

# City of Encinitas

## Assessment of Torrey Pine Tree

### Near 1206 Summit Avenue

### Asset I.D. # 13164 ETREE

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#### SUBMITTED TO:

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City of Encinitas

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JUNE 4, 2019

## BACKGROUND AND ASSIGNMENT

In June of 2019, West Coast Arborists, Inc., (WCA) was contacted by the City of Encinitas in regard to the assessment of a torrey pine (*Pinus torreyana*) tree located on the north-east corner of 1206 Summit Avenue. In ArborAccess (WCA’s tree inventory database), the tree is inventoried as 1206 SUMMIT AV F-1 (see Figure 1 below).



The City had concerns regarding the subject tree’s structure and requested that WCA perform a **Level 2 Basic Assessment** of risk. Assessments performed as part of this report are valid for a period of two years from the date of inspection and are based on the conditions present at the time of inspection. This time frame should not be considered a guarantee period for the risk assessment.



## OBSERVATIONS

I inspected the subject tree on June 3, of 2019. On site, I assessed the health and structural integrity of the tree using the **Best Management Practices (BMPs)** for tree risk assessment. I visually inspected the **crown** and **stem** of the tree, looking for structural defects such as **included bark, cavities, fungal fruiting bodies, and/or decay**. My inspection of defects in the crown was limited to a ground-level visual inspection. On site, I observed the following:

### (Refer to photos in Appendix A)

- The tree was located on the north-east side of 1206 Summit Avenue within a monolithic style planting area within the City's ROW. There were several other mature torrey pines on the west side of the tree.
- The tree had a DSH<sup>1</sup> measurement of 31 inches and a height of about 75 feet.
- Judging by the color and density of the foliage, the tree was in fair- good health for the species and time of year.
- The tree had an approximate 45-degree lean/ canopy imbalance towards the east over Summit Avenue. There were very little branches/ foliar growth opposite to the tree's lean (west side). According to an established resident, this lean has been there for as long as they recall (decades).
- The tree's trunk showed minimal signs of growth in response to the tree's lean/ loading.
- Probing the soil gave no solid indications of heaving.
- Sounding the base of the tree's trunk with a nylon mallet gave indications of a possible basal decay on the north-west side of the tree. Some loose bark on the trunk may have influenced the resonating sound.
- The tree's root collar was not visible, a light root collar excavation was not deep enough to expose it.
- The sidewalk adjacent to the tree had a lighter tone indicating it was replaced in the relatively recent past. The closest measured section of sidewalk was 104 inches from the tree's trunk.
- There were some utility lines approximately 65 feet to the east of the tree.

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<sup>1</sup> Diameter at Standard Height (DSH) is the trunk diameter measured 4.5 feet above grade level.



## RISK ASSESSMENTS

### **Risk Assessment Methodology**

Data collected from tree inspection is used to derive a level of risk based on the matrices found in the ISA Best Management Practices (BMPs) for tree risk assessment (see Tree Risk Matrices). The level of risk determined (*low, moderate, high, or extreme*) is to be used by risk managers to help in tree management decisions. When assessing risk, the value of targets is taken into consideration in order to categorize the *consequences of failure (negligible, minor, significant, or severe)*. The people who use and frequent the target zone are generally the most important target with buildings, structures, and cars being secondary in importance.

### **Limitations of Tree Risk Assessments**

According to the *Tree Risk Assessment Manual*, published by the International Society of Arboriculture (ISA), it is impossible to maintain trees free of risk: “There is no way to guarantee that a tree will not fail. Tree benefits increase as the age and size of trees increase; however, some level of risk must be accepted to experience the benefits provided. The goal in assessing and managing trees is to strike a balance between the risk that a tree poses and the benefits that individuals and communities derive from trees.”

“A considerable level of uncertainty is typically associated with tree risk assessment due to our limited ability to predict natural processes (rate of progression of decay, response growth, etc.), weather events, traffic and occupancy rates, and potential consequences of failure.”

“Conditions affecting trees change constantly; none of us will ever be able to predict every tree failure. Conducting a tree risk assessment neither ensures nor requires perfection. Risk assessment should, however, ensure that all reasonable efforts have been made to identify the *likelihood of failure*, the *likelihood of impact*, and the *consequences of failure* present at the time of assessment.”

“Abnormally extreme storms, such as tornadoes, hurricanes, and heavy freezing rain, are not predictable and, in most cases, are not considered for categorizing *likelihood of failure*.”



