

City of Capitola Agenda

Mayor: Jacques Bertrand
Vice Mayor: Kristen Petersen
Council Members: Ed Bottorff
Yvette Brooks
Sam Storey



CAPITOLA CITY COUNCIL SPECIAL MEETING

THURSDAY, MARCH 14, 2019

8:30 PM

CITY COUNCIL CHAMBERS
420 CAPITOLA AVENUE, CAPITOLA, CA 95010

All matters listed on the Special Meeting of the City Council Agenda shall be considered as Public Hearings.

1. ROLL CALL

Council Members Jacques Bertrand, Kristen Petersen, Ed Bottorff, Yvette Brooks and Council Member Sam Storey

2. ADDITIONAL MATERIALS

Additional information submitted to the City after distribution of the agenda packet.

3. GENERAL GOVERNMENT / PUBLIC HEARINGS

All items listed in "General Government" are intended to provide an opportunity for public discussion of each item listed. The following procedure pertains to each General Government item: 1) Staff explanation; 2) Council questions; 3) Public comment; 4) Council deliberation; 5) Decision.

A. Consider a Budget Amendment To Fund Emergency Tree Removal at City Hall, 420 Capitola Avenue

RECOMMENDED ACTION: Receive report and authorize the City Manager to contract for the removal of seven trees on City Hall property as detailed in a report by James Allen dated March 4, 2019, and approve a budget transfer of \$33,000 from identified funds to the Parks Tree Fund to cover the expenses.

4. ADJOURNMENT

CAPITOLA CITY COUNCIL SPECIAL MEETING AGENDA
March 14, 2019

Note: Any person seeking to challenge a City Council decision made as a result of a proceeding in which, by law, a hearing is required to be given, evidence is required to be taken, and the discretion in the determination of facts is vested in the City Council, shall be required to commence that court action within ninety (90) days following the date on which the decision becomes final as provided in Code of Civil Procedure §1094.6. Please refer to code of Civil Procedure §1094.6 to determine how to calculate when a decision becomes “final.” Please be advised that in most instances the decision become “final” upon the City Council’s announcement of its decision at the completion of the public hearing. Failure to comply with this 90-day rule will preclude any person from challenging the City Council decision in court.

Notice regarding City Council: The City Council meets on the 2nd and 4th Thursday of each month at 7:00 p.m. (or in no event earlier than 6:00 p.m.), in the City Hall Council Chambers located at 420 Capitola Avenue, Capitola.

Agenda and Agenda Packet Materials: The City Council Agenda and the complete Agenda Packet are available for review on the City’s website at www.cityofcapitola.org and at Capitola City Hall prior to the meeting. Agendas are also available at the Capitola Post Office located at 826 Bay Avenue, Capitola. Need more information? Contact the City Clerk’s office at 831-475-7300.

Agenda Materials Distributed after Distribution of the Agenda Packet: Pursuant to Government Code §54957.5, materials related to an agenda item submitted after distribution of the agenda packet are available for public inspection at the Reception Office at City Hall, 420 Capitola Avenue, Capitola, California, during normal business hours.

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Televised Meetings: City Council meetings are cablecast “Live” on Charter Communications Cable TV Channel 8 and are recorded to be rebroadcasted at 8:00 a.m. on the Wednesday following the meetings and at 1:00 p.m. on Saturday following the first rebroadcast on Community Television of Santa Cruz County (Charter Channel 71 and Comcast Channel 25). Meetings are streamed “Live” on the City’s website at www.cityofcapitola.org by clicking on the Home Page link “**Meeting Video.**” Archived meetings can be viewed from the website at any time.



CAPITOLA CITY COUNCIL SPECIAL MEETING AGENDA REPORT

MEETING OF MARCH 14, 2019

FROM: Public Works Department

SUBJECT: Consider a Budget Amendment To Fund Emergency Tree Removal at City Hall,
420 Capitola Avenue

RECOMMENDED ACTION: Receive report and authorize the City Manager to contract for the removal of seven trees on City Hall property as detailed in a report by James Allen dated March 4, 2019, and approve a budget transfer of \$33,000 from identified funds to the Parks Tree Fund to cover the expenses.

BACKGROUND: At the request of staff, arborist James Allen inspected 13 trees around City Hall and the upper Beach and Village Parking Lot. The purpose of the inspection was to assess the health and stability of the trees due to their locations immediately adjacent City Hall and the public parking lot.

James Allen has been working with the City on multiple projects and tree inspections for more than a decade. Mr. Allen is dedicated to the preservation and protection of trees, and his tree inspections are objective and take into consideration the condition of the tree, identification of defects, probability of failure, evaluation of damage or injury due to failure, and the size of the tree or branch.

DISCUSSION: Mr. Allen's report is included as Attachment 1. Unfortunately, seven of the 13 trees evaluated in the report are at a high enough risk of failure that immediate removal is necessary. Six of these trees are located between City Hall and the upper Beach and Village Parking Lot and include five large eucalyptus trees (over 100 feet tall) and one live oak tree. A second live oak tree located between the upper and lower parking lot has also been identified as a high-risk tree that needs to be removed.

The predominant factors for recommending the removal of the eucalyptus trees is their presence on a relatively steep embankment that has resulted in exposed roots and poor trunk/branch attachments, which is typical in such trees. For the oak trees, large areas of rot in their trunks has significantly weakened the trees to the point where failure is likely.

Public Works staff is consulting with two tree companies that have worked for the City in the past; staff anticipates we will have pricing by the end of the week. Until then, staff estimates the cost will be less than \$33,000 for removal. The stumps are not being removed at this time and staff will need to remove off-shoots as they appear.

Emergency Tree Removal
March 14, 2019

Two of the eucalyptus trees above City Hall are located in the Santa Cruz County Regional Transportation Commission's rail right-of-way. Staff has reached out to the SCCRTC about its participation in this project.

Title 12.12.210 of the Municipal Code has provisions for the emergency removal of trees. Under these provisions, the Public Works Director or Police Chief may order the immediate removal of a tree when it is in the public interest to protect persons or property. A report is required to be filed with the Community Development Department stating the purpose of the removal and plans for replanting. Pursuant to these regulations, no tree removal permit is required for this work.

A replanting plan will be developed to plant 14 replacement trees in the upper and lower parking lots. Staff will work with James Allen to identify appropriate native trees for these areas. Staff anticipates the replanting will take place this fall which is the best time to plant trees. Funding for the replacement trees is available from the Community Tree Fund.

FISCAL IMPACT: \$25,000 is included in the annual Parks budget for tree services throughout the city. To date, \$10,500 has been expended. Rather than exhaust this fund completely, staff has identified the following source of funds that can be transferred to the tree work allocation to cover the cost of this unanticipated expenditure:

City Hall Office Remodel	\$ 33,000
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A fund transfer has been prepared for Council approval and any unspent funds will remain in the General Fund.

