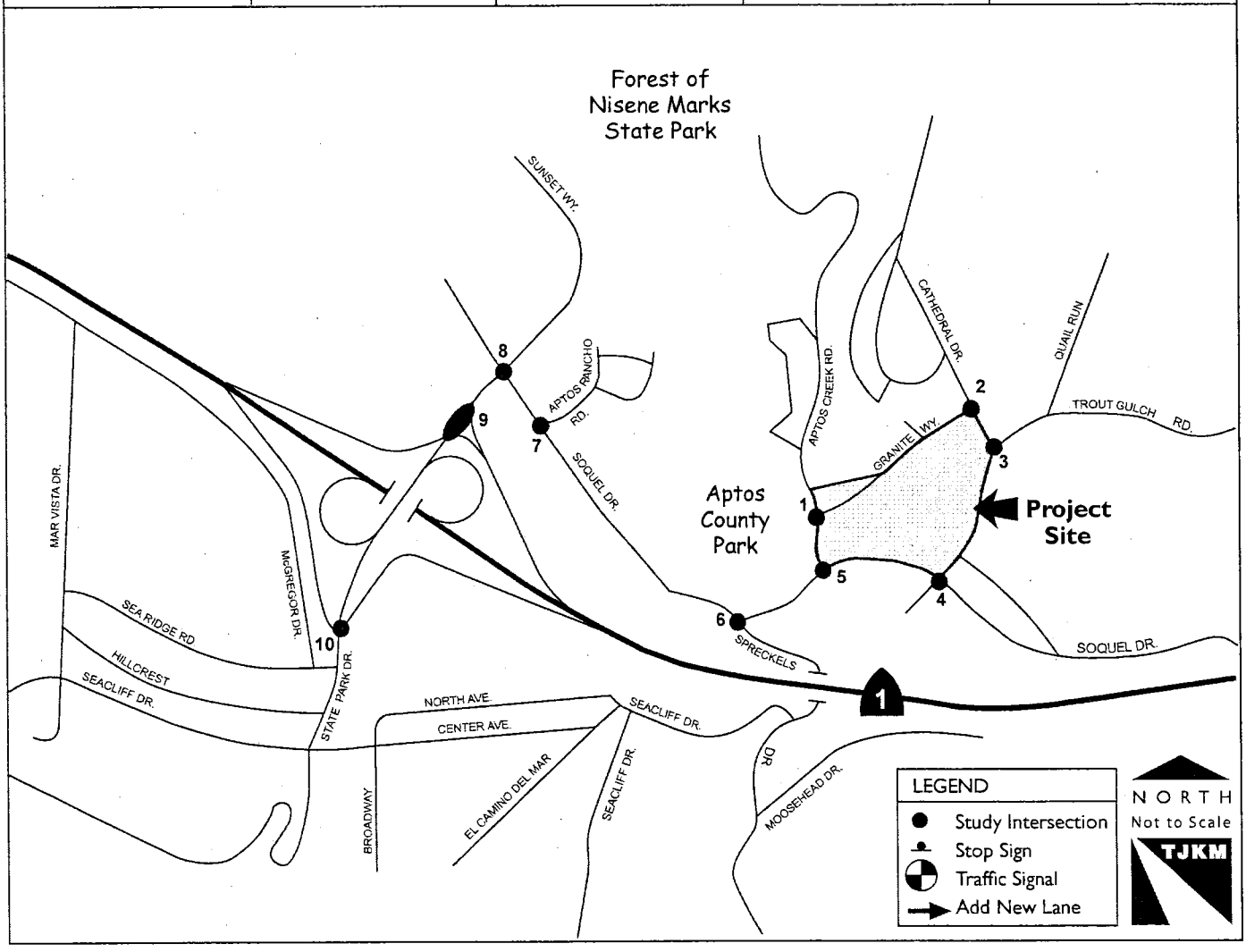
|  |  |  |  |  |
| **Intersection #6 Soquel/Spreckels** | **Intersection #7 Soquel/Aptos Rancho** | **Intersection #8 Sunset/Soquel** | **Intersection #9 State Park/NB Hwy. 1 Ramps** | **Intersection #10 State Park/SB Hwy.1 Ramps** |
|  |  |  |  |  |



## Existing plus Approved Conditions

This Scenario is similar to Existing Conditions, but with the addition of traffic from County-approved developments within the project vicinity. Approved projects consist of developments that were either under construction, were built but not fully occupied, or that were not built but had final development approval from the County, when the Existing traffic volume counts were conducted. Based on recent communication with County staff (September 2009), the approved projects shown in Table II are expected to generate traffic through the study intersections.

**Table II: Trip Generation Summary for Approved Projects**

| No. | Land Use (ITE Code) | Size | Daily Rate | Daily Trips | A.M. Peak Hour | | | | P.M. Peak Hour | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | Trip Rate | In | Out | Total | Trip Rate | In | Out | Total |
| 1 | Medical-Dental Office Building (720) | 3.3 ksf | 36.13 | 119 | 2.48 | 6 | 2 | 8 | 3.72 | 3 | 9 | 12 |
| | S.F. Detached (210) | 2.0 d.u. | 9.57 | 19 | 0.75 | 0 | 1 | 2 | 1.01 | 1 | 1 | 2 |
| 2 | Medical-Dental Office Building (720) | 0.93 ksf | 36.13 | 34 | 2.48 | 2 | 0 | 2 | 3.72 | 1 | 3 | 3 |
| | S.F. Detached (210) | 1.0 d.u. | 9.57 | 10 | 0.75 | 0 | 1 | 1 | 1.01 | 1 | 0 | 1 |
| 3 | General Office Building (710) | 1.4 ksf | 11.01 | 15 | 1.55 | 2 | 0 | 2 | 1.49 | 0 | 2 | 2 |
| | S.F. Detached (210) | 2.0 d.u. | 9.57 | 19 | 0.75 | 0 | 1 | 2 | 1.01 | 1 | 1 | 2 |
| 4 | General Office Building (710) | 10.0 ksf | 11.01 | 110 | 1.55 | 14 | 2 | 16 | 1.49 | 3 | 12 | 15 |
| 5 | Church (560) | - | - | - | - | 36 | 0 | 36 | - | 30 | 18 | 48 |
| 6 | Res. Condo/ Townhouse (230) | 10.0 d.u. | 5.86 | 59 | 0.44 | 1 | 4 | 4 | 0.52 | 3 | 2 | 5 |
| 7 | Res. Condo/ Townhouse (230) | 12.0 d.u. | 5.86 | 70 | 0.44 | 1 | 4 | 5 | 0.52 | 4 | 2 | 6 |
| 8 | Res. Condo/ Townhouse (230) | 28.0 d.u. | 5.86 | 164 | 0.44 | 2 | 10 | 12 | 0.52 | 10 | 5 | 15 |
| 9 | Res. Condo/ Townhouse (230) | 43.0 d.u. | 5.86 | 252 | 0.44 | 3 | 16 | 19 | 0.52 | 15 | 7 | 22 |
| 10 | Apartments (220) – Net Total (41 new minus 10 existing d.u.) | 31 d.u. | 6.72 | 330 | 0.51 | 4 | 15 | 19 | 0.62 | 22 | 12 | 34 |
| 11 | Senior Housing – Detached (251) | 110 d.u. | 3.71 | 408 | 0.22 | 8 | 16 | 24 | 0.27 | 18 | 12 | 30 |
| 12 | Townhomes (230) | 19 d.u. | 5.86 | 111 | 0.44 | 1 | 7 | 8 | 0.52 | 7 | 3 | 10 |
| 13 | Hotel (310) | 12 rooms | 8.17 | 98 | 0.56 | 4 | 3 | 7 | 0.59 | 4 | 3 | 7 |
| | Quality Restaurant (931) | 45 seats | 2.86 | 129 | 0.03 | 1 | 1 | 2 | 0.26 | 8 | 4 | 12 |
| | **Total** | | | **1,947** | | **85** | **83** | **169** | | **131** | **96** | **226** |

Notes: ksf = 1000 square feet; d.u. = Dwelling Units
Source: *ITE Trip Generation*, 7th Edition

### Approved Projects Trip Generation

Trip generation is defined as the number of "vehicle trips" produced by a particular land use or project. A trip is defined as having an origin and a destination, and is not a round trip. The total number of trips generated by each land use includes the inbound and outbound trips.

Trip generation estimates for the approved projects were based on empirical observations at similar land uses. The rates are contained in the standard reference Trip Generation, 7th Edition, published by the Institute of Transportation Engineers (ITE). Table II summarizes the trip generation assumption for the approved projects. The approved projects are expected to generate approximately 1,947 daily trips, with 169 trips during the a.m. peak hour and 226 trips during the p.m. peak hour. It should be noted that this traffic study is limited to the analysis of the p.m. peak hour conditions.

**Approved Projects Trip Distribution and Assignment**

Trip distribution is the process of determining in what proportion vehicles would travel between the project site and various destinations within a study area. Trip assignment is the process of determining the various paths vehicles would take from the project site to each destination. Trip distribution assumptions were developed based on existing traffic counts, knowledge of the area, and consultation with County staff. Figure 5 illustrates the assignment of the approved project trips to the study intersections.

The trips generated by the approved projects were added to the existing volumes to forecast the turning volumes under the Existing plus Approved Conditions.

**Intersection Level of Service Analysis**

Figure 6 shows the forecasted turning movement volumes at the study intersections under the Existing plus Approved scenario. Table III summarizes the results of the intersection LOS analysis. Detailed calculations are contained in Appendix D. Under this scenario, the same eight study intersections that currently operate at acceptable service levels are expected to continue operating acceptably. The mitigations identified in the previous scenario (Existing Conditions) are expected to be able to accommodate approved project traffic as well.

The following two intersections are expected to continue to operate unacceptably under the Existing plus Approved conditions:

- *Soquel Drive/Trout Gulch Road:* This All-way Stop controlled intersection currently operates at LOS D during the p.m. peak hour.
  *Recommended mitigation:* Signalization and installation of an exclusive westbound left-turn lane is expected to improve the intersection operating condition to an acceptable level.
- *Soquel Drive/Aptos Creek Road:* This One-way Stop control intersection operates at LOS F during the p.m. peak hour.
  *Recommended mitigation:* Install a traffic signal and an exclusive eastbound left-turn lane on Soquel Drive.

Both of the above mitigations are part of the current County capital improvement program and are currently under design.

**Table III: Intersection LOS – Existing + Approved Conditions**

| ID | Intersection | Control | P.M. Peak Hour | |
|---|---|---|---|---|
| | | | Delay | LOS |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 9.6 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 12.7 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **29.7** | **D** |
| | *Recommended Mitigation: Install a signal and a westbound left-turn lane* | *Signal* | *27.2* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | **66.7** | **F** |
| | *Recommended Mitigation: Install a signal and an eastbound left-turn lane* | *Signal* | *9.8* | *A* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 13.1 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 33.3 | C |
| 8 | Soquel Drive/Sunset Way/State Park Drive | Signal | 39.1 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 9.3 | A |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 7.1 | A |

Note: Delay = Overall average intersection delay for Signalized/All-way Stop control intersections or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service

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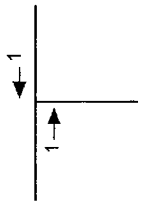
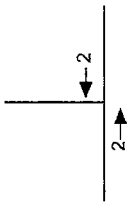
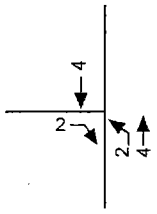
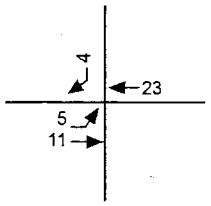
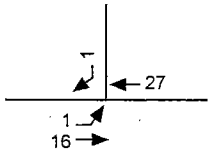
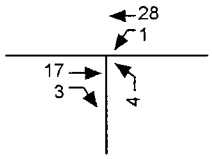
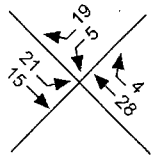
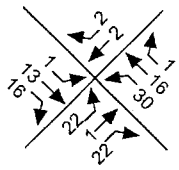
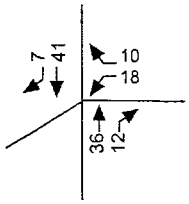
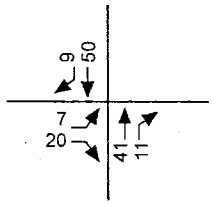
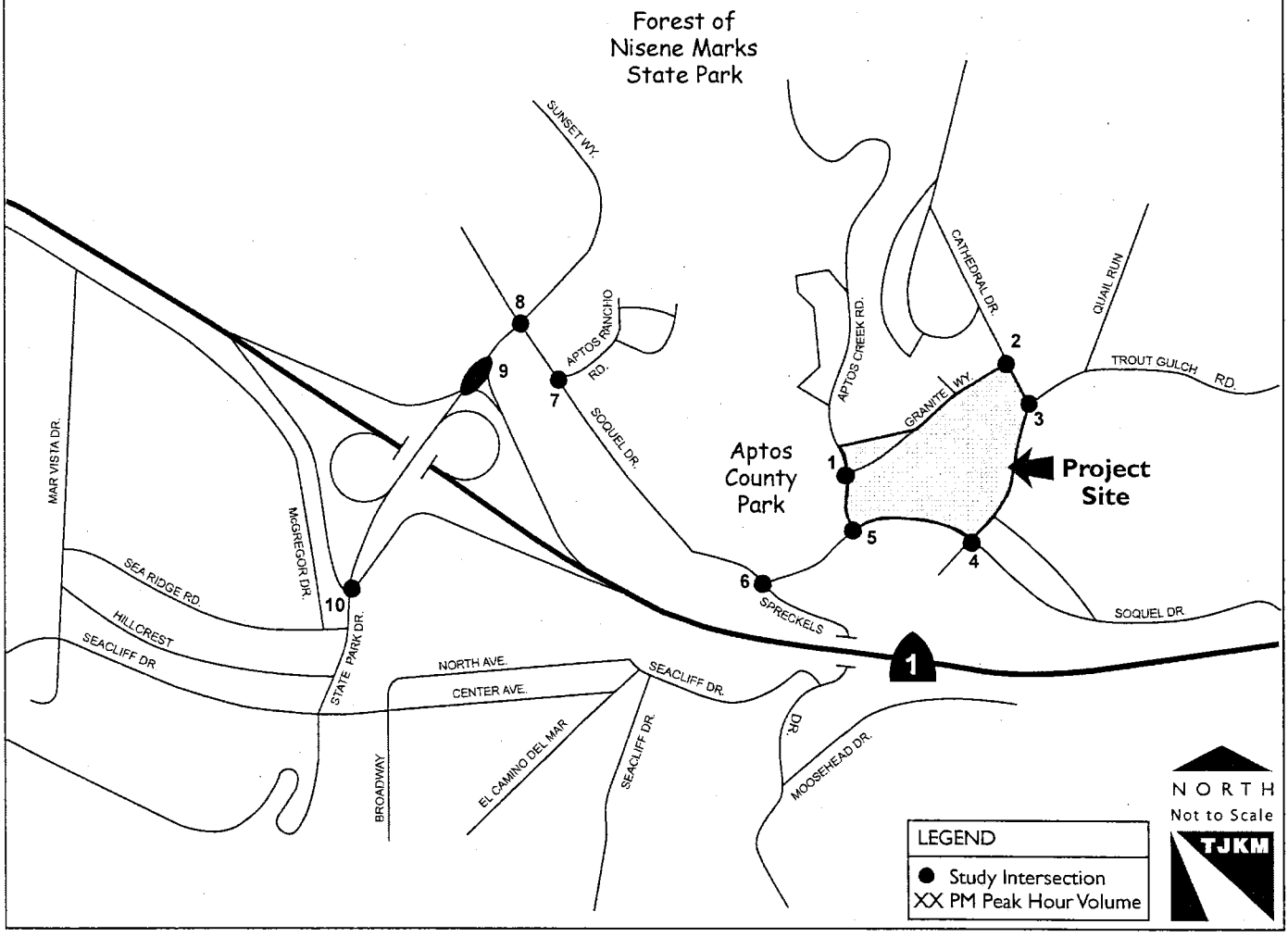
## Assignment of Approved Project Trips

Figure 5

| Intersection #1<br>Aptos Creek/Granite | Intersection #2<br>Granite/Cathedral | Intersection #3<br>Trout Gulch/Cathedral | Intersection #4<br>Soquel/Trout Gulch | Intersection #5<br>Soquel/Aptos Creek |
|---|---|---|---|---|
|  |  |  |  |  |
| **Intersection #6**<br>**Soquel/Spreckels** | **Intersection #7**<br>**Soquel/Aptos Rancho** | **Intersection #8**<br>**Sunset/Soquel** | **Intersection #9**<br>**State Park/NB Hwy. 1 Ramps** | **Intersection #10**<br>**State Park/SB Hwy. 1 Ramps** |
|  |  |  |  |  |



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## Existing + Approved Turning Movement Volumes

Figure 6

| Intersection #1<br>Aptos Creek/Granite | Intersection #2<br>Granite/Cathedral | Intersection #3<br>Trout Gulch/Cathedral | Intersection #4<br>Soquel/Trout Gulch | Intersection #5<br>Soquel/Aptos Creek |
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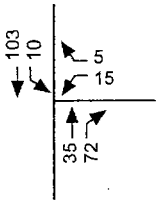
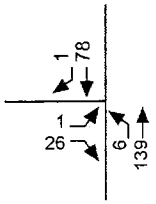
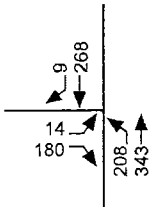
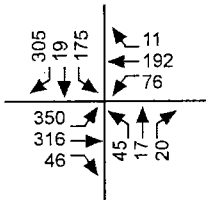
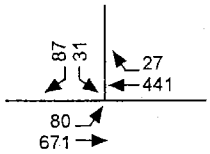
|  |  |  |  |  |
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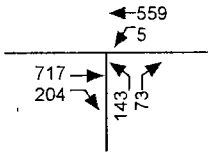
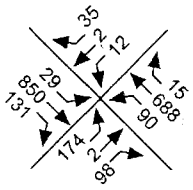
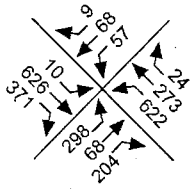
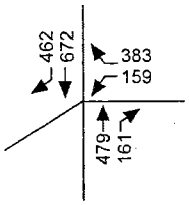
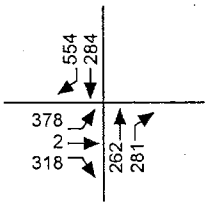
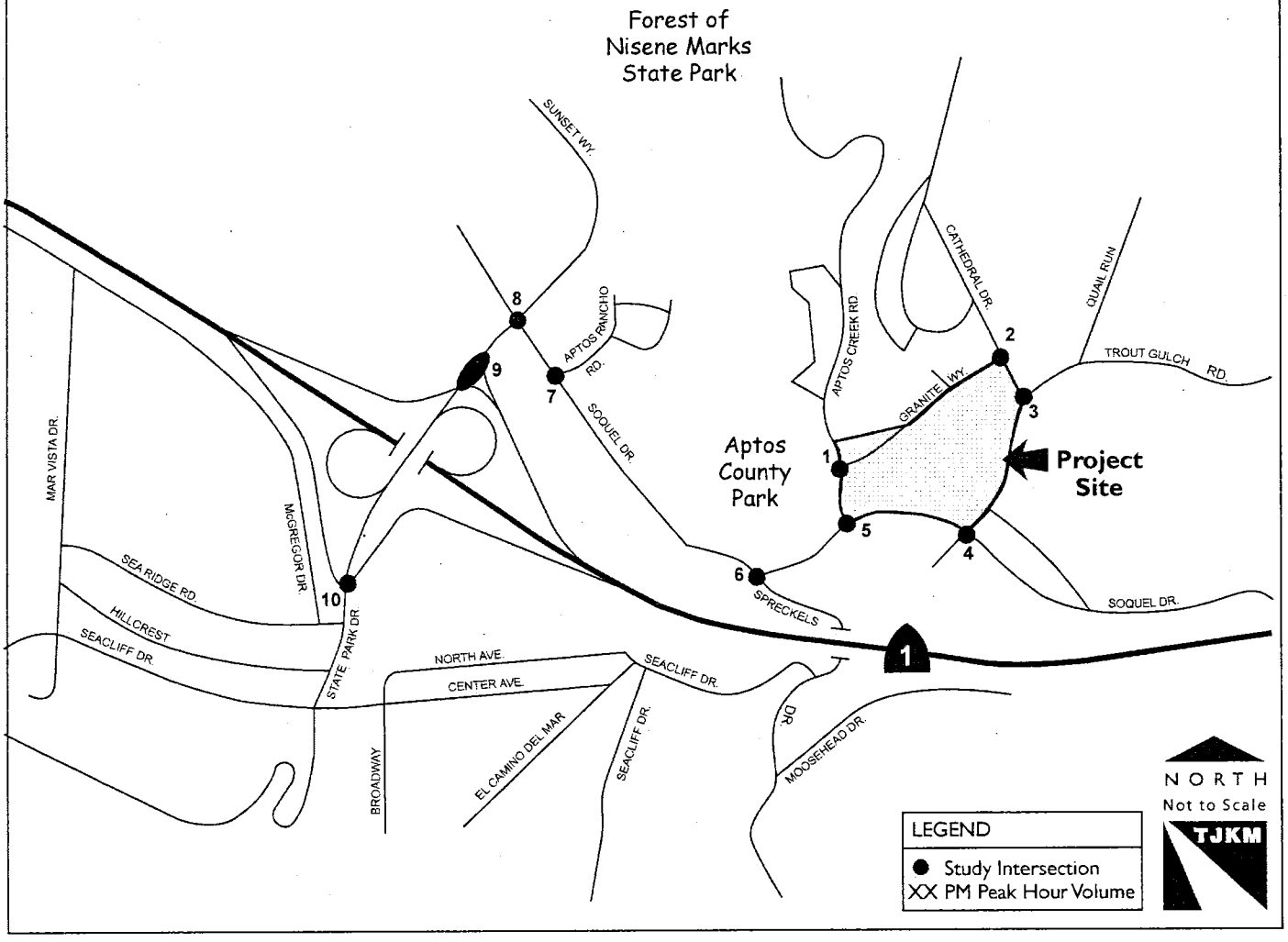
|  |  |  |  |  |

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## Existing plus Approved plus Project Conditions

This Scenario is similar to the Existing plus Approved Conditions, but with traffic added from the proposed Aptos Village mixed-use development. The project is comprised of 74,950 square feet of neighborhood commercial retail and 63 multi-family residential units on three lots with assessor's parcel numbers (APN) of 041-011-20 (4.02 acres), 041-011-03 (1.1 acres), and 041-011-33 (2.5 acres). Lot number 041-011-33 is already partially developed, with approximately 60 percent of the area (1.5 acres) remaining for development. The proposed project would occupy a currently combined vacant land area of approximately 6.62 acres. The project site is bounded by existing residential uses to the north, a post office to the east, and commercial uses to the west and south. The project will have access from Aptos Creek Road, Trout Gulch Road, and Soquel Drive.

Figure 7 shows the proposed project's preliminary site plan. A new roadway, Valencia Street, runs through the project site in an east-west direction between Trout Gulch Road and Aptos Creek Road. With the development of the project, Granite Way would be re-aligned north-south as a cul-de-sac adjacent to the project site. Parade Avenue runs north-south between Valencia Street and Soquel Drive as shown in the site plan.

### Project Trip Generation

The project consists of neighborhood commercial retail and multi-family residential uses. The project trip generation was estimated based on rates provided in Trip Generation, 7th Edition, published by the Institute of Transportation Engineers (ITE). Table IV shows the expected trip generation for the proposed project. As shown, the proposed project is expected to generate approximately 3,650 daily trips, with 113 trips occurring during the a.m. peak hour and 322 trips during the p.m. peak hour.

**Table IV: Proposed Project Trip Generation**

| *Land Use Type (ITE Code)* | *Size* | *Daily* | | *A.M. Trips* | | | *P.M. Trips* | | |
|---|---|---|---|---|---|---|---|---|---|
| | | *Rate* | *Total* | *In* | *Out* | *Total* | *In* | *Out* | *Total* |
| Neighborhood Commercial Retail (820) | 74.95 ksf | 42.92 | 3,217 | 47 | 30 | 77 | 135 | 146 | 281 |
| Multi Family Residential (230) | 63 d.u. | 6.87* | 433 | 5 | 31 | 36 | 27 | 14 | 41 |
| **Total** | | | **3,650** | **52** | **61** | **113** | **162** | **160** | **322** |

Source: *ITE Trip Generation*, 7th Edition
Note: d.u. = Dwelling Units
KSF = 1000 Square Foot
* =Regression equation was used

**Project Trip Distribution and Assignment**

Trip distribution assumptions for the Aptos Village project were developed based on existing travel patterns, knowledge of the study area, and input from County staff. These assumptions are shown in Figure 8. Project trips are expected to travel to and from the site according to the distribution assumptions described below:

- 30 percent to/from the north via Highway 1
- 20 percent to/from the south via Highway 1
- 10 percent to/from the east via Soquel Drive
- 8 percent to/from the west via Soquel Drive
- 8 percent to/from the east via Trout Gulch Road
- 5 percent to/from the north via Cathedral Drive
- 5 percent to/from the south via Spreckels Drive
- 5 percent to/from the west via McGregor Drive
- 3 percent to/from the south via Central Avenue
- 2 percent to/from the west via Seacliff Drive
- 2 percent to/from the north via Sunset Way
- 2 percent to/from the north via Aptos Creek Road

Figure 9 shows the assignment of the proposed project trips.

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Figure 7

## Preliminary Site Plan

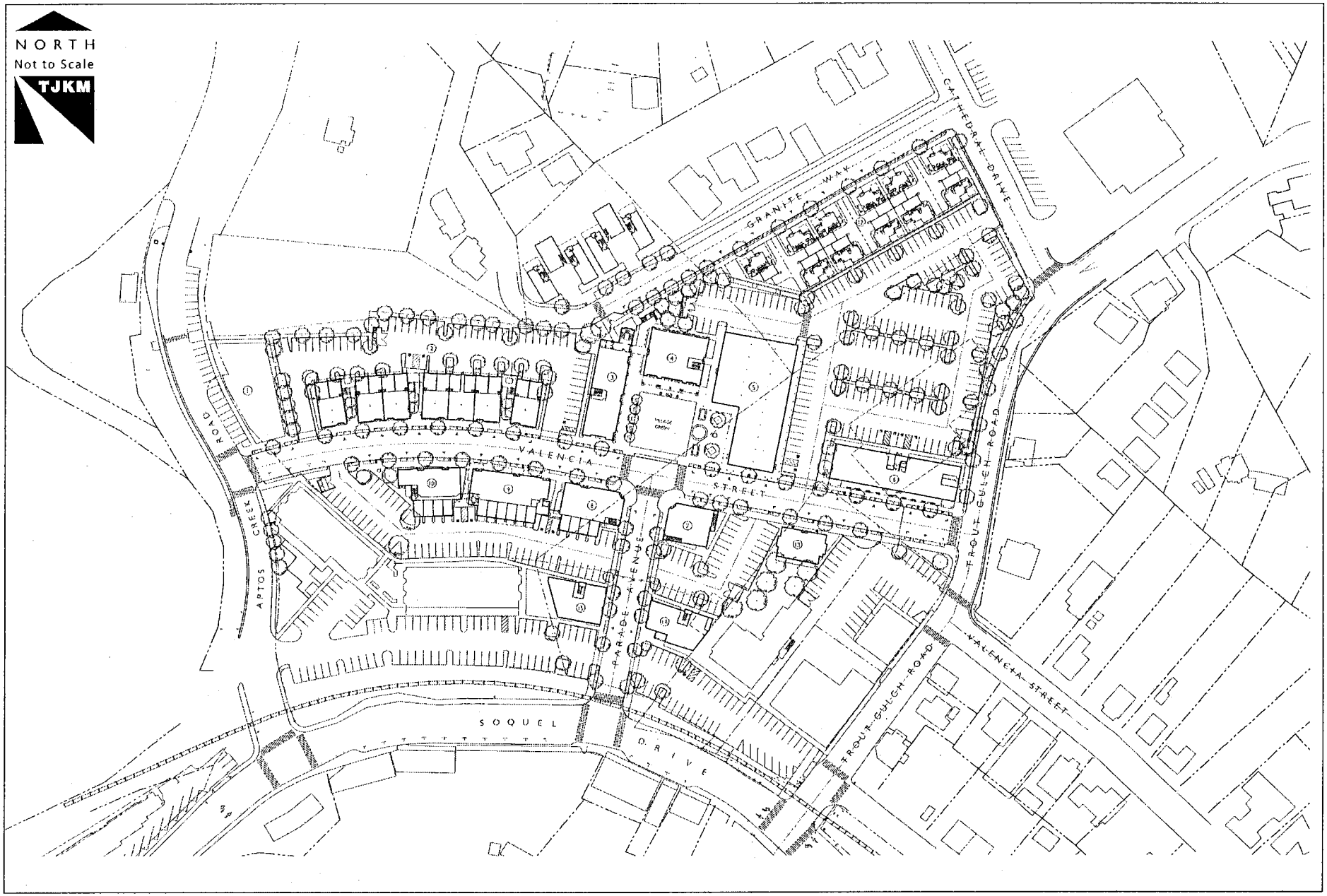


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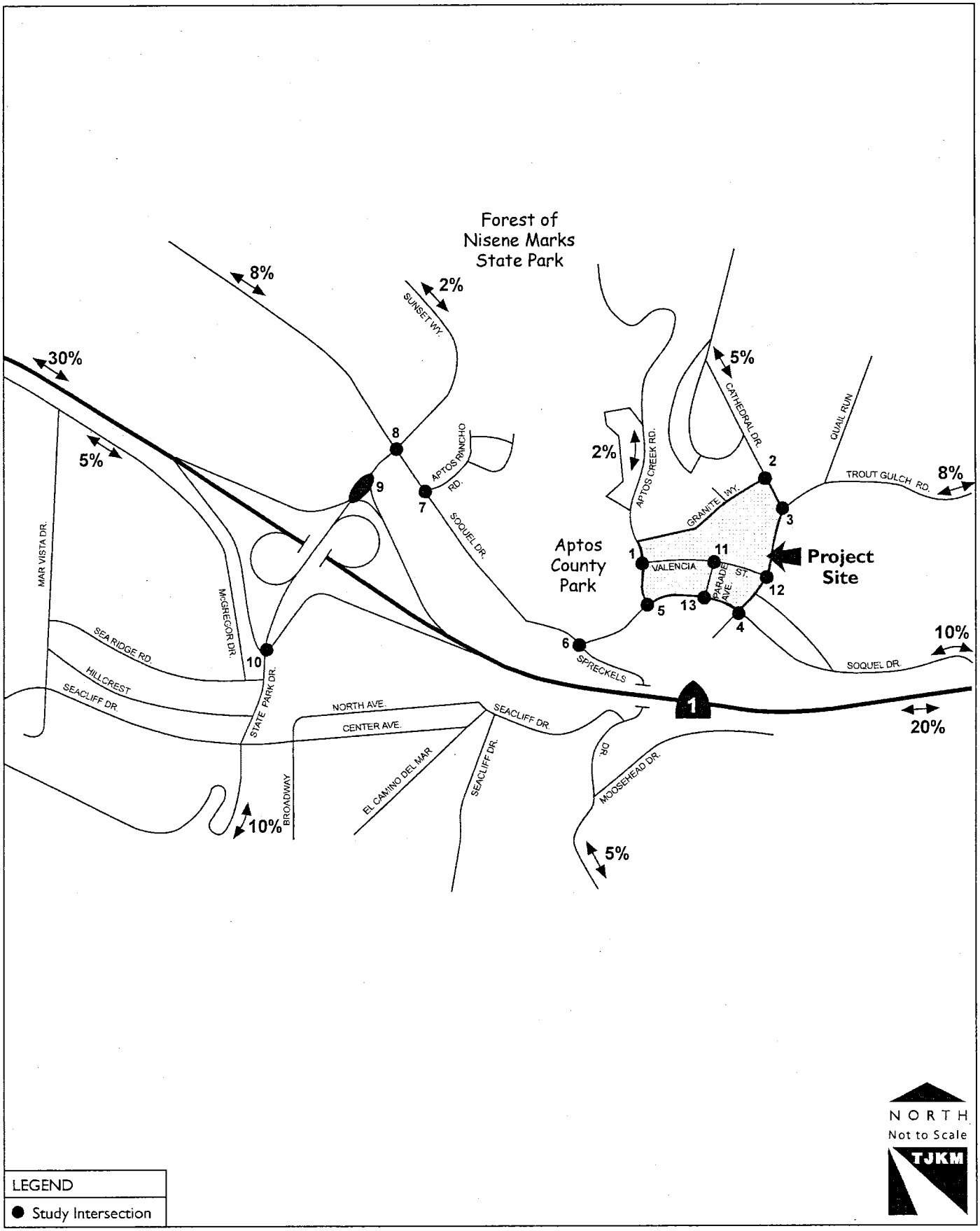
Figure 8

## Project Trip Distribution

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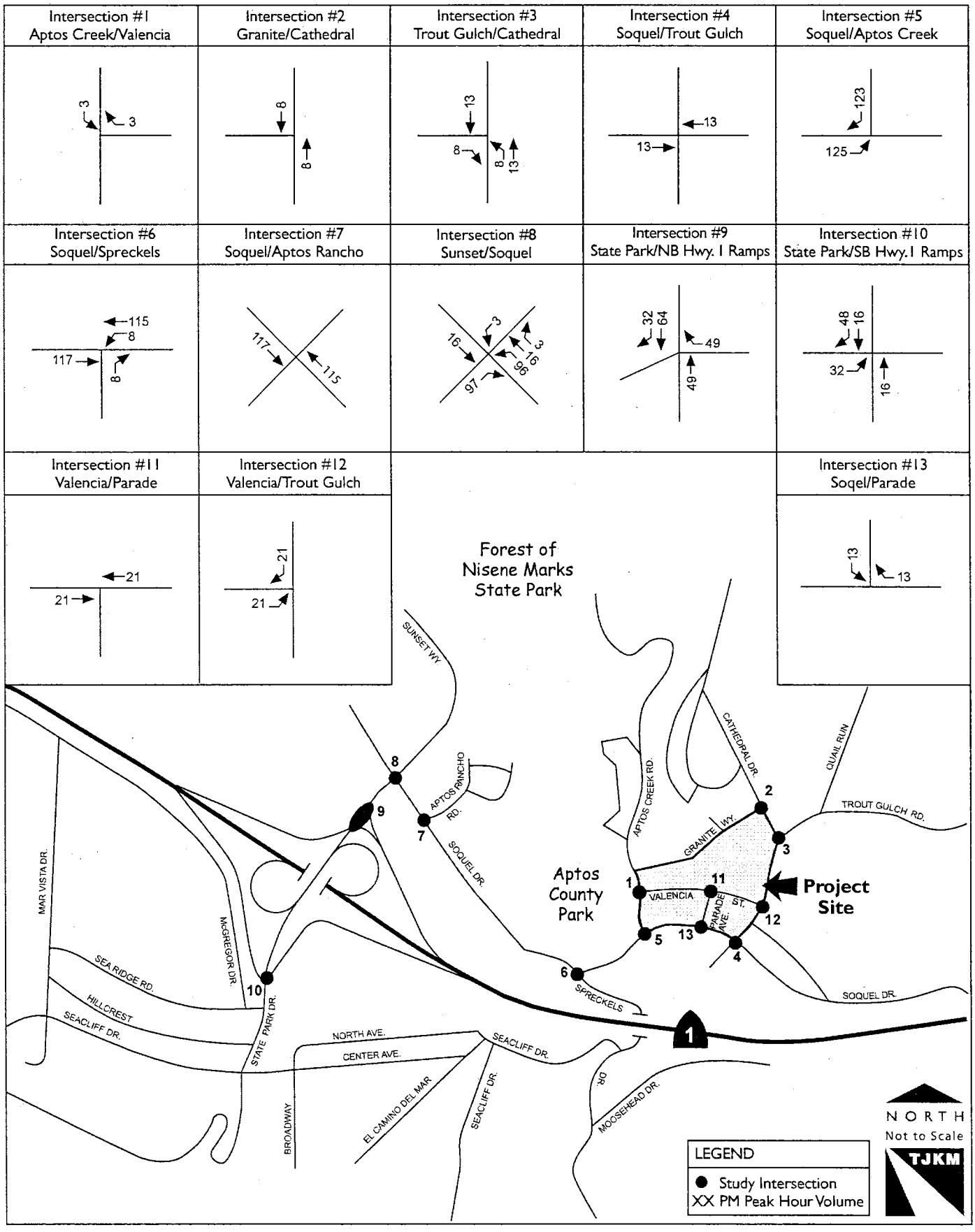
# Assignment of Proposed Project Trips

Figure 9

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**Intersection Level of Service Analysis**

Figure 10 shows the turning movement volumes resulting from project trip assignment at the study intersections under the Existing plus Approved plus Project scenario. Table V summarizes the results of the intersection LOS analysis under an Alternative 1 described below. Detailed calculations are contained in Appendix E.

**Table V: Intersection LOS – Existing + Approved + Project Conditions – Alternative 1**

| *ID* | *Intersection* | *Control* | *Existing + Approved P.M. Peak Hour* | | *Existing + Approved + Project P.M. Peak Hour (Alternative 1)* | |
|---|---|---|---|---|---|---|
| | | | *Delay* | *LOS* | *Delay* | *LOS* |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 9.6 | A | 9.5 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 8.9 | A | 8.9 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 12.7 | B | 13.1 | B |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **29.7** | **D** | **31.6** | **D** |
| | *Recommended Mitigation: Install a signal and a westbound left-turn lane* | *Signal* | *27.2* | *C* | *31.3* | *C* |
| 5 | Soquel Drive/Aptos Creek Road | One-way Stop | **66.7** | **F** | **>120.0** | **F** |
| | *Recommended Mitigation: Install a signal and an eastbound left-turn lane* | *Signal* | *9.8* | *A* | *12.2* | *B* |
| 6 | Soquel Drive/Spreckels Drive | Signal | 13.1 | B | 16.8 | B |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | 33.3 | C | **37.4** | **D** |
| | *Recommended Mitigation: Provide permissive phasing for minor street* | *Signal* | - | - | *30.5* | *C* |
| 8 | Soquel Drive/Sunset Way/State Park Drive | Signal | 39.1 | D | 44.0 | D |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 9.3 | A | 11.4 | B |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 7.1 | A | 7.5 | A |
| 11 | Valencia Street/Parade Avenue | One-way Stop | - | - | 8.9 | A |
| 12 | Valencia Street/Trout Gulch Road | One-way Stop | - | - | 34.9 | D |
| 13 | Soquel Drive/Parade Avenue | One-way Stop | - | - | **32.0** | **D** |
| | *Mitigation Alternative: Install a signal* | *Signal* | - | - | *6.7* | *A* |

Note: Delay = Overall average intersection delay for Signalized/All-way Stop control intersections or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service;
Alternative 1 = Intersection of Soquel Drive/Parade Avenue is analyzed as signalized intersection.

The new Valencia Street would be the preferred through access to the project site via Trout Gulch Road and Aptos Creek Road. The new alignment of Granite Way would affect forecasted turning movement volumes at five study intersections:

1. Aptos Creek Road/Valencia Street
2. Valencia Street/Parade Avenue
3. Soquel Drive/Parade Avenue
4. Soquel Drive/Trout Gulch Road
5. Soquel Drive/Aptos Creek Road

Table V includes summary results of the expected traffic conditions for these five intersections with the mitigation alternative of installing a traffic signal at Soquel Drive/Parade Avenue intersection (Alternative 1).

Under this scenario, ten study intersections are expected to continue to operate acceptably during the p.m. peak hour. The same two intersections that currently operate unacceptably plus one additional intersection impacted by the addition of proposed project traffic are expected to operate at unacceptable service levels under Existing plus Approved plus Project Conditions:

- Soquel Drive/Trout Gulch Road
- Soquel Drive/Aptos Creek Road
- Soquel Drive/Aptos Rancho Road

The mitigations identified at the first two intersections above under the previous scenarios (Existing and Existing plus Approved) are expected to accommodate Aptos Village project traffic as well. The County is currently in the design process for these recommended mitigations as capital improvement projects, and the traffic signals are expected to become functional prior to full occupancy of the project:

- *Soquel Drive/Trout Gulch Road:* Signalization and installation of an exclusive westbound left-turn lane is expected to improve the intersection operating condition to an acceptable level.
- *Soquel Drive/Aptos Creek Road:* Signalization and installation of an exclusive eastbound left-turn lane on Soquel Drive is expected to improve the intersection operating condition to an acceptable level.

At the intersection of Soquel Drive and Aptos Rancho Road, the delay is expected to increase by about four seconds, which would cause the LOS to decrease from C to D due to the traffic added from the project. Currently, Aptos Rancho Road operates with split phasing. TJKM recommends modifying the Aptos Rancho Road signal phasing to permissive left-turn phasing. With this mitigation, the intersection is expected to operate at an acceptable LOS C. There is sufficient capacity for left turns, and no protected left turn arrow is required for the minor street.

Although the installation of a signal at Parade Avenue and Soquel Drive indicates that the poor LOS can be mitigated, it does not meet signal warrants. This intersection is very close to the future signal at the Soquel Drive/Trout Gulch Road intersection. Eastbound queues on Soquel Drive at Trout Gulch Road will sometimes extend past the Parade Avenue intersection. Even if coordination is employed, this queuing is still likely to occur, and also westbound traffic stopped for Parade Avenue could easily queue back into the Soquel Drive/Trout Gulch intersection. Because the signal is unwarranted and is also problematic in terms of interactions with other adjacent signalized intersections, TJKM recommends that only right turns onto Soquel Drive be permitted. Even during the off peak hours, left turns from Parade Avenue would operate at a poor LOS, so left turns should be prohibited at all times. Motorists desiring to travel east on Soquel Drive are really not sent far out of the way by being rerouted to the Valencia/Trout Gulch intersection, then south to the Trout Gulch/Soquel Drive intersection.

Table VI shows the resulting delays and LOS for the intersections that would be influenced by prohibiting southbound left turns from Parade Avenue onto eastbound Soquel Drive, as well as results from analyzing the intersection of Soquel Drive/Parade Avenue as a one-way stop control

intersection (identified in the table as Alternative 2). The southbound left turn restriction at this intersection would cause the project trips to re-route through the intersections of:

- Valencia Street/Parade Avenue
- Valencia Street/Trout Gulch Road
- Soquel Drive/Trout Gulch Road

**Table VI: Intersection LOS – Existing + Approved + Project Conditions, Alternative 2**

| ID | Intersection | Control | Existing + Approved P.M. Peak Hour | | Existing + Approved + Project P.M. Peak Hour (Alternative 2) | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 4 | Soquel Drive/Trout Gulch Road | All-way Stop | **29.7** | **D** | **31.6** | **D** |
| | *Recommended Mitigation: Install a signal and a westbound left-turn lane* | *Signal* | *27.2* | *C* | *30.2* | *C* |
| 11 | Valencia Street/Parade Avenue | One-way Stop | - | - | 8.7 | A |
| 12 | Valencia Street/Trout Gulch Road | One-way Stop | - | - | 29.1 | D |
| 13 | Soquel Drive/Parade Avenue | One-way Stop | - | - | **32.0** | **D** |
| | *Recommended Mitigation: Prohibit SB Left-turn movement* | *One-way Stop* | - | - | *15.7* | *C* |

Note: Delay = Overall average intersection delay for Signalized/All-way Stop control intersections or Minor street (worst approach) delay for unsignalized intersections in seconds
LOS = Level of Service
Alternative 2 = Intersection of Soquel Drive/Parade Avenue is analyzed as one-way stop control with left turns prohibited on southbound approach.

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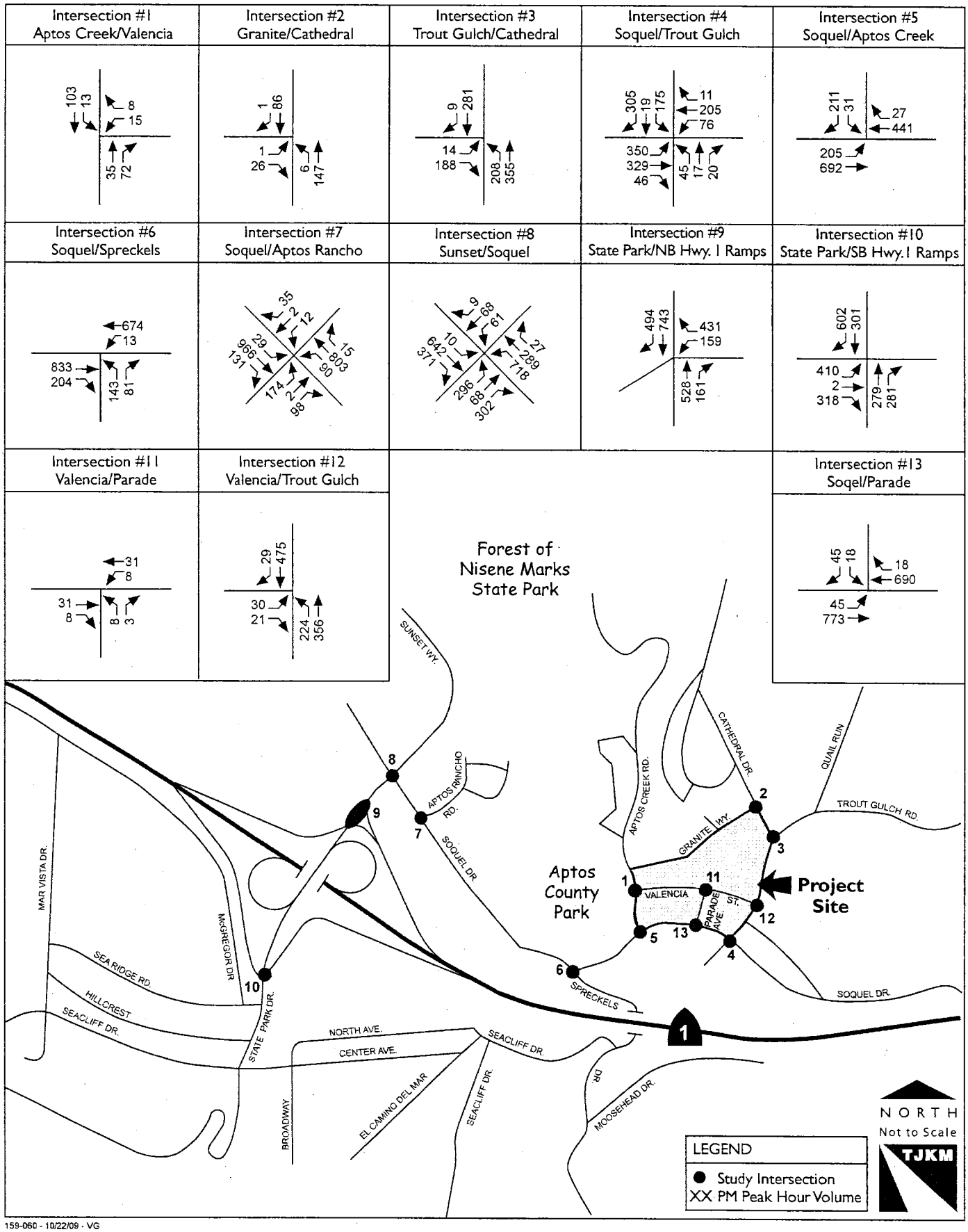
# Existing + Approved + Project Turning Movement Volumes

Figure 10

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## Cumulative (Year 2025) Conditions

This scenario evaluates conditions based on forecasted traffic volumes for the Year 2025. Future peak hour turning movement volumes for the year 2025 were forecasted based on traffic growth patterns in the study area from 1994 to 2004. Traffic at the major intersections has increased by approximately 1.3 percent per year for the past several years. This scenario assumes that the traffic in the study area would increase at a similar annual rate between 2006 and 2025.

### Intersection Level of Service Analysis

Figure 11 shows the forecasted turning movement volumes for Year 2025 Conditions. Table VII summarizes the results of the LOS analysis. The detailed LOS calculations are contained in Appendix F. Cumulative Conditions scenario assumes that the intersections of Soquel Drive/Trout Gulch Road and Soquel Drive/Aptos Creek Road are already signalized with lane improvements. The County is currently in the design process for these capital improvement projects, and the traffic signals are expected to become functional prior to full occupancy of the project.

**Table VII: Intersection LOS – Cumulative Conditions**

| ID | Intersection | Control | P.M. Peak Hour | |
|---|---|---|---|---|
| | | | Delay | LOS |
| 1 | Aptos Creek Road/Granite Way | One-way Stop | 9.9 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.1 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 15.8 | C |
| 4 | Soquel Drive/Trout Gulch Road | Signal | 33.6 | C |
| 5 | Soquel Drive/Aptos Creek Road | Signal | 11.5 | B |
| 6 | Soquel Drive/Spreckels Drive | Signal | 23.2 | C |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | **56.1** | **E** |
| | *Modify minor street split phasing to provide permissive phasing* | *Signal* | *37.4* | *D* |
| 8 | Soquel Drive/Sunset Way/State Park Drive | Signal | **58.3** | **E** |
| | *Install an eastbound right-turn lane* | *Signal* | *35.6* | *D* |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 13.3 | B |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 8.1 | A |

Note: Delay = Average intersection delay for signalized intersections or Minor street (worst approach) delay for unsignalized intersections in seconds; LOS = Level of Service

Under the Cumulative scenario, eight study intersections are expected to continue to operate at acceptable service levels during the p.m. peak hour. The following two intersections would operate unacceptably:

1. *Soquel Drive/Aptos Rancho Road:* This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Currently, Aptos Rancho Road operates with split phasing. TJKM recommends the modification of signal phasing to provide permissive left-turn phasing on Aptos Rancho road. As a result, the intersection is expected to operate at LOS D.

2. *Soquel Drive/State Park Drive/Sunset Way:* This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Installing an exclusive eastbound right-turn lane on Soquel Drive is expected to improve the intersection LOS to an acceptable level. However, the installation of a right-turn lane has right-of-way issues on the southwest corner of the intersection if ideal lane widths are used. TJKM recommends that the County consider narrower lanes. Analysis of this mitigation measure was also performed for the a.m. peak hour, and the intersection was found to operate acceptably at LOS D. A right-turn lane storage length of at least 300 feet plus transition is suggested by the analysis.

Figure 12 shows the recommended mitigations for the Cumulative Conditions.

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# Cumulative (2025) Turning Movement Volumes

Figure 11

| Intersection #1<br>Aptos Creek/Granite | Intersection #2<br>Granite/Cathedral | Intersection #3<br>Trout Gulch/Cathedral | Intersection #4<br>Soquel/Trout Gulch | Intersection #5<br>Soquel/Aptos Creek |
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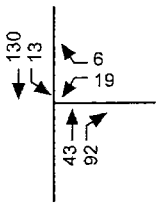
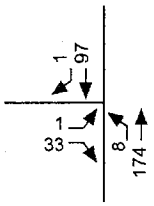
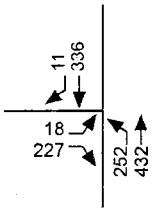
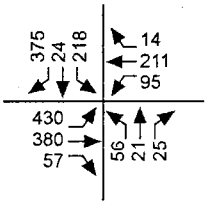
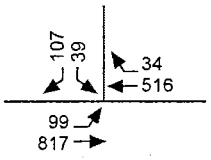
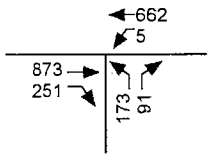
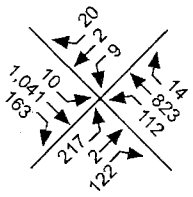
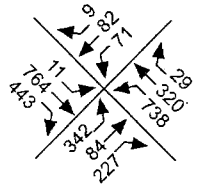
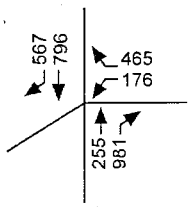
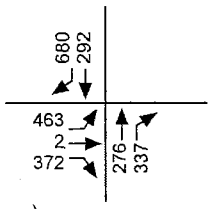
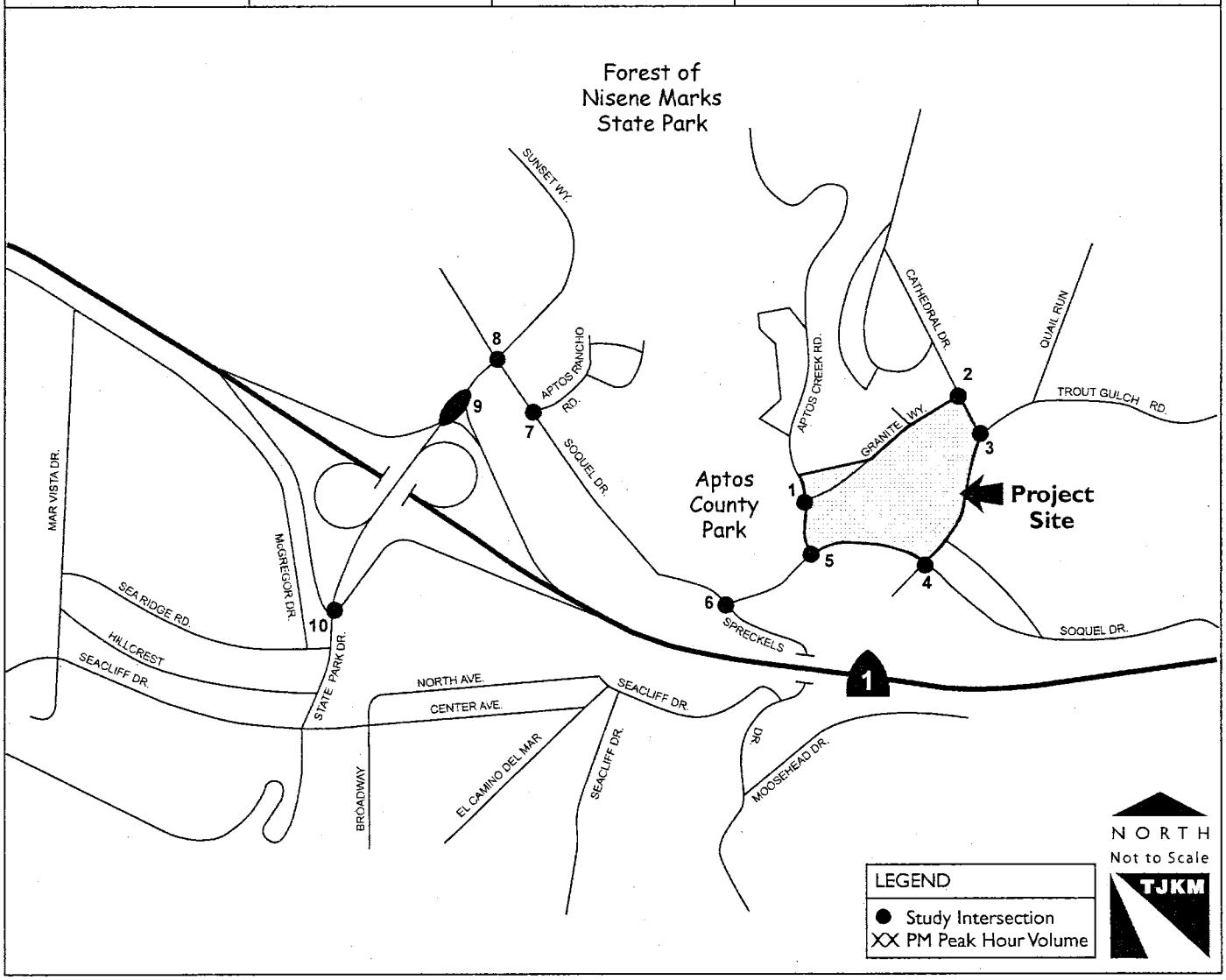
|  |  |  |  |  |
| **Intersection #6**<br>**Soquel/Spreckels** | **Intersection #7**<br>**Soquel/Aptos Rancho** | **Intersection #8**<br>**Sunset/Soquel** | **Intersection #9**<br>**State Park/NB Hwy. 1 Ramps** | **Intersection #10**<br>**State Park/SB Hwy.1 Ramps** |
|  |  |  |  |  |

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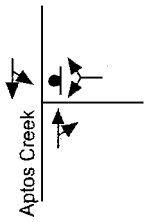
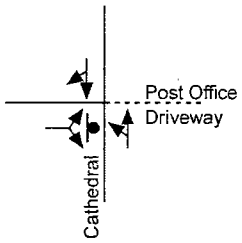
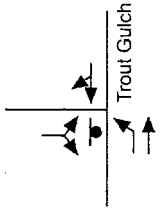
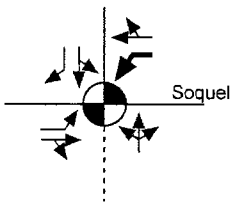
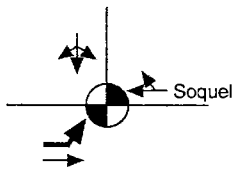
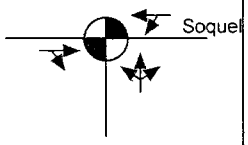
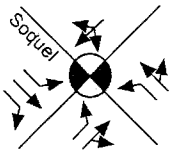
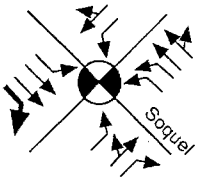
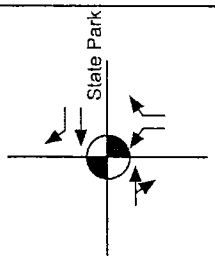
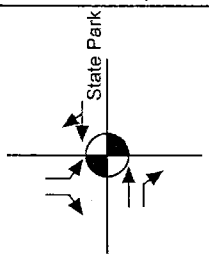
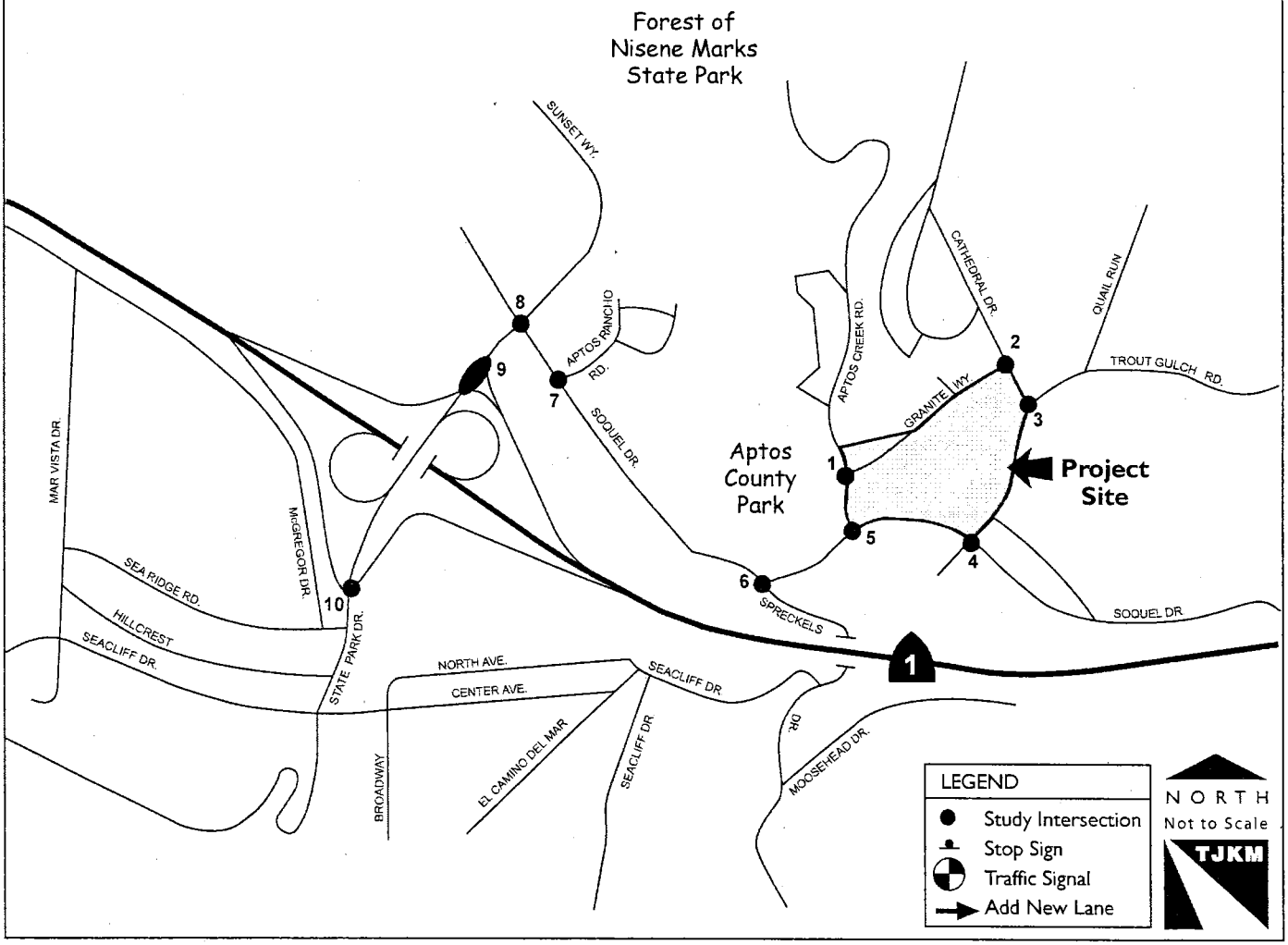
# Recommended Mitigation for Cumulative Conditions

Figure 12

| Intersection #1 Aptos Creek/Granite | Intersection #2 Granite/Cathedral | Intersection #3 Trout Gulch/Cathedral | Intersection #4 Soquel/Trout Gulch | Intersection #5 Soquel/Aptos Creek |
|---|---|---|---|---|
|  |  |  |  |  |
| **Intersection #6 Soquel/Spreckels** | **Intersection #7 Soquel/Aptos Rancho** | **Intersection #8 Sunset/Soquel** | **Intersection #9 State Park/NB Hwy. 1 Ramps** | **Intersection #10 State Park/SB Hwy.1 Ramps** |
|  |  |  |  |  |

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## Cumulative (Year 2025) plus Project Conditions

This Scenario is similar to the Cumulative Year 2025 conditions, but with traffic added from the proposed Aptos Village mixed-use development. The proposed project trip generation and trip distribution are same as mentioned under the Existing plus Approved plus Project Conditions.

### Intersection Level of Service Analysis

Figure 13 shows the forecasted turning movement volumes for the Cumulative plus Project Conditions. Table VIII summarizes the results of the LOS analysis with the alternative of signalization of the intersection, Soquel Drive/Parade Avenue (Alternative 1).

**Table VIII: Intersection LOS – Cumulative + Project Conditions – Alternative 1**

| *ID* | *Intersection* | *Control* | *Cumulative P.M. Peak Hour* | | *Cumulative + Project P.M. Peak Hour (Alternative 1)* | |
|---|---|---|---|---|---|---|
| | | | *Delay* | *LOS* | *Delay* | *LOS* |
| 1 | Aptos Creek Road/Valencia Street | One-way Stop | 9.9 | A | 9.9 | A |
| 2 | Cathedral Drive/Granite Way | One-way Stop | 9.1 | A | 9.1 | A |
| 3 | Cathedral Drive/Trout Gulch Road | One-way Stop | 15.8 | C | 16.4 | C |
| 4 | Soquel Drive/Trout Gulch Road | Signal | 33.6 | C | 35.2 | D |
| 5 | Soquel Drive/Aptos Creek Road | Signal | 11.5 | B | 14.9 | B |
| 6 | Soquel Drive/Spreckels Drive | Signal | 23.2 | C | 45.6 | D |
| 7 | Soquel Drive/Aptos Rancho Road | Signal | **56.1** | **E** | **72.0** | **E** |
| | *Provide permissive phasing for minor street* | *Signal* | *37.4* | *D* | *43.6* | *D* |
| 8 | Soquel Drive/Sunset Way/State Park Drive | Signal | **58.3** | **E** | **66.8** | **E** |
| | *Install an eastbound right-turn lane* | *Signal* | *35.6* | *D* | *41.7* | *D* |
| 9 | State Park Drive/Hwy. 1 NB Ramps | Signal | 13.3 | B | 18.1 | B |
| 10 | State Park Drive/Hwy. 1 SB Ramps | Signal | 8.1 | A | 8.0 | A |
| 11 | Valencia Street/Parade Avenue | One-way Stop | - | - | 8.9 | A |
| 12 | Valencia Street/Trout Gulch Road | One-way Stop | - | - | 34.3 | D |
| 13 | Soquel Drive/Parade Avenue | One-way Stop | - | - | **55.5** | **F** |
| | *Install a signal* | *Signal* | - | - | *7.7* | *A* |

Note: Delay = Average intersection delay for signalized intersections or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service;

Detailed LOS calculations are contained in Appendix G. Similar to the previous scenario, the intersections of Soquel Drive/Trout Gulch Road and Soquel Drive/Aptos Creek Road are analyzed as signalized intersections. The County is currently in the design process for these capital improvement projects, and the traffic signals are expected to become functional prior to full occupancy of the project.

Under the Cumulative plus Project Conditions, ten study intersections are expected to continue to operate at acceptable service levels during the peak hours. The mitigation identified in the previous scenario (Cumulative Conditions) is expected to accommodate the Aptos Village project traffic as well. The following two intersections would continue to operate unacceptably:

1. *Soquel Drive/Aptos Rancho Road:* This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Currently, Aptos Rancho Road operates with split phasing. TJKM recommends the modification of the Aptos Rancho Road signal phasing to provide permissive left turn phasing. As a result, the intersection is expected to operate at an acceptable LOS D.
2. *Soquel Drive/State Park Drive/Sunset Way:* This intersection is expected to operate at unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Installing an exclusive eastbound right-turn lane on Soquel Drive is expected to improve the intersection LOS to an acceptable level. However, the installation of a right-turn lane has right-of-way issues on the southwest corner of the intersection if ideal lane widths are used. TJKM recommends that the County consider narrower lanes. The analysis of this mitigation measure was also performed for the a.m. peak hour, and the intersection was found to operate acceptably at LOS D. A right-turn lane storage length of at least 300 feet plus transition is suggested by the analysis.

Table IX summarizes the LOS conditions for the intersections influenced with the re-routing of project trips due to the recommended restriction of southbound left-turn movement at the intersection of Soquel Drive/Parade Avenue (Alternative 2).

**Table IX: Intersection LOS – Cumulative + Project Conditions – Alternative 2**

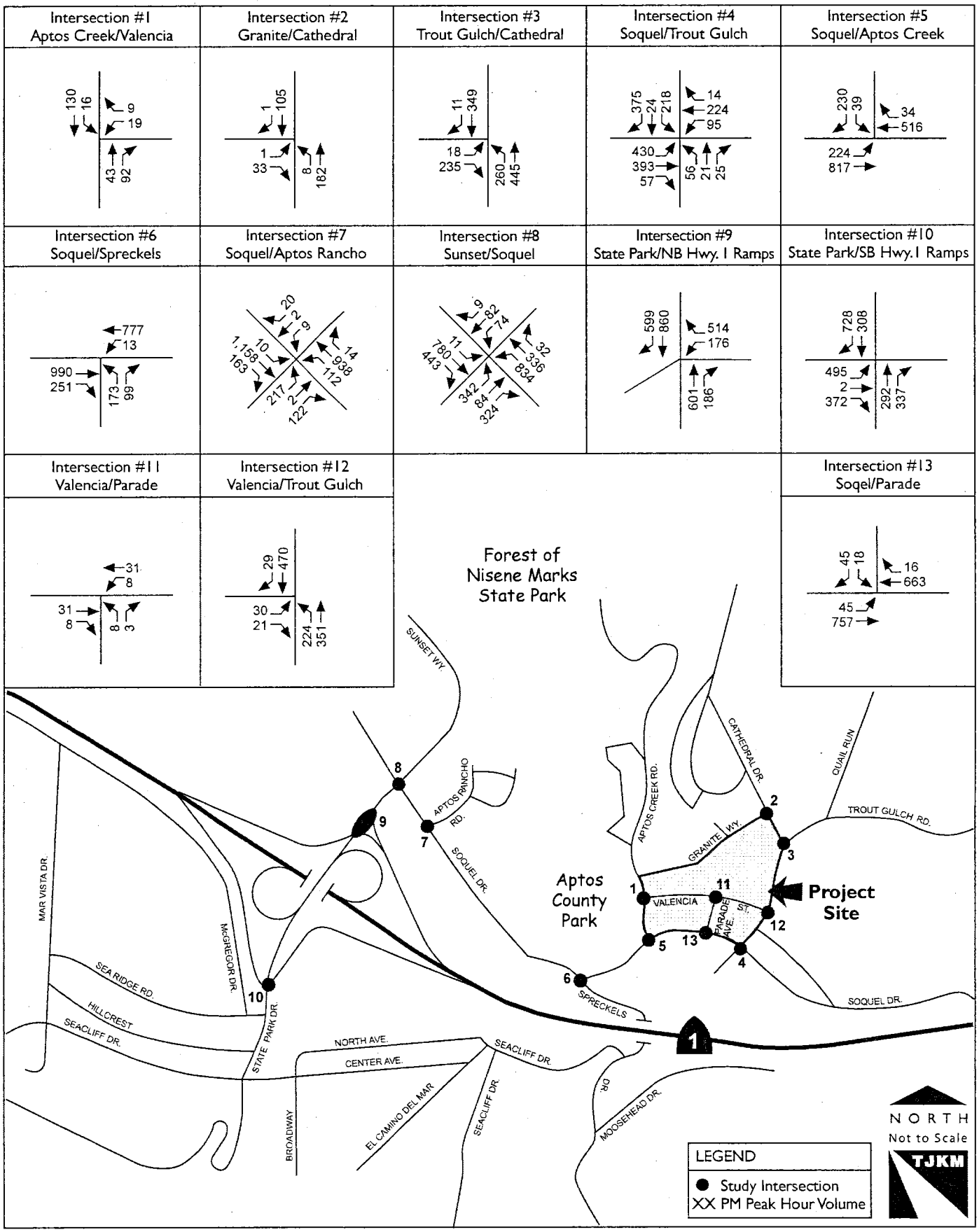
| ID | Intersection | Control | Cumulative P.M. Peak Hour | | Cumulative + Project P.M. Peak Hour (Alternative 2) | |
|---|---|---|---|---|---|---|
| | | | Delay | LOS | Delay | LOS |
| 4 | Soquel Drive/Trout Gulch Road | Signal | 33.6 | C | 36.3 | D |
| 11 | Valencia Street/Parade Avenue | One-way Stop | - | - | 8.9 | A |
| 12 | Valencia Street/Trout Gulch Road | One-way Stop | - | - | 28.6 | D |
| 13 | Soquel Drive/Parade Avenue | One-way Stop | - | - | **58.6** | **F** |
| | *Recommended Mitigation: Prohibit SB Left-turn movement* | *One-way Stop* | - | - | *15.4* | *C* |

Note: Delay = Average intersection delay for signalized intersections or Minor street (worst approach) delay for unsignalized intersections in seconds;
LOS = Level of Service
Alternative 2 = Intersection of Soquel Drive/Parade Avenue is analyzed as one-way stop control with left turns prohibited on southbound approach.

Santa Cruz County – Aptos Village Update

# Cumulative (2025) + Project Turning Movement Volumes

Figure 13

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## Conclusions and Recommendations

TJKM has reached the following conclusions regarding the proposed Aptos Village mixed-use development in Santa Cruz County:

- The proposed project is expected to generate approximately 3,650 daily trips, with 113 trips (52 inbound and 61 outbound) occurring during the a.m. peak hour and 322 trips (162 inbound and 160 outbound) during the p.m. peak hour.
- Under Existing Conditions, eight out of ten study intersections operate at acceptable service levels during the p.m. peak hour. The following two intersections operate unacceptably during the p.m. peak hour:
  - *Soquel Drive/Trout Gulch Road:* This All-way Stop controlled intersection currently operates at LOS D during the p.m. peak hour. Signalization and installation of an exclusive westbound left-turn lane is expected to improve the intersection operating condition to an acceptable level.
  - *Soquel Drive/Aptos Creek Road:* This One-way Stop control intersection operates at LOS E during the p.m. peak hour. The recommended mitigation is to install a traffic signal and an exclusive eastbound left-turn lane on Soquel Drive.
- The County is currently in the design process for these recommended mitigations as capital improvement projects, and the traffic signals are expected to become functional prior to full occupancy of the project.
- Under Existing plus Approved Conditions, two of the ten study intersections continue to operate unacceptably. The mitigations identified in the previous scenario (Existing Conditions) would accommodate the added approved projects traffic as well.
- Under Existing plus Approved plus Project Conditions, ten study intersections are expected to continue to operate acceptably during the p.m. peak hour. The same two intersections that currently operate unacceptably plus one additional intersection impacted by the addition of proposed project traffic are expected to operate at unacceptable service levels:
  - Soquel Drive/Trout Gulch Road
  - Soquel Drive/Aptos Creek Road
  - Soquel Drive/Aptos Rancho Road

The mitigations identified at the first two intersections above in the previous scenarios (Existing and Existing plus Approved) are expected to accommodate the Aptos Village project traffic as well. At the intersection of Soquel Drive and Aptos Rancho Road, the LOS is expected to decrease from LOS C to D due to the traffic added from the proposed project. Currently, Aptos Rancho Road operates with split phasing. TJKM recommends the modification of signal phasing to provide permissive left-turn phasing. With this mitigation, the intersection is expected to operate at an acceptable LOS C. There is sufficient capacity for left turns, and no protected left turn arrow is required for the minor street.

Although the new intersection at Parade Avenue and Soquel Drive would operate acceptably with installation of a signal, it does not meet signal warrants. Because the signal is unwarranted and is also problematic in terms of interactions between adjacent signalized intersections, TJKM recommends one-way stop control on Parade Avenue, with only right turns onto Soquel Drive permitted. Even during the off peak hours, left turns from Parade Avenue would operate at a poor LOS, so left turns should be prohibited at all times. Motorists desiring to travel east on Soquel

Drive are really not sent far out of the way by being rerouted to the Valencia/Trout Gulch intersection, then south to the Trout Gulch/Soquel Drive intersection.

- Under Cumulative Conditions, all the study intersections are expected to continue to operate acceptably except for the following two intersections:
  - *Soquel Drive/Aptos Rancho Road*: This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Currently, Aptos Rancho Road operates with split phasing. TJKM recommends the modification of the Aptos Rancho Road signal phasing to provide permissive left turn phasing. As a result, the intersection is expected to operate at an acceptable LOS D.
  - *Soquel Drive/State Park Drive/Sunset Way*: This intersection is expected to operate at an unacceptable LOS E due to the traffic increase forecasted for Cumulative Conditions. Installing an exclusive eastbound right-turn lane on Soquel Drive is expected to improve the intersection LOS to an acceptable level. However, the installation of a right-turn lane has right-of-way issues on the southwest corner of the intersection if ideal lane widths are used. TJKM recommends that the County consider narrower lanes. Analysis of this mitigation measure was also performed for the a.m. peak hour, and it was found that the intersection would operate acceptably at LOS D.
- Under Cumulative plus Project Conditions, three of the thirteen study intersections continue to operate unacceptably. The mitigations identified in the previous scenario (Cumulative Conditions) are expected to be able to accommodate the added Aptos Village project traffic. In addition, although the new intersection of Soquel Drive/Parade Avenue would operate acceptably with a signal, TJKM instead recommends one-way stop control and prohibiting southbound left-turns on Parade Avenue. Re-routing project trips due to the restriction of southbound left turns would result in improved intersection operations.

## Study Participants and References

### TJKM Personnel

| | |
|---|---|
| Rich Haygood, P.E., T.E. | Project Manager |
| Vishnu Gandluru | Project Engineer |
| Andrew Kluter, P.E. | Quality Control |
| Travis Richards, P.E. | Assistant Transportation Engineer |
| Erik Bjorklund | Conceptual Design, State Park and Soquel Drive |
| Geri Foley | Graphic Designer |
| Margie Pfaff | Word Processor |

### Others

| | |
|---|---|
| Jack R. Sohriakoff, P.E., T.E. | Santa Cruz County |
| Jessie Thielen | Barry Swenson Builders |

### References

*Highway Capacity Manual,* Transportation Research Board, Washington, D.C., 2000.

*Trip Generation*, 7th Edition, Institute of Transportation Engineers, Washington, D.C., 2003.

# Attachment 10

January 12, 2011

Todd Sexauer
Environmental Planner
County of Santa Cruz Planning Department
701 Ocean St, 4th Fl
Santa Cruz, CA 95060

Dear Mr. Todd Sexauer:

This letter is in response to your December 2010 request for a determination of consistency for the Aptos Village Core Development Project located in the unincorporated community of Aptos within Santa Cruz County with the 2008 Air Quality Management Plan (AQMP) for the Monterey Bay Region.

Consistency of projects with the AQMP is analyzed by comparing the total potential population growth accommodated by the project with the forecast growth for the jurisdiction and region. The 2008 Population, Housing Unit, and Employment Forecasts adopted by the AMBAG Board of Directors on June 11, 2008 has been incorporated into the 2008 Air Quality Management Plan for the North Central Coast Air Basin (August 2008), which is the document used to project consistency. If the estimated population delta in the project and associated trips does not exceed the forecast, indirect emissions associated with the project are deemed to be consistent with the AQMP.

Based on the above analysis, the proposed project is deemed **CONSISTENT** with the 2008 Air Quality Management Plan.

Additionally, please note that Consistency Determinations requested on or after January 1, 2011 should be sent to:

Jean Getchell
Supervising Planner
Monterey Bay Unified APCD
24580 Silver Cloud Court
Monterey, CA 93940
(831) 647-9411 x 227

Sincerely,

Steph A. Nelson
Associate Planner, Association of Monterey Bay Area Governments

cc: Jean Getchell, MBUAPCD



P.O.Box 809 Marina, CA 93933-0809 [ph] 831.883.3750 [fax] 831.883.3755 http://www.ambag.org info@ambag.org

# COUNTY OF SANTA CRUZ

PLANNING DEPARTMENT
701 OCEAN STREET, 4TH FLOOR, SANTA CRUZ, CA 95060
(831) 454-2580 FAX: (831) 454-2131 TDD: (831) 454-2123
**KATHLEEN MOLLOY PREVISICH, PLANNING DIRECTOR**

December 1, 2010

DEC 0 6 2010

Ms. Sasha Tepedelenova, Planner
Association of Monterey Bay Area Governments
P.O. Box 809
Marina, California 93933-0809

RE: Request for a Determination of Consistency for the Aptos Village Core Development Project

Dear Ms. Tepedelenova:

The County of Santa Cruz Planning Department is requesting a determination of consistency with the *Air Quality Management Plan for the Monterey Bay Region* for the proposed Aptos Village Core Development Project. The proposed Aptos Village Core Development project is located in the unincorporated community of Aptos within Santa Cruz County. The proposed project site is situated within the undeveloped portions of the core area of Aptos Village between Aptos Creek Road, Trout Gulch Road, and Soquel Drive. Two historic structures, the Apple Barn and the Aptos Firehouse/Veterans of Foreign Wars Hall are located within the project area and would be relocated as part of the proposed project.

The project proposes to construct a mixed-use commercial and residential development (including a maximum of 63 residential units and 75,000 square feet of commercial space) for the core area of the Aptos Village, per the requirements of the Aptos Village Plan, adopted February 23, 2010. A mix of 2 and 3 bedroom residential units are proposed. The proposed project would require a Planned Unit Development, Subdivision, Commercial Development Permit, Residential Development Permit, Roadway Abandonment, Historic Preservation Plan Review, Archaeological Report Review, Soils Report Review, and Preliminary Grading Review.

Please contact me at (831) 454-3511 with any questions regarding this request.

Sincerely,

Todd Sexauer, Environmental Planner
Policy Section

cc: Randall Adams, Development Revue Planner
Jean Getchell, MBUAPCD

# Attachment 11

DR

# Santa Cruz County Sanitation District

701 OCEAN STREET, SUITE 410, SANTA CRUZ, CA 95060-4073
(831) 454-2160 FAX (831) 454-2089 TDD: (831) 454-2123

JOHN J. PRESLEIGH, DISTRICT ENGINEER

November 23, 2010

JESSIE THIELEN
BARRY SWENSON BUILDER
777 NORTH 1ST STREET, 5TH FLOOR
SAN JOSE, CA 95112

SUBJECT: SEWER AVAILABILITY AND DISTRICT'S CONDITIONS OF SERVICE FOR THE FOLLOWING PROPOSED DEVELOPMENT:

APNS: 41-101-03, 41-011-09, 41-011-20, 41-011-24, 41-011-33
41-561-01, 41-561-02

PARCEL ADDRESS: 448 GRANITE WAY, 8035 AND 8037 SOQUEL DRIVE
417 TROUT GULCH ROAD

PROJECT DESCRIPTION: APTOS VILLAGE PLAN (MIXED USE)

This notice is effective for one year from the issuance date to allow the applicant the time to receive tentative map, development or other discretionary permit approval. If after this time frame this project has not received approval from the Planning Department, a new sewer service availability letter must be obtained by the applicant. Once a tentative map is approved this letter shall apply until the tentative map approval expires.

Department of Public Works and District approval shall be obtained for an engineered sewer improvement plan, showing on-site and off-site sewers needed to provide service to each lot or unit proposed, before sewer connection permits can be issued. The improvement plan shall conform to the County's "Design Criteria" and shall also show any roads and easements. Existing and proposed easements shall be shown on any required Final Map. If a Final Map is not required, proof of recordation of existing or proposed easement is required.

All civil drawings shall use County datum.

Proposed location of on-site sewer lateral(s), clean-out(s), and connection(s) to existing public sewer must be shown on the plot plan of the building permit application.

The plan shall show all existing and proposed plumbing fixtures on floor plans of building application. Completely describe all plumbing fixtures according to table 7-3 of the uniform plumbing code.

Water use data (actual and/or projected), and other information as may be required for this project, must be submitted to the District for review and use in fee determination and waste pretreatment requirements before sewer connection permits can be approved.

The applicant shall establish a property owners' association or agreement with ownership and maintenance responsibilities for all on-site sewers for this project; reference to property owners' association or agreement shall be included on the Final Map and in the Association's recorded CC&R's which shall be recorded. Applicant shall provide a copy of said CC&R's to the District prior to the filing of the final map.

Existing lateral(s) must be properly abandoned (including inspection by District) prior to issuance of demolition permit or relocation or disconnection of structure. An abandonment permit for disconnection work must be obtained from the District.

A backflow prevention device may be required on the sewer laterals.

Any existing lateral that will be reused will be required to be televised, repairs made to any damaged or leaking pipes that might be shown. This includes any root intrusion, open joints, cracks or breaks, sags, damaged or defective cleanout, inflow and infiltration of extraneous water, older pipe materials that are known to be inadequate, inadequate lift or pump stations, inadequate alarm systems for overflows, and inadequate maintenance of lift stations. Video results (tape or DVD) shall be made available to the District for review, along with District certification form completed by plumber, and the District shall review results within 10 working days of submittal to the District. Repairs, as required by the District, shall be made within 90 working days of receipt of video result review. Applicant/owner shall obtain a sewer repair permit (no charge) from the District and shall have repairs inspected by the District inspector prior to backfilling of pipe or structure.

Assessor's Parcel Number 041-011-09 is outside of the District's boundary. The applicant/developer is required to annex the parcel (s) to the District prior to sewer service being available. Contact the Local Agency Formation Commission (LAFCO) at (831) 454-2066 or District staff at (831) 454-2160 to initiate the annexation process.

The Sanitation District's conditions for service in the Master Plan are:

All future change of use in tenants shall require a review by the Sanitation District for additional connection permit fees and pretreatment device requirements.

All applicants shall provide estimated water use and additional information to assist staff in developing permit fees and pretreatment. A review of all changes in tenancy shall be required and no "over the counter" approval shall be granted.

The District shall review all future building permits for tenant improvements.

All changes to plumbing fixtures shall be reviewed by the District. All changes shall be accompanied by a plumbing plan and list of plumbing fixtures per the UPC as stated in table 7-3.

A payment equivalent to an installed flow metering or odor control device shall be collected at for future use at time that building permits for 30 dwelling units has been reached.

Pretreatment may be required if food preparation or medical/dental offices are proposed.

Yours truly,

JOHN J. PRESLEIGH
District Engineer

By: Rachél Lather

Rachél Lather
Senior Civil Engineer

DR:bbs/343.wpd

Copy to: Constance Lobue and Craig Scarpelli
1275 Lincoln Avenue #10A
San Jose, CA 95125

Jon Ifland, Ifland Engineers

# Attachment 12

# DRAINAGE STUDY

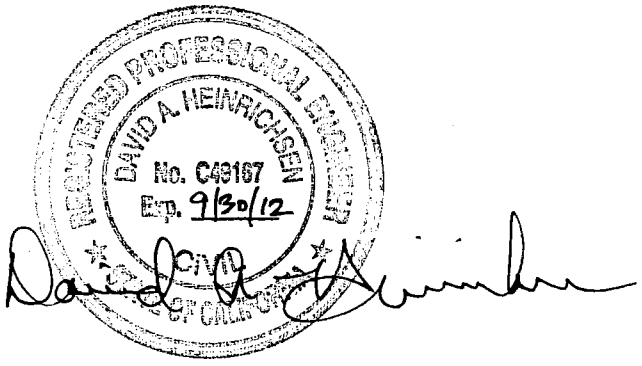
**FOR**

# Aptos Village

Tract Number 1561
Soquel Drive, Aptos
Santa Cruz County, California

October, 2010
Revised: June, 2011

*Job #07040*




IFLAND ENGINEERS

5200 Soquel Dr. Suite 101
Santa Cruz, CA 95062
T.831.426.5313
F.831.426.1763
www.flandengineers.com

Civil Engineering | Structural Design | Land Development

## Introduction:

This drainage study addresses the issue of retention and detention for the post development increases in stormwater runoff resulting from the changes in land cover associated with the proposed development in accordance with Part 3, Stormwater Management, of the County of Santa Cruz Design Criteria. The subject of this analysis is a 9.4 acre site located along Soquel Drive between Aptos Creek Road and Cathedral Drive & Trout Gulch Road in Aptos, California. The purpose of the report is to determine the change in storm water runoff resulting from the proposed site improvements and its effect on this property. As stated above, the calculations included in this report are based on the County of Santa Cruz's design requirements.

## Existing Conditions:

Currently, the subject parcel is mostly undeveloped with the exception of a 1,200-1,500 sf metal building south of Granite Way, the Apple Barn Building and parking along Trout Gulch Road, and existing parking along the southerly boundary between Aptos Station and the Bayview Hotel. The property slopes towards Aptos Creek Road to the west, Soquel Drive to the south and Trout Gulch Road to the east, with 4 main drainage basins. Drainage Basins A & B drain to Aptos Creek west of the subject parcel and Drainage Basins C & D drain to Valencia Creek east of the property. Areas north of the project site that drain south will be captured separately from the designed system and be directed to either Aptos or Valencia Creek depending on the current drainage basin to which each area now drains. The natural drainage patterns and areas have been mimicked as much as possible for the new development, to maintain natural habitats and conditions downstream of the project.

A supplemental analysis of the existing drainage system that discharges to Valencia Creek has been completed and is submitted with this report. That analysis shows that the existing piping immediately upstream of the discharge point has the capacity to convey a 25-year design storm. Post construction, additional runoff will be directed to the aforementioned discharge point via Storm Drain Retention/Detention Chambers before it is discharged to the existing drainage facilities in Trout Gulch Road and the outfall to Valencia Creek. The additional runoff will be limited to the 5-year pre-development runoff rate for a 25-year design storm, adding approximately 1.5 cfs of runoff to the existing 79.2 cfs which currently drains to this point during a 25-year storm.

Site development will necessitate compliance with drainage regulations as mandated by the County of Santa Cruz Design Criteria.

## Proposed Conditions:

The Proposed project consists of 14 mixed use buildings and 17 residential town homes. Two new roads will be developed, Valencia Street and Parade Avenue, and Granite Way will be improved to County standards. Parking lots are proposed throughout the site for each building with access to one of the 6 surrounding roads. The proposed development will maintain the 2 major drainage basins, one to Aptos Creek the other to Valencia Creek. The 2 major basins have been broken up into ten minor drainage basins, shown on the attached drainage area map. Within the ten minor drainage basins are a total of 23 sub-basins, which are either directed to Valencia or Aptos Creek. Refer to Sheets TM8-14 for locations and direction of flow.

The following provides a description of the drainage system proposed for each of the minor drainage basins.

Area-1

Area 1 is associated with the development of Phase Ia along the northern side of the property above Granite Way. This area includes the 6 new residential units and their associated driveways. Runoff from units 1-3 will be captured through the pervious concrete driveways and stone beds immediately south of each dwelling. Runoff from units 4-6 will be captured beneath the pervious concrete of their shared driveway. Each drainage system will be equipped with a section of perforated subdrain to convey water east, adjacent to Granite Way beneath the sidewalk. Units 1-3 will have a primary control of small PVC pipe between driveways. The pipe has been sized based on the required release rate for a 5-year predevelopment storm. The pipe network will then be directed to a secondary, and primary for units 4-6, controlled release box with an orifice and weir plate. Runoff from Granite Way will be directed away from the pervious concrete associated with the above mentioned dwellings and be directed to its own drainage system within the sidewalk area.

