ARBORIST REPORT-

Tree Survey, Impact Assessment & Tree Protection Plan for:

150 Felker Street
APN: 008-181-23
Santa Cruz, CA
November 15, 2021

Prepared for:

ABC Construction, LLC
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SUMMARY

This report provides the following information:

1. A summary of the health and structural condition of 18 trees.
2. A preliminary evaluation of anticipated construction impacts to the trees.
3. Recommendations for retention or removal of assessed trees based on their condition and anticipated construction impacts.
4. Tree protection specifications to mitigate anticipated impacts to retained trees.

- The *Tree Assessment Chart*, Appendix A is the condensed reference guide to inform all tree management decisions for the trees evaluated.
- An existing commercial building will be demolished and a new 4-story, 32-unit apartment building will be constructed at 150 Felker Street, Santa Cruz.
- Eighteen trees on or near the property were surveyed, including ten “protected” trees.
- Four “protected” trees are in good or fair condition and are suitable for incorporation into the project.
- Six “protected” trees are in poor condition, or will be highly impacted, and their removal will be necessary.
- “Protected” trees retained will be moderately impacted, and will require mitigation methods to reduce construction impacts, including tree protection fencing and other treatments.
- If removals are permitted, replacement trees will be required.

Background

Plans will be submitted to the City of Santa Cruz Planning Department, for construction of a new 4-story, 32-unint apartment building at 150 Felker Street, Santa Cruz. ABC Construction has requested my services, to assess the condition of eighteen trees on or near the applicant’s property, and the construction impacts that may affect them. Further, to provide a report with my findings and recommendations to meet City of Santa Cruz planning requirements.

Assignment

Provide an arborist report that includes an assessment of the trees within the project area. The assessment is to include the species, size (trunk diameter, height and canopy spread), condition (health and structure), suitability for preservation ratings. Review preliminary development plans assess potential impacts to trees, provide recommendations for retention or removal, and specify tree protection mitigation treatments for impacted trees that will be retained. Provide valuations of impacted trees to calculate a tree security deposit.

To complete this assignment, the following services were performed:

- **Tree Resource Evaluation:** Inventory, evaluate and assign suitability for preservation ratings for subject trees.

- **Plan Review: Reviewed provided plans including:** *Plan Set* by William Kempf Architects, sheets A1-A8, dated 10/6/2021, and *Topographic & Boundary Map* by Hanagan Land Surveying, dated 5/10/2019.
- **Construction Impact Assessment:** Combine tree resource data with anticipated construction impacts, to provide recommendations for removal or retention of trees.
- **Tree Protection Plan:** Develop tree protection specifications to mitigate anticipated impacts to retained trees.
- **Mapping:** Tree locations were plotted onto: Site Plan, by William Kempf Architects, and a Tree Protection Plan, Sheet T1 was created.

Limits of the Assignment

The information contained in this report covers only those items that were examined and reflects the condition of those items at the time of inspection on November 8, 2021.

The inspection is limited to visual examination of accessible items without climbing, dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied, that problems or deficiencies of the trees in questions may not arise in the future.

Purpose and use of the report

The report is intended to identify all the trees within the plan area that could be affected by a project. The report is to be used by the developer, their agents, and the City of Santa Cruz as a reference for existing tree conditions and to help satisfy the City of Santa Cruz planning requirements.

Resources

All information within this report is based on site plans as of the date of this report. Resources are as follows:

- *Plan Set* by William Kempf Architects, sheets A1-A8, dated 10/6/2021.
- Site Visit, Tree Inventory & Condition Evaluation at 150 Felker Street, Santa Cruz on 11/8/2021.
- City of Santa Cruz Municipal Code – Chapter 9.56 *Preservation of Heritage Trees* (applicable sections).

OBSERVATIONS

A commercial building on a flat parcel is surrounded by landscape trees on the south and east sides. There are mature trees on the adjacent parcel that grow next to the building on the west side. I surveyed eighteen trees. Seven trees surveyed on the property are “protected” according to City of Santa Cruz ordinance. Three “protected” trees on an adjacent property with canopies that overhang the project limits were also surveyed. A “protected” tree in the City of Santa Cruz includes any species 14 inches in diameter or larger, measured at 4.5 feet above grade. Five different “protected” species were inventoried including three liquidambar growing in front of the building, (Image #1).