ATTACHMENTS:

1. James Allen Report
2. Emergency Tree Removal Fund Transfer

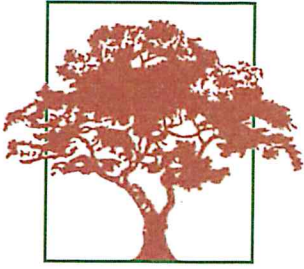
Report Prepared By: Steve Jesberg
Public Works Director

Reviewed and Forwarded by:

Jamie Goldstein, City Manager

3/12/2019

Dedicated to the Preservation of Trees



**James P. Allen
& Associates**

City of Capitola

A Limited Risk Assessment of 13 Trees City Hall and Beach & Village Parking Lots



Attachment: James Allen Report (Emergency Tree Removal)

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**Prepared for
The City of Capitola**

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Attachments

- Glossary
- Risk Rating Criteria
- Overall Risk Rating and Action Thresholds
- Tree Location Map

Attachment: James Allen Report (Emergency Tree Removal)

ASSIGNMENT/SCOPE OF SERVICES

At the request of Matt Kotila, City of Capitola Public Works Department Superintendent I performed a Level 2 tree risk assessment of 13 trees standing near City Hall and the adjacent Upper Beach and Village parking lots. These trees grow adjacent to a frequently used public buildings parking lots, pedestrian pathways and vehicle thoroughfares. Concerns have been expressed about the potential failure of the trees and the possibility of sections falling and damaging property or injuring people.

I met with Mr. Kotila and Ed Morrison, a consultant for the City on February 28 at which time he identified the trees of concern. They departed and I began the assessment immediately and continued over the weekend of March 2 and 3, 2019.

The intent of my inspection and this report is to evaluate the condition of these trees, primarily in relation to any threat posed to adjacent structures, employees, community members and residents. This report is limited to findings determined by visual assessment conducted at ground level and may be used for decision making purposes.

Although there may be other trees in the immediate area with structural problems that warrant analysis, no additional trees or situations were observed nor will be reported on.

ASSESSMENT METHODOLOGY

Condition Assessment

The subject trees were evaluated visually while standing on the ground from the **root crown** to the foliar canopy to determine health and structural stability. Visual Tree Assessment (VTA) involves an evaluation of the biology, mechanics and function, as well as the growing site of the trees.

The biological assessment includes a visual analysis of the following:

- Vitality of the leaves, bark and twigs
- Presence of fungi
- Presence of dead wood or broken branches
- Status of old wounds or cavities

The mechanical assessment involves a visual analysis of the following characteristics:

- Integrity of the framework of the tree (trunk and major branches)
- Indicators of potential internal defect such as bulges crack or ribs on the supporting trunk or large branches.
- Wounds
- Lean
- Root buttress development and configuration

The site assessment involves an analysis of the following:

- Evaluation of the growing area including availability for potential root development and soil type.
- Typical wind/rain events and previous consequences to tree stability.

Tree **health** and **structure** were assigned ratings of **good**, **fair** or **poor**.

Risk Assessment

The subject trees were assessed following Level 2 protocol as defined by American National Standards Institute A-300 (Part 9). Level 2 assessments include:

Risk Assessment, continued

- Identification of potential targets; structures, high use areas or public thoroughfares that are within striking distance.
- A 360-degree, ground-based visual inspection of the tree crown, trunk, trunk flare, above-ground roots, and site conditions around the tree in relation to targets.
- Binoculars are used to assess scaffold branches and canopy sections
- **Sounding**; wood density and the presence of serious decay are noted by the resonance of the mallet striking supporting structural members.

Neither aerial nor comprehensive **root crown** inspections were performed. **Buttress** roots were not diagnostically assessed.

For identification purposes each tree was assigned a number beginning at 101 through 113. Round shaped metal tags were affixed to each tree's trunk. Tree locations are documented on the attached *Tree Location Map*.

Levels of Risk were determined and quantified following the Pacific Northwest Chapter International Society of Arboriculture Tree Risk Assessment protocol. The purpose of this assessment is to provide a numerical rating from 1 to 12 that documents hazardous conditions and risk levels. Rating categories and numerical rating quotients are identified below and defined on the attached sheets.

- Probability of Failure (1 to 5)
- Target Area (1 to 4)
 - Note: The Target Area was assigned a *High* rating of 4. These trees stand in proximity to frequently used buildings, public thoroughfares and parking areas.
- Size of the Defective Part (1 to 3)

OBSERVATIONS

Site Description

A grove of coast live oak and eucalyptus trees grow on a steep, un-reinforced slope between City Hall and the Upper Beach & Village parking lot. The area surrounding this grove is a high use area with frequent pedestrian and vehicular traffic activity. The City Hall building and adjacent parking lots are static targets, with no opportunities to diminish the use of the site or relocate targets.

The area is vegetated with ivy, poison oak and a few native and non-native shrubs. Long strips of highly flammable eucalyptus bark have shed from the large eucalyptus and accumulated in this area.

There is no evidence of site disturbance, erosion or past tree failure. The area seems to be sheltered from strong winds by surrounding mature trees that defer **wind load**.

Tree #112 grows to the north of the upper parking lot over a high voltage utility line and parking spaces #961 and 968 in the lower parking lot. The growing site slopes dramatically and is covered with ivy and poison oak growth.



OBSERVATIONS

Tree Descriptions with Assigned Risk Ratings

Assigned Number: 101

Species: coast live oak (*Quercus agrifolia*)

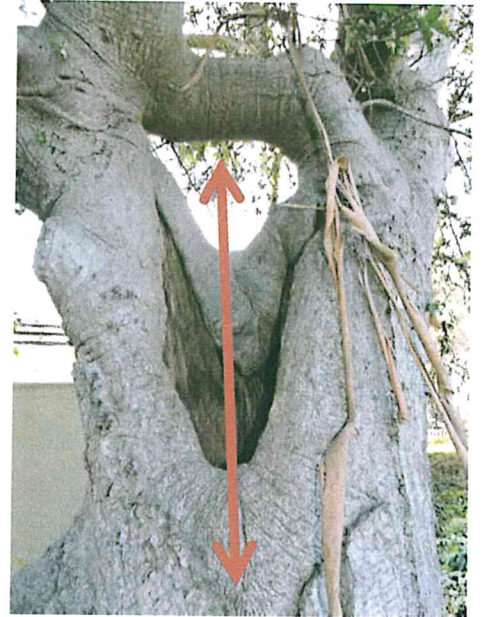
Diameter: 30 diameter inches at 36 inches above grade