Area-2

Area 2 includes all three new and/or redeveloped roads. Each road will drain to curbside rain gardens and tree wells which are interconnected by an underlying drain rock bed, similar to the pervious concrete. The stone beds for each road are designed to capture, detain, treat, and infiltrate if possible runoff prior to being released off site via an outlet control structure with orifice and weir plate. Each section of stone beds was specifically designed based on the impervious surfaces directed to that area. Refer to grading and drainage sheets for size and layout.

Area-3

Area 3 is associated with the development of Phase Ia, immediately west of Cathedral Drive & Trout Gulch Road. Said area includes buildings 5, 6, 11, and 12, the major parking area east of the proposed Apple Barn, and the driveway servicing buildings 12. The roof runoff from the buildings will be directed to pervious concrete via downspouts to through curb drains or underground piping outleting within the stone beds. The pavement runoff will be directed to the pervious concrete by overland flow. There are several landscaped islands within Area 3 that will also take in direct rainfall reducing the amount of runoff directed to the stone beds. Runoff will then be treated through bio-filtration and detained within the stone beds beneath the pervious concrete, and released to the existing drainage system within Trout Gulch Road by means of an outlet control structure equipped with an orifice and weir plate. The system has been designed and proposed to detain the runoff for a 25-year storm event while discharging at the 5-year release rate. According to the geotechnical investigation and other observed data there is opportunity for infiltration into the underlying soils in this area. Refer to Test Holes B-5A, B-5B & P-14B from HKA letter dated March 16, 2011 (Exhibit A). Darcy Columns or percolation pits have been utilized in this area to meet the County requirements for Retention. The columns are sized based on the 2-year, 2-hour design storm.

Area -4

Area 4 is associated with the development of Phase Ia, and is centrally located within the proposed development. The area includes Building 4, and the central landscaped open space "Village Green". The area also, includes the trash enclosure area and parking area immediately north of buildings 4 & 5, as well as the surrounding walkways. The drainage system for this area includes raingardens, which will capture, treat, infiltrate and convey runoff from the impervious surfaces towards an underground stone detention system within the Village Green. Runoff will then be directed to an outlet control structure within the sidewalk immediately south of the village Green which will outlet into the main system within Valencia Street.

Area-5

Area 5 is associated with the final portion of Phase Ia and the most easterly building (building 2) of Phase IIIb. The area includes the westerly portion of roof runoff from building 3 and the parking area and well site immediately west of said building. Pervious concrete is proposed within the parking stalls adjacent to the building. However, the 4 northern spaces will be paved asphalt to maintain a 50' buffer from the center of the proposed well. The stone bed underlying the concrete is designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate. Infiltration is not feasible in this area and it is assumed that little to no percolation will occur; therefore discharge into the Valencia Street storm system will be necessary. The system will be equipped with a perforated under drain to convey runoff to an outlet control structure at the southeast corner of the parking area. The control structure, designed with an orifice and weir plate, will then outlet into the proposed storm drain line within Valencia Street maintaining pre-development rates and be directed towards Valencia Creek.

Area-6

Area 6 is associated with the development of Phase Ib, north of Soquel Drive and the railroad tracks. Said area includes the southern roof areas of buildings 14 & 15 and the parking areas south of the buildings. The roof runoff from each building will be directed to through curb drains and will surface flow over the pavement and into the pervious concrete along the southern property line. The stone beds underlying the concrete are designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate. Infiltration is not feasible in this area and it is assumed that little to no percolation will occur; therefore discharge into the Parade Street storm system will be necessary. Each system will be equipped with a perforated under drain to convey runoff to an outlet control structure outside the paved area. The control structure, designed with an orifice and weir plate, will then outlet into the proposed catch basins within Parade Street maintaining pre-development rates.

Area-7

Area 7 is associated with the development of Phase Ib, II & Phase IIIa, at the southwest corner of the Valencia-Parade Street Intersection. Said area includes the entire roof area of building 8 and the northern half of building 15, as well as the parking area immediately south of building 8. Pervious concrete is proposed along the southern section of parking stalls immediately north of building 15. The roof drains from building 15 will be directly piped to the stone beds, while building 8's roof drain will be directed to through curb drains along the northern parking stalls. The stone bed underlying the concrete is designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate. Infiltration is not feasible in this area and it is assumed that little to no percolation will occur. Therefore, the drainage system will ultimately be tied into the system associated with Drainage Area 9 (Phase IIIa), but temporarily will be directed to Parade Street via a small PVC pipe to control runoff to pre-development rates. Similar to the other systems, the above system will be equipped with a perforated subdrain to direct runoff to the Phase IIIa drainage system and controlled release west of Area 9 parking lot.

Area-8

Area 8 is associated with the development of Phase Ib & Phase II, at the southeast corner of the Valencia-Parade Street intersection. Said area includes the northern roof area of building 14 and all the roof area of building 7, as well as the parking area to the south and the east of building 7. Pervious concrete is proposed along the southern section of parking stalls immediately north of building 14. The roof drains from building 14 will be directly piped to the stone beds, while building 7's roof drain will be directed to through curb drains along the northern parking stalls. The stone bed underlying the concrete is designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate. Infiltration is not feasible in this area and it is assumed that little to no percolation will occur; therefore discharge into the Parade Street storm system will be necessary. The system will be equipped with a perforated under drain to convey runoff to an outlet control structure at the southwest corner of the parking area. The control structure, designed with an orifice and weir plate, will then outlet into the proposed storm drain line within Parade Street maintaining pre-development rates.

Area-9

Area 9 is associated with the development of Phase IIIa, at the southwest corner of the project site. The area includes buildings 9 & 10 and the large parking area south of the buildings. The roof runoff will be directed through curb drains and or subdrains that outlet directly into the stone beds. Infiltration, although minimal in this area, is feasible and therefore, percolation into the underlying soils will be utilized, by means of Darcy Columns at the bottom of the stone beds. The columns will be installed to the bottom of the pervious material approximately 10' deep. The stone bed underlying the concrete is designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate, and the infiltration will meet the 2yr—2hr retention requirement. The system will be equipped with a perforated under drain to convey runoff to an outlet control structure at the northwest corner of the parking area. The control structure, designed with an orifice and weir plate, will then outlet into the proposed storm drain line within Valencia Street maintaining pre-development rates and be directed towards Aptos Creek.

Area-10

Area 10 is associated with the development of Phase IIIb, at the northwest corner of the project site. The area includes buildings 1 & 2 and the large parking area north of the buildings. The eastern buildings (roof drains) and parking area will be sloped towards the pervious concrete within the northern parking stalls. The roof drains will daylight at curb drains at pavement level. The westerly portion of the parking lot will be directed to a valley gutter centrally located within the paved surface, which will convey runoff to a drain inlet southwest of the trash enclosure. The drain inlet will then discharge, via a perforated pipe, to the stone bed beneath the pervious concrete. The roof runoff, in this area, will be directed through curb drains, sloping towards the valley gutter. Infiltration, although minimal in this area, is feasible and therefore, percolation into the underlying soils will be utilized, by means of Darcy Columns at the bottom of the stone beds. The columns will be installed to the bottom of the pervious material approximately 10' deep. The stone bed underlying the concrete is designed to detain the required volume of runoff for the 25-year storm event with a release rate at or below the 5-year pre-development rate, and the infiltration will meet the 2yr—2hr retention requirement. The system will be equipped with a perforated under drain to convey runoff to an outlet control structure at the northwest corner of the parking area. The control structure, designed with an orifice and weir plate, will then outlet into the proposed storm drain line within Valencia Street maintaining pre-development rates and be directed towards Aptos Creek.

## Proposed Drainage:

An on-site drainage system has been designed to capture and retain /detain stormwater runoff for the increase in impervious surfaces. The project will be utilizing pervious concrete, with drain rock bases, within sections of the parking stalls through the site, refer to Site Plan for area of proposed pervious concrete. Each area used for retention/detention was designed as its own drainage system, accounting for the impervious areas producing runoff to that specific area. Additionally, rain gardens, and associated drain rock beds, have been proposed along Valencia Street, Parade Street, and Granite Way. These systems are designed to capture, treat, retain/detain, stormwater runoff from the paved road ways and sidewalks. There are several other landscaped islands and landscaping features which will also capture minimal runoff and either infiltrate into the ground or be directed via overland flow to one of the above underground systems. The system has been sized and designed based on the net increase in impervious surfaces, per Santa Cruz County Design Criteria, for a 25-year storm event with a 5-year pre-development release rate. The succeeding calculations focus on the short duration storm events as required by the Santa Cruz County Design Criteria. Each retention/detention system is designed with an outlet control structure equipped with a weir and orifice plate. Refer to the following calculations and plan sheets for sizes and locations. The proposed design for the project has been carefully graded to direct runoff, via overland flow, for each drainage basin to its associated drainage system. In areas where overland flow was not possible, i.e. roof drains, landscape drains and site drains, through curb drains and/or subdrains that outlet within the stone beds, have been proposed. The runoff that will be released off-site to the west will be directed to Aptos Creek via storm drains routed down Aptos Creek Road and the adjoining hillside, across Aptos Creek Park to a riprap level spreader at the top of bank. To the east, runoff will be directed to the existing storm drain line east of Trout Gulch Road, just north of Building 6.

Sheets TM8-TM25 depicts the proposed drainage system and tributary drainage areas.

## Calculations:

***Pre-Development Calculations:***

The following calculations provide analysis of the existing site conditions.

*For the purpose of these calculations, the old foundations/building pads and paved roads/parking areas were considered impervious and given a "C" value of 0.9. According to assessor's records and building permits approximately 19,369 square feet (0.44 acres) of impervious surface can be credited to the site for drainage purposes.

-Assumptions

P60 Value = 1.40
$T_C$ = 15 minutes
$C_a$ = 1.1 (for a 25-yr event)
Rainfall Intensity is taken from Figure SWM-3
Use a Pre-Development C-Value for all Existing Drainage Calculations

*Area 1 – (Drainage Basin To Aptos Creek)*

- Total Area (within project boundary) = 2.18 AC
- Impervious area = 0.44 AC
- Pervious area = 1.74 AC

*Assume C=0.30* Per CDC Requirements (No existing impervious credits applied)

| | |
|---|---|
| $I_2$ | = 1.09 in/hr |
| $I_5$ | = 1.44 in/hr |
| $I_{25}$ | = 2.04 in/hr |
| $Q_2 = CIA = (0.30)(1.09)(2.18)$ | = 0.71 cfs |
| $Q_5 = CIA = (0.30)(1.44)(2.18)$ | = 0.94 cfs |
| $Q_{25} = C_aCIA = (1.1)(0.30)(2.04)(2.18)$ | = 1.47 cfs |

*Area 2 – (Drainage Basin To Valencia Creek)*

- Total Area (within project boundary) = 5.86 AC
- Impervious area = 0.42 AC
- Pervious area = 5.44 AC

*Assume C=0.30* Per CDC Requirements (No existing impervious credits applied)

| | |
|---|---|
| $I_2$ | = 1.09 in/hr |
| $I_5$ | = 1.44 in/hr |
| $I_{25}$ | = 2.04 in/hr |
| $Q_2 = CIA = (0.30)(1.09)(5.86)$ | = 1.92 cfs |
| $Q_5 = CIA = (0.30)(1.44)(5.86)$ | = 2.53 cfs |
| $Q_{25} = C_aCIA = (1.1)(0.30)(2.04)(5.86)$ | = 3.95 cfs |

*Off-site Analysis*

Refer to the supplemental analysis "Existing Drainage Calculations for Valencia Creek Outfall" for additional information on existing conditions and volumes associated with the Valencia Creek Outfall.

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JOB NO. Aptos Village - 07040
SHEET NO. 1 OF 1
CALCULATED BY DMR DATE April 15, 2011
SCALE: 1"=80'

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***Post-Development Calculations:***

**As per the requirements of the Santa Cruz County Public Works Stormwater Management Division, when using pervious concrete for detention/retention, the pervious concrete C value = 0.90.*

***Aptos Creek Drainage Basin***

→Area includes minor drainage basins, Area 2i, 2j, 7, 9a, 9b, & 10.

- Total area = 1.98 AC
- Impervious area (including Pervious Concrete) = 1.98 AC

| | |
|---|---|
| C = | = 0.9 |
| $I_2$ @ $T_c$ = 10 min | = 1.30 in/hr |
| $I_5$ @ $T_c$ = 10 min | = 1.72 in/hr |
| $I_{25}$ @ $T_c$ = 10 min | = 2.43 in/hr |
| $Q_2$ = CIA = (0.9)(1.30)(1.98) | = 2.32 cfs |
| $Q_5$ = CIA = (0.9)(1.72)(1.98) | = 3.07 cfs |
| $Q_{25} = C_a$CIA = (1.1)(0.9)(2.43)(1.98) | = 4.76 cfs |

*Increase in Runoff: ***$Q_2$ = 1.61 cfs, $Q_5$ = 2.13 cfs, $Q_{25}$ = 3.29 cfs***

Retention/Detention will be required to mitigate the increased runoff rate for the proposed development. It will be achieved by utilizing pervious concrete and associated stone beds as described in the Proposed Drainage Conditions, above. (Refer to Sheet TM8-TM14, Grading & Drainage Plan, for locations). The retention portion of the system is sized based on a 2-year, 2-hour, storm event, per Figure SWM-24. The Detention portion is sized for a 25-year storm event with a 5-year pre-development allowable release rate, per figure SWM-17.

*Darcy Column Retention Calculation:*

*During field investigations by County Staff, Ifland Engineers, and Haro Kasunich & Assoc. the observations for holes P-1, & P-3 appeared dry in all cases. The depths of these holes were approximately 10' and 9.5', respectively. Therefore, Darcy Columns (seepage pits) have been proposed in drainage areas 9a, 9b, 2j, & 10 to mitigate additional runoff by means of retention. The columns have been designed based on the 2-yr, 2-hr storm event set forth by the County Design criteria. A total of 35 columns are proposed throughout the drainage areas. Refer to following calculations.

*Area #9a*

➔ 4' diameter 15' deep seepage pit (bottom 5' of pit used for percolation calculations)
- Surface area used for percolation
  - $A=\pi r^2 + 2\pi rh = \pi(2^2) + 2\pi(2)(5)$
    - $A=75.4 \approx 75$ SF
- Percolation Rate = 1 in/hr (as measured per geotechnical report)
  - Adjusted percolation Rate = 0.3 in/hr (See Appendix B- Percolation Adjustment calculations)
  - Therefore, Total Infiltration rate over the effective area is:
    - Perc. Rate x A = (0.3in/hr ÷ 12) x 75SF ≈ *1.88 cf/hr*

➔ Assume 12 Darcy Columns for Drainage Area #9a
- Total infiltration provided = 12*1.88cf/hr = 22.56 cf/hr

➔ Drawdown time for the 2-yr, 2-hr Storm event is:

| | | |
|---|---|---|
| -Volume to be retained | = 642 cubic feet | (Refer to SWM-24, for Area #9a) |
| -Drawdown time | = 47.3 hrs | (Refer to SWM-24, for Area #9a) |

*Area #9b*

- 4' diameter 15' deep seepage pit (bottom 5' of pit used for percolation calculations)
  - Surface area used for percolation
    - $A=\pi r^2 + 2\pi rh = \pi(2^2) + 2\pi(2)(5)$
      - $A=75.4 \approx 75$ SF
  - Percolation Rate = 1 in/hr (as measured per geotechnical report)
    - Adjusted percolation Rate = 0.3 in/hr (See Appendix B- Percolation Adjustment calculations)
    - Therefore, Total Infiltration rate over the effective area is:
      - Perc. Rate x A = (0.3in/hr ÷ 12) x 75SF ≈ *1.88 cf/hr*
- Assume 9 Darcy Columns for Drainage Area #9b
  - Total infiltration provided = 9*1.88cf/hr = 16.9 cf/hr
- Drawdown time for the 2-yr, 2-hr Storm event is:

| | | |
|---|---|---|
| -Volume to be retained | = 464 cubic feet | (Refer to SWM-24, for Area #9b) |
| -Drawdown time | = 46.5 hrs | (Refer to SWM-24, for Area #9b) |

*Area #10*

- 6' diameter 15' deep seepage pit (bottom 5' of pit used for percolation calculations)
  - Surface area used for percolation
    - $A=\pi r^2 + 2\pi rh = \pi(3^2) + 2\pi(3)(5)$
      - $A=122.5 \approx 123$ SF
  - Percolation Rate = 6 in/hr (as measured per geotechnical report)
    - Adjusted percolation Rate = 1.8 in/hr (See Appendix B- Percolation Adjustment calculations)
    - Therefore, Total Infiltration rate over the effective area is:
      - Perc. Rate x A = (1.8in/hr ÷ 12) x 123 SF ≈ *18.5 cf/hr*
- Assume 8 Darcy Columns for Drainage Area #10
  - Total infiltration provided = 8*18.5cf/hr = 148 cf/hr
- Drawdown time for the 2-yr, 2-hr Storm event is:

| | | |
|---|---|---|
| -Volume to be retained | = 1,118 cubic feet | (Refer to SWM-24, for Area #10) |
| -Drawdown time | =12.2 hrs | (Refer to SWM-24, for Area #10) |

*Area #2j*

- 4' diameter 15' deep seepage pit (bottom 5' of pit used for percolation calculations)
  - Surface area used for percolation
    - $A=\pi r^2 + 2\pi rh = \pi(2^2) + 2\pi(2)(5)$
      - $A=75.4 \approx 75$ SF
  - Percolation Rate = 1 in/hr (as measured per geotechnical report)
    - Adjusted percolation Rate = 0.3 in/hr (See Appendix B- Percolation Adjustment calculations)
    - Therefore, Total Infiltration rate over the effective area is:
      - Perc. Rate x A = (0.3in/hr ÷ 12) x 75SF ≈ *1.88 cf/hr*
- Assume 6 Darcy Columns for Drainage Area #2j
  - Total infiltration provided = 6*1.88 cf/hr = 11.28 cf/hr
- Drawdown time for the 2-yr, 2-hr Storm event is:

| | | |
|---|---|---|
| -Volume to be retained | = 327cubic feet | (Refer to SWM-24, for Area #2j) |
| -Drawdown time | =46.9 hrs | (Refer to SWM-24, for Area #2j) |

Refer to the following pages for Santa Cruz County Figures SWM-17 and SWM-24 associated with the above referenced areas.

**PROJECT:** Aptos Creek Drainage Basin (Area #2i-Val. NW of HP) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

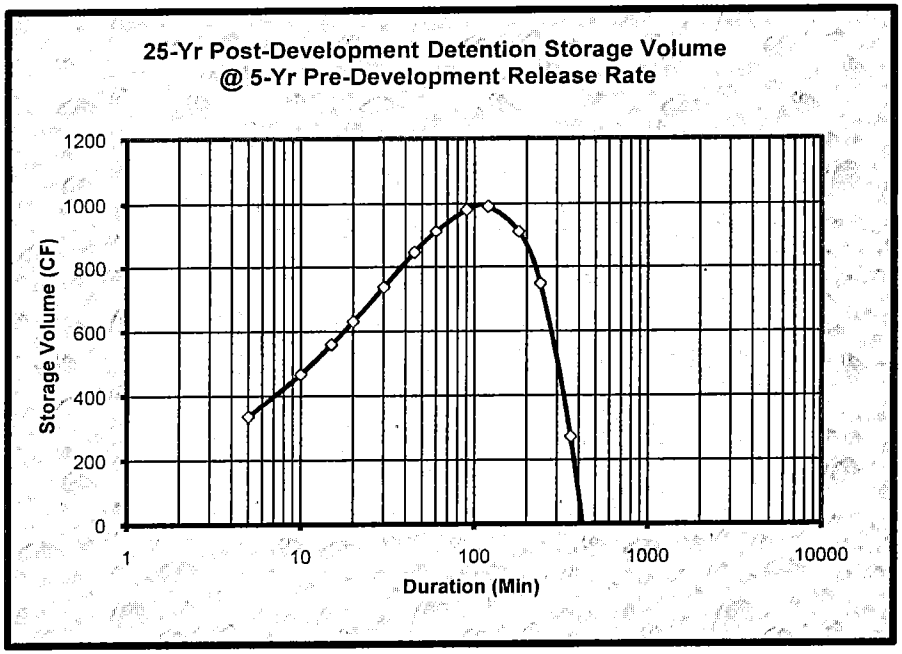
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 15321 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 991 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **2478** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 230.00 | 6.00 | 1.83 | root of the sectional area |
| **Dimen. (ft)** | **228.55** | **5.96** | **1.82** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.021 | 0.090 | -0.064 | -6913 |
| 1200 | 0.30 | 0.023 | 0.097 | -0.057 | -5096 |
| 960 | 0.33 | 0.025 | 0.107 | -0.047 | -3366 |
| 720 | 0.38 | 0.029 | 0.121 | -0.033 | -1756 |
| 480 | 0.45 | 0.034 | 0.144 | -0.009 | -331 |
| 360 | 0.51 | 0.039 | 0.164 | 0.010 | 271 |
| 240 | 0.61 | 0.046 | 0.195 | 0.042 | 748 |
| 180 | 0.69 | 0.052 | 0.221 | 0.068 | 912 |
| 120 | 0.83 | 0.062 | 0.264 | 0.110 | **991** |
| 90 | 0.94 | 0.071 | 0.299 | 0.145 | 980 |
| 60 | 1.12 | 0.084 | 0.356 | 0.203 | 912 |
| 45 | 1.27 | 0.095 | 0.404 | 0.250 | 844 |
| 30 | 1.51 | 0.114 | 0.482 | 0.328 | 738 |
| 20 | 1.80 | 0.136 | 0.574 | 0.421 | 631 |
| 15 | 2.04 | **0.154** | 0.651 | 0.497 | 559 |
| 10 | 2.43 | 0.183 | 0.776 | 0.622 | 467 |
| 5 | 3.29 | 0.248 | **1.049** | 0.895 | 336 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #2j-Val. SW of HP) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

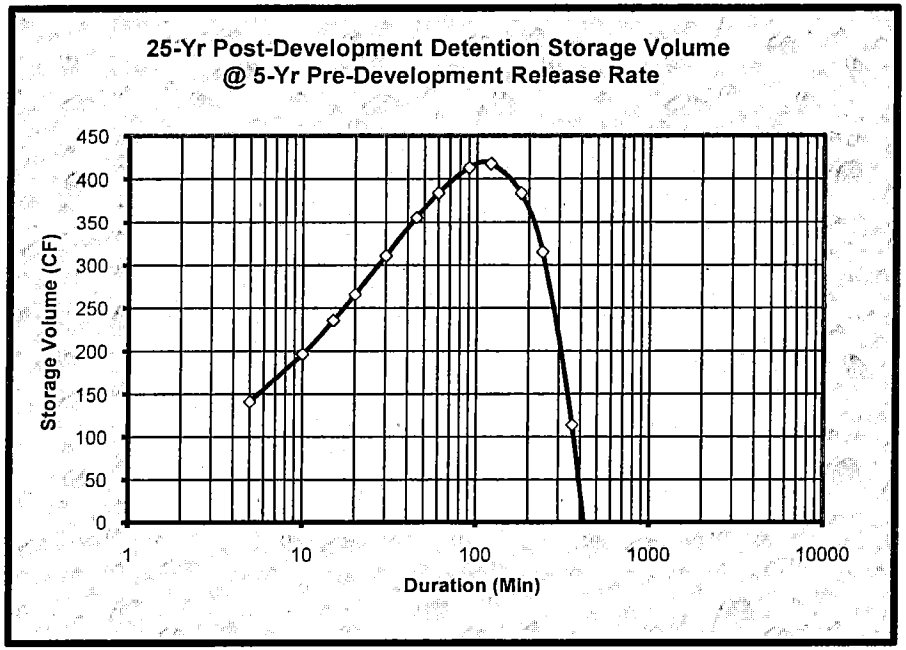
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 6450 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 417 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **1043** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 105.00 | 6.00 | 1.67 | root of the sectional area |
| **Dimen. (ft)** | **104.70** | **5.98** | **1.67** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.009 | 0.038 | -0.027 | -2910 |
| 1200 | 0.30 | 0.010 | 0.041 | -0.024 | -2145 |
| 960 | 0.33 | 0.011 | 0.045 | -0.020 | -1417 |
| 720 | 0.38 | 0.012 | 0.051 | -0.014 | -739 |
| 480 | 0.45 | 0.014 | 0.061 | -0.004 | -139 |
| 360 | 0.51 | 0.016 | 0.069 | 0.004 | 114 |
| 240 | 0.61 | 0.019 | 0.082 | 0.017 | 315 |
| 180 | 0.69 | 0.022 | 0.093 | 0.028 | 384 |
| 120 | 0.83 | 0.026 | 0.111 | 0.046 | **417** |
| 90 | 0.94 | 0.030 | 0.126 | 0.061 | 413 |
| 60 | 1.12 | 0.035 | 0.150 | 0.085 | 384 |
| 45 | 1.27 | 0.040 | 0.170 | 0.105 | 356 |
| 30 | 1.51 | 0.048 | 0.203 | 0.138 | 311 |
| 20 | 1.80 | 0.057 | 0.242 | 0.177 | 266 |
| 15 | 2.04 | **0.065** | 0.274 | 0.209 | 235 |
| 10 | 2.43 | 0.077 | 0.327 | 0.262 | 197 |
| 5 | 3.29 | 0.104 | **0.442** | 0.377 | 141 |




**Notes & Limitations on Use:**

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #2j-Val. SW of HP) **Calc by:** DMR **Date:** 4/11/2011

# RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

**Data Entry:** PRESS TAB KEY & ENTER DESIGN VALUES

SS Ver:1.0

| | | |
|---|---|---|
| Site Location P60 Isopleth: | 1.40 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.30 | |
| Cpost: | 0.90 | |
| Impervious Area: | 6450 | $ft^2$ |
| Saturated Soil Permeability: | 0.30 | in/hr |

**Notes & Limitations on Use:**

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

| 2 - YEAR DESIGN STORM | | | | RETENTION @ 120 MIN. | | DETENTION @ 60 MIN. | |
|---|---|---|---|---|---|---|---|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) | Retention Rate To Storage (cfs) | Specified Retained Volume (cf) | Detention Rate To Storage (cfs) | Specified Detained Volume (cf) |
| 1440 | 0.15 | 0.007 | 0.020 | 0.000 | -130 | -0.007 | -566 |
| 1200 | 0.16 | 0.007 | 0.022 | 0.002 | 11 | -0.005 | -352 |
| 960 | 0.18 | 0.008 | 0.024 | 0.004 | 137 | -0.003 | -154 |
| 720 | 0.20 | 0.009 | 0.027 | 0.007 | 241 | 0.001 | 23 |
| 480 | 0.24 | 0.011 | 0.032 | 0.013 | 312 | 0.006 | 166 |
| 360 | 0.27 | 0.012 | 0.037 | 0.017 | **327** | 0.010 | 218 |
| 240 | 0.33 | 0.015 | 0.044 | 0.024 | 320 | 0.017 | 247 |
| 180 | 0.37 | 0.017 | 0.050 | 0.030 | 303 | 0.023 | 240 |
| 120 | 0.44 | **0.020** | 0.059 | 0.039 | 271 | 0.033 | 234 |
| 90 | 0.50 | 0.022 | 0.067 | 0.047 | 246 | 0.040 | 218 |
| 60 | 0.60 | 0.027 | 0.080 | 0.060 | 211 | 0.053 | 192 |
| 45 | 0.67 | 0.030 | 0.091 | 0.071 | 187 | 0.064 | 173 |
| 30 | 0.80 | 0.036 | 0.108 | 0.088 | 156 | 0.081 | 147 |
| 20 | 0.96 | 0.043 | 0.129 | 0.109 | 129 | 0.102 | 123 |
| 15 | 1.09 | 0.049 | 0.146 | 0.126 | 112 | 0.119 | 108 |
| 10 | 1.30 | 0.058 | 0.174 | 0.155 | 92 | 0.148 | 89 |
| 5 | 1.75 | 0.078 | **0.235** | 0.216 | 64 | 0.209 | 63 |

**STRUCTURE DIMENSIONS FOR RETENTION**

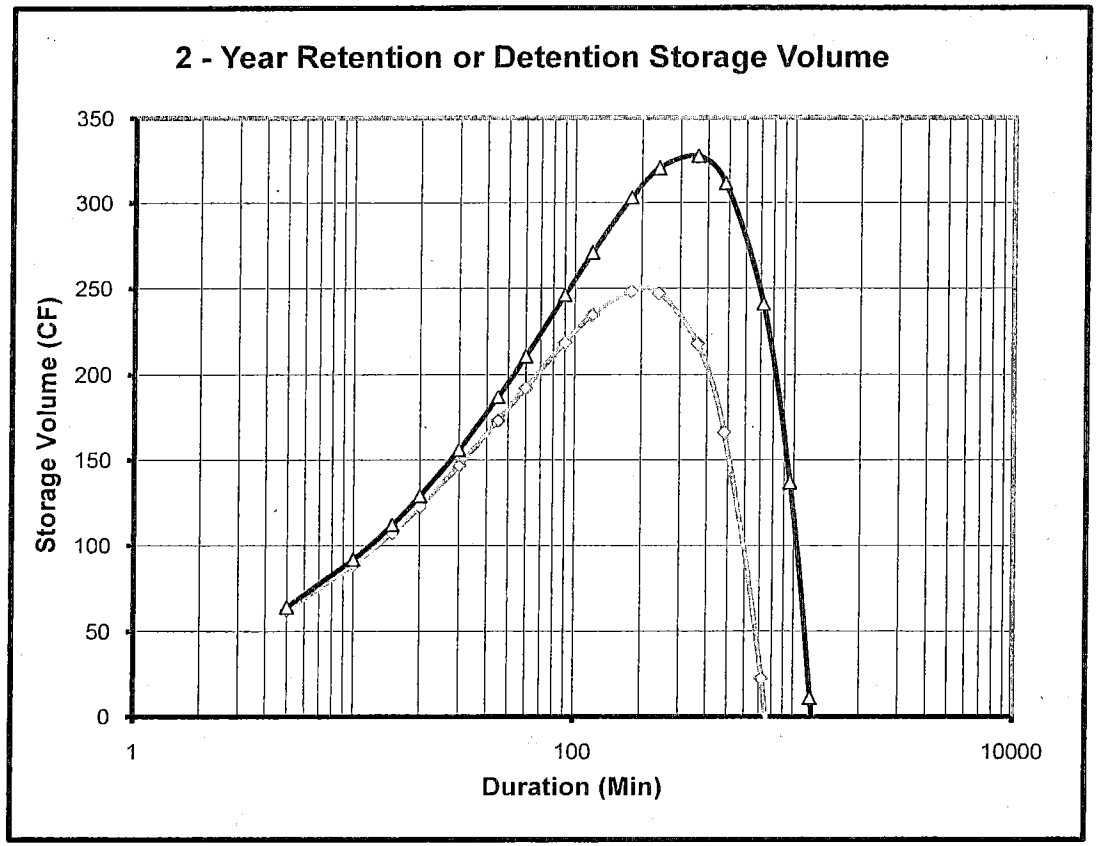
| | | | | |
|---|---|---|---|---|
| 327 | $ft^3$ storage volume calculated | | | |
| 100 | % void space assumed | | | |
| **327** | $ft^3$ excavated volume needed | | | |
| Structure Ratios | Length | Width* | Depth* # | |
| | 3.55 | 3.55 | 30.00 | |
| **Dimen. (ft)** | **3.38** | **3.38** | **28.59** | |
| 398 | $ft^2$ internal surface area | | | |
| **279** | $ft^2$ effective surface area | | | |
| **46.9** | hrs estimated structure drainage time | | | |

* For pipe, use the square root of the sectional area.

\# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.

**STRUCTURE DIMENSIONS FOR DETENTION**

| | | | |
|---|---|---|---|
| 248 | $ft^3$ storage volume calculated | | |
| 100 | % void space assumed | | |
| **248** | $ft^3$ excavated volume needed | | |
| Structure Ratios | Length | Width* | Depth* |
| | 5.30 | 5.30 | 15.00 |
| **Dimen. (ft)** | **4.44** | **4.44** | **12.58** |


2 - Year Retention or Detention Storage Volume
350
300
250
200
150
100
50
0
Storage Volume (CF)
1
100
10000
Duration (Min)

**PROJECT:** Valencia Creek Drainage Basin (Area 7) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

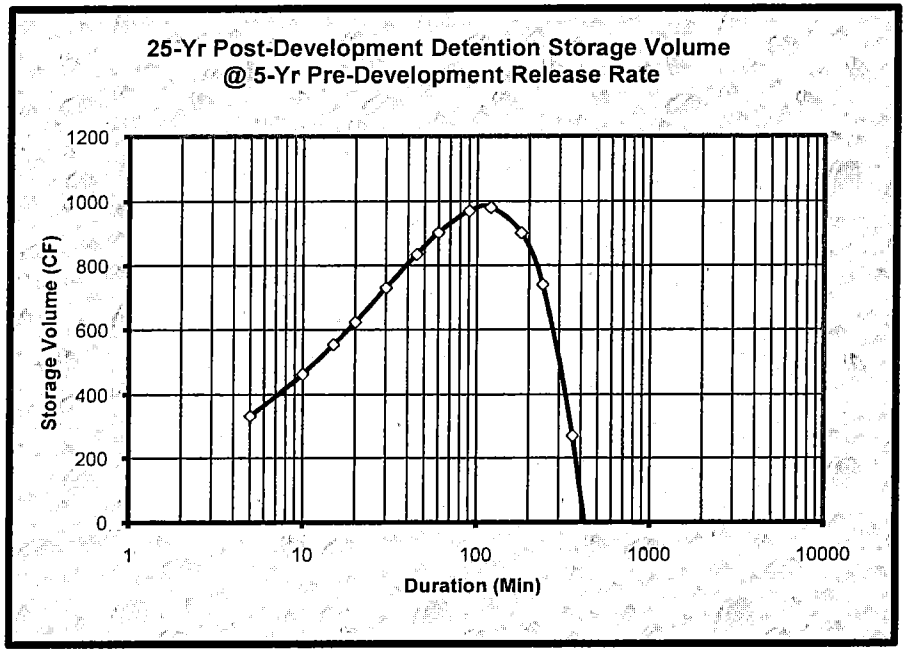
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 15150 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 980 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **2450** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 116.00 | 17.50 | 1.25 | root of the sectional area |
| **Dimen. (ft)** | **114.65** | **17.30** | **1.24** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.021 | 0.089 | -0.063 | -6836 |
| 1200 | 0.30 | 0.023 | 0.096 | -0.056 | -5039 |
| 960 | 0.33 | 0.025 | 0.106 | -0.046 | -3328 |
| 720 | 0.38 | 0.028 | 0.120 | -0.032 | -1736 |
| 480 | 0.45 | 0.034 | 0.143 | -0.009 | -327 |
| 360 | 0.51 | 0.038 | 0.162 | 0.010 | 268 |
| 240 | 0.61 | 0.046 | 0.193 | 0.041 | 740 |
| 180 | 0.69 | 0.052 | 0.219 | 0.067 | 902 |
| 120 | 0.83 | 0.062 | 0.261 | 0.109 | **980** |
| 90 | 0.94 | 0.070 | 0.296 | 0.144 | 969 |
| 60 | 1.12 | 0.083 | 0.352 | 0.201 | 902 |
| 45 | 1.27 | 0.094 | 0.399 | 0.247 | 835 |
| 30 | 1.51 | 0.112 | 0.476 | 0.324 | 730 |
| 20 | 1.80 | 0.134 | 0.568 | 0.416 | 624 |
| 15 | 2.04 | **0.152** | 0.644 | 0.492 | 553 |
| 10 | 2.43 | 0.181 | 0.767 | 0.616 | 462 |
| 5 | 3.29 | 0.245 | **1.037** | 0.885 | 332 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #9a) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

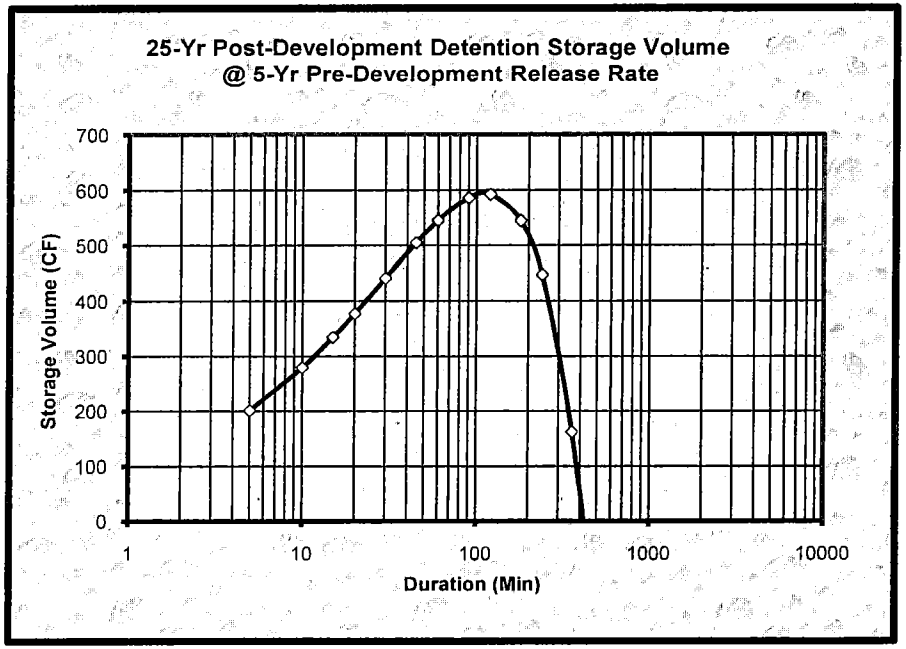
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 9165 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 593 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **1482** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 100.00 | 17.50 | 0.92 | root of the sectional area |
| **Dimen. (ft)** | **97.28** | **17.02** | **0.89** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.013 | 0.054 | -0.038 | -4135 |
| 1200 | 0.30 | 0.014 | 0.058 | -0.034 | -3048 |
| 960 | 0.33 | 0.015 | 0.064 | -0.028 | -2013 |
| 720 | 0.38 | 0.017 | 0.072 | -0.019 | -1050 |
| 480 | 0.45 | 0.020 | 0.086 | -0.005 | -198 |
| 360 | 0.51 | 0.023 | 0.098 | 0.006 | 162 |
| 240 | 0.61 | 0.028 | 0.117 | 0.025 | 447 |
| 180 | 0.69 | 0.031 | 0.132 | 0.040 | 545 |
| 120 | 0.83 | 0.037 | 0.158 | 0.066 | **593** |
| 90 | 0.94 | 0.042 | 0.179 | 0.087 | 586 |
| 60 | 1.12 | 0.050 | 0.213 | 0.121 | 546 |
| 45 | 1.27 | 0.057 | 0.242 | 0.150 | 505 |
| 30 | 1.51 | 0.068 | 0.288 | 0.196 | 441 |
| 20 | 1.80 | 0.081 | 0.344 | 0.252 | 378 |
| 15 | 2.04 | **0.092** | 0.389 | 0.297 | 335 |
| 10 | 2.43 | 0.110 | 0.464 | 0.372 | 279 |
| 5 | 3.29 | 0.148 | **0.627** | 0.535 | 201 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #9a) **Calc by:** DMR **Date:** 4/11/2011

# RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

**Data Entry:** PRESS TAB KEY & ENTER DESIGN VALUES

SS Ver:1.0

| | | |
|---|---|---|
| Site Location P60 Isopleth: | 1.40 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.30 | |
| Cpost: | 0.90 | |
| Impervious Area: | 9165 | $ft^2$ |
| Saturated Soil Permeability: | 0.30 | in/hr |

**Notes & Limitations on Use:**

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

## 2 - YEAR DESIGN STORM

| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) |
|---|---|---|---|
| 1440 | 0.15 | 0.010 | 0.029 |
| 1200 | 0.16 | 0.010 | 0.031 |
| 960 | 0.18 | 0.011 | 0.034 |
| 720 | 0.20 | 0.013 | 0.039 |
| 480 | 0.24 | 0.015 | 0.046 |
| 360 | 0.27 | 0.017 | 0.052 |
| 240 | 0.33 | 0.021 | 0.062 |
| 180 | 0.37 | 0.024 | 0.071 |
| 120 | 0.44 | **0.028** | 0.084 |
| 90 | 0.50 | 0.032 | 0.095 |
| 60 | 0.60 | **0.038** | 0.114 |
| 45 | 0.67 | 0.043 | 0.129 |
| 30 | 0.80 | 0.051 | 0.154 |
| 20 | 0.96 | 0.061 | 0.183 |
| 15 | 1.09 | 0.069 | 0.208 |
| 10 | 1.30 | 0.083 | 0.248 |
| 5 | 1.75 | 0.112 | **0.335** |

## RETENTION @ 120 MIN.

| Retention Rate To Storage (cfs) | Specified Retained Volume (cf) |
|---|---|
| 0.001 | -187 |
| 0.003 | 14 |
| 0.006 | 193 |
| 0.011 | 341 |
| 0.018 | 442 |
| 0.024 | **464** |
| 0.034 | 454 |
| 0.043 | 430 |
| 0.056 | 385 |
| 0.067 | 349 |
| 0.086 | 299 |
| 0.101 | 265 |
| 0.126 | 222 |
| 0.155 | 183 |
| 0.180 | 159 |
| 0.220 | 130 |
| 0.307 | 91 |

## STRUCTURE DIMENSIONS FOR RETENTION

464 $ft^3$ storage volume calculated
100 % void space assumed
**464** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* # |
|---|---|---|---|
| Ratios | 3.60 | 3.60 | 45.00 |
| **Dimen. (ft)** | **3.34** | **3.34** | **41.70** |

568 $ft^2$ internal surface area
**397** $ft^2$ effective surface area
**46.7** hrs estimated structure drainage time

* For pipe, use the square root of the sectional area.
\# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.

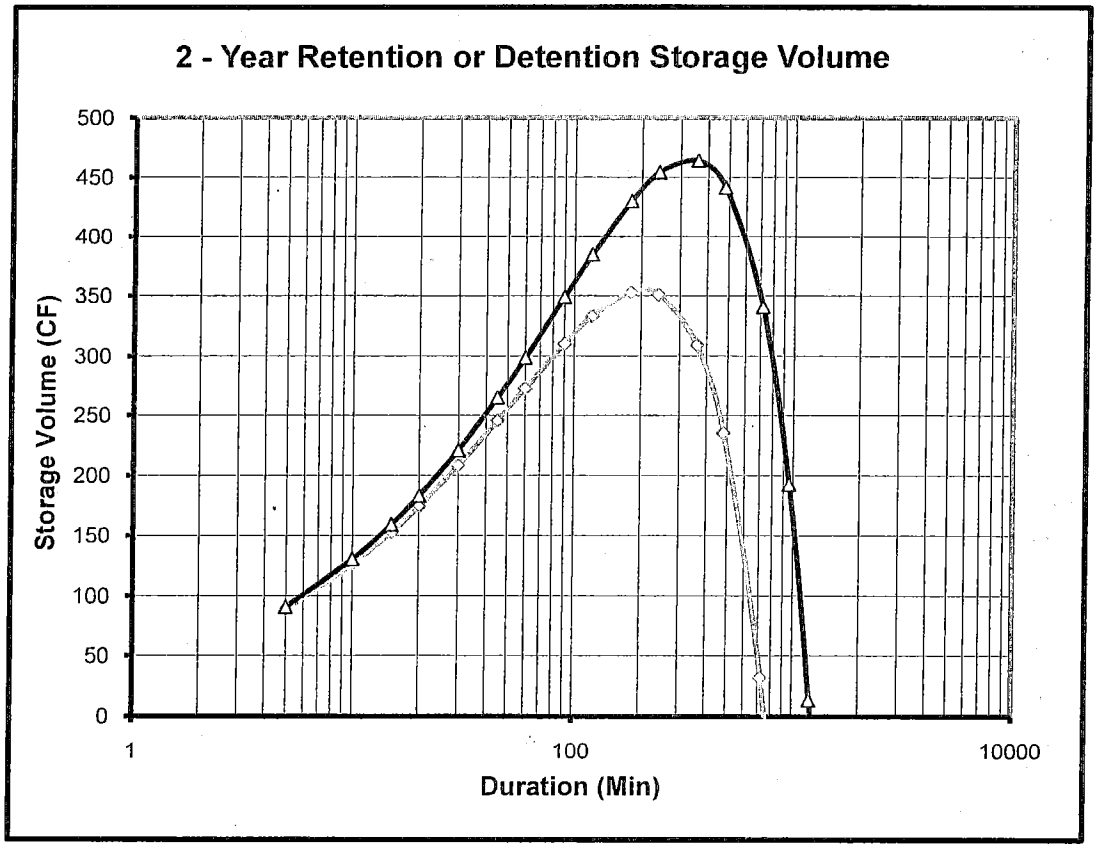
## STRUCTURE DIMENSIONS FOR DETENTION

353 $ft^3$ storage volume calculated
100 % void space assumed
**353** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 5.30 | 5.30 | 15.00 |
| **Dimen. (ft)** | **5.00** | **5.00** | **14.14** |

## DETENTION @ 60 MIN.

| Detention Rate To Storage (cfs) | Specified Detained Volume (cf) |
|---|---|
| -0.009 | -804 |
| -0.007 | -500 |
| -0.004 | -219 |
| 0.001 | 32 |
| 0.008 | 236 |
| 0.014 | 309 |
| 0.024 | 351 |
| 0.033 | 353 |
| 0.046 | 333 |
| 0.057 | 310 |
| 0.076 | 273 |
| 0.091 | 246 |
| 0.116 | 208 |
| 0.145 | 174 |
| 0.170 | 153 |
| 0.210 | 126 |
| 0.297 | 89 |


2 - Year Retention or Detention Storage Volume
Storage Volume (CF)
500
450
400
350
300
250
200
150
100
50
0
1
100
10000
Duration (Min)

**PROJECT:** Aptos Creek Drainage Basin (Area #9b) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 12669 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

820 $ft^3$ storage volume calculated

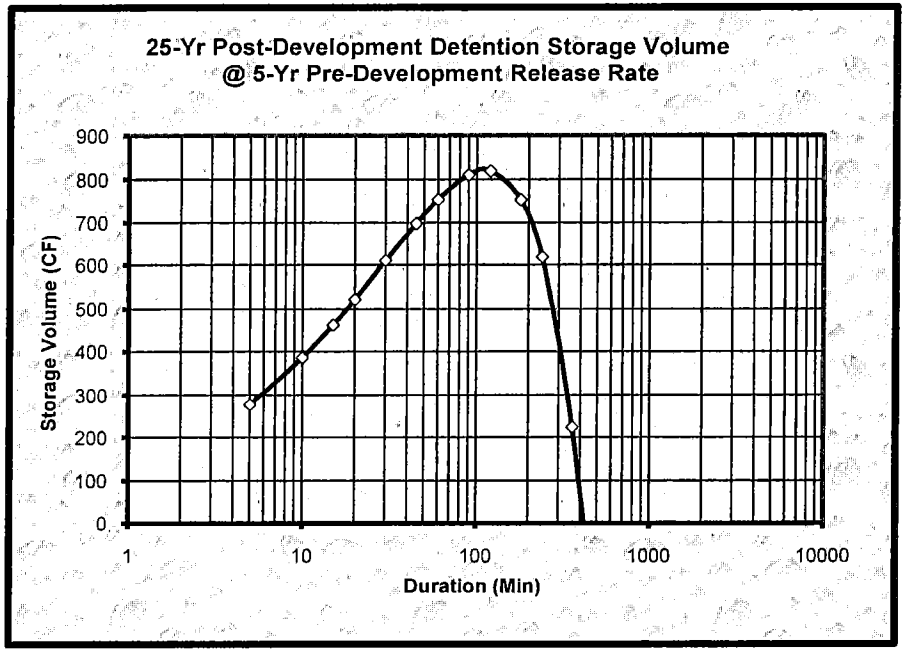
40 % void space assumed

**2049** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 127.00 | 17.50 | 1.00 |
| **Dimen. (ft)** | **123.60** | **17.03** | **0.97** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.018 | 0.074 | -0.053 | -5716 |
| 1200 | 0.30 | 0.019 | 0.080 | -0.047 | -4214 |
| 960 | 0.33 | 0.021 | 0.088 | -0.039 | -2783 |
| 720 | 0.38 | 0.024 | 0.100 | -0.027 | -1452 |
| 480 | 0.45 | 0.028 | 0.119 | -0.008 | -274 |
| 360 | 0.51 | 0.032 | 0.135 | 0.008 | 224 |
| 240 | 0.61 | 0.038 | 0.161 | 0.034 | 619 |
| 180 | 0.69 | 0.043 | 0.183 | 0.056 | 754 |
| 120 | 0.83 | 0.052 | 0.218 | 0.091 | **820** |
| 90 | 0.94 | 0.058 | 0.247 | 0.120 | 811 |
| 60 | 1.12 | 0.070 | 0.295 | 0.168 | 755 |
| 45 | 1.27 | 0.079 | 0.334 | 0.207 | 698 |
| 30 | 1.51 | 0.094 | 0.398 | 0.271 | 610 |
| 20 | 1.80 | 0.112 | 0.475 | 0.348 | 522 |
| 15 | 2.04 | **0.127** | 0.538 | 0.411 | 462 |
| 10 | 2.43 | 0.152 | 0.642 | 0.515 | 386 |
| 5 | 3.29 | 0.205 | **0.867** | 0.740 | 278 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #9b) **Calc by:** DMR **Date:** 4/11/2011

# RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

**Data Entry:** PRESS TAB KEY & ENTER DESIGN VALUES

SS Ver:1.0

| | | |
|---|---|---|
| Site Location P60 Isopleth: | 1.40 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.30 | |
| Cpost: | 0.90 | |
| Impervious Area: | 12669 | $ft^2$ |
| Saturated Soil Permeability: | 0.30 | in/hr |

**Notes & Limitations on Use:**

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

## 2 - YEAR DESIGN STORM

| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) |
|---|---|---|---|
| 1440 | 0.15 | 0.013 | 0.040 |
| 1200 | 0.16 | 0.014 | 0.043 |
| 960 | 0.18 | 0.016 | 0.047 |
| 720 | 0.20 | 0.018 | 0.053 |
| 480 | 0.24 | 0.021 | 0.064 |
| 360 | 0.27 | 0.024 | 0.072 |
| 240 | 0.33 | 0.029 | 0.086 |
| 180 | 0.37 | 0.033 | 0.098 |
| 120 | 0.44 | **0.039** | 0.116 |
| 90 | 0.50 | 0.044 | 0.132 |
| 60 | 0.60 | 0.052 | 0.157 |
| 45 | 0.67 | 0.059 | 0.178 |
| 30 | 0.80 | 0.071 | 0.212 |
| 20 | 0.96 | 0.084 | 0.253 |
| 15 | 1.09 | 0.096 | 0.287 |
| 10 | 1.30 | 0.114 | 0.342 |
| 5 | 1.75 | 0.154 | **0.463** |

## RETENTION @ 120 MIN.

| Retention Rate To Storage (cfs) | Specified Retained Volume (cf) |
|---|---|
| 0.001 | -255 |
| 0.004 | 22 |
| 0.008 | 269 |
| 0.015 | 473 |
| 0.025 | 612 |
| 0.033 | **642** |
| 0.047 | 629 |
| 0.059 | 595 |
| 0.078 | 532 |
| 0.093 | 483 |
| 0.118 | 413 |
| 0.139 | 367 |
| 0.174 | 306 |
| 0.215 | 253 |
| 0.248 | 220 |
| 0.304 | 180 |
| 0.424 | 126 |

## STRUCTURE DIMENSIONS FOR RETENTION

642 $ft^3$ storage volume calculated
100 % void space assumed
**642** $ft^3$ excavated volume needed

| Structure Ratios | Length 3.60 | Width* 3.60 | Depth* # 60.00 |
|---|---|---|---|
| **Dimen. (ft)** | **3.38** | **3.38** | **56.30** |

772 $ft^2$ internal surface area
**540** $ft^2$ effective surface area
**47.5** hrs estimated structure drainage time

* For pipe, use the square root of the sectional area.
\# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.

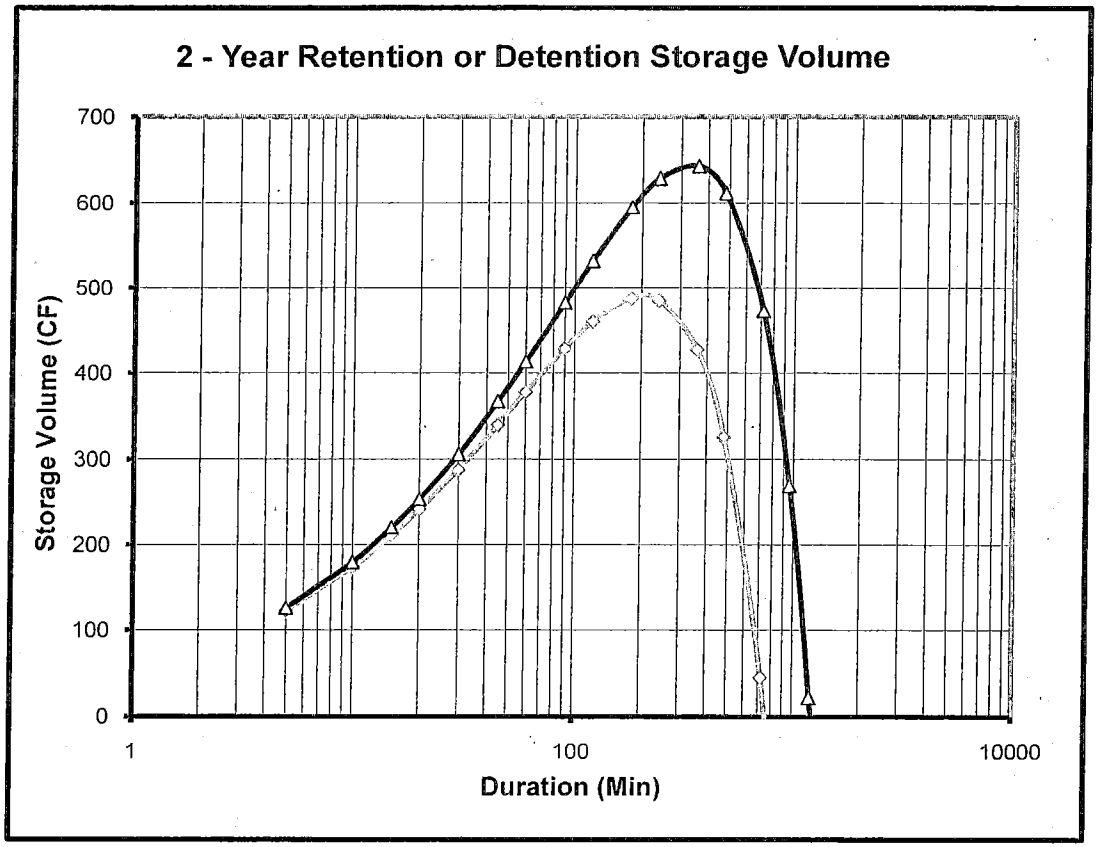
## STRUCTURE DIMENSIONS FOR DETENTION

488 $ft^3$ storage volume calculated
40 % void space assumed
**1219** $ft^3$ excavated volume needed

| Structure Ratios | Length 127.00 | Width* 17.50 | Depth* 0.67 |
|---|---|---|---|
| **Dimen. (ft)** | **118.81** | **16.37** | **0.63** |

## DETENTION @ 60 MIN.

| Detention Rate To Storage (cfs) | Specified Detained Volume (cf) |
|---|---|
| -0.013 | -1111 |
| -0.010 | -691 |
| -0.005 | -302 |
| 0.001 | 44 |
| 0.011 | 326 |
| 0.020 | 428 |
| 0.034 | 485 |
| 0.045 | 488 |
| 0.064 | 460 |
| 0.079 | 429 |
| 0.105 | 377 |
| 0.126 | 339 |
| 0.160 | 288 |
| 0.201 | 241 |
| 0.235 | 211 |
| 0.290 | 174 |
| 0.410 | 123 |


2 - Year Retention or Detention Storage Volume
Storage Volume (CF)
700
600
500
400
300
200
100
0
1
100
10000
Duration (Min)

**PROJECT:** Aptos Creek Drainage Basin (Area #10) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

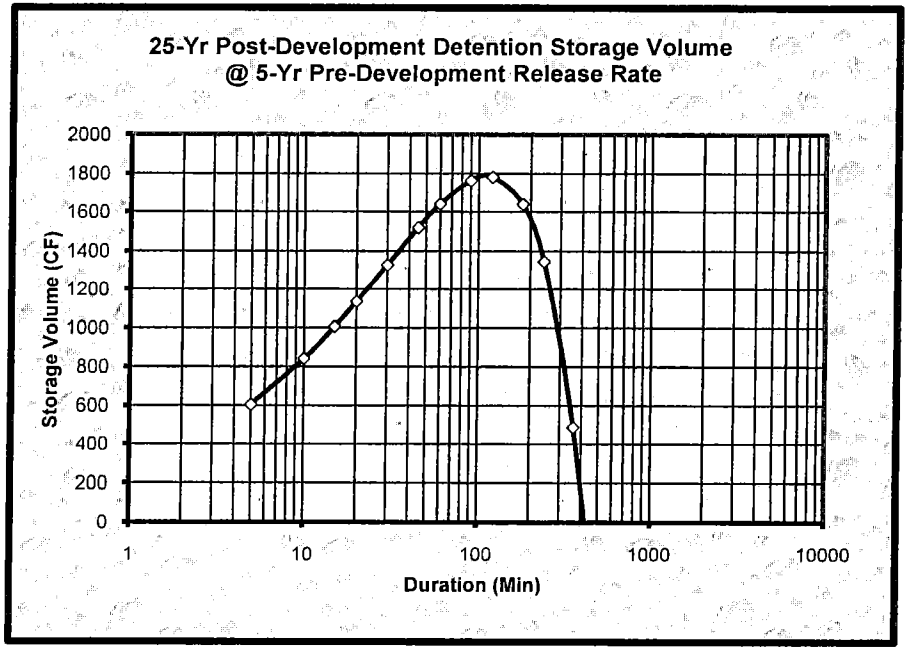
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 27541 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 1782 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **4454** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 126.00 | 19.00 | 2.00 | root of the sectional area |
| **Dimen. (ft)** | **123.00** | **18.55** | **1.95** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.038 | 0.161 | -0.115 | -12426 |
| 1200 | 0.30 | 0.041 | 0.174 | -0.102 | -9160 |
| 960 | 0.33 | 0.045 | 0.192 | -0.084 | -6050 |
| 720 | 0.38 | 0.051 | 0.218 | -0.058 | -3156 |
| 480 | 0.45 | 0.061 | 0.260 | -0.017 | -595 |
| 360 | 0.51 | 0.069 | 0.294 | 0.018 | 487 |
| 240 | 0.61 | 0.083 | 0.351 | 0.075 | 1345 |
| 180 | 0.69 | 0.094 | 0.398 | 0.121 | 1639 |
| 120 | 0.83 | 0.112 | 0.474 | 0.198 | **1782** |
| 90 | 0.94 | 0.127 | 0.537 | 0.261 | 1762 |
| 60 | 1.12 | 0.151 | 0.641 | 0.365 | 1640 |
| 45 | 1.27 | 0.171 | 0.726 | 0.450 | 1518 |
| 30 | 1.51 | 0.204 | 0.866 | 0.590 | 1327 |
| 20 | 1.80 | 0.244 | 1.032 | 0.756 | 1134 |
| 15 | 2.04 | **0.276** | 1.170 | 0.894 | 1005 |
| 10 | 2.43 | 0.329 | 1.395 | 1.119 | 839 |
| 5 | 3.29 | 0.445 | **1.885** | 1.609 | 603 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

***Allowable Release Rate and Overflow Discharge:***

The total allowable release rate per the calculations performed on page 6 of this report, is $Qpre_{5yr}$ = 0.94 cfs, for a 25-year storm event.
As shown in the preceding Figures SWM-17 the total combined release rate = 0.866 cfs. As discussed in the descriptions of each drainage basin, the subdrains and overflow pipes associated with each system will discharge into an outlet control structure with weir and orifice prior to entering the main system and eventually Aptos Creek. The orifice calculations are shown below. Systems 7, 9a & 9b have been combined to outlet into a single outlet control structure and therefore a combined flowrate has been used.

| **Orifice Calculator –Areas #7, #9a & #9b (Control Structure #7)** | **Orifice Calculator – Area #10 (Control Structure #10)** |
|---|---|
| Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.371 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 1.2500 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 3.5261 in***<br>Velocity ..... 4.8932 fps | Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.2760 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 2.0000 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 2.7042 in***<br>Velocity ..... 6.9201 fps |
| **Orifice Calculator – Area #2i (Control Structure #11)** | **Orifice Calculator – Area #2j (Control Structure #12)** |
| Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.1540 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 1.8300 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 2.0653 in***<br>Velocity ..... 6.6195 fps | Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.0650 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 2.0800 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 1.2995 in***<br>Velocity ..... 7.0571 fps |

Therefore,

| Control Structure # | Weir Height (feet) | Orifice Size (inches) | Max. Flowrate (cfs) |
|---|---|---|---|
| 7 | 1.00 | 3.5 | 0.366 |
| 10 | 2.00 | 2.70 | 0.275 |
| 11 | 1.83 | 2.00 | 0.144 |
| 12 | 2.08 | 1.30 | 0.065 |

*Total Flowrate offsite from above Detention Systems, for a 25-yr storm event = 0.87 cfs* < $Qpre_{5yr}$ *=0.94 cfs*

➔ Total runoff offsite from impervious surfaces not captured by detention systems:
- Area =0.08 Acres, C=0.9, $C_a$=1.1, $I_{25}$=2.43
- $Q_{25} = C_aCIA$ =(1.1)(0.9)(2.43)(0.08) = 0.19 cfs

➔ Therefore, Total Runoff offsite for 25-yr storm = 0.87cfs+0.19 cfs =1.06 cfs

***Valencia Creek Drainage Basin***

→Area includes minor drainage basins, Area 1, 2a-2h, 3-6, & 8.

- Total area = 5.51 AC
- Impervious area (including Pervious Concrete) = 5.51 AC

| | |
|---|---|
| C = | = 0.9 |
| $I_2$ @ $T_c$ = 10 min | = 1.30 in/hr |
| $I_5$ @ $T_c$ = 10 min | = 1.72 in/hr |
| $I_{25}$ @ $T_c$ = 10 min | = 2.43 in/hr |
| $Q_2$ = CIA = (0.9)(1.30)(5.51) | = 6.45 cfs. |
| $Q_5$ = CIA = (0.9)(1.72)(5.51) | = 8.53 cfs |
| $Q_{25}$ = $C_a$CIA = (1.1)(0.9)(2.43)(5.51) | = 13.26 cfs |

*Increase in Runoff: ***$Q_2$ = 4.28 cfs, $Q_5$ = 5.66 cfs, $Q_{25}$ = 8.79 cfs***

Retention/Detention will be required to mitigate the increased runoff rate for the proposed development. It will be achieved by utilizing pervious concrete and associated stone beds as described in the Proposed Drainage Conditions, above. (Refer to Sheet C4, Grading & Paving Plan, for locations). The retention portion of the system is sized based on a 2-year, 2-hour, storm event, per Figure SWM-24. The Detention portion is sized for a 25-year storm event with a 5-year pre-development allowable release rate, per figure SWM-17.

*Darcy Column Retention Calculation:*

*During field investigations by County Staff, Ifland Engineers, and Haro Kasunich & Assoc. the observations for holes B-5A & B5B appeared dry in all cases. The depths of these holes were approximately 6.25' and 3.3', respectively. Therefore, the stone bed beneath the pervious concrete can be used for retention. Furthermore, Darcy Columns (seepage pits) have also been proposed in this area to mitigate additional runoff by means of retention. No other boring holes appeared viable for infiltration and retention purposes. Therefore, the only system to utilize Darcy Columns within the Valencia Creek Drainage Basin is Area #3, within the large parking area. The Stone bed and columns have been designed based on the 2-yr, 2-hr storm event set forth by the County Design criteria. In addition to the structural dimensions of the lower parking stalls (most easterly rows), a total of 11 columns are proposed throughout the pervious concrete stone beds to mitigate runoff. Refer to following calculations.

*Area #3*

➔ 6' diameter 4' deep seepage pit (entire 4' of pit used for percolation calculations)
  - Surface area used for percolation
    - $A=\pi r^2 + 2\pi rh = \pi(3^2) + 2\pi(3)(4)$
      - $A=28.27+75.4 \approx 104$ SF
  - Percolation Rate = 3 & 1.5 in/hr (as measured per geotechnical report)
    - Adjusted percolation Rate = 0.68 in/hr (See Appendix B- Percolation Adjustment calculations)

➔ Drawdown and Retained Volume time for the 2-yr, 2-hr Storm event is:

| | | |
|---|---|---|
| -Req'd Volume to be retained | = 4,385 cubic feet | (Refer to calcs on following page) |
| -Available Volume to be retained | = 4,494 cubic feet | (Refer to calcs on following page) |
| -Drawdown time | = 35.9 hrs | (Refer to calcs on following page) |

❖ The spreadsheet on the following page is based on the Santa Cruz County Figure SWM-24. Figure SWM-24 was modified to incorporate both the Darcy Columns and the Stone bed beneath the pervious concrete.

→Figures SWM-17, on the following pages, demonstrate the required detention volumes, sizes and required flowrates for each area within the Valencia Creek drainage basin for a 25-year storm event with a 5-year release rate.

**Project:** Valencia Ceek Drainage Basin (Area #3) Calc by: DMR Date: 4/11/2011

## Runoff Retention by the Storage Percolation Method

| *Site Characteristics* | | |
|---|---|---|
| Site Location P60 Isopleth: | **1.40** | Fig. SWM-2 |
| Rational Coefficients Cpre: | **0.30** | |
| Cpost: | **0.90** | |
| Impervious Area: | **91,581** | $ft^2$ |
| Saturated Soil Permeability: | **0.68** | in/hr |

| *Darcy Columns (DC)* | | | |
|---|---|---|---|
| Area: | **1,664** | $ft^2$ | Number of Columns: 16 |
| Depth of Column: | **4.00** | feet | Diameter: 6' |
| Void Space: | **40%** | | |
| Saturated Soil Permeability: | **0.68** | in/hr | |
| Effective Surface Area: | **1,165** | $ft^2$ (assumes 70% effectiveness) | |
| Available Storage: | **2662** | | |

| 2 - YEAR DESIGN STORM | | | | | | | RETENTION | |
|---|---|---|---|---|---|---|---|---|
| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre at 2 hr Int. (cfs) | Direct Rainfall Rate (cfs) | Soil Infiltration Rate (DC) (cfs) | Soil Infiltration Rate (PC) (cfs) | Qpost (cfs) | Required Retention Rate (cfs) | Required Storage Volume (cf) |
| 1440 | 0.15 | 0.278 | 0.009 | 0.018 | 0.034 | 0.283 | 0.005 | -3,304 |
| 1200 | 0.16 | 0.278 | 0.009 | 0.018 | 0.034 | 0.307 | 0.029 | -1,020 |
| 960 | 0.18 | 0.278 | 0.010 | 0.018 | 0.034 | 0.338 | 0.060 | 1,037 |
| 720 | 0.20 | 0.278 | 0.012 | 0.018 | 0.034 | 0.383 | 0.105 | 2,781 |
| 480 | 0.24 | 0.278 | 0.014 | 0.018 | 0.034 | 0.457 | 0.179 | 4,043 |
| 360 | 0.27 | 0.278 | 0.016 | 0.018 | 0.034 | 0.518 | 0.240 | **4,385** |
| 240 | 0.33 | 0.278 | 0.019 | 0.018 | 0.034 | 0.617 | 0.339 | 4,402 |
| 180 | 0.37 | 0.278 | 0.021 | 0.018 | 0.034 | 0.699 | 0.421 | 4,216 |
| 120 | 0.44 | 0.278 | 0.026 | 0.018 | 0.034 | 0.834 | 0.556 | 3,810 |
| 90 | 0.50 | 0.278 | 0.029 | 0.018 | 0.034 | 0.945 | 0.667 | 3,475 |
| 60 | 0.60 | 0.278 | 0.035 | 0.018 | 0.034 | 1.127 | 0.849 | 2,992 |
| 45 | 0.67 | 0.278 | 0.039 | 0.018 | 0.034 | 1.277 | 0.999 | 2,661 |
| 30 | 0.80 | 0.278 | 0.047 | 0.018 | 0.034 | 1.523 | 1.245 | 2,230 |
| 20 | 0.96 | 0.278 | 0.056 | 0.018 | 0.034 | 1.816 | 1.538 | 1,849 |
| 15 | 1.09 | 0.278 | 0.063 | 0.018 | 0.034 | 2.058 | 1.780 | 1,611 |
| 10 | 1.30 | 0.278 | 0.075 | 0.018 | 0.034 | 2.454 | 2.176 | 1,319 |
| 5 | 1.75 | 0.278 | 0.102 | 0.018 | 0.034 | 3.316 | 3.038 | 926 |

| *Structual Dimensions - Pervious Concrete & Stone Bed (PC)* | | |
|---|---|---|
| Void Space: | **40%** | |
| Length: | **143.0** | ft |
| Width: | **17.5** | ft |
| Depth: | **1.83** | ft |
| Effective Surface Area: | **2,163** | $ft^2$ (assumes 70% effectiveness) |
| Available Storage Volume: | **1,832** | $ft^3$ |
| Drawdown Time: | **35.9** | hours |

***TOTAL AVAILABLE STORAGE: 4,494 $ft^3$***

**PROJECT:** Valencia Creek Drainage Basin (Area #3) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

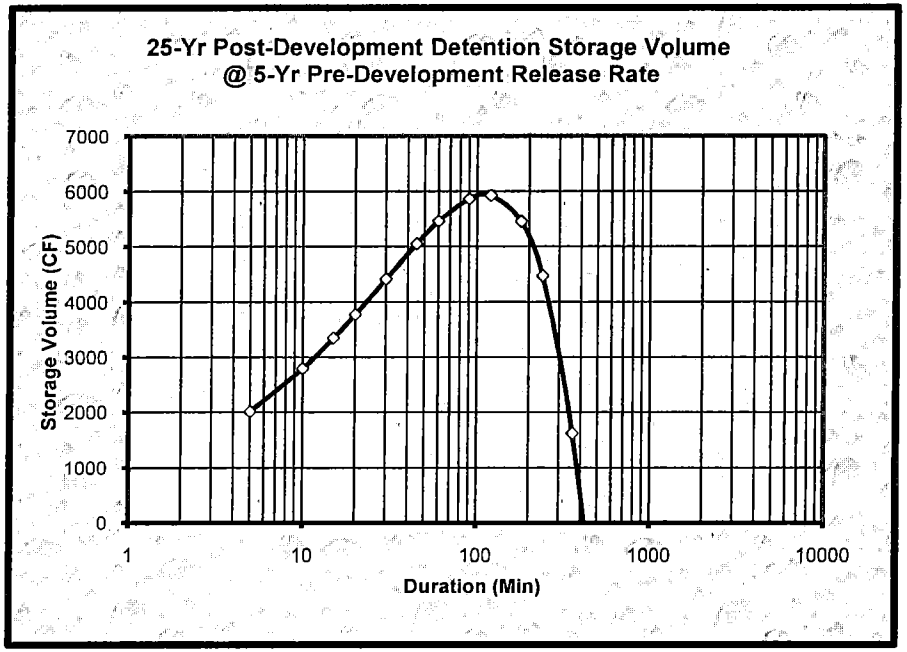
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 91581 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 5924 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **14811** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 270.00 | 30.66 | 1.83 | root of the sectional area |
| **Dimen. (ft)** | **267.98** | **30.43** | **1.82** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.127 | 0.536 | -0.383 | -41321 |
| 1200 | 0.30 | 0.137 | 0.580 | -0.338 | -30460 |
| 960 | 0.33 | 0.151 | 0.639 | -0.279 | -20118 |
| 720 | 0.38 | 0.171 | 0.724 | -0.194 | -10496 |
| 480 | 0.45 | 0.204 | 0.864 | -0.055 | -1978 |
| 360 | 0.51 | 0.231 | 0.979 | 0.060 | 1620 |
| 240 | 0.61 | 0.276 | 1.167 | 0.248 | 4471 |
| 180 | 0.69 | 0.312 | 1.322 | 0.404 | 5450 |
| 120 | 0.83 | 0.372 | 1.577 | 0.658 | **5924** |
| 90 | 0.94 | 0.422 | 1.787 | 0.868 | 5860 |
| 60 | 1.12 | 0.503 | 2.131 | 1.212 | 5454 |
| 45 | 1.27 | 0.570 | 2.414 | 1.496 | 5048 |
| 30 | 1.51 | 0.680 | 2.879 | 1.960 | 4411 |
| 20 | 1.80 | 0.811 | 3.433 | 2.515 | 3772 |
| 15 | 2.04 | **0.919** | 3.890 | 2.972 | 3343 |
| 10 | 2.43 | 1.095 | 4.639 | 3.721 | 2791 |
| 5 | 3.29 | 1.480 | **6.269** | 5.350 | 2006 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #1a) **Calc by:** ____ **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

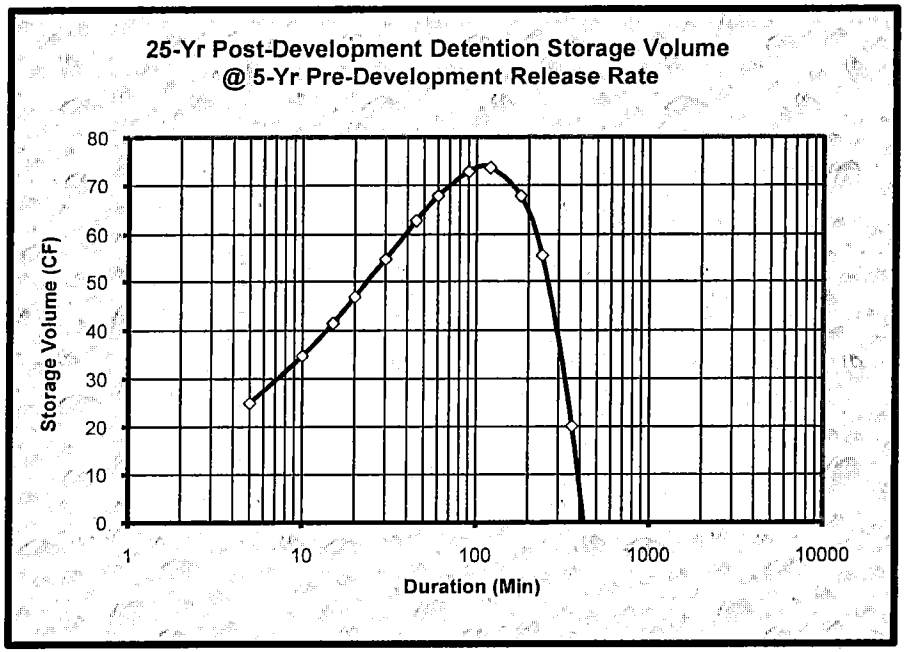
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 1138 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 74 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **184** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 19.00 | 10.00 | 1.00 | root of the sectional area |
| **Dimen. (ft)** | **18.80** | **9.89** | **0.99** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.002 | 0.007 | -0.005 | -513 |
| 1200 | 0.30 | 0.002 | 0.007 | -0.004 | -378 |
| 960 | 0.33 | 0.002 | 0.008 | -0.003 | -250 |
| 720 | 0.38 | 0.002 | 0.009 | -0.002 | -130 |
| 480 | 0.45 | 0.003 | 0.011 | -0.001 | -25 |
| 360 | 0.51 | 0.003 | 0.012 | 0.001 | 20 |
| 240 | 0.61 | 0.003 | 0.015 | 0.003 | 56 |
| 180 | 0.69 | 0.004 | 0.016 | 0.005 | 68 |
| 120 | 0.83 | 0.005 | 0.020 | 0.008 | **74** |
| 90 | 0.94 | 0.005 | 0.022 | 0.011 | 73 |
| 60 | 1.12 | 0.006 | 0.026 | 0.015 | 68 |
| 45 | 1.27 | 0.007 | 0.030 | 0.019 | 63 |
| 30 | 1.51 | 0.008 | 0.036 | 0.024 | 55 |
| 20 | 1.80 | 0.010 | 0.043 | 0.031 | 47 |
| 15 | 2.04 | **0.011** | 0.048 | 0.037 | 42 |
| 10 | 2.43 | 0.014 | 0.058 | 0.046 | 35 |
| 5 | 3.29 | 0.018 | **0.078** | 0.066 | 25 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #1b) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

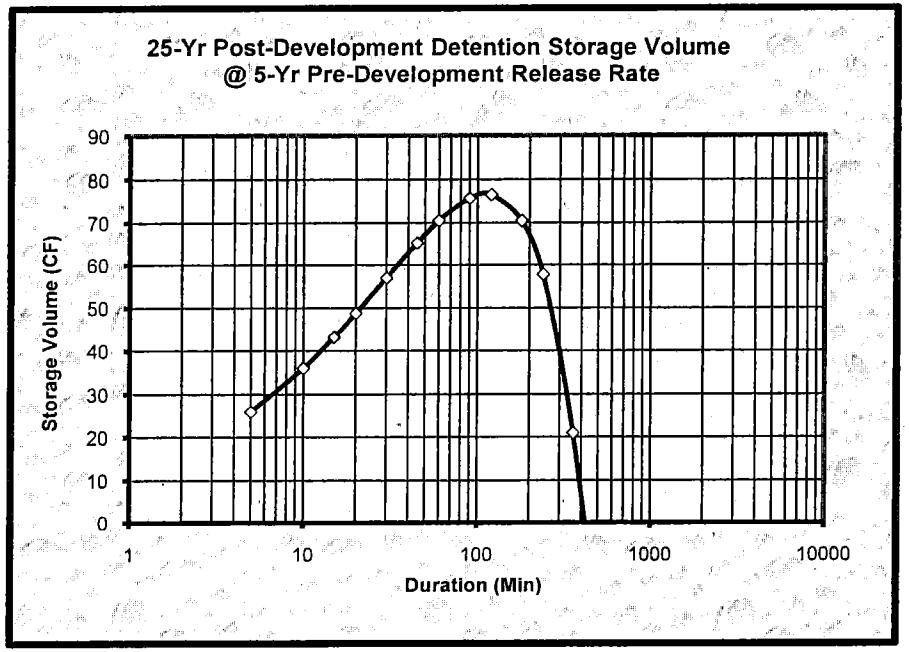
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 1184 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 77 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **191** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 19.00 | 10.00 | 1.08 | root of the sectional area |
| **Dimen. (ft)** | **18.57** | **9.77** | **1.06** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.002 | 0.007 | -0.005 | -534 |
| 1200 | 0.30 | 0.002 | 0.007 | -0.004 | -394 |
| 960 | 0.33 | 0.002 | 0.008 | -0.004 | -260 |
| 720 | 0.38 | 0.002 | 0.009 | -0.003 | -136 |
| 480 | 0.45 | 0.003 | 0.011 | -0.001 | -26 |
| 360 | 0.51 | 0.003 | 0.013 | 0.001 | 21 |
| 240 | 0.61 | 0.004 | 0.015 | 0.003 | 58 |
| 180 | 0.69 | 0.004 | 0.017 | 0.005 | 70 |
| 120 | 0.83 | 0.005 | 0.020 | 0.009 | **77** |
| 90 | 0.94 | 0.005 | 0.023 | 0.011 | 76 |
| 60 | 1.12 | 0.007 | 0.028 | 0.016 | 71 |
| 45 | 1.27 | 0.007 | 0.031 | 0.019 | 65 |
| 30 | 1.51 | 0.009 | 0.037 | 0.025 | 57 |
| 20 | 1.80 | 0.010 | 0.044 | 0.033 | 49 |
| 15 | 2.04 | **0.012** | 0.050 | 0.038 | 43 |
| 10 | 2.43 | 0.014 | 0.060 | 0.048 | 36 |
| 5 | 3.29 | 0.019 | **0.081** | 0.069 | 26 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #1c) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

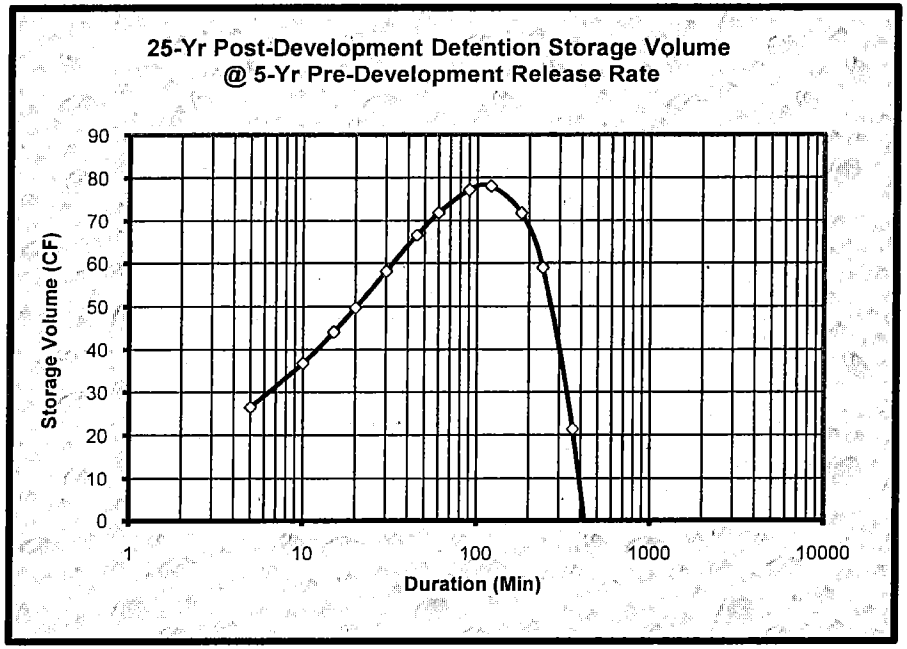
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 1206 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 78 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **195** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 19.00 | 10.00 | 1.08 | root of the sectional area |
| **Dimen. (ft)** | **18.68** | **9.83** | **1.06** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.002 | 0.007 | -0.005 | -544 |
| 1200 | 0.30 | 0.002 | 0.008 | -0.004 | -401 |
| 960 | 0.33 | 0.002 | 0.008 | -0.004 | -265 |
| 720 | 0.38 | 0.002 | 0.010 | -0.003 | -138 |
| 480 | 0.45 | 0.003 | 0.011 | -0.001 | -26 |
| 360 | 0.51 | 0.003 | 0.013 | 0.001 | 21 |
| 240 | 0.61 | 0.004 | 0.015 | 0.003 | 59 |
| 180 | 0.69 | 0.004 | 0.017 | 0.005 | 72 |
| 120 | 0.83 | 0.005 | 0.021 | 0.009 | **78** |
| 90 | 0.94 | 0.006 | 0.024 | 0.011 | 77 |
| 60 | 1.12 | 0.007 | 0.028 | 0.016 | 72 |
| 45 | 1.27 | 0.008 | 0.032 | 0.020 | 66 |
| 30 | 1.51 | 0.009 | 0.038 | 0.026 | 58 |
| 20 | 1.80 | 0.011 | 0.045 | 0.033 | 50 |
| 15 | 2.04 | **0.012** | 0.051 | 0.039 | 44 |
| 10 | 2.43 | 0.014 | 0.061 | 0.049 | 37 |
| 5 | 3.29 | 0.019 | **0.083** | 0.070 | 26 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #1d) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

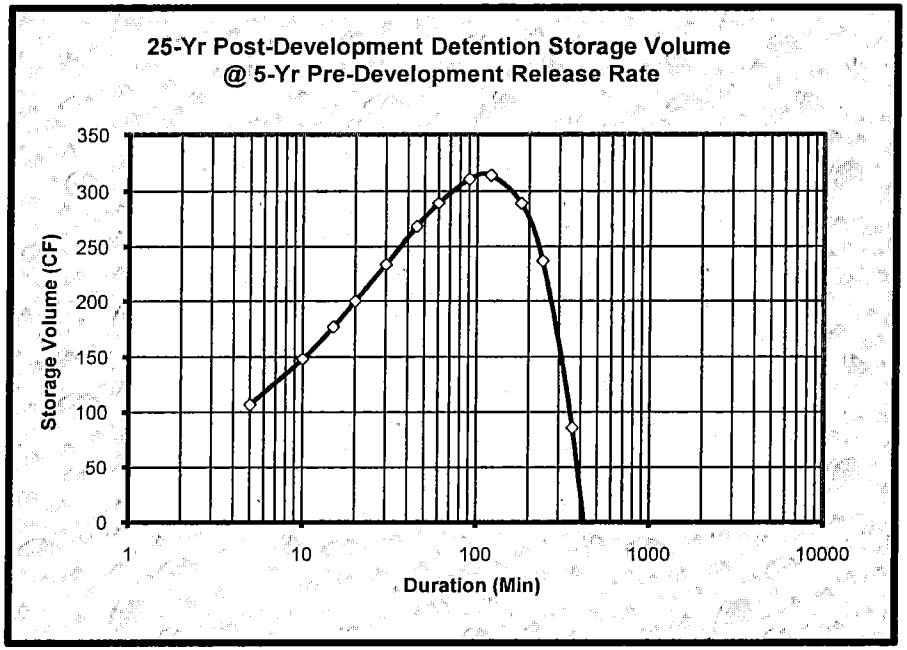
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 4857 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 314 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **785** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 43.50 | 27.00 | 0.67 | root of the sectional area |
| **Dimen. (ft)** | **43.47** | **26.98** | **0.67** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.007 | 0.028 | -0.020 | -2191 |
| 1200 | 0.30 | 0.007 | 0.031 | -0.018 | -1615 |
| 960 | 0.33 | 0.008 | 0.034 | -0.015 | -1067 |
| 720 | 0.38 | 0.009 | 0.038 | -0.010 | -557 |
| 480 | 0.45 | 0.011 | 0.046 | -0.003 | -105 |
| 360 | 0.51 | 0.012 | 0.052 | 0.003 | 86 |
| 240 | 0.61 | 0.015 | 0.062 | 0.013 | 237 |
| 180 | 0.69 | 0.017 | 0.070 | 0.021 | 289 |
| 120 | 0.83 | 0.020 | 0.084 | 0.035 | **314** |
| 90 | 0.94 | 0.022 | 0.095 | 0.046 | 311 |
| 60 | 1.12 | 0.027 | 0.113 | 0.064 | 289 |
| 45 | 1.27 | 0.030 | 0.128 | 0.079 | 268 |
| 30 | 1.51 | 0.036 | 0.153 | 0.104 | 234 |
| 20 | 1.80 | 0.043 | 0.182 | 0.133 | 200 |
| 15 | 2.04 | **0.049** | 0.206 | 0.158 | 177 |
| 10 | 2.43 | 0.058 | 0.246 | 0.197 | 148 |
| 5 | 3.29 | 0.078 | **0.332** | 0.284 | 106 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2a -West of HP) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 21836 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

1413 $ft^3$ storage volume calculated

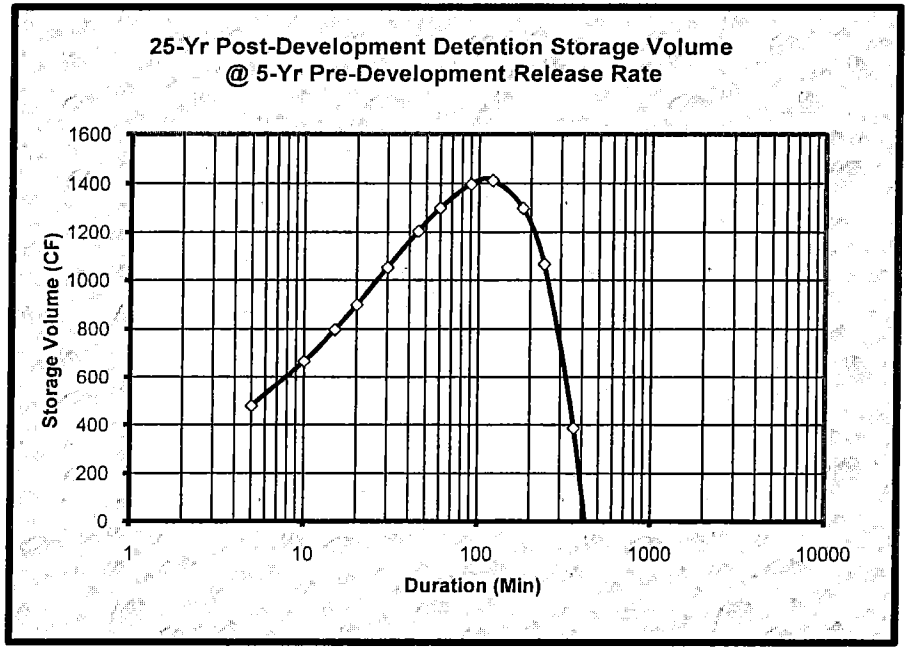
40 % void space assumed

**3531** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 240.00 | 7.00 | 2.17 |
| **Dimen. (ft)** | **237.47** | **6.93** | **2.15** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.030 | 0.128 | -0.091 | -9852 |
| 1200 | 0.30 | 0.033 | 0.138 | -0.081 | -7263 |
| 960 | 0.33 | 0.036 | 0.152 | -0.067 | -4797 |
| 720 | 0.38 | 0.041 | 0.173 | -0.046 | -2503 |
| 480 | 0.45 | 0.049 | 0.206 | -0.013 | -472 |
| 360 | 0.51 | 0.055 | 0.233 | 0.014 | 386 |
| 240 | 0.61 | 0.066 | 0.278 | 0.059 | 1066 |
| 180 | 0.69 | 0.074 | 0.315 | 0.096 | 1299 |
| 120 | 0.83 | 0.089 | 0.376 | 0.157 | **1413** |
| 90 | 0.94 | 0.101 | 0.426 | 0.207 | 1397 |
| 60 | 1.12 | 0.120 | 0.508 | 0.289 | 1301 |
| 45 | 1.27 | 0.136 | 0.576 | 0.357 | 1204 |
| 30 | 1.51 | 0.162 | 0.686 | 0.467 | 1052 |
| 20 | 1.80 | 0.193 | 0.819 | 0.600 | 899 |
| 15 | 2.04 | **0.219** | 0.928 | 0.709 | 797 |
| 10 | 2.43 | 0.261 | 1.106 | 0.887 | 665 |
| 5 | 3.29 | 0.353 | **1.495** | 1.276 | 478 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2b-East of HP) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