Image #1 – Trees T1, T2 & T3, liquidambar, (left to right). Grow in front of building adjacent to Felker Street.

The three liquidambars have trunk diameters between 16” and 24”. Trees T1 and T2 are in fair condition. The trees have normal canopy density and most branches appear well attached. Tree T3 is in poor condition. Several major scaffolds have failed, and deadwood and decay have formed at the limb tear out locations. The center of the canopy has no structural limbs and there is some tip dieback.

Tree T3 liquidambar showing deadwood and decay at several limb tear outs, (Image #2)

Image #2 – Tree T3, liquidambar. Note broken scaffolds with deadwood and decay.

The liquidambar is showing a pattern of limb failure progressing to decay and is in significant decline.

Three podocarpus grow in a row adjacent to the building, (Image #3)

Image #3 – Trees T4, T5 & T6, (left to right), podocarpus.

The podocarpus have trunk diameters between 15” and 24”. The three podocarpus grow in a landscape planter adjacent to the building. All three trees have developed a co-dominant trunk growth habit and are in fair condition.

The three podocarpus have dense canopies and grow over the exising breezeway entry, (Image #4).

Image #4 – Tree T4, T5 & T6, podocarpus. Grow over breezeway overhang.

Tree T7 is a maturing, 28” diameter cedar growing in a landscape planter adjacent to Felker Street, (Image #5).

Image #5 – Tree T7, Incense cedar, (circled).

The cedar is in good condition.

Two protected silver dollar gum (eucalyptus), grow on the adjacent property and have canopies that overhang the project limits, (Image #6).

Image #6 – Trees T3-A and 4-A, silver dollar gum. The tree grows near the west corner of the property.

Tree T3-A is a mature, 26” diameter silver dollar gum in poor condition. The gum has a thin canopy density, with tip and branch dieback in limbs up to 10-inches in diameter.

Tree T4-A is a mature 34” diameter silver dollar gum in fair to poor condition. There canopy is thin and there is some tip dieback. A few limbs and co-dominant stems have failed up to 10-inches in diameter.

Tree T3-A has multiple limb tear outs in branches up to 10-inches in diameter, (Image #7).

Image #7 – Tree T3-A, silver dollar gum. Note limb tear outs, (circled).

A mature blue gum eucalyptus grows adjacent to the northwest corner of the project boundary, (Image #8).

Image #8 – Tree T6-A, blue gum eucalyptus. The trees upper canopy, not visible in this image overhangs the existing building.

The eucalyptus is in fair condition and has a trunk diameter of 48-inches. The canopy overhangs the existing building by 8-feet.

The remainder of the trees inventoried on the property are “not protected” size and are in fair condition. They include four Carolina laurel cherry and a Colorado blue spruce.

Three “not protected” size coast live oak grow on an adjacent property. Since they have canopies overhanging the project limits, they were surveyed. The three oaks are in fair condition.

DISCUSSION

Species List

TOTAL SUBJECT TREES: 18

Protected: 7 - (applicant)

3	liquidambar	(*Liquidambar styraciflua*)
3	podocarpus	*(Afrocarpus falcatus*)
1	incense cedar	(*Calocedrus decurrens*)

3 - (adjacent property)

2	silver dollar gum	(*Eucalyptus polyanthemos*)
1	blue gum eucalyptus	(*Eucalyptus globulus*)

Not Protected: 8

The are 4 different “not protected” species. A complete species list can be found in the Tree Assessment Chart spreadsheet, Appendix A.

Tree Evaluation and Recording Methods

Site evaluations were made on 11/8/2021. *The inventory included all trees on the property within the project limits.* The health and structural **condition** of each tree was assessed and recorded. Based on the trees health and structural condition, each trees **suitability for preservation** was rated and recorded.

The recorded data is included in the *Tree Assessment Chart, Appendix A,* of this report. Tree numbers were plotted on the attached *Tree Protection Plan sheet, T1*. **To correlate the data in the Tree Assessment Chart to the tree’s location on the site, refer to the Tree Protection Plan, sheet T1 - Appendix C.**

Condition Rating (Protected Trees)

A trees condition is determined by an assessing both the **health** and **structure**, then combining the two factors to reach a *condition rating*. Tree condition is rated as poor, fair or good. The quantity of trees assigned for each category (good, fair or poor), is indicated below:

Tree Condition Rating

- Good - 1
- Fair - 6
- Poor - 3

Suitability for Preservation (Protected Trees)

A trees suitability for preservation is determined based on its health, structure, age, species characteristics and longevity using a scale of good, fair or poor. The quantity of trees assigned to each category (good, fair or poor), is listed below.