Approximate Height: 25 feet

- Three large diameter pruning wounds are poorly compartmentalized.
- Extensive **decay** columns extend downward toward supporting roots and upward to scaffold branch connection points
- Decay columns have merged to create a hollow trunk
- HIGH FAILURE POTENTIAL
- Fair Health with Poor Structure

Assigned Risk Rating = 11, High Risk Category 3

- Probability of Failure, High = 4
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3



Attachment: James Allen Report (Emergency Tree Removal)

Assigned Number: 102

Species: coast live oak (*Quercus agrifolia*)

Diameter: Double trunk, 13.7 and 12 diameter inches at 54 inches above grade

Approximate Height: 25-35 feet

- Poor trunk/stem attachments with **included bark**
- Heavily weighted, over-extended lateral branches spread to the west over City Hall
- Stress fractures are visible at several positions on the supporting trunks
- Fair Health with Poor Structure

Assigned Risk Rating = 9, High Risk Category 1

- Probability of Failure, Moderately High = 3
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems between 4 and 20 diameter inches = 2

Assigned Number: 103

Species: Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)

Diameter: Approximately 56 diameter inches at 54 inches above grade

Approximate Height: 100 to 120 feet

- Stout trunk stands at the bottom of a steep slope just above an un-reinforced 4-foot vertical cut
- Exposed surface roots
- Divides into two poorly attached secondary trunks with included bark at the height of 6-feet above grade, see red arrows at right photo
- The upper canopy is over-weighted, extending to the North and East over the City Hall building
- HIGH FAILURE POTENTIAL



Tree #103, continued

- Fair Health with Poor Structure

Assigned Risk Rating = 11, High Risk Category 3

- Probability of Failure, High = 4
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3

Assigned Number: 104

Species: Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)

Diameter: 41.5 diameter inches at 54 inches above grade

Approximate Height: 100-120 feet

- Stout trunk stands at the bottom of a steep slope just above an un-reinforced 4-foot cut
- Exposed surface roots
- Dese ivy growth between 30 and 60 feet above grade
- Poor branch/trunk attachments to the south
- Fair Health with Poor Structure

Assigned Risk Rating = 10, High Risk Category 2

- Probability of Failure, Moderately High = 3
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3

Assigned Number: 105

Species: coast live oak (*Quercus agrifolia*)

Diameter: 14.4 diameter inches at 54 inches above grade

Approximate Height: 25 feet

- Low **Live Crown Ratio (LCR)**
- Leans to the West towards City Hall
- Fair Health with Poor Structure

Assigned Risk Rating = 8, Moderate Risk Category 3

- Probability of Failure, Moderate = 2
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems between 4 and 20 diameter inches = 2

Assigned Number: 106

Species: coast live oak (*Quercus agrifolia*)

Diameter: 6.8 diameter inches at 54 inches above grade

Approximate Height: 25 feet

- Tall, suppressed young tree
- Low Live Crown Ratio (LCR)
- Fair Health with Poor Structure

Assigned Risk Rating = 6, Moderate Risk Category 1

Probability of Failure, Low = 1

Target Area, High = 4

Size of the Defective Part, Branches or Stems less than 4 diameter inches = 1

Assigned Number: 107**Species:** coast live oak (*Quercus agrifolia*)

- Tall, suppressed young tree
- Low Live Crown Ratio (LCR)
- Fair Health with Poor Structure

Assigned Risk Rating = 6, Moderate Risk Category 1

Probability of Failure, Low = 1

Target Area, High = 4

Size of the Defective Part, Branches or Stems less than 4 diameter inches = 1

Assigned Number: 108**Species:** Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)**Diameter:** Approximately 41.2 diameter inches at 54 inches above grade**Approximate Height:** 100-120 feet

- Stout trunk stands at the bottom of a steep slope
- Exposed surface roots
- Poor trunk/branch attachments
- Fair Health with Poor Structure

Assigned Risk Rating = 10, High Risk Category 2

- Probability of Failure, Moderately High = 3
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3

Assigned Number: 109**Species:** Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)**Diameter:** Approximately 16 diameter inches at 54 inches above grade**Approximate Height:** 40

- Develops from a decayed parent stump
- Poor attachment point, prone to failure
- Fair Health with Poor Structure

Assigned Risk Rating = 9, High Risk Category 1

- Probability of Failure, Moderately High = 3
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems between 4 and 20 diameter inches = 2



Assigned Number: 110**Species:** Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)**Diameter:** Four trunks ranging from 43 to 18.5 diameter inches at 54 inches above grade**Approximate Height:**

- Visual assessment was limited by dense ivy and poison oak growth in the lower trunk sections
- Grows adjacent to frequently used, unimproved foot path and Santa Cruz County Regional Transportation Commission's (SCCRTC) rail line
- Codominant stems with included bark
- Suppressed growth to the South
- Over-extended/weighted canopies to the North, West and East
- HIGH FAILURE POTENTIAL
- Fair Health with Poor Structure

Assigned Risk Rating = 11 High Risk Category 3

- Probability of Failure, High = 4
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3

Assigned Number: 111**Species:** Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)**Diameter:** Double trunk 7.1 and 6 diameter inches at 54 inches above grade**Approximate Height:** Approximately 40 feet

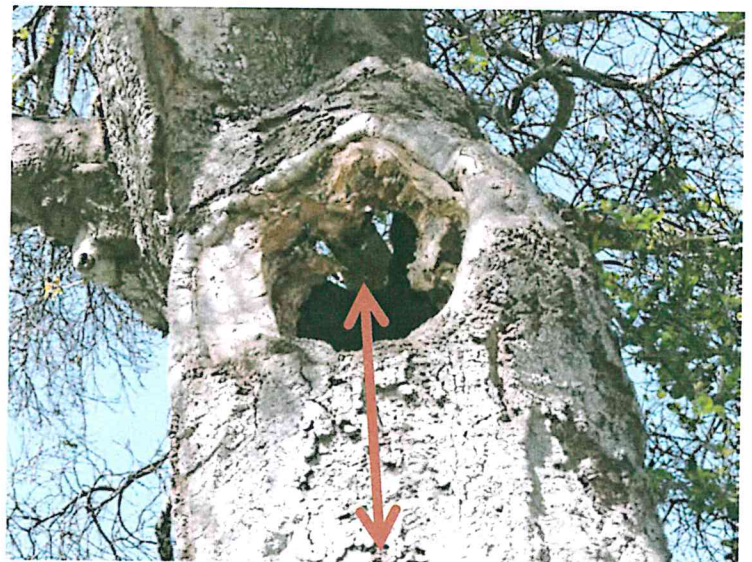
- Tall suppressed young tree
- Codominant stems with included bark
- Fair Health with Poor Structure

Assigned Risk Rating = 6, Moderate Risk Category 1

- Probability of Failure, Moderate = 2
- Target Area, High = 2
- Size of the Defective Part, Branches or Stems between 4 and 20 diameter inches = 2