## RISK ASSESSMENT OF SUBJECT TORREY PINE

### *Likelihood of Failure<sup>2</sup>*

The tree's lean appeared to be an ordinary **trophic response** to its surroundings and it has not failed in recent storm/ wind events; however, there remained several conditions of concern including: an approximate 45-degree lean, a history of sidewalk repairs/ possible root pruning on the tension side of the lean, minimal growth in response to the lean, a buried root collar, and signs of possible basal decay. Considering these defects, the tree was assessed as having a *possible* basal/ root failure within the next two years. This failure would most likely occur towards the south-east in the direction of the lean.

### *Likelihood of Impacting Target*

Based on short-term observations of occupancy rates and protection factors, the likelihood of this root failure causing the tree to impact a target was assessed as *very low* for a pedestrian or home, *low* for vehicles, and *high* for the utility lines, the fence, and Summit Ave itself.

### *Consequences*

The consequences should one of these failure-and-impact scenarios occur was assessed as likely being *severe* for impact to a pedestrian, vehicle, or home. *Significant* for impact to the utility lines, and *minor* for impact to Summit Ave itself or the fence.

Based on the categorization of the above risk factors, the torrey pine tree under discussion is currently presenting an overall *moderate* risk. **See below for an example of going through the risk assessment matrices for a specified failure and target(s).**

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<sup>2</sup> Italicized terms are those terms used in the tree risk rating matrices.



## RISK ASSESSMENT MATRICES

The **red arrows** are used to guide you through the process of determining the overall risk associated with the subject tree.

Matrix 1 (Basal/ Root Failure)				
This matrix is used to estimate the likelihood of the specified tree failure and impact to utility lines. The pink box exemplifies a somewhat likely failure and impact scenario within the next two years if no mitigation is implemented.				
Likelihood of Failure	Likelihood of Impacting Target			
	Very Low	Low	Medium	High
Imminent	Unlikely	Somewhat Likely	Likely	Very Likely
Probable	Unlikely	Unlikely	Somewhat Likely	Likely
Possible	Unlikely	Unlikely	Unlikely	Somewhat Likely
Improbable	Unlikely	Unlikely	Unlikely	Unlikely

Matrix 2 (Basal/ Root Failure)				
This matrix is used to determine the overall level of risk associated with the subject tree by using the likelihood of failure and impact in combination with severity of the consequences. The pink box exemplifies an overall moderate risk for the tree under discussion in its current state.				
Likelihood of Failure and Impact	Consequences			
	Negligible	Minor	Significant	Severe
Very likley	Low	Moderate	High	Extreme
Likely	Low	Moderate	High	High
Somewhat likely	Low	Low	Moderate	Moderate
Unlikely	Low	Low	Low	Low



## DISCUSSION AND RECOMMENDATIONS

The subject tree was assessed as currently presenting an overall moderate level of risk (see Risk Assessment on pages 4 -6). If the City would like to further reduce associated risks, then I have the following recommendation options that are discussed below:

**Pruning/ Monitoring for Preservation** – With the use of a laser, the tree was measured as having a height of 75 feet, and a distance of 65 feet from the utility lines (main target of concern). If tree preservation is desired, WCA recommends performing and maintaining a canopy reduction of at least 11 feet with the use of **reduction pruning** techniques. This will reduce the overall risk from moderate to low by eliminating the utility line’s potential for impact and reducing the likelihood of failure from possible to improbable.

If a more in-depth analysis of the tree’s root/ trunk structure is desired, WCA can perform a **Level 3 Advanced Assessment** using air spading or tomography equipment upon the City’s request. If monitoring of the lean is desired, a survey nail can be installed on the underside of the tree’s lean to periodically measure with an electronic distance meter (EMD) or a simple plumb bob.

**Removal** – A primary goal in assessing and managing the urban forest is to strike a balance between the risk that a tree poses, and the benefits that individuals and communities derive from trees. All trees have a limited life span which is often shortened due to numerous stresses in an urban environment. Removal of the tree should be considered if the City/ community does not view the tree’s benefits as outweighing the fiscal and logistical burdens associated with preservation. This decision would completely eliminate the associated risks and allow space for the adjacent tree to grow.

## APPENDIX A – PHOTOS

Photo #1



- The tree (red arrow) was located on the north-east side of 1206 Summit Avenue within a monolithic style planting area within the City’s ROW. There were several other mature torrey pine trees on the west side of the tree.
- The tree had a DSH<sup>1</sup> measurement of 31 inches and a height of about 75 feet.
- Judging by the color and density of the foliage, the tree was in fair- good health for the species and time of year.
- The tree had an approximate 45-degree lean/ canopy imbalance towards the east over Summit Avenue. There were very little branches/ foliar growth opposite to the tree’s lean (west side). According to an established resident, this lean has been there for as long as they recall (decades).
- There were some utility lines approximately 65 feet to the east of the tree.