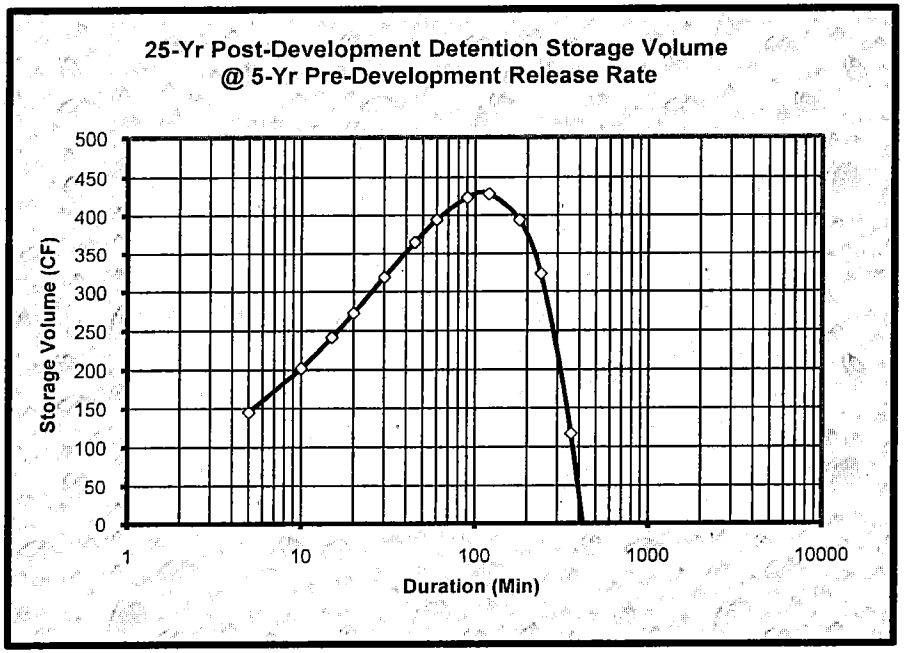
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 6618 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 428 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **1070** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 72.00 | 7.00 | 2.17 | root of the sectional area |
| **Dimen. (ft)** | **71.48** | **6.95** | **2.15** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.009 | 0.039 | -0.028 | -2986 |
| 1200 | 0.30 | 0.010 | 0.042 | -0.024 | -2201 |
| 960 | 0.33 | 0.011 | 0.046 | -0.020 | -1454 |
| 720 | 0.38 | 0.012 | 0.052 | -0.014 | -758 |
| 480 | 0.45 | 0.015 | 0.062 | -0.004 | -143 |
| 360 | 0.51 | 0.017 | 0.071 | 0.004 | 117 |
| 240 | 0.61 | 0.020 | 0.084 | 0.018 | 323 |
| 180 | 0.69 | 0.023 | 0.096 | 0.029 | 394 |
| 120 | 0.83 | 0.027 | 0.114 | 0.048 | **428** |
| 90 | 0.94 | 0.030 | 0.129 | 0.063 | 423 |
| 60 | 1.12 | 0.036 | 0.154 | 0.088 | 394 |
| 45 | 1.27 | 0.041 | 0.174 | 0.108 | 365 |
| 30 | 1.51 | 0.049 | 0.208 | 0.142 | 319 |
| 20 | 1.80 | 0.059 | 0.248 | 0.182 | 273 |
| 15 | 2.04 | **0.066** | 0.281 | 0.215 | 242 |
| 10 | 2.43 | 0.079 | 0.335 | 0.269 | 202 |
| 5 | 3.29 | 0.107 | **0.453** | 0.387 | 145 |




**Notes & Limitations on Use:**

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6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2c-Val. NE of HP sec. A) **Calc by:** DMR **Date:** 6/3/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

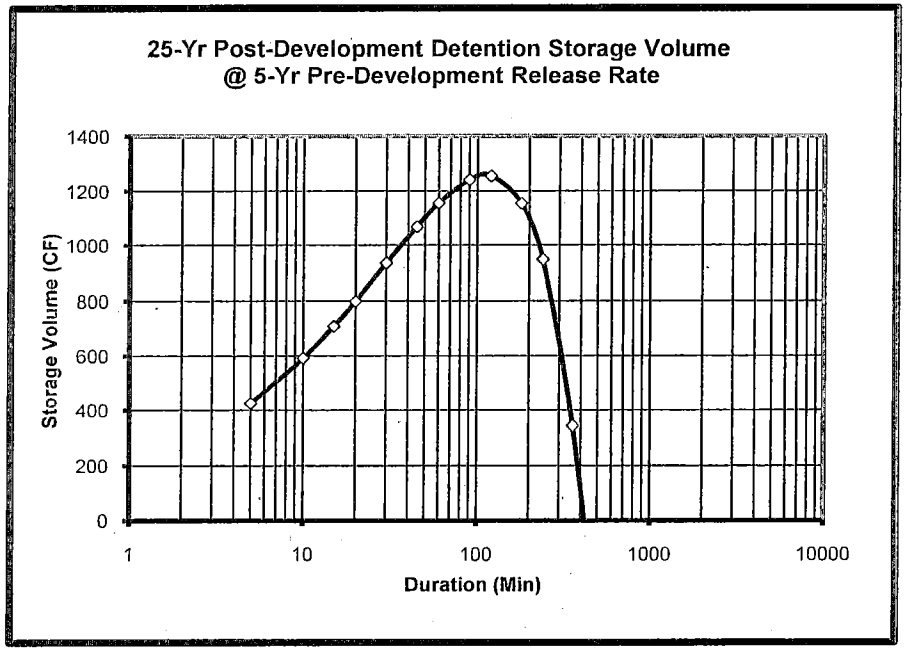
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 19403 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 1255 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **3138** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 250.00 | 6.00 | 2.17 | root of the sectional area |
| **Dimen. (ft)** | **246.97** | **5.93** | **2.14** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.027 | 0.114 | -0.081 | -8755 |
| 1200 | 0.30 | 0.029 | 0.123 | -0.072 | -6453 |
| 960 | 0.33 | 0.032 | 0.135 | -0.059 | -4262 |
| 720 | 0.38 | 0.036 | 0.153 | -0.041 | -2224 |
| 480 | 0.45 | 0.043 | 0.183 | -0.012 | -419 |
| 360 | 0.51 | 0.049 | 0.207 | 0.013 | 343 |
| 240 | 0.61 | 0.058 | 0.247 | 0.053 | 947 |
| 180 | 0.69 | 0.066 | 0.280 | 0.086 | 1155 |
| 120 | 0.83 | 0.079 | 0.334 | 0.139 | **1255** |
| 90 | 0.94 | 0.089 | 0.379 | 0.184 | 1241 |
| 60 | 1.12 | 0.107 | 0.451 | 0.257 | 1156 |
| 45 | 1.27 | 0.121 | 0.511 | 0.317 | 1069 |
| 30 | 1.51 | 0.144 | 0.610 | 0.415 | 935 |
| 20 | 1.80 | 0.172 | 0.727 | 0.533 | 799 |
| 15 | 2.04 | **0.195** | 0.824 | 0.630 | 708 |
| 10 | 2.43 | 0.232 | 0.983 | 0.788 | 591 |
| 5 | 3.29 | 0.314 | **1.328** | 1.134 | 425 |




### Notes & Limitations on Use:

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2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
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6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2d-Val. SE of HP sec. A) **Calc by:** DMR **Date:** 6/3/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 11011 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

712 $ft^3$ storage volume calculated

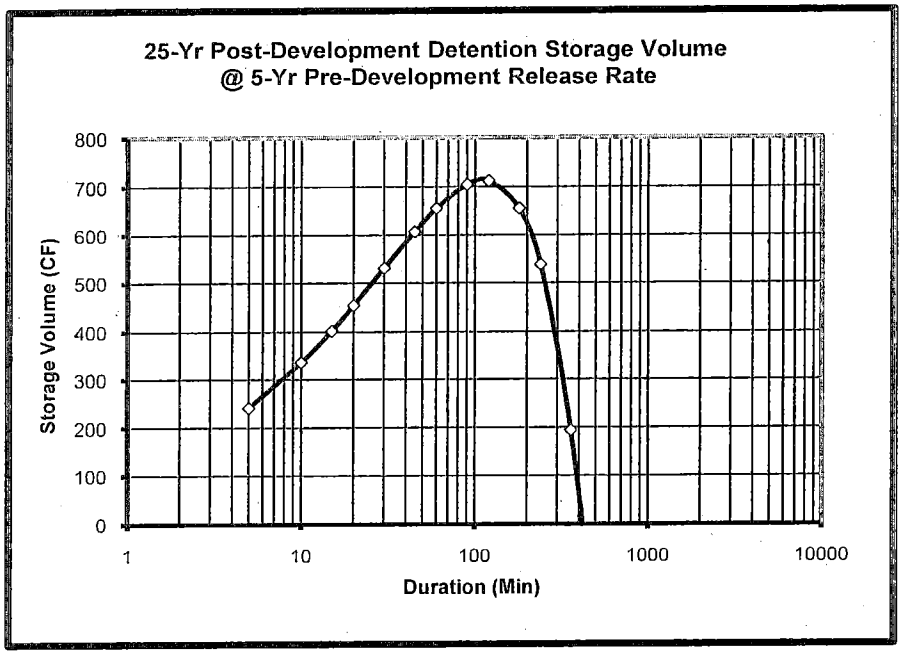
40 % void space assumed

**1781** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 195.00 | 5.00 | 1.83 |
| **Dimen. (ft)** | **194.87** | **5.00** | **1.83** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.015 | 0.064 | -0.046 | -4968 |
| 1200 | 0.30 | 0.016 | 0.070 | -0.041 | -3662 |
| 960 | 0.33 | 0.018 | 0.077 | -0.034 | -2419 |
| 720 | 0.38 | 0.021 | 0.087 | -0.023 | -1262 |
| 480 | 0.45 | 0.025 | 0.104 | -0.007 | -238 |
| 360 | 0.51 | 0.028 | 0.118 | 0.007 | 195 |
| 240 | 0.61 | 0.033 | 0.140 | 0.030 | 538 |
| 180 | 0.69 | 0.038 | 0.159 | 0.049 | 655 |
| 120 | 0.83 | 0.045 | 0.190 | 0.079 | **712** |
| 90 | 0.94 | 0.051 | 0.215 | 0.104 | 705 |
| 60 | 1.12 | 0.060 | 0.256 | 0.146 | 656 |
| 45 | 1.27 | 0.069 | 0.290 | 0.180 | 607 |
| 30 | 1.51 | 0.082 | 0.346 | 0.236 | 530 |
| 20 | 1.80 | 0.097 | 0.413 | 0.302 | 454 |
| 15 | 2.04 | **0.110** | 0.468 | 0.357 | 402 |
| 10 | 2.43 | 0.132 | 0.558 | 0.447 | 336 |
| 5 | 3.29 | 0.178 | **0.754** | 0.643 | 241 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2e-Val. NE of HP Sec. B) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

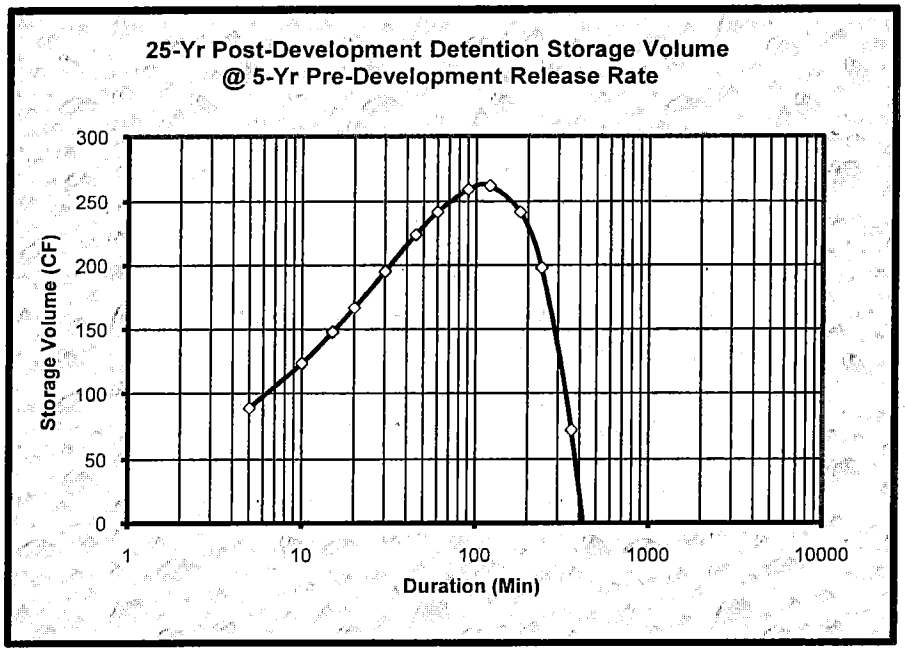
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 4050 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 262 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **655** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 50.00 | 6.00 | 2.25 | root of the sectional area |
| **Dimen. (ft)** | **49.50** | **5.94** | **2.23** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.006 | 0.024 | -0.017 | -1827 |
| 1200 | 0.30 | 0.006 | 0.026 | -0.015 | -1347 |
| 960 | 0.33 | 0.007 | 0.028 | -0.012 | -890 |
| 720 | 0.38 | 0.008 | 0.032 | -0.009 | -464 |
| 480 | 0.45 | 0.009 | 0.038 | -0.002 | -87 |
| 360 | 0.51 | 0.010 | 0.043 | 0.003 | 72 |
| 240 | 0.61 | 0.012 | 0.052 | 0.011 | 198 |
| 180 | 0.69 | 0.014 | 0.058 | 0.018 | 241 |
| 120 | 0.83 | 0.016 | 0.070 | 0.029 | **262** |
| 90 | 0.94 | 0.019 | 0.079 | 0.038 | 259 |
| 60 | 1.12 | 0.022 | 0.094 | 0.054 | 241 |
| 45 | 1.27 | 0.025 | 0.107 | 0.066 | 223 |
| 30 | 1.51 | 0.030 | 0.127 | 0.087 | 195 |
| 20 | 1.80 | 0.036 | 0.152 | 0.111 | 167 |
| 15 | 2.04 | **0.041** | 0.172 | 0.131 | 148 |
| 10 | 2.43 | 0.048 | 0.205 | 0.165 | 123 |
| 5 | 3.29 | 0.065 | **0.277** | 0.237 | 89 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2f-Val. SE of HP Sec. B) **Calc by:** DMR **Date:** 6/3/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 7683 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

497 $ft^3$ storage volume calculated

40 % void space assumed

**1243** $ft^3$ excavated volume needed

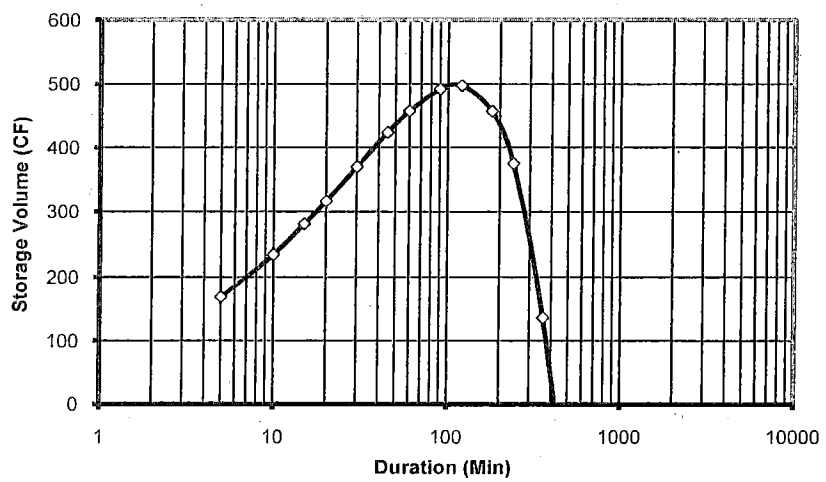
| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 60.00 | 7.00 | 3.00 |
| **Dimen. (ft)** | **59.72** | **6.97** | **2.99** |

*For pipe, use the square root of the sectional area

### 25 - YEAR DESIGN STORM / DETENTION @ 15 MIN.

| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
|---|---|---|---|---|---|
| 1440 | 0.28 | 0.011 | 0.045 | -0.032 | -3467 |
| 1200 | 0.30 | 0.011 | 0.049 | -0.028 | -2555 |
| 960 | 0.33 | 0.013 | 0.054 | -0.023 | -1688 |
| 720 | 0.38 | 0.014 | 0.061 | -0.016 | -881 |
| 480 | 0.45 | 0.017 | 0.072 | -0.005 | -166 |
| 360 | 0.51 | 0.019 | 0.082 | 0.005 | 136 |
| 240 | 0.61 | 0.023 | 0.098 | 0.021 | 375 |
| 180 | 0.69 | 0.026 | 0.111 | 0.034 | 457 |
| 120 | 0.83 | 0.031 | 0.132 | 0.055 | **497** |
| 90 | 0.94 | 0.035 | 0.150 | 0.073 | 492 |
| 60 | 1.12 | 0.042 | 0.179 | 0.102 | 458 |
| 45 | 1.27 | 0.048 | 0.203 | 0.125 | 423 |
| 30 | 1.51 | 0.057 | 0.242 | 0.164 | 370 |
| 20 | 1.80 | 0.068 | 0.288 | 0.211 | 316 |
| 15 | 2.04 | **0.077** | 0.326 | 0.249 | 280 |
| 10 | 2.43 | 0.092 | 0.389 | 0.312 | 234 |
| 5 | 3.29 | 0.124 | **0.526** | 0.449 | 168 |

**25-Yr Post-Development Detention Storage Volume @ 5-Yr Pre-Development Release Rate**




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2g-West Parade) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 7497 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

485 $ft^3$ storage volume calculated

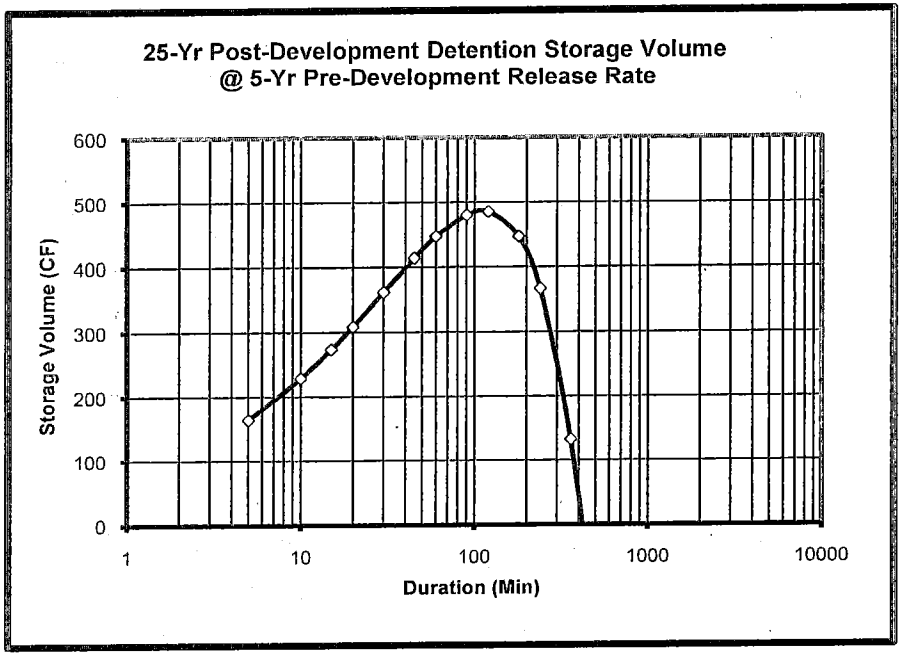
40 % void space assumed

**1212** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 75.00 | 8.50 | 1.93 |
| **Dimen. (ft)** | **74.63** | **8.46** | **1.92** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.010 | 0.044 | -0.031 | -3383 |
| 1200 | 0.30 | 0.011 | 0.047 | -0.028 | -2494 |
| 960 | 0.33 | 0.012 | 0.052 | -0.023 | -1647 |
| 720 | 0.38 | 0.014 | 0.059 | -0.016 | -859 |
| 480 | 0.45 | 0.017 | 0.071 | -0.004 | -162 |
| 360 | 0.51 | 0.019 | 0.080 | 0.005 | 133 |
| 240 | 0.61 | 0.023 | 0.096 | 0.020 | 366 |
| 180 | 0.69 | 0.026 | 0.108 | 0.033 | 446 |
| 120 | 0.83 | 0.030 | 0.129 | 0.054 | **485** |
| 90 | 0.94 | 0.035 | 0.146 | 0.071 | 480 |
| 60 | 1.12 | 0.041 | 0.174 | 0.099 | 447 |
| 45 | 1.27 | 0.047 | 0.198 | 0.122 | 413 |
| 30 | 1.51 | 0.056 | 0.236 | 0.160 | 361 |
| 20 | 1.80 | 0.066 | 0.281 | 0.206 | 309 |
| 15 | 2.04 | **0.075** | 0.318 | 0.243 | 274 |
| 10 | 2.43 | 0.090 | 0.380 | 0.305 | 228 |
| 5 | 3.29 | 0.121 | **0.513** | 0.438 | 164 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #2h-East Parade) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 7040 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

455 $ft^3$ storage volume calculated

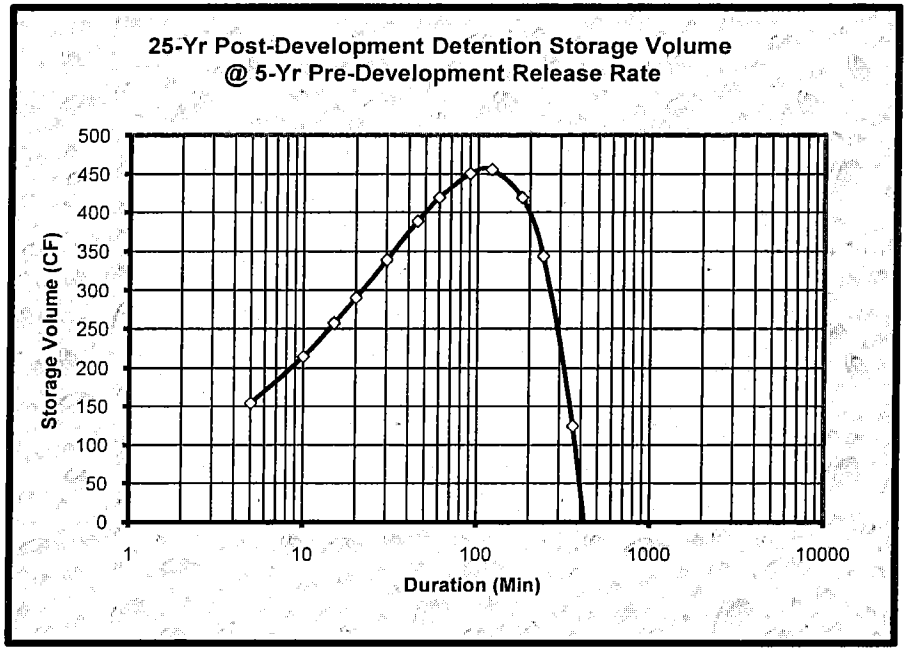
40 % void space assumed

**1139** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 162.00 | 4.00 | 1.83 |
| **Dimen. (ft)** | **159.82** | **3.95** | **1.81** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.010 | 0.041 | -0.029 | -3176 |
| 1200 | 0.30 | 0.011 | 0.045 | -0.026 | -2342 |
| 960 | 0.33 | 0.012 | 0.049 | -0.021 | -1546 |
| 720 | 0.38 | 0.013 | 0.056 | -0.015 | -807 |
| 480 | 0.45 | 0.016 | 0.066 | -0.004 | -152 |
| 360 | 0.51 | 0.018 | 0.075 | 0.005 | 125 |
| 240 | 0.61 | 0.021 | 0.090 | 0.019 | 344 |
| 180 | 0.69 | 0.024 | 0.102 | 0.031 | 419 |
| 120 | 0.83 | 0.029 | 0.121 | 0.051 | **455** |
| 90 | 0.94 | 0.032 | 0.137 | 0.067 | 450 |
| 60 | 1.12 | 0.039 | 0.164 | 0.093 | 419 |
| 45 | 1.27 | 0.044 | 0.186 | 0.115 | 388 |
| 30 | 1.51 | 0.052 | 0.221 | 0.151 | 339 |
| 20 | 1.80 | 0.062 | 0.264 | 0.193 | 290 |
| 15 | 2.04 | **0.071** | 0.299 | 0.228 | 257 |
| 10 | 2.43 | 0.084 | 0.357 | 0.286 | 215 |
| 5 | 3.29 | 0.114 | **0.482** | 0.411 | 154 |




**Notes & Limitations on Use:**

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
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6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #4) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

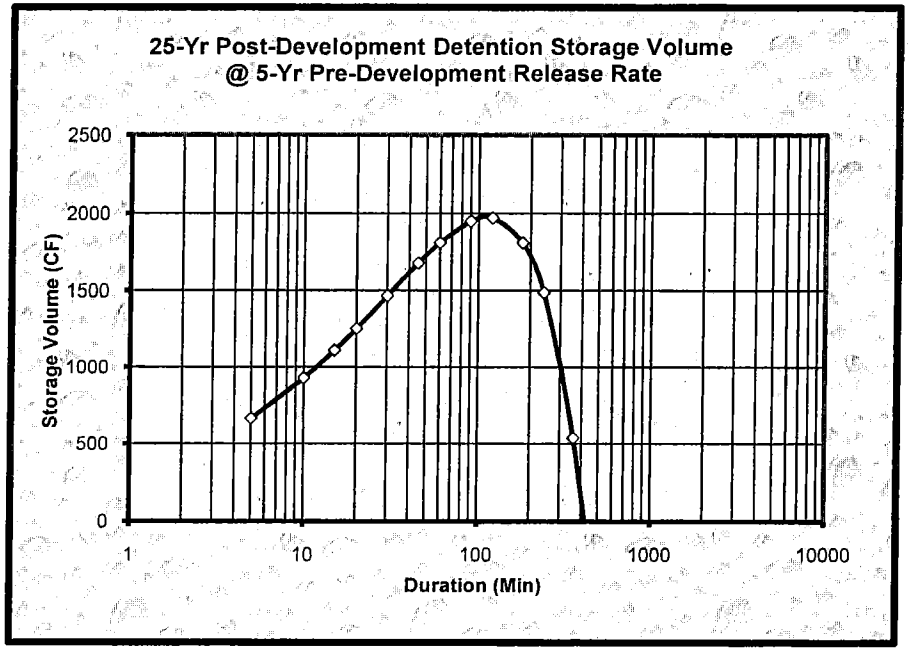
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 30466 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 1971 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **4927** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 55.00 | 45.00 | 2.00 | root of the sectional area |
| **Dimen. (ft)** | **54.92** | **44.93** | **2.00** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.042 | 0.178 | -0.127 | -13746 |
| 1200 | 0.30 | 0.046 | 0.193 | -0.113 | -10133 |
| 960 | 0.33 | 0.050 | 0.213 | -0.093 | -6693 |
| 720 | 0.38 | 0.057 | 0.241 | -0.065 | -3492 |
| 480 | 0.45 | 0.068 | 0.287 | -0.018 | -658 |
| 360 | 0.51 | 0.077 | 0.326 | 0.020 | 539 |
| 240 | 0.61 | 0.092 | 0.388 | 0.083 | 1487 |
| 180 | 0.69 | 0.104 | 0.440 | 0.134 | 1813 |
| 120 | 0.83 | 0.124 | 0.525 | 0.219 | **1971** |
| 90 | 0.94 | 0.140 | 0.594 | 0.289 | 1949 |
| 60 | 1.12 | 0.167 | 0.709 | 0.403 | 1815 |
| 45 | 1.27 | 0.190 | 0.803 | 0.498 | 1679 |
| 30 | 1.51 | 0.226 | 0.958 | 0.652 | 1467 |
| 20 | 1.80 | 0.270 | 1.142 | 0.837 | 1255 |
| 15 | 2.04 | **0.306** | 1.294 | 0.989 | 1112 |
| 10 | 2.43 | 0.364 | 1.543 | 1.238 | 928 |
| 5 | 3.29 | 0.492 | **2.085** | 1.780 | 667 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
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4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #5) **Calc by:** DMR **Date:** 6/3/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

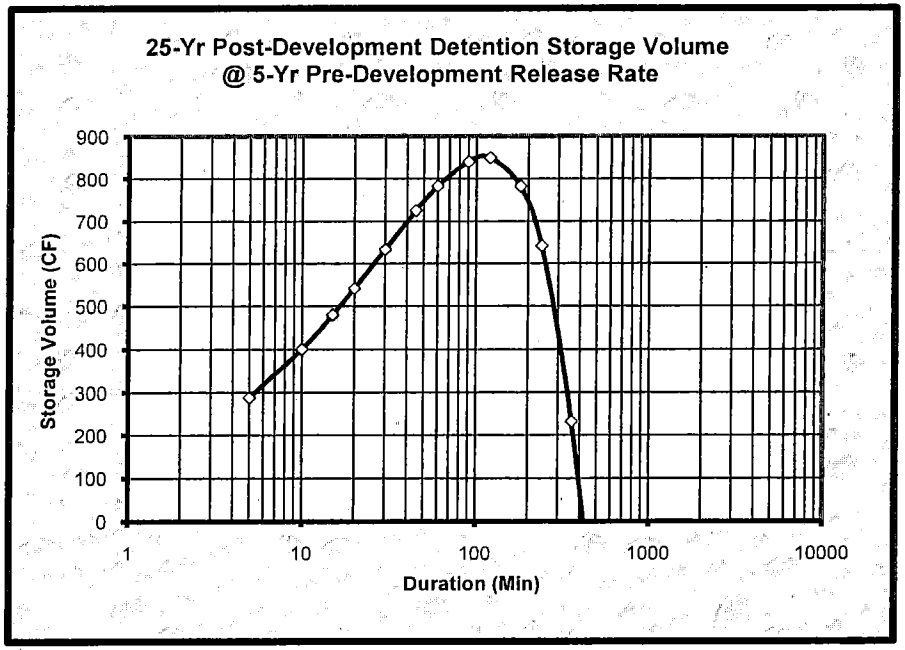
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 13142 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 850 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **2125** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 40.00 | 44.00 | 1.25 | root of the sectional area |
| **Dimen. (ft)** | **39.54** | **43.50** | **1.24** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.018 | 0.077 | -0.055 | -5930 |
| 1200 | 0.30 | 0.020 | 0.083 | -0.049 | -4371 |
| 960 | 0.33 | 0.022 | 0.092 | -0.040 | -2887 |
| 720 | 0.38 | 0.025 | 0.104 | -0.028 | -1506 |
| 480 | 0.45 | 0.029 | 0.124 | -0.008 | -284 |
| 360 | 0.51 | 0.033 | 0.140 | 0.009 | 232 |
| 240 | 0.61 | 0.040 | 0.167 | 0.036 | 642 |
| 180 | 0.69 | 0.045 | 0.190 | 0.058 | 782 |
| 120 | 0.83 | 0.053 | 0.226 | 0.094 | **850** |
| 90 | 0.94 | 0.061 | 0.256 | 0.125 | 841 |
| 60 | 1.12 | 0.072 | 0.306 | 0.174 | 783 |
| 45 | 1.27 | 0.082 | 0.346 | 0.215 | 724 |
| 30 | 1.51 | 0.098 | 0.413 | 0.281 | 633 |
| 20 | 1.80 | 0.116 | 0.493 | 0.361 | 541 |
| 15 | 2.04 | **0.132** | 0.558 | 0.426 | 480 |
| 10 | 2.43 | 0.157 | 0.666 | 0.534 | 400 |
| 5 | 3.29 | 0.212 | **0.900** | 0.768 | 288 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
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6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #6a) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 4893 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

317 $ft^3$ storage volume calculated

40 % void space assumed

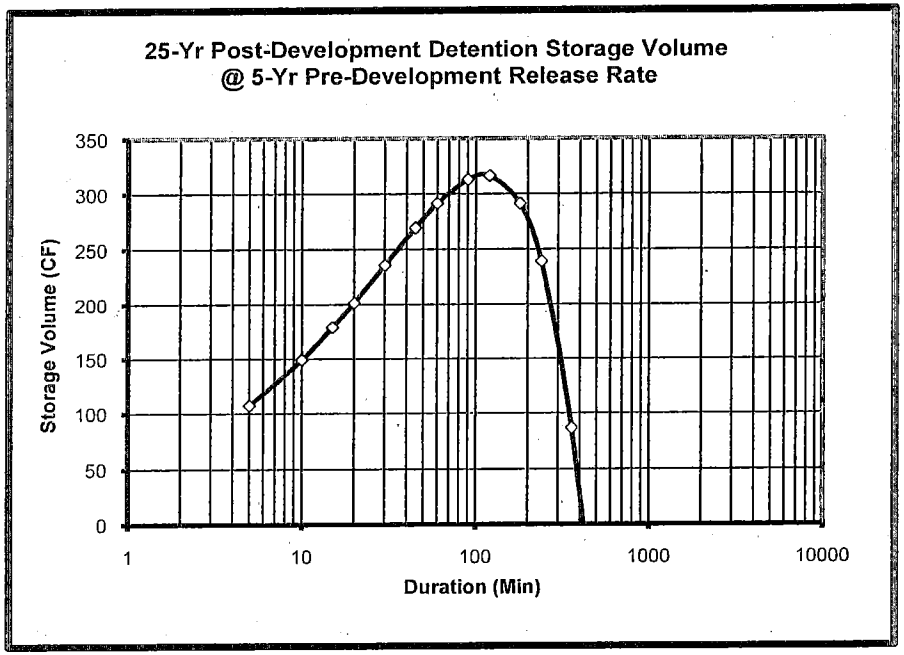
**791** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 25.50 | 19.50 | 1.67 |
| **Dimen. (ft)** | **25.09** | **19.19** | **1.64** |

*For pipe, use the square root of the sectional area

### 25 - YEAR DESIGN STORM / DETENTION @ 15 MIN.

| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
|---|---|---|---|---|---|
| 1440 | 0.28 | 0.007 | 0.029 | -0.020 | -2208 |
| 1200 | 0.30 | 0.007 | 0.031 | -0.018 | -1627 |
| 960 | 0.33 | 0.008 | 0.034 | -0.015 | -1075 |
| 720 | 0.38 | 0.009 | 0.039 | -0.010 | -561 |
| 480 | 0.45 | 0.011 | 0.046 | -0.003 | -106 |
| 360 | 0.51 | 0.012 | 0.052 | 0.003 | 87 |
| 240 | 0.61 | 0.015 | 0.062 | 0.013 | 239 |
| 180 | 0.69 | 0.017 | 0.071 | 0.022 | 291 |
| 120 | 0.83 | 0.020 | 0.084 | 0.035 | **317** |
| 90 | 0.94 | 0.023 | 0.095 | 0.046 | 313 |
| 60 | 1.12 | 0.027 | 0.114 | 0.065 | 291 |
| 45 | 1.27 | 0.030 | 0.129 | 0.080 | 270 |
| 30 | 1.51 | 0.036 | 0.154 | 0.105 | 236 |
| 20 | 1.80 | 0.043 | 0.183 | 0.134 | 202 |
| 15 | 2.04 | **0.049** | 0.208 | 0.159 | 179 |
| 10 | 2.43 | 0.059 | 0.248 | 0.199 | 149 |
| 5 | 3.29 | 0.079 | **0.335** | 0.286 | 107 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #6b) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | Fig. SWM-2 in County Design Criteria | |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 4394 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

284 $ft^3$ storage volume calculated

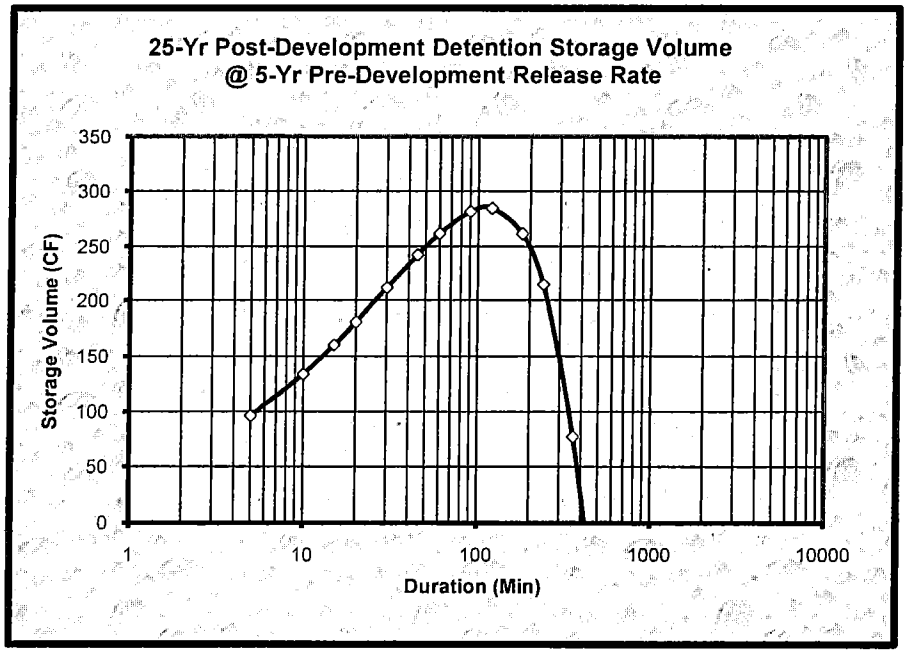
40 % void space assumed

**711** $ft^3$ excavated volume needed

| Structure | Length | Width* | Depth* |
|---|---|---|---|
| Ratios | 25.50 | 18.00 | 1.58 |
| **Dimen. (ft)** | **25.31** | **17.87** | **1.57** |

*For pipe, use the square root of the sectional area

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.006 | 0.026 | -0.018 | -1983 |
| 1200 | 0.30 | 0.007 | 0.028 | -0.016 | -1461 |
| 960 | 0.33 | 0.007 | 0.031 | -0.013 | -965 |
| 720 | 0.38 | 0.008 | 0.035 | -0.009 | -504 |
| 480 | 0.45 | 0.010 | 0.041 | -0.003 | -95 |
| 360 | 0.51 | 0.011 | 0.047 | 0.003 | 78 |
| 240 | 0.61 | 0.013 | 0.056 | 0.012 | 215 |
| 180 | 0.69 | 0.015 | 0.063 | 0.019 | 261 |
| 120 | 0.83 | 0.018 | 0.076 | 0.032 | **284** |
| 90 | 0.94 | 0.020 | 0.086 | 0.042 | 281 |
| 60 | 1.12 | 0.024 | 0.102 | 0.058 | 262 |
| 45 | 1.27 | 0.027 | 0.116 | 0.072 | 242 |
| 30 | 1.51 | 0.033 | 0.138 | 0.094 | 212 |
| 20 | 1.80 | 0.039 | 0.165 | 0.121 | 181 |
| 15 | 2.04 | **0.044** | 0.187 | 0.143 | 160 |
| 10 | 2.43 | 0.053 | 0.223 | 0.179 | 134 |
| 5 | 3.29 | 0.071 | **0.301** | 0.257 | 96 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Valencia Creek Drainage Basin (Area #8) **Calc by:** DMR **Date:** 4/11/2011

## RUNOFF DETENTION BY THE MODIFIED RATIONAL METHOD

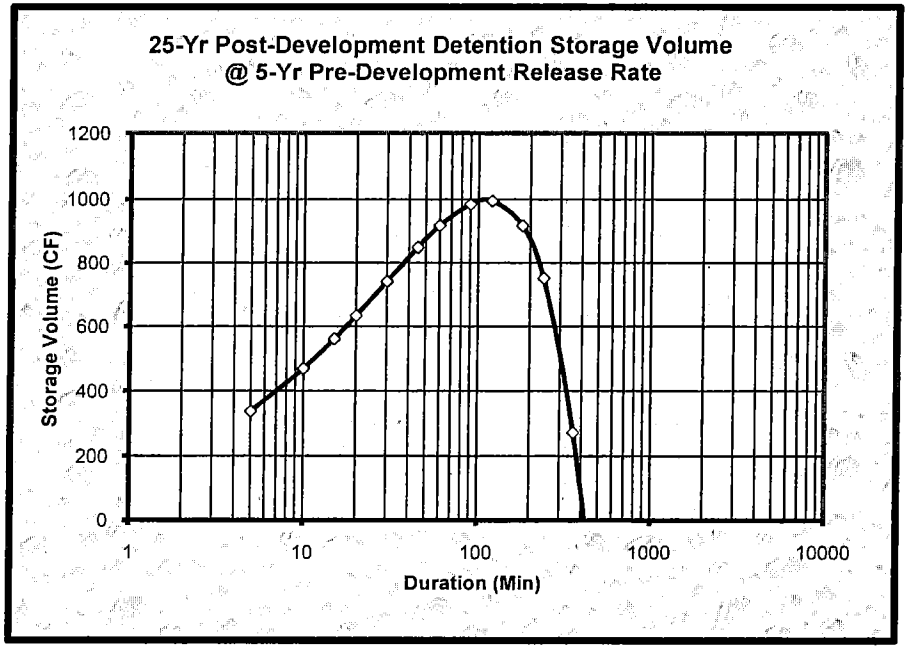
**Data Entry:** PRESS TAB & ENTER DESIGN VALUES SS Ver: 1.0

| | | | |
|---|---|---|---|
| Site Location P60 Isopleth: | 1.40 | | Fig. SWM-2 in County Design Criteria |
| Rational Coefficients Cpre: | 0.30 | | See note # 2 |
| Cpost: | 0.90 | | See note # 2 |
| Impervious Area: | 15375 | $ft^2$ | See note # 2 and # 4 |

### STRUCTURE DIMENSIONS FOR DETENTION

| | | | | |
|---|---|---|---|---|
| 995 | $ft^3$ storage volume calculated | | | |
| 40 | % void space assumed | | | |
| **2487** | $ft^3$ excavated volume needed | | | |
| Structure | Length | Width* | Depth* | *For pipe, use the square |
| Ratios | 76.50 | 17.50 | 1.92 | root of the sectional area |
| **Dimen. (ft)** | **75.66** | **17.31** | **1.90** | |

| 25 - YEAR DESIGN STORM | | | | DETENTION @ 15 MIN. | |
|---|---|---|---|---|---|
| Storm Duration (min) | 25 - Year Intensity (in/hr) | 5 - Yr. Release Qpre (cfs) | 25 - Year Qpost (cfs) | Detention Rate To Storage (cfs) | Specified Storage Volume (cf) |
| 1440 | 0.28 | 0.021 | 0.090 | -0.064 | -6937 |
| 1200 | 0.30 | 0.023 | 0.097 | -0.057 | -5114 |
| 960 | 0.33 | 0.025 | 0.107 | -0.047 | -3377 |
| 720 | 0.38 | 0.029 | 0.122 | -0.033 | -1762 |
| 480 | 0.45 | 0.034 | 0.145 | -0.009 | -332 |
| 360 | 0.51 | 0.039 | 0.164 | 0.010 | 272 |
| 240 | 0.61 | 0.046 | 0.196 | 0.042 | 751 |
| 180 | 0.69 | 0.052 | 0.222 | 0.068 | 915 |
| 120 | 0.83 | 0.063 | 0.265 | 0.111 | **995** |
| 90 | 0.94 | 0.071 | 0.300 | 0.146 | 984 |
| 60 | 1.12 | 0.084 | 0.358 | 0.203 | 916 |
| 45 | 1.27 | 0.096 | 0.405 | 0.251 | 847 |
| 30 | 1.51 | 0.114 | 0.483 | 0.329 | 741 |
| 20 | 1.80 | 0.136 | 0.576 | 0.422 | 633 |
| 15 | 2.04 | **0.154** | 0.653 | 0.499 | 561 |
| 10 | 2.43 | 0.184 | 0.779 | 0.625 | 468 |
| 5 | 3.29 | 0.248 | **1.052** | 0.898 | 337 |




### Notes & Limitations on Use:

1) The modified rational method, and therefore the standard calculations are applicable in watersheds up to 20 acres in size.
2) Required detention volume determinations shall be based on all net new impervious area both on and off-site, resulting from the proposed project. Pervious areas shall not be included in detention volume sizing; an exception may be made for incidental pervious areas less than 10% of the total area.
3) Gravel packed detention chambers shall specify on the plans, aggregate that is washed, angular, and uniformly graded (of single size), assuring void space not less than 35%.
4) A map showing boundaries of both regulated impervious areas and actual drainage areas routed to the hydraulic control structure of the detention facility is to be provided, clearly distinguishing between the two areas, and noting the square footage.
5) The EPA defines a class V injection well as any bored, drilled, or driven shaft, or dug hole that is deeper than its widest surface dimension, or an improved sinkhole, or a subsurface fluid distribution system. Such storm water drainage wells are "authorized by rule". For more information on these rules, contact the EPA. A web site link is provided from the County DPW Stormwater Management web page.
6) Refer to the County of Santa Cruz Design Criteria, for complete method criteria.

**PROJECT:** Aptos Creek Drainage Basin (Area #10) **Calc by:** DMR **Date:** 4/11/2011

# RUNOFF RETENTION BY THE STORAGE PERCOLATION METHOD

**Data Entry:** PRESS TAB KEY & ENTER DESIGN VALUES

| | | |
|---|---|---|
| Site Location P60 Isopleth: | 1.40 | Fig. SWM-2 |
| Rational Coefficients Cpre: | 0.30 | |
| Cpost: | 0.90 | |
| Impervious Area: | 27541 | $ft^2$ |
| Saturated Soil Permeability: | 1.80 | in/hr |

**Notes & Limitations on Use:**

Saturated soil permeability values may be used conservatively from the USDA-NRCS soil survey, or use actual test values.
Site selection and design shall give proper consideration to the path for excess flows downstream of the designated retention area.
Retention site location on, or immediately above, slopes exceeding 15% will require consulting a geotechnical engineer.
Gravel packed structures shall use washed, angular, uniformly graded aggregate providing not less than 35% void space.
Refer to the County of Santa Cruz Design Criteria, Stormwater Management - Section H, for complete method criteria.

SS Ver:1.0

## 2 - YEAR DESIGN STORM

| Storm Duration (min) | 2 - Year Intensity (in/hr) | Qpre (cfs) | Qpost (cfs) |
|---|---|---|---|
| 1440 | 0.15 | 0.029 | 0.086 |
| 1200 | 0.16 | 0.031 | 0.093 |
| 960 | 0.18 | 0.034 | 0.103 |
| 720 | 0.20 | 0.039 | 0.116 |
| 480 | 0.24 | 0.046 | 0.139 |
| 360 | 0.27 | 0.052 | 0.157 |
| 240 | 0.33 | 0.062 | 0.187 |
| 180 | 0.37 | 0.071 | 0.212 |
| 120 | 0.44 | **0.084** | 0.253 |
| 90 | 0.50 | 0.096 | 0.287 |
| 60 | 0.60 | 0.114 | 0.342 |
| 45 | 0.67 | 0.129 | 0.387 |
| 30 | 0.80 | 0.154 | 0.462 |
| 20 | 0.96 | 0.184 | 0.551 |
| 15 | 1.09 | 0.208 | 0.624 |
| 10 | 1.30 | 0.248 | 0.744 |
| 5 | 1.75 | 0.335 | **1.005** |

## RETENTION @ 120 MIN.

| Retention Rate To Storage (cfs) | Specified Retained Volume (cf) |
|---|---|
| 0.002 | -2048 |
| 0.009 | -1196 |
| 0.018 | -411 |
| 0.032 | 282 |
| 0.054 | 832 |
| 0.073 | 1023 |
| 0.103 | **1118** |
| 0.128 | 1107 |
| 0.169 | 1033 |
| 0.202 | 956 |
| 0.257 | 836 |
| 0.303 | 750 |
| 0.377 | 635 |
| 0.466 | 530 |
| 0.540 | 463 |
| 0.660 | 381 |
| 0.921 | 269 |

## STRUCTURE DIMENSIONS FOR RETENTION

1118 $ft^3$ storage volume calculated
100 % void space assumed
**1118** $ft^3$ excavated volume needed

| Structure Ratios | Length 5.30 | Width* 5.30 | Depth* # 40.00 |
|---|---|---|---|
| **Dimen. (ft)** | **5.29** | **5.29** | **39.93** |

873 $ft^2$ internal surface area
**611** $ft^2$ effective surface area
**12.2** hrs estimated structure drainage time

* For pipe, use the square root of the sectional area.
\# If cell values displayed are corrupted, enter zero for depth, then re-enter a positive numeric value within allowed range.

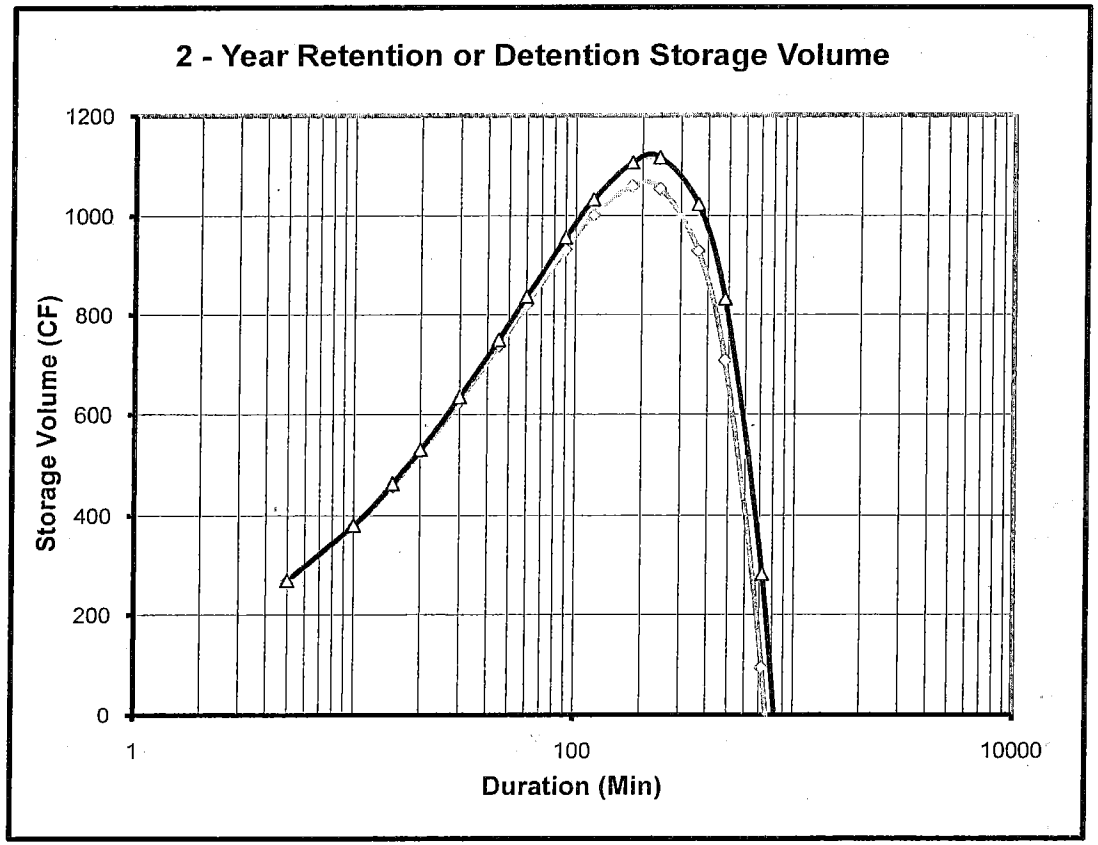
## STRUCTURE DIMENSIONS FOR DETENTION

1060 $ft^3$ storage volume calculated
100 % void space assumed
**1060** $ft^3$ excavated volume needed

| Structure Ratios | Length 5.30 | Width* 5.30 | Depth* 40.00 |
|---|---|---|---|
| **Dimen. (ft)** | **5.20** | **5.20** | **39.23** |

## DETENTION @ 60 MIN.

| Detention Rate To Storage (cfs) | Specified Detained Volume (cf) |
|---|---|
| -0.028 | -2415 |
| -0.021 | -1503 |
| -0.011 | -657 |
| 0.002 | 97 |
| 0.025 | 708 |
| 0.043 | 930 |
| 0.073 | 1055 |
| 0.098 | 1060 |
| 0.139 | 1001 |
| 0.173 | 932 |
| 0.228 | 820 |
| 0.273 | 738 |
| 0.348 | 626 |
| 0.437 | 524 |
| 0.510 | 459 |
| 0.630 | 378 |
| 0.892 | 267 |


2 - Year Retention or Detention Storage Volume
Storage Volume (CF)
1200
1000
800
600
400
200
0
1
100
10000
Duration (Min)

***Allowable Release Rate and Overflow Discharge:***

The total allowable release rate per the calculations performed on page 6 of this report, is $Qpre_{5yr}$ = 2.53 cfs, for a 25-year storm event.
As shown in the preceding Figures SWM-17 the total combined release rate = 2.54 cfs. As discussed in the descriptions of each drainage basin, the subdrains and overflow pipes associated with each system will discharge into an outlet control structure with weir and orifice prior to entering the main system and eventually Valencia Creek. The orifice calculations are shown below. To reduce the number of control structures, where feasible, drainage basins have been directed to single structures, as noted below. These areas include combined flowrates.

| **Orifice Calculator –Areas #1a-1d (Control Structure #1)** | **Orifice Calculator – Areas #2a-2b (Control Structure #2)** |
|---|---|
| Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.0840 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 1.0800 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 1.7403 in***<br>Velocity ..... 5.0852 fps | Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.2850 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 2.1700 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 2.6924 in***<br>Velocity ..... 7.2082 fps |
| **Orifice Calculator – Area #2c (Control Structure #13)** | **Orifice Calculator – Area #2d (Control Structure #14)** |
| Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.2030 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 2.2500 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 2.2519 in***<br>Velocity ..... 7.3399 fps | Given Input Data:<br>Solving for ..... Area or Diameter<br>Flowrate ..... 0.1480 cfs<br>Coefficient ..... 0.6100<br>Headwater ..... 2.0000 ft<br>Tailwater ..... 0.0000 ft<br><br>Computed Results:<br>***Diameter ..... 1.9802 in***<br>Velocity ..... 6.9201 fps |

**Orifice Calculator – Area #2e**
**(Control Structure #15)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.0410 cfs
Coefficient ..... 0.6100
Headwater ..... 2.2500 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 1.0120 in***
Velocity ..... 7.3399 fps

**Orifice Calculator – Area #2f**
**(Control Structure #16)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.0400 cfs
Coefficient ..... 0.6100
Headwater ..... 2.5000 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 0.9736 in***
Velocity ..... 7.7369 fps

**Orifice Calculator – Area #2g, 6a**
**(Control Structure #6a)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.1240 cfs
Coefficient ..... 0.6100
Headwater ..... 1.9300 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 1.8288 in***
Velocity ..... 6.7979 fps

**Orifice Calculator – Area #2h, 6b**
**(Control Structure #6b)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.1150 cfs
Coefficient ..... 0.6100
Headwater ..... 1.8300 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 1.7847 in***
Velocity ..... 6.6195 fps

**Orifice Calculator – Area #3**
**(Control Structure #3)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.9190 cfs
Coefficient ..... 0.6100
Headwater ..... 1.8300 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 5.0452 in***
Velocity ..... 6.6195 fps

**Orifice Calculator – Area #4**
**(Control Structure #4)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.3060 cfs
Coefficient ..... 0.6100
Headwater ..... 2.0000 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 2.8473 in***
Velocity ..... 6.9201 fps

**Orifice Calculator – Area #5**
**(Control Structure #5)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.1230 cfs
Coefficient ..... 0.6100
Headwater ..... 2.7500 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 1.6671 in***
Velocity ..... 8.1145 fps

**Orifice Calculator – Area #8**
**(Control Structure #8)**

Given Input Data:
Solving for ..... Area or Diameter
Flowrate ..... 0.1540 cfs
Coefficient ..... 0.6100
Headwater ..... 1.9200 ft
Tailwater ..... 0.0000 ft

Computed Results:
***Diameter ..... 2.0407 in***
Velocity ..... 6.7803 fps

Therefore,

| Control Structure # | Weir Height (feet) | Orifice Size (inches) | Max. Flowrate (cfs) |
|---|---|---|---|
| 1 | 1.08 | 1.75 | 0.085 |
| 2 | 2.17 | 2.70 | 0.287 |
| 3 | 1.83 | 5.00 | 0.903 |
| 4 | 2.00 | 2.80 | 0.296 |
| 5 | 2.75 | 2.75 | 0.113 |
| 6a | 1.92 | 1.80 | 0.120 |
| 6b | 1.83 | 1.80 | 0.117 |
| 8 | 1.92 | 2.00 | 0.148 |
| 13 | 2.25 | 2.25 | 0.203 |
| 14 | 2.00 | 2.00 | 0.151 |
| 15 | 2.25 | 1.00 | 0.040 |
| 16 | 2.50 | 1.00 | 0.042 |

*Total Flowrate offsite from above Detention Systems, for a 25-yr storm event = 2.51 cfs < $Qpre_{5yr}$ =2.53 cfs*

- ➔ Total runoff offsite from impervious surfaces not captured by detention systems:
  - Area = 5,928 sf ≈ 0.14 Acres, C=0.9, $C_a$=1.1, $I_{25}$=2.43
  - $Q_{25} = C_aCIA$ =(1.1)(0.9)(2.43)(0.14) = 0.34 cfs
- ➔ Therefore, Total Runoff offsite for 25-yr storm = 2.51 cfs+0.34 cfs =2.85 cfs

---

***Perforated Subdrain Capacity Calculations:***

The underlying stone beds for each drainage system are designed with a virtually flat bottom. Therefore, flow through the stone media occurs when there is head pressure. As runoff flows through the stone media it will eventually reach an outlet point via perforated subdrains. The subdrains are proposed at the downhill ends of the system adjacent to the control structures. The purpose of the subdrains is to convey runoff from the stone trenches to the control structures, prior to entering the main system. The calculations for these subdrains are below.

- ➔ Standard perforation patterns are per technical notes provided by the manufacturer and are based on the AASHTO Class II perforation specification.
- ➔ The perforations shall be located in the outside valleys of the corrugations.
  - 4" & 6" perforated Subdrain
    - Slotted perforations (3 slots per circumference of pipe)
      - Max. slot length = 0.875in
      - Max. slot width = 0.125in
      - Min. inlet area = 1 $in^2/ft \approx 0.007$ $ft^2/ft$
    - Therefore, total number of slots per 1 foot section of pipe = 9 (3 sets of 3 slots)
      - Flowrate at different head pressures =

| | |
|---|---|
| 0.048 cfs @ 2.0' head | 0.024 cfs @ 6" head |
| 0.042 cfs @ 1.5' head | 0.020 cfs @ 4" head |
| 0.034 cfs @ 1.0' head | 0.014 cfs @ 2" head |

    - Refer to the table on the following page for the subdrain lengths provided for each drainage area and available capacities for each pipe for a 2' head pressure and a 4" head pressure.

| Drainage Area | Pipe diameter | Length of Perf Pipe | Available Capacity of perforations @ 2' head | Available Capacity of perforations @ 4" head | Required Min. Capacity |
|---|---|---|---|---|---|
| | (inches) | (Feet) | (cfs) | (cfs) | (cfs) |
| 1a | 4 | 5 | 0.240 | 0.070 | 0.011 |
| 1b | 4 | 5 | 0.240 | 0.070 | 0.012 |
| 1c | 4 | 5 | 0.240 | 0.070 | 0.012 |
| 1d | 4 | 5 | 0.240 | 0.070 | 0.049 |
| 2a | 6 | 16 | 0.768 | 0.224 | 0.219 |
| 2b | 6 | 10 | 0.480 | 0.140 | 0.066 |
| 2c | 6 | 15 | 0.720 | 0.210 | 0.203 |
| 2d | 6 | 12 | 0.576 | 0.168 | 0.148 |
| 2e | 6 | 5 | 0.240 | 0.070 | 0.041 |
| 2f | 6 | 5 | 0.240 | 0.070 | 0.040 |
| 2g | 6 | 8 | 0.384 | 0.112 | 0.075 |
| 2h | 6 | 8 | 0.384 | 0.112 | 0.071 |
| 2i | 6 | 12 | 0.576 | 0.168 | 0.154 |
| 2j | 6 | 10 | 0.480 | 0.140 | 0.065 |
| 3 | 6 | 66* | 3.168 | 0.924 | 0.919 |
| 4 | 6 | 32 | 1.536 | 0.448 | 0.306 |
| 5 | 4 | 15 | 0.720 | 0.210 | 0.123 |
| 6a | 4 | 10 | 0.480 | 0.140 | 0.049 |
| 6b | 4 | 10 | 0.480 | 0.140 | 0.044 |
| 7 | 6 | 12 | 0.576 | 0.168 | 0.152 |
| 8 | 6 | 12 | 0.576 | 0.168 | 0.154 |
| 9a | 6 | 12 | 0.576 | 0.168 | 0.092 |
| 9b | 6 | 12 | 0.576 | 0.168 | 0.127 |
| 10 | 6 | 25 | 1.200 | 0.350 | 0.276 |

*66 linear feet is the minimum length of pipe required to convey the runoff for a 25-year storm event. Drainage area 3 provides different lengths for different areas of the drainage system. However, on average the length of pipe provided is greater than the required minimum of 66 feet.

***Pipe Capacity Calculations:***

| Manning Pipe Calculator (4" HDPE Pipe) | Manning Pipe Calculator (6" HDPE Pipe) |
|---|---|
| Given Input Data: | Given Input Data: |
| Shape ..... Circular | Shape ..... Circular |
| Solving for ..... Flowrate | Solving for ..... Flowrate |
| Diameter ..... 4.0000 in | Diameter ..... 6.0000 in |
| Depth ..... 4.0000 in | Depth ..... 6.0000 in |
| Slope ..... 0.0020 ft/ft | Slope ..... 0.0020 ft/ft |
| Manning's n ..... 0.0090 | Manning's n ..... 0.0090 |
| Computed Results: | Computed Results: |
| Flowrate ..... 0.1229 cfs | Flowrate ..... 0.3625 cfs |
| Area ..... 0.0873 ft2 | Area ..... 0.1963 ft2 |
| Wetted Area ..... 0.0873 ft2 | Wetted Area ..... 0.1963 ft2 |
| Wetted Perimeter ..... 12.5664 in | Wetted Perimeter ..... 18.8496 in |
| Perimeter ..... 12.5664 in | Perimeter ..... 18.8496 in |
| Velocity ..... 1.4088 fps | Velocity ..... 1.8460 fps |
| Hydraulic Radius ..... 1.0000 in | Hydraulic Radius ..... 1.5000 in |
| Percent Full ..... 100.0000 % | Percent Full ..... 100.0000 % |
| **Full flow Flowrate ..... 0.1229 cfs** | **Full flow Flowrate ..... 0.3625 cfs** |
| Full flow velocity ..... 1.4088 fps | Full flow velocity ..... 1.8460 fps |

**Water Quality Treatment:**

The Aptos Village project has utilized several different LID's (Low impact Development) and BMP's (Best Management Practices) in the design of the storm drain system. The use of pervious concrete and associated stone beds throughout the site not only reduces impervious surfaces but provides lag time form runoff to be treated through bio-filtration. Similarly, the raingardens and underlying stone trenches, along the proposed roads, will also provide treatment through bio-filtration. Within drainage area #3 there are 2 oversized bio-swales, to soften the surrounding impervious surfaces while treating runoff before entering the pervious concrete and stone beds, essentially creating a pre-treatment facility prior to entering the main system. As designed, the overall system adequately mitigates storm water runoff and treats flows sufficiently prior to entering the county systems and ultimately Aptos and Valencia Creeks.

**Conclusion:**

The proposed drainage plan has been separated into several mini drainage basins. Each area of pervious concrete was designed based on the actual impervious surfaces draining to each bed, refer to county spread sheets from above calculations. The stone beds were designed based on the 25-year storm event with a 5-year pre-development release rate. In the cases of drainage areas 2j, 3, 9a, 9b and 10 stormwater retention was obtained by use of Darcy Columns. The retention systems for the above mentioned drainage areas were based on the Santa Cruz County Design Criteria of a 2-year 2-hour storm event. In each case, the additional runoff from the impervious surfaces shall adequately be captured and infiltrated into the underlying soils as required. For all drainage areas runoff will be controlled by an outlet control structure as defined in the above calculations. Each control structure has proven to sufficiently control flows to the required pre-development rates. The impervious surfaces that will not be captured within the pervious concrete and stone beds or raingardens are minimal and have been considered in the above calculations.

The above calculations demonstrate that the proposed stormwater management system will be sufficient to control flows from the proposed development. The flow restrictor orifice calculations prove that the orifices will release stormwater flows at the same rate as existing conditions allow. The calculations within the report, for the retention/detention systems, prove to keep runoff below pre-development rates and also show that the depths of stone beds are adequate in storing the necessary runoff to conform to county standards. In all, this drainage study demonstrates that the stormwater drainage system, as designed, will be adequate and sufficient for the proposed development.

# Exhibit A

(Geotechnical Engineering figures & Tables)

| Summary of Water Level Readings for Aptos Village 7 March 2011 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Test Hole # | P-1 | P-1A | P-1B | P-2B | P-3 | P-3A | P-3B | P-4B | P-5B |
| Depth to Water Level (ft) | Dry | Dry | Dry | Dry[Notexx] | Dry | Dry | 1.31 | Dry | Dry |
| Total Depth of Hole (ft) | 10.01 | 6.31 | 3 | 3 | 9.49 | 6.15 | 2 | 3.02 | 3.42 |
| Standing Water Elevation (ft) | - | - | - | - | - | - | 115 | - | - |
| Percolation Rate (In/hr) | 1 | 0.25 | 0[xxx] | 36 | 6 | 0.5 | 0[xxx] | 0.125 | 0 |
| USCS Symbol | SC | SC | SC | SM | SM/CL | SM | CL | CL | SC |

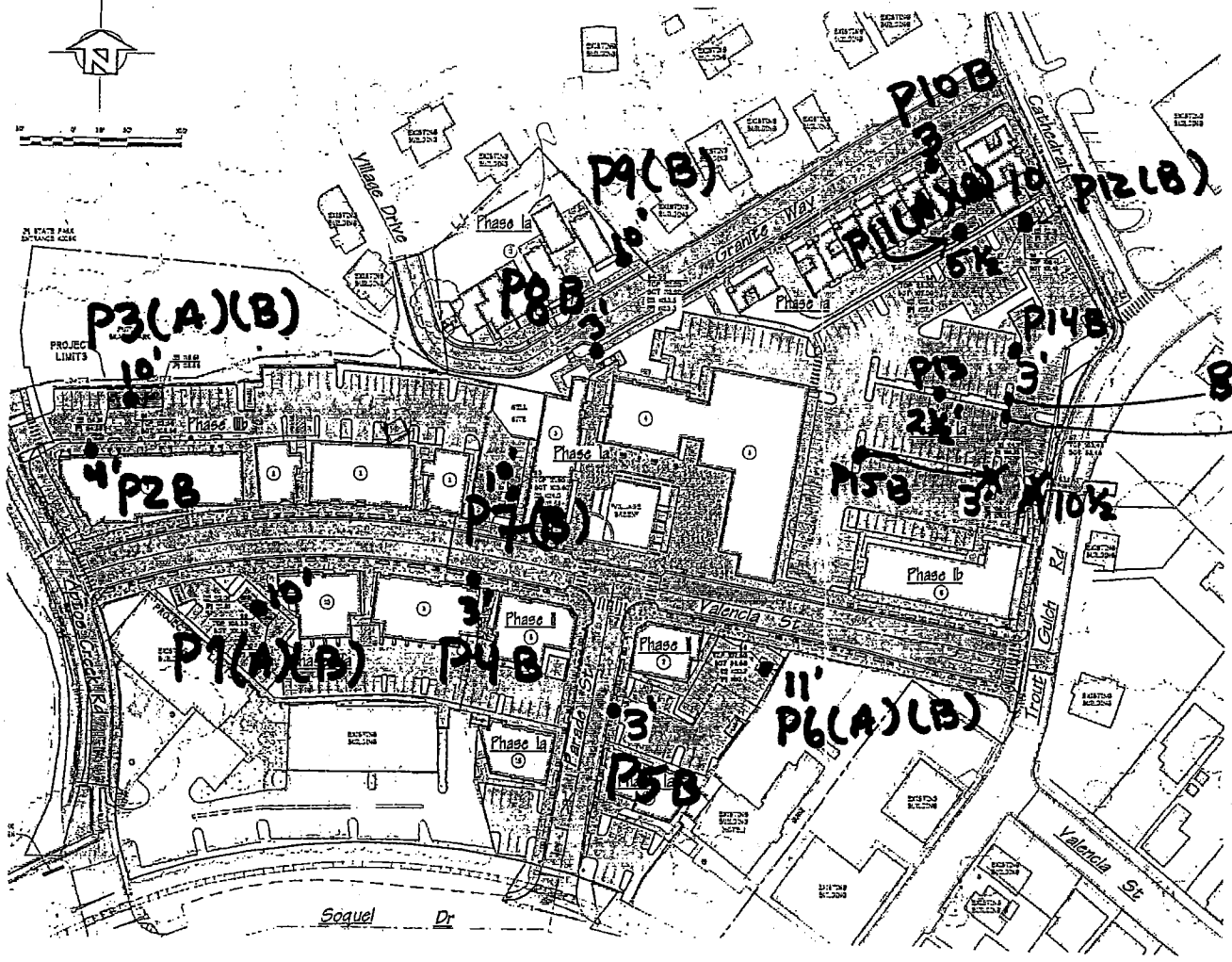
| Test Hole # | P-6 | P-6A | P-6B | P-7 | P-7B | P-8B | P-9 | P-9B | P-10B |
|---|---|---|---|---|---|---|---|---|---|
| Depth to Water Level (ft) | Dry | 5.88 | Dry | 8.74 | Dry | Dry | 4.81 | Dry | 2.6 |
| Total Depth of Hole (ft) | 10.1 | 6.25 | 2.75 | 9.83 | 3.69 | 3.3 | 10.53 | 2.96 | 3.63 |
| Standing Water Elevation (ft) | - | 105 | - | 105 | - | - | 115 | - | 117 |
| Percolation Rate (In/hr) | 4.5 | 0.125 | 0.25 | 5 | 0.5 | 0.75 | 0.25 | 6 | 0.25 |
| USCS Symbol | SC | SM | SC | SC | SC | SC | SM | SM | SC |

| Test Hole # | P-11A | P-11B | P-12 | P-12B | P-13B | P-14B | P-15B | B-5A | B-5B |
|---|---|---|---|---|---|---|---|---|---|
| Depth to Water Level (ft) | Note x | Note x | Note x | Dry | 1.33 | Dry | 1.69[Notexx] | Dry | Dry |
| Total Depth of Hole (ft) | 6.96 | 3 | 10 | 3.31 | 2.17 | 3.33 | 3.21 | 6.25 | 3.33 |
| Standing Water Elevation (ft) | - | - | - | - | 107 | - | 108 | - | - |
| Percolation Rate (In/hr) | 1 | 0[xxx] | 0[xxxx] | 36 | 1.5 | 0.25 | 0.25 | 3 | 1.5 |
| USCS Symbol | SC | SC | SC | SC | SC | SC | SC | SC | SC |

Note X: Pipe Pulled Out
Note XX: Cap Remvoed From Pipe
Footnote XXX: Standing Water in Hole After Presaturation Period
Foootnote XXXX: Water Encountered During Field Drilling (Seep)

Figure No. 1

PRELIMINARY
For Client Review Only




## General Notes

1. ALL CONSTRUCTION SHALL COMPLY WITH THE APTOS VILLAGE DEVELOPMENT PLAN APPLICABLE REQUIREMENTS OF THE CURRENT EDITION OF THE COUNTY OF SANTA CRUZ DESIGN CRITERIA.
2. NO LAND DISTURBANCE SHALL TAKE PLACE PRIOR TO THE ISSUANCE OF BUILDING PERMITS, EXCEPT THE MINIMUM NECESSARY TO INSTALL STREET IMPROVEMENTS, FENCES, ACCESS FOR COUNTY APPROVED TESTS OR TO CARRY OUT OTHER WORK SPECIFICALLY REQUIRED BY ANOTHER OF THESE CONDITIONS. IN ADDITION THE CONTRACTOR SHALL BE RESPONSIBLE FOR OBTAINING A NOTICE PERMIT FROM THE REGIONAL WATER QUALITY CONTROL BOARD PRIOR TO GRADING.
3. ALL GRADING WORK AND CONSTRUCTION OF IMPROVEMENTS SHALL BE DONE IN ACCORDANCE WITH RECOMMENDATIONS PRESCRIBED IN THE GEOTECHNICAL REPORT PREPARED FOR THIS PROJECT.
4. ALL UTILITIES SHALL BE INSTALLED UNDERGROUND.
5. UNDERGROUND UTILITY LOCATIONS SHOWN ARE COMPILED FROM INFORMATION SUPPLIED BY UTILITY AGENCIES, AND ARE APPROXIMATE ONLY. CONTRACTOR SHALL VERIFY LOCATIONS OF SUPPLIED UTILITY LINES PRIOR TO ANY EXCAVATION OR EXCAVATION. FOR LOCATION, CALL USA 800-642-2444.
6. ANY EXISTING UTILITIES THAT ARE DISCARDED TO BE RELOCATED AS A PART OF THIS CONSTRUCTION SHALL BE RELOCATED AT THE DEVELOPERS EXPENSE.

## Building Key

1. MIXED USE BUILDING WITH ANCHOR STORE (LOT 10)
2. MIXED USE WITH SMALL SHOPS BUILDING (LOTS 11-13)
3. MIXED USE WITH CONDO FLATS BUILDING (LOT 14)
4. [illegible] BUILDING (LOT 15)
5. [illegible] AND RETAIL BUILDING (LOT 16)
6. LARGE TENANT COMMERCIAL BUILDING (LOT 17)
7. SMALL MIXED USE BUILDING (LOT 5)
8. CORNER MIXED-USE BUILDING (LOT 6)
9. MID-BLOCK MIXED-USE BUILDING (LOT 7)
10. WEST MIXED-USE BUILDING (LOT 8)
11. HILLSIDE CLUSTER TOWNHOUSES (LOTS 18-24)
12. TOWNHOUSES (LOTS 25-28)
13. EXISTING BAYVIEW HOTEL (LOT 4)
14. EAST PARADE MIXED-USE BUILDING (LOT 3)
15. WEST PARADE MIXED-USE BUILDING (LOT 2)
16. RELOCATED HISTORICAL VFW BUILDING

## Abbreviations

| | |
|---|---|
| EG | EXISTING GRADE |
| FG | PROPOSED FINISHED GRADE |
| TOP | TOP CHAMBER |
| BOT | BOTTOM CHAMBER |
| S1-S3 | PROPOSED STORMDRAIN DETENTION/RETENTION CISTERN |

For Plan Check Only

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Water Infiltration Chamber Exhibit

Los Village

Drive, Aptos, California

Proposed Percolation Test Hole Location Map
Aptos Village
Aptos, California

| | |
|---|---|
| SCALE | 1"=100' |
| DRAWN BY | MC |
| DATE | December 2010 |
| JOB NO. | |
| FILE NO. | SC3427 |

HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE WATSONVILLE CA 95076
(831) 722-4175

FIGURE NO. 1

PRELIMINARY
For Client Review Only

# Exhibit B

(Infiltration Adjustment Spreadsheet)

**This table presents information for the system from the last submittal. 2-2011**

| BMP Name | BMP Description | Length | Width/Diameter | Surface Area | Depth of unit |
|---|---|---|---|---|---|
| Area #3 | Main Parking area, bldg 12 (all units) & driveway area, portions of bldgs 5 &6, | 4.00 | 6.00 | 104 | 4 |
| Area #9 | Phase IIIa development, incl. bldgs 9 & 10 & associated parking | 5.00 | 4.00 | 75 | 15 |
| Area #10 | Phase IIIb development incl. northern section of bldgs and associated parkign area | 5.00 | 6.00 | 123 | 15 |

**Design Methodology**

*Idesign = I measured*Ftesting*Fgeometry*Fplugging* This equation from King County Surface Water Design Manual

| | | |
|---|---|---|
| I design | | |
| I-measured | | |
| F testing | 0.30 | |
| Fgeometry range | 0.25-1.0 | |
| Fgeometry | 4(D/W)+0.5 | if this value is over 1.0 use 1.0 |
| | *D* :W or Imp. Layer | |
| | *W* of Infiltration unit | |
| Fplugging | 1.00 | (Accounted for in County Spreadsheets) |

| BMP Name | Length | Width | Depth to GW or Imp. Layer HKA Report | Reported Infiltration Values (in/hr) KHA Report | | Average (in/hr) | Ftesting | Fplugging | Fgeometry, calculated | Fgeometry used | I-design |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Area #10 | 5.00 | 6.00 | 5 | 6 | - | 6.00 | 0.3 | 1 | 3.38 | 1.00 | 1.80 |
| Area #9 | 5.00 | 4.00 | 5 | 1 | - | 1.00 | | | 5.05 | 1.00 | 0.30 |
| Area #3 | 4.00 | 6.00 | 2 | 3 | 1.5 | 2.25 | | | 1.38 | 1.00 | 0.68 |

# Off-Site DRAINAGE STUDY

## (For Valencia Creek Outfall)

**FOR**

# Aptos Village

Tract Number 1561
Soquel Drive, Aptos
Santa Cruz County, California

Revised: June, 2011

*Job #07040*

IFLAND ENGINEERS

5200 Soquel Dr. Suite 101
Santa Cruz, CA 95062
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Civil Engineering | Structural Design | Land Development

# EXISTING DRAINAGE CALCULATIONS FOR VALENCIA CREEK OUTFALL

## →Introduction

The following calculations are a detailed analysis of the upstream conditions draining to the Valencia Creek Outfall southeast of the subject parcel. The analyzed drainage basin includes approximately 178 acres consisting mainly of single family residences and heavily wooded areas. There are commercial properties adjacent to Soquel Drive, as well as multifamily properties throughout the area. The below C-values have been calculated using the County Design Criteria, Fig SWM-1, and aerial photography. This report has been prepared to supplement the Drainage Study for Aptos Village.

## → Drainage Mapping

- Refer to Attached Trout Gulch & Valencia Creek Outfall Drainage Exhibit for detailed map of existing drainage system within Trout Gulch Road and Cathedral Drive. Said map depicts offsite drainage system discharging to Valencia Creek.
- Refer to Watershed Exhibit for existing drainage patterns and areas associated with each drain inlet connected to system.

## → Assumptions

Total Area of Upstream Watershed (from County Topography Maps) ≈ 178 Acres
Antecedent Moisture Factor (25-yr) = $C_a$ = 1.1
$P_{60}$ = 1.40 (Figure SWM-2)
10-yr Rainfall Intensity = $I_{10}$ = 1.75 in/hr (Figure SWM-3)
25-yr Rainfall Intensity = $I_{10}$ = 2.10 in/hr (Figure SWM-3)
Time of Concentration = $T_c$ = 15 minutes
Manning's Roughness Coefficient for 42" RCP = n = 0.011 (Per SWM-5)
Manning's Roughness Coefficient for 24"-33" RCP = n = 0.013 (Per SWM-5)
Manning's Roughness Coefficient for 3'x4' Box Culvert = n = 0.013
Manning's Roughness Coefficient for HDPE = n = 0.010

Runoff Coefficient (C-values taken from Figure SWM-1)

| | |
|---|---|
| Business & Commercial Area | [C=0.80] |
| Low Residential (Dense) Area | [C=0.60] |
| Low Residential (Sparse) Area | [C=0.45] |
| High Residential Area | [C=0.70] |
| Rural, Forested Area | [C=0.20] |

*See following 4 pages for Santa Cruz County Figures and Values*

## →Assessment of Existing 42" RCP Outfall Pipe:

On-site assessment of the existing 42" RCP outfall into Valencia Creek has been performed. The pipe appears to be in good condition and performing adequately, with the exception of cracking at the joints within the center three sections of the storm drain. The cracks may be the result of slow creeping of the outfall structure and storm drain line over a long period of time. The sag, located at the midpoint of the pipe, may be a result of construction or due to erosion of the soil caused by flow through the separated joints. A retrofit of the outfall and grouting of the cracks within the pipe have been proposed on TM-17 of the Civil Drawings. The pipe and cracks should be monitored bi-annually to ensure the separation has subsided and the sag has remained unchanged.

| TYPE OF AREA | 10- YEAR RUNOFF COEFFICIENTS |
|---|---|
| Rural, park, forested, agricultural | 0.10 - 0.30 |
| Low residential (Single family dwellings) | SPARSE DENSE 0.45 - 0.60 |
| High residential (Multiple family dwellings) | 0.65 - 0.75 |
| Business and commercial | 0.80 |
| Industrial | 0.70 |
| Impervious | 0.90 |

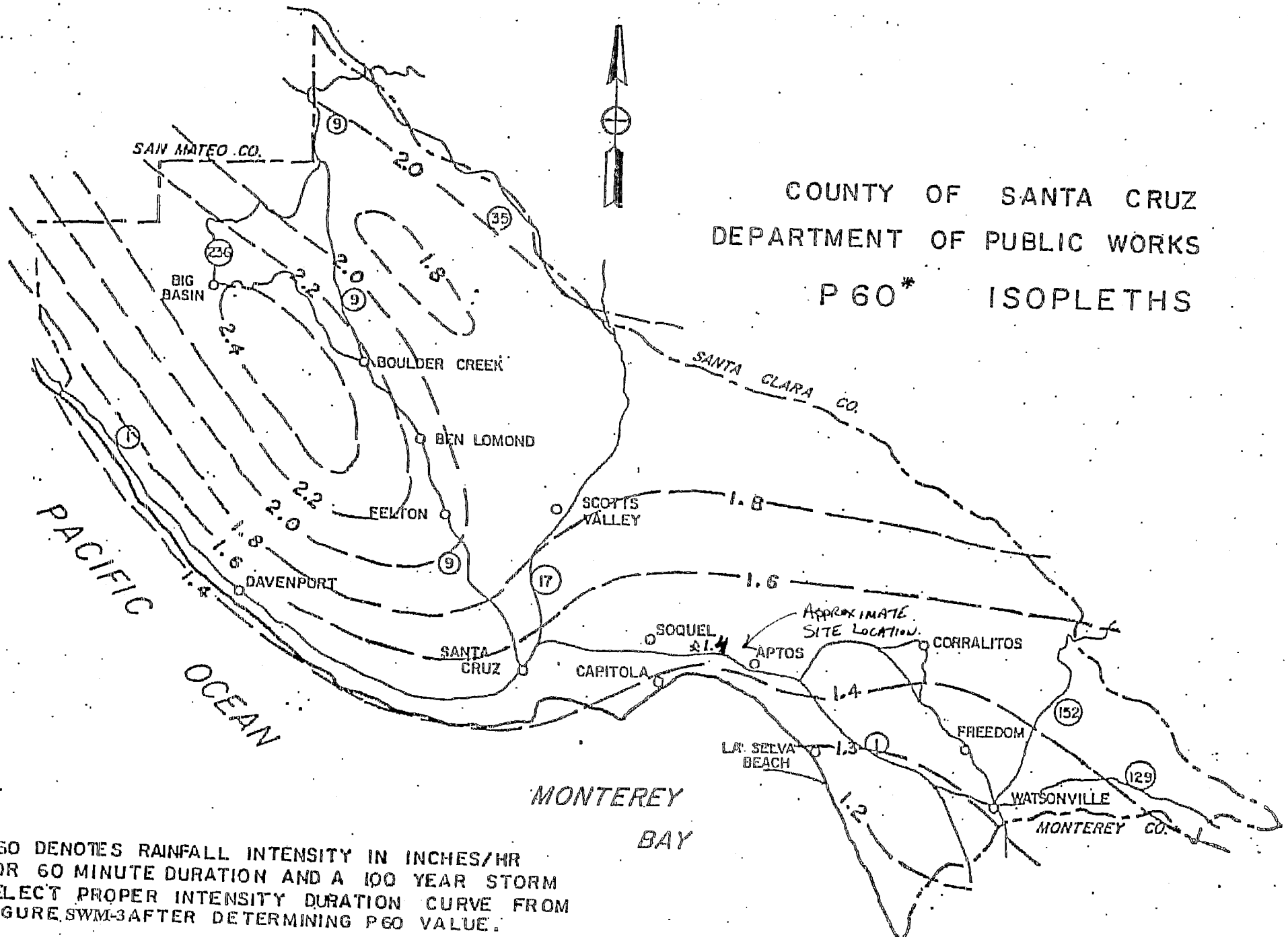
REQUIRED ANTECEDENT MOISTURE FACTORS (Ca) FOR THE RATIONAL METHOD*

| Recurrence Interval (Years) | Ca |
|---|---|
| 2 to 10 | 1.0 |
| 25 | 1.1 |
| 50 | 1.2 |
| 100 | 1.25 |

Note: Application of antecedent moisture factors (Ca) should not result in an adjusted runoff coefficient (C) exceeding a value of 1.00

*APWA Publication "Practices in Detention of Stormwater Runoff"

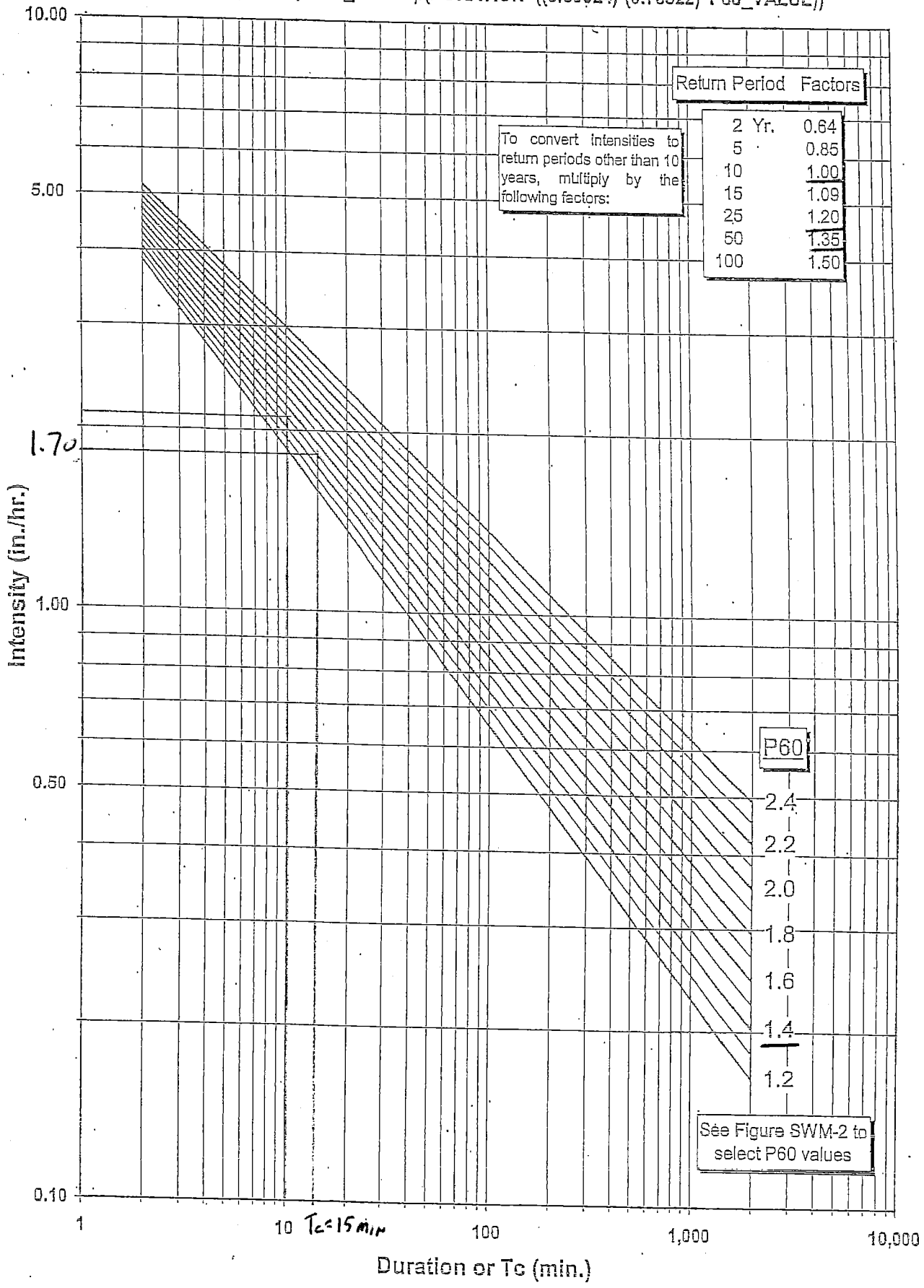
12/05




*P60 DENOTES RAINFALL INTENSITY IN INCHES/HR FOR 60 MINUTE DURATION AND A 100 YEAR STORM SELECT PROPER INTENSITY DURATION CURVE FROM FIGURE SWM-3 AFTER DETERMINING P60 VALUE.