Assigned Number: 112**Species:** coast live oak (*Quercus agrifolia*)**Diameter:** 38.5 diameter inches at 36 inches above grade**Approximate Height:** 45-55 feet

- Leans to the North toward un-insulated electrical utility lines and Lower Beach & Village parking spaces #961 through 968
- Two large diameter pruning wounds are poorly **compartmentalized** with extensive **decay** columns
- Decay columns have merged to create a hollow trunk that extends down to the **buttress** area and up toward major scaffold branch attachment points
- HIGH FAILURE POTENTIAL



Assigned Number: 112, continued

- Fair Health with Poor Structure

Assigned Risk Rating = 11 High Risk Category 3

- Probability of Failure, High = 4
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches =3

Assigned Number: 113

Species: Tasmanian blue gum eucalyptus (*Eucalyptus globulus*)

Diameter: Approximately 48 diameter inches at 12 inches above grade

Approximate Height: 80 to 100 feet

- Divides into several poorly attached secondary stems at 24 inches above grade
- Codominant stems with included bark
- Fair Health with Poor Structure

Assigned Risk Rating = 10, High Risk Category 2

- Probability of Failure, Moderately High = 3
- Target Area, High = 4
- Size of the Defective Part, Branches or Stems greater than 20 diameter inches = 3

**DISCUSSION/CONCLUSION**

Thirteen trees identified by Capitola City Staff have been inspected and assessed following Level 2 Risk Assessment protocols. Each of these trees meet “protected” criteria as defined by Capitola Municipal Code Section 12.12.

Risk Ratings for trees 16 diameter inches or greater range from 9 to 11. These are High Level ratings, indicating conditions that warrant attention and action in the near term.

Trees #101, 103, 110 and 112 with Risk Ratings of 11 have HIGH FAILURE POTENTIAL. These trees could fail at any time and should be managed on an emergency basis within the next few days/weeks.

Tree #110 Grows adjacent to frequently used, unimproved foot path and Santa Cruz County Regional Transportation Commission’s (SCCRTC) rail line. This tree may be within the SCCRTC Right of Way and be their responsibility.

The remainder of the smaller diameter trees assessed have been assigned Moderate Risk Ratings between 6 and 8. Although trees with this level of ratings could be retained and managed, if the larger

DISCUSSION/CONCLUSION, continued

trees are to be removed the smaller trees will be more prone to failure with stronger wind load and less buffering from the larger surrounding trees.

Unfortunately, the most significant coast live oak trees evaluated, Trees #101 and 112 have large decay “chimneys” that began with large pruning wounds or branch failures that did not compartmentalize. These decay columns weaken support capabilities and are prone to failure. There are no professional treatments available to remedy the advancement of decay and further weakening.

Several of the trees (#102, 103, 110, 111 and 113, pictured on the previous page) have codominant stems with included bark; a defined structural weakness common in trees that fail. Codominant stems are by definition a structural defect. They consist of stems that are of similar size that originate from the same position on the trunk. In cases where the bark ridge turns inward the union between the two stems is much weaker. These types of attachments with included bark do not form connective tissues between the stems. The stems push against one another as they develop, literally growing themselves apart. The weight of the broad canopy and over-extended scaffold branches exerts additional stresses on these weak attachment points

Weak unions of this type can open and crack when stresses are applied to the upper crown of the tree. Decay causing pathogens, organic material and moisture can enter through these cracks. In areas of included bark, the tree cannot compartmentalize therefore the spread of decay or other pathogens cannot be stopped or limited by the trees usual defense systems.

Forces of wind can cause the large stems to move in opposition to one another causing the attachment area to open allowing moisture and debris into the sites. The collection of this material can lead to the formation of decay. The callus visible on either side of the included bark indicates that the area has been open and the tree has attempted to seal the area.

The bulge on the trunk of Tree #103 can be an indication of forces from inside the tree pushing against the bark and the attachment point. Bulges can also indicate an area of internal decay (Mattheck 1997).

The loss of any of these trees/ tree portions would be significant if not devastating.

While there are no remedies to correct these genetic deficiencies, the installation of cable systems may provide additional support to help prevent future stem failure. Weight/Height reduction pruning is required where cable systems are to be installed.

Risk Mitigation Options are offered for consideration with residual risk level ratings provided once the chosen treatments are implemented. If height reduction and cable installation is chosen as the preferred Option, continued observation and treatment would be required to manage risk levels.

If tree removal is the chosen risk management Option there will be significant canopy loss the East and South of the City Hall Building. It is strongly suggested that a replanting program be implemented to restore lost resources. Smaller stature trees with proper structure and aesthetic functions should be replanted. Suitable species to be considered include:

- coast live oak, (*Quercus agrifolia*)
- dogwood (*Cornus* sp.)
- redbud (*Cercis* sp.)

RISK MITIGATION OPTIONS AND RESIDUAL RISK LEVELS AFTER TREATMENT IMPLEMENTATION

Option 1

- Reduce entire tree canopy height and width by 40 to 60% to undersized lateral growth or **topping/heading** cuts. Retain small diameter lateral branches where possible, reduce and shape to maintain minimal canopy.
- Install Simple Direct Cables between poorly attached stems using the following or similar hardware:
 - 5/16" EHS cable
 - 3/4" Through bolts with eyes
 - Preformed grips with thimbles
 - Requirements for maintenance pruning and cable tension inspection at 3 to 5-year intervals ongoing
 - Monitoring by a qualified arborist at annual intervals

Option 2

- Reduce entire tree canopy height and width by 40 to 60% to undersized lateral growth or **topping/heading** cuts. Retain small diameter lateral branches where possible, reduce and shape to maintain minimal canopy.
 - Requirements for reconstructive pruning annually for a period of 3 years
 - Reconstructive pruning intervals decrease to 3-year intervals after the first 3-year period
 - Monitoring by a qualified arborist at 6-month intervals

Option 3

- Complete tree removal
 - Current Risk Rating is reduced to 0

NOTE:

- The installation of cables, bolts and other hardware in these trees, suggested as Option 1 is intended to reduce failure potential. Such bracing does not permanently remedy structural weakness and is not a guarantee against failure. The tree and hardware must be inspected periodically for hardware deterioration, adequacy and changes in the tree's and site condition.
- Suggested height reduction described in Option 2 is inconsistent with professional pruning standards. Option 2 is suggested as a treatment method to preserve trees and avoid removal. Frequent maintenance/restructuring pruning is required. Refer to the attached *Overall Risk Rating and Action Thresholds* to determine priorities and risk tolerance thresholds.