## APPENDIX A – PHOTOS

Photo #2



- The tree's trunk (red arrow) showed minimal signs of growth in response to the tree's lean/loading. Notice how it tapers in towards the base of the tree.

## APPENDIX A – PHOTOS

Photo #3



- The sidewalk adjacent to the tree (red arrow) had a lighter tone indicating it was replaced in the relatively recent past. The closest measured section of sidewalk was 104 inches from the tree's trunk.

## APPENDIX A – PHOTOS

Photo #4



- Sounding the base of the tree's trunk with a nylon mallet gave indications of a possible basal decay on the north-west side of the tree. Some loose bark on the trunk may have influenced the resonating sound.
- The tree's root collar was not visible, a light root collar excavation was not deep enough to expose it.



## ASSUMPTIONS AND LIMITING CONDITIONS

1. Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the Consultant can neither guarantee nor be responsible for the accuracy of information provided by others. Standard of Care has been met with regards to this project within reasonable and normal conditions.
2. The Consultant will not be required to give testimony or to attend court by reason of this report unless subsequent contractual agreements are made, including payment of an additional fee for such services as described in the fee schedule and contract of engagement.
3. Loss or alteration of any part of this report invalidates the entire report.
4. Possession of this report or a copy thereof does not imply right of publication or use for any purpose by any other than the person to whom it is addressed, without the prior written consent of the Consultant.
5. This report and any values expressed herein represent the opinion of the Consultant, and the Consultant's fee is in no way contingent upon the reporting of a stipulated result, a specified value, the occurrence of a subsequent event, nor upon any finding to be reported.
6. Unless expressed otherwise: 1) information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection; and 2) the inspection is limited to visual examination of accessible items without dissection, excavation, or coring, unless otherwise stated. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the tree(s) or property in question may not arise in the future.
7. Arborists are tree specialists who use their education, knowledge, training, and experience to examine trees, recommend measures to enhance the beauty and health of trees, and attempt to reduce the risk of living near trees. It is highly recommended that you follow the arborist recommendations; however, you may choose to accept or disregard the recommendations and/or seek additional advice.
8. Arborists cannot detect every condition that could possibly lead to the structural failure of a tree. Trees are living organisms that fail in ways we do not fully understand. Conditions are often hidden within trees and below ground. Arborists cannot guarantee that a tree will be healthy or safe under all circumstances, or for a specific period of time.



9. Any recommendation and/or performed treatments (including, but not limited to, pruning or removal) of trees may involve considerations beyond the scope of the arborist's services, such as property boundaries, property ownership, site lines, disputes between neighbors, and any other related issues. Arborists cannot take such considerations into account unless complete and accurate information is disclosed to the arborist. An arborist can then be expected to consider and reasonably rely on the completeness and accuracy of the information provided.
10. The author has no personal interest or bias with respect to the subject matter of this report or the parties involved. He/she has inspected the subject tree(s) and to the best of their knowledge and belief, all statements and information presented in the report are true and correct.
11. Unless otherwise stated, trees were examined using the risk assessment criteria detailed by the International Society of Arboriculture's publications *Best Management Practices – Tree Risk Assessment* and the *Tree Risk Assessment Manual*.



## BIBLIOGRAPHY

Harris, Richard W., James R. Clark, and Nelda P. Matheny. *Arboriculture: Integrated Management of Landscape Tree, Shrubs, and Vines*. New Jersey: Prentice Hall, 2004. Print (ISA) *International Society of Arboriculture*. Web. 15 March 2014.

Smiley, Thomas E., Nelda Matheny, and Sharon Lilly. *Best Management Practices: Tree Risk Assessment*. Illinois: International Society of Arboriculture, 2011. Print.

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Edward F. Gilman, Brian Kempf, Nelda Matheny, Jim Clark. *Structural Pruning, A Guide For The Green Industry*: Urban Tree Foundation, 2013.

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## GLOSSARY

**Air Spade** – A specialist excavation tool that uses compressed air to remove and break up soil with minimal damage to roots and underground utilities. It can be used for a variety of reasons including the alleviation of compaction, soil improvement, root inspection and root location.

**Best Management Practices (BMPs)** – The International Society of Arboriculture has developed a series of Best Management Practices (BMPs) for the purpose of interpreting tree care standards and providing guidelines of practice for arborists, tree workers, and the people who employ their services.

**Canopy** – The part of the crown composed of leaves and small twigs (Harris, Clark, and Matheny 526).

**Cavity** – An open wound, characterized by the presence of decay and resulting in a hollow (Harris, Clark, and Matheny 527).