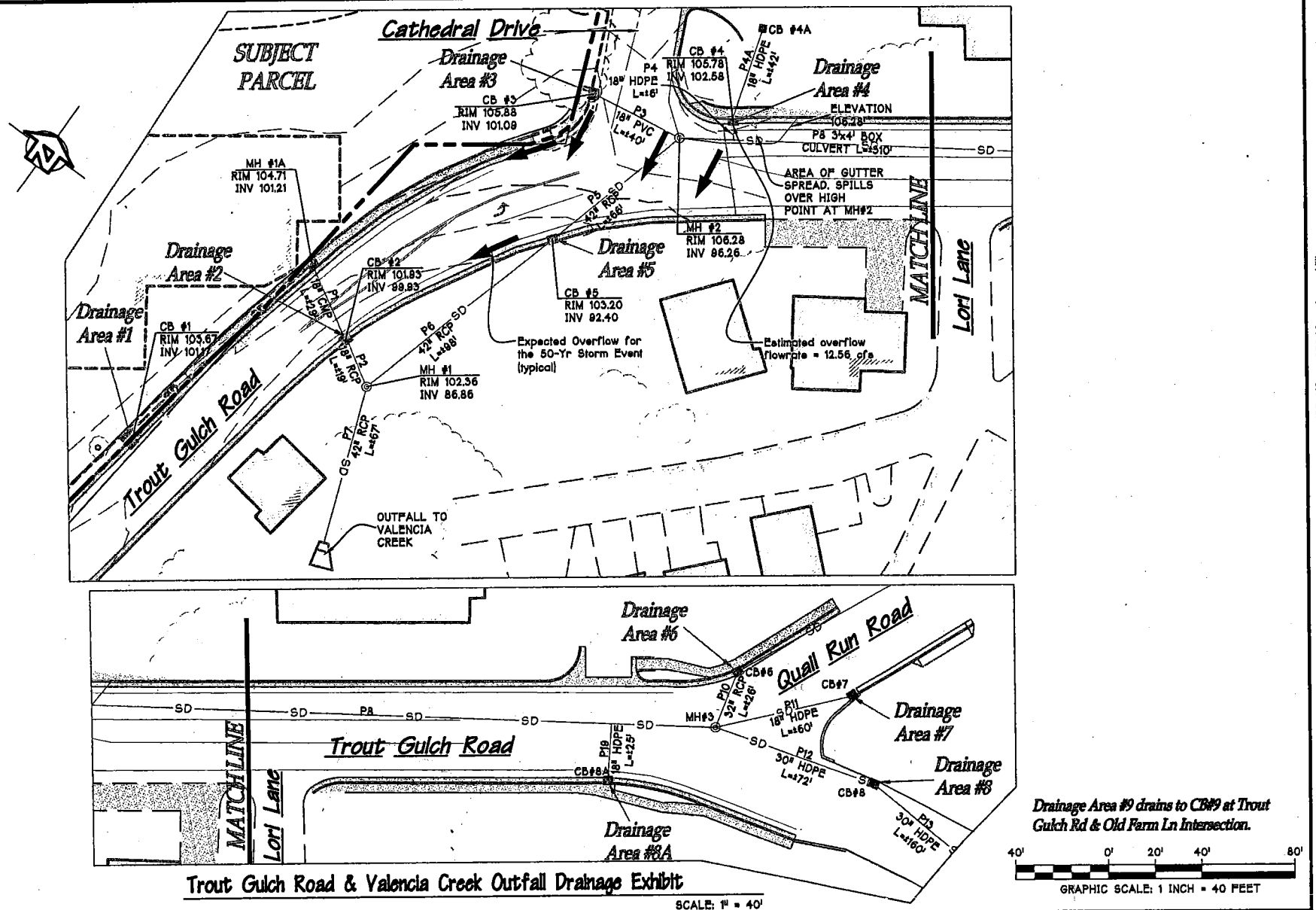
# Rainfall Intensity - Duration Curves
## 10 Yr. Return Period

((4.29112)*(1.1952)^P60_VALUE)/(DURATION^((0.60924)*(0.78522)^P60_VALUE))



| TYPE OF CONDUIT OR CHANNEL | ROUGHNESS COEFFICIENT |
|---|---|
| Plastic (PVC, ABS, or HDPE) | 0.010 to 0.012 |
| Concrete gutters | 0.015 |
| Corrugated metal (annular corrugations) | 0.024 |
| Reinforced concrete pipe 300 to 525mm (12 to 21 in) | 0.015 |
| Reinforced concrete pipe 600 to 825mm (24 to 33 in) | 0.013 |
| Reinforced concrete pipe 900 mm (36 in) and larger | 0.011 |
| Lined channels | |
| Concrete | 0.014 |
| Air blown mortar | 0.016 |
| Bituminous | 0.018 |
| Sacked concrete | 0.025 |

To determine roughness coefficients for natural channels, refer to "Handbook of Hydraulics," King & Brater; "Open-Channel Hydraulics," V.T. Chow; or "Street and Highway Drainage," Institute of Transportation, University of California.




Trout Gulch Road & Valencia Creek Outfall Drainage Exhibit

SCALE: 1" = 40'

JOB NO. 07040 - Aptos Village
SHEET NO. 1 OF 1
CALCULATED BY DMR DATE JUNE 13, 2011
SCALE: 1" = 40'

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JOB NO. 07040 - APTOS VILLAGE
SHEET NO. _____ OF _____
CALCULATED BY RYAN/DAVE DATE 6/8/11
SCALE: 1" = 400'

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**→ Calculations**

- Drainage Area #1
  - Total Area 160,410 SF ≈ 3.68 Acres
    - Area considered developed with Low Residential (Dense)

      Therefore, $C = 0.60$

$Q_{10} = CIA = (0.60)*(1.75)*(3.68)$ $Q_{25} = C_a\ CIA = (1.1)*(0.60)*(2.10)*(3.68)$

**$Q_{10} = 3.86$ cfs** **$Q_{25} = 5.10$ cfs**

---

- Drainage Area #2
  - Total Area 134,762 SF ≈ 3.09 Acres
    - Area considered developed with Low Residential (Dense)

      Therefore, $C = 0.60$

$Q_{10} = CIA = (0.60)*(1.75)*(3.09)$ $Q_{25} = C_a\ CIA = (1.1)*(0.60)*(2.10)*(3.09)$

**$Q_{10} = 3.24$ cfs** **$Q_{25} = 4.28$ cfs**

---

- Drainage Area #3
  - Total Area 90,634 SF ≈ 2.08 Acres
    - Sub-Areas

      Low Residential (dense) = 1.04 Acres

      Impervious Road Surface = 1.04 Acres

Composite C-Value = $\frac{1.04(0.60)+1.04(0.90)}{2.08}$

$C_{comp} = 0.75$

$Q_{10} = CIA = (0.75)*(1.75)*(2.08)$ $Q_{25} = C_a\ CIA = (1.1)*(0.75)*(2.10)*(2.08)$

**$Q_{10} = 2.73$ cfs** **$Q_{25} = 3.60$ cfs**

---

- Drainage Area #4
  - Total Area 640,561 SF ≈ 14.11 Acres
    - Sub-Areas

      Low Residential (dense) = 5.85 Acres

      Low Residential (Sparse) = 4.45 Acres

      Rural, Forested = 3.81 Acres

Composite C-Value = $\frac{5.85(0.60)+4.45(0.45)+3.81(0.20)}{14.11}$

$C_{comp} = 0.45$

$Q_{10} = CIA = (0.45)*(1.75)*(14.11)$ $Q_{25} = C_a\ CIA = (1.1)*(0.45)*(2.10)*(14.11)$

**$Q_{10} = 11.11$ cfs** **$Q_{25} = 14.67$ cfs**

---

- Drainage Area #4A
  - Total Area 47,044 SF ≈ 1.08 Acres
    - Area considered developed with Low Residential (Dense)

      Therefore, $C = 0.80$

$Q_{10}$ = CIA = (0.80)*(1.75)*(1.08)

**$Q_{10}$ = 1.51 cfs**

$Q_{25} = C_a$ CIA = (1.1)*(0.80)*(2.10)*(1.08)

**$Q_{25}$ = 2.00 cfs**

---

- Drainage Area #5
  - Total Area 145,219 SF ≈ 3.33 Acres
    - Sub-Areas

| | |
|---|---|
| Impervious | = 1.75 Acres |
| Low Residential (dense) | = 0.07 Acres |
| Low Residential (Sparse) | = 0.26 Acres |
| Rural, Forested | = 1.27 Acres |

Composite C-Value $= \frac{0.08(0.60)+0.26(0.45)+1.75(0.90)+1.26(0.20)}{3.33}$

$C_{comp} = 0.59$

$Q_{10}$ = CIA = (0.59)*(1.75)*(3.33)

**$Q_{10}$ = 3.44 cfs**

$Q_{25} = C_a$ CIA = (1.1)*(0.59)*(2.10)*(3.33)

**$Q_{25}$ = 4.54 cfs**

---

- Drainage Area #6
  - Total Area 5,098,495 SF ≈ 118.72 Acres
    - Sub-Areas

| | |
|---|---|
| Low Residential (dense) | = 4.77 Acres |
| Low Residential (Sparse) | = 44.27 Acres |
| Rural, Forested | = 69.68 Acres |

Composite C-Value $= \frac{4.77(0.60)+44.27(0.45)+69.68(0.20)}{118.72}$

$C_{comp} = 0.31$

$Q_{10}$ = CIA = (0.31)*(1.75)*(118.72)

**$Q_{10}$ = 64.41 cfs**

$Q_{25} = C_a$ CIA = (1.1)*(0.31)*(2.10)*(118.72)

**$Q_{25}$ = 85.02 cfs**

---

- Drainage Area #7
  - Total Area 89,501 SF ≈ 2.05 Acres
    - Sub-Areas

| | |
|---|---|
| Low Residential (dense) | = 0.27 Acres |
| Low Residential (Sparse) | = 0.72 Acres |
| Rural, Forested | = 1.06 Acres |

Composite C-Value $= \frac{0.27(0.60)+0.72(0.45)+1.06(0.20)}{2.05}$

$C_{comp} = 0.34$

$Q_{10} = CIA = (0.34)*(1.75)*(2.05)$ $\quad$ $Q_{25} = C_a\,CIA = (1.1)*(0.34)*(2.10)*(2.05)$

**$Q_{10} = 1.22$ cfs** $\quad$ **$Q_{25} = 1.61$ cfs**

---

- Drainage Area #8
  - Total Area 58,579 SF ≈ 1.35 Acres
    - Sub-Areas

      Low Residential (Sparse) = 0.79 Acres

      Rural, Forested = 0.56 Acres

    Composite C-Value $= \frac{0.79(0.45)+0.55(0.20)}{118.32}$

    $C_{comp} = 0.35$

$Q_{10} = CIA = (0.35)*(1.75)*(1.34)$ $\quad$ $Q_{25} = C_a\,CIA = (1.1)*(0.35)*(2.10)*(1.34)$

**$Q_{10} = 0.82$ cfs** $\quad$ **$Q_{25} = 1.08$ cfs**

---

- Drainage Area #8A
  - Total Area 21,480 SF ≈ 0.49 Acres
    - Area considered developed with High Residential

      Therefore, $C = 0.70$

$Q_{10} = CIA = (0.70)*(1.75)*(0.49)$ $\quad$ $Q_{25} = C_a\,CIA = (1.1)*(0.70)*(2.10)*(0.49)$

**$Q_{10} = 0.60$ cfs** $\quad$ **$Q_{25} = 0.79$ cfs**

---

- Drainage Area #9
  - Total Area 1,216,856 SF ≈ 27.94 Acres
    - Sub-Areas

      Low Residential (dense) = 7.75 Acres

      Low Residential (Sparse) = 6.12 Acres

      Rural, Forested = 14.07 Acres

    Composite C-Value $= \frac{7.75(0.60)+6.12(0.45)+14.07(0.20)}{118.32}$

    $C_{comp} = 0.37$

$Q_{10} = CIA = (0.37)*(1.75)*(27.94)$ $\quad$ $Q_{25} = C_a\,CIA = (1.1)*(0.37)*(2.10)*(27.94)$

**$Q_{10} = 18.09$ cfs** $\quad$ **$Q_{25} = 23.88$ cfs**

---

## → Cumulative Drainage Calculations

- Refer to SWM-6 for the 10-yr, 25-yr, and 50-yr Cumulative Drainage System Calculations (Following Pages). Includes calculations for the proposed improvements.

- Although the following spreadsheets show that the existing system will overtop CB#1 for both the 10 & 25-year storm event, with the new system in place and replacing CB#1, as proposed, the 10 & 25 year storm events will be contained within the system.

- According to the Santa Cruz CDC spreadsheet, the 50 year storm event will overtop a significant portion of the drainage system analyzed. However, once the lowest structure begins to overflow that will relieve some of the upstream constraints. The structures of concern would be CB's #1, 2, 3 & 4. Trout Gulch Road is pitched to the south, north of Quail Run Road, and crowned south of Quail Run Road. Overflow runoff from upstream structures, north of Quail Run Rd will eventually reach CB#5 by means of a roadside ditch and eventually curb & gutter. Overflow from Quail Run Road itself will be directed along the northerly curb & gutter along Trout Gulch and eventually reach CB#4. With the proposed improvements in place no structure downstream of MH#2 will overtop. Therefore, any excess flows from the upstream drainage system will eventually reach CB#5 or CB#2 and be safely conveyed underground to the Valencia Creek Outfall, improving the existing systems capacity for large storms.
  The overtopping of CB#3 will be mitigated by the installation of 2 additional upstream catch basins as well as drainage improvements along Granite Way. Additionally, a gutter spread analysis has been performed (following Figures SWM-6) that shows the overflow from CB#3 routing along the northern curb & gutter to the new CB#1, with minimal flows running across Trout Gulch Road. CB#4 will also overtop and a gutter spread analysis (following Figures SWM-6) shows that the overtopping would cause flooding for approximately 7' over Trout Gulch Road and Cathedral Drive, allowing a 32' dry travel lane on Trout Gulch and a 28' dry travel lane on Cathedral, before spilling over the high point at MH#2 and flowing to the southern curb line and eventually CB#5.

## →Conclusion

The existing drainage system, upslope of Cathedral Drive and to the Valencia Creek Outfall, is sufficient for both a 10 and 25 year storm event. For a 50-year event the Santa Cruz CDC Figure SWM-6 proves that much of the system will be flooded, in its current state. With the development of Aptos Village and the drainage improvements along Trout Gulch Road and Cathedral Drive, the system south of Cathedral will be upgraded and will adequately convey the 50-yr flows to Valencia Creek without overflow. CB#3 & CB#4 will still overflow and as calculated a dry travel lane of approximately 32 feet will be available, prior to the overflow reaching the high point in Trout Gulch Road and flow towards the southern curb line and CB#5 & CB#2. As for the upstream system, no improvements are proposed, but the analysis shows that if the upstream CB's do overtop, there is safe overland routing with no major flooding other than within the curb and gutters, prior to reaching the downstream CB's. The cross slope and Crown of Trout Gulch Road, as specified above, is sufficient to convey overland flows quickly and without ponding to the north and south curb and gutters.

## 10 year Storm Drain Analysis

$P_{60}$ = 1.4
Return period Factor: 1.00
Antecedent Moisture Factor (Ca): 1.00

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | Σ A*C | $T_c$ (min) | Σ $T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Manninga' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "Hi" (ft) | Sum of Head Loss (ft) | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 1.70 | 62.53 | CB6 | 36.80 | 0.04 | 15.00 | 1.70 | 62.53 | | | | | | | | | | | | 106.57 | 112.80 | 111.21 | 106.40 | 1.59 |
| | | | | | | | MH3 | 36.80 | | 15.04 | 1.70 | 62.46 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 11.19 | 671.52 | 0.01645 | 0.428 | 2.140 | 2.567 | 101.77 | 110.60 | 104.00 | 104.00 | 6.50 |
| 7 | 2.060 | 0.34 | 0.70 | 15 | 1.70 | 1.18 | CB7 | 0.70 | 1.49 | 15.00 | 1.70 | 1.18 | | | | | | | | | | | | | 104.01 | 112.60 | 109.01 | 107.50 | 3.79 |
| | | | | | | | MH3 | 37.50 | | 16.49 | 1.63 | 61.15 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 0.67 | 40.19 | 0.00008 | 0.005 | 0.008 | 0.012 | 101.77 | 110.60 | 104.00 | 104.00 | 6.50 |
| 8A | 3.330 | 0.8 | 2.66 | 10 | 2.03 | 5.40 | CB8A | 2.66 | 0.14 | 10.00 | 2.03 | 5.40 | | | | | | | | | | | | | 110.02 | 108.00 | 106.00 | 106.00 | -2.02 |
| | | | | | | | MH3 | 40.16 | | 10.14 | 2.01 | 80.91 | P19 | 25 | 18 | HDPE | 0.010 | 1.77 | 3.05 | 183.21 | 0.00156 | 0.039 | 0.159 | 0.198 | 100.00 | 106.26 | 96.26 | 96.26 | 6.26 |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 1.70 | 17.57 | CB9 | 10.34 | 0.75 | 15.00 | 1.70 | 17.57 | | | | | | | | | | | | | 109.62 | 111.60 | 110.02 | 107.30 | 1.48 |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 1.70 | 0.80 | CB8 | 10.81 | 0.33 | 15.75 | 1.66 | 17.99 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 3.58 | 214.62 | 0.00108 | 0.173 | 0.219 | 0.392 | 109.20 | 111.60 | 109.23 | 106.50 | 2.27 |
| | | | | | | | MH3 | 50.97 | 0.72 | 15.04 | 1.70 | 86.52 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 3.66 | 219.75 | 0.00114 | 0.082 | 0.229 | 0.311 | 101.77 | 110.60 | 108.89 | 104.00 | 1.81 |
| | | | | | | | MH2 | 50.97 | | 15.78 | 1.66 | 84.78 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 7.21 | 432.58 | 0.00285 | 0.883 | 0.888 | 1.771 | 100.00 | 106.26 | 97.77 | 96.26 | 6.26 |
| 4A | 1.080 | 0.8 | 0.86 | 15 | 1.70 | 1.47 | CB4a | 0.86 | 0.84 | 15.00 | 1.70 | 1.47 | | | | | | | | | | | | | 104.88 | 108.00 | 106.09 | 104.58 | 1.91 |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 1.70 | 10.79 | CB4 | 7.21 | 0.01 | 15.84 | 1.66 | 11.97 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 0.83 | 49.82 | 0.00012 | 0.005 | 0.012 | 0.017 | 100.83 | 105.78 | 104.86 | 102.58 | 0.92 |
| | | | | | | | MH2 | 58.19 | | 15.86 | 1.66 | 96.51 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 6.77 | 406.22 | 0.00767 | 0.046 | 0.783 | 0.829 | 100.00 | 106.58 | 96.26 | 96.26 | 6.58 |
| 3 | 2.080 | 0.75 | 1.56 | 15 | 1.70 | 2.65 | CB3 | 1.56 | 0.44 | 15.00 | 1.70 | 2.65 | | | | | | | | | | | | | 101.62 | 105.88 | 102.63 | 101.09 | 3.25 |
| | | | | | | | MH2 | 59.75 | | 15.88 | 1.66 | 99.10 | P3 | 40 | 18 | HDPE | 0.010 | 1.77 | 1.50 | 89.96 | 0.00038 | 0.015 | 0.038 | 0.053 | 100.00 | 106.26 | 101.57 | 96.26 | 4.71 |
| 5 | 0.490 | 0.7 | 0.34 | 15 | 1.70 | 0.58 | CB5 | 60.09 | 0.16 | 15.86 | 1.66 | 99.67 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 10.30 | 617.75 | 0.00694 | 0.458 | 1.811 | 2.269 | 91.42 | 103.20 | 97.73 | 92.40 | 5.47 |
| | | | | | | | MH1 | 60.09 | | 16.02 | 1.65 | 99.24 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 10.35 | 621.30 | 0.00702 | 0.688 | 1.831 | 2.519 | 88.90 | 102.36 | 88.86 | 88.86 | 13.46 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 1.70 | 3.75 | CB1 | 2.21 | 4.66 | 15.00 | 1.70 | 3.75 | | | | | | | | | | | | | 102.79 | 103.67 | 104.67 | 101.17 | [redacted] |
| | | | | | | | MH1A | 2.21 | | 19.66 | 1.51 | 3.34 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.39 | 23.39 | 0.00001 | 0.001 | 0.003 | 0.004 | 101.81 | 104.71 | 102.79 | 101.21 | 1.92 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 1.70 | 3.15 | CB2 | 4.06 | 0.09 | 19.66 | 1.51 | 6.14 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 1.89 | 113.21 | 0.00343 | 0.099 | 0.077 | 0.177 | 92.70 | 101.93 | 101.64 | 99.93 | 0.29 |
| | | | | | | | MH1 | 64.15 | | 16.02 | 1.65 | 105.95 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 3.47 | 208.28 | 0.00341 | 0.065 | 0.206 | 0.271 | 88.90 | 102.36 | 92.43 | 88.86 | 9.93 |
| | | | | | | | OUT | 64.15 | | 16.02 | 1.65 | 105.95 | P7 | 67 | 42 | RCP | 0.011 | 9.63 | 11.01 | 660.45 | 0.00793 | 0.531 | 2.070 | 2.601 | 86.30 | | | | |

Legend:

*Red text indicates Mainline, blue text indicates tributary lines*

[redacted] Indicates flooded structure

## 25 year Storm Drain Analysis

$P_{60}$ = 1.4
Return period Factor: 1.20
Antecedent Moisture Factor (Ca): 1.10

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | Σ A*C | $T_c$ (min) | Σ $T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Mannings' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "Hl" (ft) | Sum of Head Loss Loss (ft) | | | | | |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 2.04 | 82.54 | CB6 | 36.80 | 0.03 | 15.00 | 2.04 | 82.54 | | | | | | | | | | | | 110.69 | 112.80 | 112.79 | 106.40 | 0.01 |
| | | | | | | | MH3 | 36.80 | | 15.03 | 2.04 | 82.47 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 14.77 | 886.41 | 0.02867 | 0.745 | 3.728 | 4.473 | 108.21 | 110.50 | 104.00 | 104.00 | 4.29 |
| 7 | 2.060 | 0.34 | 0.70 | 15 | 2.04 | 1.56 | CB7 | 0.70 | 1.13 | 15.00 | 2.04 | 1.56 | | | | | | | | | | | | 108.23 | 112.80 | 109.01 | 107.50 | 3.79 |
| | | | | | | | MH3 | 37.50 | | 16.13 | 1.98 | 81.49 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 0.88 | 53.06 | 0.00013 | 0.008 | 0.013 | 0.021 | 108.21 | 110.50 | 104.00 | 104.00 | 4.29 |
| 8A | 3.330 | 0.8 | 2.66 | 10 | 2.43 | 7.13 | CB8A | 2.66 | 0.10 | 10.00 | 2.43 | 7.13 | | | | | | | | | | | | 110.78 | 111.50 | 109.00 | 109.00 | 0.72 |
| | | | | | | | MH3 | 40.16 | | 10.10 | 2.42 | 108.95 | P19 | 25 | 18 | HDPE | 0.010 | 1.77 | 4.03 | 241.83 | 0.00272 | 0.068 | 0.277 | 0.345 | 103.13 | 110.50 | 104.00 | 104.00 | 6.50 |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 2.04 | 23.19 | CB9 | 10.34 | 0.56 | 15.00 | 2.04 | 23.19 | | | | | | | | | | | | 110.78 | 111.50 | 110.18 | 107.30 | 0.72 |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 2.04 | 1.06 | CB8 | 10.81 | 0.25 | 15.56 | 2.01 | 23.86 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 4.72 | 283.29 | 0.00189 | 0.302 | 0.361 | 0.663 | 110.09 | 111.50 | 109.40 | 105.50 | 1.41 |
| | | | | | | | MH3 | 50.97 | 0.54 | 16.03 | 2.04 | 114.23 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 4.86 | 291.52 | 0.00200 | 0.144 | 0.403 | 0.547 | 106.21 | 110.50 | 109.55 | 104.00 | 0.95 |
| | | | | | | | MH2 | 50.97 | | 15.57 | 2.01 | 112.48 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 9.52 | 571.16 | 0.00497 | 1.539 | 1.548 | 3.087 | 103.13 | 106.28 | 97.78 | 96.26 | 3.15 |
| 4A | 1.080 | 0.8 | 0.86 | 15 | 2.04 | 1.94 | CB4a | 0.86 | 0.64 | 15.00 | 2.04 | 1.94 | | | | | | | | | | | | 105.49 | 108.00 | 106.10 | 104.58 | 1.90 |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 2.04 | 14.24 | CB4 | 7.21 | 0.01 | 15.64 | 2.00 | 15.89 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 1.10 | 65.77 | 0.00020 | 0.008 | 0.021 | 0.029 | 104.59 | 106.78 | 105.46 | 102.58 | 0.32 |
| | | | | | | | MH2 | 58.19 | | 15.65 | 2.00 | 128.13 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 8.99 | 539.25 | 0.01351 | 0.081 | 1.380 | 1.461 | 103.13 | 106.58 | 96.26 | 96.26 | 3.45 |
| 3 | 2.080 | 0.75 | 1.56 | 15 | 2.04 | 3.50 | CB3 | 1.56 | 0.34 | 15.00 | 2.04 | 3.50 | | | | | | | | | | | | 103.22 | 105.88 | 102.66 | 101.09 | 2.66 |
| | | | | | | | MH2 | 59.75 | | 15.65 | 2.00 | 131.56 | P3 | 40 | 18 | HDPE | 0.010 | 1.77 | 1.98 | 118.75 | 0.00066 | 0.026 | 0.067 | 0.093 | 103.13 | 106.28 | 102.95 | 96.26 | 3.15 |
| 5 | 0.490 | 0.7 | 0.34 | 15 | 2.04 | 0.77 | CB5 | 60.09 | 0.12 | 15.65 | 2.00 | 132.32 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 13.67 | 820.12 | 0.01223 | 0.807 | 3.191 | 3.998 | 95.33 | 103.20 | 99.13 | 92.40 | 4.07 |
| | | | | | | | MH1 | 60.09 | | 15.77 | 2.00 | 131.88 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 13.75 | 824.83 | 0.01237 | 1.212 | 3.228 | 4.440 | 90.89 | 102.36 | 86.86 | 86.86 | 11.47 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 2.04 | 4.95 | CB1 | 2.21 | 3.53 | 15.00 | 2.04 | 4.95 | | | | | | | | | | | | 102.86 | 103.67 | 104.67 | 101.17 | |
| | | | | | | | MH1A | 2.21 | | 18.53 | 1.86 | 4.52 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.51 | 30.87 | 0.00002 | 0.002 | 0.005 | 0.006 | 102.13 | 104.71 | 102.85 | 101.21 | 1.86 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 2.04 | 4.16 | CB2 | 4.06 | 0.07 | 18.53 | 1.86 | 8.31 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 2.56 | 153.33 | 0.00629 | 0.182 | 0.142 | 0.324 | 94.51 | 101.93 | 101.81 | 99.93 | 0.12 |
| | | | | | | | MH1 | 64.15 | | 15.77 | 2.00 | 140.80 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 4.70 | 282.08 | 0.00825 | 0.119 | 0.378 | 0.496 | 90.89 | 102.36 | 94.02 | 86.86 | 8.34 |
| | | | | | | | OUT | 64.15 | | 15.77 | 2.00 | 140.80 | P7 | 67 | 42 | RCP | 0.011 | 9.63 | 14.63 | 877.70 | 0.01401 | 0.939 | 3.655 | 4.594 | 88.30 | | | | |

Legend:

*Red text indicates Mainline, blue text indicates tributary lines*

Indicates flooded structure

## 50 year Storm Drain Analysis

$P_{50}$ = 1.4
Return period Factor: 1.35
Antecedent Moisture Factor (Ca): 1.20

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | Σ A*C | $T_c$ (min) | Σ $T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Mannings' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "Hi" (ft) | Sum of Head Loss Loss (ft) | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 2.29 | 101.30 | CB6 | 36.80 | 0.02 | 15.00 | 2.29 | 101.30 | | | | | | | | | | | | 118.25 | 112.80 | 114.68 | 106.40 | |
| | | | | | | | MH3 | 36.80 | | 15.02 | 2.29 | 101.23 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 18.13 | 1087.87 | 0.04318 | 1.123 | 5.615 | 6.738 | 111.51 | 110.50 | 104.00 | 104.00 | |
| 7 | 2.050 | 0.34 | 0.70 | 15 | 2.29 | 1.92 | CB7 | 0.70 | 0.92 | 15.00 | 2.29 | 1.92 | | | | | | | | | | | | | 111.54 | 112.80 | 109.02 | 107.60 | 1.26 |
| | | | | | | | MH3 | 37.50 | | 15.92 | 2.24 | 100.58 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 1.09 | 65.11 | 0.00020 | 0.012 | 0.020 | 0.032 | 111.51 | 110.50 | 104.00 | 104.00 | |
| 8A | 3.330 | 0.8 | 2.66 | 10 | 2.74 | 8.74 | CB8A | 2.66 | 0.08 | 10.00 | 2.74 | 8.74 | | | | | | | | | | | | | 113.37 | 108.00 | 106.00 | 106.00 | |
| | | | | | | | MH3 | 40.16 | | 10.08 | 2.73 | 131.36 | P19 | 25 | 18 | HDPE | 0.010 | 1.77 | 4.95 | 298.79 | 0.00409 | 0.102 | 0.418 | 0.520 | 106.86 | 106.26 | 96.26 | 96.26 | |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 2.29 | 28.46 | CB9 | 10.34 | 0.46 | 15.00 | 2.29 | 28.46 | | | | | | | | | | | | | 113.37 | 111.50 | 110.37 | 107.30 | |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 2.29 | 1.30 | CB8 | 10.81 | 0.20 | 15.46 | 2.26 | 29.37 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 5.79 | 347.68 | 0.00284 | 0.455 | 0.574 | 1.029 | 112.34 | 111.50 | 109.61 | 106.50 | |
| | | | | | | | MH3 | 50.97 | 0.44 | 15.02 | 2.29 | 140.22 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 5.98 | 358.83 | 0.00303 | 0.218 | 0.611 | 0.829 | 111.51 | 110.50 | 110.33 | 104.00 | |
| | | | | | | | MH2 | 50.97 | | 15.47 | 2.26 | 138.46 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 11.88 | 701.08 | 0.00748 | 2.319 | 2.332 | 4.651 | 106.86 | 106.26 | 97.79 | 96.26 | |
| 4A | 1.080 | 0.8 | 0.86 | 15 | 2.29 | 2.38 | CB4a | 0.86 | 0.52 | 15.00 | 2.29 | 2.38 | | | | | | | | | | | | | 109.12 | 108.00 | 106.11 | 104.58 | |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 2.29 | 17.48 | CB4 | 7.21 | 0.01 | 15.52 | 2.26 | 19.56 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 1.35 | 80.72 | 0.00030 | 0.013 | 0.031 | 0.044 | 109.07 | 105.78 | 106.17 | 102.58 | |
| | | | | | | | MH2 | 58.19 | | 15.53 | 2.26 | 157.77 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 11.07 | 663.99 | 0.02048 | 0.123 | 2.092 | 2.215 | 106.86 | 106.58 | 96.26 | 96.26 | |
| 3 | 2.080 | 0.75 | 1.56 | 15 | 2.29 | 4.29 | CB3 | 1.56 | 0.27 | 15.00 | 2.29 | 4.29 | | | | | | | | | | | | | 107.00 | 105.88 | 102.69 | 101.09 | |
| | | | | | | | MH2 | 59.75 | | 15.53 | 2.26 | 162.00 | P3 | 40 | 18 | HDPE | 0.010 | 1.77 | 2.43 | 145.74 | 0.00099 | 0.039 | 0.101 | 0.140 | 106.86 | 106.28 | 104.60 | 96.26 | |
| 5 | 0.490 | 0.7 | 0.34 | 15 | 2.29 | 0.94 | CB5 | 60.09 | 0.10 | 15.53 | 2.26 | 162.93 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 16.83 | 1009.89 | 0.01855 | 1.224 | 4.839 | 6.063 | 100.01 | 103.20 | 100.79 | 92.40 | 2.41 |
| | | | | | | | MH1 | 60.09 | | 15.63 | 2.25 | 162.50 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 18.93 | 1015.69 | 0.01878 | 1.838 | 4.895 | 6.733 | 93.27 | 102.36 | 86.86 | 86.86 | 9.09 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 2.29 | 6.08 | CB1 | 2.21 | 2.88 | 15.00 | 2.29 | 6.08 | | | | | | | | | | | | | 102.94 | 103.67 | 104.68 | 101.17 | |
| | | | | | | | MH1A | 2.21 | | 17.88 | 2.13 | 5.63 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.63 | 37.89 | 0.00003 | 0.003 | 0.007 | 0.010 | 102.52 | 104.71 | 102.93 | 101.21 | 1.78 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 2.29 | 5.10 | CB2 | 4.06 | 0.05 | 17.88 | 2.13 | 10.36 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 3.19 | 191.14 | 0.00978 | 0.284 | 0.221 | 0.504 | 96.68 | 101.93 | 102.02 | 99.83 | |
| | | | | | | | MH1 | 64.15 | | 15.63 | 2.25 | 173.48 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 5.86 | 351.64 | 0.00971 | 0.184 | 0.587 | 0.771 | 93.27 | 102.36 | 95.91 | 86.86 | 6.45 |
| | | | | | | | OUT | 64.15 | | 15.63 | 2.25 | 173.48 | P7 | 67 | 42 | RCP | 0.011 | 9.63 | 18.02 | 1081.43 | 0.02127 | 1.425 | 5.549 | 6.974 | 86.30 | | | | |

Legend:

***Red text indicates Mainline, blue text indicates tributary lines***

Indicates Structure from Tributary Branch

Indicates flooded structure on main line

## 10 year Storm Drain Analysis (With Proposed Improvements)

$P_{60}$ = 1.4
Return period Factor: 1.00
Antecedent Moisture Factor (Ca): 1.00

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | $\Sigma$ A*C | $T_c$ (min) | $\Sigma T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Mannings' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "Hi" (ft) | Sum of Head Loss Loss (ft) | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 1.70 | 62.53 | CB6 | 36.80 | 0.04 | 15.00 | 1.70 | 62.53 | | | | | | | | | | | | 106.57 | 112.80 | 111.21 | 106.40 | 1.59 |
| | | | | | | | MH3 | 36.80 | | 15.04 | 1.70 | 62.46 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 11.19 | 671.52 | 0.01645 | 0.428 | 2.140 | 2.567 | 103.02 | 110.50 | 104.00 | 104.00 | 6.50 |
| 7 | 2.050 | 0.34 | 0.70 | 15 | 1.70 | 1.18 | CB7 | 0.70 | 1.49 | 15.00 | 1.70 | 1.18 | | | | | | | | | | | | | 104.01 | 112.80 | 109.01 | 107.50 | 3.79 |
| | | | | | | | MH3 | 37.50 | | 16.49 | 1.63 | 61.15 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 0.67 | 40.19 | 0.00008 | 0.005 | 0.008 | 0.012 | 103.02 | 110.50 | 104.00 | 104.00 | 6.50 |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 1.70 | 17.57 | CB9 | 10.34 | 0.75 | 15.00 | 1.70 | 17.57 | | | | | | | | | | | | | 109.62 | 111.50 | 110.02 | 107.30 | 1.48 |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 1.70 | 0.80 | CB8 | 10.81 | 0.33 | 15.75 | 1.66 | 17.99 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 3.58 | 214.62 | 0.00108 | 0.173 | 0.219 | 0.392 | 109.11 | 111.50 | 109.23 | 106.50 | 2.27 |
| | | | | | | | MH3 | 48.31 | 0.76 | 16.04 | 1.70 | 81.99 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 3.66 | 219.75 | 0.00114 | 0.082 | 0.229 | 0.311 | 103.02 | 110.50 | 108.80 | 104.00 | 1.70 |
| | | | | | | | MH2 | 48.31 | | 15.79 | 1.66 | 80.27 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 6.83 | 409.97 | 0.00256 | 0.793 | 0.797 | 1.591 | 99.76 | 106.26 | 101.43 | 96.26 | 4.85 |
| 4A | 1.060 | 0.8 | 0.86 | 15 | 1.70 | 1.47 | CB4a | 0.86 | 0.84 | 15.00 | 1.70 | 1.47 | | | | | | | | | | | | | 104.88 | 108.00 | 106.09 | 104.58 | 1.91 |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 1.70 | 10.79 | CB4 | 7.21 | 0.01 | 15.84 | 1.66 | 11.97 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 0.83 | 49.82 | 0.00012 | 0.005 | 0.012 | 0.017 | 102.26 | 105.78 | 104.86 | 102.58 | 0.92 |
| | | | | | | | MH2 | 55.52 | | 15.86 | 1.66 | 92.09 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 6.77 | 406.22 | 0.00767 | 0.046 | 0.783 | 0.829 | 99.76 | 106.58 | 101.43 | 96.26 | 5.15 |
| 8A | 0.490 | 0.7 | 0.34 | 10 | 2.03 | 0.70 | CB8A | 0.34 | 10.94 | 10.00 | 2.03 | 0.70 | | | | | | | | | | | | | 101.44 | 108.00 | 107.50 | 106.00 | 0.50 |
| | | | | | | | MH2 | 55.87 | | 20.94 | 1.47 | 82.13 | P19 | 258 | 18 | HDPE | 0.010 | 1.77 | 0.39 | 23.59 | 0.00003 | 0.007 | 0.003 | 0.009 | 99.76 | 106.26 | 101.43 | 96.26 | 4.85 |
| 3b | 1.960 | 0.72 | 1.41 | 15 | 1.70 | 2.40 | CB3b | 1.41 | 1.07 | 15.00 | 1.70 | 2.40 | | | | | | | | | | | | | 106.41 | 116.50 | 112.03 | 110.50 | 4.47 |
| 3a | 0.070 | 0.9 | 0.06 | 10 | 2.03 | 0.13 | CB3a | 1.47 | 0.80 | 16.07 | 1.65 | 2.43 | P3b | 87 | 18 | HDPE | 0.010 | 1.77 | 1.36 | 81.38 | 0.00031 | 0.027 | 0.031 | 0.058 | 102.68 | 111.20 | 106.35 | 104.82 | 4.85 |
| 3 | 0.050 | 0.9 | 0.05 | 10 | 2.03 | 0.09 | CB3 | 1.52 | 0.84 | 16.67 | 1.61 | 2.45 | P3a | 66 | 18 | HDPE | 0.010 | 1.77 | 1.38 | 82.51 | 0.00032 | 0.021 | 0.032 | 0.053 | 101.49 | 105.88 | 102.62 | 101.09 | 3.26 |
| | | | | | | | MH2 | 57.39 | | 15.86 | 1.66 | 95.18 | P3 | 70 | 18 | HDPE | 0.010 | 1.77 | 1.39 | 83.25 | 0.00032 | 0.023 | 0.033 | 0.055 | 99.76 | 106.26 | 101.43 | 96.26 | 4.85 |
| 5 | 3.330 | 0.59 | 1.96 | 15 | 1.70 | 3.34 | CB5 | 59.35 | 0.16 | 15.86 | 1.66 | 98.44 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 9.89 | 593.33 | 0.00640 | 0.423 | 1.670 | 2.093 | 91.30 | 103.20 | 97.69 | 92.40 | 5.51 |
| | | | | | | | MH1 | 59.35 | | 16.02 | 1.65 | 98.01 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 10.23 | 613.64 | 0.00685 | 0.671 | 1.787 | 2.458 | 88.84 | 102.36 | 88.86 | 88.86 | 13.52 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 1.70 | 3.75 | CB1 | 2.21 | 4.66 | 15.00 | 1.70 | 3.75 | | | | | | | | | | | | | 100.76 | 103.50 | 103.31 | 99.81 | 0.19 |
| | | | | | | | MH1A | 2.21 | | 19.66 | 1.51 | 3.34 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.39 | 23.39 | 0.00001 | 0.001 | 0.003 | 0.004 | 97.78 | 104.40 | 100.76 | 99.18 | 3.64 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 1.70 | 3.15 | CB2 | 4.06 | 0.09 | 19.66 | 1.51 | 6.14 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 1.89 | 113.21 | 0.00343 | 0.099 | 0.077 | 0.177 | 92.65 | 101.93 | 97.61 | 95.90 | 4.32 |
| | | | | | | | MH1 | 63.41 | | 16.02 | 1.65 | 104.72 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 3.47 | 208.28 | 0.00341 | 0.065 | 0.208 | 0.271 | 88.84 | 102.36 | 92.38 | 86.86 | 9.98 |
| | | | | | | | OUT | 63.41 | | 16.02 | 1.65 | 104.72 | P7 | 67 | 42 | RCP | 0.011 | 9.63 | 10.88 | 652.80 | 0.00775 | 0.519 | 2.022 | 2.541 | 86.30 | | | | |

Legend:

*Red text indicates Mainline, blue text indicates tributary lines*

## 25 year Storm Drain Analysis (With Proposed Improvements)

$P_{60}$ = 1.4
Return period Factor: 1.20
Antecedent Moisture Factor (Ca): 1.10

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | Σ A*C | $T_c$ (min) | Σ $T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Mannings' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "Hi" (ft) | Sum of Head Loss Loss (ft) | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 2.04 | 82.54 | CB6 | 36.80 | 0.03 | 15.00 | 2.04 | 82.54 | | | | | | | | | | | | 109.98 | 112.80 | 112.79 | 106.40 | 0.01 |
| | | | | | | | MH3 | 36.80 | | 15.03 | 2.04 | 82.47 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 14.77 | 886.41 | 0.02887 | 0.745 | 3.728 | 4.473 | 105.51 | 110.50 | 104.00 | 104.00 | 4.99 |
| 7 | 2.050 | 0.34 | 0.70 | 15 | 2.04 | 1.56 | CB7 | 0.70 | 1.13 | 15.00 | 2.04 | 1.56 | | | | | | | | | | | | | 105.53 | 112.80 | 109.01 | 107.50 | 3.79 |
| | | | | | | | MH3 | 37.50 | | 16.13 | 1.98 | 81.49 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 0.88 | 53.08 | 0.00013 | 0.008 | 0.013 | 0.021 | 105.51 | 110.50 | 104.00 | 104.00 | 4.99 |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 2.04 | 23.19 | CB9 | 10.34 | 0.56 | 15.00 | 2.04 | 23.19 | | | | | | | | | | | | | 110.62 | 111.50 | 110.16 | 107.30 | 0.88 |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 2.04 | 1.06 | CB8 | 10.81 | 0.25 | 15.56 | 2.01 | 23.86 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 4.72 | 283.29 | 0.00189 | 0.302 | 0.381 | 0.683 | 109.94 | 111.50 | 109.40 | 106.50 | 1.56 |
| | | | | | | | MH3 | 48.31 | 0.57 | 15.03 | 2.04 | 108.26 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 4.86 | 291.52 | 0.00200 | 0.144 | 0.403 | 0.547 | 105.51 | 110.50 | 109.39 | 104.00 | 1.11 |
| | | | | | | | MH2 | 48.31 | | 15.60 | 2.00 | 106.52 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 9.02 | 541.31 | 0.00446 | 1.383 | 1.390 | 2.773 | 102.74 | 106.28 | 102.70 | 96.26 | 3.54 |
| 4A | 1.080 | 0.8 | 0.86 | 15 | 2.04 | 1.94 | CB4a | 0.86 | 0.64 | 15.00 | 2.04 | 1.94 | | | | | | | | | | | | | 105.49 | 108.00 | 108.10 | 104.58 | 1.90 |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 2.04 | 14.24 | CB4 | 7.21 | 0.01 | 15.64 | 2.00 | 15.89 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 1.10 | 65.77 | 0.00020 | 0.008 | 0.021 | 0.029 | 104.20 | 106.78 | 105.46 | 102.58 | 0.32 |
| | | | | | | | MH2 | 55.52 | | 15.65 | 2.00 | 122.26 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 8.99 | 539.25 | 0.01351 | 0.081 | 1.380 | 1.461 | 102.74 | 106.58 | 102.70 | 96.26 | 3.84 |
| 8A | 0.490 | 0.7 | 0.34 | 10 | 2.43 | 0.82 | CB8A | 0.34 | 8.29 | 10.00 | 2.43 | 0.82 | | | | | | | | | | | | | 102.75 | 108.00 | 107.50 | 106.00 | 0.50 |
| | | | | | | | MH2 | 55.87 | | 18.29 | 1.87 | 114.97 | P18 | 258 | 18 | HDPE | 0.010 | 1.77 | 0.52 | 31.14 | 0.00005 | 0.012 | 0.005 | 0.018 | 102.74 | 106.28 | 102.70 | 96.26 | 3.54 |
| 3b | 1.960 | 0.72 | 1.41 | 15 | 2.04 | 3.17 | CB3b | 1.41 | 0.81 | 15.00 | 2.04 | 3.17 | | | | | | | | | | | | | 106.48 | 116.50 | 112.05 | 110.50 | 4.45 |
| 3a | 0.070 | 0.9 | 0.06 | 10 | 2.43 | 0.17 | CB3a | 1.47 | 0.60 | 15.81 | 1.99 | 3.23 | P3b | 87 | 18 | HDPE | 0.010 | 1.77 | 1.79 | 107.42 | 0.00054 | 0.047 | 0.055 | 0.101 | 102.93 | 111.20 | 108.38 | 104.82 | 4.82 |
| 3 | 0.050 | 0.9 | 0.05 | 10 | 2.43 | 0.12 | CB3 | 1.52 | 0.63 | 16.41 | 1.98 | 3.28 | P3a | 66 | 18 | HDPE | 0.010 | 1.77 | 1.83 | 109.68 | 0.00056 | 0.037 | 0.057 | 0.094 | 102.84 | 105.88 | 102.65 | 101.09 | 3.04 |
| | | | | | | | MH2 | 57.39 | | 15.65 | 2.00 | 126.36 | P3 | 70 | 18 | HDPE | 0.010 | 1.77 | 1.85 | 111.21 | 0.00057 | 0.040 | 0.059 | 0.099 | 102.74 | 106.28 | 102.70 | 98.26 | 3.54 |
| 5 | 3.330 | 0.59 | 1.96 | 15 | 2.04 | 4.41 | CB5 | 59.35 | 0.12 | 15.65 | 2.00 | 130.89 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 13.13 | 787.70 | 0.01128 | 0.745 | 2.944 | 3.689 | 95.12 | 103.20 | 99.05 | 92.40 | 4.15 |
| | | | | | | | MH1 | 59.35 | | 15.77 | 2.00 | 130.25 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 13.58 | 814.67 | 0.01207 | 1.183 | 3.149 | 4.332 | 90.79 | 102.36 | 86.86 | 86.86 | 11.57 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 2.04 | 4.95 | CB1 | 2.21 | 3.53 | 15.00 | 2.04 | 4.95 | | | | | | | | | | | | | 100.83 | 103.50 | 103.31 | 99.81 | 0.19 |
| | | | | | | | MH1A | 2.21 | | 18.53 | 1.86 | 4.52 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.51 | 30.87 | 0.00002 | 0.002 | 0.005 | 0.006 | 98.10 | 104.40 | 100.82 | 99.18 | 3.58 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 2.04 | 4.16 | CB2 | 4.06 | 0.07 | 18.53 | 1.86 | 8.31 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 2.58 | 153.33 | 0.00629 | 0.182 | 0.142 | 0.324 | 94.43 | 101.93 | 97.78 | 95.90 | 4.15 |
| | | | | | | | MH1 | 63.41 | | 15.77 | 2.00 | 139.17 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 4.70 | 282.08 | 0.00625 | 0.119 | 0.378 | 0.496 | 90.79 | 102.36 | 93.93 | 86.86 | 8.43 |
| | | | | | | | OUT | 63.41 | | 15.77 | 2.00 | 139.17 | P7 | 67 | 42 | RCP | 0.011 | 9.63 | 14.46 | 867.54 | 0.01369 | 0.917 | 3.571 | 4.488 | 86.30 | | | | |

Legend:

*Red text indicates Mainline, blue text indicates tributary lines*

## 50 year Storm Drain Analysis (With Proposed Improvements)

$P_{60}$ = 1.4
Return period Factor: 1.35
Antecedent Moisture Factor (Ca): 1.20

| INLET OR JUNCTION STRUCTURE | | | | | | | | | | | | | PIPE PROPERTIES | | | | | | | | LOSSES | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Area Designation | Area"A" (Acres) | C | A*C | $T_c$ (min) | I (in/hr) | Q (cfs) | Junction Designation | Σ A*C | $T_c$ (min) | Σ $T_c$ (min) | I (in/hr) | Q (cfs) | Pipeline Designation | L (ft) | Dia. (in) | Type | Mannings' "n" | Pipe Area (sf) | V (fps) | V (fpm) | HGL Slope "Sn" | Friction Loss L*Sn (ft) | Entrance Loss "HI" (ft) | Sum of Head Loss Loss (ft) | Outlet Control W.S. Elev. | T.G. Elev. | Inlet Control W.S. Elev. | Pipe Flowline | Freeboard (ft) |
| 6 | 118.720 | 0.31 | 36.80 | 15 | 2.29 | 101.30 | CB6 | 36.80 | 0.02 | 15.00 | 2.29 | 101.30 | | | | | | | | | | | | 118.23 | 112.80 | 114.68 | 106.40 | |
| | | | | | | | MH3 | 36.80 | | 15.02 | 2.29 | 101.23 | P10 | 26 | 32 | RCP | 0.013 | 5.59 | 18.13 | 1087.87 | 0.04318 | 1.123 | 5.615 | 6.738 | 111.49 | 110.50 | 104.00 | 104.00 | |
| 7 | 2.050 | 0.34 | 0.70 | 15 | 2.29 | 1.62 | CB7 | 0.70 | 0.92 | 15.00 | 2.29 | 1.92 | | | | | | | | | | | | | 111.53 | 112.80 | 109.02 | 107.50 | 1.27 |
| | | | | | | | MH3 | 37.50 | | 15.92 | 2.24 | 100.58 | P11 | 60 | 18 | HDPE | 0.010 | 1.77 | 1.09 | 65.11 | 0.00020 | 0.012 | 0.020 | 0.032 | 111.49 | 110.50 | 104.00 | 104.00 | |
| 8A | 3.330 | 0.8 | 2.66 | 10 | 2.74 | 8.74 | CB8A | 2.66 | 0.08 | 10.00 | 2.74 | 8.74 | | | | | | | | | | | | | 107.36 | 108.00 | 107.92 | 106.00 | 0.08 |
| | | | | | | | MH3 | 40.16 | | 10.08 | 2.73 | 131.36 | P19 | 25 | 18 | HDPE | 0.010 | 1.77 | 4.95 | 296.79 | 0.00409 | 0.102 | 0.418 | 0.520 | 106.84 | 106.28 | 104.59 | 96.26 | |
| 9 | 27.940 | 0.37 | 10.34 | 15 | 2.29 | 28.46 | CB9 | 10.34 | 0.46 | 15.00 | 2.29 | 28.46 | | | | | | | | | | | | | 113.35 | 111.50 | 110.37 | 107.30 | |
| 8 | 1.350 | 0.35 | 0.47 | 15 | 2.29 | 1.30 | CB8 | 10.81 | 0.20 | 15.46 | 2.26 | 29.37 | P13 | 160 | 30 | HDPE | 0.010 | 4.91 | 5.79 | 347.66 | 0.00284 | 0.455 | 0.574 | 1.029 | 112.32 | 111.50 | 109.61 | 106.50 | |
| | | | | | | | MH3 | 50.97 | 0.44 | 15.02 | 2.29 | 140.22 | P12 | 72 | 30 | HDPE | 0.010 | 4.91 | 5.98 | 358.83 | 0.00303 | 0.218 | 0.611 | 0.829 | 111.49 | 110.50 | 110.33 | 104.00 | |
| | | | | | | | MH2 | 50.97 | | 15.47 | 2.26 | 138.46 | P8 | 310 | 48 | 3X4 BOX | 0.011 | 12.00 | 11.68 | 701.08 | 0.00748 | 2.319 | 2.332 | 4.651 | 106.84 | 106.28 | 104.59 | 96.26 | |
| 4A | 1.080 | 0.8 | 0.86 | 15 | 2.29 | 2.38 | CB4a | 0.86 | 0.52 | 15.00 | 2.29 | 2.38 | | | | | | | | | | | | | 109.10 | 108.00 | 106.11 | 104.58 | |
| 4 | 14.110 | 0.45 | 6.35 | 15 | 2.29 | 17.48 | CB4 | 7.21 | 0.01 | 15.52 | 2.26 | 19.56 | P4A | 42 | 18 | HDPE | 0.010 | 1.77 | 1.35 | 80.72 | 0.00030 | 0.013 | 0.031 | 0.044 | 109.06 | 106.78 | 106.17 | 102.58 | |
| | | | | | | | MH2 | 58.19 | | 15.53 | 2.26 | 157.77 | P4 | 6 | 18 | HDPE | 0.010 | 1.77 | 11.07 | 663.99 | 0.02048 | 0.123 | 2.092 | 2.215 | 106.84 | 106.58 | 104.59 | 96.26 | |
| 3b | 1.960 | 0.72 | 1.41 | 15 | 2.29 | 3.88 | CB3b | 1.41 | 0.66 | 15.00 | 2.29 | 3.88 | | | | | | | | | | | | | 107.30 | 116.50 | 112.08 | 110.50 | 4.42 |
| 3a | 0.070 | 0.9 | 0.06 | 10 | 2.74 | 0.21 | CB3a | 1.47 | 0.79 | 15.66 | 2.25 | 3.98 | P3b | 87 | 18 | HDPE | 0.010 | 1.77 | 2.20 | 131.84 | 0.00081 | 0.070 | 0.082 | 0.153 | 107.14 | 111.20 | 106.41 | 104.82 | 4.06 |
| 3 | 0.050 | 0.9 | 0.05 | 10 | 2.74 | 0.15 | CB3 | 1.52 | 0.29 | 16.45 | 2.20 | 4.02 | P3a | 107 | 18 | HDPE | 0.010 | 1.77 | 2.25 | 135.17 | 0.00085 | 0.091 | 0.087 | 0.178 | 106.97 | 105.88 | 102.68 | 101.09 | |
| | | | | | | | MH2 | 59.71 | | 15.53 | 2.26 | 161.89 | P3 | 40 | 18 | HDPE | 0.010 | 1.77 | 2.27 | 136.35 | 0.00086 | 0.035 | 0.088 | 0.123 | 106.84 | 106.28 | 104.59 | 96.26 | |
| 5 | 0.490 | 0.7 | 0.34 | 15 | 2.29 | 0.94 | CB5 | 60.05 | 0.10 | 15.53 | 2.26 | 162.82 | P5 | 66 | 42 | RCP | 0.011 | 9.63 | 16.82 | 1009.20 | 0.01852 | 1.222 | 4.832 | 6.055 | 100.05 | 103.20 | 100.79 | 92.40 | 2.41 |
| | | | | | | | MH1 | 60.05 | | 15.63 | 2.25 | 162.38 | P6 | 98 | 42 | RCP | 0.011 | 9.63 | 16.92 | 1015.00 | 0.01873 | 1.836 | 4.888 | 6.724 | 93.33 | 102.36 | 86.86 | 86.86 | 9.03 |
| 1 | 3.680 | 0.6 | 2.21 | 15 | 2.29 | 6.08 | CB1 | 2.21 | 2.88 | 15.00 | 2.29 | 6.08 | | | | | | | | | | | | | 100.91 | 103.50 | 103.32 | 99.81 | 0.18 |
| | | | | | | | MH1A | 2.21 | | 17.88 | 2.13 | 5.63 | P1A | 109 | 42 | RCP | 0.011 | 9.63 | 0.63 | 37.89 | 0.00003 | 0.003 | 0.007 | 0.010 | 98.49 | 104.40 | 100.90 | 99.18 | 3.50 |
| 2 | 3.090 | 0.6 | 1.85 | 15 | 2.29 | 5.10 | CB2 | 4.06 | 0.05 | 17.88 | 2.13 | 10.36 | P1 | 29 | 18 | CMP | 0.024 | 1.77 | 3.19 | 191.14 | 0.00976 | 0.284 | 0.221 | 0.504 | 96.67 | 101.93 | 97.99 | 95.90 | 3.94 |
| | | | | | | | MH1 | 64.11 | | 15.63 | 2.25 | 173.37 | P2 | 19 | 18 | RCP | 0.013 | 1.77 | 5.86 | 351.64 | 0.00971 | 0.184 | 0.587 | 0.771 | 93.33 | 102.36 | 95.90 | 86.86 | 6.46 |
| | | | | | | | OUT | 64.11 | | 15.63 | 2.25 | 173.37 | P7 | 70 | 42 | RCP | 0.011 | 9.63 | 18.01 | 1080.74 | 0.02124 | 1.487 | 5.542 | 7.029 | 86.30 | | | | |

Legend:

***Red text indicates Mainline, blue text indicates tributary lines***

Indicates Structure from Tributary Branch

Indicates flooded structure on main line

## Curb, Gutter Pavement Hydraulic Capacity

**Trout Gulch Road Cathedral Drive- 50 Year Overflow**

***Overflow at Catch Basin #3***

By: David Ramsey
Date: April 27, 2011
Revised: June 7, 2011

**Run-off** The total overflow runoff has been calculated by taking the difference between the total flowrate flowing through CB#3, and a 50-year flowrate that would keep all runoff within the storm drain system.

$Q_{50}$ into CB#3 from Figure SWM-6 = 4.02 cfs

CB#3 Available Capacity = 2.25 cfs

**Total Overflow Run-off: $Q_{50}$ = 1.77 cfs**

**Hydraulic Capacity**

| W (ft) | $S_X$ | $S_W$ | S | n | d (ft) |
|---|---|---|---|---|---|
| 2 | 0.060 | 0.083 | 0.013 | 0.015 | 0.17 |

| T (ft) | FL Depth (ft) | Q (cfs) | A (sq ft) | V (fps) | $Q_S$ (cfs) | $Q_W$ (cfs) | $T_S$ (ft) | W/T | Eo | Dry Travel Lane (ft) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1.00 | 0.08 | 0.07 | 0.04 | 1.62 | n/a | n/a | n/a | n/a | n/a | 39.00 | |
| 2.00 | 0.17 | 0.43 | 0.17 | 2.59 | n/a | n/a | n/a | n/a | n/a | 38.00 | |
| 2.50 | 0.20 | 0.67 | 0.23 | 2.93 | 0.01 | 0.66 | 0.50 | 0.80 | 0.99 | 37.50 | |
| 3.00 | 0.23 | 0.99 | 0.31 | 3.19 | 0.04 | 0.95 | 1.00 | 0.67 | 0.96 | 37.00 | |
| 3.50 | 0.26 | 1.40 | 0.41 | 3.44 | 0.12 | 1.28 | 1.50 | 0.57 | 0.92 | 36.50 | |
| 3.60 | 0.26 | 1.49 | 0.43 | 3.48 | 0.14 | 1.35 | 1.60 | 0.56 | 0.91 | 36.40 | |
| 3.70 | 0.27 | 1.59 | 0.45 | 3.53 | 0.16 | 1.43 | 1.70 | 0.54 | 0.90 | 36.30 | |
| 3.80 | 0.27 | 1.69 | 0.47 | 3.58 | 0.19 | 1.50 | 1.80 | 0.53 | 0.89 | 36.20 | |
| 3.88 | 0.28 | **1.77** | 0.49 | 3.62 | 0.21 | 1.56 | 1.88 | 0.52 | 0.88 | 36.12 | $Q_{50}$ |
| 4.00 | 0.29 | 1.90 | 0.52 | 3.67 | 0.25 | 1.65 | 2.00 | 0.50 | 0.87 | 36.00 | |
| 4.50 | 0.32 | 2.52 | 0.64 | 3.91 | 0.45 | 2.07 | 2.50 | 0.44 | 0.82 | 35.50 | |
| 5.00 | 0.35 | 3.25 | 0.79 | 4.14 | 0.74 | 2.52 | 3.00 | 0.40 | 0.77 | 35.00 | |
| 6.00 | 0.41 | 5.11 | 1.11 | 4.59 | 1.59 | 3.53 | 4.00 | 0.33 | 0.69 | 34.00 | |
| 7.00 | 0.47 | 7.55 | 1.50 | 5.03 | 2.88 | 4.67 | 5.00 | 0.29 | 0.62 | 33.00 | |
| 8.00 | 0.53 | 10.63 | 1.95 | 5.45 | 4.69 | 5.94 | 6.00 | 0.25 | 0.56 | 32.00 | |
| 9.00 | 0.59 | 14.41 | 2.46 | 5.86 | 7.08 | 7.33 | 7.00 | 0.22 | 0.51 | 26.00 | |

*Results:* for a 50-year storm event CB#3 will overtop per CDC figure SWM-6. The excess flows would pool immediately around the catch basin then travel along the northern gutter pan to CB#1A. Minimal flows will also be directed across Trout Gulch Road to CB#5. The Overall dry travel lane within Cathedral Drive would be approximately 36' . Although Runoff will migrate across Trout Gulch Road the cross slope is significant enough to adequately convey the overflow runoff.

**Notes:**

T= Flow Spread
W = Width of gutter pan
S = Longitudinal slope of Trout Gulch Road
$S_W$ = Cross slope of gutter pan
$S_X$ = Cross slope of Trout Gulch Road
d = Depth of gutter pan

## Curb, Gutter Pavement Hydraulic Capacity

**Trout Gulch Road Cathedral Drive - 50 Year Overflow**

***Overflow at Catch Basin #4***

By: David Ramsey
Date: April 27, 2011
Revised: June 7, 2011

**Run-off** The total overflow runoff has been calculated by taking the difference between the total flowrate flowing through CB#4, and a 50-year flowrate that would keep all runoff within the storm drain system.

$Q_{50}$ into CB#4 from Figure SWM-6 = 19.56 cfs
CB#4 Available Capacity = 7 cfs

**Total Overflow Run-off: $Q_{50}$ = 12.56 cfs**

**Hydraulic Capacity**

| W (ft) | $S_X$ | $S_W$ | S | n | d (ft) |
|---|---|---|---|---|---|
| 2 | 0.060 | 0.083 | 0.013 | 0.015 | 0.17 |

| T (ft) | FL Depth (ft) | Q (cfs) | A (sq ft) | V (fps) | $Q_S$ (cfs) | $Q_W$ (cfs) | $T_S$ (ft) | W/T | Eo | Dry Travel Lane (ft) | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 2.00 | 0.17 | 0.43 | 0.17 | 2.59 | n/a | n/a | n/a | n/a | n/a | 38.00 | |
| 4.00 | 0.33 | 2.73 | 0.66 | 4.11 | n/a | n/a | n/a | n/a | n/a | 36.00 | |
| 6.00 | 0.41 | 5.11 | 1.11 | 4.59 | 1.59 | 3.53 | 4.00 | 0.33 | 0.69 | 34.00 | |
| 7.00 | 0.47 | 7.55 | 1.50 | 5.03 | 2.88 | 4.67 | 5.00 | 0.29 | 0.62 | 33.00 | |
| 7.25 | 0.48 | 8.26 | 1.61 | 5.14 | 3.28 | 4.98 | 5.25 | 0.28 | 0.60 | 32.75 | |
| 7.35 | 0.49 | 8.56 | 1.65 | 5.18 | 3.46 | 5.11 | 5.35 | 0.27 | 0.60 | 32.65 | |
| 7.50 | 0.50 | 9.01 | 1.72 | 5.24 | 3.72 | 5.29 | 5.50 | 0.27 | 0.59 | 32.50 | |
| 8.00 | 0.53 | 10.63 | 1.95 | 5.45 | 4.69 | 5.94 | 6.00 | 0.25 | 0.56 | 32.00 | |
| 8.50 | 0.56 | 12.43 | 2.20 | 5.66 | 5.81 | 6.62 | 6.50 | 0.24 | 0.53 | 31.50 | |
| 8.54 | 0.56 | **12.56** | 2.21 | 5.67 | 5.89 | 6.67 | 6.54 | 0.23 | 0.53 | 31.47 | $Q_{50}$ |
| 9.00 | 0.59 | 14.41 | 2.46 | 5.86 | 7.08 | 7.33 | 7.00 | 0.22 | 0.51 | 31.00 | |
| 10.00 | 0.65 | 18.96 | 3.03 | 6.26 | 10.11 | 8.84 | 8.00 | 0.20 | 0.47 | 30.00 | |
| 11.00 | 0.71 | 24.31 | 3.65 | 6.65 | 13.85 | 10.47 | 9.00 | 0.18 | 0.43 | 29.00 | |
| 12.16 | 0.78 | 31.60 | 4.45 | 7.09 | 19.12 | 12.48 | 10.16 | 0.16 | 0.39 | 27.84 | |
| 12.25 | 0.78 | 32.24 | 4.52 | 7.13 | 19.60 | 12.65 | 10.25 | 0.16 | 0.39 | 27.75 | |
| 12.50 | 0.80 | 34.00 | 4.71 | 7.22 | 20.90 | 13.10 | 10.50 | 0.16 | 0.39 | 22.50 | |

*Results:* for a 50-year storm event CB#4 will overtop per CDC figure SWM-6. The excess flows would pool at the intersection of Trout Gulch Road and Cathedral Drive until the spread reached 7.5 feet providing a dry travel lane of 27.65' along Cathedral and 32.65' along Trout Gulch. Once the spread reached 7.5 feet, the excess runoff would begin overtopping the high point in Trout Gulch Road and flow towards the southern curb line to CB#5 and CB#2. Therefore, flows over 9 cfs will have a smaller spread yielding a larger dry travel lane.

**Notes:**

T= Flow Spread
W = Width of gutter pan
S = Longitudinal slope of Trout Gulch Road
$S_W$ = Cross slope of gutter pan
$S_X$ = Cross slope of Trout Gulch Road
d = Depth of gutter pan

# Attachment 13

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Project No. SC9427
28 September 2007

RECEIVED
2010 AUG 20 AM 9:29
BARRY SWENSON BUILDER

BARRY SWENSON BUILDER
5300 Soquel Avenue, Suite 103
Santa Cruz, California 95062

Attention: Jesse Nickell

Subject: Updated Geotechnical Investigation Report

Reference: Aptos Village Phase I
Santa Cruz County, California

Dear Mr. Nickell:

The purpose of this letter report is to update the existing Geotechnical Investigation for the subject property by Steven Raas and Associates, dated 20 June 1989, and to include design criteria not required at the time of the original report.

**Site Location**

The project is located in Aptos Village approximately one quarter mile north of State Highway 1, on the north side of Soquel Drive. The site is bordered by Soquel Drive to the south, Trout Gulch Road to the east, Aptos Creek Road to the west and Granite Way to the north. It is roughly 13.5 acres in size with existing commercial buildings, storage buildings, and abandoned concrete foundations from demolished structures. The existing structures are arrayed around the perimeter of the site. Most of the undeveloped portion of the site is currently covered in grasses or is bare ground used for parking. The site slopes gently towards the south, east, and west, becoming essentially flat at the boundaries in these directions.

**Project Description**

We have been provided with preliminary project plans by Thatcher and Thompson Architects, dated 22 August 2007. It is our understanding, based upon our review of these documents, the development will consist of approximately 25 new buildings on the referenced site. Proposed uses include mixed use (presumably residential and commercial), commercial, and hotel commercial. New buildings will be one to three stories high, and presumably of wood frame or masonry construction with some slabs-on-grade. In addition, an existing barn/packing shed used by antique dealers is to be adapted and re-used in a new location on the site. Infrastructure improvements include underground utilities, storm drain system, and streets and parking areas. A portion of the northwest corner of the site is set aside for future recreational use.

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**Previous Investigations**

A geotechnical investigation for earlier proposed development at the site was conducted by Steven Raas and Associates in June 1989. The specific geotechnical concerns raised in the Raas report include presence of loose and/or soft soil in foundation zones, control of surface runoff (both during and after construction), construction of engineered fill slopes, and seismic factors such as liquefaction and lateral spreading potential, ground shaking, surface ground rupture, and seismically induced slope instability. Liquefaction, lateral spreading, and ground rupture potential was considered low at this site. Slope stability analysis was outside the scope of the Raas report, as it is also beyond the scope of this update. **Given that our observations at the site indicate that soil conditions at the site have changed little since the Raas report, we conclude that the recommendations of the Raas report remain valid.** We include in this update letter additional recommendations not required at the time of the Raas report. Included are general site drainage and utility trench construction recommendations, as well as seismic coefficients as specified in the 1997 Uniform Building Code. Percolation tests were performed to determine the drainage properties of the in-situ soils. R-value tests were performed to provide parameters for the design of pavement structural sections.

It is our understanding that a feasibility level geotechnical investigation is requested at this time for the project. A specific design level geotechnical investigation may be required by the Santa Cruz County Planning Department for each individual building site prior to development.

**Field Exploration**

Subsurface conditions were investigated by our firm on 29 August 2007. Exploration consisted of nine (9) borings drilled to depths of 11.5 to 16.5 feet. The approximate location of the test borings are indicated on the Boring Location Site Plan (Figure 2). The borings were advanced with 6-inch diameter continuous flight-auger equipment mounted on a truck.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0 inch O.D. Modified California Sampler (L) or the Standard Terzaghi Sampler (T).

The penetration resistance blow counts noted on the boring logs were obtained as the sampler was dynamically driven into the in situ soil. The process was performed by dropping a 140-pound hammer a 30-inch free fall distance and driving the sampler 6 to 18 inches and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs represent the accumulated number of blows that were required to drive the last 12 inches.

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The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2486). The Logs of Test Borings are included in Appendix A of this report. The Boring Logs denote subsurface conditions at the locations and time observed, and it is not warranted that they are representative of subsurface conditions at other locations or times.

Five of the borings were configured for percolation testing. Percolation tests were performed on 4 September 2007. Tests were four hours in duration. The water level in the standpipe was measured at approximately 30 minute intervals.

**Laboratory Testing**

The laboratory testing program was directed toward determining pertinent engineering and index soil properties.

The natural moisture contents and dry densities were determined on selected samples and are recorded on the boring logs at the appropriate depths. Since water has a significant influence on soil, the natural moisture content provides a rough indicator of the soil's compressibility, strength, and potential expansion characteristics.

The strength parameters of the underlying earth materials were determined from field test values derived from field penetration resistance of the in situ soils, and from laboratory direct shear testing. Atterberg limits testing was performed to aid in soil classification and as an indicator of expansion potential of the native soils. Gradation analysis was performed on soils in the foundation zone to determine grain size distribution and specifically the proportion of fines in the soils.

R-value testing was performed to develop criteria for pavement design and construction.

The results of the field and laboratory testing appear on the "Logs of Test Boring" opposite the sample tested. Results of percolation and R-value testing appear elsewhere in this report and in Appendix B.

**Groundwater**

Groundwater was not encountered in our borings during drilling, nor was it encountered in borings drilled by Steven Raas and Associates. Ground water depths will probably vary seasonally, and can be expected to fluctuate due to variations in rainfall or other factors not evident during our investigation.

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**Geologic Environment**

The site is located north of the confluence of Aptos and Trout Gulch Creeks. In-situ soils at the site consist of alluvial fan facies (Qof) underlain by Purisima sandstone bedrock. The alluvial material is composed of semi-consolidated, moderately to poorly sorted discontinuous layers of silty clay, silt, sand and gravel. Strata were deposited by streams, sheet flow or debris flow. These deposits are up to 50 feet thick. (Brabb, 1997) Bedrock was encountered in our boring at the southeast corner of the site at a depth of approximately 16 feet. In Raas and Associates' boring at the northeast corner of the site, a material which was visually similar and in which similar SPT blow counts were recorded was encountered at a depth of approximately 24 feet.

**Subsurface Conditions**

In general, the native earth materials underlying this site to the depths explored consist of silty sands, clayey sands, and sandy silts with embedded siltstone and sandstone gravels. Sampling and testing data suggest moderate amounts of non plastic silts. The sandy soils are loose near the ground surface but become medium dense to dense with depth. The area is underlain by very dense Purisima sandstone bedrock.

In general, it is our opinion that the native materials underlying this site possess adequate engineering characteristics for support of the proposed improvements, provided our recommendations and those of the Raas report are incorporated into the design and construction of the project. We provide the following design criteria and recommendations for this project.

**Foundations**

At the time of this update, we have not had the opportunity to review final grading and foundation details. Therefore, our recommendations are general in nature. Supplemental recommendations may be required upon completion of final plans.

Foundations for the project may be conventional spread footings embedded in engineered fills consisting of the on-site native soils. Following demolition of existing structures designated for removal and stripping of organic-laden topsoil, exposed soil in the area of proposed buildings should be removed to a minimum depth of 24 inches below existing grade or as designated by the geotechnical engineer. The base of the excavation should be scarified to a depth of 6 inches, moisture conditioned, and compacted to at least 90 percent relative compaction. Native soil (or imported fill approved by the geotechnical engineer) may then be placed in thin lifts not exceeding 8 inches in loose thickness and compacted to 90 percent minimum relative compaction. There should be a minimum of 12 inches of engineered fill under all foundation elements.

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In roadway and parking areas, the depth of subexcavation should be a minimum of I2 inches. The base of the excavation should be scarified a depth of 6 inches, moisture conditioned, and compacted to 90 percent relative compaction. Engineered fill should be compacted to at least 90 percent relative compaction with the upper 8 inches compacted to at least 95 percent relative compaction.

The area of redensification should extend 5 feet beyond the perimeter of all buildings and paved areas.

Footings should be embedded a minimum of 18 inches below the nearest adjacent grade for 2 story structures and 24 inches for 3 story structures. Depth of redensification may exceed 24 inches to achieve both minimum embedment and the required minimum thickness of engineered fill of 12 inches below the bottom of footings.

Footing excavations must be observed by the geotechnical engineer prior to placement of reinforcing steel and concrete.

**Cut and Fill Slopes**

Temporary excavations should be properly shored and braced during construction to prevent sloughing and caving at sidewalls. The contractor should be aware of all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

There should be a minimum of 10 feet horizontal separation between the bottom of all footing elements and the top of a fill slope or the base of a cut slope. In addition, the bottom of all footing elements should be at least 10 feet horizontally from the nearest adjacent slope. These are minimum distances. Additional setback requirements contained in Section 1806 of the 2001 California Building Code may also be applicable.

Site grading for the current project is anticipated to consist of demolition of existing structures, primarily abandoned foundations, stripping of existing groundcover and trees, and removal of accumulated debris. If additional cuts or fills are required, they should be completed in accordance with the requirements of the Raas report and this update. Design criteria for retaining walls included in the Raas report are applicable to the current project. Additional retaining wall recommendations are noted below.

Voids created by the removal of trees or existing structures should be filled in accordance with paragraph 8 of the Raas report. Several large trees were removed from the site in the Spring of 2007 and the resulting holes filled with

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engineered fill. Our firm has records of the compaction testing of these in-filled holes.

After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed without the direct observation and approval of the geotechnical engineer.

**Surface Drainage**

Gutters should be connected to downspouts that connect with closed rigid conduits to carry runoff away from the structure. The conduits should discharge at locations that minimize erosion and saturation of slopes. Existing conduits that are discovered in the course of construction should be removed or directed away from the proposed and existing buildings. Drainage pipe should not conduct runoff beneath proposed construction. Runoff should not be allowed to flow over adjacent slopes.

Stormwater runoff may be be required to be stored on site prior to discharge into the County storm drain system, or to be allowed to percolate into the in-situ native soils. Criteria for design of retention or detention facilities have been developed based on percolation tests at the site and are included in the Percolation section of this report. It is the responsibility of the project Civil Engineer to design these facilities as part of the overall drainage plan for the project.

Irrigation activities at the site should be done in a controlled and reasonable manner. Planter areas should not be sited adjacent to walls; otherwise, measures should be implemented to contain irrigation water and prevent it from seeping into walls and under foundations.

The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent damage to these structures. Landscaping should be planned accordingly.

Drainage patterns approved at the time of fine grading should be maintained throughout the life of the proposed structure.

**Percolation**

Percolation tests were conducted in Borings B-1, B-2, B-3, B-4, and B-5, which were located in areas planned for parking and streets. After boring and sampling, a 4 inch slotted pipe was inserted in each hole, and the annular space between the pipe and the walls of the boring was filled with round gravel. All borings were

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pre-saturated and capped for a minimum of 24 hours prior to percolation testing. Tests were four hours in duration using the falling head method. Water level readings were taken at approximately 30 minute intervals. The last two readings were used to determine the percolation rate. Data from these tests is presented in Appendix B.

The highest percolation rates were found in Boring B-2 (at the southeast corner of the site in front of the Bayview Hotel), and in Boring B-4 (on the west side of the site behind 8035 Soquel Drive, Unit 23, currently a dance studio). The lowest rates were in Boring B-3 (at the southwest corner of the site in front of 8035 Soquel Drive, Unit 33, currently a liquor store) and in Boring B-5 ( at the northeast corner of the site behind 417 Trout Gulch Road, Village Fair). It should be noted that percolation rates vary with depth and are dependent on the permeability of the strata encountered in the borings. Seasonal variations in the degree of soil saturation will also affect percolation rates.

**Utility Trenches**

Trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

We strongly recommend placing a 3 foot concrete plug in each trench where it passes under the exterior foundations. Care should be taken not to damage utility lines.

Trenches should be capped with 1.5± feet of relatively impermeable soil.

**Seismic Shaking**

The primary seismic hazard associated with the proposed development appears to be the potential for strong ground shaking. Experience following the 17 October 1989 Loma Prieta earthquake indicates that the quality of construction is a primary factor affecting the amounts of earthquake damage sustained by wood framed structures. Most of the structural damage from the Loma Prieta earthquake was sustained in buildings where the foundations were not adequately embedded into firm materials, where the wood-frame was not well braced for lateral shear and/or where the wood-frame was not securely tied to the building foundations.

Conversely, where wood-frame structures were supported on foundations embedded into firm material, well braced for lateral shear and securely tied to the foundation, structural damage was generally minor, even in areas quite close to

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the epicenter where structures sustained very strong to severe ground shaking. Based on these considerations, the risk of substantial structural damage from earthquakes appears relatively low for well-built structures which incorporate lateral shear bracing and modern building code requirements into their design and construction.

It is highly probable that a major earthquake will occur in northern California during the next 50 years. During a major earthquake epicentered nearby, there is a potential for severe ground shaking at this site. Structures designed in accordance with the most current UBC should react well to seismic shaking.

**UBC Design Criteria**

Based on standard penetration test (SPT) data obtained from the Raas report and our observations during exploratory boring of the native subsurface soil conditions, we have classified the site soil profile as Soil Type $S_D$ as defined in Table 16-J of the 1997 UBC. The following table indicates the 1997 UBC Seismic Coefficients appropriate for this site. These are minimum values; the project designer or structural designer may utilize more conservative values at his or her discretion.

| FAULT NAME | DISTANCE TO SITE | Mmax (Mw) | SLIP RATE (mm/yr) | UBC FAULT TYPE | Na | Nv | Ca | Cv |
|---|---|---|---|---|---|---|---|---|
| San Andreas | 10.1 km<br>6.3 miles | 7.9 | 24 | A | 1.0 | 1.2 | 0.44 | 0.77 |
| Monterey Bay-Tularcitos | 19.4 km<br>12.0 miles | 7.3 | 0.5 | B | 1.0 | 1.00 | 0.44 | 0.64 |
| Zayante-Vergeles | 5.5 km<br>3.4 miles | 7.0 | 0.1 | B | 1.0 | 1.18 | 0.44 | 0.76 |

**Retaining Walls**

Retaining walls free to move at the top should be designed to resist both lateral earth pressures and any additional surcharge loads. For design of retaining walls up to 8 feet high and fully drained, the following design criteria may be used. Active earth pressure for walls allowed to yield is that exerted by an equivalent fluid weighing 35 pcf for a level backslope gradient, and 55 pcf for a 2:1 (horizontal to vertical) backslope gradient. **This assumes a fully drained condition.**

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Use a coefficient of friction between base of foundation and native soil of 0.30. Alternatively, where retaining wall footings are poured neat against dense native soil, a passive resistance of 275 pcf (EFW) may be used. Neglect the top 3 feet and any remaining fill, topsoil, and/or other loose materials when computing passive resistance.

For soldier beam walls, the following design criteria may be used. Minimum pier diameter should be 18 inches. Piers should be embedded a minimum of 8 feet into native silty sands. Passive earth pressure is exerted over 2 pier diameters. The upper 3 feet of native soil and any loose fill should be disregarded when computing passive pressure.

**R-Value Testing**

R-value testing was performed to provide criteria for design of structural pavement sections for streets and parking areas. Bulk samples for R-value testing were taken at two locations (Boring B-1 and Boring B-4) at depths of 1 to 5 feet below existing grade.
Results of R-value tests are included in Appendix B.

**Structural Pavement Design**

Based on the results of R-value testing, we offer three choices for the structural pavement section, depending upon the expected traffic volume as expressed by the traffic index (TI). Section options assume flexible, or asphalt concrete, pavement.

| Traffic Index (TI) | Class II Aggregate Base (AB) (inches) | Asphalt Concrete (AC) (inches) |
|---|---|---|
| 8.0 | 10 | 3 |
| 6.0 | 8 | 2.5 |
| 4.0 | 6 | 2 |

Asphaltic concrete, aggregate base (with subbase, if desired) and preparation of the subgrade should conform to and be placed in accordance with the Caltrans Standard Specifications, latest edition, except that the test method for compaction should be determined by ASTM D1557.

To have the selected sections perform to their greatest efficiency, it is important that the following items be considered:

A. Moisture condition the upper 12 inches of the subgrade and compact to a minimum relative compaction of at least 95 percent, at about 2 percent over optimum moisture content.

B. Provide sufficient gradient to prevent ponding of water.

C. Use only quality materials of the type and thickness (minimum) specified. Base rock should meet Caltrans Standard Specifications for Class II Aggregate Base, and be angular in shape.

D. Compact the base rock to a relative dry density of 95 percent.

E. Place the asphaltic concrete during periods of fair weather when the free air temperature is within prescribed limits per Caltrans specifications.

F. Provide a routine maintenance program.

Based on our review of the project plans provided to us, it is our opinion that the geotechnical aspects of the referenced building plans are in general conformance with our recommendations. If you have any questions concerning this letter, please contact our office.

If you have any questions concerning this update letter, please contact our office.

Very truly yours,

**HARO, KASUNICH, AND ASSOCIATES, INC.**

Mike Hopper
Staff Engineer

John E. Kasunich
G.E. 455

MH/sq
Attachments
Copies: 4 to addressee
1 to Ifland Engineers
1 to Thatcher and Thompson, Architects

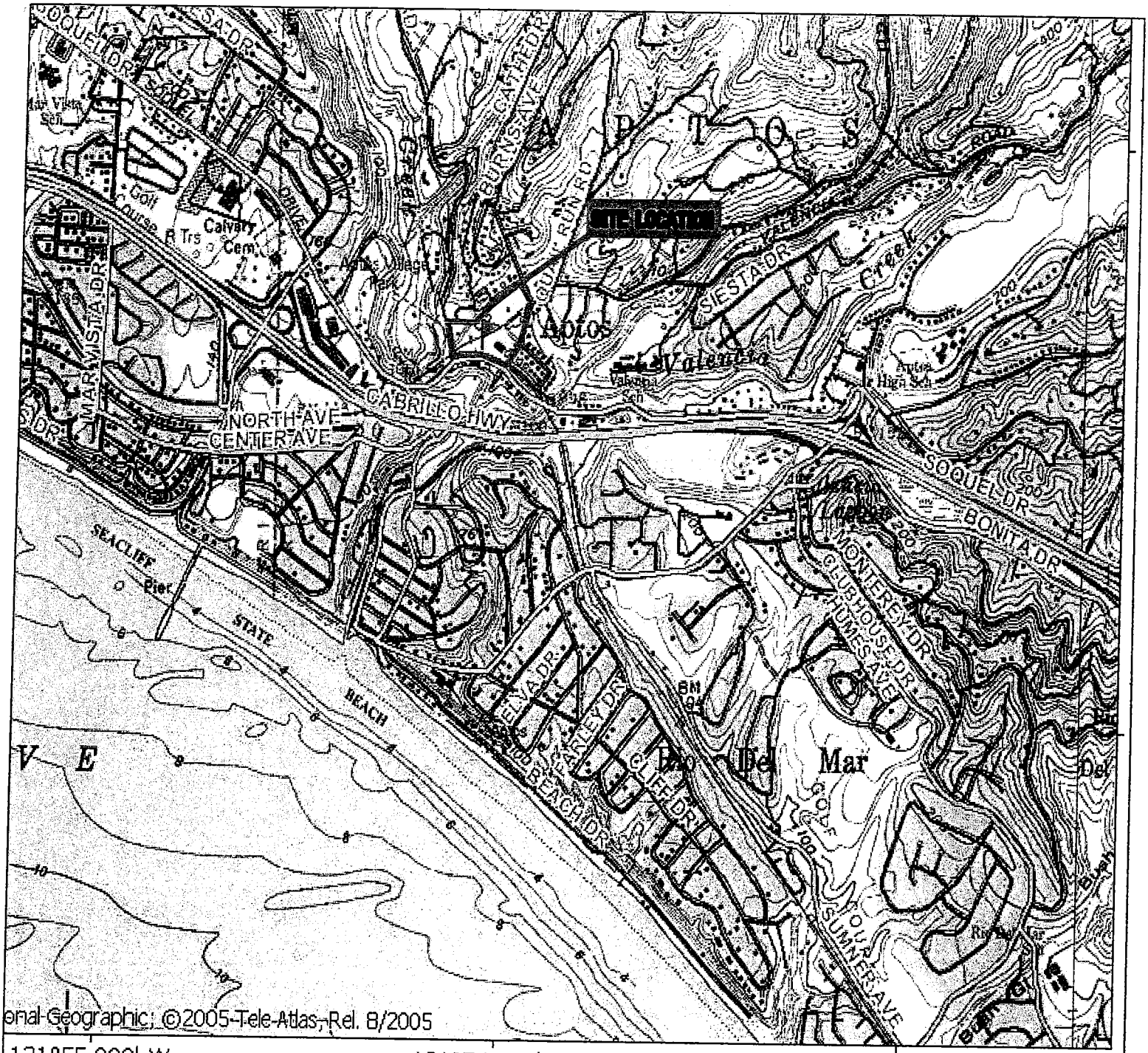
## APPENDIX A

**Site Vicinity Map**

**Boring Location Site Plan**

**Key to Logs**

**Logs of Test Borings**




121°55.000' W 121°54.000' W WGS84 121°53.000' W

0 .5 1 MILES

1000 0 1000 2000 3000 4000 5000 FEET

1 .5 0 KILOMETERS 1

1000 0 METERS 1000

TN MN

14½°

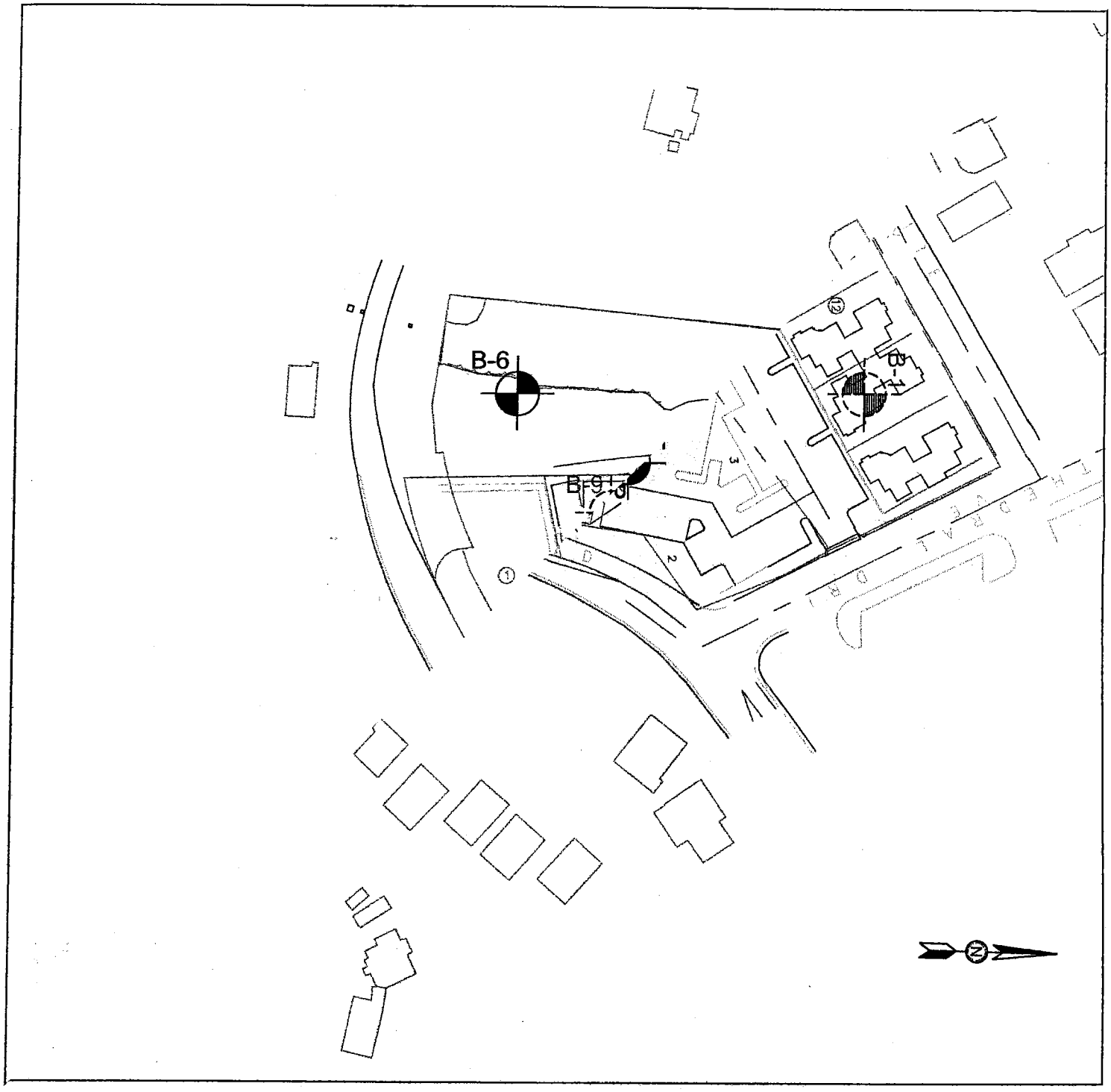
09/21/07

# SITE VICINITY MAP
# APTOS VILLAGE

| | |
|---|---|
| SCALE: AS NOTED | APTOS |
| DRAWN BY: MH | SANTA CRUZ COUNTY, CALIFORNIA |
| DATE: 21 SEPTEMBER 2007 | HARO, KASUNICH & ASSOCIATES, INC. |
| REVISED: | GEOTECHNICAL AND COASTAL ENGINEERS |
| JOB NO. SC9427 | 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-4175 |

FIGURE NO. 1

SHEET NO.