All work is to be performed by qualified, state licensed, fully insured Arborists adhering to the most current versions of the following industry standards:

- American National Standards Institute A300 for Tree Care Operations-Tree, Shrub and Other Woody Plant Maintenance-Standard Practices.
 - (Part 1)-2017 Pruning
 - (Part 3)-2013 Supplemental Support Systems
- American National Standards Institute Z133.1-1994 for Tree Care Operations
- International Society of Arboriculture: Best Management Practices
 - All Relevant Sections

**City of Capitola
Level 2 Tree Risk Analysis
Limited to 13 Trees Identified by City Staff
March 4, 2019
Summary Table**

Tree #	Probability of Failure	Target Area	Size of the Defective Part	Risk Rating	Category	Mitigation Options	Residual Risk Rating after Treatment Implementation
101	4	4	3	11	High 3	2	6 Moderate 1
						3	0
102	3	4	2	9	High 1	2	6 Moderate 1
						3	6 Moderate 1
103	4	4	3	11	High 3	1	8 Moderate 3
						3	0
104	3	4	3	10	High 2	2	7 Moderate 2
						3	6 Moderate 1
105	2	4	2	8	Moderate 3	2	6 Moderate 1
						3	0
106	1	4	1	6	Moderate 1	3	0
107	1	4	1	6	Moderate 1	3	0
108	3	4	3	10	High 2	2	6 Moderate 1
						3	0
109	3	4	2	9	High 1	3	0
110	4	4	3	11	High 3	1	8 Moderate 3
						3	0
111	2	2	2	6	Moderate 1	3	0
112	4	4	3	11	High 3	2	8 Moderate 3
						3	0
113	3	4	3	10	High 2	1	8 Moderate 3
						3	0

Attachment: James Allen Report (Emergency Tree Removal)

Be advised that all trees create some level of risk that can only be managed, not eliminated unless the subject tree is removed. There are no guarantees that these or any other trees are or can be made "safe" nor are there any guarantees as to the effectiveness of the suggested short-term risk management options.

Please contact me with any questions regarding this assessment at 831-426-6603.

Respectfully submitted,

James P. Allen

James P. Allen

Registered Consulting Arborist #390

Board Certified Master Arborist #WC-0625B

Qualified Tree Risk Assessor

Certified Urban Forester #121

GLOSSARY/DESCRIPTION OF TERMINOLOGY

Buttress Roots

A large, woody root developing at the base of the trunk, providing structural support necessary for the tree to stand. Buttress roots flare as they transition to the **root crown** and then to the **tree trunk**.

Codominant Stems

Stems of similar size originating from the same position. Codominant stems are by definition a structural defect. They consist of stems that are of similar size that originate from the same position on the trunk. In cases where the bark ridge turns inward the union between the two stems is much weaker. These types of attachments with included bark do not form connective tissues between the stems. The stems push against one another as they develop, literally growing themselves apart. The weight of the broad canopy exerts additional stresses on the weak attachment point.

Weak unions of this type can open and crack when stresses are applied to the upper crown of the tree. Decay causing pathogens, organic material and moisture can enter through these cracks. In areas of included bark the tree cannot compartmentalize.

Compartmentalization

A physiological process whereby a tree creates physical and chemical boundaries to resist the spread of decay.

Decay, commonly referred to as rot are the primary pathogen that degrades wood strength and tree support capabilities. Boundaries are penetrated as cellulose and lignin, key components in the formation of wood are degraded.

Incipient/Early stage decay

Early stage/incipient decay has not developed far enough to soften or otherwise perceptibly impair the hardness of wood. It is usually accompanied by a slight discoloration or bleaching of the wood.

Advanced levels of decay indicate wood strength has been compromised and support capabilities can no longer be guaranteed maintain the tree in an upright position.

Defect, something less than perfect, a deviation from the acceptable norm or a structural weakness.

Diameter

The width of the trunk measured at 24-inches or 4.5 feet above natural grade (ground level) depending on regional ordinance.

Tree Health and Structure are separate issues that are related since both are revealed by tree anatomy. A tree's vascular system is confined in a thin layer of tissue between the bark and wood layers. This thin layer is responsible for transport of nutrients and water between the root system and the foliar canopy. When this tissue layer is functioning properly a tree has the ability to produce foliage (leaves). As long as the tree maintains a connected vascular system it may appear to be in good health.

When conditions conducive to decay are present, fungi, bacteria or poor compartmentalization, wood strength is degraded. As decay advances, the tree's ability to continue standing is compromised. Thus, a tree can appear to be in good health, but have poor structure.

Tree Health: This rating is determined visually. Annual growth rates, leaf size and coloration are examined. Indications of insect activity, decay and dieback percentages are also used to define health ratings.

Trees in "**good**" health are full canopied, with dark green leaf coloration. Areas of foliar dieback or discoloration are less than 10% of the canopy. Dead material in the tree is limited to small twigs and branches less than one inch in diameter. There is no evidence of insects, disease or decay.

Trees with a "**fair**" health rating have from 10% to 30% foliar dieback, with faded coloration, dead wood larger than one inch, and/or visible insect activity, disease or decay.

Trees rated as having "**poor**" health have greater than 30% foliar dieback, dead wood greater than two inches, severe decay, disease or insect activity.

Tree Structure: This rating is determined by visually assessing the roots, root crown (where the trunk meets the ground), supporting trunk, and branch structure. The presence of decay can affect both health and structural ratings.

Trees that receive a "**good**" structural rating are well rooted, with visible taper in the lower trunk, leading to buttress root development. These qualities indicate that the tree is solidly rooted in the growing site. No structural defects such as codominant stems (two stems of equal size that emerge from the same point), poorly attached branches, cavities, or decay are present.

Trees that receive a "**fair**" structural rating may have defects such as poor taper in the trunk, inadequate root development or growing site limitations. They may have multiple trunks, included bark (where bark turns inward at an attachment point), or suppressed canopies. Decay or previous limb loss (less than 2 inches in diameter) may be present in these trees. Trees with fair structure may be improved through proper maintenance procedures.

Poorly structured trees display serious defects that may lead to limb, trunk or whole tree failure due to uprooting. Trees in this condition may have had root loss or severe decay that has weakened their support structure. Trees in this condition can present a risk to people and structures. Maintenance procedures may reduce, but not eliminate these defects.

Imbedded/Included bark

Bark developing between two structural components (trunks, stems, branches) with a **narrow angle of attachment**. As diameter increases the forces push against one another, in essence “growing themselves apart”.

Lever Arm

The distance between the applied force (or center of the force) and the point where the object will bend or rotate.

Load

The result of various forces influences on a structure.

Live Crown Ratio (LCR)

The term Live Crown Ratio (LCR) calculates the ratio of total tree height and the vertical extents of the living canopy. Usually this value is within the range of 100% (canopy from grade to trunk apex) to 50%; ratios under 30% are considered structurally weak (Dunster & Dunster, 1996). This structural weakness derives from the elevation of the individual tree’s center of gravity, contributing to reduced trunk taper that in turn creates more stress upon the mid trunk and root ball, often lifting the root plate and making it prone to toppling over or snapping off mid-trunk. Many trees growing closely spaced grove conditions develop Low LCRs.