**Codominant** – Equal in size and relative importance, usually associated with either the trunks/stems or scaffold limbs/branches in the crown (Harris, Clark, and Matheny 527).

**Crown** – The leaves and branches of a tree measured from the lowest branch on the trunk to the top of the tree (Harris, Clark, and Matheny 527).

**Decay** – Process of degradation of woody tissues by fungi and bacteria through the decomposition of cellulose and lignin (Harris, Clark, and Matheny 527).

**Failure** – Breakage of stem, branch, roots, or loss of mechanical support in the root system (Smiley, Matheny, and Lilly 48).

**Fungal Fruiting Bodies** – Any complex fungal structure that contains or bears spores.

**Included Bark** – Pattern of development at branch junctions where bark is turned inward rather than pushed out (Harris, Clark, and Matheny 529).

**Level 2 Basic Assessment:** - A Level 2 or basic assessment is a detailed visual inspection of a tree and its surrounding site, and a synthesis of the information collected. It requires that a tree risk assessor walk completely around a tree looking at the site, buttress roots, trunk, and branches. A basic assessment may include the use of simple tools to gain additional information about the tree or defects. This is the standard assessment that is performed by arborists in response to a client's request for tree risk assessment (Smiley, Matheny, and Lilly 15).



**Level 3 Advanced Assessment:** – Advanced assessments (generally more time intensive) that are performed in conjunction with or after a Level 2 assessment to provide detailed information about specific tree parts, defects, targets, or site conditions. Specialized equipment, data collection and analysis, and/or expertise are usually required for advanced assessments. Procedures and methodologies should be selected and applied as appropriate, with consideration for what is reasonable to specific conditions and situations. All technologies involve some uncertainty and have their limitations; any evaluation of an individual tree will not be an accurate measure, but a qualified estimation. Information collected from advanced assessments can aid in making a final tree removal or retention recommendation.

**Minor Consequence** – A consequences that involves low to moderate property damage, small disruptions to traffic or communication utility, or a very minor injury, examples include:

- A small branch striking a house roof from a high height.
- A medium sized branch striking a deck from a moderate height.
- A large part striking a structure and causing moderate monetary damage.
- Short term disruption of power at a service drop to a house.
- Temporary disruption of traffic on a neighborhood street.

**Negligible Consequence** – A consequence that involves low-value property damage or disruption that can be replaced or repaired; they do not involve personal injury, examples include:

- A small branch striking a fence.
- A medium-sized branch striking a shrub bed.
- A large branch striking a structure and causing low monetary damage.
- Disruption of power to landscape lighting.

**Reduction Pruning** – Pruning cut that reduces the length of a branch back to live lateral branch large enough to assume apical dominance. Typically, at least one-third the diameter of the cut parent branch.

**Response Growth** - New wood produced in response to loads to compensate for higher strain in marginal fibers; includes reaction wood (compression and tension) and woundwood (Smiley, Matheny, and Lilly 50).

**Risk** – The combination of the likelihood of an event and the severity of the potential consequences. In the context of trees, risk is the likelihood of a conflict or tree failure occurring and affecting a target, and the severity of the associated consequence—personal injury, property damage, or disruption of activities (Smiley, Matheny, and Lilly 50).



**Severe Consequence** – A consequence that could involve serious personal injury or death, disruption of important activities, damage to high-value property, examples include:

- Injury that may result in hospitalization or permanent damage.
- A medium- sized part striking an occupied vehicle.
- A large part striking an occupied house.
- Serious disruption of high-voltage distribution and transmission powerline.
- Disruption of arterial traffic or motorways.

**Significant Consequence** – A consequence that involves property damage of moderate – high value, considerable disruption, or personal injury, examples include:

- A medium sized part striking an unoccupied vehicle from a moderate to high height.
- A large part striking a structure and resulting in high monetary damage.
- Disruption of distribution primary or secondary voltage power lines, including individual services and street- lighting circuits.
- Disruption to traffic on a secondary street.

**Tomography** – An impulse-detecting tomographic instrument that simultaneously records the time that that impulses or sound waves take to travel through wood between sensors placed around a tree’s selected cross-section.

**Target** – People, property, or activities that could be injured, damaged, or disrupted by a tree (Smiley, Matheny, and Lilly 50).

**Target zone** – The area where a tree or branch is likely to land if it were to fail (Smiley, Matheny, and Lilly 50).

**Trophic Response** – The response of an organism (especially plant) to an external stimulus by growing in a direction determined by the stimulus. Stimulus examples include: light, gravity, water, and wind.