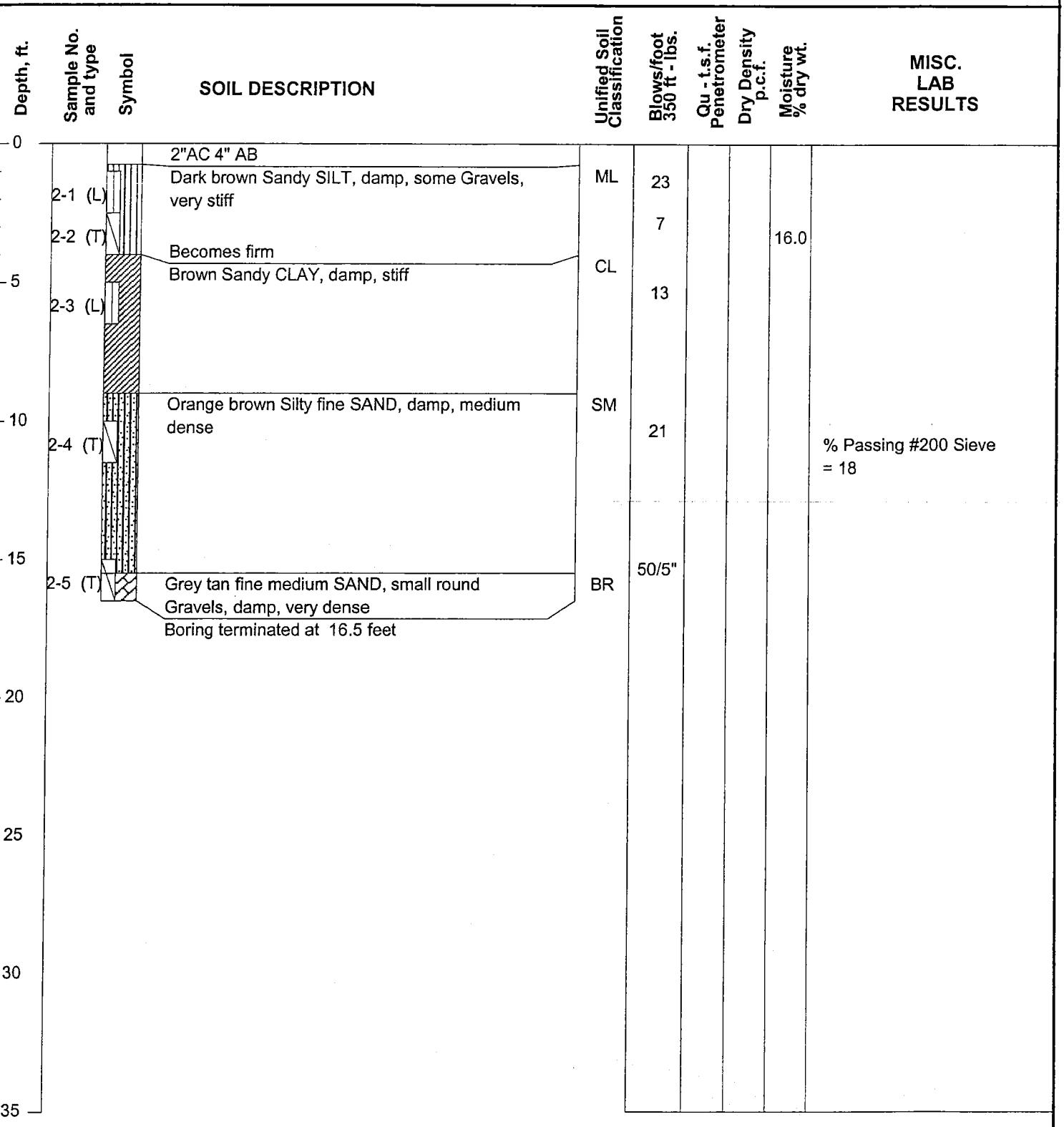

B-6
B-9
1
2
3

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-2




*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO.

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SC9427.log Date: 9/24/2007

| PRIMARY DIVISIONS | | | GROUP SYMBOL | SECONDARY DIVISIONS |
|---|---|---|---|---|
| COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE | CLEAN GRAVELS (LESS THAN 5% FINES) | GW | Well graded gravels, gravel-sand mixtures, little or no fines. |
| | | | GP | Poorly graded gravels or gravel-sand mixtures, little or no fines. |
| | | GRAVEL WITH FINES | GM | Silty gravels, gravel-sand-silt mixtures, non-plastic fines |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures, plastic fines. |
| | SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE | CLEAN SANDS (LESS THAN 5% FINES) | SW | Well graded sands, gravelly sands, little or no fines. |
| | | | SP | Poorly graded sands or gravelly sands, little or no fines. |
| | | SANDS WITH FINES | SM | Silty sands, sand-silt mixtures, non-plastic fines. |
| | | | SC | Clayey sands, sand-clay mixtures, plastic fines. |
| FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50% | | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |
| | | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. |
| | | | OL | Organic silts and organic silty clays of low plasticity. |
| | SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50% | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | | CH | Inorganic clays of high plasticity, fat clays. |
| | | | OH | Organic clays of medium to high plasticity, organic silts. |
| HIGHLY ORGANIC SOILS | | | PT | Peat and other highly organic soils. |

## GRAIN SIZES

| U.S STANDARD SERIES SIEVE | | | | CLEAR SQUARE SIEVE OPENINGS | | | |
|---|---|---|---|---|---|---|---|
| 200 | 40 | 10 | 4 | 3/4" | 3" | 12" | |
| SILTS AND CLAYS | SAND | | | GRAVEL | | COBBLES | BOULDERS |
| | FINE | MEDIUM | COARSE | FINE | COARSE | | |

## RELATIVE DENSITY

| SANDS AND GRAVELS | BLOWS/FT* |
|---|---|
| VERY LOOSE | 0 - 4 |
| LOOSE | 4-10 |
| MEDIUM DENSE | 10 - 30 |
| DENSE | 30 - 50 |
| VERY DENSE | OVER 50 |

## CONSISTENCY

| SILTS AND CLAYS | STRENGTH** | BLOWS/FT* |
|---|---|---|
| VERY SOFT | 0 - 1/4 | 0 - 2 |
| SOFT | 1/4 - 1/2 | 2 - 4 |
| FIRM | 1/2 - 1 | 4 - 8 |
| STIFF | 1 - 2 | 8 - 16 |
| VERY STIFF | 2 - 4 | 16 - 32 |
| HARD | OVER 4 | OVER 32 |

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D) split spoon (ASTM D-1586)

** Unconfined compressive strength in tons/ft$^2$ as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

| HARO, KASUNICH & ASSOCIATES | KEY TO LOGS | | FIGURE NO. |
|---|---|---|---|

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-1

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 1-1 (L) | | Dark brown Silty SAND, damp, loose | SM | 11 | | | | |
| | 1-2 (T) | | | | 2 | | | 13.6 | |
| 5 | 1-3 (L) | | Tan fine medium SAND, damp, loose | SP | 9 | | | | |
| | 1-4 (T) | | Tan, yellow Sandy CLAY, moist, firm | CL-SC | 7 | | | 13.3 | |
| | | | Orange brown fine-medium SAND, loose | SP | | | | | |
| 10 | 1-5 (T) | | | | 10 | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

SuperLog CivilTech Software, USA www.civiltech.com File: C:\Superlog4\HKALOGS\SC9427.log Date: 9/24/2007

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BY: dk | FIGURE NO.

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-3

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 2" AC 6" AB | | | | | | |
| | 3-1 (L) | | Dark brown Sandy SILT, damp, stiff | ML | 16 | | 113 | 12.0 | |
| | 3-2 (T) | | | | 5 | | 102 | 20.1 | |
| 5 | 3-3 (L) | | | | 25 | | | | |
| | | | Brown Clayey SAND, damp, medium dense | SC | 7 | | | | |
| | 3-4 (T) | | Becomes Sandy CLAY, firm | CL | | | | | |
| 10 | 3-5 (L) | | | | 24 | | | | |
| | | | Same, becomes stiff | | | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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BY: dk | FIGURE NO.

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-4

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Turf | | | | | | |
| | 4-1 (L) | | Brown Silty SAND, dry, loose | SM | 21 | | | | |
| | 4-2 (T) | | Becomes medium dense | | 15 | | | | |
| 5 | 4-3 (T) | | | | 14 | | | 14.0 | |
| | | | Tan orange mottled Clayey SAND, dry, medium dense | SC | | | | | |
| 10 | 4-4 (T) | | Becomes Sand CLAY, moist, firm | CL | 9 | | | | |
| 15 | 4-5 (T) | | Orange fine SAND, damp, medium dense | SP | 14 | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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Geotechnical Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-5

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark brown Sandy SILT, damp, firm | ML | | | | | |
| | 5-1 (L) | | | | 10 | | | | |
| | 5-2 (T) | | Brown Silty SAND, some Clay, damp, loose | | 6 | | | 18.5 | |
| 5 | | | | | | | | | |
| | 5-3 (L) | | Brown Clayey SAND, damp, loose | | 14 | | | | |
| 10 | | | | | | | | | |
| | 5-4 (T) | | Tan Sandy CLAY, moist, firm | | 8 | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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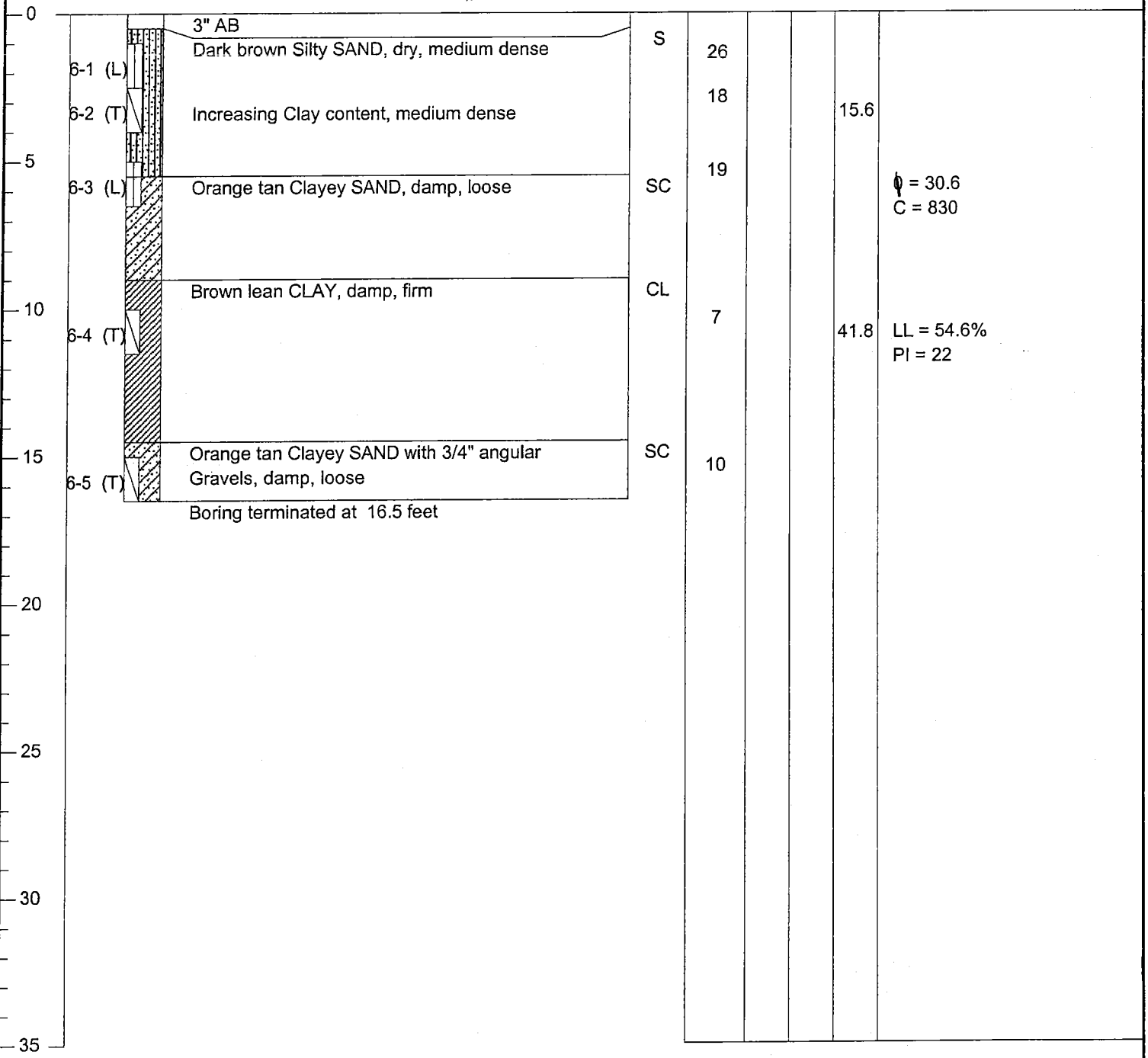
Geotechnical and Environmental Engineers

# Aptos Village

**PROJECT NO. SC9427**

**LOGGED BY** MH **DATE DRILLED** August 29, 2007 **BORING DIAMETER** 6" **BORING NO.** B-6

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**BY:** dk | **FIGURE NO.**

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-7

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 3" AB | | | | | | |
| | 7-1 (L) | | Brown Silty SAND, dry, medium dense | SM | 40 | | | | |
| | 7-2 (T) | | Brown fine medium SAND, dry, medium dense | | 23 | | | 13.2 | |
| 5 | 7-3 (L) | | Same | | 31 | | 93 | 13.0 | |
| | | | Small rounded Gravels | | | | | | |
| 10 | 7-4 (T) | | Tan, yellow fine-medium SAND, damp, very dense | | 57 | | | | |
| 15 | 7-5 (T) | | Tan yellow Gravelly SAND, (silica rounded Gravels) damp, very dense | | 50/5" | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH DATE DRILLED August 29, 2007 BORING DIAMETER 6" BORING NO. B-8

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 4" AB | | | | | | |
| | 8-1 (L) | | Dark brown Silty SAND, dry, loose with small rounded Gravels | SM | 18 | | | | |
| | 8-2 (T) | | | | 8 | | | 7.7 | % Passing #200 Sieve = 42 |
| 5 | | | Brown Gravelly SAND, dry, loose | SP | 16 | | | | ϕ = 39.3 |
| | 8-3 (L) | | | | | | | | C = 470 |
| | 8-4 (T) | | | | 11 | | | 10.7 | |
| 10 | | | Increasing Gravel, SAND, micaceous, damp, medium dense | | 24 | | | | |
| 15 | 8-6 (T) | | Tan fine-medium SAND, damp, dense | SP | 31 | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO.

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Geotechnical & Environmental Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-9

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | 9-1 (L) | | Brown Silty SAND with organics, dry, medium dense | SM | 34 | | | | |
| | 9-2 (T) | | | | 19 | | | | % Passing #200 Sieve = 44 |
| | | | Orange Clayey SAND, dry, medium dense | SC | | | | | |
| 5 | 9-3 (L) | | Well graded Gravelly SAND with slight Clay binder, damp, medium dense | SP-SC | 44 | | 109 | 15.2 | |
| 10 | 9-4 (T) | | Tan interbedded fine and coarse SANDS, damp, dense | SP | 31 | | | | |
| | | | Small Gravels | | | | | | |
| 15 | 9-5 (T) | | | | 44 | | | | |
| | | | Tan fine-medium SAND, damp, dense | SP | | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO.

## APPENDIX B

**Percolation Test Results**

**Lab Results**

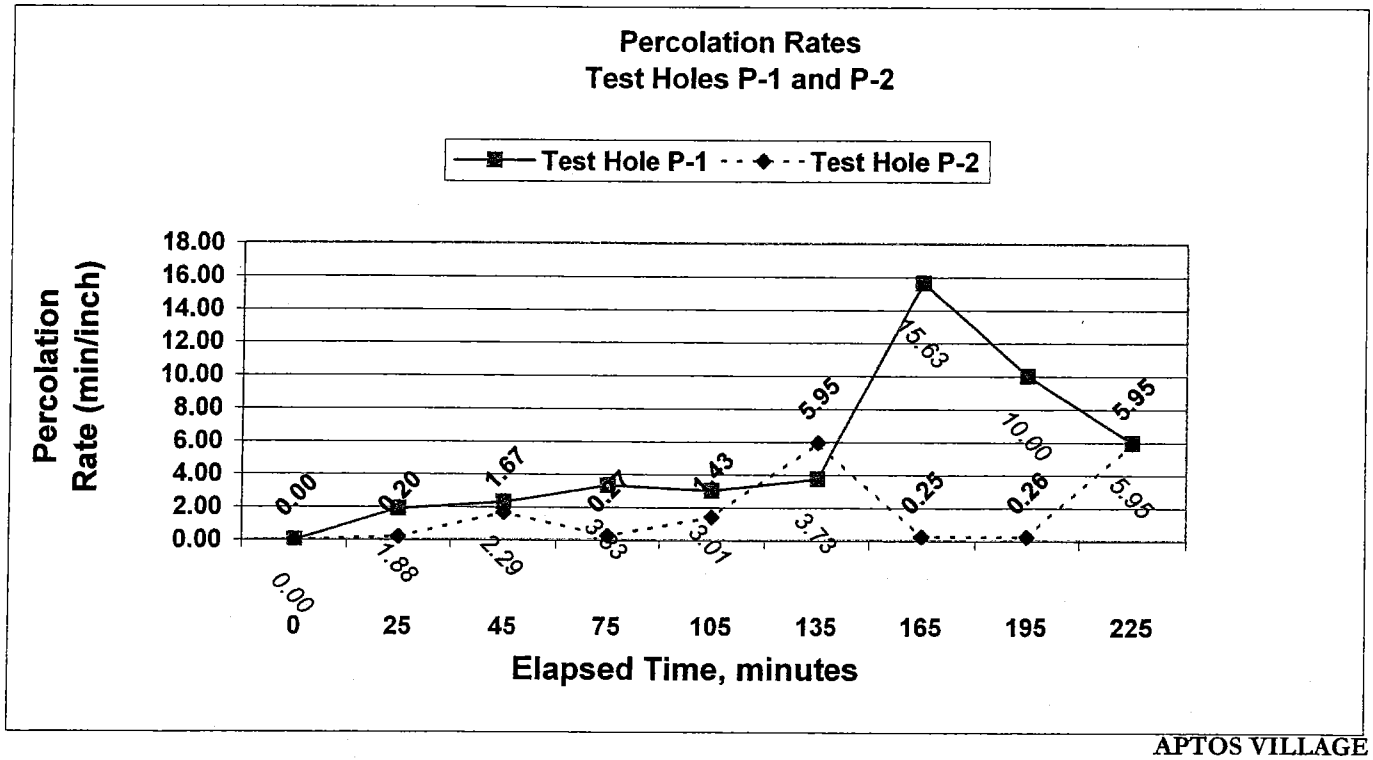
# Appendix B

Percolation Test Data

APTOS VILLAGE

| HOLE NO. | P-1 | | TEST DATE: 9/04/07 DRILL DATE: 8/29/07 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: ~10 ft | | | DEPTH OF BORING: 10 feet | | | |
| TESTED BY: | JD | | PERCOLATION ZONE: ~10 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 30 | 1.33 | 16.0 | | 1.88 | 31.92 |
| 2 | 60 | 2.42 | 13.1 | | 2.29 | 26.16 |
| 3 | 90 | 3.17 | 9.0 | | 3.33 | 18.00 |
| 4 | 120 | 4.00 | 10.0 | | 3.01 | 19.92 |
| 5 | 150 | 4.67 | 8.0 | | 3.73 | 16.08 |
| 6 | 180 | 4.83 | 1.9 | | 15.63 | 3.84 |
| 7 | 210 | 5.08 | 3.0 | | 10.00 | 6.00 |
| 8 | 240 | 5.50 | 5.0 | | 5.95 | 10.08 |

| HOLE NO. | P-2 | | TEST DATE: 9/04/07 DRILL DATE: 8/29/07 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: ~13.25 ft | | | DEPTH OF BORING (FT) | | 13.25 | |
| TESTED BY: | JD | | PERCOLATION ZONE: ~13.25 feet | | | |
| BORE DIAM | 6 | BORE AREA (SI | 0.19625 | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 1.58 | 0 | | 0.00 | 0.00 |
| 1 | 25 | 12.00 | 125.0 | | 0.20 | 300.01 |
| 2 | 45 | 13.00 | 12.0 | | 1.67 | 36.00 |
| 3 | 75 | 22.33 | 112.0 | | 0.27 | 223.92 |
| 4 | 105 | 24.08 | 21.0 | | 1.43 | 42.00 |
| 5 | 135 | 24.50 | 5.0 | | 5.95 | 10.08 |
| 6 | 165 | 34.50 | 120.0 | | 0.25 | 240.00 |
| 7 | 195 | 44.08 | 115.0 | | 0.26 | 229.92 |
| 8 | 225 | 44.50 | 5.0 | | 5.95 | 10.08 |




APTOS VILLAGE
Project SC9427
September, 2007

HARO, KASUNICH & ASSOCIATES

Figure No.

# Appendix B

***Percolation Test Data***

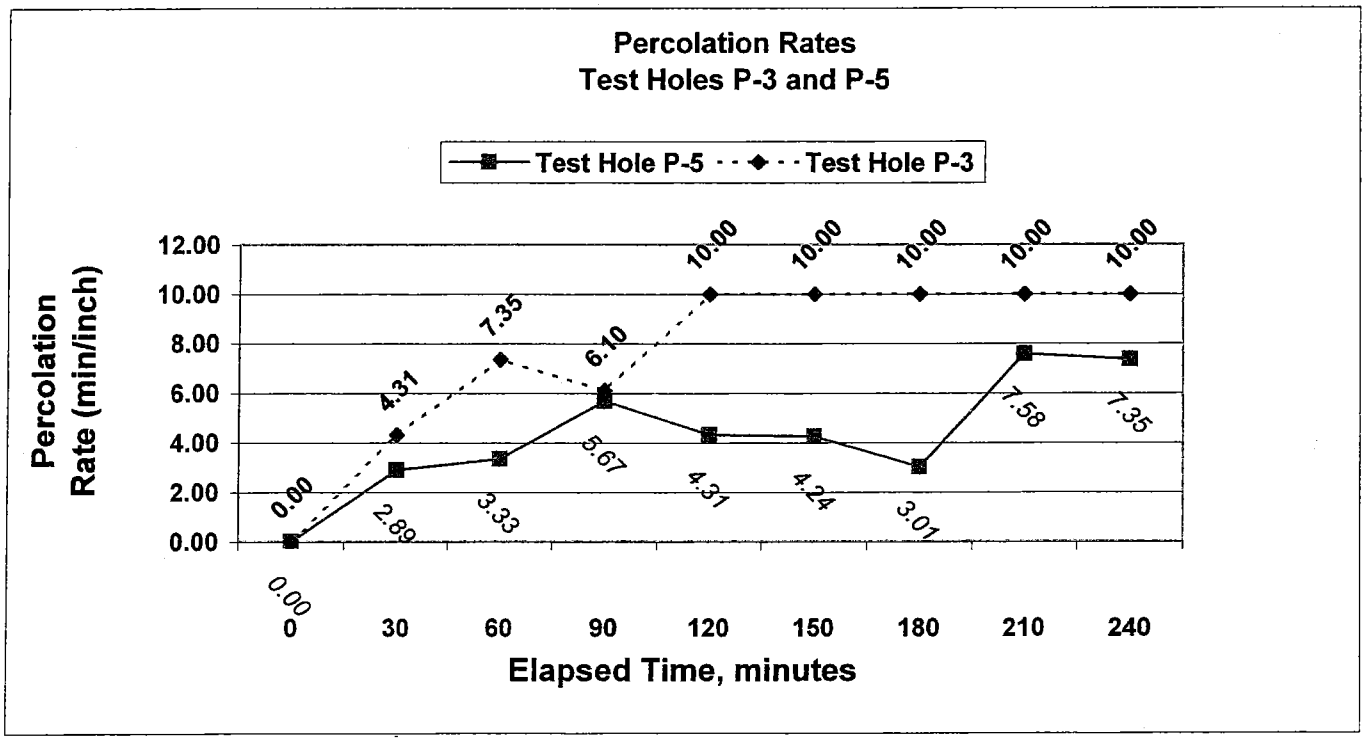
APTOS VILLAGE Job No. SC9427

| HOLE NO.: | P-5 | | TEST DATE: 9/04/2007 DRILL DATE: 8/29/2007 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: DRY | | | DEPTH OF BORING: 10 feet | | | |
| TESTED BY: | JD | | PERCOLATION ZONE: 0 FT TO 10 FT | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 26 | 0.75 | 9.0 | | 2.89 | 20.77 |
| 2 | 56 | 1.50 | 9.0 | | 3.33 | 18.00 |
| 3 | 90 | 2.00 | 6.0 | | 5.67 | 10.59 |
| 4 | 120 | 2.58 | 7.0 | | 4.31 | 13.92 |
| 5 | 150 | 3.17 | 7.1 | | 4.24 | 14.16 |
| 6 | 180 | 4.00 | 10.0 | | 3.01 | 19.92 |
| 7 | 210 | 4.33 | 4.0 | | 7.58 | 7.92 |
| 8 | 240 | 4.67 | 4.1 | | 7.35 | 8.16 |

NOTE 1: HOLE REFILLED TO 0.50 FT.

NOTE 2: HOLE REFILLED TO 1.00 FT.

| HOLE NO.: | P-3 | | TEST DATE: 9/04/2007 DRILL DATE: 8/29/2007 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: -6.25 FT | | | DEPTH OF BORING: 10.5 feet | | | |
| TESTED BY: | MH | | PERCOLATION ZONE: 0.5 TO 10.5 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0 | 0 | | 0.00 | 0.00 |
| 1 | 30 | 0.58 | 7.0 | | 4.31 | 13.92 |
| 2 | 60 | 0.92 | 4.1 | | 7.35 | 8.16 |
| 3 | 90 | 1.33 | 4.9 | | 6.10 | 9.84 |
| 4 | 120 | 1.58 | 3.0 | | 10.00 | 6.00 |
| 5 | 150 | 1.83 | 3.0 | | 10.00 | 6.00 |
| 6 | 180 | 2.08 | 3.0 | | 10.00 | 6.00 |
| 7 | 210 | 2.33 | 3.0 | | 10.00 | 6.00 |
| 8 | 240 | 2.58 | 3.0 | | 10.00 | 6.00 |




**APTOS VILLAGE**
**Project SC9427**
**9/24/2007**

HARO, KASUNICH & ASSOCIATES Figure No.

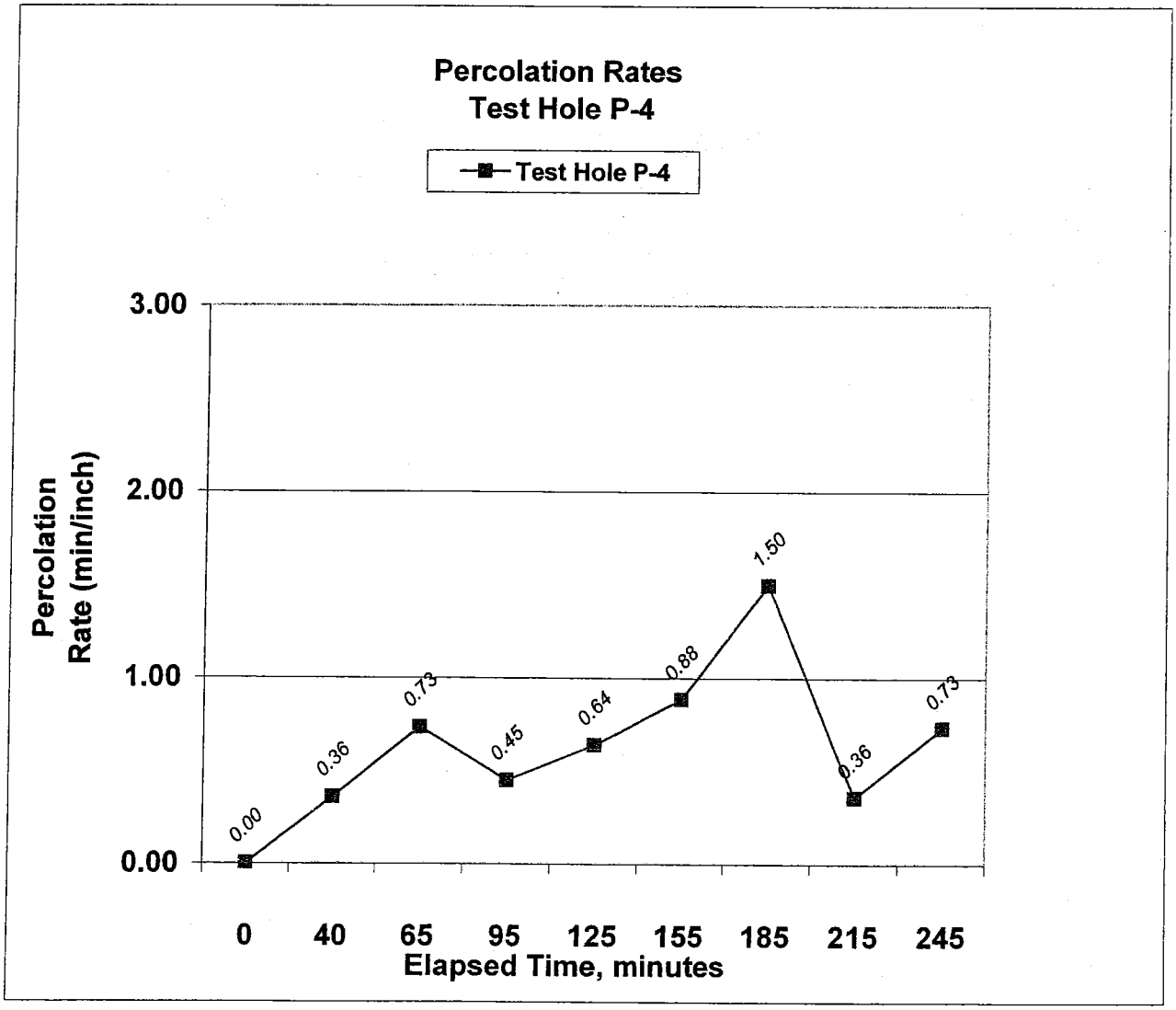
# Appendix B

***Percolation Test Data***

APTOS VILLAGE Job No. SC9427

| HOLE NO.: P-4 | | | TEST DATE: 9/4/2007 | | DRILL DATE: 8/29/07 | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: DRY | | | DEPTH OF BORING 15.25 feet | | | |
| TESTED BY: JD | | | PERCOLATION ZONE: 0.5 TO 15.25 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 40 | 9.33 | 112.0 | | 0.36 | 167.94 |
| 2 | 65 | 12.17 | 34.1 | NOTE 1 | 0.73 | 81.79 |
| 3 | 95 | 5.58 | 67.0 | | 0.45 | 133.92 |
| 4 | 125 | 9.50 | 47.0 | | 0.64 | 94.08 |
| 5 | 155 | 12.33 | 34.0 | | 0.88 | 67.92 |
| 6 | 185 | 14.00 | 20.0 | NOTE 1 | 1.50 | 40.08 |
| 7 | 215 | 7.00 | 84.0 | | 0.36 | 168.00 |
| 8 | 245 | 10.42 | 41.0 | | 0.73 | 82.08 |

NOTE 1: HOLE REFILLED TO 0 FT




HARO, KASUNICH & ASSOCIATES

APTOS VILLAGE
Project SC9427
9/24/2007

Figure No.

HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

## *FULL GRADATION*

| Project Name: | Aptos Village |
|---|---|
| File No.: | SC 9427 |
| Sample No.: | 2-4 |
| Date: | September 12, 2007 |
| By: | JR/MA |

| Moisture Density | |
|---|---|
| Part of Sample | Bag |
| Tare No. | 10-A |
| Gross Wet Weight | 604.2 |
| Gross Dry Weight | 512.3 |
| Tare Weight | 71.8 |
| Net Dry Weight | 440.5 |
| Weight of Water | 91.9 |
| % Moisture | 20.9% |
| Dry Density | 0.0 |

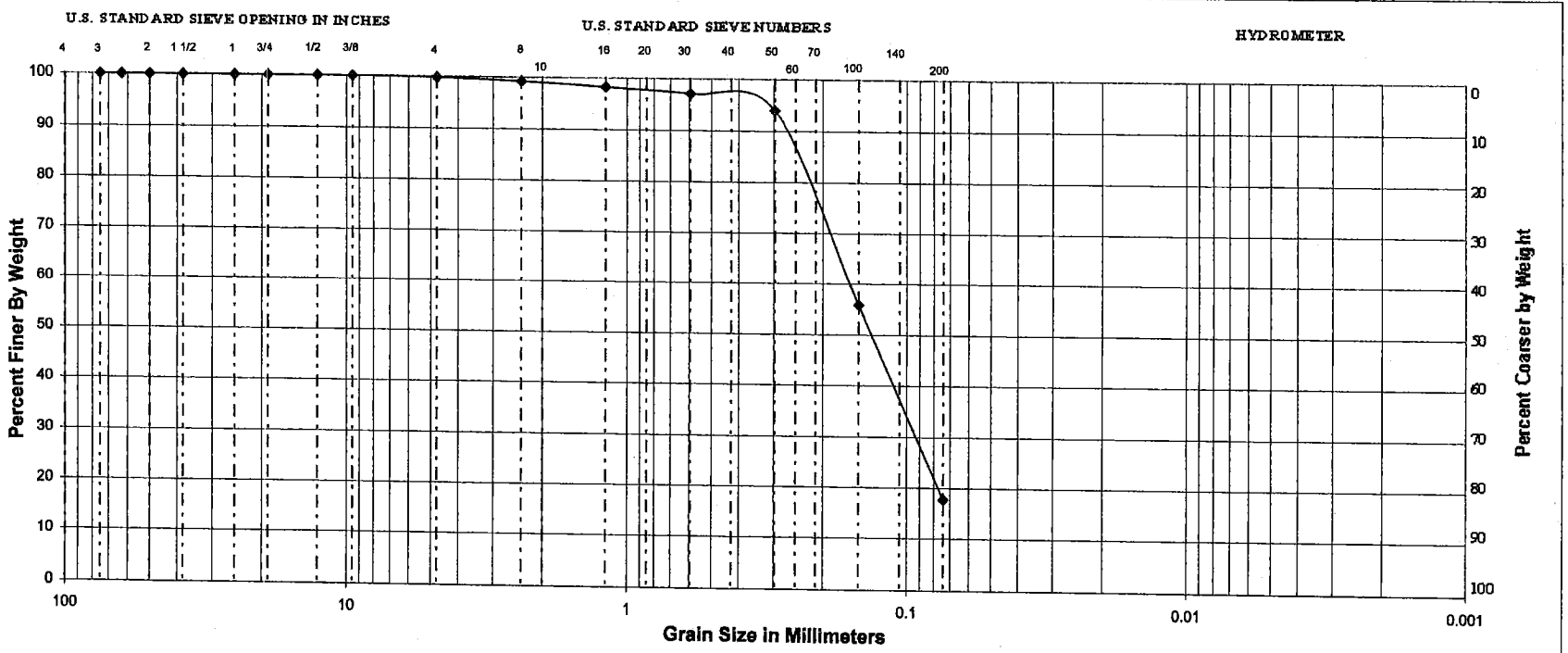
Sample Description:

Rusrt Brown Silty Fine Sand W/Clay Binder

| | |
|---|---|
| Group Symbol: | |
| Gravel Content: | 0.2% |
| Sand Content: | 82.1% |
| Fines Content: | 17.7% |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 0.0 | 0.0% | 0.0% | 100.0% | |
| No. 4 | 0.7 | 0.2% | 0.2% | 99.8% | |
| No. 8 | 2.6 | 0.6% | 0.7% | 99.3% | |
| No. 16 | 4.2 | 1.0% | 1.7% | 98.3% | |
| No. 30 | 5.0 | 1.1% | 2.8% | 97.2% | |
| No. 50 | 13.9 | 3.2% | 6.0% | 94.0% | |
| No. 100 | 168.4 | 38.2% | 44.2% | 55.8% | |
| No. 200 | 167.6 | 38.0% | 82.3% | 17.7% | |
| Pan | 76.8 1.3 | 17.7% | 100.0% | 0.0% | |
| Total | 440.5 | 100.0% | | 100.0% | |

| | | | |
|---|---|---|---|
| Before | 440.5 | After | |
| Dry Wt. | | Dry Wt. | 435.5 |
| Tare | | Tare | 71.8 |
| | | 363.7 | |




**Gravel Content:** 0.2%
**Sand Content:** 82.1%
**Fines Content:** 17.7%

**Sample Description:** Rusrt Brown Silty Fine Sand W/Clay Binder
**Group Symbol:** 0

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Geotechnical and Geological Engineers
116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202

| | |
|---|---|
| HKA Project No: | SC 9427 |
| Sample No: | 2-4 |
| Date: | September 12, 2007 |

***GRAIN SIZE DISTRIBUTION***

**Aptos Village**

Figure No.

| | | | |
|---|---|---|---|
| **Project:** | Aptos Village | **Date** | September 11, 2007 |
| **Project #** | SC 9427 | **Tested By:** | MA/JR |
| **Sample #** | 6-3-2 | | |

| Test Number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Normal Pressure (KSF) | 1000 | 2000 | 4000 | |
| Max Shear Stress | 42.9 | 64.2 | 98.5 | |
| Shear Stress (PSF) | 1383.9 | 2071.0 | 3177.4 | |

| Equation of Trendline | |
|---|---|
| Intercept | Slope |
| 830.7 | 0.5915 |

| C (PSF) | PHI |
|---|---|
| 830 | 30.6 |

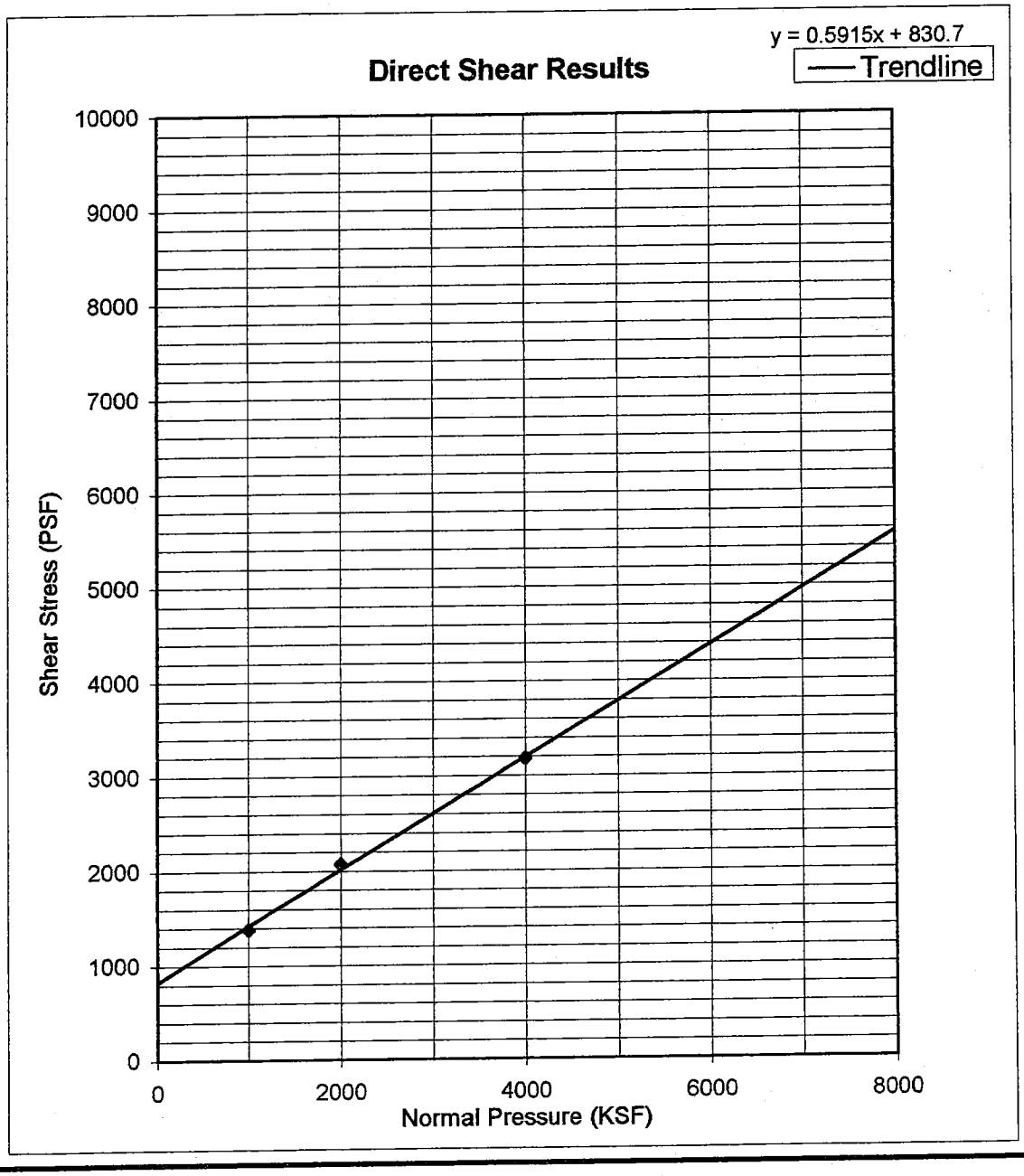
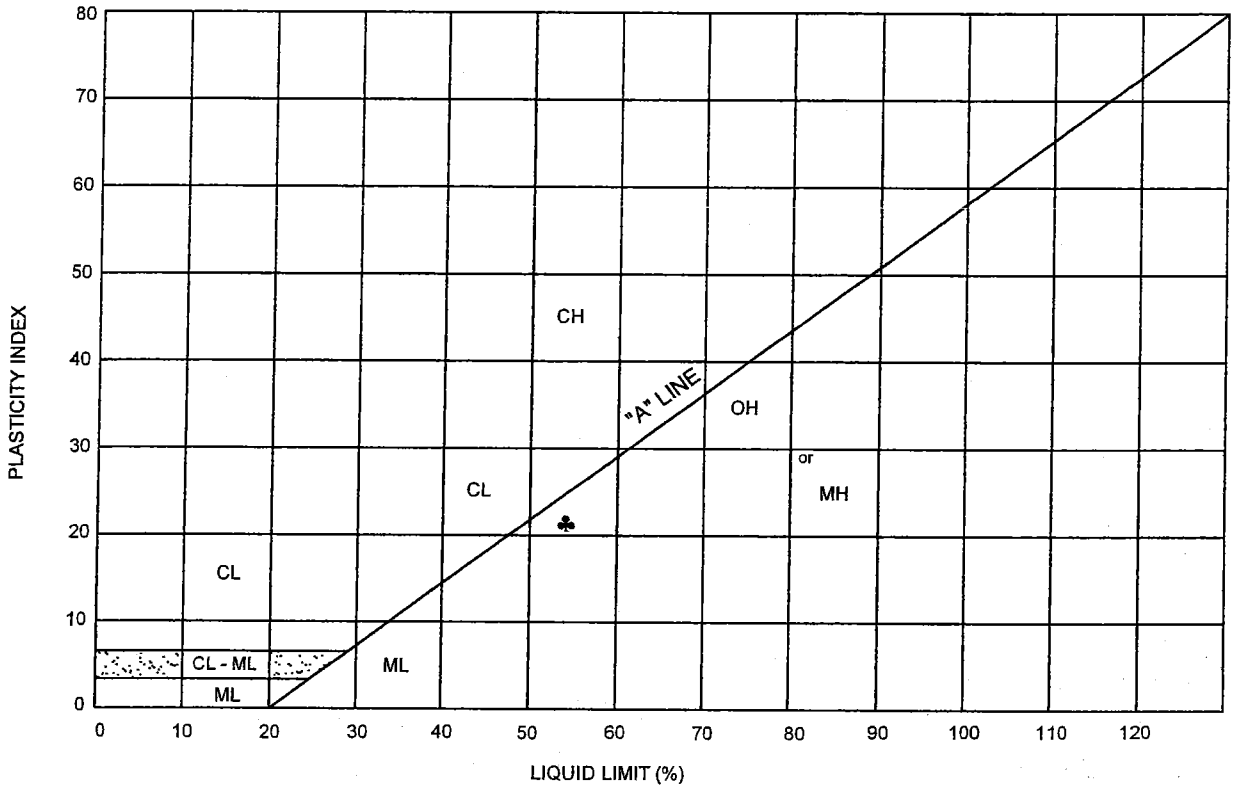



**Figure No.**

## PLASTICITY CHART




## PLASTICITY DATA

| Key Symbol | Sample Number | Depth (feet) | Natural Water Content W(%) | Plastic Limit (%) | Liquid Limit (%) | Plasticity Index | Liquidity Index $\frac{W - PL}{LL - PL}$ | Unified Soil Classification Symbol |
|---|---|---|---|---|---|---|---|---|
| ♣ | 6-4 | 11 | 41.8 | 33.5 | 54.6 | 22 | .39 | MH |

# ATTERBERG LIMITS TEST RESULTS

APTOS VILLAGE
PHASE I

| | |
|---|---|
| SCALE: | APTOS, SANTA CRUZ COUNTY, CALIFORNIA |
| DRAWN BY: MH | |
| DATE: 19 SEPT 07 | HARO, KASUNICH & ASSOCIATES, INC. |
| REVISED: | GEOTECHNICAL AND COASTAL ENGINEERS |
| JOB NO. SC 9427 | 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-1475 |
| FIGURE NO. | SHEET NO. OF 1 |

| | | | |
|---|---|---|---|
| **Project:** | Aptos Village | **Date** | September 12, 2007 |
| **Project #** | SC 9427 | **Tested By:** | MA/JR |
| **Sample #** | 8-3-1 | | |

| Test Number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Normal Pressure (KSF) | 1000 | 2000 | 4000 | 8000 |
| Max Shear Stress | 39.7 | 56.1 | 130.0 | 212.5 |
| Shear Stress (PSF) | 1280.6 | 1809.7 | 4193.5 | 6854.8 |

| Equation of Trendline | |
|---|---|
| Intercept | Slope |
| 470.39 | 0.8171 |

| C (PSF) | PHI |
|---|---|
| 470 | 39.3 |

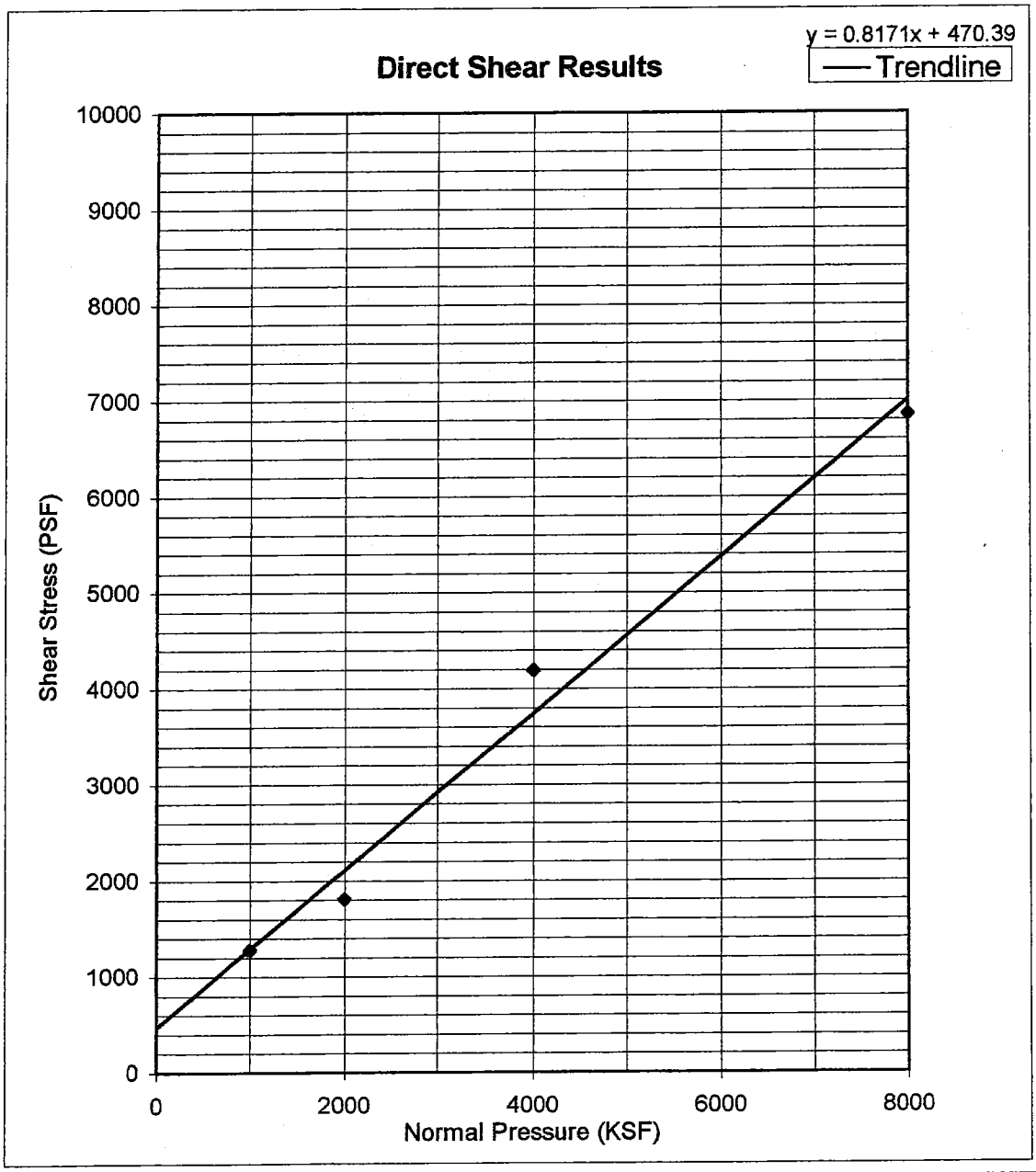



**Figure No.**

HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

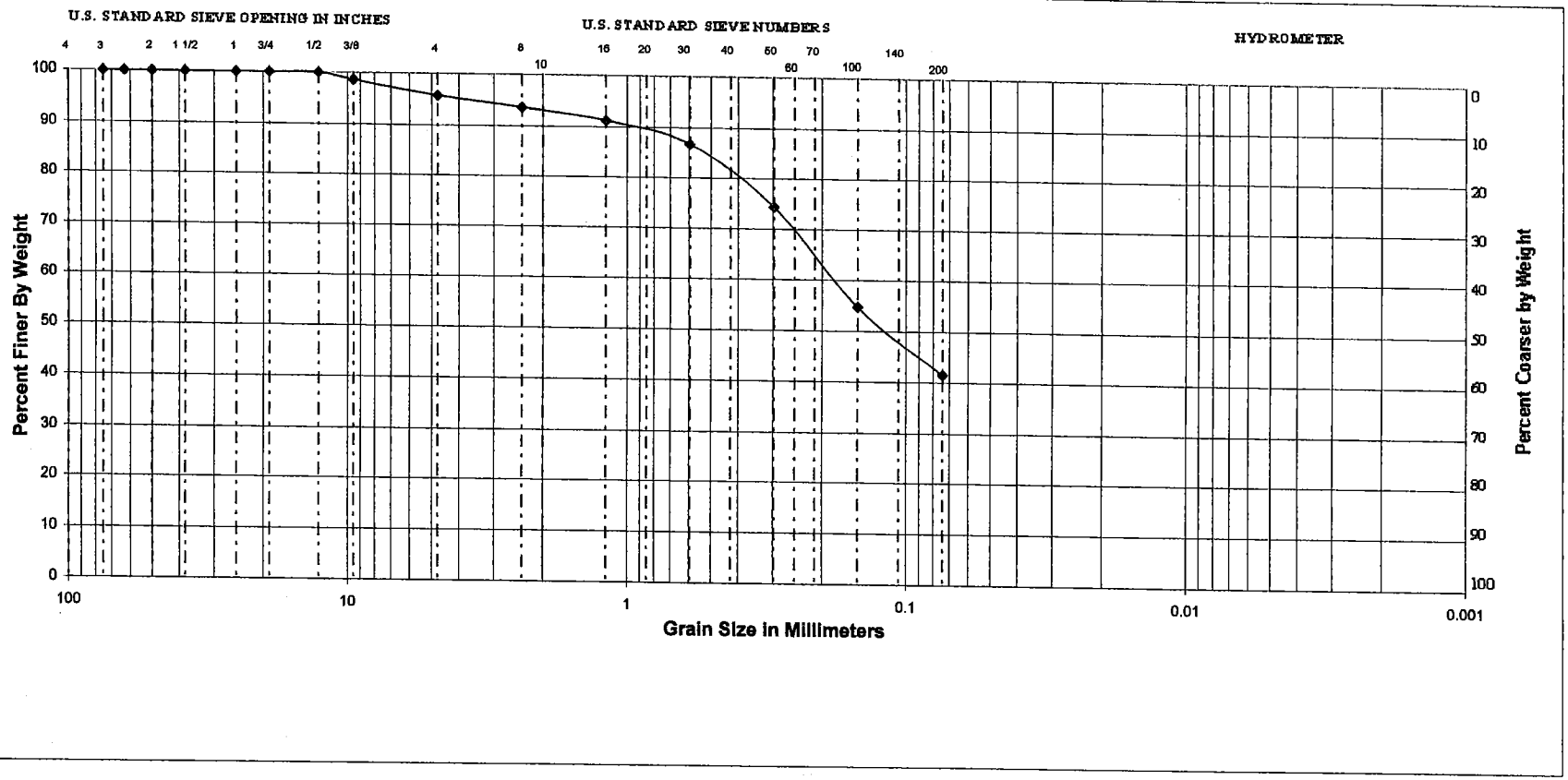
## *FULL GRADATION*

| Moisture Density | |
|---|---|
| Part of Sample | Bag |
| Tare No. | 104 |
| Gross Wet Weight | 467.6 |
| Gross Dry Weight | 439.8 |
| Tare Weight | 77.0 |
| Net Dry Weight | 362.8 |
| Weight of Water | 27.8 |
| % Moisture | 7.7% |
| Dry Density | 0.0 |

| | |
|---|---|
| Project Name: | Aptos Village |
| File No.: | SC 9427 |
| Sample No.: | 8-2 |
| Date: | September 12, 2007 |
| By: | JR/MA |
| Sample Description: | |
| Dark Brown Silty Sand | |
| Group Symbol: | |
| Gravel Content: | 4.2% |
| Sand Content: | 54.2% |
| Fines Content: | 41.5% |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 5.0 | 1.4% | 1.4% | 98.6% | |
| No. 4 | 10.3 | 2.8% | 4.2% | 95.8% | |
| No. 8 | 7.6 | 2.1% | 6.3% | 93.7% | |
| No. 16 | 8.6 | 2.4% | 8.7% | 91.3% | |
| No. 30 | 16.5 | 4.5% | 13.2% | 86.8% | |
| No. 50 | 44.9 | 12.4% | 25.6% | 74.4% | |
| No. 100 | 71.4 | 19.7% | 45.3% | 54.7% | |
| No. 200 | 47.8 | 13.2% | 58.5% | 41.5% | |
| Pan | 150.5 0.2 | 41.5% | 100.0% | 0.0% | |
| Total | 362.8 | 100.0% | | 100.0% | |

| | | | |
|---|---|---|---|
| Before | 362.8 | After | |
| Dry Wt. | | Dry Wt. | 289.3 |
| Tare | | Tare | 77 |
| | | 212.3 | |




**Gravel Content:** 4.2%
**Sand Content:** 54.2%
**Fines Content:** 41.5%

**Sample Description:** Dark Brown Silty Sand
**Group Symbol:** 0

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Geotechnical and Environmental Engineers
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(831) 722-4175 ~ Fax (831) 722-3202

| | |
|---|---|
| HKA Project No: | SC 9427 |
| Sample No: | 8-2 |
| Date: | September 12, 2007 |

***GRAIN SIZE DISTRIBUTION***

**Aptos Village**

Figure No.

HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

## *FULL GRADATION*

| Moisture Density | |
|---|---|
| Part of Sample | Bag |
| Tare No. | 11-A |
| Gross Wet Weight | 586.0 |
| Gross Dry Weight | 505.9 |
| Tare Weight | 72.9 |
| Net Dry Weight | 433.0 |
| Weight of Water | 80.1 |
| % Moisture | 18.5% |
| Dry Density | 0.0 |

| | |
|---|---|
| Project Name: | Aptos Village |
| File No.: | SC 9427 |
| Sample No.: | 9-2 |
| Date: | September 12, 2007 |
| By: | JR/MA |

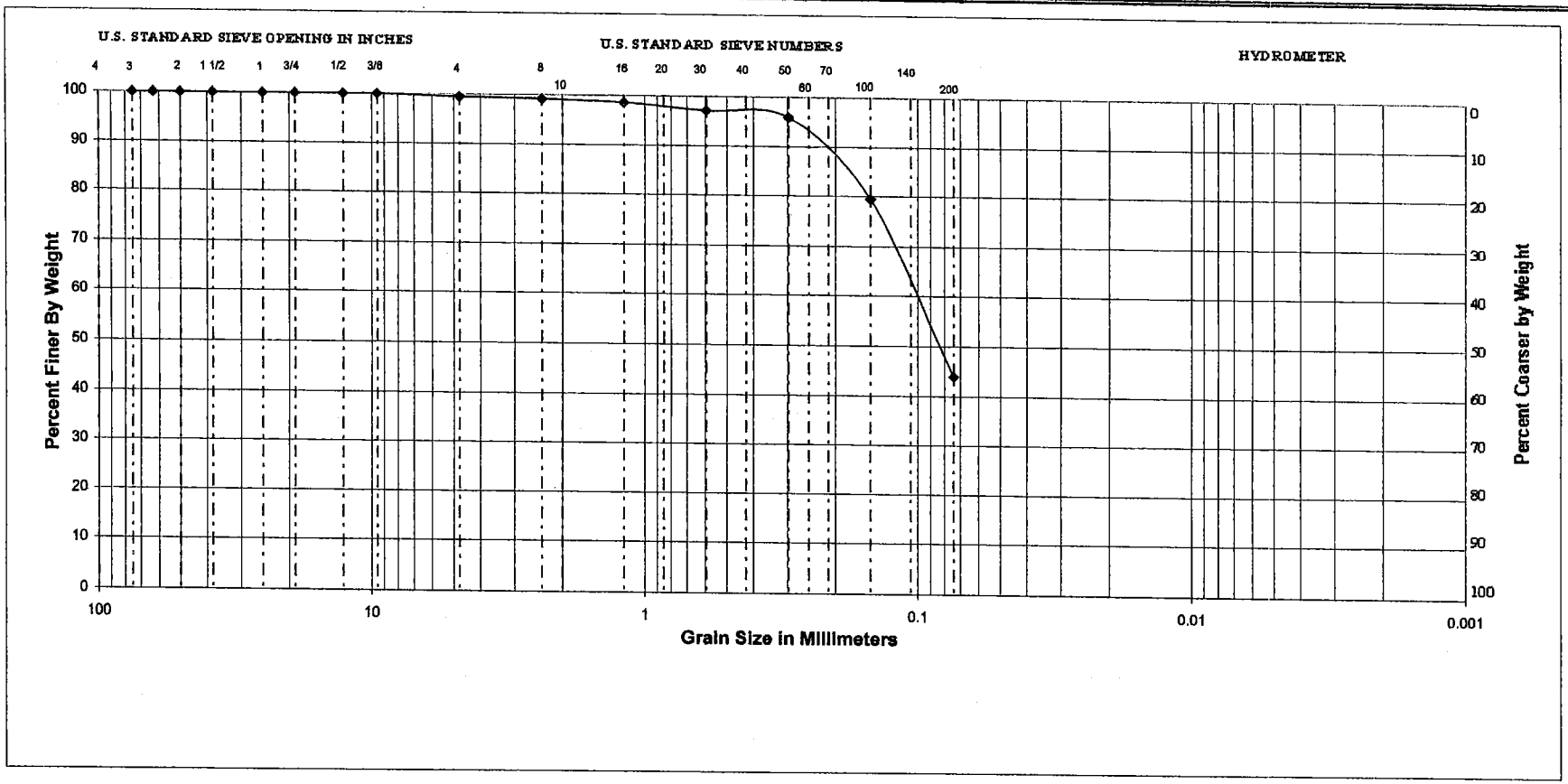
Sample Description:

Orange Brown Clayey Silty Sand

| | |
|---|---|
| Group Symbol: | |
| Gravel Content: | 0.5% |
| Sand Content: | 55.5% |
| Fines Content: | 44.0% |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 0.0 | 0.0% | 0.0% | 100.0% | |
| No. 4 | 2.3 | 0.5% | 0.5% | 99.5% | |
| No. 8 | 1.3 | 0.3% | 0.8% | 99.2% | |
| No. 16 | 2.5 | 0.6% | 1.4% | 98.6% | |
| No. 30 | 6.2 | 1.4% | 2.8% | 97.2% | |
| No. 50 | 5.3 | 1.2% | 4.1% | 95.9% | |
| No. 100 | 71.1 | 16.4% | 20.5% | 79.5% | |
| No. 200 | 153.7 | 35.5% | 56.0% | 44.0% | |
| Pan | 188.5 2.1 | 44.0% | 100.0% | 0.0% | |
| Total | 433.0 | 100.0% | | 100.0% | |

| | | | |
|---|---|---|---|
| Before | 433.0 | After | |
| Dry Wt. | | Dry Wt. | 317.4 |
| Tare | | Tare | 72.9 |
| | | 244.5 | |




**Gravel Content:** 0.5%
**Sand Content:** 55.5%
**Fines Content:** 44.0%

**Sample Description:** Orange Brown Clayey Silty Sand
**Group Symbol:** 0

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Geotechnical and Geoenvironmental Engineers
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(831) 722-4175 ~ Fax (831) 722-3202

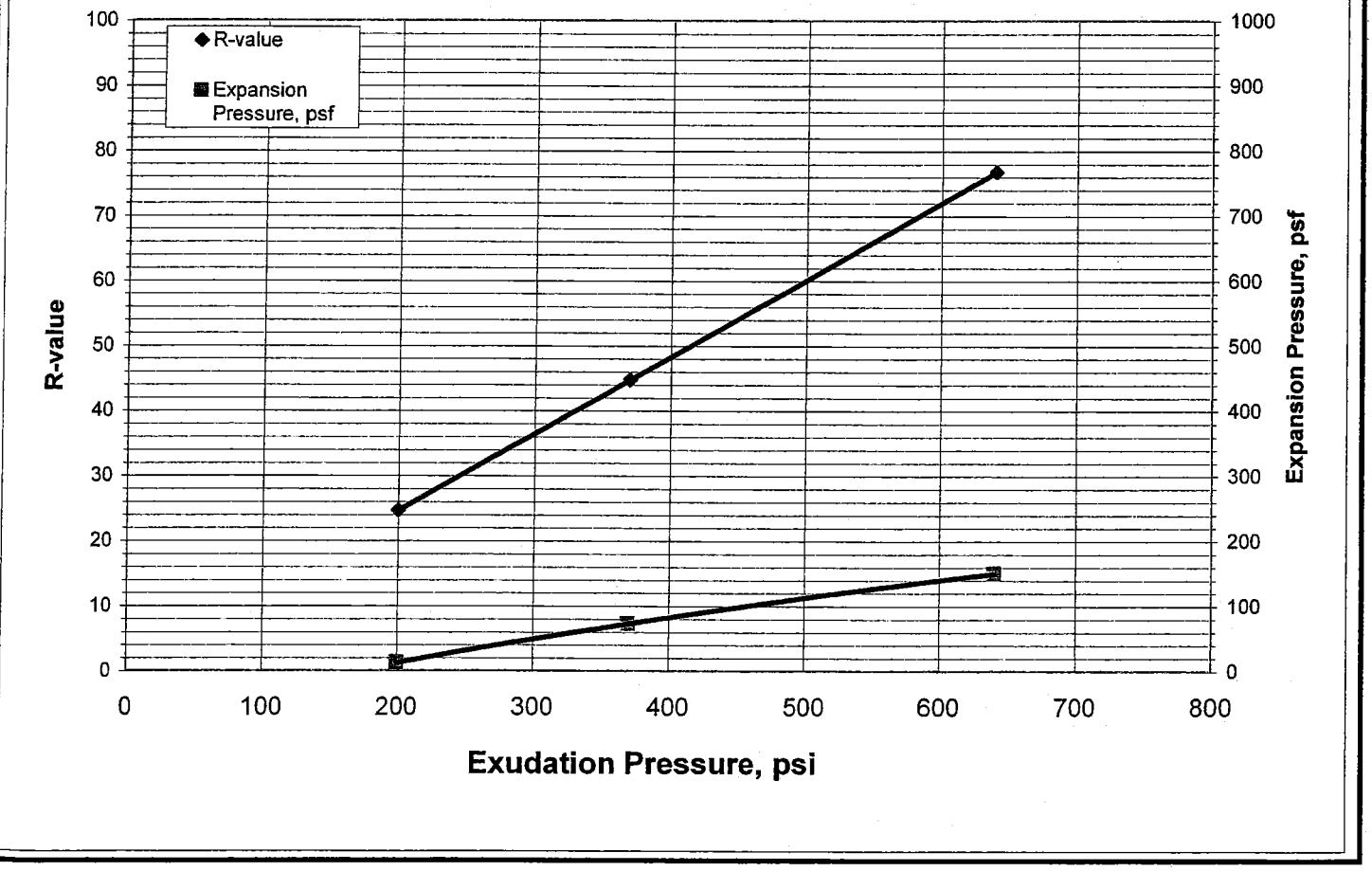
| | |
|---|---|
| HKA Project No: SC 9427 | ***GRAIN SIZE DISTRIBUTION*** |
| Sample No: 9-2 | |
| Date: September 12, 2007 | **Aptos Village** |
| | Figure No. |

# R-value Test Report (Caltrans 301)

| | | | | | |
|---|---|---|---|---|---|
| **Job No.:** | 032-336 | **Date:** | 09/07/07 | **Initial Moisture,** | 10.3% |
| **Client:** | Haro, Kasunich and Associates | **Tested** | MD | **R-value by Stabilometer** | 38 |
| **Project:** | Aptos Village - SC9427 | **Reduced** | RU | | |
| **Sample** | R-1;B-4 | **Checked** | DC | **Expansion Pressure** | 50 psf |
| **Soil Type:** | Dark Brown Clayey SAND | | | | |

| Specimen Number | A | B | C | D |
|---|---|---|---|---|
| **Exudation Pressure, psi** | 200 | 370 | 640 | |
| **Prepared Weight, grams** | 1200 | 1200 | 1200 | |
| **Final Water Added, grams/cc** | 40 | 19 | 7 | |
| **Weight of Soil & Mold, grams** | 3083 | 3173 | 3166 | |
| **Weight of Mold, grams** | 2089 | 2096 | 2067 | |
| **Height After Compaction, in.** | 2.25 | 2.42 | 2.46 | |
| **Moisture Content, %** | 14.0 | 12.1 | 11.0 | |
| **Dry Density, pcf** | 117.3 | 120.2 | 121.9 | |
| **Expansion Pressure, psf** | 12.9 | 73.1 | 150.5 | |
| **Stabilometer @ 1000** | | | | |
| **Stabilometer @ 2000** | 106 | 72 | 29 | |
| **Turns Displacement** | 3.06 | 3.45 | 3.3 | |
| **R-value** | 25 | 45 | 77 | |

**Remarks:**

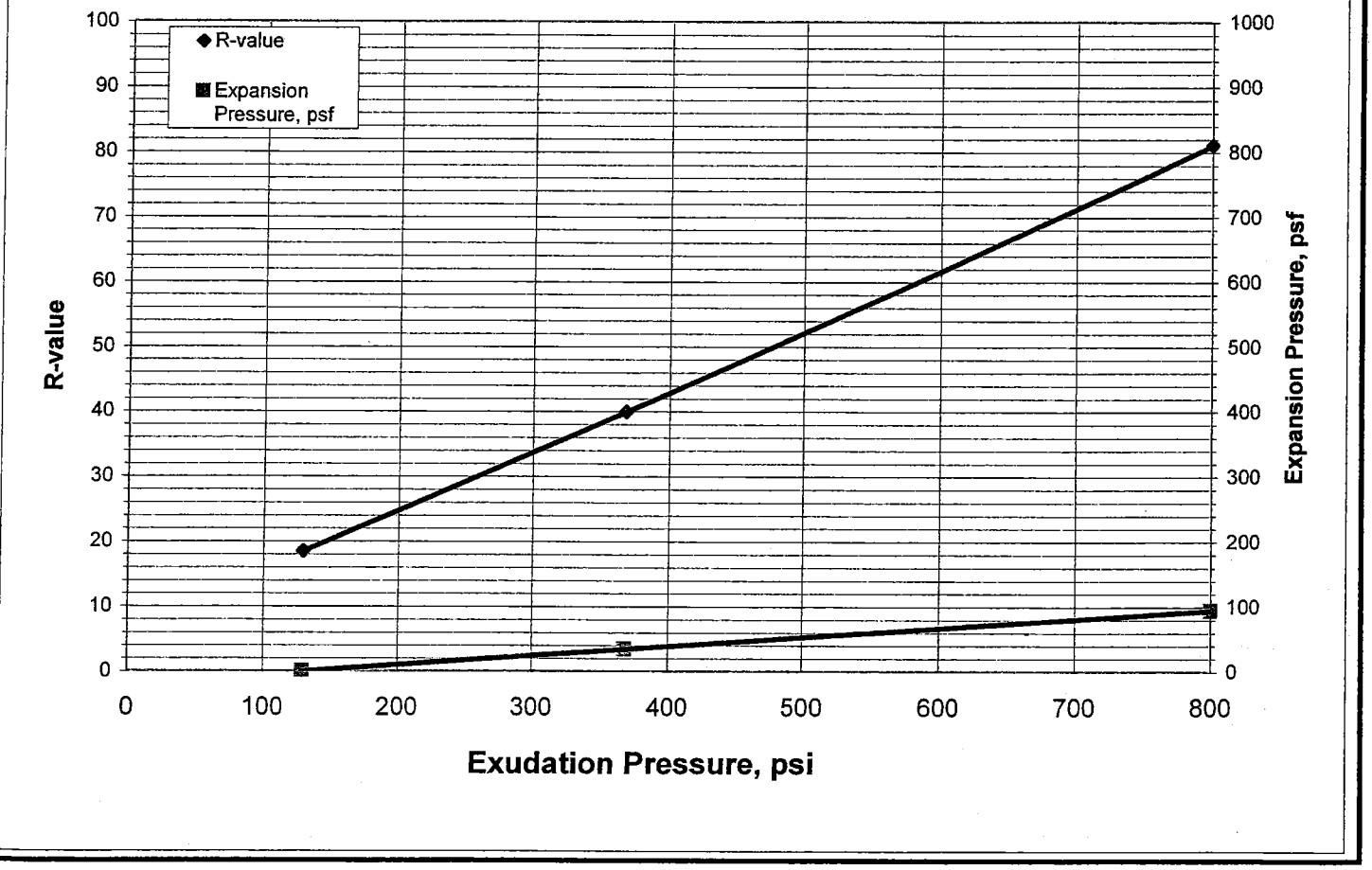


# R-value Test Report (Caltrans 301)

| | | | | | |
|---|---|---|---|---|---|
| **Job No.:** | 032-336 | **Date:** | 09/11/07 | **Initial Moisture,** | 10.4% |
| **Client:** | Haro, Kasunich & Associates | **Tested** | MD | **R-value by Stabilometer** | 34 |
| **Project:** | Aptos Village - SC9427 | **Reduced** | RU | | |
| **Sample** | R-2;B-1 | **Checked** | DC | **Expansion Pressure** | 20 psf |
| **Soil Type:** | Dark Brown Clayey SAND | | | | |

| Specimen Number | A | B | C | D |
|---|---|---|---|---|
| **Exudation Pressure, psi** | 129 | 368 | 800 | |
| **Prepared Weight, grams** | 1200 | 1200 | 1200 | |
| **Final Water Added, grams/cc** | 42 | 8 | -4 | |
| **Weight of Soil & Mold, grams** | 3146 | 3206 | 3203 | |
| **Weight of Mold, grams** | 2097 | 2123 | 2082 | |
| **Height After Compaction, in.** | 2.4 | 2.46 | 2.48 | |
| **Moisture Content, %** | 14.3 | 11.2 | 10.1 | |
| **Dry Density, pcf** | 115.8 | 119.9 | 124.3 | |
| **Expansion Pressure, psf** | 0.0 | 34.4 | 94.6 | |
| **Stabilometer @ 1000** | | | | |
| **Stabilometer @ 2000** | 116 | 80 | 24 | |
| **Turns Displacement** | 3.9 | 3.6 | 3.25 | |
| **R-value** | 19 | 40 | 81 | |

**Remarks:**



# GEOTECHNICAL INVESTIGATION
# FOR
# APTOS JUNCTION
# APTOS, CALIFORNIA

FOR
STEVE MILLS
APTOS, CALIFORNIA

BY
STEVEN RAAS & ASSOCIATES
CONSULTING GEOTECHNICAL ENGINEERS
8988-SZ70-B13
JUNE 1989

# STEVEN RAAS & ASSOCIATES

CONSULTING GEOTECHNICAL ENGINEERS
120 WESTGATE DRIVE WATSONVILLE, CALIFORNIA 95076
(408) 722-9446


8988-SZ70-B13
June 20, 1989

Steve Mills
232 Santa Cruz Avenue
Aptos, CA 95003

Subject: Geotechnical Investigation
Aptos Junction
Aptos, California

Dear Mr. Mills,

In accordance with your authorization, we have performed a geotechnical investigation for your project located in Aptos, California.

The accompanying report presents our conclusions and recommendations as well as the results of the geotechnical investigation on which they are based. If you have any questions concerning the data, conclusions or recommendations presented in this report, please call our office.

Very truly yours,

STEVEN RAAS & ASSOCIATES

Steven M. Raas
G.E. 2039
Exp. 6/30/90

SMR/jb
Copies: 3

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8988-SZ70-B13
June 20, 1989

# GEOTECHNICAL INVESTIGATION

## PURPOSE AND SCOPE

This report describes the geotechnical investigation and presents results, including recommendations, for the proposed development. Our scope of services for this project has consisted of:

1. Discussions with you.
2. Review of the pertinent published material concerning the site including County planning maps, preliminary site plans, and other available literature.
3. The drilling and logging of 9 test borings.
4. Laboratory analysis of retrieved soil samples.
5. Engineering analysis of the field and laboratory results.
6. Preparation of this report documenting our investigation and presenting recommendations for the design of the project.

## LOCATION AND DESCRIPTION

The project site is located west of Trout Gulch Road and Cathedral Drive, north of Soquel Drive, and east of the T. Hopkins right of way in the unincorporated portion of Santa Cruz County known as Aptos. A small commercial center and the Aptos Station commercial center, as well as the Southern Pacific Railroad tracks separate the project from Soquel Drive. The Bayview Hotel is adjacent to the southeast portion of the site.

The majority of the site is relatively level rising moderately to the north at the north edge of the site. Many old concrete foundations and slabs are on the site.

It is our understanding that the proposed development will consist of 2 or 3 story wood framed structures with commercial uses on the first floor and residential uses above.

FIELD INVESTIGATION

Nine 6 inch diameter test borings were drilled on the site on June 8, 1989. The drilling method used was hydraulically operated continuous flight augers. An engineering geologist from Steven Raas & Associates was present during the drilling operations to log the soil encountered and to choose soil sampling type and locations.

Relatively undisturbed soil samples were obtained at various depths by driving a split spoon sampler 18 inches into the ground. This was achieved by freely dropping a 140 pound down hole safety hammer through a vertical height of 30 inches. The number of blows needed to drive the sampler for each 6 inch portion is recorded and the total number of blows needed to drive the last 12 inches is reported as the Standard Penetration Test value. The outside diameter of the samplers used in this investigation was either 3 inches or 2 inches. All standard

penetration test data has been normalized to a 2 inch O.D. sampler so as to be the standard "N" value.

Appendix A contains the Site Plan showing the locations of the test borings and the Boring Logs presenting the soil profile explored in each boring, the sample locations, and the SPT "N" values for each sample. Stratification lines on the boring logs are approximate as the actual transition between soil types may be gradual.

LABORATORY INVESTIGATION

The laboratory testing program was developed to help in evaluating the bearing capacity, settlement characteristics and swell potential for the soil on the site. Laboratory tests performed include:

a. Moisture Density relationships in accordance with ASTM test D2937.

b. Unconfined Compression tests in accordance with ASTM test D2166-85.

c. Atterberg Limits tests in accordance with ASTM test D4318-84.

The results of the laboratory tests are presented on the boring logs opposite the sample tested.

SOIL CONDITIONS

The upper 2 to 4 feet of soil on the site is a loose to very loose sand or a soft clay which was dry. Below this loose and soft upper material is medium dense clayey sand and sand. In Boring No. 1 nine feet of stiff silt was encountered under the upper loose material and in Boring No's. 4, 6, and 8 a stiff to very stiff sandy clay was encountered. In Boring No. 9 a firm clay was encountered. No free groundwater was encountered in any boring.

SEISMIC HAZARDS

The seismic setting of the site is one in which it is reasonable to assume that the site will experience significant seismic shaking during the lifetime of the project. Active or potentially active faults which may significantly effect the site include the San Andreas (7 1/2 miles to the northeast), and the Zayante (3 miles to the northeast).

Seismic hazards which may effect the site are ground shaking, surface ground rupture, liquefaction and lateral spreading, and seismically induced slope instabilities.

Ground shaking will be felt on the site. Structures founded on firm bedrock will experience shaking of higher frequency and lower amplitude than those founded on soft residual colluvial or

fluvial soils. Also, shaking will be more intense the closer the site is to the epicenter of the earthquake. Structures built in accordance with the latest edition of the Uniform Building Code for seismic area 4 should experience only minor damage.

Surface ground rupture occurs along active faults. Since the nearest known active or potentially active fault is located 3 1/2 miles from the site, the potential for surface ground rupture to occur at this site is low.

Liquefaction and lateral spreading tend to occur in loose, saturated fine grained sands or coarse silts. An analysis of this site, including the nature of the subsurface soil, the location of the ground water table, and the estimated ground accelerations, leads to the conclusion that the liquefaction potential is low.

Seismically induced landsliding is a hazard which may effect the slopes on this property. Slope stability analysis was outside of our scope of services for this project.

## DISCUSSIONS, CONCLUSIONS AND RECOMMENDATIONS

### GENERAL

1. The results of our investigation indicate that from a geotechnical engineering standpoint the property may be developed as proposed provided these recommendations are included in the design and construction.

2. Our laboratory testing indicates that the near surface soils possess moderately low expansive properties.

3. Grading and foundation plans should be reviewed by the Geotechnical Engineer during their preparation and prior to contract bidding.

4. The Geotechnical Engineer should be notified at least four (4) working days prior to any site clearing and grading operations on the property in order to observe the stripping and disposal of unsuitable materials, and to coordinate this work with the grading contractor. During this period, a pre-construction conference should be held on the site, with at least the owner, the grading contractor, a county representative and one of our engineers present. At this time, the project specifications and the testing and inspection responsibilities will be outlined and discussed.

5. Field observation and testing must be provided by a representative of Steven Raas & Associates to enable them to form an opinion regarding the adequacy of the site preparation, the acceptability of fill materials, and the extent to which the earthwork construction and the degree of compaction comply with the specification requirements. Any work related to grading performed without the full knowledge of, and not under the direct observation of Steven Raas & Associates, the Geotechnical Engineer, will render the recommendations of this report invalid.

6. Earthwork construction should be performed in accordance with the "Recommended Grading Specifications", Appendix B. These specifications set forth the minimum standards necessary to satisfy the other requirements of this report and without compliance with these standards, the design criteria in this report will not be valid.

SITE PREPARATION

7. The initial preparation of the site will consist of the removal of the existing foundations and slabs and any debris. Septic tanks and leaching lines, if found, must be completely removed.

8. Any wells encountered shall be capped in accordance with the requirements of the County Health Department. The strength of

the cap shall be equal to the adjacent soil and shall not be located within 5 feet of a structural footing.

9. Any voids created by septic tank and leach line removal must be backfilled with properly compacted native soils that are free of organics and other deleterious materials or with approved import fill.

10. Surface vegetation and organically contaminated topsoil should then be removed from the area to be graded. These soils may be stockpiled for future landscaping. The required depth of stripping will vary with the time of year and must be based upon visual observations of the Geotechnical Engineer. It is anticipated that the depth of stripping may be 2 to 4 inches.

11. Following the foundation removal and the stripping, the exposed soils in the building areas should be removed to a minimum depth of 24 inches below existing grade or as designated by the Geotechnical Engineer. The base of the excavation should be scarified and the soil moisture conditioned and compacted. The moisture conditioning procedure will depend upon the time of year that the work is done, but should result in the soils being 1 to 3 percent over their optimum moisture contents at the time of compaction. The excavated soil may then be placed and compacted in thin lifts. There should be a minimum of 12 inches of

engineered fill under all foundation elements. The excavation and compaction in the roadway and parking areas should extend to a minimum depth of 18 inches below the original ground surface and should result in a minimum of 8 inches of recompacted material below all roadway sections. Recompacted sections should extend 5 feet beyond all building and pavement areas.

Note: If this work is done during or soon after the rainy season, the on-site soils may be too wet to be used as engineered fill.

12. With the exception of the upper 8 inches of subgrade in paved areas and driveways, the soil on the project should be compacted to a minimum relative dry density of 90%. The upper 8 inches of subgrade in the pavement areas and all aggregate subbase and aggregate base should be compacted to a minimum relative dry density of 95%.

13. The relative dry density will be based on the maximum dry density obtained from a laboratory compaction curve run in accordance with ASTM Procedure #D1557-78. This test will also establish the optimum moisture content of the material. Field density testing will be in accordance with ASTM Test #D2922.

14. Should the use of imported fill be necessary on this

project, the fill material should be:

a. free of organics, debris and other deleterious materials
b. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open
c. free of rocks in excess of 2 inches in size
d. have a Plasticity Index between 4 and 12
e. have a minimum Sand Equivalent of 20, and
f. have a minimum Resistance "R" Value of 30 and be non-expansive

15. Samples of any proposed imported fill planned for use on this project should be submitted to the Geotechnical Engineer for appropriate testing and approval not less than 4 working days before the anticipated jobsite delivery.

CUT AND FILL SLOPES

16. All fill slopes should be constructed with engineered fill meeting the minimum density requirements of this report and have a gradient no steeper than 2:1 (horizontal to vertical). Fill slopes should not exceed 10 feet in vertical height unless specifically reviewed by the Geotechnical Engineer. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

17. Fill slopes shall be keyed into the native slopes by providing a 10 foot wide base keyway sloped negatively at least 2% into

the bank. The depth of the keyways will vary, depending on the materials encountered. It is anticipated that the depth of the keyways may be 3 to 6 feet, but at all locations shall be at least 2 feet into firm material.

Subsequent keys may be required as the fill section progress upslope. Keys will be designated in the field by the Geotechnical Engineer. See Figure No. 12 for general details.

18. Cut slopes shall not exceed a 2:1 (horizontal to vertical) gradient and a 10 foot vertical height unless specifically reviewed by the Geotechnical Engineer. Where the vertical height exceeds 15 feet, intermediate benches must be provided. These benches should be at least 6 feet wide and sloped to control surface drainage. A lined ditch should be used on the bench.

19. The above slope gradients are based on the strength characteristics of the materials under conditions of normal moisture content that would result from rainfall falling directly on the slope, and do not take into account the additional activating forces applied by seepage from spring areas. Therefore, in order to maintain stable slopes at the recommended gradients, it is important that any seepage forces and accompanying hydrostatic pressure encountered be relieved by adequate drainage. Drainage facilities may include subdrains, gravel blankets, rockfill

surface trenches or horizontally drilled drains. Configurations and type of drainage will be determined by the Geotechnical Engineer during the grading operations.

20. The surfaces of all cut and fill slopes should be prepared and maintained to reduce erosion. This work, as a minimum, should include track rolling of the slope and effective planting. The protection of the slopes should be installed as soon as practicable so that a sufficient growth will be established prior to inclement weather conditions. It is vital that no slope be left standing through a winter season without the erosion control measures having been provided.

21. The above recommended gradients do not preclude periodic maintenance of the slopes, as minor sloughing and erosion may take place.

22. If a fill slope is to be placed above a cut slope, the toe of the fill slope should be set back at least 8 feet horizontally from the top of the cut slope. A lateral surface drain should be placed in the area between the cut and fill slopes.

SLOPE EROSION CONTROL

23. The surface soils are classified as moderately to highly erodable. Therefore, the finished ground surface should be

planted with ground cover and continually maintained to minimize surface erosion.

FOUNDATIONS - GENERAL

24. At the time we prepared this report, the grading plans had not been completed and the structure location and foundation details had not been finalized. We request an opportunity to review these items during the design stages to determine if supplemental recommendations will be required.

FOUNDATIONS - SPREAD FOOTINGS

25. Considering the soil characteristics and site preparation recommendations, it is our opinion that an appropriate foundation system to support the proposed two or three story wood framed structures will consist of conventional spread footings bedded into engineered fills of the on-site soils. This system could consist of continuous exterior footings, in conjunction with interior isolated spread footings or additional continuous footings or concrete slabs.

26. Footing widths should be based on the allowable bearing value but not less than 15 inches for 2 story and 18 inches for 3 story structures. Footings should be embedded below the lowest adjacent grade not less than 18 inches for 2 story structures and 24 inches for 3 story structures. Should local building codes

require deeper embedment of the footings or wider footings, the local codes must apply. Footing excavations must be observed by the Geotechnical Engineer before steel is placed and concrete is poured to insure bedding into proper material. The footing excavations should be thoroughly saturated prior to placing concrete.

27. Footings constructed to the given criteria may be designed for the following allowable bearing capacities:

a. 1,800 psf for Dead Plus Live Load
b. a 1/3rd increase for Seismic or Wind Load

In computing the pressures transmitted to the soil by the footings, the embedded weight of the footing may be neglected.

28. No footing should be placed closer than 8 feet to the top of a fill slope nor 6 feet from the base of a cut slope.

29. The footings should contain steel reinforcement as determined by the Project Structural Engineer in accordance with applicable UBC or ACI Standards.

30. Important: If structural systems other than 2 or 3 story wood frame buildings are proposed, including concrete or steel frame buildings which could impose significant column loads on the soil, Steven Raas & Associates should be contacted for

further recommendations. The firm clays existing at depth on site may result in significant differential settlement for high column load buildings founded on spread footings.

SLAB-ON-GRADE CONSTRUCTION

31. Concrete slab-on-grade floors may be used for ground level construction on engineered fill.

32. Slabs may be structurally integrated with the footings. If the slabs are constructed as "free floating" slabs, they should be provided with a minimum 15 pound felt separation between the slab and footing. The slabs should be separated into approximately 15' x 15' square sections with dummy joints or similar type crack control devices.

33. All concrete slabs-on-grade should be underlain by a minimum 4 inch thick capillary break of 3/4" clean crushed rock. It is recommended that neither Class II baserock nor sand be employed as the capillary break material.

34. Where floor coverings are anticipated or vapor transmission may be a problem, a 10 mil waterproof membrane should be placed between the granular layer and the floor slab in order to reduce moisture condensation under the floor coverings. A 2 inch layer of moist sand on top of the membrane will help protect the mem-

brane and will assist in equalizing the curing rate of the concrete.