Response (Adaptive) Growth

One way that tree health and structure are linked is that healthy trees are more capable of producing new wood to compensate for strength loss associated with structural defects (weaknesses). A healthy tree develops response (adaptive) growth that adds strength to parts weakened by decay, cracks and wounds. Response growth, a form of adaption is the production of new wood in response to damage or additional loads to compensate for higher strain in the outermost fibers; it includes **reaction wood**, **flexure wood** and **woundwood**.

- **Reaction Wood** is expressed in two forms; compression and tension, both formed to counteract gravity and other static loads. Compression wood, common in conifer species is the response to increased static load, primarily gravity. It is formed on the downslope side of a trunk to make the tree upright or on the underside of a branch near the union to support the branch. Tension wood cells are formed in hardwoods on the upper side of the branch near the union or on the windward or uphill side of the trunk.
- **Flexure Wood** develops in stems and branches in response to wind load. Development of trunk taper and buttress roots are examples of load responsive (flexure) growth.
- **Woundwood** is comprised of lignified, differentiated tissue produced in response to cambial (vascular tissue) damage. It develops from a mass of callus cells and is chemically different and often much denser than other wood. It has the capability to resist the spread of decay better than normal wood and reinforces the strength of wounded areas.

Risk is the combination of the likelihood of an event and the severity of the potential consequences. In the context of trees, risk combines the likelihood of a conflict or tree failure occurring and affecting a target with the severity of the associated consequences- personal injury, property damage or disruption of activities (Dunster, 2013).

Risk Assessment is a systematic and thorough scientific process of investigating observable phenomena to derive an estimated level of risk. A risk assessment yields numerical ratings and mitigation prescriptions to better inform management decisions.

Level 2 protocol as defined by American National Standards Institute A-300 (Part 9) include:

- Identification of potential targets; structures, high use areas or public thoroughfares that are within striking distance.
- A 360-degree, ground-based visual inspection of the tree crown, trunk, trunk flare, above-ground roots, and site conditions around the tree in relation to targets.
- Binoculars were used to assess scaffold branches and canopy sections

Sounding; wood density and the presence of serious decay are noted by the resonance of the mallet striking supporting members of tree structure. Tone variations may indicate hollows or dead bark.

Root Crown/Collar

The zone of differentiation at the base of the trunk where roots and stems merge. This is an area that absorbs a high level of wind force

Taper

The relative change in diameter with length/height. Trees with poor taper are less capable of distributing stress.

Topping or Heading

The reduction of a tree's size using reduction cuts that shorten limbs or branches back to stubs. Topping is not an acceptable pruning practice due to poorly attached regrowth and decay development at the point of the heading cuts.

Trunk

The dominant vertical, super structure

Wind Load

A dynamic force imposed upon structural components by constantly changing pressure, direction and duration of wind events.

RISK RATING CRITERIA

Probability of Failure (1-5 points)

Probability of Failure (1-5 points)		
Low 1 point	Defect is not likely to lead to imminent failure, and no further action is required. In many cases, defects might not be recorded.	Minor branch or crown dieback, small wounds, minor defects.
Moderate 2 points	One or more defects areas well-established but typically do not lead to failure for several years. Corrective action might be useful to prevent future problems but only if time and money are available. Not the highest priority for action, these are retain and monitor situations used to inform budget and work schedules for subsequent years.	Several defects present. <ul style="list-style-type: none"> • Shell wall exceeds minimum required • Cracks initiated but no extensive decay • Cavity opening or other stem damage less than 30% of circumference • Crown damage or breakage less than 50% of canopy (30% in pines) • Dead crown limbs with fine twigs attached and bark intact • Weak branch union such as major branch or codominant stem with included bark • Stem girdling roots with less than 40% of circumference compressed • Root damage or root decay affects less than 33% of roots within the critical zone • Standing dead tree that is recently dead (still has fine twigs) and no other significant defects*
Moderately High 3 points	One or more defects areas well-established, but not yet deemed to be a high priority issue. Additional testing may be required or, the assessor may feel the problems are not serious enough to warrant immediate action, but do warrant placing the tree on a list of trees to be inspected more regularly. These are Retain and Monitor trees.	Areas of decay that may be expanding; trees that have developed a recent but not yet critical lean; cracks noted but may be stable; edge trees that may adapt and become more stable.
High 4 points	The defect is serious and imminent failure is likely and corrective action is required immediately. These cases require treatment within the next few days or weeks.	One or more major defects present. <ul style="list-style-type: none"> • Insufficient shell wall thickness • Large cracks, possibly associated with other defects • Cavity opening greater than 30% of circumference • Crown damage or breakage more than 50% of canopy (> 30% in pines) • Dead crown limbs with no fine twigs and bark peeling away. May be some saprophytic fungal evidence. • Weak branch union has crack(s) or decay • Stem girdling root affects 40% or more of trunk circumference • More than 33% of roots are damaged within the critical zone • Tree is leaning. Recent root breakage, or soil mounding, or cracks, or extensive decay evident • Standing dead tree, has very few fine twigs, and no other significant defects*
Extreme 5 points	The tree or component part is already failing, An emergency situation where treatment is required today.	Multiple high or extreme risk defects present. <ul style="list-style-type: none"> • Shell wall is already cracked and failing • Major cracks already open, such as hazard beams or split trunks • More than 30% of circumference defective and cracks or decay obvious • Dead crown limbs, no fine twigs, no bark, decay present. • Weak branch union has crack(s) and decay • Leaning tree with recent root failure, soil mounding, and cracks or extensive decay • Dead branches hung up or partly failed • Visual obstruction of traffic signs / lights at intersections • Any partly failed component or whole tree • Standing dead trees that have been dead for more than one season with multiple defects such as cracks, decay, damaged roots, shedding bark*

* Standing dead trees pose their own set of risk assessment difficulties since it is often impossible to determine when the tree died and what caused its death. Tree mortality caused by insects such as defoliators, drought, or low intensity fires will usually be structurally sound, and may remain safely standing for several years. In some cases, where the target rating is 'occasional' and the wildlife value of the dead tree is high, the assessor should consider an additional assessment step to determine the feasibility of retaining the tree as a wildlife tree. Appendix Two provides a simple graphic to assist with creation of wildlife habitat. There is a standard set of decay classes used by the US Forest Service, and other North American agencies, which when matched with wildlife value provide a wildlife tree habitat rating.

The Target Area (1-4 points)

The Target Area (1-4 points)

Low 1 point	Sites rated at one point are very rarely used for any long period of time, and people passing through the area (regardless of how they travel) do not spend a lot of time within the striking range of the tree. There are no valuable buildings or other facilities within striking range. Examples are seldom used back country roads or trails; seldom used overflow or long-term parking, industrial areas where workers drive machines (trucks, forklifts, tractors) with substantial cab protection; natural or wilderness areas; transition areas with limited access; remote areas of yards, parks, or private lands open for public use within set hours. All of these sites have relatively low occupancy within any one day.
Moderate 2 points	Valuable buildings are at the edge of the striking distance, so they would not be seriously damaged even if the tree did fall down. The site has people within striking range occasionally, meaning less than 50% of the time span in any one day, week, or month, and do not stay within striking range very long. Examples include areas that are used seasonally; more remote areas of camping areas or parks; minor rural roads; picnic areas; low to moderate use trails; most park and school playgrounds.** Moderate to low use parks, parking lots with daily use; secondary roads and intersections, dispersed camping sites, moderate to high use trails, works and / or storage yards.
Moderately High 3 points	The site has valuable buildings within striking range. People are within striking range more than 50% of the time span in any one day, week, or month, and their exposure time can be more than just passing by. Examples include secondary roads, trails, and access points; less commonly used parking areas and trails within parks; trails alongside fairways, bus stops.
High 4 points	The highest rated targets have a) a building within striking range frequently accessed by people, often for longer periods of time, or high volumes of people coming and going within striking range. Valuable buildings or other structures within striking range that would suffer major structural damage in the event people or b) people within striking distance of the tree, or both, seven days a week, all year long, and at all times of the day. Examples include main roads, the busiest streets or highways; high volume intersections power lines;* paths through busy open space areas and parks; short-term parking constantly in use; institutional buildings such as police stations, hospitals, fire stations; shopping areas; highly used walking trails; pick up and drop off points for commuters; golf tees and greens; emergency access routes and / or marshalling areas; handicap access areas; high use camping areas, visitor centres or shelters; residential buildings; industrial areas where workers take outside breaks; development sites where work activity within striking range lasts more than a few hours at a time.

*There are very specific safe work practices required when working close to Power Lines. These vary depending on location, but all employ similar principles.

** It is recognized that there is a tendency to rate playgrounds higher simply because children are involved. Most playgrounds are occupied for short periods of time in daylight hours. Overall, their use is infrequent when compared to other locations such as busy streets.

Size of Defective Part (1-3 points)

Size of Defective Part (1-3 points)

1 point	Branches or stems up to 10 centimeters (4 inches) in diameter.
2 points	Branches or stems between 10 to 50 centimeters (4 to 20 inches) in diameter.
3 points	Branches or stems greater than 50 centimeters (20 inches) in diameter.

* In some cases, there may be large areas of sloughing bark, dwarf mistletoe brooms, branch stubs, or large bird nests in cavities that pose a risk. The assessor must use his or her judgement to assign a number to these components. In general, the lowest rating (1 point) is reserved for component parts that would not create much impact on a person or property if it were to fail. The highest rating is used for parts that have the potential to kill people or seriously damage property.

Overall Risk Rating and Action Thresholds

The Overall Risk Rating and Action Thresholds

<i>Risk Rating</i>	<i>Risk Category</i>	<i>Interpretation and Implications</i>
3	Low 1	Insignificant - no concern at all.
4	Low 2	Insignificant - very minor issues.
5	Low 3	Insignificant - minor issues not of concern for many years yet.
6	Moderate 1	Some issues but nothing that is likely to cause any problems for another 10 years or more.
7	Moderate 2	Well defined issues - retain and monitor. Not expected to be a problem for at least another 5 - 10 years.
8	Moderate 3	Well defined issues - retain and monitor. Not expected to be a problem for at least another 1 - 5 years.
9	High 1	The assessed issues have now become very clear. The tree can still reasonably be retained as it is not likely to fall apart right away, but it must now be monitored annually. At this stage it may be reasonable for the risk manager/owner to hold public education sessions to inform people of the issues and prepare them for the reality that part or the entire tree has to be removed.
10	High 2	The assessed issues have now become very clear. The probability of failure is now getting serious, or the target rating and/or site context have changed such that mitigation measures should now be on a schedule with a clearly defined timeline for action. There may still be time to inform the public of the work being planned, but there is not enough time to protracted discussion about whether or not there are alternative options available.
11	High 3	The tree, or a part of it has reached a stage where it could fail at any time. Action to mitigate the risk is required within weeks rather than months. By this stage there is not time to hold public meetings to discuss the issue. Risk reduction is a clearly defined issue and although the owner may wish to inform the public of the planned work, he/she should get on with it to avoid clearly foreseeable liabilities.
12	Extreme	This tree, or a part of it, is in the process of failing. Immediate action is required. All other, less significant tree work should be suspended, and roads or work areas should be closed off, until the risk issues have been mitigated. This might be as simple as removing the critical part, drastically reducing overall tree height, or taking the tree down and cordoning off the area until final clean up, or complete removal can be accomplished. The immediate action required is to ensure that the clearly identified risk of harm is eliminated. For areas hit by severe storms, where many extreme risk trees can occur, drastic pruning and/or partial tree removals, followed by barriers to contain traffic, would be an acceptable first stage of risk reduction. There is no time to inform people or worry about public concerns. Clearly defined safety issues preclude further discussion.

The Table shown above outlines the interpretation and implications of the risk ratings and associated risk categories. This table is provided to inform the reader about these risk categories so that they can better understand any risk abatement recommendations made in the risk assessment report.

Zero Risk	1 - 2 points
Low Risk	3 - 5 points
Moderate Risk	6 - 8 points
High Risk	9 - 11 points
Extreme Risk	12 points

Map Key / Legend

- Surveyed Tree Trunk Location
- Field Located Tree Trunk Location
- 101** Assigned Tree Number
- Indicates "Protected" Tree
- HIGH RISK TREES**
Trees #101, 103, 110 & 112
Emergency Tree Removal or
Dramatic Height Reduction Required
- Eucalyptus Tree that may stand within the
Santa Cruz County Regional Transmission
(SCRTC) Right of way