35. Requirements for pre-wetting of the subgrade soils prior to the pouring of the slabs will depend on the specific soils and seasonal moisture conditions and will be determined by the Geotechnical Engineer at the time of construction. It is important that the subgrade soils be thoroughly saturated at the time the concrete is poured.

36. Slab thickness, reinforcement, and dowelling should be determined by the Project Structural Engineer, based on the design live and dead loads, including vehicles.

UTILITY TRENCHES

37. Utility trenches that are parallel to the sides of the building should be placed so that they do not extend below a line sloping down and away at a 2 horizontal to 1 vertical slope from the bottom outside edge of all footings.

38. Trenches may be backfilled with the native materials or approved imported granular material with the soil compacted in thin lifts to a minimum relative dry density of 95% in street areas and 90% in other areas.

39. Jetting of the trench backfill should be carefully considered as it may result in an unsatisfactory degree of compaction.

40. Trenches must be shored as required by the local agency and the State of California Division of Industrial Safety construction safety orders.

LATERAL PRESSURES

41. Retaining walls with a horizontal backfill and fully drained should be designed using the following criteria:

a. When walls are free to yield an amount sufficient to develop the active earth pressure condition (about 1/2% of height), design for an active earth pressure of 40 psf/ft of depth.

b. For resisting passive earth pressure use 275 psf/ft of depth.

c. A "coefficient of friction" between base of foundation and soil of 0.30.

d. Any live or dead loads which will transmit a force to the wall. Refer to Figure No. 13.

Should the slope behind the retaining walls be other than horizontal, supplemental design criteria will be provided for the active earth or at rest pressures for the particular slope angle.

42. The above criteria are based on fully drained conditions. Therefore, we recommend that permeable material meeting the State of California Standard Specification Section 68-1.025, Class I,

Type A, be placed behind the wall, with a minimum width of 12 inches and extending for the full height of the wall to within 1 foot of the ground surface. The rock should be covered with Mirafi 140 filter fabric or equivalent and then compacted native soil placed to the ground surface. A 4 inch diameter perforated rigid plastic or metal drain pipe should be installed within 3 inches of the bottom of the granular backfill and be discharged to a suitable, approved location.

43. The area behind the wall and permeable material should be compacted with approved soil to a minimum relative dry density of 90%.

DRAINAGE - SURFACE

44. Surface water must not be allowed to pond or be trapped adjacent to the building foundations nor on the building pad nor in the parking areas.

45. All roof eaves should be guttered, with the outlets from the downspouts provided with adequate capacity to carry the storm water from the structures to reduce the possibility of soil saturation and erosion. The connection should be in a closed conduit which discharges at an approved location away from the structures and the graded area.

46. Final grades should be provided with a positive gradient away from all foundations in order to provide for rapid removal of the surface water from the foundations to an adequate discharge point. Concentrations of surface water runoff should be handled by providing necessary structures, such as paved ditches, catch basins, etc.

47. Cut and fill slopes shall be constructed so that surface water will not be allowed to drain over the top of the slope face. This may require berms along the top of fill slopes and surface drainage ditches above cut slopes.

48. Irrigation activities at the site should not be done in an uncontrolled or unreasonable manner.

49. The building and surface drainage facilities must not be altered nor any filling or excavation work performed in the area without first consulting the Geotechnical Engineer.

PAVEMENT DESIGN

50. The design of the pavement section was beyond our scope of services for this project. To have the selected pavement sections perform to their greatest efficiency, it is very important that the following items be considered:

a. Properly moisture condition the subgrade and

compact it to a minimum relative dry density of 95%, at a moisture content 1-3% over the optimum moisture content.

b. Provide sufficient gradient to prevent ponding of water.

c. Use only quality materials of the type and thickness (minimum) specified. All baserock must meet Cal-Trans Standard Specifications for Class II Aggregate Base, and be angular in shape.

d. Compact the base and subbase uniformly to a minimum relative dry density of 95%.

e. Place the asphaltic concrete only during periods of fair weather when the free air temperature is within prescribed limits.

f. Maintenance should be undertaken on a routine basis.

PLAN REVIEW

51. We respectfully request an opportunity to review the plans during preparation and before bidding to insure that the recommendations of this report have been included and to provide additional recommendations, if needed.

# LIMITATIONS AND UNIFORMITY OF CONDITIONS

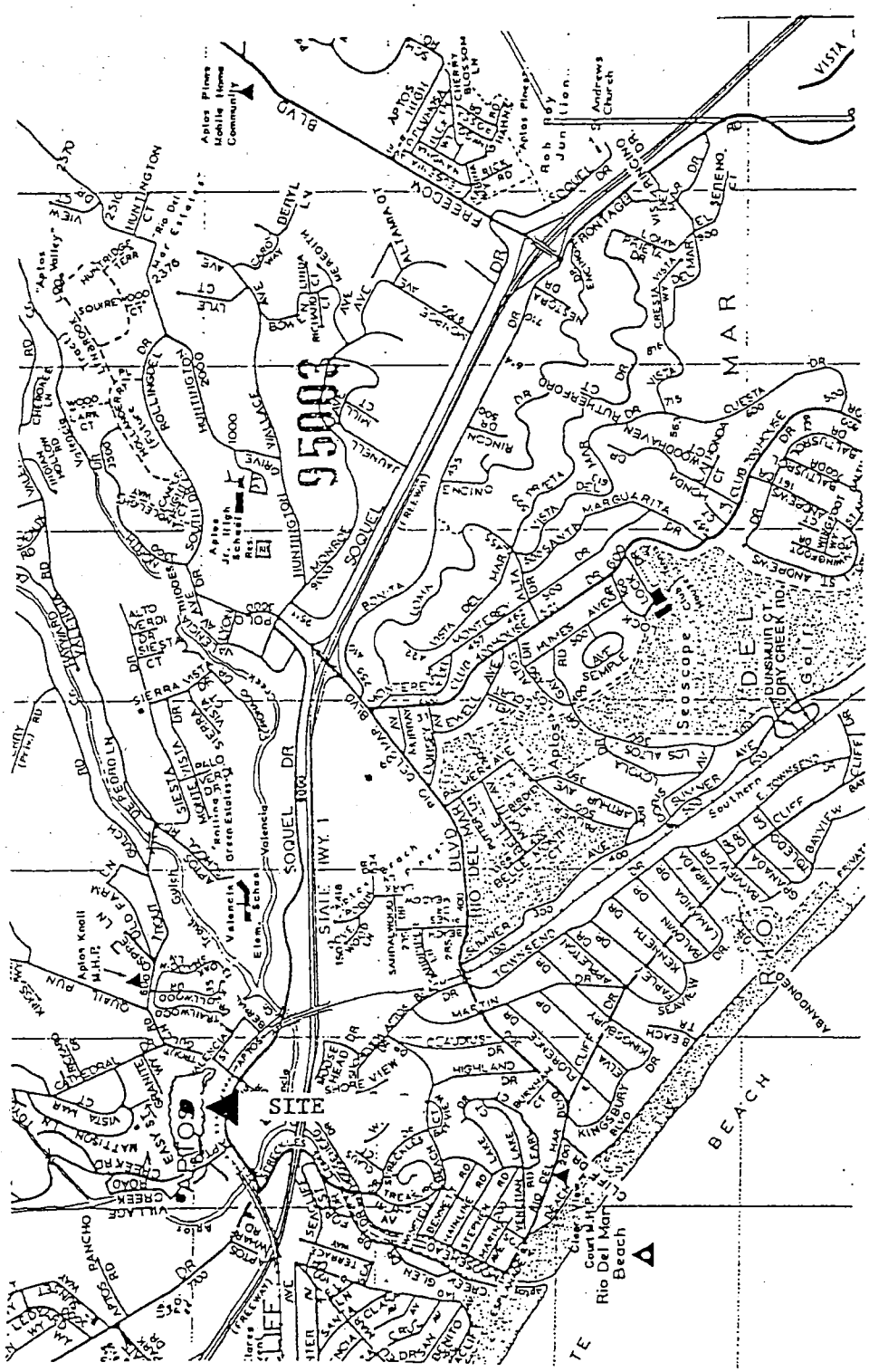
1. The recommendations of this report are based upon the assumption that the soil conditions do not deviate from those disclosed in the borings. If any variations or undesirable conditions are encountered during construction, or if the proposed construction will differ from that planned at the time, our firm should be notified so that supplemental recommendations can be given.

2. This report is issued with the understanding that it is the responsibility of the owner, or his representative, to ensure that the information and recommendations contained herein are called to the attention of the Architects and Engineers for the project and incorporated into the plans, and that the necessary steps are taken to ensure that the Contractors and Subcontractors carry out such recommendations in the field.

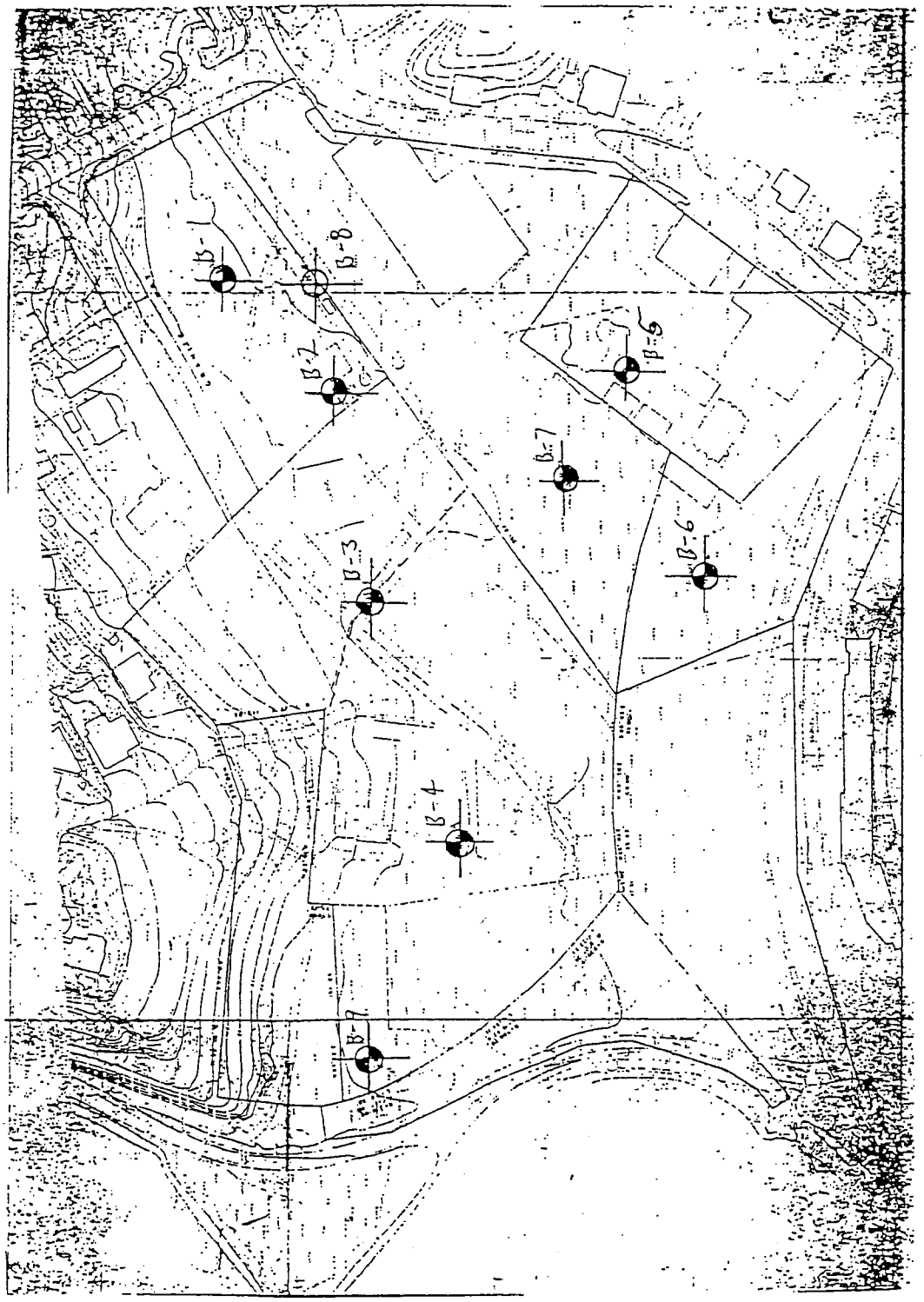
3. The findings of this report are valid as of the present date. However, changes in the conditions of a property can occur with the passage of time, whether they are due to natural process or the works of man, on this or adjacent properties. In addition, changes in applicable or appropriate standards occur, whether they result from legislation or the broadening of knowledge. Accordingly, the findings of this report may be invalidated, wholly or partially, by changes outside of our control. This report should therefore be reviewed in light of future planned construction and then current applicable codes.

APPENDIX A

Regional Site Plan
Site Plan Showing Test Borings
Log of Test Borings
Keyway Detail
Surcharge Pressure Diagram




| Steven Raas & Associates | FIGURE NO: 1 | Regional Site Plan |
|---|---|---|




Steven Raas & Associates | FIGURE NO.: 2 | Site Plan Showing Test Borings



FORM NO. 2

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 1

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t.s.f. - Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Dark brown Clayey SAND, loose, dry, sand fine grained | | | | | | |
| 2 | | | medium dense | | | | | | |
| 3 | | | Orange brown mottled SILT with trace sand and gravel, moist, very stiff, gravel fine grained, rounded | | | | | | |
| 5 | 1-1 L | | | | 13 | | 97.6 | 21.8 | Qu=3465 psf |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | 1-2 L | | similar to above except stiff, slightly sandier<br>no sample recovered | | 10 | | | | |
| 10 | | | | | | | | | |
| 11 | | | grading to | | | | | | |
| 12 | | | Brown Clayey SAND, moist, loose, cohesive, sand medium grained | | | | | | |
| 13 | | | | | | | | | |
| 14 | 1-3 L | | | | 13 | | 107.3 | 19.5 | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| | | | Break-in-log | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | Brown Gravelly SAND, very moist, very dense, sand well graded, gravel fine, rounded | | | | | | |
| 24 | 1-4 L | | | | 50/6" | | 105.4 | 12.7 | |
| 25 | | | | | | | | | |
| | | | Boring Terminated @ 25' | | | | | | |

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FIGURE NO. 3 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 2

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Brown Clayey SAND, loose, dry, sand fine grained | | | | | | |
| 2 | 2-1 L | | damp | | | | | | |
| 3 | | | becoming medium dense, moist, sand well graded | | 24 | | 116.4 | 8.6 | Qu=3765 psf |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | continue in medium dense brown clayey sand | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | Gray SAND with trace silt, moist, very dense, sand fine to medium grained | | | | | | |
| 14 | 2-2 L | | | | 50 | | 93.6 | 16.5 | |
| 15 | | | Boring Terminated @ 15' | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

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FIGURE NO. 4 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 3

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 1" AC<br>Brown Clayey SAND, loose, slightly moist, sand medium to fine | | | | | | |
| 5 | 3-1 L | | continue in clayey sand, moist, medium dense, with locally heavy orange iron oxide staining | | 17 | | 109.6 | 17.6 | Qu=3225 psf |
| 9 | | | decreasing sand content 7-10' | | | | | | |
| 10 | 3-2 L | | Orange Sandy GRAVEL, moist, very dense, gravel fine, rounded, weathered (iron oxide rinds), sand well graded except for local fine grained beds 3" thick | | 48 | | 119.4 | 12.0 | |
| 15 | | | Boring Terminated @ 15' | | | | | | |

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FIGURE NO. 5 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 4

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. . Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Brown Sandy CLAY, dry, loose, firm | | | | | | |
| 2 | | | | | | | | | |
| 3 | | | Brown Clayey SAND, moist, medium dense, sand fine, orange mottling locally | | | | | | |
| 4 | 4-1 L | | | | 12 | | 104.8 | 14.2 | Qu=620 psf |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | Tan Sandy CLAY, moist, stiff, sand fine grained | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | Orange brown SAND with trace gravel, moist, medium dense, sand graded, gravel fine, rounded | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | 4-2 L | | | | 19 | | 99.9 | 12.3 | |
| 20 | | | | | | | | | |
| 21 | | | Boring Terminated @ 20' | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

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FIGURE NO. 6 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 5

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Dark brown Clayey SAND, dry, loose | | | | | | |
| 2 | | | Orange brown Clayey SAND, moist, medium dense | | | | | | |
| 3 | | | | | | | | | |
| 4 | 5-1 L | | | | 19 | | 101.1 | 19.8 | Qu=2590 psf |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | | | | | | | |
| 8 | | | Orange brown SAND, moist, medium dense, sand medium to fine grained | | | | | | |
| 9 | 5-2 T | | | | 30 | | | 16.8 | |
| 10 | | | | | | | | | |
| 11 | | | very dense below 11' | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | 5-3 L | | continue in brown sand, moist, very dense, well graded | | 47 | | 95.0 | 11.9 | |
| 15 | | | Boring Terminated @ 15' | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

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FIGURE NO. 7 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 6

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. . Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | 2" concrete<br>Dark brown Clayey SAND with trace organics, damp, loose | | | | | | |
| 2 | 6-1 | | | | 10 | | 105.7 | 12.2 | Qu=2460 psf |
| 3 | L | | continue in dark brown clayey sand, moist, loose | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | Tan Sandy CLAY with some silt, with horizontal orange (oxide) and black laminations, slightly moist, very stiff | | | | | | |
| 8 | | | | | | | | | |
| 9 | 6-2 | | | | 17 | | 105.0 | 19.0 | Qu=10840 psf |
| 10 | L | | moist | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | continue in very stiff, damp to slightly moist, silty clay | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | Boring Terminated @ 20' | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

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FIGURE NO. 8 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 7

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. - Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1 | | | Dark brown Sandy CLAY, dry to damp, soft | | | | | | |
| 2 | 7-1 | | Orange brown Clayey SAND, damp, medium dense, cohesive, sand well graded, coarse to fine, coarse grains weathered | | 23 | | 112.6 | 8.6 | |
| 3 | L | | | | | | | | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | | | | | | | |
| 7 | | | tan below 7' | | | | | | |
| 8 | | | | | | | | | |
| 9 | | | | | | | | | |
| 10 | | | continue in tan clayey sand, medium dense, moist | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | 7-2 | | gravelly 13½-14' | | 81 | | | 14.6 | |
| 15 | T | | Gray SAND, moist, very dense, sand fine grained | | | | | | |
| 16 | | | Boring Terminated @ 15' | | | | | | |
| 17 | | | | | | | | | |
| 18 | | | | | | | | | |
| 19 | | | | | | | | | |
| 20 | | | | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

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FIGURE NO. 9 Log of Test Borings

LOGGED BY MRR DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 8

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f. - Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 1–2 | | | Dark brown Clayey SAND, dry, loose, sand fine grained | | | | | | |
| 3–4 | 8-1 T | | Orange brown Sandy CLAY with some silt, moist, stiff, sand very fine grained | | 13 | | | 18.7 | LL=25% PI=2 |
| 5–9 | | | | | | | | | |
| 10–14 | | | Tan Clayey SAND, moist, medium dense, sand medium to fine grained | | | | | | |
| 15 | | | Boring Terminated @ 15' | | | | | | |
| 16–24 | | | | | | | | | |

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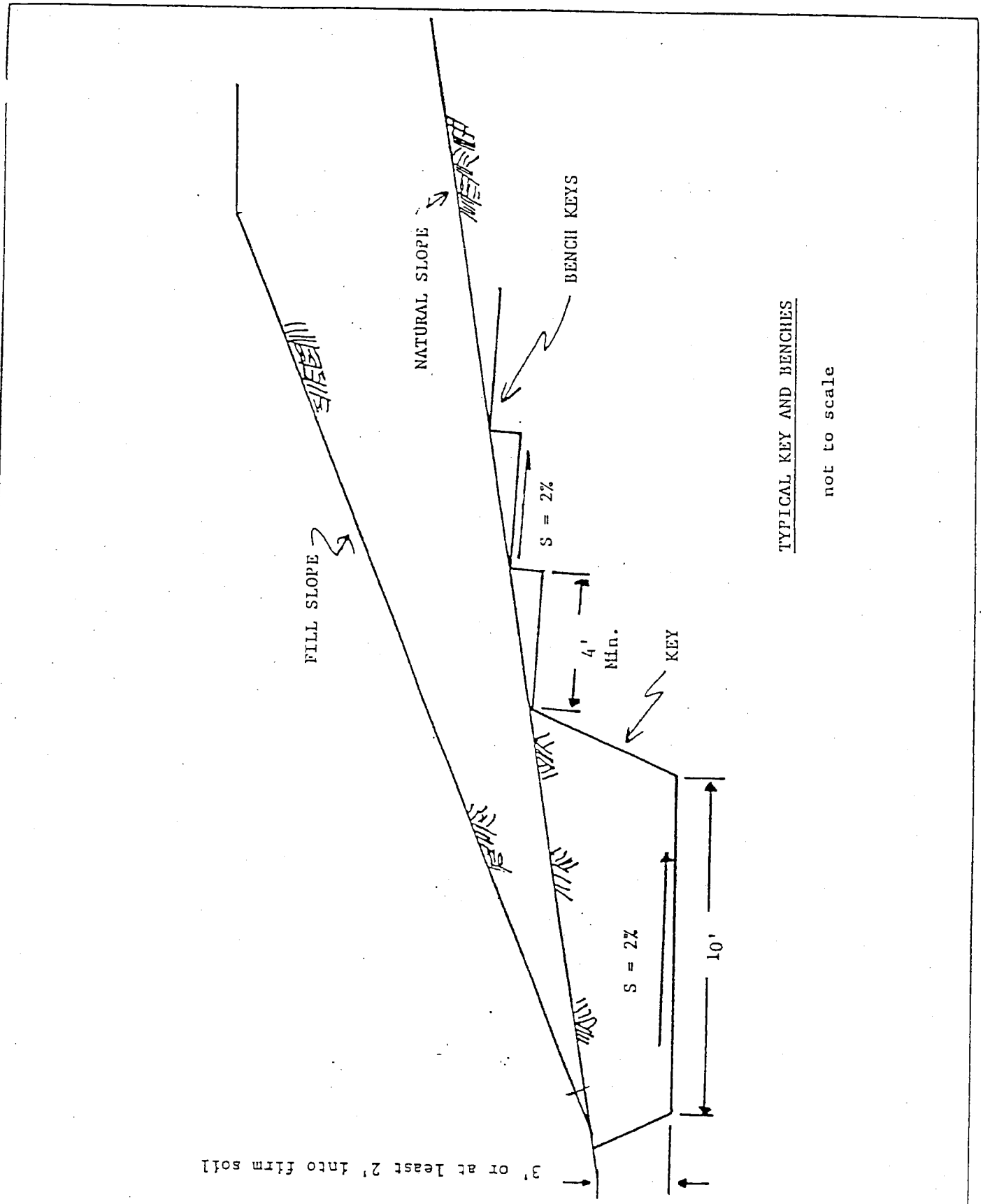
FIGURE NO. 10 Log of Test Borings

LOGGED BY MBB DATE DRILLED 6/8/89 BORING DIAMETER 6" BORING NO. 9

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft-lbs. | Qu - t. s. f., Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| | | | FILL | | | | | | |
| | | | Gray Gravelly SAND, loose, dry | | | | | | |
| 1 | | | NATIVE | | | | | | |
| | | | Brown Clayey SAND, slightly moist, loose, | | | | | | |
| 2 | 9-1 | | sand medium to fine grained | | | | | | |
| 3 | T | | | | 6 | | | 11.4 | |
| 4 | | | | | | | | | |
| 5 | | | | | | | | | |
| 6 | | | Brown CLAY with trace sand with orange | | | | | | |
| 7 | | | mottling, moist, firm | | | | | | |
| 8 | | | | | | | | | |
| 9 | 9-2 | | | | 8 | | | 16.8 | |
| 10 | T | | | | | | | | |
| 11 | | | | | | | | | |
| 12 | | | | | | | | | |
| 13 | | | | | | | | | |
| 14 | | | | | | | | | |
| 15 | | | | | | | | | |
| 16 | | | Gray brown SAND with trace silt, moist, | | | | | | |
| 17 | | | meidum dense, graded | | | | | | |
| 18 | | | | | | | | | |
| 19 | 9-3 | | | | 27 | | | 28.7 | |
| 20 | T | | | | | | | | |
| | | | Boring Terminated @ 20' | | | | | | |
| 21 | | | | | | | | | |
| 22 | | | | | | | | | |
| 23 | | | | | | | | | |
| 24 | | | | | | | | | |

Steven Raas & Associates

FIGURE NO. 22 Log of Test Borings



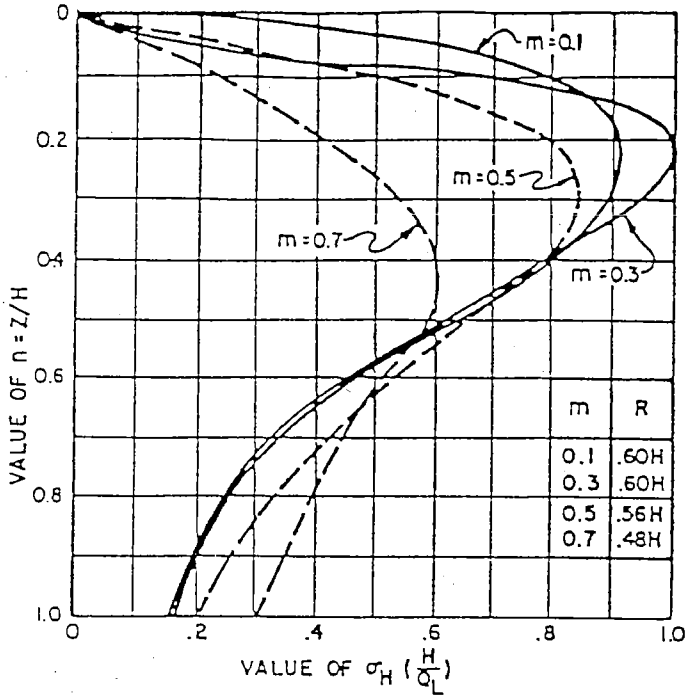

TYPICAL KEY AND BENCHES

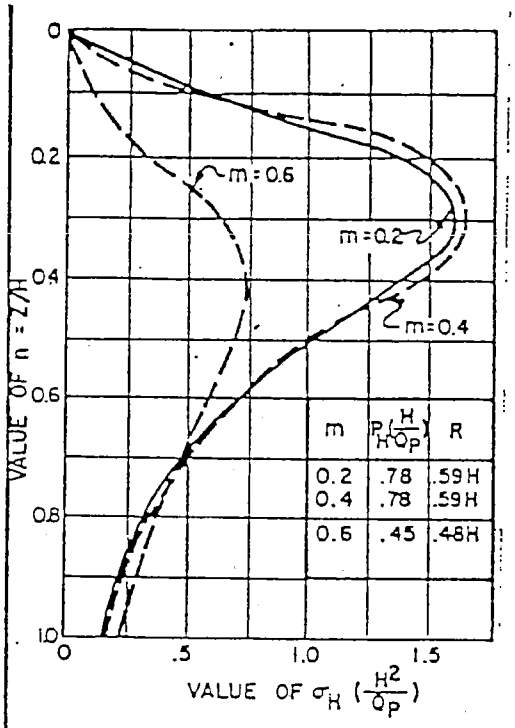
not to scale

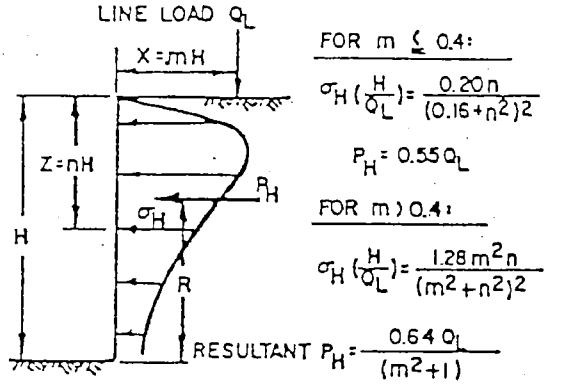
| STEVEN RAAS & ASSOCIATES | FIGURE NO. 12 Keyway Detail |
|---|---|



LITHO HATBOROVILLE PRESS




FOR $m \leq 0.4$:

$$\sigma_H\left(\frac{H}{Q_L}\right) = \frac{0.20n}{(0.16+n^2)^2}$$

$$P_H = 0.55\,Q_L$$

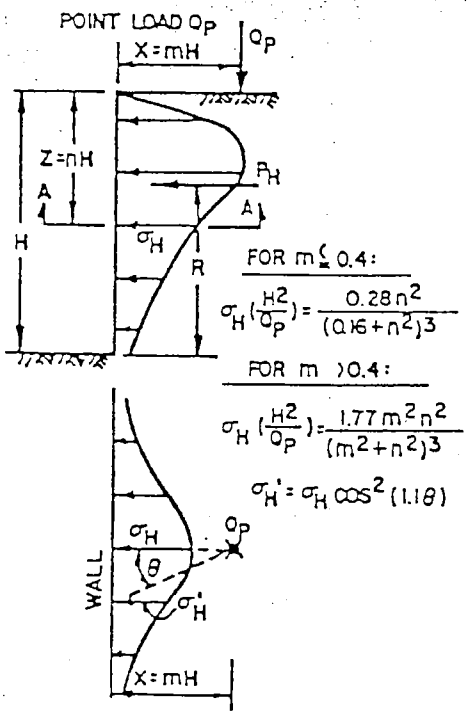
FOR $m > 0.4$:

$$\sigma_H\left(\frac{H}{Q_L}\right) = \frac{1.28m^2n}{(m^2+n^2)^2}$$

PRESSURES FROM LINE LOAD $Q_L$

(BOUSSINESQ EQUATION MODIFIED BY EXPERIMENT)

Reference: Design Manual
NAVFAC DM-7.2
Figure 11
Page 7.2-74




FOR $m \leq 0.4$:

$$\sigma_H\left(\frac{H^2}{Q_P}\right) = \frac{0.28n^2}{(0.16+n^2)^3}$$

FOR $m > 0.4$:

$$\sigma_H\left(\frac{H^2}{Q_P}\right) = \frac{1.77m^2n^2}{(m^2+n^2)^3}$$

$$\sigma_H' = \sigma_H \cos^2(1.1\theta)$$

SECTION A-A

PRESSURES FROM POINT LOAD $Q_P$

(BOUSSINESQ EQUATION MODIFIED BY EXPERIMENT)

| STEVEN RAAS & ASSOCIATES | FIGURE NO. 13 Surcharge Pressure Diagram - 1 |
|---|---|

# RECOMMENDED GRADING SPECIFICATIONS

1. These Recommended Grading Specifications are for the proposed Aptos Junction.

2. SCOPE OF WORK: These specifications pertain to and include all earthwork related to the site, rough grading, site clearing and grubbing, stripping, preparation of foundation materials for receiving fills, excavations, and the processing, placement and compaction of fill materials to the lines and grades shown on the project plans, and placement of subsurface drain lines, and are only valid when used in conjunction with the attached report. This work must be observed and tested by a representative of Steven Raas & Associates, Consulting Geotechnical Engineers, herein-after known as the Geotechnical Engineer, who shall be the owner's representative. If the contractor should fail to meet the technical requirements embodied in these specifications, he shall make the necessary adjustments until a satisfactory fill, as determined by the Geotechnical Engineer, is obtained. The Geotechnical Engineer shall give written approval upon satisfactory completion of the earthwork. No deviation from these specifications can be made except upon written approval from the Geotechnical Engineer at least four working days prior to commencement of any work.

3. CONDITIONS AT THE SITE: Visit the site. Examine and note all conditions as to the character and extent of work involved.

4. PERMITS, ORDINANCES: Procure and pay for all necessary permits or certificates required by local authorities having jurisdiction over the work. Comply with all Federal, State and Local ordinances applicable to the work.

5. SITE PREPARATION: Site preparation shall consist of clearing and grubbing, stripping, excavation and removal of unsuitable materials, and preparation of the foundation materials to receive fill.

6. CLEARING AND GRUBBING: The contractor shall accept the site in its present condition and shall remove from the areas of earthwork all materials considered deleterious by the Geotechnical Engineer.

7. EXCAVATION FOR THE REDENSIFICATION OF EXISTING SOIL: The excavation shall be continuous under the entire structure areas and shall extend to the elevation shown on the drawings

but in no case less than the depth specified in the Geotechnical Investigation. Additionally, excavations shall extend a horizontal distance of 5 feet beyond the outside perimeter. After the soils have been excavated and the approved materials stockpiled, the next 6 inches of in-place soils shall be scarified, moisture conditioned and compacted as delineated in Paragraph 8 below. Moisture shall be added or the soil dried so that the moisture content at the time of compaction is 1-3% above the optimum moisture content of the soil. The approved excavated soils shall then be replaced in uniformly thin layers, approximately 6 inches in thickness, moisture conditioned and compacted as delineated in Paragraph 10 below. The backfilling process shall extend up to the design grade.

8. FOUNDATION PREPARATION OF AREAS TO RECEIVE FILL: Loose and/or disturbed soil shall be scarified to a 6 inch depth, moisture conditioned as necessary and compacted to a minimum relative dry density of 90% as determined by ASTM Test Designation #D1557-78. Moisture shall be added or the soil dried so that the moisture content at the time of compaction is 1-3% above the optimum moisture content of the soil. All areas which are to receive fill shall be approved by the Geotechnical Engineer prior to the placement of any material.

Note: The ASTM D1557-78 Test shall be used as the laboratory compaction test for control of all soils to be compacted on the site.

9. FILL MATERIAL: The source of material to be used for fill, in addition to the acceptable on-site soils, shall be tested and approved by the Geotechnical Engineer prior to the commencement of work. Samples of any proposed imported fill planned for use on this project shall be submitted to the Geotechnical Engineer for appropriate testing and approval no less than 4 working days prior to the anticipated jobsite delivery. Fill material shall be:

a. free of organics, debris and other deleterious materials
b. granular in nature, well graded, and contain sufficient binder to allow utility trenches to stand open
c. free of rocks in excess of 2 inches in size
d. have a Plasticity Index between 4 and 12
e. have a minimum Sand Equivalent of 20, and
f. have a minimum Resistance "R" Value of 30 and be non-expansive

10. PLACEMENT, SPREADING AND COMPACTION: The placement and

spreading of fill materials and its processing and compaction of fill materials by flooding, ponding, or jetting shall not be permitted without the prior approval of the Geotechnical Engineer. The fill shall be placed in 6 inch lifts (compacted layers), moisture conditioned as required so that the moisture content at the time of compaction is 1-3% above the optimum moisture content of the soil and each lift shall be compacted to a minimum relative dry density of 90%. Field density tests shall be made by the Geotechnical Engineer to ensure proper compaction.

11. SUBGRADE PREPARATION: A minimum of 8 inches of subgrade soil under all pavement sections shall be compacted to a minimum relative dry density of 95%. This depth of densified soils does not include any additional fill material required to bring the subgrade to grade.

12. AGGREGATE BASE SECTION: Cal-Trans Class II Aggregate Base material shall be compacted to a minimum relative dry density of 95% as determined by ASTM Test Designation #D1557-78.

13. UNDERGROUND UTILITIES: Backfill for underground utilities placed on the site shall consist of the approved on-site near surface soils or other granular soils meeting the requirements of paragraph 9 so as to maintain the upper stratum soil as uniform as possible. Backfill within the utility trenches shall be compacted to a minimum relative dry density of 95% in street areas and 90% in other locations, (based on the maximum dry density as determined by ASTM Test Designation #D1557-78).

14. DUST CONTROL: The Contractor shall conduct all grading operations in such a manner as to preclude wind blown dirt and dust and related damage to neighboring properties. The means of dust control shall be left to the discretion of the Contractor. The Contractor shall assume liability for claims related to wind blown material.

15. SEASONAL LIMITS: No fill material shall be placed, spread or rolled during unfavorable weather conditions. When the work is interrupted by heavy rains, fill operations shall not resume until field density tests taken by the Geotechnical Engineer indicate that the moisture content and density of the fill meet the specified requirements.

16. UNUSUAL CONDITIONS: In the event that any unusual conditions, not covered in the soils report, are encountered during grading operations, the Geotechnical Engineer shall be immediately notified for directions.

Project No. SC9427
28 September 2007

BARRY SWENSON BUILDER
5300 Soquel Avenue, Suite 103
Santa Cruz, California 95062

Attention: Jesse Nickell

Subject: Updated Geotechnical Investigation Report

Reference: Aptos Village Phase I
Santa Cruz County, California

Dear Mr. Nickell:

The purpose of this letter report is to update the existing Geotechnical Investigation for the subject property by Steven Raas and Associates, dated 20 June 1989, and to include design criteria not required at the time of the original report.

**Site Location**

The project is located in Aptos Village approximately one quarter mile north of State Highway 1, on the north side of Soquel Drive. The site is bordered by Soquel Drive to the south, Trout Gulch Road to the east, Aptos Creek Road to the west and Granite Way to the north. It is roughly 13.5 acres in size with existing commercial buildings, storage buildings, and abandoned concrete foundations from demolished structures. The existing structures are arrayed around the perimeter of the site. Most of the undeveloped portion of the site is currently covered in grasses or is bare ground used for parking. The site slopes gently towards the south, east, and west, becoming essentially flat at the boundaries in these directions.

**Project Description**

We have been provided with preliminary project plans by Thatcher and Thompson Architects, dated 22 August 2007. It is our understanding, based upon our review of these documents, the development will consist of approximately 25 new buildings on the referenced site. Proposed uses include mixed use (presumably residential and commercial), commercial, and hotel commercial. New buildings will be one to three stories high, and presumably of wood frame or masonry construction with some slabs-on-grade. In addition, an existing barn/packing shed used by antique dealers is to be adapted and re-used in a new location on the site. Infrastructure improvements include underground utilities, storm drain system, and streets and parking areas. A portion of the northwest corner of the site is set aside for future recreational use.

**Previous Investigations**

A geotechnical investigation for earlier proposed development at the site was conducted by Steven Raas and Associates in June 1989. The specific geotechnical concerns raised in the Raas report include presence of loose and/or soft soil in foundation zones, control of surface runoff (both during and after construction), construction of engineered fill slopes, and seismic factors such as liquefaction and lateral spreading potential, ground shaking, surface ground rupture, and seismically induced slope instability. Liquefaction, lateral spreading, and ground rupture potential was considered low at this site. Slope stability analysis was outside the scope of the Raas report, as it is also beyond the scope of this update. **Given that our observations at the site indicate that soil conditions at the site have changed little since the Raas report, we conclude that the recommendations of the Raas report remain valid.** We include in this update letter additional recommendations not required at the time of the Raas report. Included are general site drainage and utility trench construction recommendations, as well as seismic coefficients as specified in the 1997 Uniform Building Code. Percolation tests were performed to determine the drainage properties of the in-situ soils. R-value tests were performed to provide parameters for the design of pavement structural sections.

It is our understanding that a feasibility level geotechnical investigation is requested at this time for the project. A specific design level geotechnical investigation may be required by the Santa Cruz County Planning Department for each individual building site prior to development.

**Field Exploration**

Subsurface conditions were investigated by our firm on 29 August 2007. Exploration consisted of nine (9) borings drilled to depths of 11.5 to 16.5 feet. The approximate location of the test borings are indicated on the Boring Location Site Plan (Figure 2). The borings were advanced with 6-inch diameter continuous flight-auger equipment mounted on a truck.

Representative soil samples were obtained from the exploratory borings at selected depths, or at major strata changes. These samples were recovered using the 3.0 inch O.D. Modified California Sampler (L) or the Standard Terzaghi Sampler (T).

The penetration resistance blow counts noted on the boring logs were obtained as the sampler was dynamically driven into the in situ soil. The process was performed by dropping a 140-pound hammer a 30-inch free fall distance and driving the sampler 6 to 18 inches and recording the number of blows for each 6-inch penetration interval. The blows recorded on the boring logs represent the accumulated number of blows that were required to drive the last 12 inches.

The soils encountered in the borings were continuously logged in the field and described in accordance with the Unified Soil Classification System (ASTM D2486). The Logs of Test Borings are included in Appendix A of this report. The Boring Logs denote subsurface conditions at the locations and time observed, and it is not warranted that they are representative of subsurface conditions at other locations or times.

Five of the borings were configured for percolation testing. Percolation tests were performed on 4 September 2007. Tests were four hours in duration. The water level in the standpipe was measured at approximately 30 minute intervals.

**Laboratory Testing**

The laboratory testing program was directed toward determining pertinent engineering and index soil properties.

The natural moisture contents and dry densities were determined on selected samples and are recorded on the boring logs at the appropriate depths. Since water has a significant influence on soil, the natural moisture content provides a rough indicator of the soil's compressibility, strength, and potential expansion characteristics.

The strength parameters of the underlying earth materials were determined from field test values derived from field penetration resistance of the in situ soils, and from laboratory direct shear testing. Atterberg limits testing was performed to aid in soil classification and as an indicator of expansion potential of the native soils. Gradation analysis was performed on soils in the foundation zone to determine grain size distribution and specifically the proportion of fines in the soils.

R-value testing was performed to develop criteria for pavement design and construction.

The results of the field and laboratory testing appear on the "Logs of Test Boring" opposite the sample tested. Results of percolation and R-value testing appear elsewhere in this report and in Appendix B.

**Groundwater**

Groundwater was not encountered in our borings during drilling, nor was it encountered in borings drilled by Steven Raas and Associates. Ground water depths will probably vary seasonally, and can be expected to fluctuate due to variations in rainfall or other factors not evident during our investigation.

**Geologic Environment**

The site is located north of the confluence of Aptos and Trout Gulch Creeks. In-situ soils at the site consist of alluvial fan facies (Qof) underlain by Purisima sandstone bedrock. The alluvial material is composed of semi-consolidated, moderately to poorly sorted discontinuous layers of silty clay, silt, sand and gravel. Strata were deposited by streams, sheet flow or debris flow. These deposits are up to 50 feet thick. (Brabb, 1997) Bedrock was encountered in our boring at the southeast corner of the site at a depth of approximately 16 feet. In Raas and Associates' boring at the northeast corner of the site, a material which was visually similar and in which similar SPT blow counts were recorded was encountered at a depth of approximately 24 feet.

**Subsurface Conditions**

In general, the native earth materials underlying this site to the depths explored consist of silty sands, clayey sands, and sandy silts with embedded siltstone and sandstone gravels. Sampling and testing data suggest moderate amounts of non plastic silts. The sandy soils are loose near the ground surface but become medium dense to dense with depth. The area is underlain by very dense Purisima sandstone bedrock.

In general, it is our opinion that the native materials underlying this site possess adequate engineering characteristics for support of the proposed improvements, provided our recommendations and those of the Raas report are incorporated into the design and construction of the project. We provide the following design criteria and recommendations for this project.

**Foundations**

At the time of this update, we have not had the opportunity to review final grading and foundation details. Therefore, our recommendations are general in nature. Supplemental recommendations may be required upon completion of final plans.

Foundations for the project may be conventional spread footings embedded in engineered fills consisting of the on-site native soils. Following demolition of existing structures designated for removal and stripping of organic-laden topsoil, exposed soil in the area of proposed buildings should be removed to a minimum depth of 24 inches below existing grade or as designated by the geotechnical engineer. The base of the excavation should be scarified to a depth of 6 inches, moisture conditioned, and compacted to at least 90 percent relative compaction. Native soil (or imported fill approved by the geotechnical engineer) may then be placed in thin lifts not exceeding 8 inches in loose thickness and compacted to 90 percent minimum relative compaction. There should be a minimum of 12 inches of engineered fill under all foundation elements.

In roadway and parking areas, the depth of subexcavation should be a minimum of I2 inches. The base of the excavation should be scarified a depth of 6 inches, moisture conditioned, and compacted to 90 percent relative compaction. Engineered fill should be compacted to at least 90 percent relative compaction with the upper 8 inches compacted to at least 95 percent relative compaction.

The area of redensification should extend 5 feet beyond the perimeter of all buildings and paved areas.

Footings should be embedded a minimum of 18 inches below the nearest adjacent grade for 2 story structures and 24 inches for 3 story structures. Depth of redensification may exceed 24 inches to achieve both minimum embedment and the required minimum thickness of engineered fill of 12 inches below the bottom of footings.

Footing excavations must be observed by the geotechnical engineer prior to placement of reinforcing steel and concrete.

**Cut and Fill Slopes**

Temporary excavations should be properly shored and braced during construction to prevent sloughing and caving at sidewalls. The contractor should be aware of all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

There should be a minimum of 10 feet horizontal separation between the bottom of all footing elements and the top of a fill slope or the base of a cut slope. In addition, the bottom of all footing elements should be at least 10 feet horizontally from the nearest adjacent slope. These are minimum distances. Additional setback requirements contained in Section 1806 of the 2001 California Building Code may also be applicable.

Site grading for the current project is anticipated to consist of demolition of existing structures, primarily abandoned foundations, stripping of existing groundcover and trees, and removal of accumulated debris. If additional cuts or fills are required, they should be completed in accordance with the requirements of the Raas report and this update. Design criteria for retaining walls included in the Raas report are applicable to the current project. Additional retaining wall recommendations are noted below.

Voids created by the removal of trees or existing structures should be filled in accordance with paragraph 8 of the Raas report. Several large trees were removed from the site in the Spring of 2007 and the resulting holes filled with

engineered fill. Our firm has records of the compaction testing of these in-filled holes.

After the earthwork operations have been completed and the geotechnical engineer has finished his observation of the work, no further earthwork operations shall be performed without the direct observation and approval of the geotechnical engineer.

**Surface Drainage**

Gutters should be connected to downspouts that connect with closed rigid conduits to carry runoff away from the structure. The conduits should discharge at locations that minimize erosion and saturation of slopes. Existing conduits that are discovered in the course of construction should be removed or directed away from the proposed and existing buildings. Drainage pipe should not conduct runoff beneath proposed construction. Runoff should not be allowed to flow over adjacent slopes.

Stormwater runoff may be be required to be stored on site prior to discharge into the County storm drain system, or to be allowed to percolate into the in-situ native soils. Criteria for design of retention or detention facilities have been developed based on percolation tests at the site and are included in the Percolation section of this report. It is the responsibility of the project Civil Engineer to design these facilities as part of the overall drainage plan for the project.

Irrigation activities at the site should be done in a controlled and reasonable manner. Planter areas should not be sited adjacent to walls; otherwise, measures should be implemented to contain irrigation water and prevent it from seeping into walls and under foundations.

The migration of water or spread of extensive root systems below foundations, slabs, or pavements may cause undesirable differential movements and subsequent damage to these structures. Landscaping should be planned accordingly.

Drainage patterns approved at the time of fine grading should be maintained throughout the life of the proposed structure.

**Percolation**

Percolation tests were conducted in Borings B-1, B-2, B-3, B-4, and B-5, which were located in areas planned for parking and streets. After boring and sampling, a 4 inch slotted pipe was inserted in each hole, and the annular space between the pipe and the walls of the boring was filled with round gravel. All borings were

pre-saturated and capped for a minimum of 24 hours prior to percolation testing. Tests were four hours in duration using the falling head method. Water level readings were taken at approximately 30 minute intervals. The last two readings were used to determine the percolation rate. Data from these tests is presented in Appendix B.

The highest percolation rates were found in Boring B-2 (at the southeast corner of the site in front of the Bayview Hotel), and in Boring B-4 (on the west side of the site behind 8035 Soquel Drive, Unit 23, currently a dance studio). The lowest rates were in Boring B-3 (at the southwest corner of the site in front of 8035 Soquel Drive, Unit 33, currently a liquor store) and in Boring B-5 ( at the northeast corner of the site behind 417 Trout Gulch Road, Village Fair). It should be noted that percolation rates vary with depth and are dependent on the permeability of the strata encountered in the borings. Seasonal variations in the degree of soil saturation will also affect percolation rates.

**Utility Trenches**

Trenches must be properly shored and braced during construction or laid back at an appropriate angle to prevent sloughing and caving at sidewalls. The project plans and specifications should direct the attention of the contractor to all CAL OSHA and local safety requirements and codes dealing with excavations and trenches.

We strongly recommend placing a 3 foot concrete plug in each trench where it passes under the exterior foundations. Care should be taken not to damage utility lines.

Trenches should be capped with 1.5± feet of relatively impermeable soil.

**Seismic Shaking**

The primary seismic hazard associated with the proposed development appears to be the potential for strong ground shaking. Experience following the 17 October 1989 Loma Prieta earthquake indicates that the quality of construction is a primary factor affecting the amounts of earthquake damage sustained by wood framed structures. Most of the structural damage from the Loma Prieta earthquake was sustained in buildings where the foundations were not adequately embedded into firm materials, where the wood-frame was not well braced for lateral shear and/or where the wood-frame was not securely tied to the building foundations.

Conversely, where wood-frame structures were supported on foundations embedded into firm material, well braced for lateral shear and securely tied to the foundation, structural damage was generally minor, even in areas quite close to

the epicenter where structures sustained very strong to severe ground shaking. Based on these considerations, the risk of substantial structural damage from earthquakes appears relatively low for well-built structures which incorporate lateral shear bracing and modern building code requirements into their design and construction.

It is highly probable that a major earthquake will occur in northern California during the next 50 years. During a major earthquake epicentered nearby, there is a potential for severe ground shaking at this site. Structures designed in accordance with the most current UBC should react well to seismic shaking.

## UBC Design Criteria

Based on standard penetration test (SPT) data obtained from the Raas report and our observations during exploratory boring of the native subsurface soil conditions, we have classified the site soil profile as Soil Type $S_D$ as defined in Table 16-J of the 1997 UBC. The following table indicates the 1997 UBC Seismic Coefficients appropriate for this site. These are minimum values; the project designer or structural designer may utilize more conservative values at his or her discretion.

| FAULT NAME | DISTANCE TO SITE | Mmax (Mw) | SLIP RATE (mm/yr) | UBC FAULT TYPE | Na | Nv | Ca | Cv |
|---|---|---|---|---|---|---|---|---|
| San Andreas | 10.1 km<br>6.3 miles | 7.9 | 24 | A | 1.0 | 1.2 | 0.44 | 0.77 |
| Monterey Bay-Tularcitos | 19.4 km<br>12.0 miles | 7.3 | 0.5 | B | 1.0 | 1.00 | 0.44 | 0.64 |
| Zayante-Vergeles | 5.5 km<br>3.4 miles | 7.0 | 0.1 | B | 1.0 | 1.18 | 0.44 | 0.76 |

## Retaining Walls

Retaining walls free to move at the top should be designed to resist both lateral earth pressures and any additional surcharge loads. For design of retaining walls up to 8 feet high and fully drained, the following design criteria may be used. Active earth pressure for walls allowed to yield is that exerted by an equivalent fluid weighing 35 pcf for a level backslope gradient, and 55 pcf for a 2:1 (horizontal to vertical) backslope gradient. **This assumes a fully drained condition.**

Use a coefficient of friction between base of foundation and native soil of 0.30. Alternatively, where retaining wall footings are poured neat against dense native soil, a passive resistance of 275 pcf (EFW) may be used. Neglect the top 3 feet and any remaining fill, topsoil, and/or other loose materials when computing passive resistance.

For soldier beam walls, the following design criteria may be used. Minimum pier diameter should be 18 inches. Piers should be embedded a minimum of 8 feet into native silty sands. Passive earth pressure is exerted over 2 pier diameters. The upper 3 feet of native soil and any loose fill should be disregarded when computing passive pressure.

**R-Value Testing**

R-value testing was performed to provide criteria for design of structural pavement sections for streets and parking areas. Bulk samples for R-value testing were taken at two locations (Boring B-1 and Boring B-4) at depths of 1 to 5 feet below existing grade.
Results of R-value tests are included in Appendix B.

**Structural Pavement Design**

Based on the results of R-value testing, we offer three choices for the structural pavement section, depending upon the expected traffic volume as expressed by the traffic index (TI). Section options assume flexible, or asphalt concrete, pavement.

| Traffic Index (TI) | Class II Aggregate Base (AB) (inches) | Asphalt Concrete (AC) (inches) |
|---|---|---|
| 8.0 | 10 | 3 |
| 6.0 | 8 | 2.5 |
| 4.0 | 6 | 2 |

Asphaltic concrete, aggregate base (with subbase, if desired) and preparation of the subgrade should conform to and be placed in accordance with the Caltrans Standard Specifications, latest edition, except that the test method for compaction should be determined by ASTM D1557.

To have the selected sections perform to their greatest efficiency, it is important that the following items be considered:

A. Moisture condition the upper 12 inches of the subgrade and compact to a minimum relative compaction of at least 95 percent, at about 2 percent over optimum moisture content.

B. Provide sufficient gradient to prevent ponding of water.

C. Use only quality materials of the type and thickness (minimum) specified. Base rock should meet Caltrans Standard Specifications for Class II Aggregate Base, and be angular in shape.

D. Compact the base rock to a relative dry density of 95 percent.

E. Place the asphaltic concrete during periods of fair weather when the free air temperature is within prescribed limits per Caltrans specifications.

F. Provide a routine maintenance program.

Based on our review of the project plans provided to us, it is our opinion that the geotechnical aspects of the referenced building plans are in general conformance with our recommendations. If you have any questions concerning this letter, please contact our office.

If you have any questions concerning this update letter, please contact our office.

Very truly yours,

**HARO, KASUNICH, AND ASSOCIATES, INC.**

Mike Hopper
Staff Engineer

John E. Kasunich
G.E. 455

REGISTERED PROFESSIONAL ENGINEER
JOHN E. KASUNICH
No. 455
Exp. 6/12
GEOTECHNICAL
STATE OF CALIFORNIA

MH/sq
Attachments
Copies: 4 to addressee
1 to Ifland Engineers
1 to Thatcher and Thompson, Architects

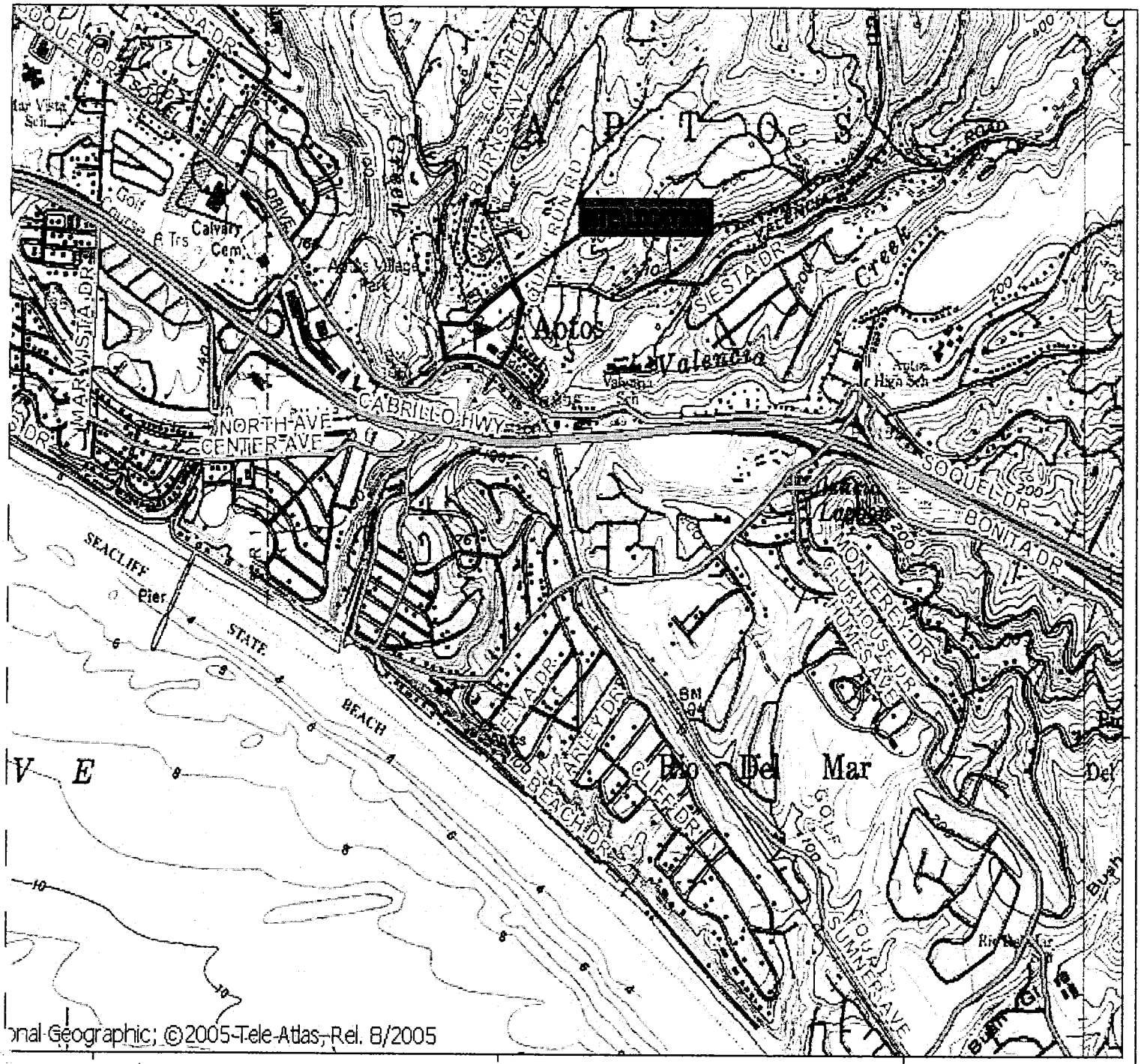
## APPENDIX A

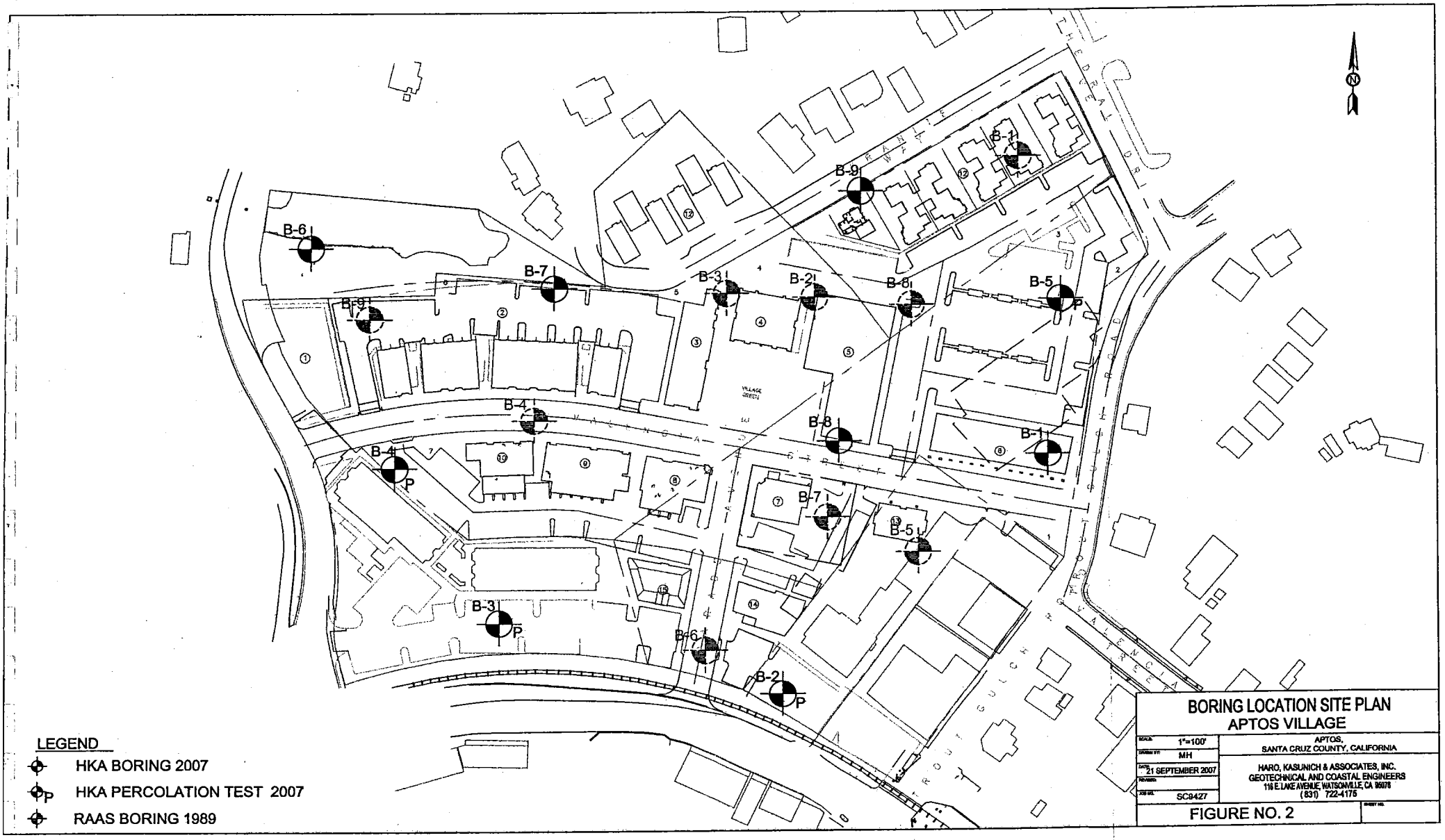
**Site Vicinity Map**

**Boring Location Site Plan**

**Key to Logs**

**Logs of Test Borings**


APTOS
Aptos
La Valencia
Bay Del Mar
CABRILLO HWY
SOQUEL DR
BONITA DR
SEACLIFF
Pier
STATE
BEACH
NORTH AVE
CENTER AVE
MARINA DR
SIESTA DR
MONTEREY DR
CLIFF DR
SUMMER AVE
Calvary Cem
Golf Course
Aptos Village Park
Valencia Sch
Aptos Jr High Sch
Rio Del Mar
Golf Course
Clubhouse
Tennis Courts
Rio Del Mar Esplanade
Rio Del Mar Beach
Rio Del Mar Flat
Rio Del Mar Knoll
Rio Del Mar Lagoon
Rio Del Mar Terrace
Aptos Creek
Valencia Creek
Quail Run Rd
Burns Ave
Beach Dr
Elva Dr
Harley Dr
Golf Club Dr
Sequoia Dr
Marina Dr
Orchard Dr
Soquel Dr
Aptos Rd
Vista Sch
Golf Course
Calvary Cem
Aptos Village Park
Valencia Sch
Aptos Jr High Sch


B-1
B-9
B-6
B-7
B-3
B-2
B-8
B-5
B-9
B-4
B-4
P
B-8
B-1
B-7
B-5
B-3
P
B-6
B-2
P
N
LEGEND
HKA BORING 2007
HKA PERCOLATION TEST 2007
RAAS BORING 1989
BORING LOCATION SITE PLAN
APTOS VILLAGE
SCALE: 1"=100'
DRAWN BY: MH
DATE: 21 SEPTEMBER 2007
REVISED:
JOB NO.: SC9427
APTOS,
SANTA CRUZ COUNTY, CALIFORNIA
HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E.LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175
FIGURE NO. 2

| PRIMARY DIVISIONS | | | GROUP SYMBOL | SECONDARY DIVISIONS |
|---|---|---|---|---|
| COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE | CLEAN GRAVELS (LESS THAN 5% FINES) | GW | Well graded gravels, gravel-sand mixtures, little or no fines. |
| | | | GP | Poorly graded gravels or gravel-sand mixtures, little or no fines. |
| | | GRAVEL WITH FINES | GM | Silty gravels, gravel-sand-silt mixtures, non-plastic fines |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures, plastic fines. |
| | SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE | CLEAN SANDS (LESS THAN 5% FINES) | SW | Well graded sands, gravelly sands, little or no fines. |
| | | | SP | Poorly graded sands or gravelly sands, little or no fines. |
| | | SANDS WITH FINES | SM | Silty sands, sand-silt mixtures, non-plastic fines. |
| | | | SC | Clayey sands, sand-clay mixtures, plastic fines. |
| FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50% | | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |
| | | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. |
| | | | OL | Organic silts and organic silty clays of low plasticity. |
| | SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50% | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts |
| | | | CH | Inorganic clays of high plasticity, fat clays. |
| | | | OH | Organic clays of medium to high plasticity, organic silts. |
| HIGHLY ORGANIC SOILS | | | PT | Peat and other highly organic soils. |

## GRAIN SIZES

| U.S STANDARD SERIES SIEVE | | | | CLEAR SQUARE SIEVE OPENINGS | | | |
|---|---|---|---|---|---|---|---|
| 200 | 40 | 10 | 4 | 3/4" | 3" | 12" | |
| SILTS AND CLAYS | SAND | | | GRAVEL | | COBBLES | BOULDERS |
| | FINE | MEDIUM | COARSE | FINE | COARSE | | |

## RELATIVE DENSITY

| SANDS AND GRAVELS | BLOWS/FT* |
|---|---|
| VERY LOOSE | 0 - 4 |
| LOOSE | 4-10 |
| MEDIUM DENSE | 10 - 30 |
| DENSE | 30 - 50 |
| VERY DENSE | OVER 50 |

## CONSISTENCY

| SILTS AND CLAYS | STRENGTH** | BLOWS/FT* |
|---|---|---|
| VERY SOFT | 0 - 1/4 | 0 - 2 |
| SOFT | 1/4 - 1/2 | 2 - 4 |
| FIRM | 1/2 - 1 | 4 - 8 |
| STIFF | 1 - 2 | 8 - 16 |
| VERY STIFF | 2 - 4 | 16 - 32 |
| HARD | OVER 4 | OVER 32 |

*Number of blows of 140 pound hammer falling 30 inches to drive a 2 inch O.D. (1 3/8 inch I.D) split spoon (ASTM D-1586)

**Unconfined compressive strength in tons/ft$^2$ as determined by laboratory testing or approximated by the standard penetration test (ASTM D-1586), pocket penetrometer, torvane, or visual observation

| HARO, KASUNICH & ASSOCIATES | KEY TO LOGS | | FIGURE NO. |
|---|---|---|---|

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-1

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | |
| | 1-1 (L) | | Dark brown Silty SAND, damp, loose | SM | 11 | | | | |
| | 1-2 (T) | | | | 2 | | | 13.6 | |
| 5 | | | | | 9 | | | | |
| | 1-3 (L) | | Tan fine medium SAND, damp, loose | SP | | | | | |
| | 1-4 (T) | | Tan, yellow Sandy CLAY, moist, firm | CL-SC | 7 | | | 13.3 | |
| | | | Orange brown fine-medium SAND, loose | SP | | | | | |
| 10 | 1-5 (T) | | | | 10 | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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BY: dk | FIGURE NO.

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-2

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 2"AC 4" AB | | | | | | |
| | 2-1 (L) | | Dark brown Sandy SILT, damp, some Gravels, very stiff | ML | 23 | | | | |
| | 2-2 (T) | | | | 7 | | | 16.0 | |
| | | | Becomes firm | | | | | | |
| 5 | | | Brown Sandy CLAY, damp, stiff | CL | | | | | |
| | 2-3 (L) | | | | 13 | | | | |
| | | | Orange brown Silty fine SAND, damp, medium dense | SM | | | | | |
| 10 | 2-4 (T) | | | | 21 | | | | % Passing #200 Sieve = 18 |
| 15 | 2-5 (T) | | Grey tan fine medium SAND, small round Gravels, damp, very dense | BR | 50/5" | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-3

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 2" AC 6" AB | | | | | | |
| | | | Dark brown Sandy SILT, damp, stiff | ML | | | | | |
| | 3-1 (L) | | | | 16 | | 113 | 12.0 | |
| | 3-2 (T) | | | | 5 | | 102 | 20.1 | |
| 5 | | | | | | | | | |
| | 3-3 (L) | | | | 25 | | | | |
| | | | Brown Clayey SAND, damp, medium dense | SC | | | | | |
| | 3-4 (T) | | | | 7 | | | | |
| | | | Becomes Sandy CLAY, firm | CL | | | | | |
| 10 | | | | | | | | | |
| | 3-5 (L) | | | | 24 | | | | |
| | | | Same, becomes stiff | | | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH DATE DRILLED August 29, 2007 BORING DIAMETER 6" BORING NO. B-4

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Turf | | | | | | |
| | 4-1 (L) | | Brown Silty SAND, dry, loose | SM | 21 | | | | |
| | 4-2 (T) | | Becomes medium dense | | 15 | | | | |
| 5 | 4-3 (T) | | | | 14 | | | 14.0 | |
| | | | Tan orange mottled Clayey SAND, dry, medium dense | SC | | | | | |
| 10 | 4-4 (T) | | Becomes Sand CLAY, moist, firm | CL | 9 | | | | |
| 15 | 4-5 (T) | | Orange fine SAND, damp, medium dense | SP | 14 | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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BY: dk | FIGURE NO.

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-5

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark brown Sandy SILT, damp, firm | ML | | | | | |
| | 5-1 (L) | | | | 10 | | | | |
| | 5-2 (T) | | Brown Silty SAND, some Clay, damp, loose | | 6 | | | 18.5 | |
| 5 | | | | | | | | | |
| | 5-3 (L) | | Brown Clayey SAND, damp, loose | | 14 | | | | |
| 10 | | | | | | | | | |
| | 5-4 (T) | | Tan Sandy CLAY, moist, firm | | 8 | | | | |
| | | | Boring terminated at 11.5 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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BY: dk | FIGURE NO.

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Geotechnical and Environmental Engineering

# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH DATE DRILLED August 29, 2007 BORING DIAMETER 6" BORING NO. B-6

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 3" AB | | | | | | |
| | 6-1 (L) | | Dark brown Silty SAND, dry, medium dense | S | 26 | | | | |
| | 6-2 (T) | | Increasing Clay content, medium dense | | 18 | | | 15.6 | |
| 5 | | | | | 19 | | | | |
| | 6-3 (L) | | Orange tan Clayey SAND, damp, loose | SC | | | | | ϕ = 30.6<br>C = 830 |
| | | | Brown lean CLAY, damp, firm | CL | | | | | |
| 10 | 6-4 (T) | | | | 7 | | | 41.8 | LL = 54.6%<br>PI = 22 |
| 15 | | | Orange tan Clayey SAND with 3/4" angular Gravels, damp, loose | SC | 10 | | | | |
| | 6-5 (T) | | | | | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-7

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 3" AB | | | | | | |
| | 7-1 (L) | | Brown Silty SAND, dry, medium dense | SM | 40 | | | | |
| | 7-2 (T) | | Brown fine medium SAND, dry, medium dense | | 23 | | | 13.2 | |
| 5 | 7-3 (L) | | Same | | 31 | | 93 | 13.0 | |
| | | | Small rounded Gravels | | | | | | |
| 10 | 7-4 (T) | | Tan, yellow fine-medium SAND, damp, very dense | | 57 | | | | |
| 15 | 7-5 (T) | | Tan yellow Gravelly SAND, (silica rounded Gravels) damp, very dense | | 50/5" | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-8

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | 4" AB | | | | | | |
| | 8-1 (L) | | Dark brown Silty SAND, dry, loose with small rounded Gravels | SM | 18 | | | | |
| | 8-2 (T) | | | | 8 | | | 7.7 | % Passing #200 Sieve = 42 |
| 5 | | | Brown Gravelly SAND, dry, loose | SP | 16 | | | | $\phi$ = 39.3 |
| | 8-3 (L) | | | | | | | | C = 470 |
| | 8-4 (T) | | | | 11 | | | 10.7 | |
| 10 | | | | | | | | | |
| | 8-5 (T) | | Increasing Gravel, SAND, micaceous, damp, medium dense | | 24 | | | | |
| 15 | | | | | | | | | |
| | 8-6 (T) | | Tan fine-medium SAND, damp, dense | SP | 31 | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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BY: dk | FIGURE NO.

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# Aptos Village

**PROJECT NO. SC9427**

LOGGED BY MH | DATE DRILLED August 29, 2007 | BORING DIAMETER 6" | BORING NO. B-9

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | | | | | | | |
| | 9-1 (L) | | Brown Silty SAND with organics, dry, medium dense | SM | 34 | | | | |
| | 9-2 (T) | | | | 19 | | | | % Passing #200 Sieve = 44 |
| 5 | | | Orange Clayey SAND, dry, medium dense | SC | | | | | |
| | 9-3 (L) | | Well graded Gravelly SAND with slight Clay binder, damp, medium dense | SP-SC | 44 | | 109 | 15.2 | |
| 10 | 9-4 (T) | | Tan interbedded fine and coarse SANDS, damp, dense | SP | 31 | | | | |
| | | | Small Gravels | | | | | | |
| 15 | 9-5 (T) | | | | 44 | | | | |
| | | | Tan fine-medium SAND, damp, dense | SP | | | | | |
| | | | Boring terminated at 16.5 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO.

## APPENDIX B

**Percolation Test Results**

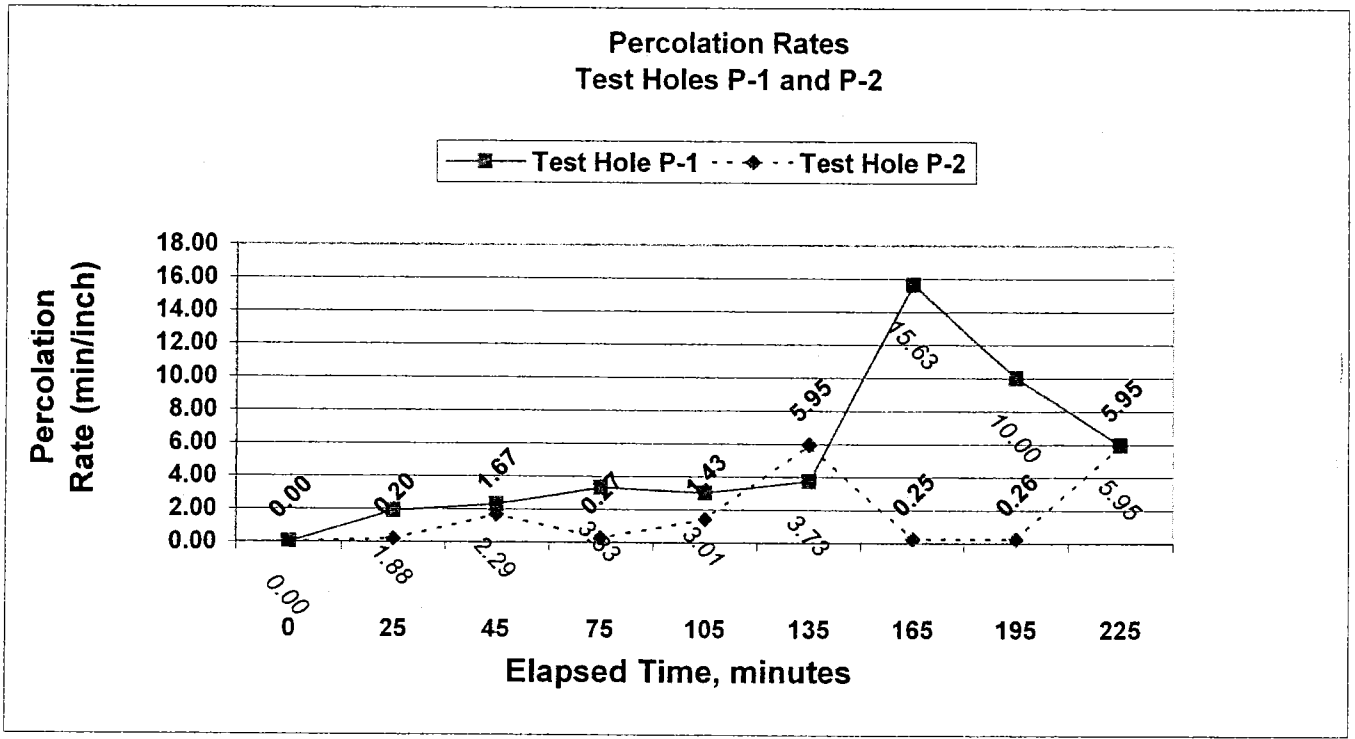
**Lab Results**

# Appendix B

Percolation Test Data
APTOS VILLAGE

| HOLE NO.: | P-1 | | TEST DATE: 9/04/07 DRILL DATE: 8/29/07 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: -10 ft | | | DEPTH OF BORING: 10 feet | | | |
| TESTED BY: | JD | | PERCOLATION ZONE: 10 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 30 | 1.33 | 16.0 | | 1.88 | 31.92 |
| 2 | 60 | 2.42 | 13.1 | | 2.29 | 26.16 |
| 3 | 90 | 3.17 | 9.0 | | 3.33 | 18.00 |
| 4 | 120 | 4.00 | 10.0 | | 3.01 | 19.92 |
| 5 | 150 | 4.67 | 8.0 | | 3.73 | 16.08 |
| 6 | 180 | 4.83 | 1.9 | | 15.63 | 3.84 |
| 7 | 210 | 5.08 | 3.0 | | 10.00 | 6.00 |
| 8 | 240 | 5.50 | 5.0 | | 5.95 | 10.08 |

| HOLE NO.: | P-2 | | TEST DATE: 9/04/07 DRILL DATE: 8/29/07 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: -13.25 ft | | | DEPTH OF BORING: (FT) | | 13.25 | |
| TESTED BY: | JD | | PERCOLATION ZONE: 13.25 feet | | | |
| BORE DIAM | 6 | BORE AREA (SI | 0.19625 | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 1.58 | 0 | | 0.00 | 0.00 |
| 1 | 25 | 12.00 | 125.0 | | 0.20 | 300.01 |
| 2 | 45 | 13.00 | 12.0 | | 1.67 | 36.00 |
| 3 | 75 | 22.33 | 112.0 | | 0.27 | 223.92 |
| 4 | 105 | 24.08 | 21.0 | | 1.43 | 42.00 |
| 5 | 135 | 24.50 | 5.0 | | 5.95 | 10.08 |
| 6 | 165 | 34.50 | 120.0 | | 0.25 | 240.00 |
| 7 | 195 | 44.08 | 115.0 | | 0.26 | 229.92 |
| 8 | 225 | 44.50 | 5.0 | | 5.95 | 10.08 |




APTOS VILLAGE
Project SC9427
September, 2007

HARO, KASUNICH & ASSOCIATES

Figure No.

# Appendix B

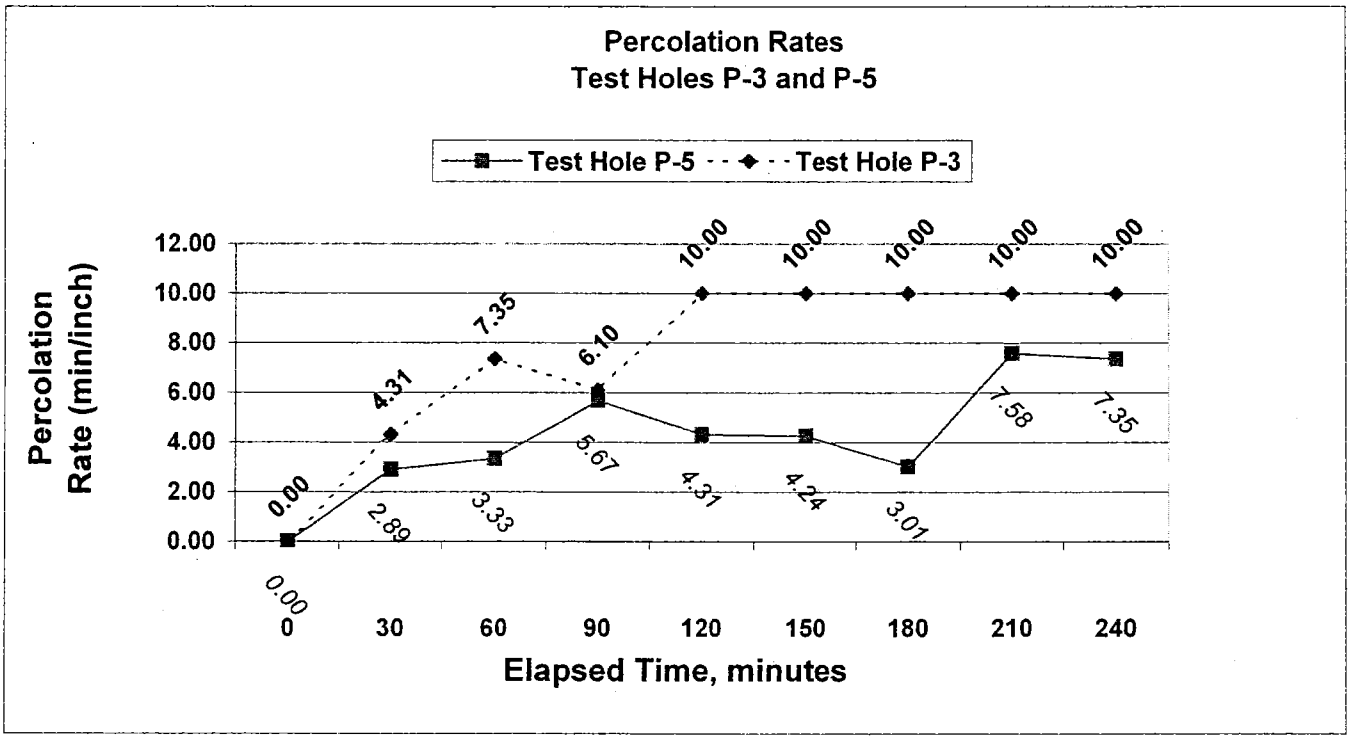
***Percolation Test Data***

APTOS VILLAGE Job No. SC9427

| HOLE NO.: | P-5 | | TEST DATE: 9/04/2007 DRILL DATE: 8/29/2007 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: DRY | | | DEPTH OF BORING: 10 feet | | | |
| TESTED BY: | JD | | PERCOLATION ZONE: 0 FT TO 10 FT | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 26 | 0.75 | 9.0 | | 2.89 | 20.77 |
| 2 | 56 | 1.50 | 9.0 | | 3.33 | 18.00 |
| 3 | 90 | 2.00 | 6.0 | | 5.67 | 10.59 |
| 4 | 120 | 2.58 | 7.0 | | 4.31 | 13.92 |
| 5 | 150 | 3.17 | 7.1 | | 4.24 | 14.16 |
| 6 | 180 | 4.00 | 10.0 | | 3.01 | 19.92 |
| 7 | 210 | 4.33 | 4.0 | | 7.58 | 7.92 |
| 8 | 240 | 4.67 | 4.1 | | 7.35 | 8.16 |

NOTE 1: HOLE REFILLED TO 0.50 FT.
NOTE 2: HOLE REFILLED TO 1.00 FT.

| HOLE NO.: | P-3 | | TEST DATE: 9/04/2007 DRILL DATE: 8/29/2007 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: -6.25 FT | | | DEPTH OF BORING: 10.5 feet | | | |
| TESTED BY: | MH | | PERCOLATION ZONE: 0.5 TO 10.5 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0 | 0 | | 0.00 | 0.00 |
| 1 | 30 | 0.58 | 7.0 | | 4.31 | 13.92 |
| 2 | 60 | 0.92 | 4.1 | | 7.35 | 8.16 |
| 3 | 90 | 1.33 | 4.9 | | 6.10 | 9.84 |
| 4 | 120 | 1.58 | 3.0 | | 10.00 | 6.00 |
| 5 | 150 | 1.83 | 3.0 | | 10.00 | 6.00 |
| 6 | 180 | 2.08 | 3.0 | | 10.00 | 6.00 |
| 7 | 210 | 2.33 | 3.0 | | 10.00 | 6.00 |
| 8 | 240 | 2.58 | 3.0 | | 10.00 | 6.00 |




APTOS VILLAGE
Project SC9427
9/24/2007

HARO, KASUNICH & ASSOCIATES Figure No.

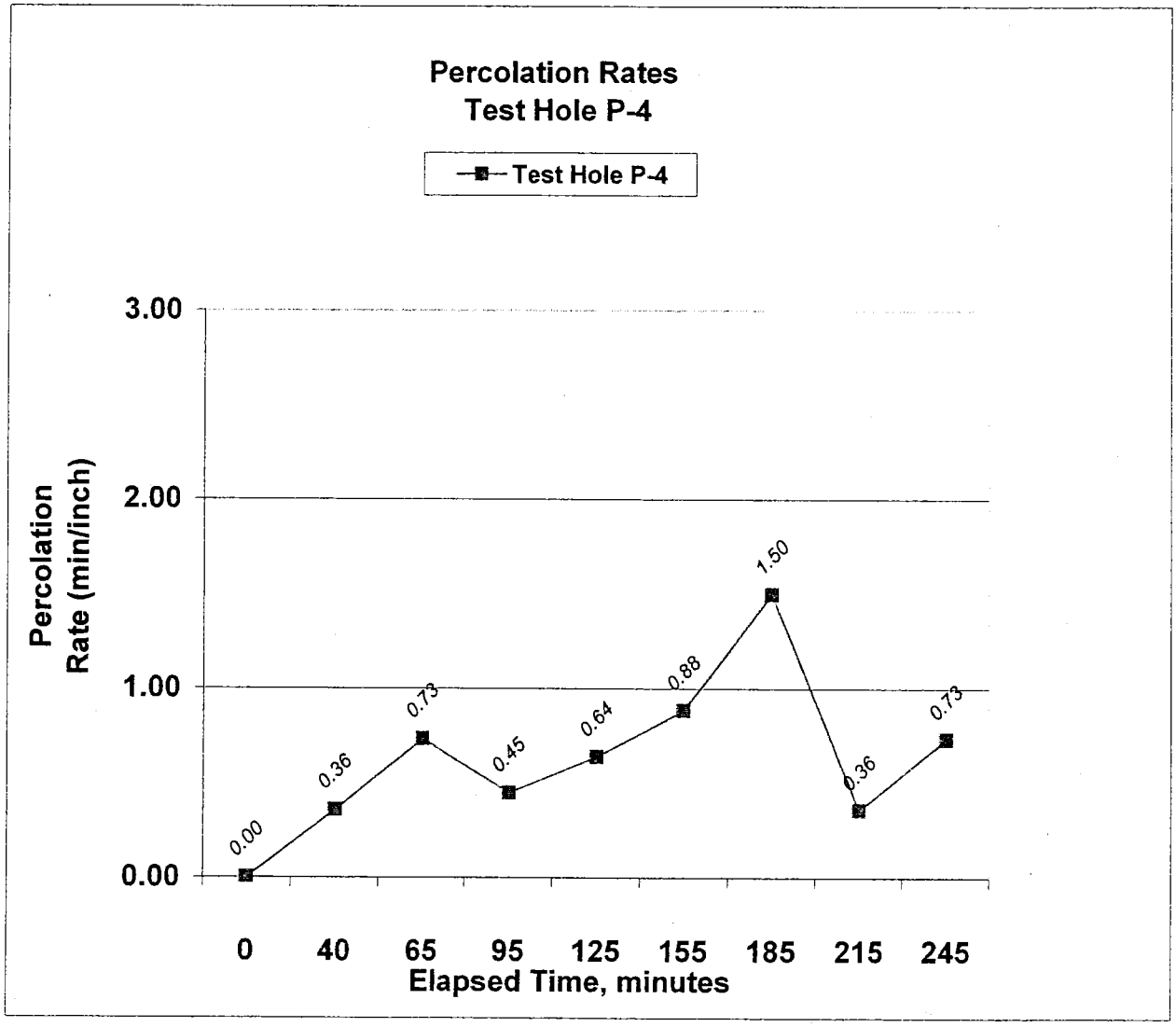
# Appendix B

***Percolation Test Data***

APTOS VILLAGE Job No. SC9427

| HOLE NO.: | P-4 | | TEST DATE: | 9/4/2007 | DRILL DATE: 8/29/07 | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: DRY | | | DEPTH OF BORING: 15.25 feet | | | |
| TESTED BY: | JD | | PERCOLATION ZONE: 0.5 TO 15.25 feet | | | |
| READING | ELAPSED TIME (min) | DEPTH TO WATER (feet) | INCREMENTAL FALL OF WATER (inches) | | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 0.00 | 0 | | 0.00 | 0.00 |
| 1 | 40 | 9.33 | 112.0 | | 0.36 | 167.94 |
| 2 | 65 | 12.17 | 34.1 | NOTE 1 | 0.73 | 81.79 |
| 3 | 95 | 5.58 | 67.0 | | 0.45 | 133.92 |
| 4 | 125 | 9.50 | 47.0 | | 0.64 | 94.08 |
| 5 | 155 | 12.33 | 34.0 | | 0.88 | 67.92 |
| 6 | 185 | 14.00 | 20.0 | NOTE 1 | 1.50 | 40.08 |
| 7 | 215 | 7.00 | 84.0 | | 0.36 | 168.00 |
| 8 | 245 | 10.42 | 41.0 | | 0.73 | 82.08 |

NOTE 1: HOLE REFILLED TO 0 FT




HARO, KASUNICH & ASSOCIATES

APTOS VILLAGE
Project SC9427
9/24/2007

Figure No.

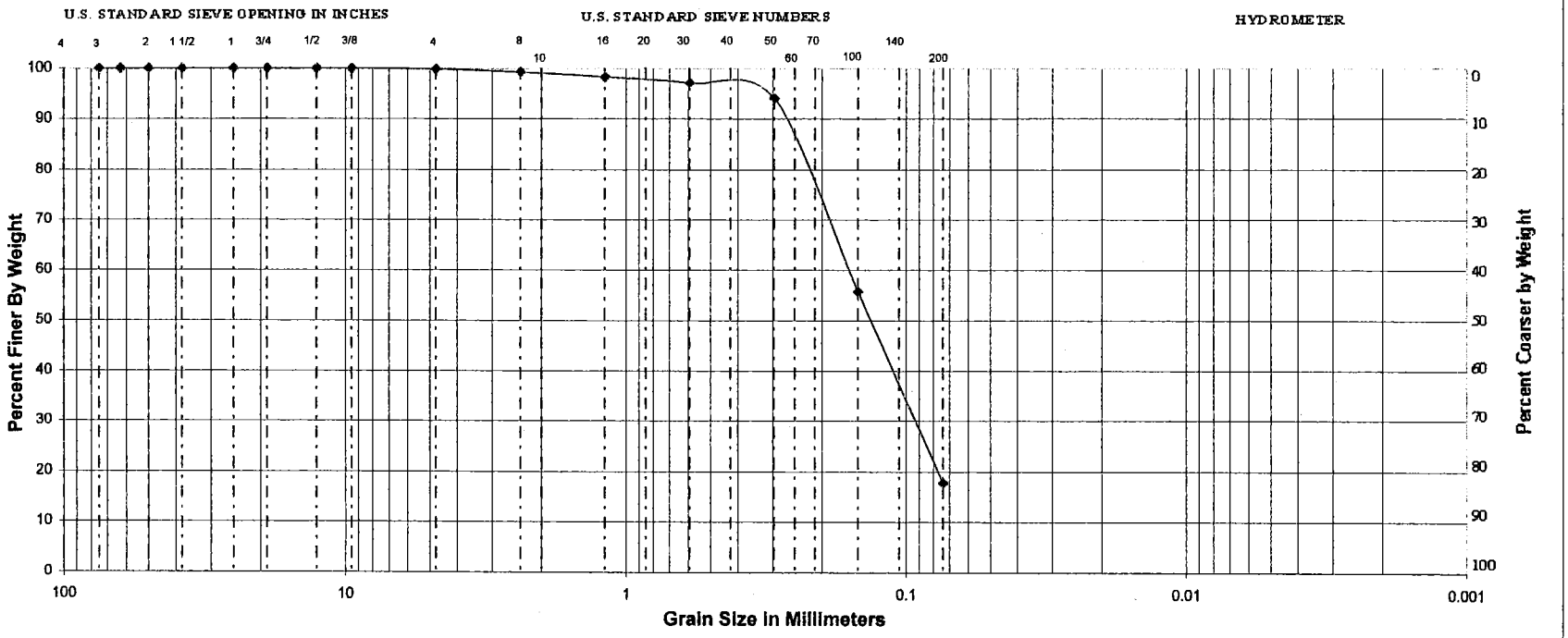
HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

| *FULL GRADATION* | | | Project Name: | Aptos Village | |
|---|---|---|---|---|---|
| | | | File No.: | SC 9427 | |
| Moisture Density | | | Sample No.: | 2-4 | |
| Part of Sample | | Bag | Date: | September 12, 2007 | |
| Tare No. | | 10-A | By: | JR/MA | |
| Gross Wet Weight | | 604.2 | Sample Description: | | |
| Gross Dry Weight | | 512.3 | Rusrt Brown Silty Fine Sand W/Clay Binder | | |
| Tare Weight | | 71.8 | | | |
| Net Dry Weight | | 440.5 | Group Symbol: | | |
| Weight of Water | | 91.9 | Gravel Content: | 0.2% | |
| % Moisture | | 20.9% | Sand Content: | 82.1% | |
| Dry Density | | 0.0 | Fines Content: | 17.7% | |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 0.0 | 0.0% | 0.0% | 100.0% | |
| No. 4 | 0.7 | 0.2% | 0.2% | 99.8% | |
| No. 8 | 2.6 | 0.6% | 0.7% | 99.3% | |
| No. 16 | 4.2 | 1.0% | 1.7% | 98.3% | |
| No. 30 | 5.0 | 1.1% | 2.8% | 97.2% | |
| No. 50 | 13.9 | 3.2% | 6.0% | 94.0% | |
| No. 100 | 168.4 | 38.2% | 44.2% | 55.8% | |
| No. 200 | 167.6 | 38.0% | 82.3% | 17.7% | |
| Pan | 76.8 1.3 | 17.7% | 100.0% | 0.0% | |
| Total | 440.5 | 100.0% | | 100.0% | |

| Before | 440.5 | After | |
|---|---|---|---|
| Dry Wt. | | Dry Wt. | 435.5 |
| Tare | | Tare | 71.8 |
| | | 363.7 | |




**Gravel Content:** 0.2%
**Sand Content:** 82.1%
**Fines Content:** 17.7%

**Sample Description:** Rusrt Brown Silty Fine Sand W/Clay Binder
**Group Symbol:** 0

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| | |
|---|---|
| HKA Project No: SC 9427 | ***GRAIN SIZE DISTRIBUTION*** |
| Sample No: 2-4 | |
| Date: September 12, 2007 | **Aptos Village** |
| | Figure No. |

| | | | |
|---|---|---|---|
| **Project:** | Aptos Village | **Date** | September 11, 2007 |
| **Project #** | SC 9427 | **Tested By:** | MA/JR |
| **Sample #** | 6-3-2 | | |

| Test Number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Normal Pressure (KSF) | 1000 | 2000 | 4000 | |
| Max Shear Stress | 42.9 | 64.2 | 98.5 | |
| Shear Stress (PSF) | 1383.9 | 2071.0 | 3177.4 | |

| Equation of Trendline | |
|---|---|
| Intercept | Slope |
| 830.7 | 0.5915 |

| C (PSF) | PHI |
|---|---|
| 830 | 30.6 |

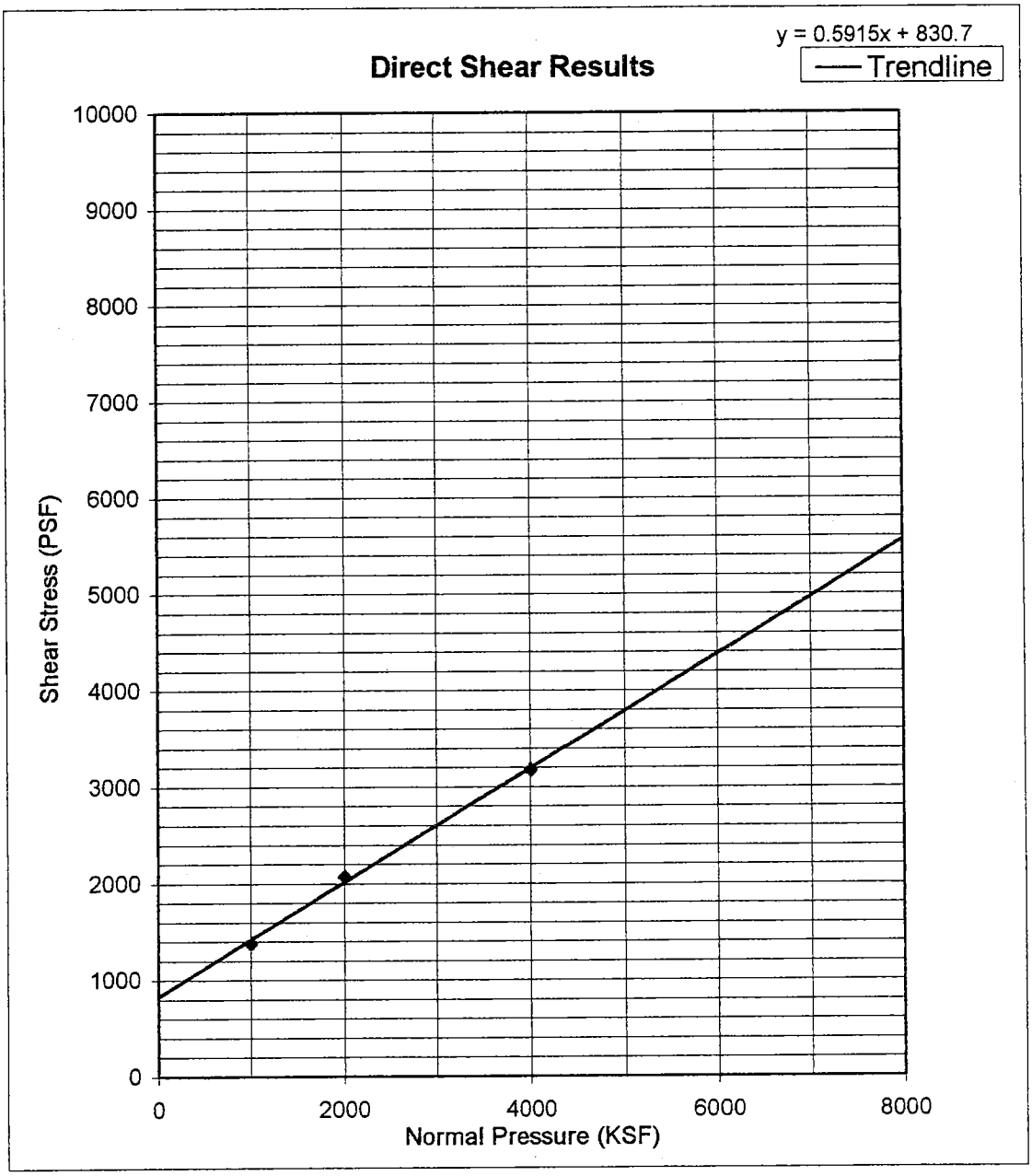
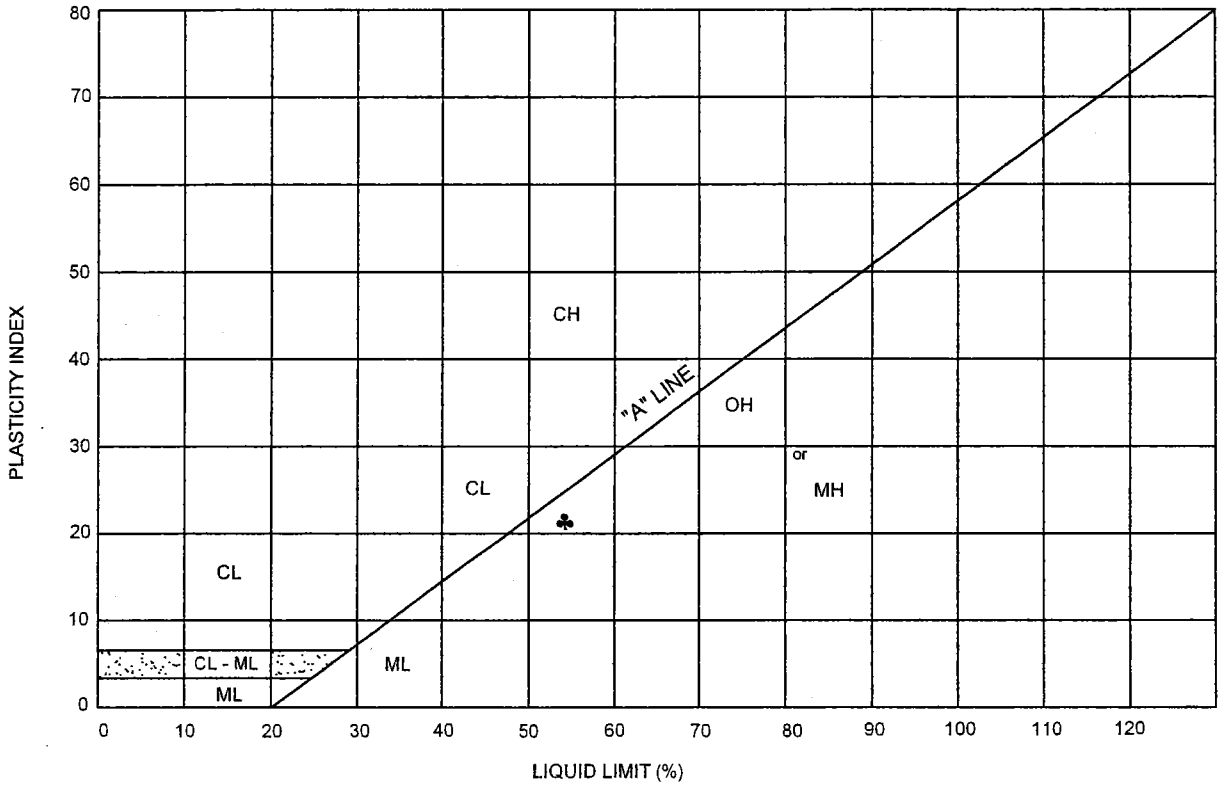



**Figure No.**

## PLASTICITY CHART




## PLASTICITY DATA

| Key Symbol | Sample Number | Depth (feet) | Natural Water Content W(%) | Plastic Limit (%) | Liquid Limit (%) | Plasticity Index | Liquidity Index $\frac{W - PL}{LL - PL}$ | Unified Soil Classification Symbol |
|---|---|---|---|---|---|---|---|---|
| ♣ | 6-4 | 11 | 41.8 | 33.5 | 54.6 | 22 | .39 | MH |

# ATTERBERG LIMITS TEST RESULTS

APTOS VILLAGE
PHASE I

| | |
|---|---|
| SCALE: | APTOS, SANTA CRUZ COUNTY, CALIFORNIA |
| DRAWN BY: MH | |
| DATE: 19 SEPT 07 | HARO, KASUNICH & ASSOCIATES, INC. |
| REVISED: | GEOTECHNICAL AND COASTAL ENGINEERS |
| JOB NO: SC 9427 | 116 E. LAKE AVENUE, WATSONVILLE, CA 95076 (831) 722-1475 |
| FIGURE NO. | SHEET NO. OF 1 |

| | | | |
|---|---|---|---|
| **Project:** | Aptos Village | **Date** | September 12, 2007 |
| **Project #** | SC 9427 | **Tested By:** | MA/JR |
| **Sample #** | 8-3-1 | | |

| Test Number | 1 | 2 | 3 | 4 |
|---|---|---|---|---|
| Normal Pressure (KSF) | 1000 | 2000 | 4000 | 8000 |
| Max Shear Stress | 39.7 | 56.1 | 130.0 | 212.5 |
| Shear Stress (PSF) | 1280.6 | 1809.7 | 4193.5 | 6854.8 |

| Equation of Trendline | |
|---|---|
| Intercept | Slope |
| 470.39 | 0.8171 |

| C (PSF) | PHI |
|---|---|
| 470 | 39.3 |

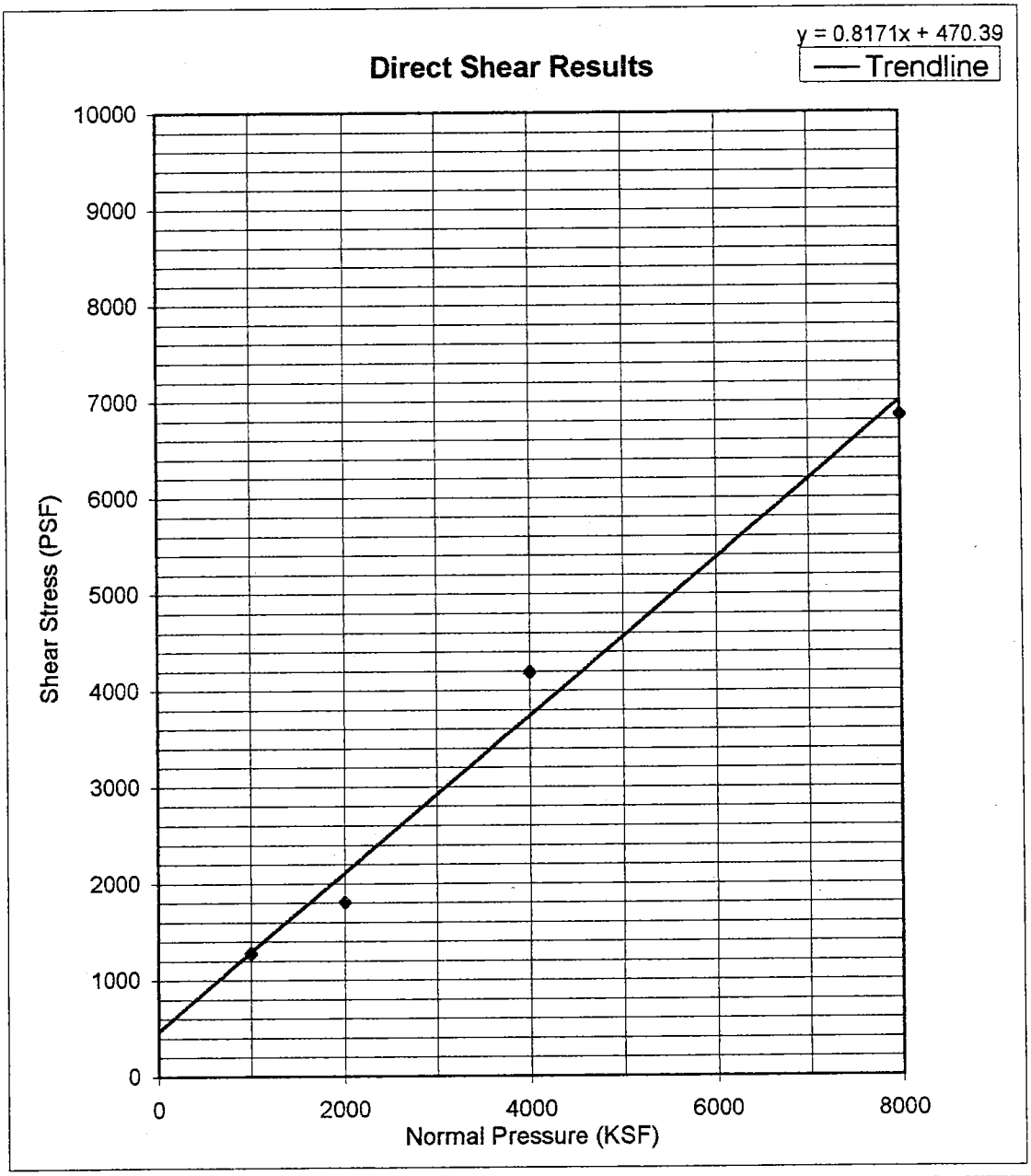



**Figure No.**

HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

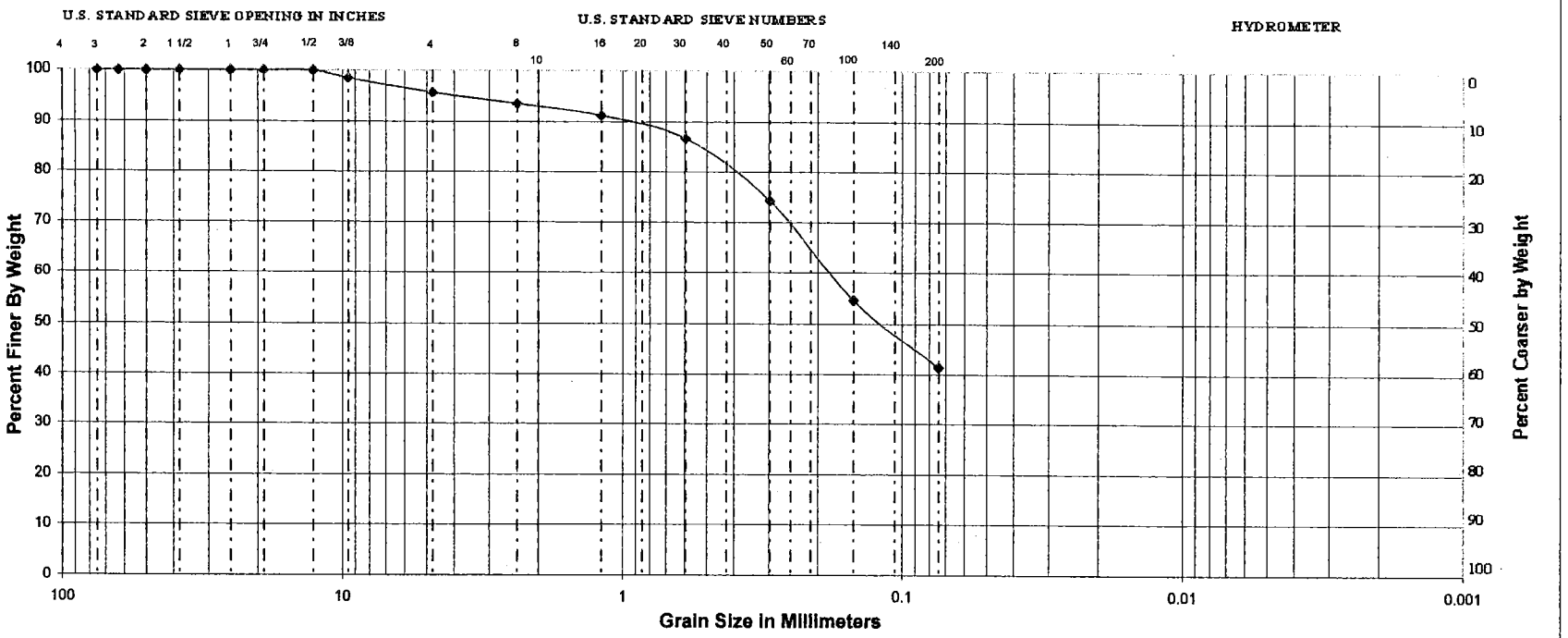
## *FULL GRADATION*

| Moisture Density | |
|---|---|
| Part of Sample | Bag |
| Tare No. | 104 |
| Gross Wet Weight | 467.6 |
| Gross Dry Weight | 439.8 |
| Tare Weight | 77.0 |
| Net Dry Weight | 362.8 |
| Weight of Water | 27.8 |
| % Moisture | 7.7% |
| Dry Density | 0.0 |

| | |
|---|---|
| Project Name: | Aptos Village |
| File No.: | SC 9427 |
| Sample No.: | 8-2 |
| Date: | September 12, 2007 |
| By: | JR/MA |
| Sample Description: | |
| Dark Brown Silty Sand | |
| Group Symbol: | |
| Gravel Content: | 4.2% |
| Sand Content: | 54.2% |
| Fines Content: | 41.5% |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 5.0 | 1.4% | 1.4% | 98.6% | |
| No. 4 | 10.3 | 2.8% | 4.2% | 95.8% | |
| No. 8 | 7.6 | 2.1% | 6.3% | 93.7% | |
| No. 16 | 8.6 | 2.4% | 8.7% | 91.3% | |
| No. 30 | 16.5 | 4.5% | 13.2% | 86.8% | |
| No. 50 | 44.9 | 12.4% | 25.6% | 74.4% | |
| No. 100 | 71.4 | 19.7% | 45.3% | 54.7% | |
| No. 200 | 47.8 | 13.2% | 58.5% | 41.5% | |
| Pan | 150.5 0.2 | 41.5% | 100.0% | 0.0% | |
| Total | 362.8 | 100.0% | | 100.0% | |

| | | | |
|---|---|---|---|
| Before | 362.8 | After | |
| Dry Wt. | | Dry Wt. | 289.3 |
| Tare | | Tare | 77 |
| | | 212.3 | |




**Gravel Content:** 4.2%
**Sand Content:** 54.2%
**Fines Content:** 41.5%

**Sample Description: Dark Brown Silty Sand**
**Group Symbol: 0**

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116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202

| | |
|---|---|
| HKA Project No: | SC 9427 |
| Sample No: | 8-2 |
| Date: | September 12, 2007 |

***GRAIN SIZE DISTRIBUTION***

**Aptos Village**

Figure No.

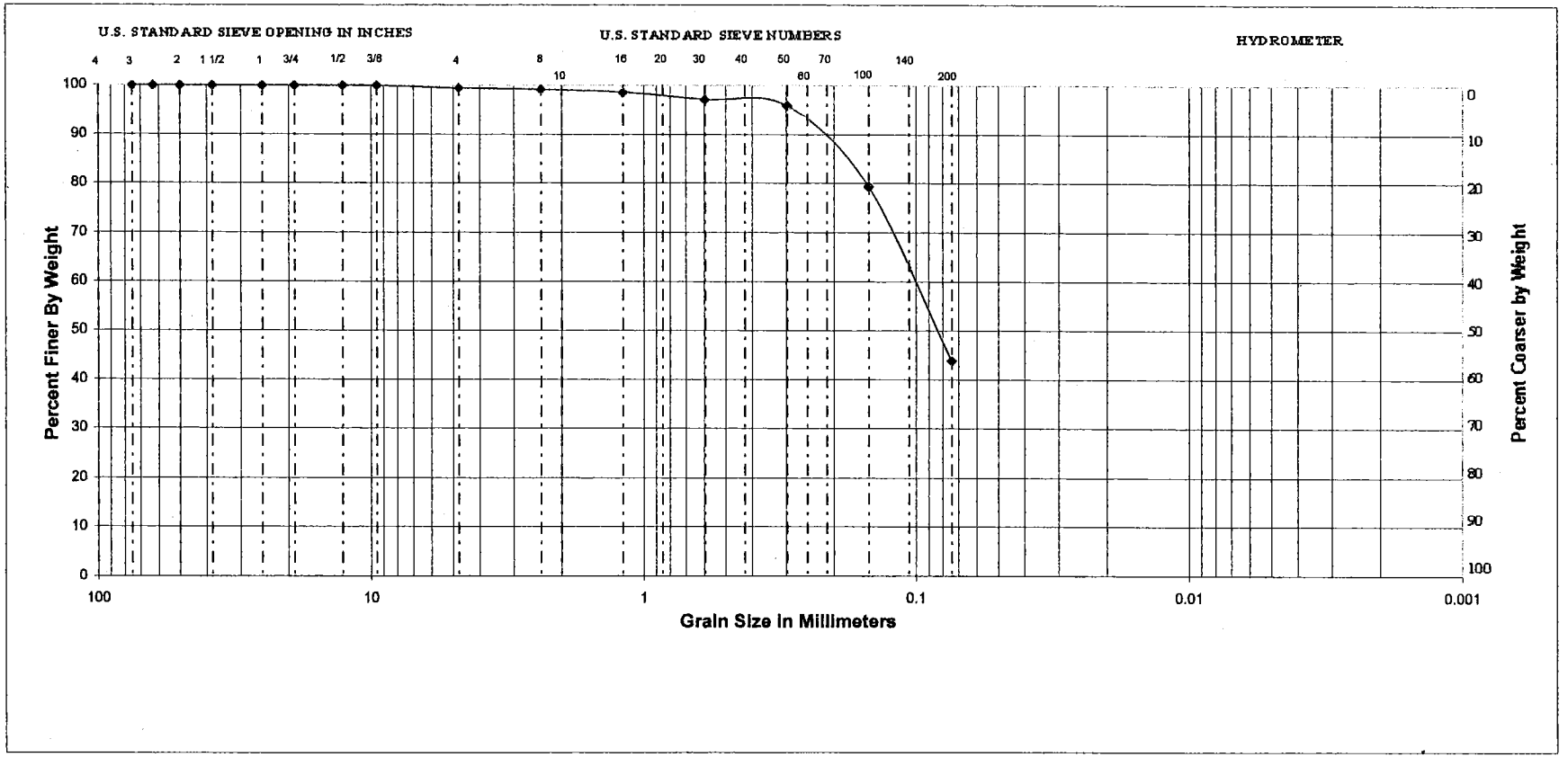
HARO KASUNICH & ASSOCIATES

Soil Testing and Inspection - Field and Laboratory

| *FULL GRADATION* | | | Project Name: | Aptos Village | |
|---|---|---|---|---|---|
| | | | File No.: | SC 9427 | |
| Moisture Density | | | Sample No.: | 9-2 | |
| Part of Sample | | Bag | Date: | September 12, 2007 | |
| Tare No. | | 11-A | By: | JR/MA | |
| Gross Wet Weight | | 586.0 | Sample Description: | | |
| Gross Dry Weight | | 505.9 | Orange Brown Clayey Silty Sand | | |
| Tare Weight | | 72.9 | | | |
| Net Dry Weight | | 433.0 | Group Symbol: | | |
| Weight of Water | | 80.1 | Gravel Content: | 0.5% | |
| % Moisture | | 18.5% | Sand Content: | 55.5% | |
| Dry Density | | 0.0 | Fines Content: | 44.0% | |

| Sieve | Weight Retained | % Retained | Cumulative Percent | | Specs |
|---|---|---|---|---|---|
| | | | Retained | Passing | |
| 3" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 2" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 1" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ¾" | 0.0 | 0.0% | 0.0% | 100.0% | |
| ½" | 0.0 | 0.0% | 0.0% | 100.0% | |
| 3/8" | 0.0 | 0.0% | 0.0% | 100.0% | |
| No. 4 | 2.3 | 0.5% | 0.5% | 99.5% | |
| No. 8 | 1.3 | 0.3% | 0.8% | 99.2% | |
| No. 16 | 2.5 | 0.6% | 1.4% | 98.6% | |
| No. 30 | 6.2 | 1.4% | 2.8% | 97.2% | |
| No. 50 | 5.3 | 1.2% | 4.1% | 95.9% | |
| No. 100 | 71.1 | 16.4% | 20.5% | 79.5% | |
| No. 200 | 153.7 | 35.5% | 56.0% | 44.0% | |
| Pan | 188.5 2.1 | 44.0% | 100.0% | 0.0% | |
| Total | 433.0 | 100.0% | | 100.0% | |

| Before | 433.0 | After | |
|---|---|---|---|
| Dry Wt. | | Dry Wt. | 317.4 |
| Tare | | Tare | 72.9 |
| | | 244.5 | |




**Gravel Content:** 0.5%
**Sand Content:** 55.5%
**Fines Content:** 44.0%

**Sample Description:** Orange Brown Clayey Silty Sand
**Group Symbol:** 0

Haro, Kasunich & Associates, Inc.
Geotechnical and Geotechnical Engineers
116 East Lake Avenue, Watsonville, California
(831) 722-4175 ~ Fax (831) 722-3202

| | |
|---|---|
| HKA Project No: | SC 9427 |
| Sample No: | 9-2 |
| Date: | September 12, 2007 |

***GRAIN SIZE DISTRIBUTION***

**Aptos Village**

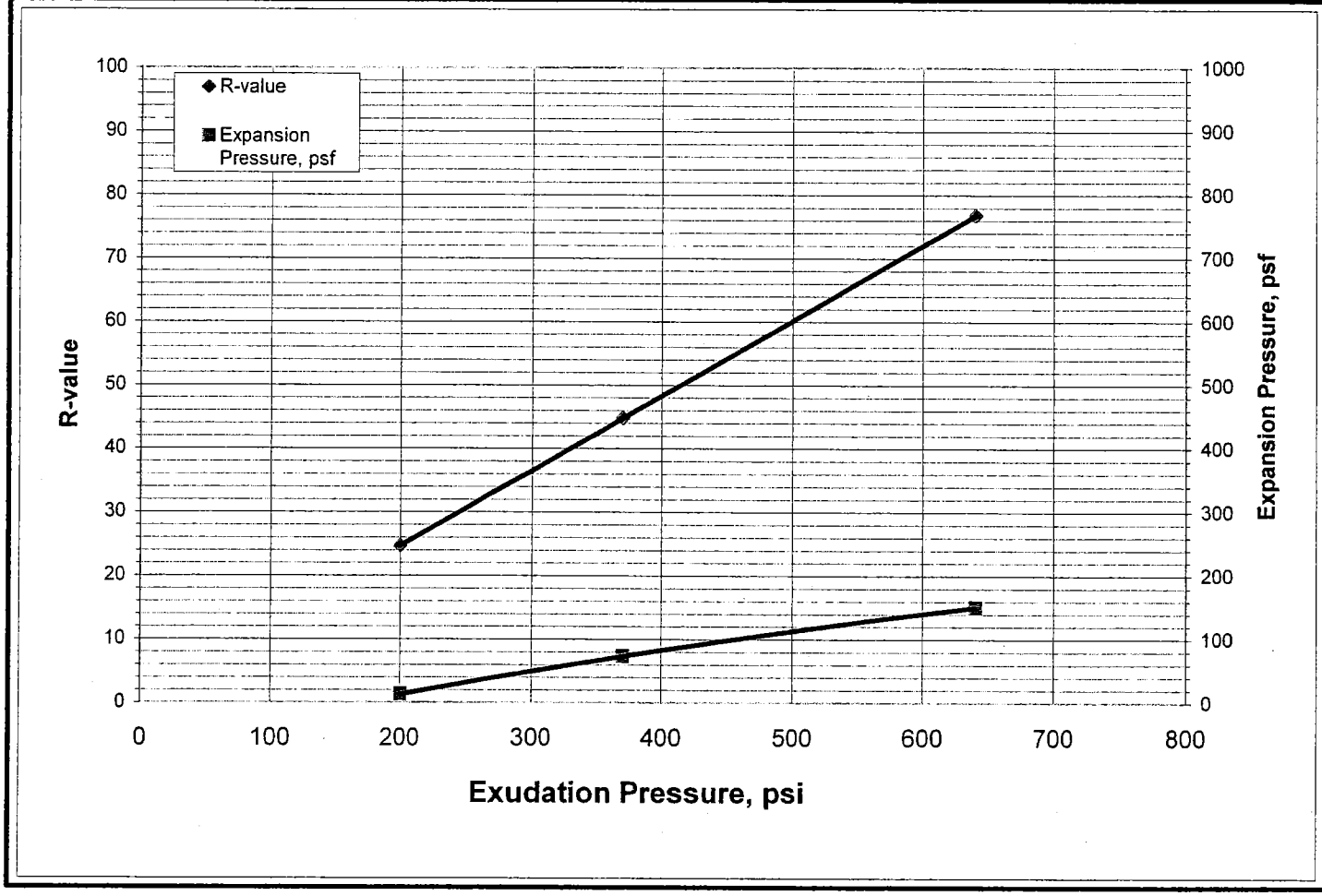
Figure No.

# R-value Test Report (Caltrans 301)

| | | | | | |
|---|---|---|---|---|---|
| **Job No.:** | 032-336 | **Date:** | 09/07/07 | **Initial Moisture,** | 10.3% |
| **Client:** | Haro, Kasunich and Associates | **Tested** | MD | **R-value by Stabilometer** | 38 |
| **Project:** | Aptos Village - SC9427 | **Reduced** | RU | | |
| **Sample** | R-1;B-4 | **Checked** | DC | **Expansion Pressure** | 50 psf |
| **Soil Type:** | Dark Brown Clayey SAND | | | | |

| Specimen Number | A | B | C | D |
|---|---|---|---|---|
| **Exudation Pressure, psi** | 200 | 370 | 640 | |
| **Prepared Weight, grams** | 1200 | 1200 | 1200 | |
| **Final Water Added, grams/cc** | 40 | 19 | 7 | |
| **Weight of Soil & Mold, grams** | 3083 | 3173 | 3166 | |
| **Weight of Mold, grams** | 2089 | 2096 | 2067 | |
| **Height After Compaction, in.** | 2.25 | 2.42 | 2.46 | |
| **Moisture Content, %** | 14.0 | 12.1 | 11.0 | |
| **Dry Density, pcf** | 117.3 | 120.2 | 121.9 | |
| **Expansion Pressure, psf** | 12.9 | 73.1 | 150.5 | |
| **Stabilometer @ 1000** | | | | |
| **Stabilometer @ 2000** | 106 | 72 | 29 | |
| **Turns Displacement** | 3.06 | 3.45 | 3.3 | |
| **R-value** | 25 | 45 | 77 | |

**Remarks:**

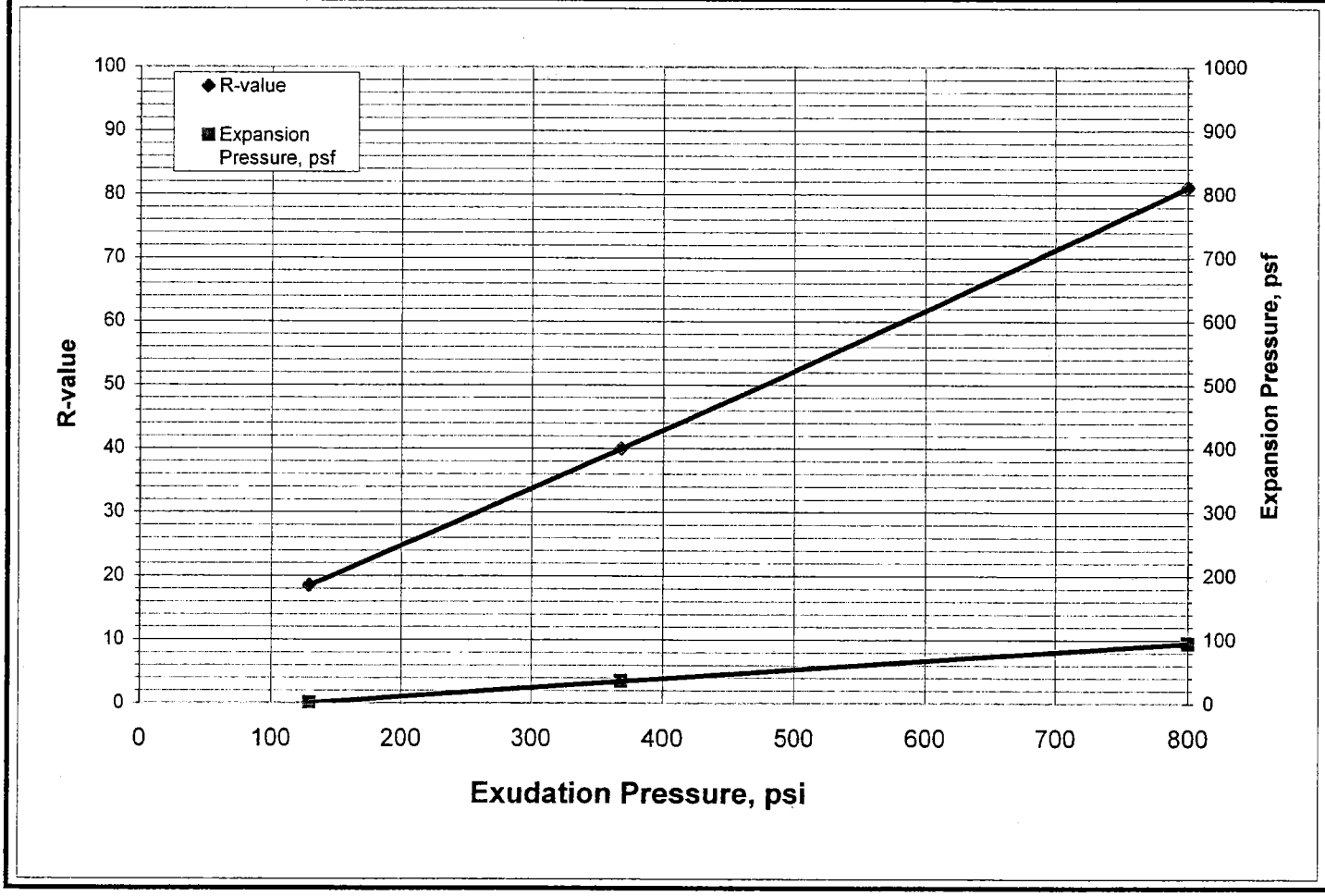


# R-value Test Report (Caltrans 301)

| | | | | | |
|---|---|---|---|---|---|
| **Job No.:** | 032-336 | **Date:** | 09/11/07 | **Initial Moisture,** | 10.4% |
| **Client:** | Haro, Kasunich & Associates | **Tested** | MD | **R-value by Stabilometer** | 34 |
| **Project:** | Aptos Village - SC9427 | **Reduced** | RU | | |
| **Sample** | R-2;B-1 | **Checked** | DC | **Expansion Pressure** | 20 psf |
| **Soil Type:** | Dark Brown Clayey SAND | | | | |

| Specimen Number | A | B | C | D |
|---|---|---|---|---|
| Exudation Pressure, psi | 129 | 368 | 800 | |
| Prepared Weight, grams | 1200 | 1200 | 1200 | |
| Final Water Added, grams/cc | 42 | 8 | -4 | |
| Weight of Soil & Mold, grams | 3146 | 3206 | 3203 | |
| Weight of Mold, grams | 2097 | 2123 | 2082 | |
| Height After Compaction, in. | 2.4 | 2.46 | 2.48 | |
| Moisture Content, % | 14.3 | 11.2 | 10.1 | |
| Dry Density, pcf | 115.8 | 119.9 | 124.3 | |
| Expansion Pressure, psf | 0.0 | 34.4 | 94.6 | |
| Stabilometer @ 1000 | | | | |
| Stabilometer @ 2000 | 116 | 80 | 24 | |
| Turns Displacement | 3.9 | 3.6 | 3.25 | |
| R-value | 19 | 40 | 81 | |

**Remarks:**



Project No. SC9427.1
2 March 2011

BARRY SWENSON BUILDERS
c/o Jessie Nickell
5300 Soquel Avenue, Suite 103
Soquel, California 95062

Subject: Geotechnical Update Letter

Reference: Aptos Village
Santa Cruz County, California

Dear Mr. Nickell:

At your request, Haro, Kasunich & Associates (HKA) is providing a Geotechnical Update Letter to the 28 September 2007 Updated Geotechnical Investigation Report prepared by HKA and the 20 June 1989 report prepared by Steven Raas and Associates (RA). The geotechnical reports have been prepared for use within the area that encompasses Phases Ia, Ib, Ic, II, IIIa, and IIIb as shown on the Preliminary Site Plan dated 11 January 2011 prepared by Ifland Engineers.

The purpose of this letter is to update the previously mentioned feasibility level reports for the proposed development as it's currently planned with an emphasis on obtaining additional percolation test results at various subsurface strata. We will also provide additional discussion and general recommendations from a geotechnical standpoint. The aforementioned reports are an integral part of this study and they contain data collected during those investigations that is relevant to our current evaluation that will need to be considered during preparation of design level plans within each phase, and during construction of those phases.

Our recommendations are based upon a field reconnaissance of the project area by John E. Kasunich (Geotechnical Engineer); twenty-seven percolation tests in the vicinity of the proposed drainage retention areas, and review of the following documents:

1. Steven Raas and Associates, Geotechnical Investigation For Aptos Junction, Aptos, California, Project No. 8988-SZ70-B13, dated 20 June 1989;

2. Haro Kasunich and Associates, Updated Geotechnical Investigation Report, Aptos Village Phase I, Santa Cruz County, California, Project No. SC9427, 28 September 2007;

Included in our review for this project are prior borings, laboratory tests, mapping, and the findings and conclusions in those reports. In addition we have reviewed other analyses and

reports prepared by our firm in the area of this project. Logs of percolation test bore holes and percolation data from our recent study are enclosed with this letter.

Based on a preliminary site plan by Ifland Engineers (civil engineers of record), Sheet TM5 dated 18 January 2011, we understand the project consists of mass grading to achieve finished grade elevations, construction of retaining walls to support permanent cut slopes, construction of mixed commercial residential buildings, relocation of existing buildings, new roads, parking lots, and well site. The new development will have frontage on Aptos Creek Road, Soquel Drive, Trout Gulch Road, and Cathedral Drive. In general drainage will be collected and discharged into detention/retention chambers 10 feet deep or less and shallow rain gardens 3 feet deep or less. Overflow will be metered out and carried through solid pipe to energy dissipaters or into existing storm drains. HKA has written a review letter dated 1 February 2011 with an update addendum plan review letter dated 23 February 2011for the tentative plan set dated 18 January 2011, prepared by Ifland Engineers that discusses in detail our understanding of each phase proposed.

We presume the new buildings will be of wood frame and masonry construction, combined with some concrete slab-on-grade floors. Actual loads are not known at this time but are expected to be typical of such construction.

The project site is bordered by Soquel Drive to the south, Trout Gulch Road to the east, Aptos Creek Road to the west, and Granite Way to the north. The site is roughly 13.5 acres in size with existing commercial buildings, storage buildings, abandoned concrete foundations, and large tree stumps.

On 20 June 1989 RA completed nine (9) test bore holes to depths of 15 to 25 feet. On 29 August 2007 HKA completed nine (9) test bore holes to depths of 11 ½ to 16 ½ feet. Recently on 8 December 2010 HKA advanced twenty-seven (27) percolation test bore holes and three (3) exploratory bore holes using a solid flight auger drill rig mounted on four wheel drive limited access equipment. The percolation test bore holes were 2 ½ to 11 feet deep and the three exploratory bore holes were 16 feet deep. Percolation test bore holes were advanced in the vicinity of all proposed detention retention chambers, with the exception being chamber S7 due to limitations of access and existing utilities. Three exploratory bore holes 16 feet deep were advanced to a depth of approximately 5 to 6 feet below bottom of the proposed detention retention chambers P1(west side), P6 (southeast side), and P12 (northeast side). Spoils from the bore holes were logged by visual examination. Light to moderate rain and cold air temperature was experienced during field drilling operations.

Based on review of RA (1989), HKA (2007), and HKA (2010) logs of bore holes within the project area, the earth materials underlying the site consist of interbedded alluvial deposits

that vary with depth. The depositional material is granular in nature with Purisima Sandstone and Aromas Sands being the dominating contributing sources. HKA and Raas Associates logs of test bore holes indicate interbedded layers of silty sands, sands, sandy silts, and sandy clays. The randomly arranged soil layers are typically 2 to 5 feet thick with an occasional layer 5 to 10 feet thick or greater. A 5 foot thick layer of clay was encountered in HKA test hole B-6 (2007) at a depth of 9 feet below the surface. A 10 foot thick layer of clay was encountered in Raas Associates test hole B-9 (1989) at a depth of 5 feet. These test bore holes (HKA and Raas) are within approximately 60 feet of one another. The clay encountered at this site is lean based on measured Atterberg Limits. The forty-eight (48) test bore holes spread around the proposed development area clearly demonstrate the lean clay is localized to the northeast quadrant of Phase IIIb.

Although the USDA-NRCS soil mapping indicates soil types such as Watsonville Loam present within the project area our logs of test bore holes for this site do not indicate a Watsonville Loam (fat clay) was encountered. Watsonville Loam is typically encountered within the vicinity of the lakes near Watsonville and the Pajaro River. It is also encountered within the town of Watsonville and easterly almost to the mountains.

Exploratory bore holes (RA and HKA) were advanced within close proximity to the proposed detention/retention chambers S1 to S9. With the exception of chamber S7 the exploratory holes were advanced to depths of 5 feet or more below the bottom of the proposed detention chambers. The exploratory hole near chamber S7 only extended to a depth of 2 ½ feet below the bottom of the chamber. Detention/retention chambers are proposed to be 10 or 11 feet deep. Cut or fill on the order of 1 foot or less is proposed in the areas of most of the chambers with the exception of chambers S8 and S9 where 5 and 2 feet of fill is proposed respectively.

In general our logs of exploratory bore holes indicate silty sand, clayey sand, sand, and sandy silt at the same elevation as the proposed chamber bottoms with the exception of chambers S1 and S2. These soils also extend at least five feet below the proposed elevations of the chamber bottoms. Sandy clay was encountered at the same elevations of the proposed chamber bottoms for S1 and S2. The sandy clay extended 5 feet below the bottom of chamber S1 and graded to sand within 10 feet from the bottom of the chamber. The soils encountered at and below the bottom of the proposed detention/retention chambers are similar to those tested for percolation at other elevations. The following table summarizes the soil stratums at and below the bottom of the retention/detention chambers.

| Exploratory Borings Near Retention Detention Chambers | | | | | | | |
|---|---|---|---|---|---|---|---|
| Chamber No. | S1 | S2 | S3 | S4/S5 | S6 | S7 | S8/S9 |
| Chamber Depth (ft) | 10 | 10 | 10 | 10 | 11 | 11 | 10/11 |
| Cut/Fill Proposed (ft) | +1 | +1/2 | +1½ | -1/2 | -1/2 | +1 | +5/+2 |
| Boring No. Near Chamber | B-9 (RA) | B-4 & P-1C | B-3 (RA) | B-9 | B-7 (RA) & P-6C | B-1 | B-1 (RA) & P-12C |
| Soil Class @ Chamber Bottom | Sandy Clay | Sandy Clay & Sandy Silt | Clayey Sand | Gravelly Sand | Silty Sand | Sand | Sandy Silt & Clayey Sand |
| Soil Class 5 Feet Below Chamber Bottom | Sandy Clay | Sand & Silty Sand | Gravels | Coarse Sand | Silty Sand | N/A | Clayey Sand |
| Soil Class 10 Feet Below Chamber Bottom | Sand | N/A | N/A | N/A | N/A | N/A | Clayey Sand or Sand |

Perched groundwater was encountered in our recent bore hole P-12 at depth of 7 feet and a seep was noted on the log for bore hole P-12C at depth of 12 feet. The perched groundwater water was present during the three days of filed drilling. No groundwater was encountered within any other bore holes (RA and HKA) at the site. Surface puddles were observed where low spots and pot holes exist. The puddles observed were lined along their base with fines creating an impermeable layer that perched the surface water. The potential for perched surface and/or groundwater within the project area is moderate near Cathedral Drive and moderately low elsewhere within the project area.

Percolation testing of the subsurface soil within the project area was performed. The purpose of this testing was to determine a falling head percolation rate at 3, 6, and 10 feet

below the ground surface. Rain and cold weather persisted throughout the three days of field drilling and percolation testing. Each of the 27 bore holes that the falling head percolation test procedure was performed on were prepared as follows;

a. Walls of the bore holes were scarified using a 6 inch diameter chimney brush.

b. Four inch diameter XDS pipe was perforated along the bottom 12 inches by sawing slits on each side that were staggered relative to each other.

c. A layer of pea gravel approximately 2 inches thick was placed at the bottom of each bore hole.

d. The XDS pipe was then placed in the bore hole with the perforations located at the bottom.

e. Pea gravel was then placed within the annular space between the XDS pipe and the walls of the bore hole up to an approximate elevation of 2 feet above the bottom of the bore hole.

f. The remaining annular space between the XDS pipe and the walls of the bore hole were backfilled with native spoils up to the ground surface.

g. The bottom 2 feet of the hole was carefully filled with clear water as a pre-saturation of the percolation zone.

h. The pipe was capped to prevent rain water from entering the percolation test hole.

The following day, 9 December 2010, falling head percolation tests were performed as follows;

a. Clear water was placed within the bottom 6 inches of each test hole.

b. Water level reading were taken from a fixed reference point to the nearest $1/16^{th}$ of an inch every 30 minutes using a steel tape and high powered flash light. Other methods (electronic and plunker) to obtain water level readings were attempted. It was determined that the steel tape and high powered flash light method yielded the most accurate and consistent results.

c. After each water level reading the percolation test hole was refilled with

clear water up to 6 inches above the bottom of the hole. The process was repeated every 30 minutes until two successive water level drops did not vary by more than 1/16$^{th}$ of an inch within a 90 minute period. The test was ended after 4 hours of readings if the above criteria were not met.

d. In cases where all the water seeped out of the hole within 30 minutes or less the hole was refilled with clear water and reading were taken every 10 minutes for 60 minutes.

e. The remaining holes that were not tested on 9 December 2010 were pre-saturated again following the procedure described above unless standing water was still in hole. Falling head percolation tests were performed as described above on the remaining holes on 10 December 2010.

The percolation rate for each test hole was determined as follows;

a. For test holes that had two successive water level drops that did not vary by more than 1/16$^{th}$ inch within 90 minutes the percolation test rate was determined by taking the final reading and dividing it by the time interval (1/2 hour).

b. For test holes where the entire 6 inch water column seeped away in less than 30 minutes the percolation rate was determined by taking the last water level drop and dividing it by 1/6 hour.

c. Where neither of the above scenarios occurred and the test was ended after 3 to 4 hours time the percolation rate was determined by taking an approximate average of all the water level drops and dividing it by ½ hour.

The final percolation rate presented in Figures 34 to 56 should be used by the civil engineer of record in their drainage retention (soil infiltration) design. In summary the percolation test results in this project area were poor to good depending on the local soil layer the test was being performed within. The high variability of soil layers was reflected with equally variable percolation test results. Percolation test holes P-1B, P-3B, and P-11B had standing water after the 24 hour saturation period and were not tested. Bore hole P-12 had perched groundwater at a depth of 7 feet and was not tested. However bore hole P-12B was tested at a depth of 3 feet with a percolation rate of 36 inches per hour.

New structures should be designed in conformance with the most current California Building Code (2010 CBC). For seismic design, on the basis of the subsoils and geologic description the project site is classified as **Site Class D**, based on definitions presented in Table 1613.5.2 in the 2010 CBC. The longitude and latitude were determined using a

satellite image generated by Google Earth. These coordinates were taken from the middle of the area of the proposed improvements:

Longitude = -121.8997, Latitude = 36.9774

The coordinates listed above were used as input in the Java Ground Motion Parameter Calculator created by the USGS to determine ground motion associated with the maximum considered earthquake (MCE) SM and the reduced ground motion for design SD.

Site Class D
$SM_s$= 1.693
$SM_1$= 1.078
$SD_s$= 1.129
$SD_1$= 0.719

Based on the results of our recent geotechnical work, the general recommendations and findings presented in the June 1989 Geotechnical Investigation prepared by RA and August 2007 Geotechnical Investigation Update prepared by HKA still apply.

If conflict arises between the updated recommendations in this letter and past reports, recommendations in this letter govern. If further clarification is needed, please contact our office.

The results of our recent study indicate that geotechnical concerns at the location of this project area can still be mitigated with standard geotechnical engineering practices. Primary geotechnical concerns and/or conditions that may have the most impact on the proposed project include strong seismic shaking, perched surface/groundwater on clay/silt layers, compressible highly erodible residual soils within the upper 1-2 feet, adequate setback from ascending/descending slopes, erosion from uncontrolled surface runoff, and uniform bearing support for foundations.

Surface and subsurface site drainage should be adequately controlled during and after construction. We have reviewed Ifland Engineers drainage plan which includes capturing surface runoff from proposed development and retaining it on site or allowing for soil infiltration. The retention form of design is being proposed with the project area percolation rates with the exception of a few localized areas where either perched groundwater was encountered or the presaturation water never seeped away after 48 hours. In these localized areas a detention form of design releasing the runoff at a metered rate or changing the proposed elevation of the retention chamber base is a consideration for this development that is more compatible with the soil conditions. In the area of test bore hole P-12 the retention chamber base should be no more than 3 feet below the existing surface

elevation. We recommend the safe overflow path be such that it does not exacerbate slope erosion, and that does not negatively impact down slope properties. Where onsite retention is not possible surface drainage should be collected and dispersed over non- erodible well vegetated or paved surfaces or discharged into drainage channels. Collected surface drainage should be discharged in a manner that will not increase the erosion of drainage channels or residual soil at the discharge points.

In our opinion firm native near surface silty sands, clayey sands, and sandy lean clays underlying this site do not possess adequate bearing capacity for structural support. The proposed improvements should be supported by engineered fill. The mat of engineered fill would extend on the order of 12 inches below the bottom of footing elements and 5 horizontal feet beyond building footprint in all directions. It is noted that conventional spread footings may not be compatible with every design concept or may not satisfy code requirements in a cost effective manner. Structural foundation elements should meet the required setbacks from ascending/descending slopes set forth in the 2010 CBC Section 1808.7. This will reduce the potential of building foundations being impacted by slope failures.

In conclusion, it is our opinion that the proposed project is geotechnically feasible, provided the recommendations in this report and the prior reports are complied with during design, development, construction, and occupancy of the property.

The recommendations of this update letter are to be followed during the development process for each lot. A design-level geotechnical study including recommendations specific to the developer's conceptual design should be completed for each phase (Ia-IIIb) of the development. The project geotechnical engineer should review the developer's conceptual design and related aspects of construction for each phase.

If you have any questions concerning this letter, please contact our office.

Very truly yours,

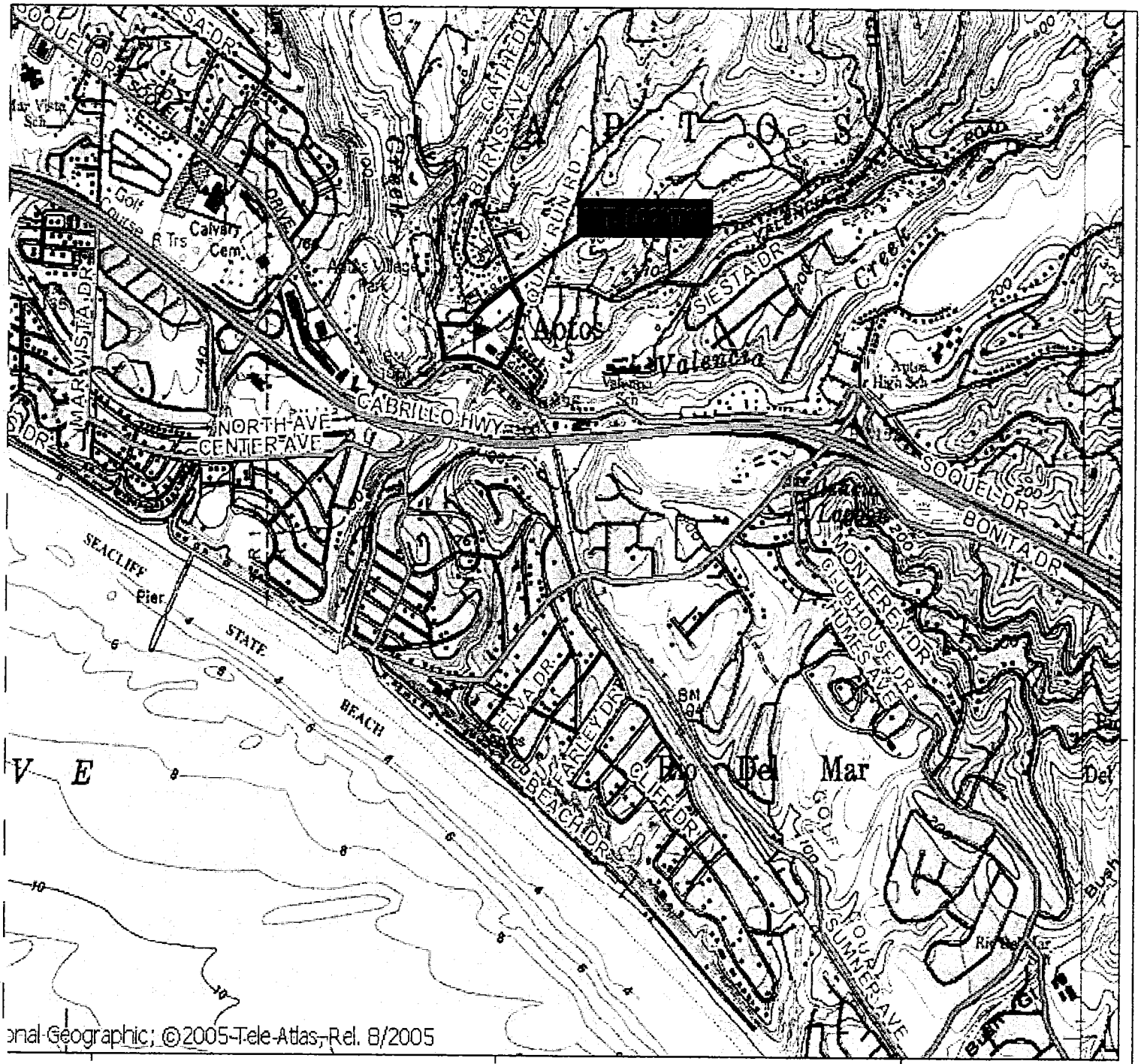
Reviewed By:

**HARO, KASUNICH AND ASSOCIATES, INC.**

John E, Kasunich
G.E. 455

Moses E. Cuprill
Staff Engineer

Copies: 2 to Addressee
1 to Fall Creek
1 to Ifland Engineer

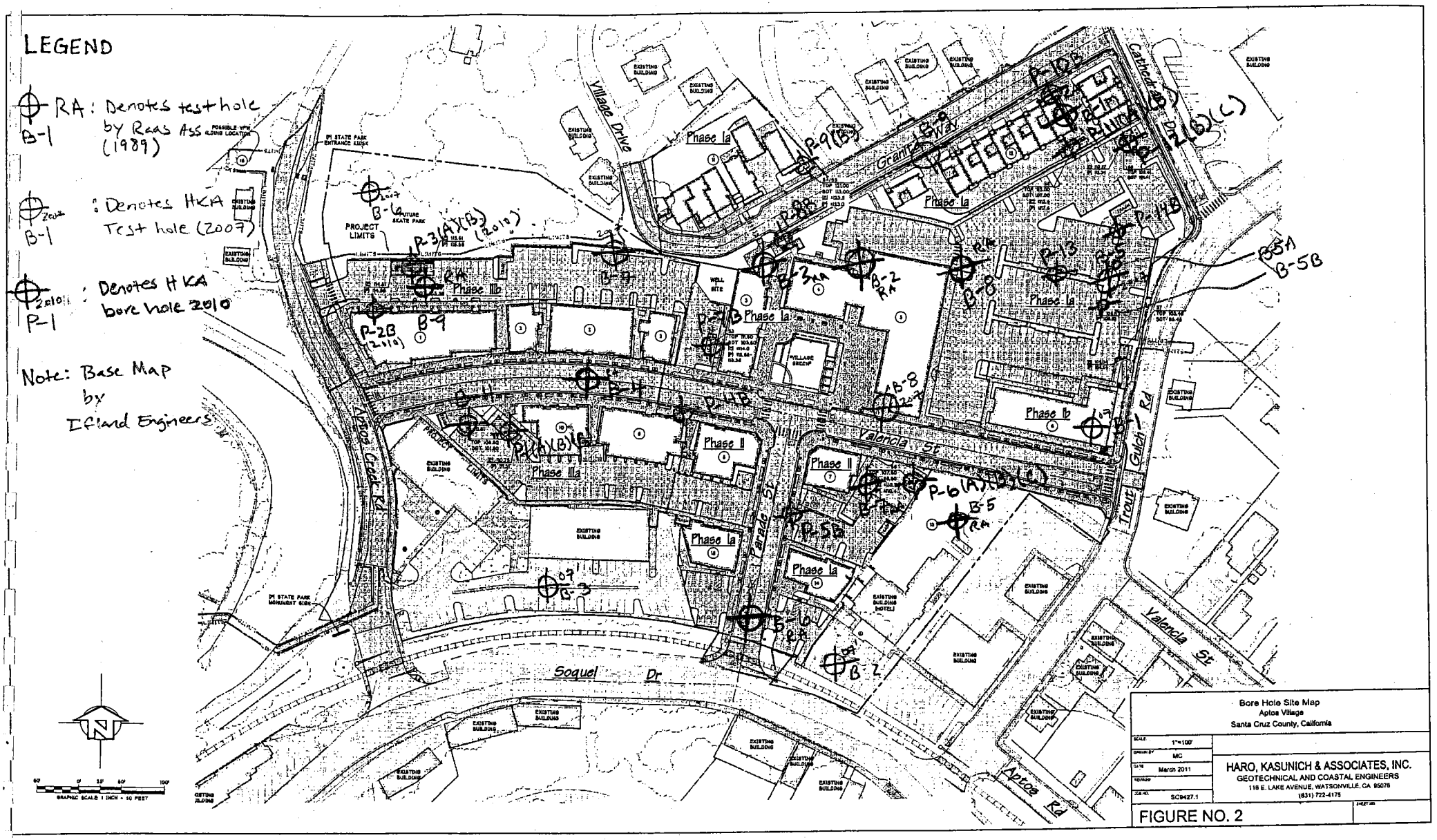



LAT. 36.9779 N
LONG. 121.9001 W

# SITE VICINITY MAP
# APTOS VILLAGE

| | |
|---|---|
| SCALE: AS NOTED | APTOS<br>SANTA CRUZ COUNTY, CALIFORNIA |
| DRAWN BY: MH | |
| DATE: 21 SEPTEMBER 2007 | HARO, KASUNICH & ASSOCIATES, INC.<br>GEOTECHNICAL AND COASTAL ENGINEERS<br>116 E. LAKE AVENUE, WATSONVILLE, CA 95076<br>(831) 722-4175 |
| REVISED: | |
| JOB NO. SC9427 | SHEET NO. |

FIGURE NO. 1


LEGEND
RA: Denotes test hole by Reas Ass (1989)
B-1
: Denotes HKA Test hole (2007)
2007
B-1
: Denotes HKA bore hole 2010
2010
P-1
Note: Base Map by Ifland Engineers
Village Drive
Cathedral Dr
Grant Swan
Phase Ia
Phase IIb
Phase II
Phase IIa
Phase III
Valencia St
Trout Gulch
Aptos Creek Rd
Soquel Dr
Aptos Rd
PROJECT LIMITS
FUTURE SKATE PARK
EXISTING BUILDING
VILLAGE GREEN
WELL SITE
PI STATE PARK ENTRANCE KIOSK
PI STATE PARK MONUMENT SIGN
GRAPHIC SCALE 1 INCH = 50 FEET
Bore Hole Site Map
Aptos Village
Santa Cruz County, California
SCALE 1"=100'
DRAWN BY MC
DATE March 2011
REVISED
JOB NO. SC9427.1
HARO, KASUNICH & ASSOCIATES, INC.
GEOTECHNICAL AND COASTAL ENGINEERS
116 E. LAKE AVENUE, WATSONVILLE, CA 95076
(831) 722-4175
SHEET NO.
FIGURE NO. 2

| PRIMARY DIVISIONS | | | GROUP SYMBOL | SECONDARY DIVISIONS |
|---|---|---|---|---|
| COARSE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE | GRAVELS — MORE THAN HALF OF COARSE FRACTION IS LARGER THAN NO. 4 SIEVE | CLEAN GRAVELS (LESS THAN 5% FINES) | GW | Well graded gravels, gravel-sand mixtures, little or no fines. |
| | | | GP | Poorly graded gravels or gravel-sand mixtures, little or no fines. |
| | | GRAVEL WITH FINES | GM | Silty gravels, gravel-sand-silt mixtures, non-plastic fines. |
| | | | GC | Clayey gravels, gravel-sand-clay mixtures, plastic fines. |
| | SANDS — MORE THAN HALF OF COARSE FRACTION IS SMALLER THAN NO. 4 SIEVE | CLEAN SANDS (LESS THAN 5% FINES) | SW | Well graded sands, gravelly sands, little or no fines |
| | | | SP | Poorly graded sands or gravelly sands, little or no fines |
| | | SANDS WITH FINES | SM | Silty sands, sand-silt mixtures, non-plastic fines. |
| | | | SC | Clayey sands, sand-clay mixtures, plastic fines. |
| FINE GRAINED SOILS — MORE THAN HALF OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE | SILTS AND CLAYS — LIQUID LIMIT IS LESS THAN 50% | | ML | Inorganic silts and very fine sands, rock flour, silty or clayey fine sands or clayey silts with slight plasticity. |
| | | | CL | Inorganic clays of low to medium plasticity, gravelly clays, sandy clays, silty clays, lean clays. |
| | | | OL | Organic silts and organic silty clays of low plasticity. |
| | SILTS AND CLAYS — LIQUID LIMIT IS GREATER THAN 50% | | MH | Inorganic silts, micaceous or diatomaceous fine sandy or silty soils, elastic silts. |
| | | | CH | Inorganic clays of high plasticity, fat clays. |
| | | | OH | Organic clays of medium to high plasticity, organic silts. |
| HIGHLY ORGANIC SOILS | | | Pt | Peat and other highly organic soils. |

## GRAIN SIZES

| U.S. STANDARD SERIES SIEVE | | | | CLEAR SQUARE SIEVE OPENINGS | | | |
|---|---|---|---|---|---|---|---|
| 200 | 40 | 10 | 4 | 3/4" | 3" | 12" | |
| SILTS AND CLAYS | SAND | | | GRAVEL | | COBBLES | BOULDERS |
| | FINE | MEDIUM | COARSE | FINE | COARSE | | |

| RELATIVE DENSITY | | CONSISTENCY | | | SAMPLING METHOD | | | H,O |
|---|---|---|---|---|---|---|---|---|
| SANDS AND GRAVELS | BLOWS PER FOOT* | SILTS AND CLAYS | STRENGTH (TSF)** | BLOWS PER FOOT* | STANDARD PENETRATION TEST | T | | Final |
| VERY LOOSE | 0 - 4 | VERY SOFT | 0 - ¼ | 0 - 2 | MODIFIED CALIFORNIA | I, or M | | Initial |
| LOOSE | 4 - 10 | SOFT | ¼ - ½ | 2 - 4 | PITCHER BARREL | P | | Water level designation |
| MEDIUM DENSE | 10 - 30 | FIRM | ½ - 1 | 4 - 8 | SHELBY TUBE | S | | |
| DENSE | 30 - 50 | STIFF | 1 - 2 | 8 - 16 | BULK | B | | |
| VERY DENSE | OVER 50 | VERY STIFF | 2 - 4 | 16 - 32 | | | | |
| | | HARD | OVER 4 | OVER 32 | | | | |

*Number of blows of 140 lb hammer falling 30 inches to drive a 2" O.D. (1⅜" I.D.) split spoon sampler (ASTM D-1586)

**Unconfined compressive strength in tons/ft² as determined by laboratory testing or approximated by the Standard Penetration Test (ASTM D-1586), pocket penetrometer, torvane, or visual observation.

| | | | |
|---|---|---|---|
| Haro Kasunich & Associates | KEY TO LOGS<br>Aptos Village<br>Santa Cruz County, California | Project No.<br>SC9427.1<br>March 2011 | Figure No. 3 |

Haro, Kasunich & Associates, Inc.
Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-1

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND, fine to medium grain, brick, rubble, moist (Fill) | SC | | | | | |
| | | | Dark brown Silty SAND, trace of binder, moist | SM | | | | | |
| 5 | | | Brown Clayey SAND, fine - medium grain, very moist | SC | | | | | |
| | | | Brown Silty SAND, fine to medium grain, damp | SM | | | | | |
| | | | Brown Clayey SAND, fine-medium grain, wet, very moist | SC | | | | | |
| 10 | | | Boring terminated at 10 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 4

Haro, Kasunich & Associates, Inc.
Geotechnical and Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-1A

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown, black Silty SAND with Clay, damp | SM | | | | | |
| | | | Dark brown Clayey SAND | SC | | | | | |
| 5 | | | Light brown Clayey SAND, fine to medum grain, moist | | | | | | |
| | | | Boring terminated at 6.0 feet | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

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*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 5

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-1B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND | SC | | | | | |
| 2 | | | Dark brown Clayey SAND, moist | | | | | | |
| | | | Boring terminated at 3.5 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 6

Haro, Kasunich & Associates, Inc.
Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 16 BORING NO. P-1C

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, fine grain - coarse grain, Gravels, damp | SM | | | | | |
| | | | Black Clayey SAND, moist | SC | | | | | |
| 5 | | | Brown, black Clayey SAND, fine grain, damp - moist | | | | | | |
| | | | Brown Silty SAND fine to medium grain, damp | SM | | | | | |
| 10 | | | Brown Sandy SILT, fine to medium grain, wet | ML | | | | | |
| | | | Brown Silty SAND, fine - medium grain, damp | SM | | | | | |
| 15 | | | Boring terminated at 16 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 7

Date: ; 9427.1 HKALI C:\Sui .com www. oftwar og Civ

Haro, Kasunich & Associates, Inc.
Geotechnical and Geochemical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-2

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | AB | | | | | | |
| | | | Black Silty SAND | SM | | | | | |
| | | | Light brown Silty SAND | SM | | | | | |
| | | | Boring terminated at 4.0 feet | | | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 8

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Haro, Kasunich & Associates, Inc.
Geotechnical and Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-3

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Aggregate Baserock | AB | | | | | |
| | | | Black Silty SAND, fine grain, damp-moist | SM | | | | | |
| 5 | | | Red brown Silty SAND trace of binder, fine-medium grain, moist, color change to light brown. | SM | | | | | |
| | | | Brown Silty CLAY, moist | CL-ML | | | | | |
| 10 | | | Boring terminated at 10 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 9

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Haro, Kasunich & Associates, Inc.
Geotechnical and Coastal Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-3A

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | AB | | | | | | |
| | | | Black Silty SAND | SM | | | | | |
| 5 | | | Brown Silty SAND | SM | | | | | |
| | | | Boring terminated at 6.0 feet | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 10

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-3B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND | SM | | | | | |
| | | | Brown Silty CLAY | CL | | | | | |
| 2 | | | Boring terminated at 2.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 11

Haro, Kasunich & Associates, Inc.
Geotechnical and Geoenvironmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-4

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND, wet | SC | | | | | |
| 2 | | | Black Sandy CLAY, fine to coarse grain, wet | CL | | | | | |
| | | | Boring terminated at 3.0 | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 12

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. B-5B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, moist | SM | | | | | |
| | | | Dark brown Clayey SAND, fine to medium grain, moist | SC | | | | | |
| 2 | | | Boring terminated at 3.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 13

Haro, Kasunich & Associates, Inc.
Geotechnical and Geoenvironmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-5A

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, Gravels, damp-moist | SM | | | | | |
| | | | Black Clayey SAND, moist-wet | SC | | | | | |
| 5 | | | Mottled brown/dark brown Clayey SAND, moist | | | | | | |
| | | | Boring terminated at 6.0 feet | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 14

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Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-5B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, moist | SM | | | | | |
| | | | Dark Brown Clayey SAND | SC | | | | | |
| 2 | | | | | | | | | |
| | | | Boring terminated at 3.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

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*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 15

Haro, Kasunich & Associates, Inc.
Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-6

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND with trace of Clay, moist | SM | | | | | |
| 5 | | | Light brown Clayey SAND, fine to coarse grain, wet | SC | | | | | |
| | | | Same | | | | | | |
| 10 | | | Boring terminated at 11 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 16

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Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-6A

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark brown Silty SAND, moist | SM | | | | | |
| | | | Brown Silty SAND with Clay, wet, fine to medium grain | | | | | | |
| 5 | | | Boring terminated at 6.0 feet | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO. 17

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Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-6B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND | SC | | | | | |
| 2 | | | Brown Clayey SAND | | | | | | |
| | | | Boring terminated at 3.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO. 18

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Geotechnical and Geoenvironmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-6C

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, moist | SM | | | | | |
| | | | Black Clayey SAND, moist | SC | | | | | |
| 5 | | | Brown Silty SAND, moist | SM | | | | | |
| | | | Brown Clayey SAND, fine-medium grain | SC | | | | | |
| 10 | | | Brown Clayey SAND, fine to coarse grain, 1 1/2" rounded Gravels | | | | | | |
| | | | Brown Silty SAND, fine to coarse grain, trace of binder | SM | | | | | |
| 15 | | | Boring terminated at 16 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 19

Haro, Kasunich & Associates, Inc.
Geotechnical and Environmental Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-7

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown/black Silty SAND, fine to coarse grain, trace of binder, 1/4" Gravels, moist | SM | | | | | |
| | | | Brown Clayey SAND, fine to coarse grain, damp, Gravels | SC | | | | | |
| 5 | | | | | | | | | |
| 10 | | | Boring terminated at 10 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk FIGURE NO. 20

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Geotechnical and Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-7B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND, trace of Clay, fine grain, damp-moist | SM | | | | | |
| 2 | | | | | | | | | |
| | | | Brown Clayey SAND, fine to coarse grain, moist | SC | | | | | |
| 4 | | | Boring terminated at 4.0 feet | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 21

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Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-8

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | AB | | | | | | |
| | | | Brown Silty SAND, moist | SM | | | | | |
| | | | Dark brown Clayey SAND, fine grain, moist | SC | | | | | |
| | | | Boring terminated at 3.5 feet | | | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 22

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# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-9

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark Brown Silty SAND, moist | SM | | | | | |
| | | | Light brown Silty SAND, fine grain, damp | | | | | | |
| 5 | | | | | | | | | |
| 10 | | | Boring terminated at 10 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 23

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-9B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, damp<br>Dark brown fine Silty SAND, damp | SM | | | | | |
| | | | Boring terminated at 3.0 feet | | | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 24

Haro, Kasunich & Associates, Inc.
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# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-10B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND, trace of binder, moist | SM | | | | | |
| | | | Brown Clayey SAND, moist | SC | | | | | |
| | | | Boring terminated at 4.0 feet | | | | | | |
| 5 | | | | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 25

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Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-11

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, moist, fine-medium grain, moist | SM | | | | | |
| | | | Fine brown Silty SAND, dry-damp | | | | | | |
| | | | Tan Clayey SAND, fine to coarse grain, moist | SC | | | | | |
| 5 | | | Boring terminated at 6.0 feet | | | | | | |
| 10 | | | | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 26

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-11B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Dark brown Clayey SAND, moist | SC | | | | | |
| 2 | | | Boring terminated at 2.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 27

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-12

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND, trace of binder, fine-medium grain, cobbles, moist | SM | | | | | |
| | | | Light Brown Clayey SAND, fine grain, wet | SC | | | | | |
| 5 | | | Groundwater 1st encounter @ 5' 12/8/10<br>Brown Clayey SAND, fine-medium grain, saturated<br>Groundwater at 7' 12/10/10 | | | | | | |
| 10 | | | Boring terminated at 10.0 feet | | | | | | |
| 15 | | | | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 28

Haro, Kasunich & Associates, Inc.
Geotechnical Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-12C

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Silty SAND, trace of binder, fine-medium grain, cobbles, moist | SM | | | | | |
| | | | Brown Clayey SAND, fine-medium grain, wet | SC | | | | | |
| 5 | | | | | | | | | |
| | | | Brown Clayey SAND, fine-medium grain, wet-very | | | | | | |
| 10 | | | | | | | | | |
| | | | Light brown Clayey SAND, fine-medium grain, wet (slight seep noticed in hole) | | | | | | |
| 15 | | | | | | | | | |
| | | | Boring terminated at 16 feet | | | | | | |
| 20 | | | | | | | | | |
| 25 | | | | | | | | | |
| 30 | | | | | | | | | |
| 35 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 29

Haro, Kasunich & Associates, Inc.
Geotechnical and Geological Engineers

# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-12B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND, moist | SC | | | | | |
| 2 | | | Boring terminated at 3.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk | FIGURE NO. 30

Haro, Kasunich & Associates, Inc.
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# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-13B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, Gravels, damp | SM | | | | | |
| | | | Black Clayey SAND, moist | SC | | | | | |
| 2 | | | Boring terminated at 2.5 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 31

Haro, Kasunich & Associates, Inc.
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# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-14B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Black Clayey SAND, moist to wet | SC | | | | | |
| 2 | | | Boring terminated at 3.0 feet | | | | | | |
| 4 | | | | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 32

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# Aptos Village

PROJECT NO. SC9427.1

LOGGED BY MC DATE DRILLED December 8, 2010 BORING DIAMETER 6" BORING NO. P-15B

| Depth, ft. | Sample No. and type | Symbol | SOIL DESCRIPTION | Unified Soil Classification | Blows/foot 350 ft - lbs. | Qu - t.s.f. Penetrometer | Dry Density p.c.f. | Moisture % dry wt. | MISC. LAB RESULTS |
|---|---|---|---|---|---|---|---|---|---|
| 0 | | | Brown Silty SAND, Gravels, moist | SM | | | | | |
| | | | Black Silty SAND, trace of binder, damp | | | | | | |
| 2 | | | Brown Clayey SAND, moist | SC | | | | | |
| 4 | | | Boring terminated at 4.0 feet | | | | | | |
| 6 | | | | | | | | | |
| 8 | | | | | | | | | |
| 10 | | | | | | | | | |
| 12 | | | | | | | | | |
| 14 | | | | | | | | | |

*HARO, KASUNICH AND ASSOCIATES, INC.*

BY: dk

FIGURE NO. 33

| Summary of Percolation Test Results for Aptos Village 9 & 10 December 2010 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Test Hole # | P-1 | P-1A | P-1B | P-2B | P-3 | P-3A | P-3B | P-4B | P-5B |
| Approximate Depth (ft) | 10 | 6 | 3 | 3 | 10 | 6 | 3 | 3 | 3 |
| Percolation Rate (In/hr) | 1 | 0.25 | $0^{X}$ | 36 | 6 | 0.5 | $0^{X}$ | 0.125 | 0 |

| Test Hole # | P-6 | P-6A | P-6B | P-7 | P-7B | P-8B | P-9 | P-9B | P-10B |
|---|---|---|---|---|---|---|---|---|---|
| Approximate Depth (ft) | 10 | 6 | 3 | 10 | 3 | 3 | 10 | 3 | 3 |
| Percolation Rate (In/hr) | 4.5 | 0.125 | 0.25 | 5 | 0.5 | 0.75 | 0.25 | 6 | 0.25 |

| Test Hole # | P-11A | P-11B | P-12 | P-12B | P-13B | P-14B | P-15B | B-5A | B-5B |
|---|---|---|---|---|---|---|---|---|---|
| Approximate Depth (ft) | 6 | 3 | 10 | 3 | 3 | 3 | 3 | 6 | 3 |
| Percolation Rate (In/hr) | 1 | $0^{X}$ | $0^{XX}$ | 36 | 1.5 | 0.25 | 0.25 | 3 | 1.5 |

Footnote X: Standing Water in Hole After Presaturation Period
Foootnote XX: Water Encountered During Field Drilling (Seep)

Figure No. 34

## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-1 | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 9.516 | | DEPTH OF BORING (feet) 10.010 | | | |
| TESTED BY: | MA | | PERCOLATION ZONE (feet): | | 9.510 | 10.010 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 9.5156 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 9.6354 | - | 1.4375 | 20.87 | 2.8750 |
| 2 | 60 | 9.7344 | 9.6510 | 1.1875 | 25.26 | 2.3750 |
| 3 | 90 | 9.7135 | 9.6198 | 0.7500 | 40.00 | 1.5000 |
| 4 | 120 | 9.6875 | 9.6094 | 0.8125 | 36.92 | 1.6250 |
| 5 | 150 | 9.7031 | 9.6250 | 1.1250 | 26.67 | 2.2500 |
| 6 | 180 | 9.6979 | 9.5990 | 0.8750 | 34.29 | 1.7500 |
| 7 | 210 | 9.6979 | 9.6198 | 1.1875 | 25.26 | 2.3750 |
| 8 | 240 | 9.7135 | - | 1.1250 | 26.67 | 2.2500 |

**Average Of Reading's (in/hr)= 2.1250**

**Reported Percolation Rate (in/hr) = 1.0**

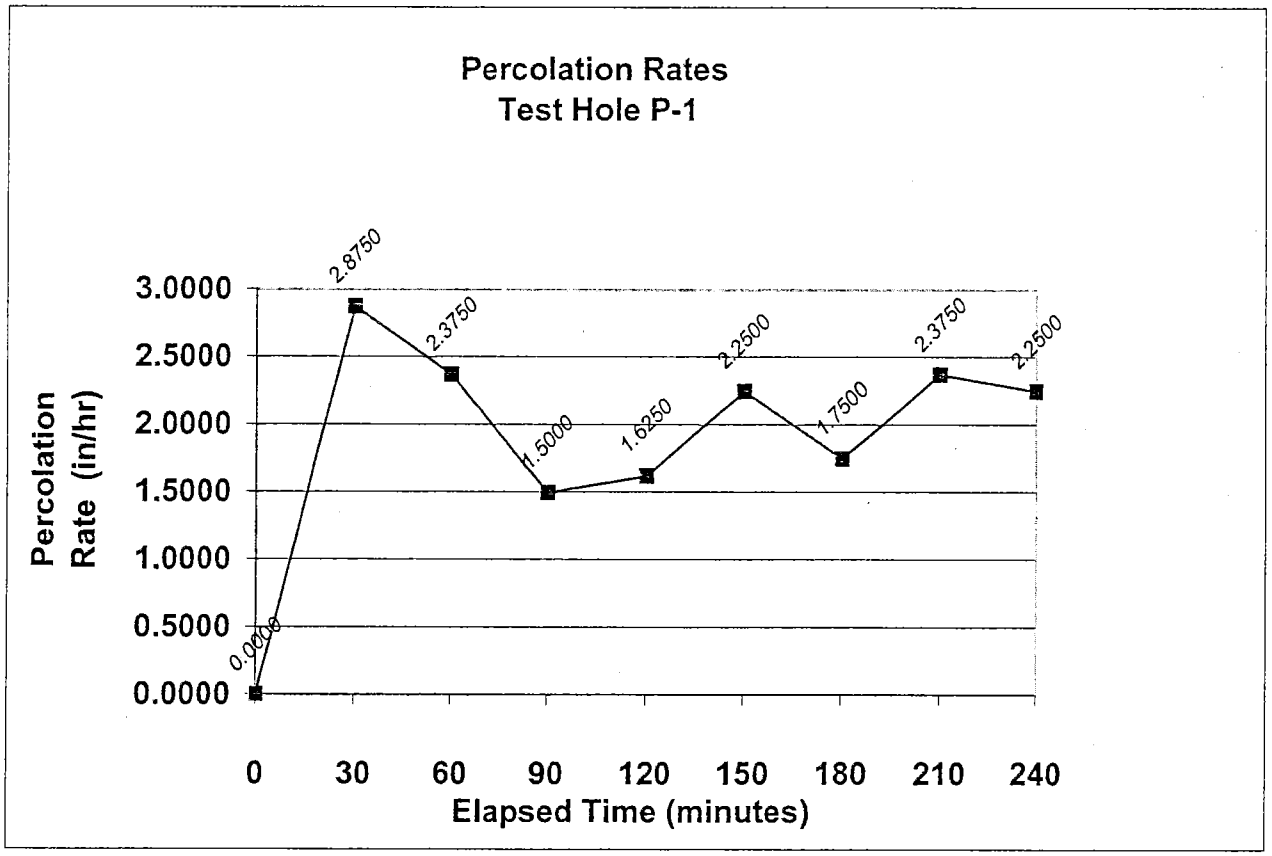


Figure No. 35

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-1A | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: 6.313 | | | DEPTH OF BORING: = 6.313 | | | |
| TESTED BY: | MA | | PERCOLATION ZONE: 5.813 to 6.313 feet | | | |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 5.8125 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 6.3125 | 5.8125 | 6.0000 | 5.00 | 12.0000 |
| 2 | 60 | 6.1250 | 5.8907 | 3.7500 | 8.00 | 7.5000 |
| 3 | 90 | 5.9011 | - | 0.1250 | 240.00 | 0.2500 |
| 4 | 120 | 5.9063 | - | 0.0625 | 480.00 | 0.1250 |
| 5 | 150 | 5.9115 | - | 0.0625 | 480.00 | 0.1250 |
| 6 | 180 | 5.9219 | - | 0.1250 | 240.00 | 0.2500 |
| 7 | 210 | 5.9271 | - | 0.0625 | 480.00 | 0.1250 |
| 8 | 240 | 5.9323 | - | 0.0625 | 480.00 | 0.1250 |

**Average Of Reading's (in/hr)= 2.5625**

**Reported Percolation Rate (in/hr) = 0.250**

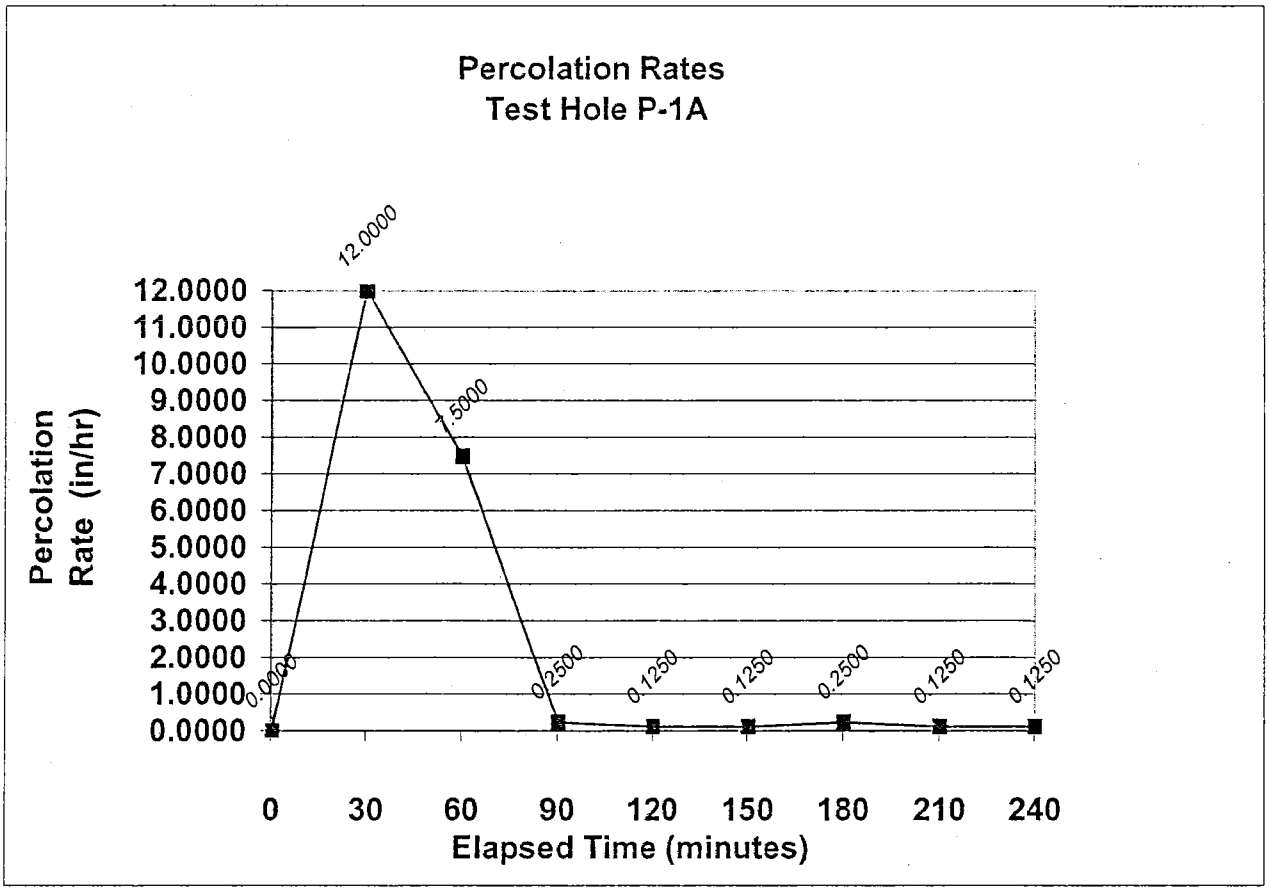


Figure No. 36

## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-3 | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 9.4896 | | DEPTH OF BORING (feet) | 9.4896 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 8.9896 | 9.4896 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 9.0104 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 9.1927 | 8.9271 | 2.1875 | 13.71 | 4.3750 |
| 2 | 60 | 9.0938 | 8.8542 | 2.0000 | 15.00 | 4.0000 |
| 3 | 90 | 9.0781 | 8.8542 | 2.6875 | 11.16 | 5.3750 |
| 4 | 120 | 9.1458 | - | 3.5000 | 8.57 | 7.0000 |
| 5 | - | - | - | - | - | - |
| 6 | - | - | - | - | - | - |
| 7 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 5.1875**