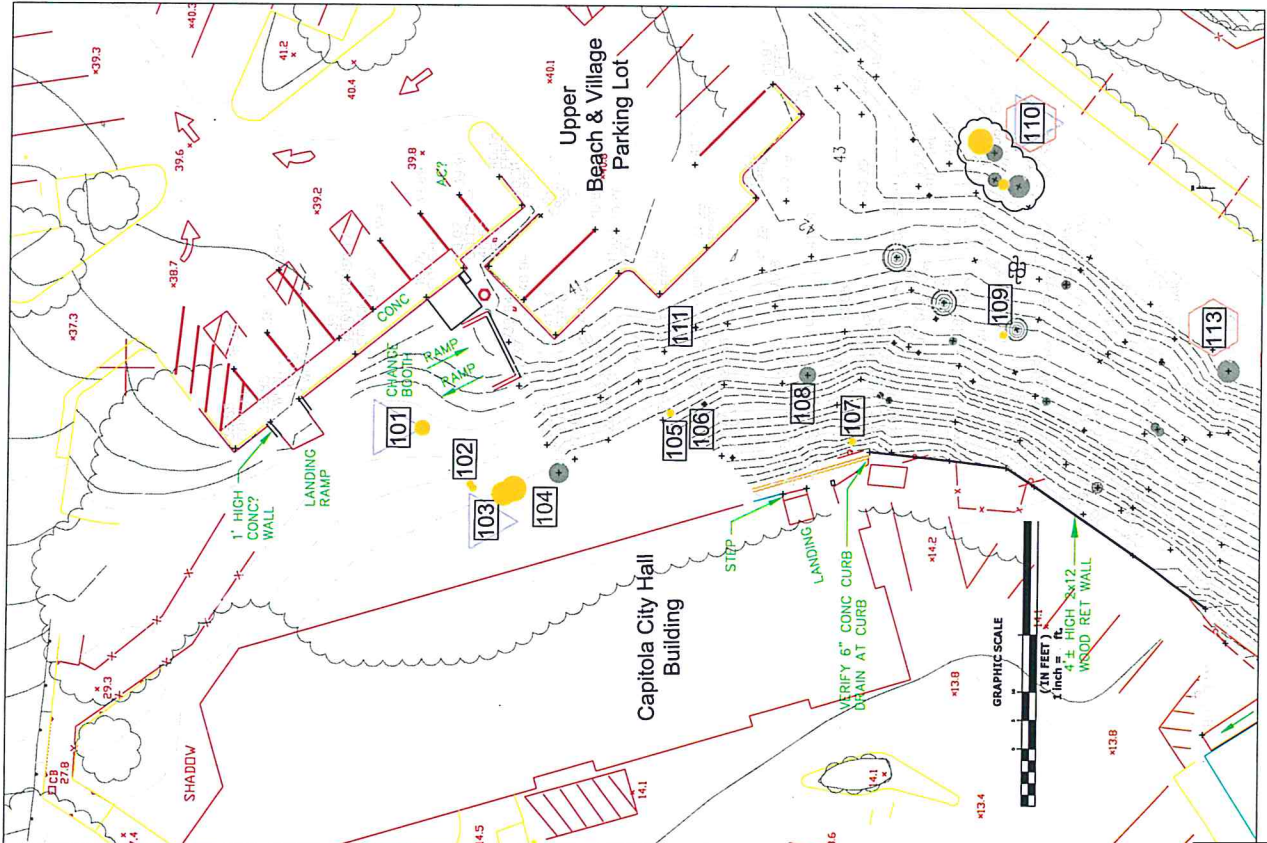
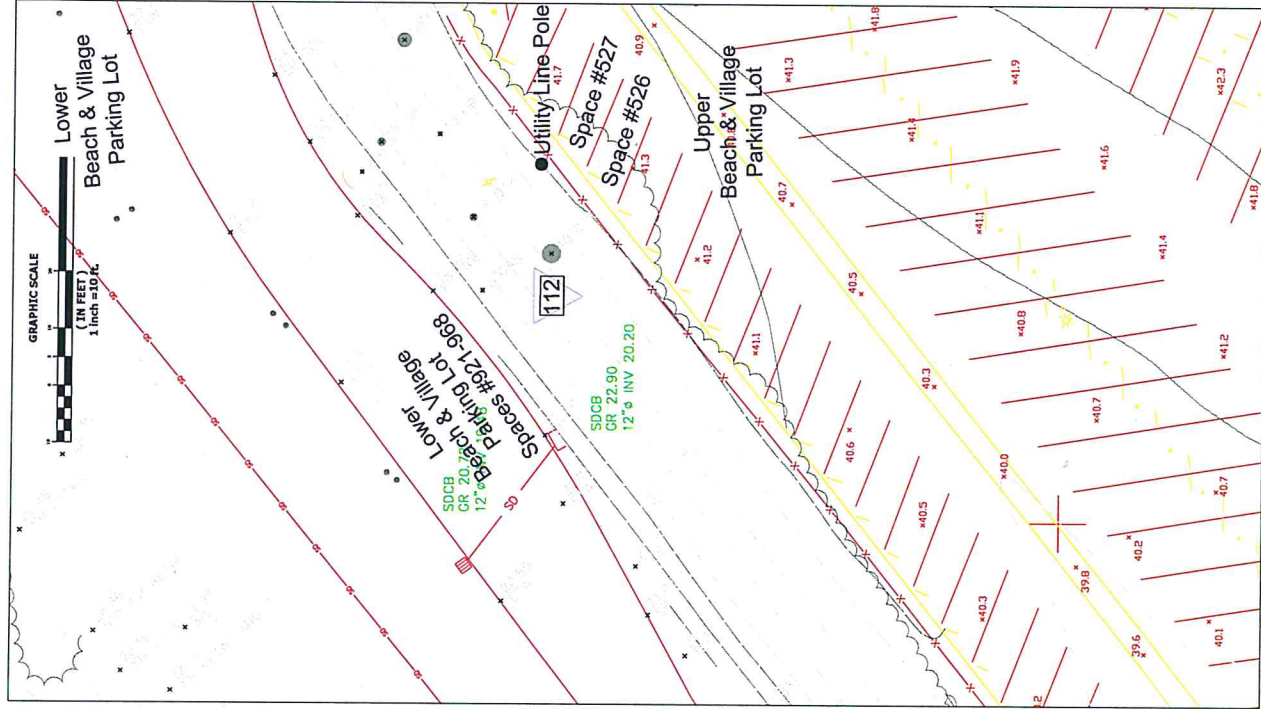
City of Capitola

**City Hall/
Beach & Village Parking Lots**

Level 2 Tree Risk Analysis:

Limited to 13 Trees

Tree Location Map



City of Capitola Budget Adjustment Form



Date 3/12/2019

Requesting Department Public Works

Administrative Council

Item # TBD
 Council Date 3/14/2019
 Council Approval _____

Revenues		
Account #	Account Description	Increase/Decrease
Total		-

Expenditures		
Account #	Account Description	Increase/Decrease
1000-30-31-310-4355.250	CS-PW & Trans Tree Services	33,000
1025-00-00-000-4390.100	Construction Service-Project Srvs	(33,000)
Total		-

Net Impact -

Purpose: Emergency tree removal from City Facilities

Department Head Approval _____

Finance Department Approval _____

City Manager Approval _____

Attachment: Emergency Tree Removal Fund Transfer (Emergency Tree Removal)