**Reported Percolation Rate (in/hr) = 6.0**

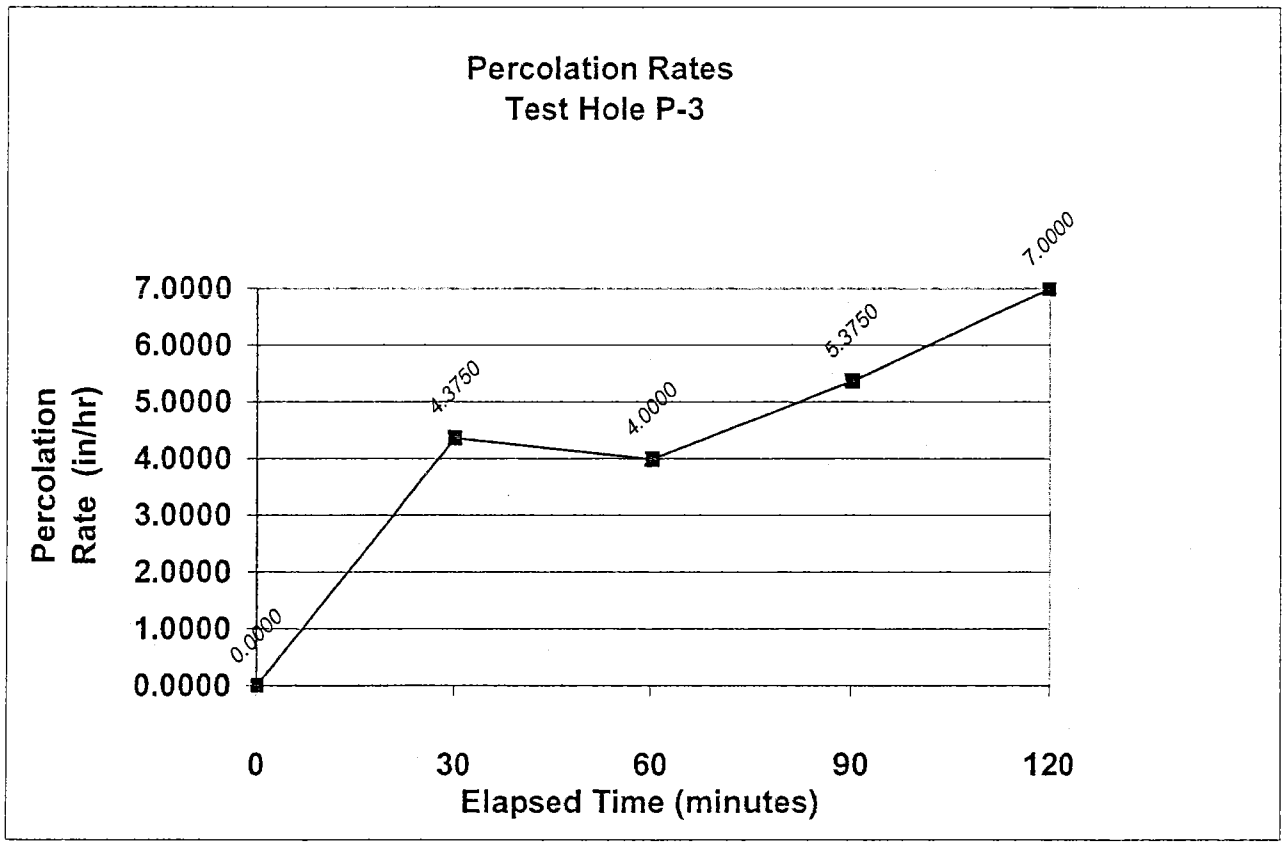


Figure No. 37

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-3A | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 6.1510 | | DEPTH OF BORING (feet) 6.1510 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 5.6510 | 6.1510 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 5.7344 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 5.7708 | - | 0.4375 | 68.57 | 0.8750 |
| 2 | 60 | 5.8802 | - | 1.3125 | 22.86 | 2.6250 |
| 3 | 90 | 5.8958 | - | 0.1875 | 160.00 | 0.3750 |
| 4 | 120 | 5.9844 | - | 1.0625 | 28.24 | 2.1250 |
| 5 | 150 | 6.0573 | 5.5469 | 0.8750 | 34.29 | 1.7500 |
| 6 | 180 | 5.6615 | - | 1.3750 | 21.82 | 2.7500 |
| 7 | 210 | 5.7552 | - | 1.1250 | 26.67 | 2.2500 |
| 8 | 240 | 5.8229 | - | 0.8125 | 36.92 | 1.6250 |

**Average Of Reading's (in/hr)= 1.797**

**Reported Percolation Rate (in/hr) = 0.50**

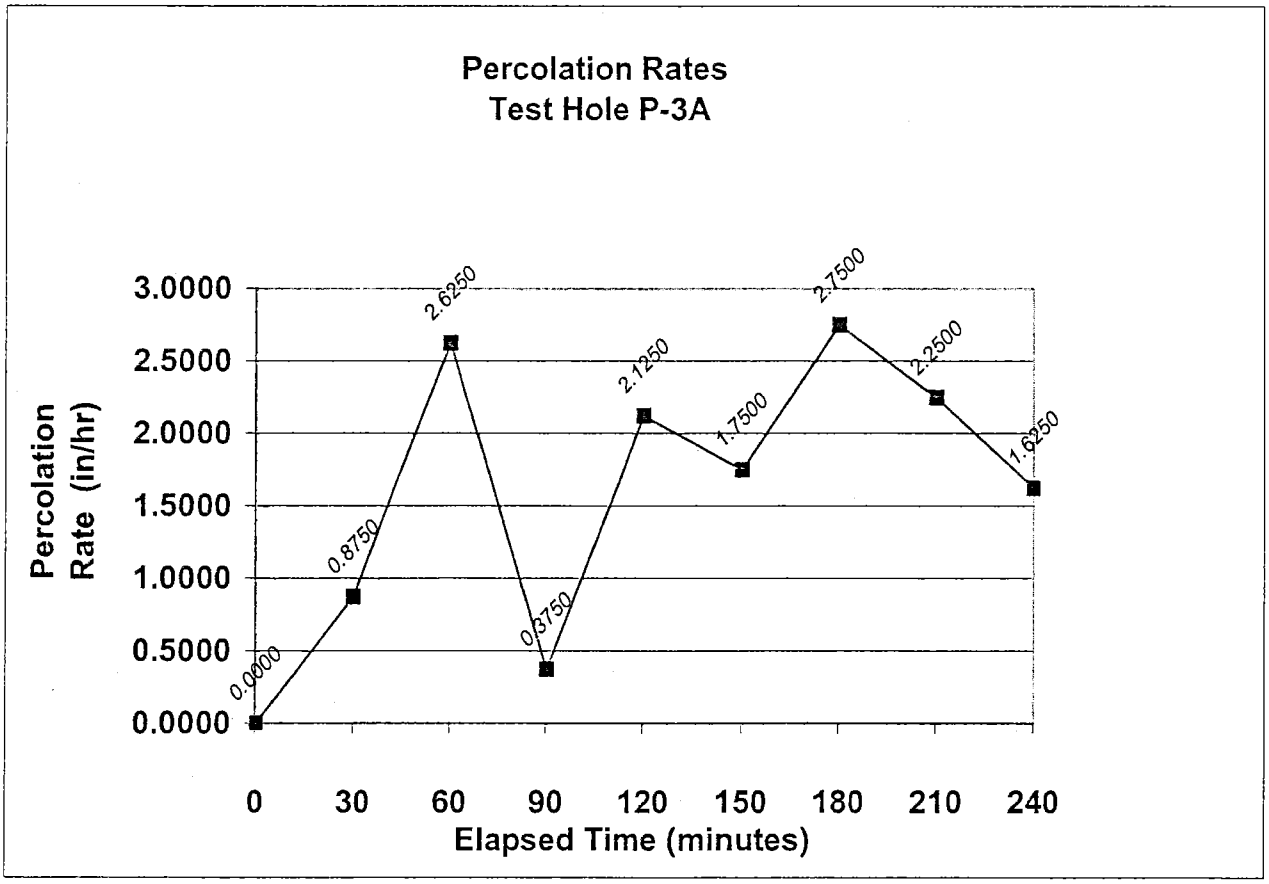


Figure No. 38

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-4B | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.0208 | | DEPTH OF BORING (feet) | 3.0208 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.5208 | 3.0208 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.5521 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.5729 | - | 0.2500 | 120.00 | 0.5000 |
| 2 | 60 | 2.5833 | - | 0.1250 | 240.00 | 0.2500 |
| 3 | 90 | 2.5938 | - | 0.1250 | 240.00 | 0.2500 |
| 4 | 120 | 2.5938 | - | 0.0000 | #DIV/0! | 0.0000 |
| 5 | 150 | 2.5990 | - | 0.0625 | 480.00 | 0.1250 |
| 6 | - | - | - | - | - | - |
| 7 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 0.2250**

**Reported Percolation Rate in/hr = 0.1250**

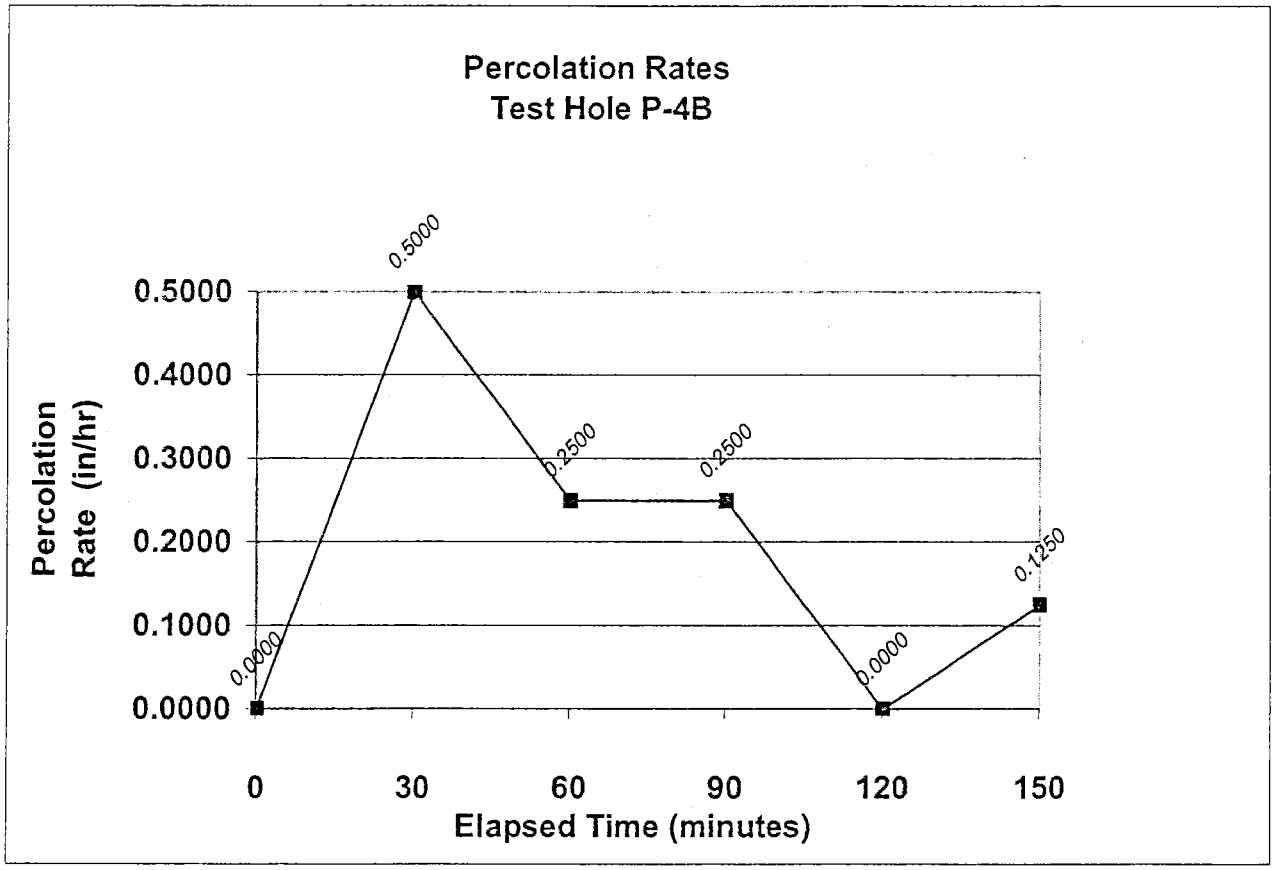


Figure No. 39

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-6B | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.1354 | | DEPTH OF BORING (feet) 3.4219 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.9219 | 3.4219 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.9219 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.9271 | - | 0.0625 | 480.00 | 0.1250 |
| 2 | 60 | 2.9271 | - | 0.0000 | #DIV/0! | 0.0000 |
| 3 | 90 | 2.9271 | - | 0.0000 | #DIV/0! | 0.0000 |
| 4 | 120 | 2.9271 | - | 0.0000 | #DIV/0! | 0.0000 |
| 5 | - | - | - | - | - | - |
| 6 | - | - | - | - | - | - |
| 7 | - | - | - | - | - | - |
| 8 | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 0.0313**

**Reported Percolation Rate in/hr = 0.0**

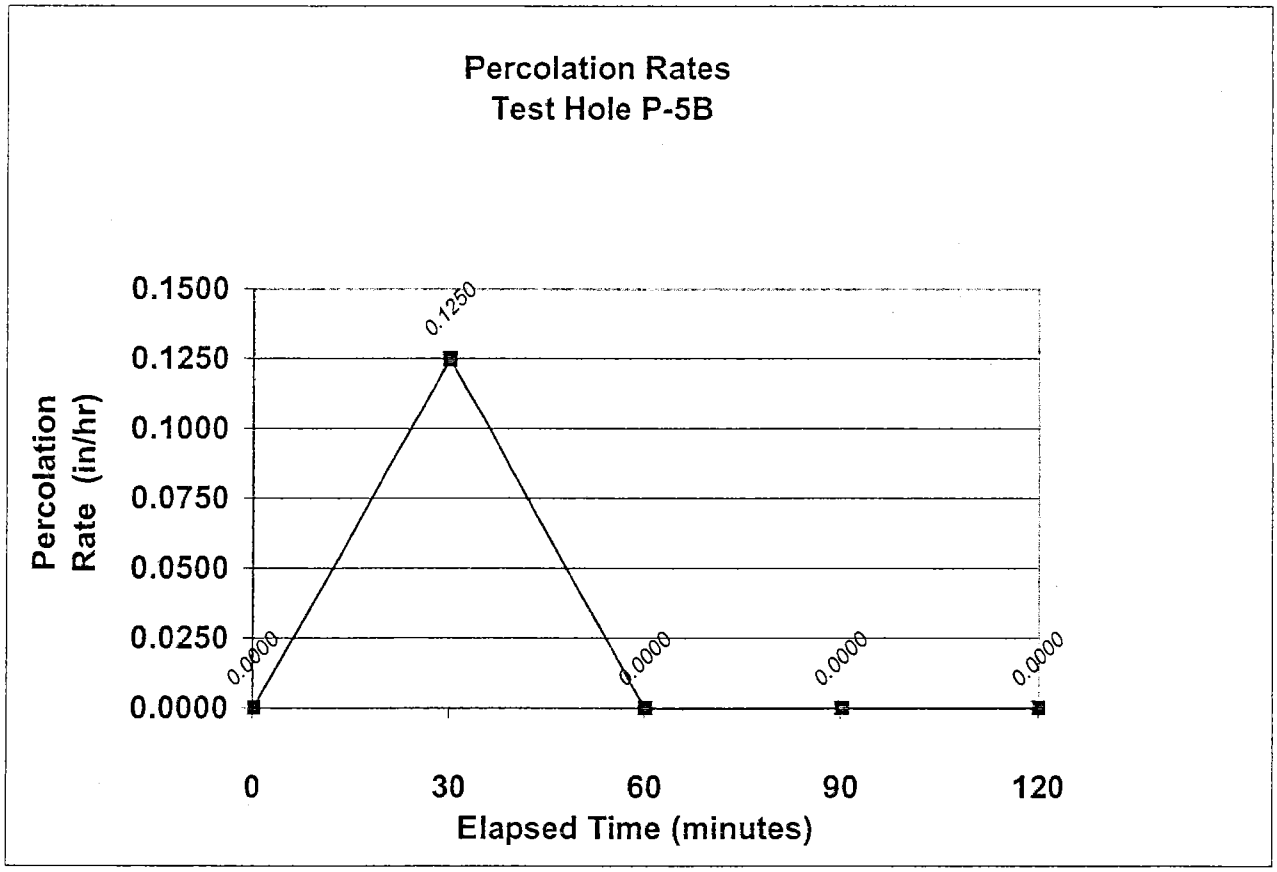


Figure No. 40

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | B-5A | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 6.2500 | | DEPTH OF BORING (feet) | 6.2500 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 5.7500 | 6.2500 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 5.7500 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 5.9375 | - | 2.2500 | 13.33 | 4.5000 |
| 2 | 60 | 6.0833 | 5.8438 | 1.7500 | 17.14 | 3.5000 |
| 3 | 90 | 6.0521 | 5.9167 | 2.5000 | 12.00 | 5.0000 |
| 4 | 120 | 6.0365 | 5.9271 | 1.4375 | 20.87 | 2.8750 |
| 5 | 150 | 6.0833 | 5.8542 | 1.8750 | 16.00 | 3.7500 |
| 6 | 180 | 6.0990 | 5.8750 | 2.9375 | 10.21 | 5.8750 |
| 7 | 210 | 6.0156 | 5.9063 | 1.6875 | 17.78 | 3.3750 |
| 8 | 240 | 6.0833 | 5.8333 | 2.1250 | 14.12 | 4.2500 |

**Average Of Reading's (in/hr)= 4.1406**

**Reported Percolation Rate in/hr = 3.0**

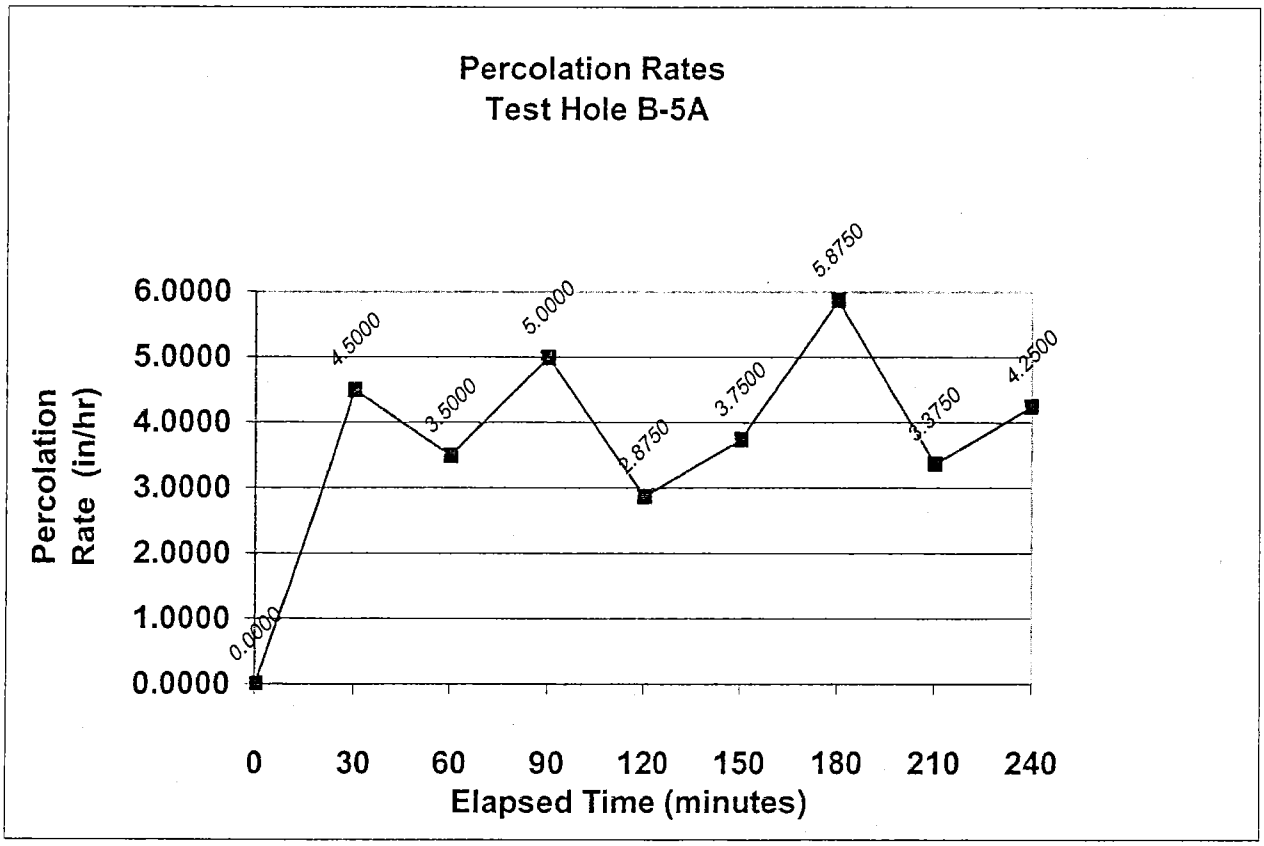


Figure No. 41

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | B-5B | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.3333 | | DEPTH OF BORING (feet) | 3.3333 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.8333 | 3.3333 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.8542 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 3.0000 | - | 1.7500 | 17.14 | 3.5000 |
| 2 | 60 | 3.0417 | 2.8333 | 0.5000 | 60.00 | 1.0000 |
| 3 | 90 | 2.9583 | - | 1.5000 | 20.00 | 3.0000 |
| 4 | 120 | 3.0469 | 2.9583 | 1.0625 | 28.24 | 2.1250 |
| 5 | 150 | 3.0677 | 2.9583 | 1.3125 | 22.86 | 2.6250 |
| 6 | 180 | 3.0521 | 2.9531 | 1.1250 | 26.67 | 2.2500 |
| 7 | 210 | 3.0365 | 2.9063 | 1.0000 | 30.00 | 2.0000 |
| 8 | 240 | 3.0521 | 2.9063 | 1.7500 | 17.14 | 3.5000 |

**Average Of Reading's (in/hr)= 2.5000**

**Reported Percolation Rate in/hr = 1.50**

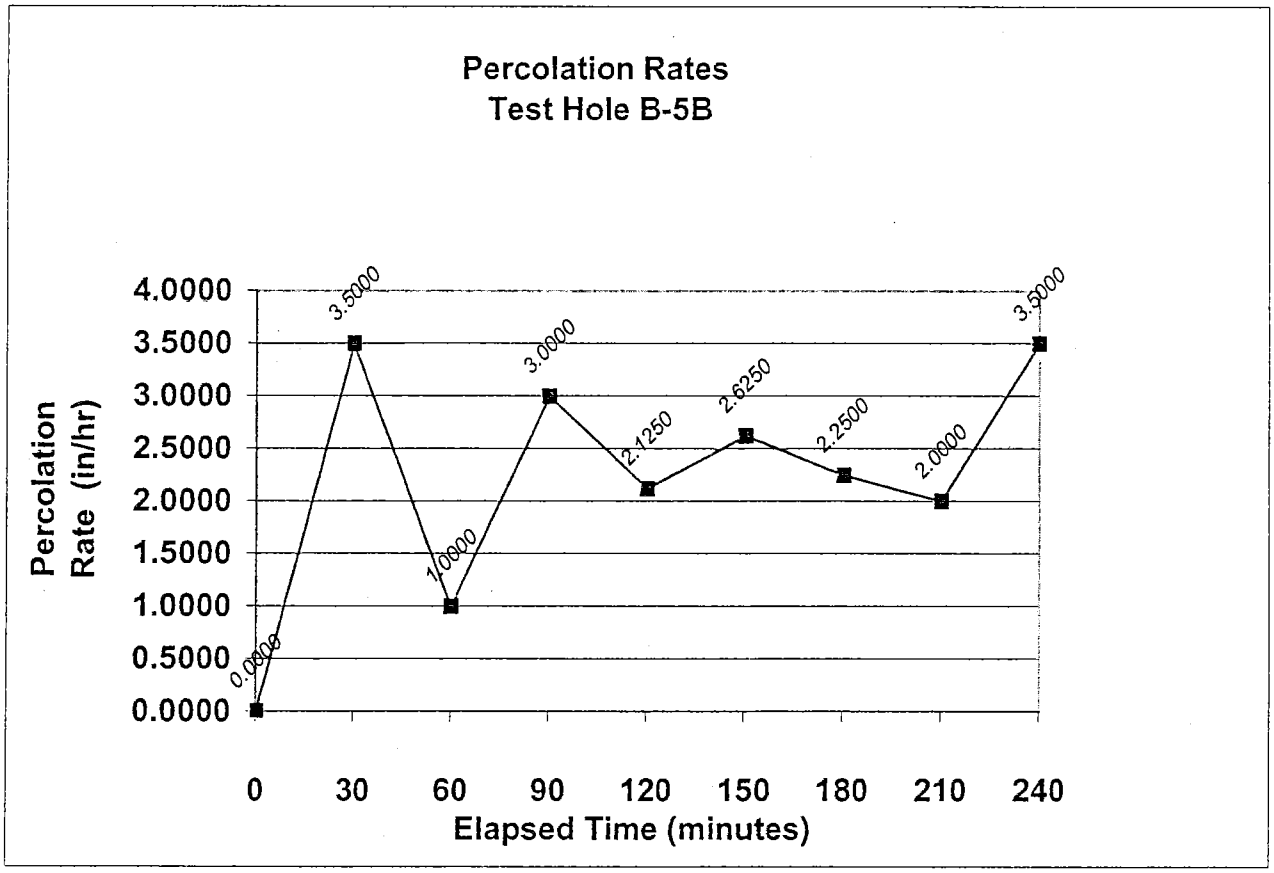


Figure No. 42

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-6 | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 10.1042 | | DEPTH OF BORING (feet) 10.1042 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 9.6042 | 10.1042 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 9.6458 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 10.0000 | 9.6042 | 4.2500 | 7.06 | 8.5000 |
| 2 | 60 | 9.7188 | - | 1.3750 | 21.82 | 2.7500 |
| 3 | 90 | 9.8958 | - | 2.1250 | 14.12 | 4.2500 |
| 4 | 120 | 10.0677 | 9.6458 | 2.0625 | 14.55 | 4.1250 |
| 5 | 150 | 9.8021 | - | 1.8750 | 16.00 | 3.7500 |
| 6 | 180 | 9.9896 | - | 2.2500 | 13.33 | 4.5000 |
| 7 | 210 | 10.1042 | 9.6563 | 1.3750 | 21.82 | 2.7500 |
| 8 | 240 | 9.8438 | - | 2.2500 | 13.33 | 4.5000 |

**Average Of Reading's (in/hr)= 4.3906**

**Reported Percolation Rate in/hr = 4.50**

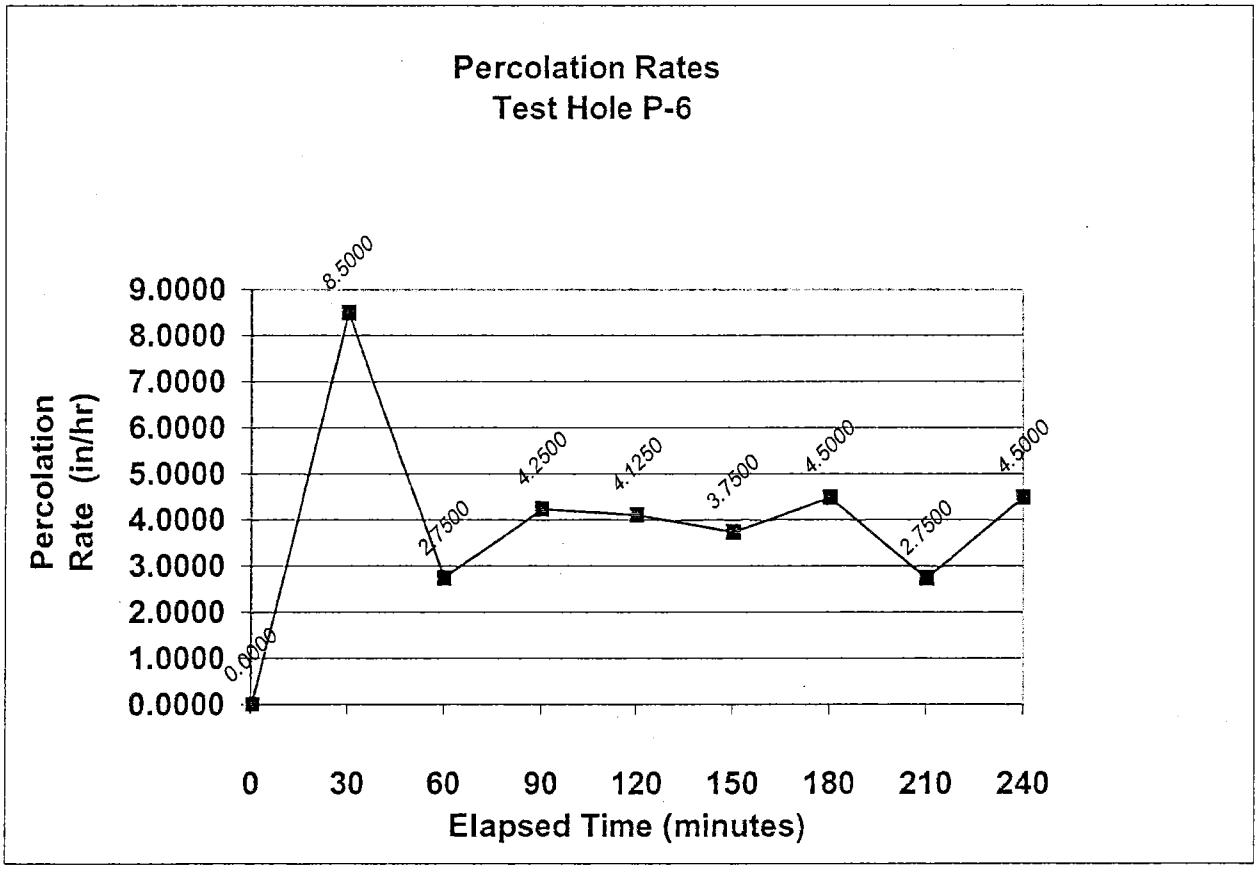


Figure No. 43

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-6A | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 5.583 | | DEPTH OF BORING (feet) | 4.958 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 4.458 | 4.958 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 4.8750 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 4.9063 | - | 0.3750 | 80.00 | 0.7500 |
| 2 | 60 | 4.9167 | - | 0.1250 | 240.00 | 0.2500 |
| 3 | 90 | 4.9271 | - | 0.1250 | 240.00 | 0.2500 |
| 4 | 120 | 4.9323 | - | 0.0625 | 480.00 | 0.1250 |
| 5 | 150 | 4.9375 | - | 0.0625 | 480.00 | 0.1250 |
| 6 | 180 | 4.9427 | - | 0.0625 | 480.00 | 0.1250 |
| 7 | 210 | 4.9479 | - | 0.0625 | 480.00 | 0.1250 |
| 8 | 240 | 4.9531 | - | 0.0625 | 480.00 | 0.1250 |

**Average Of Reading's (in/hr)= 0.2344**

**Reported Percolation Rate in/hr = 0.125**

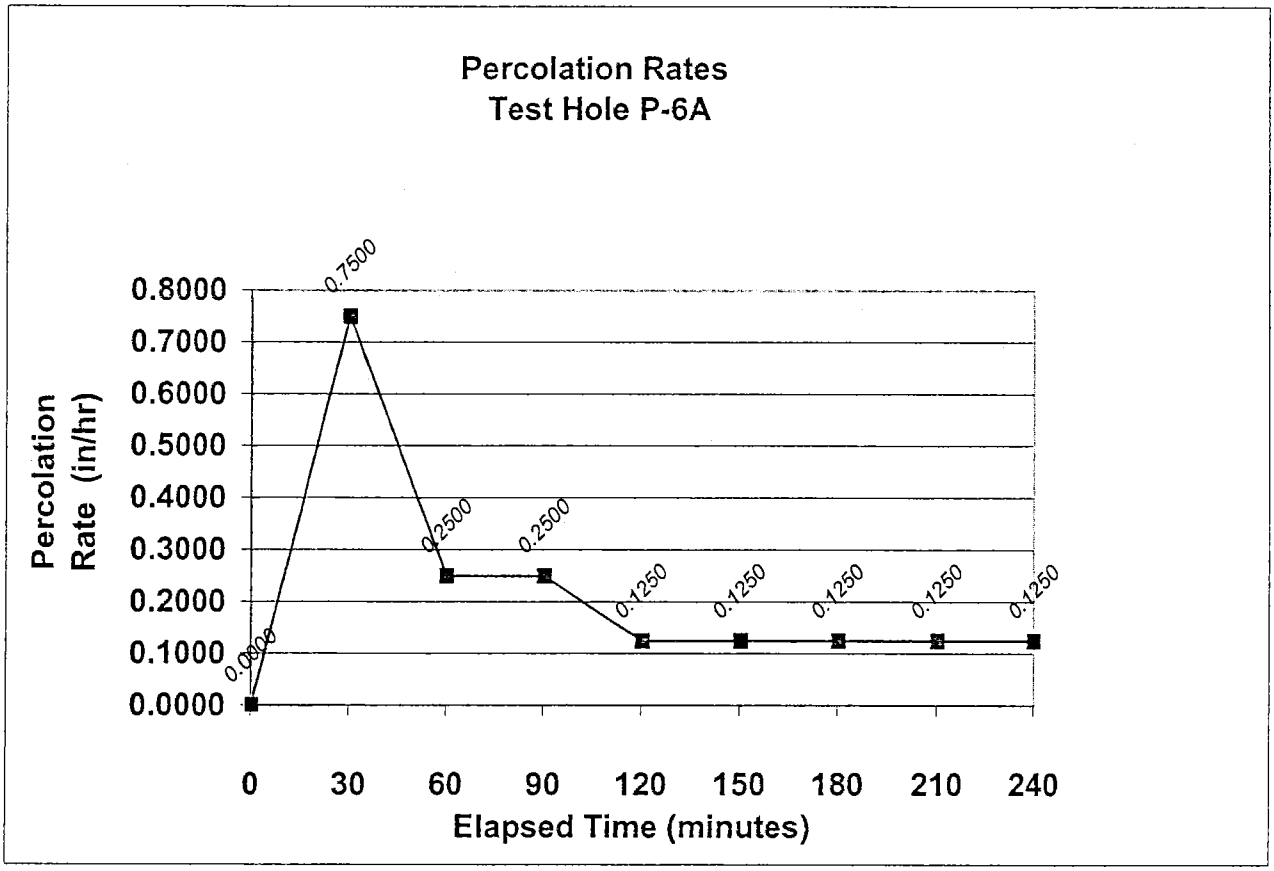


Figure No. 44

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-6B | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 2.750 | | DEPTH OF BORING (feet) | 2.750 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.250 | 2.750 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.2500 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.2500 | - | 0.0000 | #DIV/0! | 0.0000 |
| 2 | 60 | 2.2917 | - | 0.5000 | 60.00 | 1.0000 |
| 3 | 90 | 2.3125 | - | 0.2500 | 120.00 | 0.5000 |
| 4 | 120 | 2.3125 | - | 0.0000 | #DIV/0! | 0.0000 |
| 5 | 150 | 2.3229 | - | 0.1250 | 240.00 | 0.2500 |
| 6 | 180 | 2.3333 | - | 0.1250 | 240.00 | 0.2500 |
| 7 | 210 | 2.3438 | - | 0.1250 | 240.00 | 0.2500 |
| 8 | 240 | 2.3542 | - | 0.1250 | 240.00 | 0.2500 |

**Average Of Reading's (in/hr)= 0.3125**

**Reported Percolation Rate in/hr = 0.25**

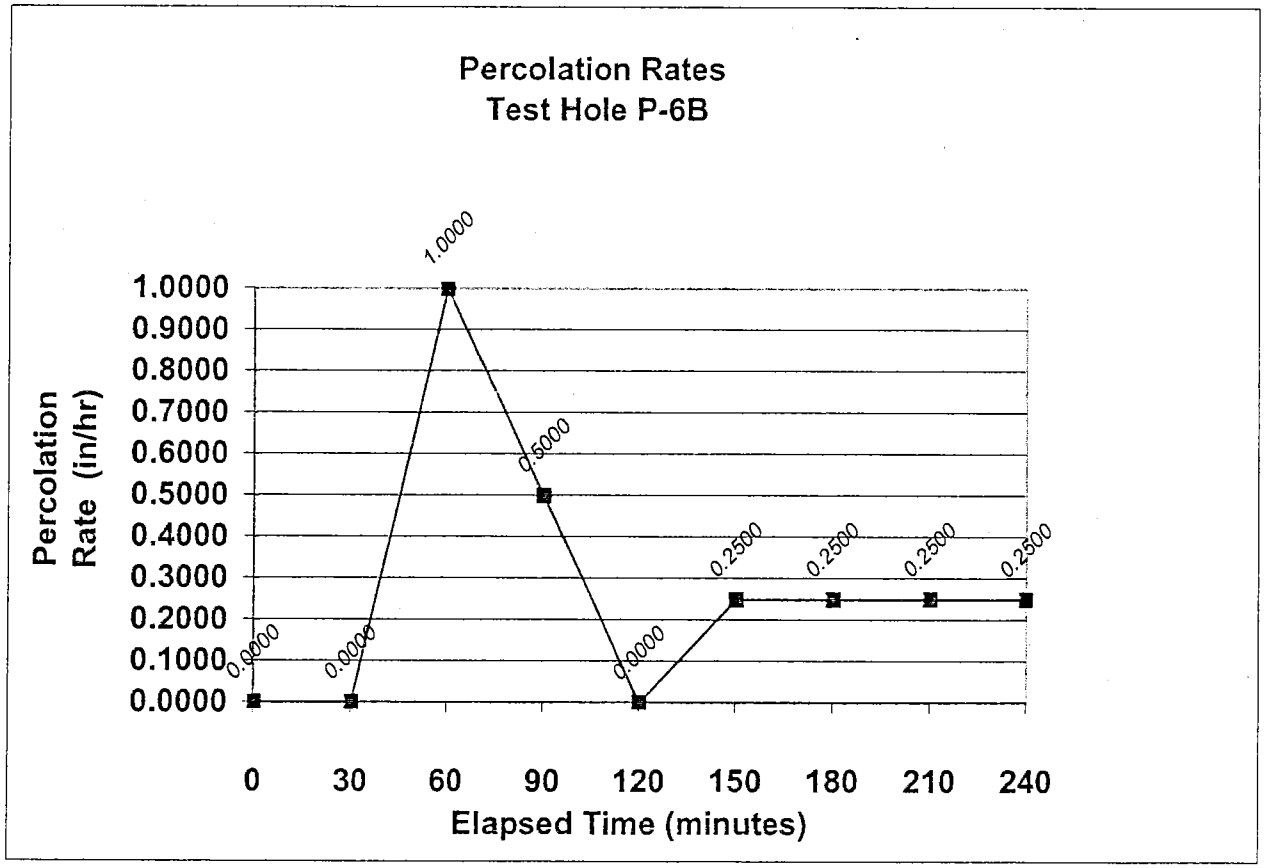


Figure No. 45

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-7 | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 10.3333 | | DEPTH OF BORING (feet) 10.3333 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 9.8333 | 10.3333 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 9.7969 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 10.3333 | 9.9583 | 6.4375 | 4.66 | 12.8750 |
| 2 | 60 | 10.2188 | - | 3.1250 | 9.60 | 6.2500 |
| 3 | 90 | 10.3333 | 9.9167 | 1.3750 | 21.82 | 2.7500 |
| 4 | 120 | 10.1875 | - | 3.2500 | 9.23 | 6.5000 |
| 5 | 150 | 10.2917 | - | 1.2500 | 24.00 | 2.5000 |
| 6 | 180 | 10.3333 | - | 0.5000 | 60.00 | 1.0000 |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 5.3125**

**Reported Percolation Rate in/hr = 5.0**

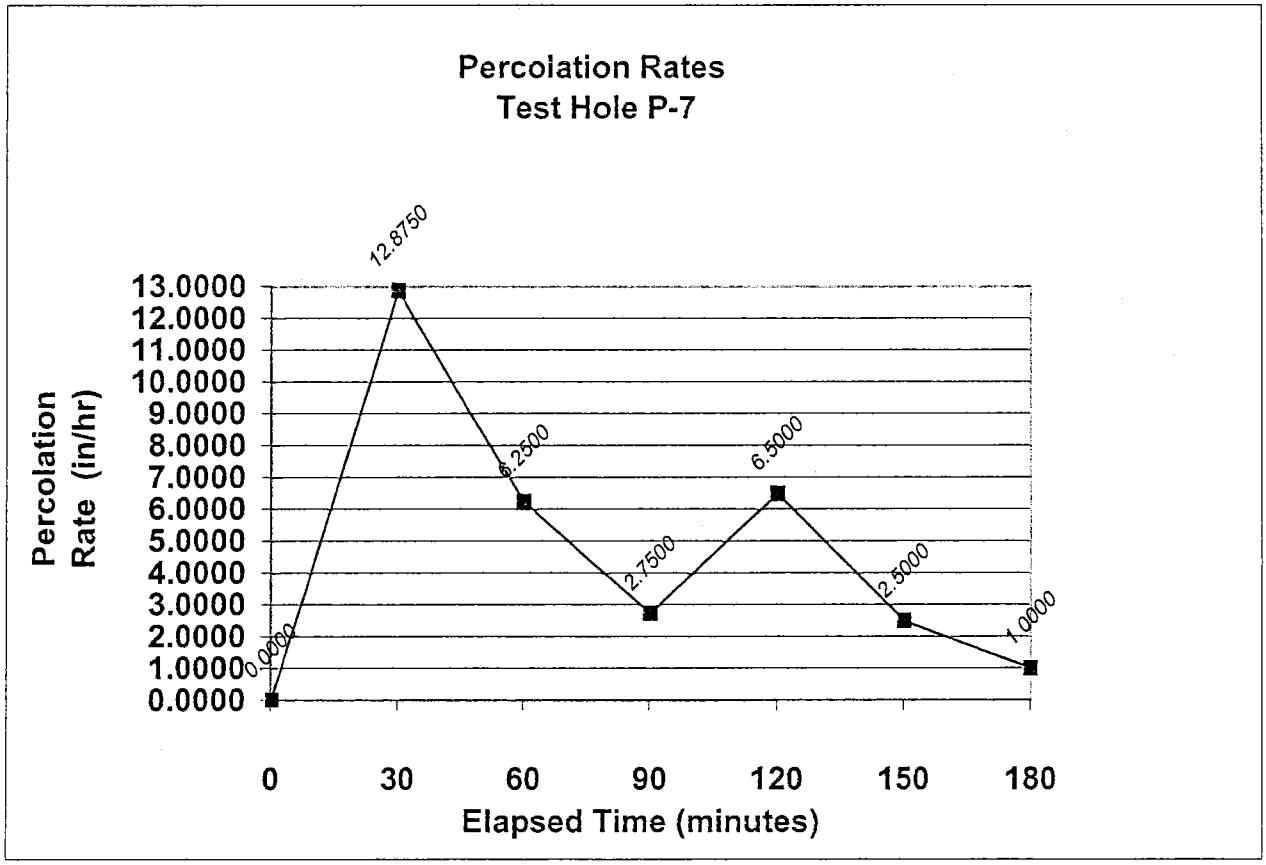


Figure No. 4b

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-7B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.6875 | | DEPTH OF BORING (feet) | 2.4375 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 1.9375 | 2.4375 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 3.2292 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 3.2500 | - | 0.2500 | 120.00 | 0.5000 |
| 2 | 60 | 3.2500 | - | 0.0000 | #DIV/0! | 0.0000 |
| 3 | 90 | 3.2708 | - | 0.2500 | 120.00 | 0.5000 |
| 4 | 120 | 3.2865 | - | 0.1875 | 160.00 | 0.3750 |
| 5 | 150 | 3.3073 | - | 0.2500 | 120.00 | 0.5000 |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 0.3750**

**Reported Percolation Rate in/hr = 0.25**

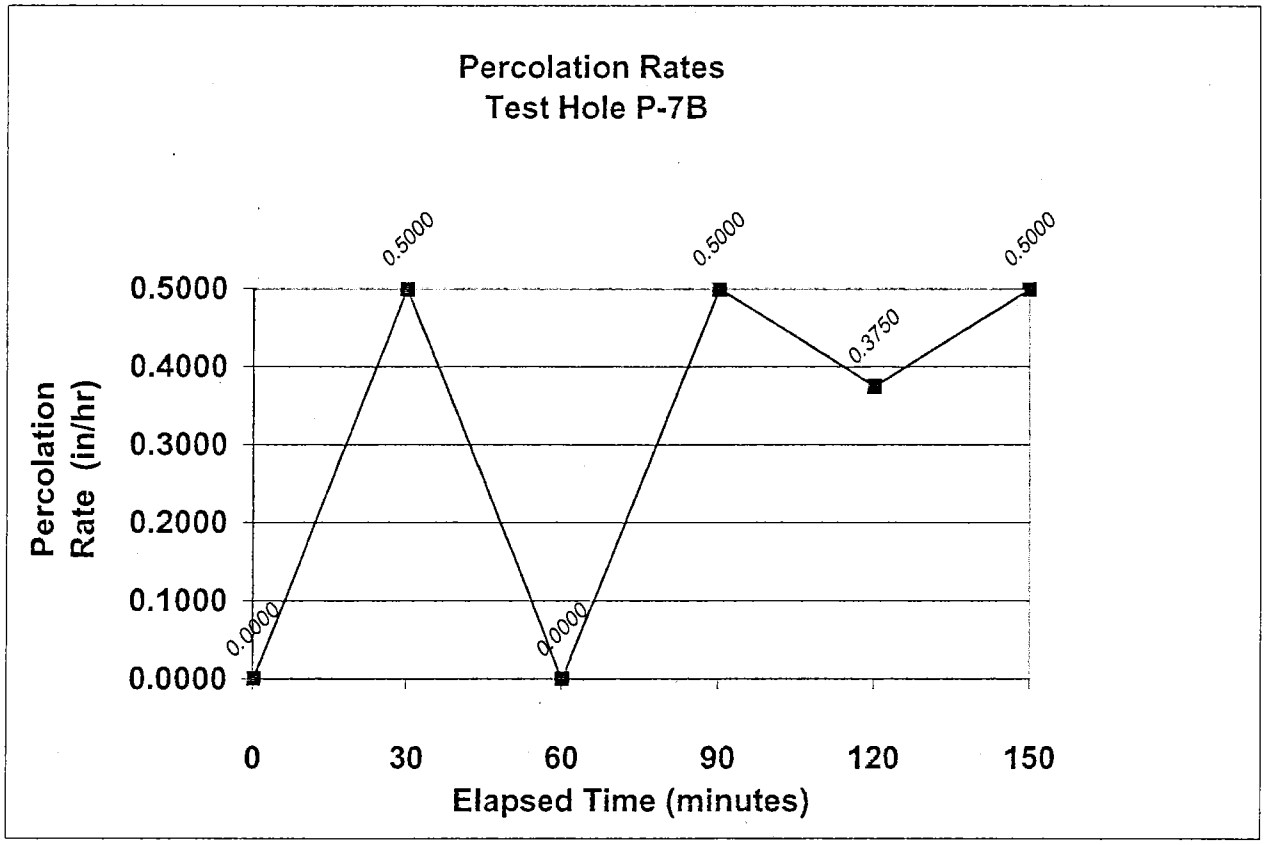


Figure No. 47

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-8B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.3021 | | DEPTH OF BORING (feet) 3.3021 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.8021 | 3.3021 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.8021 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 3.3021 | 2.8021 | 6.0000 | 5.00 | 12.0000 |
| 2 | 60 | 2.8177 | - | 0.1875 | 160.00 | 0.3750 |
| 3 | 90 | 2.8177 | - | 0.0000 | #DIV/0! | 0.0000 |
| 4 | 120 | 2.8229 | - | 0.0625 | 480.00 | 0.1250 |
| 5 | 150 | 2.823 | - | 0.0000 | #DIV/0! | 0.0000 |
| 6 | 180 | 2.823 | - | 0.0000 | #DIV/0! | 0.0000 |
| 7 | 210 | 2.828 | - | 0.0625 | 480.00 | 0.1250 |
| 8 | 240 | 2.833 | - | 0.0625 | 480.00 | 0.1250 |

**Average Of Reading's (in/hr)= 1.5938**

**Reported Percolation Rate in/hr = 0.750**

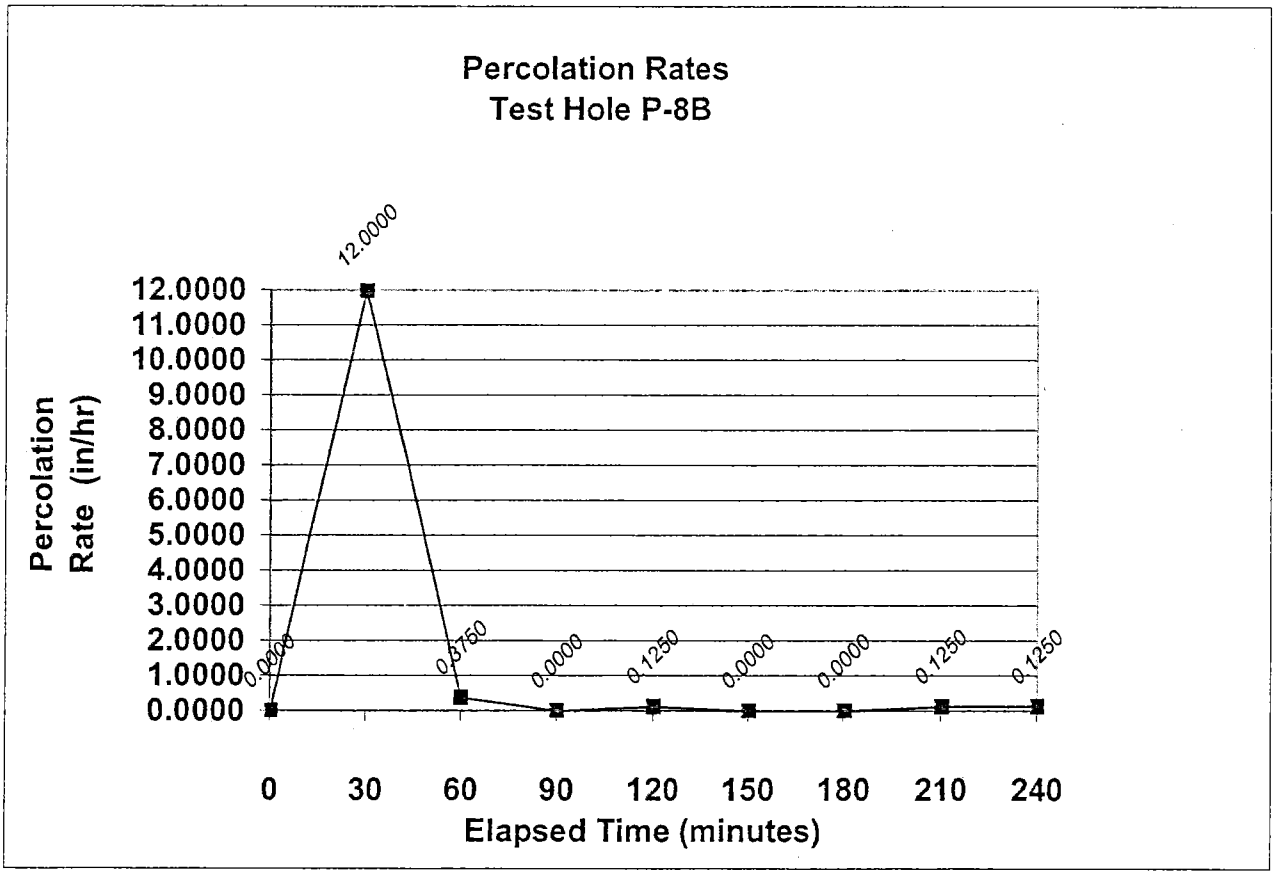


Figure No. 48

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-9 | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 10.5313 | | DEPTH OF BORING (feet) 10.5313 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 10.0313 | 10.5313 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 9.4896 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 9.5104 | - | 0.2500 | 120.00 | 0.5000 |
| 2 | 60 | 9.5365 | - | 0.3125 | 96.00 | 0.6250 |
| 3 | 90 | 9.5938 | - | 0.6875 | 43.64 | 1.3750 |
| 4 | 120 | 9.5938 | - | 0.0000 | #DIV/0! | 0.0000 |
| 5 | 150 | 9.5938 | - | 0.0000 | #DIV/0! | 0.0000 |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 0.5000**

**Reported Percolation Rate in/hr = 0.250**

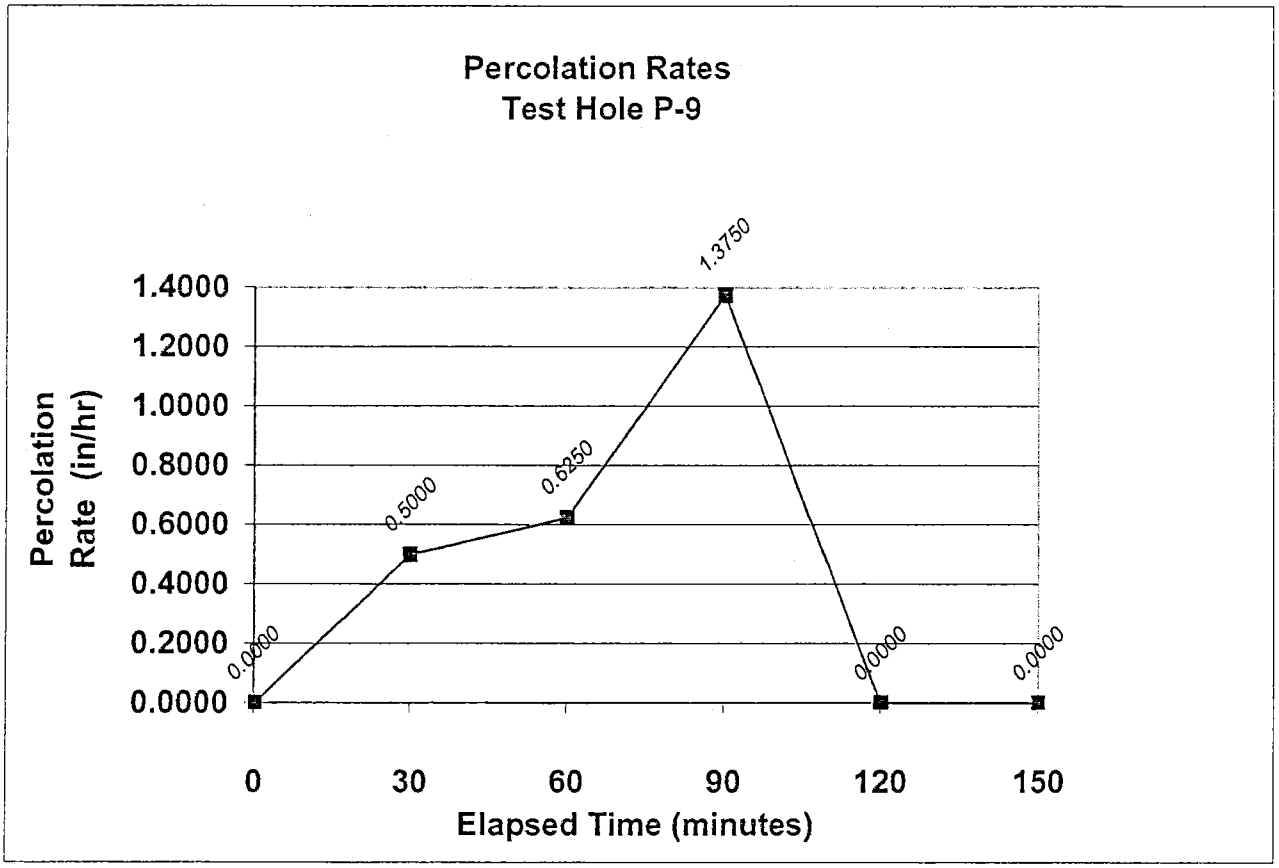


Figure No. 49

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-9B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 2.9688 | | DEPTH OF BORING (feet) 2.9688 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.4688 | 2.9688 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.5313 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.8646 | - | 4.0000 | 7.50 | 8.0000 |
| 2 | 60 | 2.9688 | 2.5625 | 1.2500 | 24.00 | 2.5000 |
| 3 | 70 | 2.6458 | - | 1.0000 | 10.00 | 6.0000 |
| 4 | 80 | 2.7708 | - | 1.5000 | 6.67 | 9.0000 |
| 5 | 90 | 2.8385 | - | 0.8125 | 12.31 | 4.8750 |
| 6 | 100 | 2.9167 | - | 0.9375 | 10.67 | 5.6250 |
| 7 | 110 | 2.9688 | 2.5000 | 0.6250 | 16.00 | 3.7500 |
| 8 | 120 | 2.6146 | - | 1.3750 | 7.27 | 8.2500 |

**Average Of Reading's (in/hr)= 6.0000**

**Reported Percolation Rate (in/hr) = 6.0**

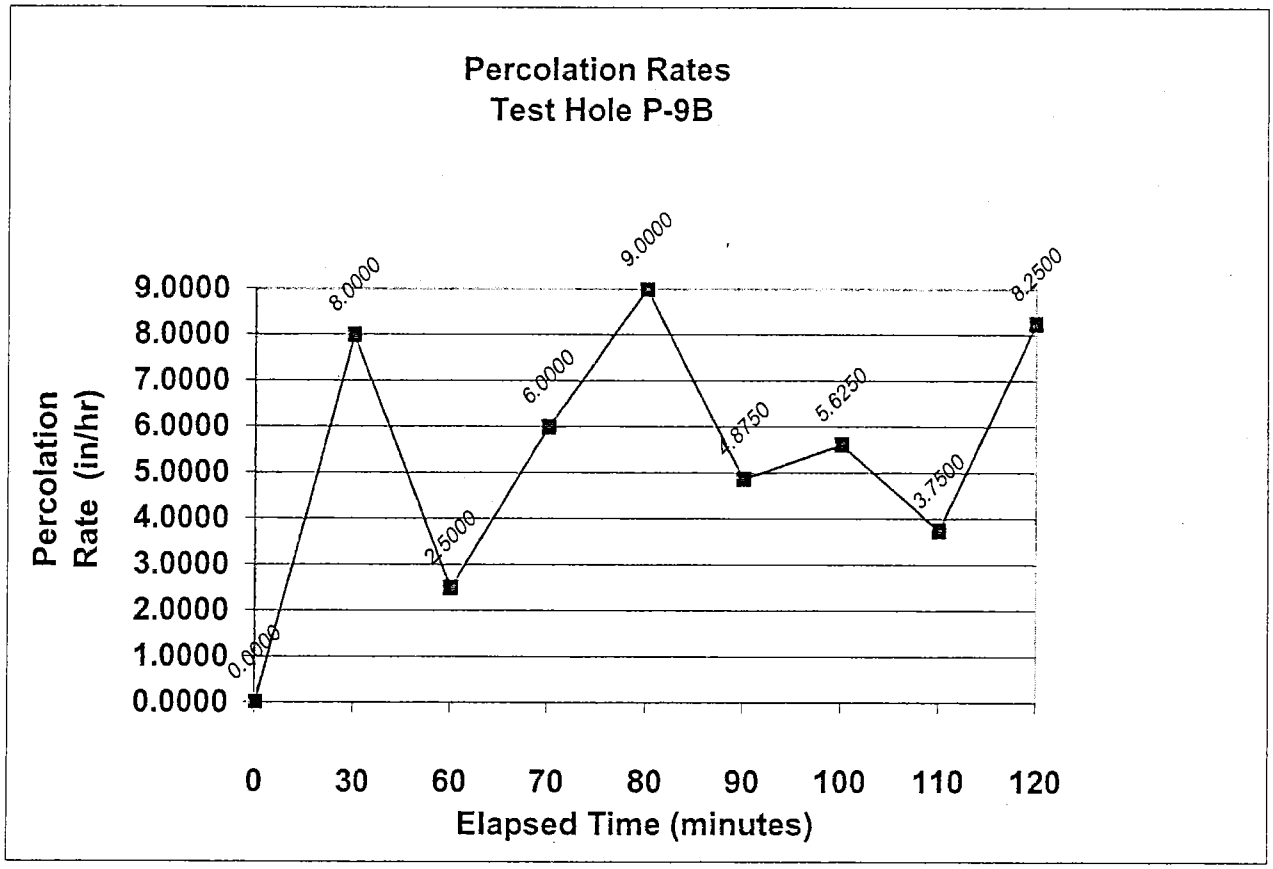


Figure No. 5C

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-10B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.6250 | | DEPTH OF BORING (feet) | 3.6250 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 3.1250 | 3.6250 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.5729 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.5729 | - | 0.0000 | #DIV/0! | 0.0000 |
| 2 | 60 | 2.5729 | - | 0.0000 | #DIV/0! | 0.0000 |
| 3 | 90 | 2.6302 | - | 0.6875 | 43.64 | 1.3750 |
| 4 | 120 | 2.6615 | - | 0.3750 | 80.00 | 0.7500 |
| 5 | 150 | 2.7396 | - | 0.9375 | 32.00 | 1.8750 |
| 6 | 180 | 2.7500 | - | 0.1250 | 240.00 | 0.2500 |
| - | - | - | - | - | - | - |
| - | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 0.7083**

**Reported Percolation Rate in/hr = 0.250**

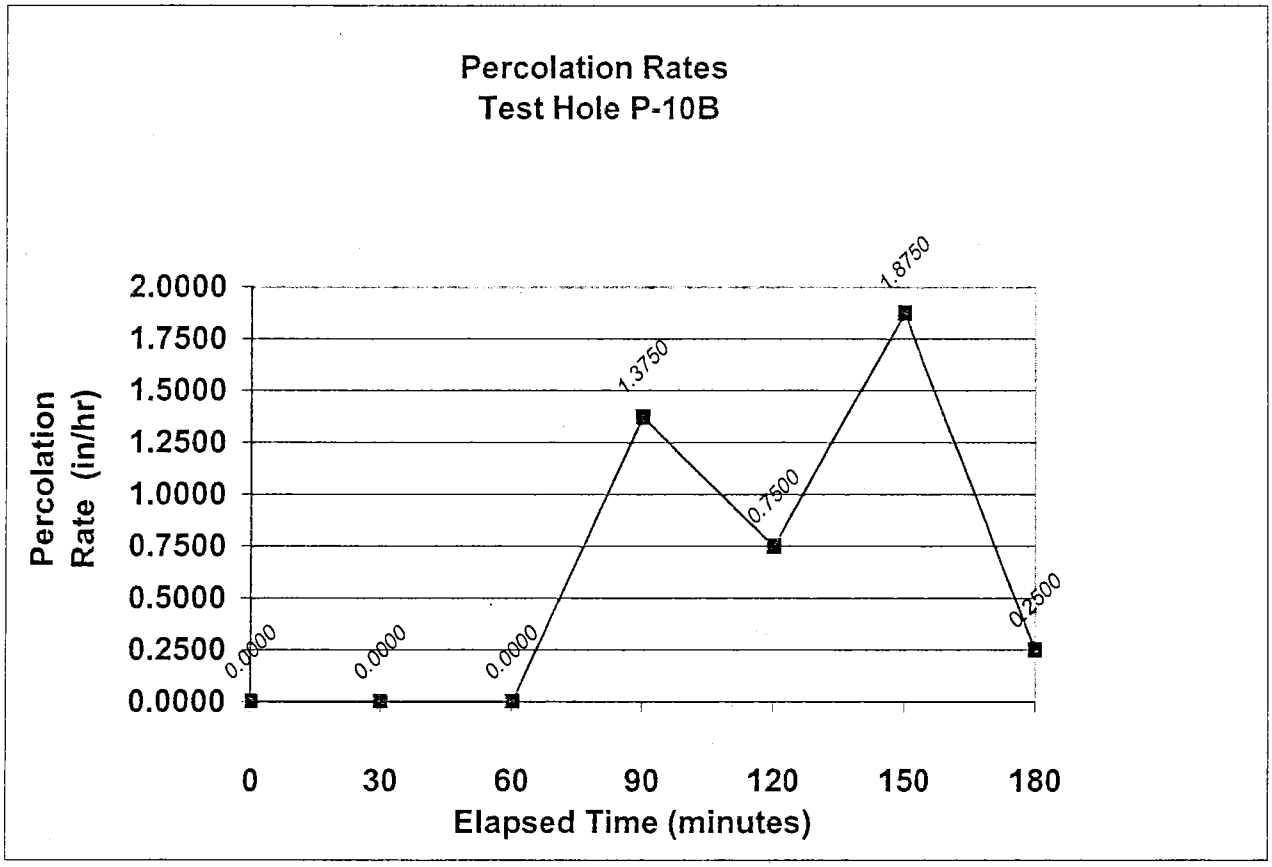


Figure No. 5i

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-11A | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 6.9583 | | DEPTH OF BORING (feet) | 6.9583 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 6.4583 | 6.9583 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 5.9531 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 6.2604 | 5.9219 | 3.6875 | 8.14 | 7.3750 |
| 2 | 40 | 5.9531 | - | 0.3750 | 26.67 | 2.2500 |
| 3 | 60 | 5.9583 | - | 0.0625 | 320.00 | 0.1875 |
| 4 | 90 | 5.9844 | - | 0.3125 | 96.00 | 0.6250 |
| 5 | 120 | 6.0052 | - | 0.2500 | 120.00 | 0.5000 |
| 6 | 150 | 6.0156 | - | 0.1250 | 240.00 | 0.2500 |
| 7 | 180 | 6.0833 | 5.9740 | 0.8125 | 36.92 | 1.6250 |
| 8 | 210 | 6.0208 | - | 0.5625 | 53.33 | 1.1250 |

**Average Of Reading's (in/hr)= 1.7422**

**Reported Percolation Rate in/hr = 1.0**

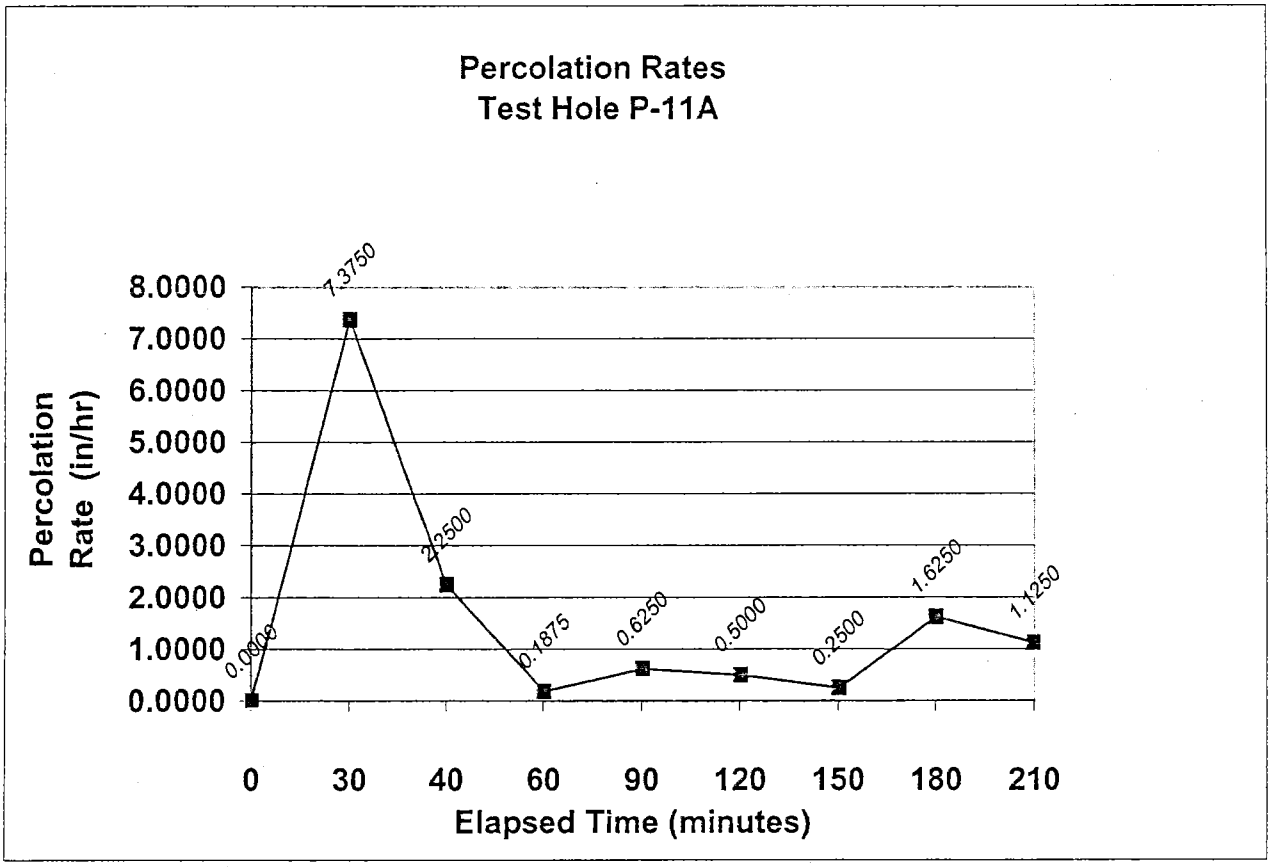


Figure No. 52

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-12B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 3.3125 | | DEPTH OF BORING (feet) | 3.3125 | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.8125 | 3.3125 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.9375 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 3.3125 | 2.9219 | 4.5000 | 6.67 | 9.0000 |
| 2 | 40 | 3.3125 | 2.9375 | 4.6875 | 2.13 | 28.1250 |
| 3 | 50 | 3.3125 | 2.8125 | 4.5000 | 2.22 | 27.0000 |
| 4 | 60 | 3.3125 | 2.8125 | 6.0000 | 1.67 | 36.0000 |
| 5 | 70 | 3.3125 | 2.8125 | 6.0000 | 1.67 | 36.0000 |
| 6 | 80 | 3.3125 | 2.8125 | 6.0000 | 1.67 | 36.0000 |
| 7 | 90 | 3.3125 | - | 6.0000 | 1.67 | 36.0000 |
| - | - | - | - | - | - | - |

**Average Of Reading's (in/hr)= 29.7321**

**Reported Percolation Rate (in/hr) = 36.0**

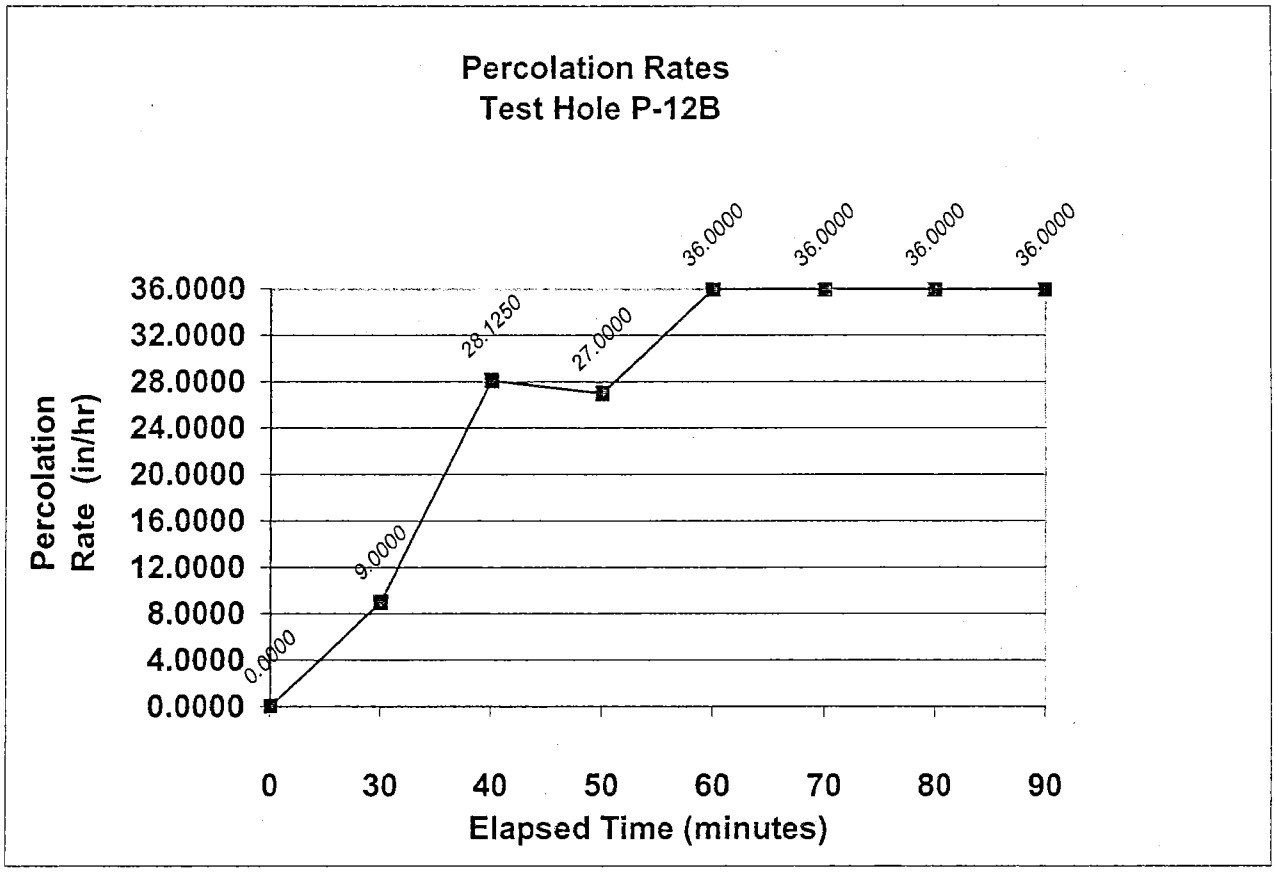


Figure No. 53

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-13B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 2.1667 | | DEPTH OF BORING (feet) 2.1667 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 1.6667 | 2.1667 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 1.6875 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 1.7708 | - | 1.0000 | 30.00 | 2.0000 |
| 2 | 60 | 1.8125 | 1.6875 | 0.5000 | 60.00 | 1.0000 |
| 3 | 90 | 1.7396 | - | 0.6250 | 48.00 | 1.2500 |
| 4 | 120 | 1.7917 | - | 0.6250 | 48.00 | 1.2500 |
| 5 | 150 | 1.8490 | 1.7917 | 0.6875 | 43.64 | 1.3750 |
| 6 | 180 | 1.8490 | 1.7708 | 0.6875 | 43.64 | 1.3750 |
| 7 | 210 | 1.8906 | 1.7240 | 1.4375 | 20.87 | 2.8750 |
| 8 | 240 | 1.8125 | 1.6771 | 1.0625 | 28.24 | 2.1250 |

**Average Of Reading's (in/hr)= 1.6563**

**Reported Percolation Rate in/hr = 1.5**

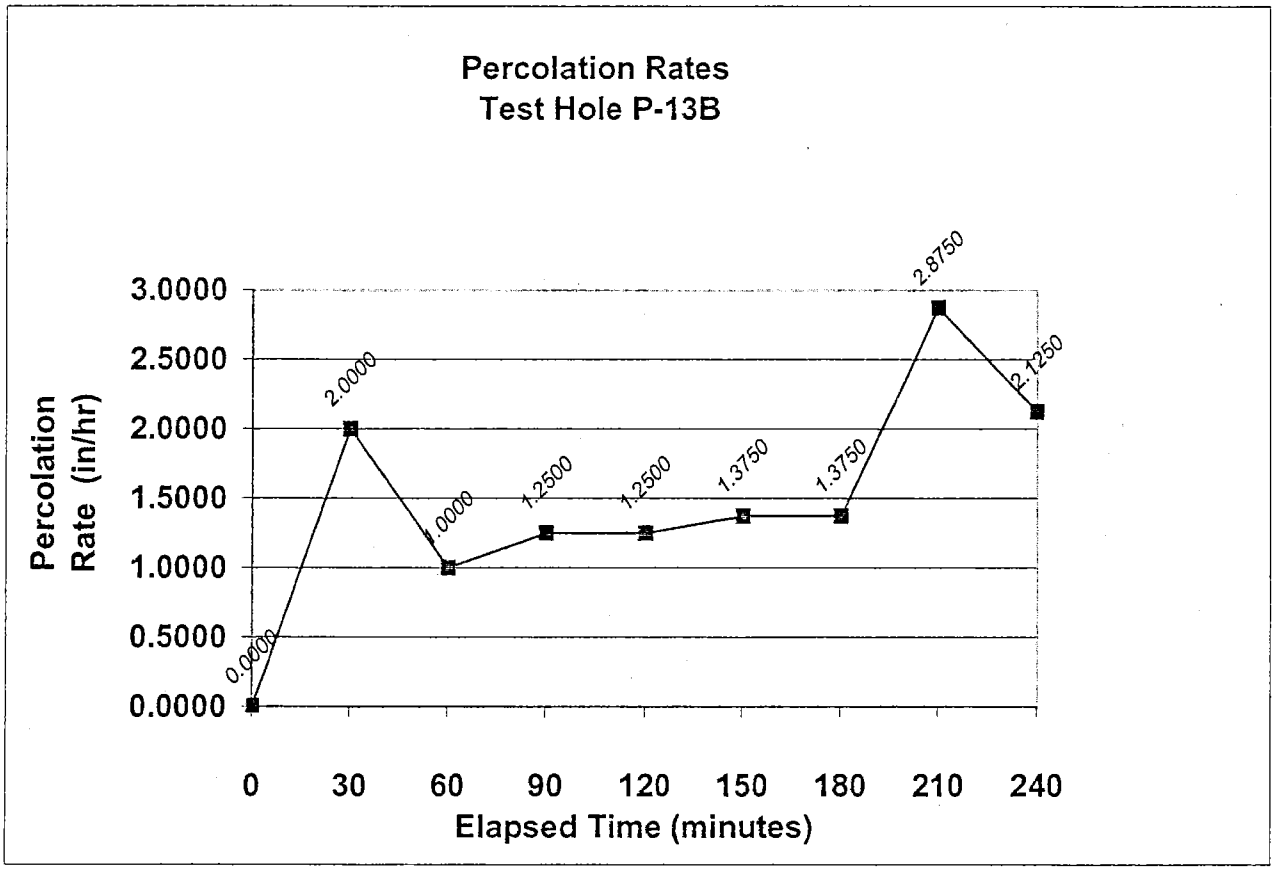


Figure No. 54

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-14B | | TEST DATE: 12/10/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 2.9010 | | DEPTH OF BORING (feet) 3.3281 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.8281 | 3.3281 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.9010 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.9167 | - | 0.1875 | 160.00 | 0.3750 |
| 2 | 60 | 2.9323 | - | 0.1875 | 160.00 | 0.3750 |
| 3 | 90 | 2.9375 | - | 0.0625 | 480.00 | 0.1250 |
| 4 | 120 | 2.9531 | - | 0.1875 | 160.00 | 0.3750 |
| 5 | 150 | 2.9740 | - | 0.2500 | 120.00 | 0.5000 |
| 6 | 180 | 2.9844 | - | 0.1250 | 240.00 | 0.2500 |
| 7 | 210 | 3.0156 | - | 0.3750 | 80.00 | 0.7500 |
| 8 | 240 | 3.0417 | - | 0.3125 | 96.00 | 0.6250 |

**Average Of Reading's (in/hr)= 0.4219**

**Reported Percolation Rate in/hr = 0.250**

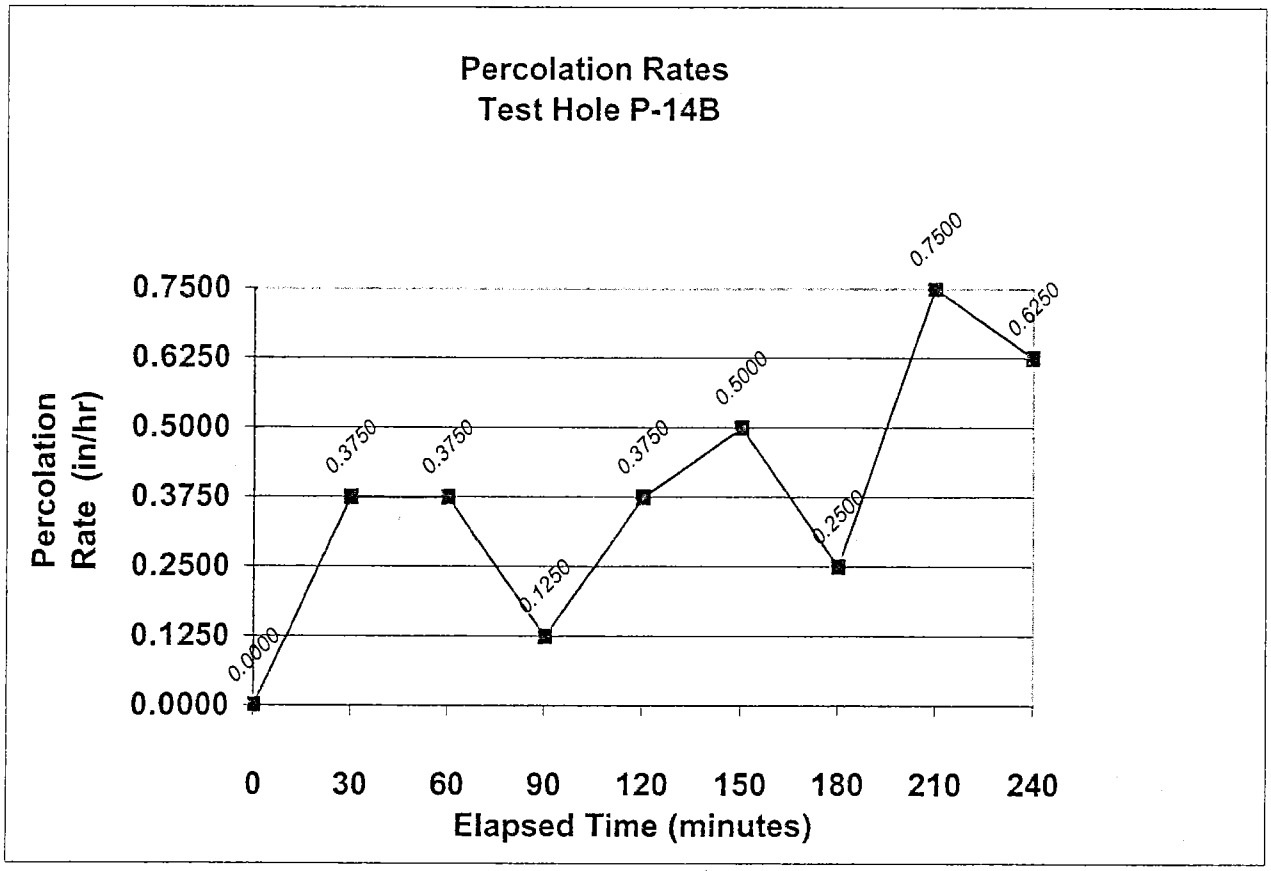


Figure No. 55

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## Percolation Test Results For Aptos Village

Project No: SC9427.1
Date: 1 March 2011
By: Haro, Kasunich and Associates

| HOLE NO.: | P-15B | | TEST DATE: 12/9/10 DRILL DATE: 12/8/10 | | | |
|---|---|---|---|---|---|---|
| WATER LEVEL AFTER PRE-SOAK: | 1.2083 | | DEPTH OF BORING (feet) 3.2083 | | | |
| TESTED BY: | MC | | PERCOLATION ZONE (feet): | | 2.7083 | 3.2083 |
| READING | ELAPSED TIME (min) | WATER DEPTH (feet) | REFILL TO (feet) | Incremental Change (in.) | PERCOLATION RATE (min/inch) | PERC (in/hr) |
| Start | 0 | 2.7083 | - | - | 0.00 | 0.0000 |
| 1 | 30 | 2.7083 | - | 0.0000 | #DIV/0! | 0.0000 |
| 2 | 60 | 2.7500 | - | 0.5000 | 60.00 | 1.0000 |
| 3 | 90 | 2.7708 | - | 0.2500 | 120.00 | 0.5000 |
| 4 | 120 | 2.8021 | - | 0.3750 | 80.00 | 0.7500 |
| 5 | 150 | 2.8333 | - | 0.3750 | 80.00 | 0.7500 |
| 6 | 180 | 2.8542 | - | 0.2500 | 120.00 | 0.5000 |
| 7 | 210 | 2.8802 | - | 0.3125 | 96.00 | 0.6250 |
| 8 | 240 | 2.9375 | - | 0.6875 | 43.64 | 1.3750 |

**Average Of Reading's (in/hr)= 0.6875**

**Reported Percolation Rate (in/hr) = 0.250**

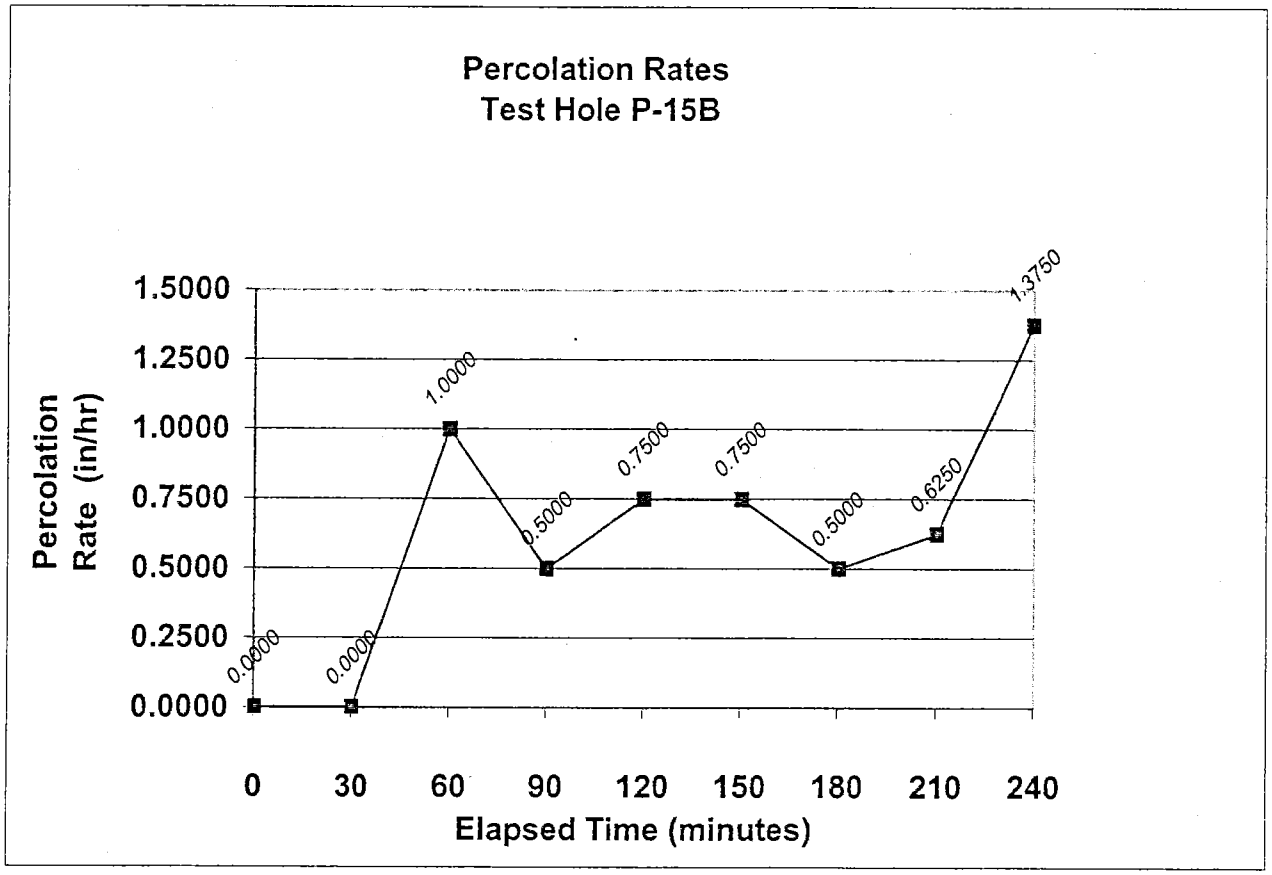


Figure No. 56

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