Suitability Rating

- Good - 1
- Fair – 6
- Poor - 3

Protected Trees Recommended for Removal Due to Poor Condition/Suitability for Preservation

One Tree – (on applicant property) -

T3, liquidambar

One Tree (on City of Santa Cruz property?) -

T3-A silver dollar gum

Tree Protection Zone

The tree protection zone (TPZ), is a defined area within which certain activities are prohibited or restricted to minimize potential injury to designated trees during construction.

The size of the optimal TPZ can be determined by a formula based on: 1) trunk diameter 2) species tolerance to construction impacts, and 3) tree age (Matheny, N. and Clark, J 1998). In some instances, tree drip line is used as the TPZ. Development constraints can also influence the final size of the tree protection zone.

Fencing is installed to delineate the (TPZ), and to protect tree roots, trunk, and scaffold branches from construction equipment. *The fenced protection area may be smaller than the optimal or designated TPZ area in some circumstances.* Tree protection may also involve the armoring of the tree trunk and/or scaffold limbs with barriers to prevent mechanical damage from construction equipment. *See Tree Protection Guidelines & Restrictions* – Appendix E.

Once the TPZ is delineated and fenced (prior to any site work, equipment and materials move in), construction activities are only to be permitted within the TPZ if allowed for and specified by the project arborist.

Where tree protection fencing cannot be used, or as an additional protection from heavy equipment, tree wrap may be used. Wooden slats at least one inch thick are to be bound securely, edge to edge, around the trunk. A single layer or more of orange plastic construction fencing is to be wrapped and secured around the outside of the wooden slats. Major scaffold limbs may require protection as determined by the City arborist or Project arborist. Straw wattle may also be used as a trunk wrap and secured with orange plastic fencing.

Data has been entered in the *Tree Assessment Chart – Appendix A,* which indicates the optimal Tree Protection Zone for each tree.

Additional general tree protection guidelines are included in *Tree Protection Guidelines & Restrictions* – Appendix G.

Critical Root Zone

Critical Root Zone (CRZ) is the area of soil around the trunk of a tree where roots are located that provide critical stability, uptake of water and nutrients required for a tree's survival. The CRZ is the minimum distance from the trunk that trenching that requires root cutting should occur and can be calculated as three to the five times the trunk Diameter at Breast Height (DBH). For example, if a tree is one foot in trunk diameter than the CRZ is three to five feet from the trunk location. We will often average this as four times the trunk diameter or 1ft. DBH = 4ft. CRZ (Smiley, E.T., Fraedrich, B. and Hendrickson, N. 2007).

Root Disturbance Distance

No one can estimate and predict with absolute certainty what distance from a tree, a soil disturbance such as excavation for construction should be, to ensure it will not significantly affect tree stability or health. Or to what degree, (low, moderate or high), a tree might be impacted. There are simply too many variables involved that we cannot see or anticipate. However, three times the D.B.H. (diameter at breast height), is a widely accepted minimum used in the industry for root disturbance, *on one side of the trunk*, and is supported by several research studies including (Smiley, Fraedich & Hendrickson 2002, Bartlett Tree Research Laboratories). This distance is often used during the design and planning phases of a project in order to estimate root loss due to construction activities. This distance is a guideline only and should be increased for trees with significant leans, decay or other structural problems.

The ISA, International Society of Arboriculture- Root Management (2017) publication recommends, “cutting roots at a distance greater than six times the trunk diameter (DBH) minimizes the likelihood of affecting both health and stability. This recommendation is given further direction by the companion publication, A.N.S.I. (*American National Standard*) A300 (Part 8)- 2013 Root Management, when roots are cut in a *non-selective* manner, i.e. in a straight line on one side of a tree. It says, if the cutting is “within six times the trunk diameter (DBH), mitigation shall be recommended”. Further, A.N.S.I. recommends the “minimum distance from the trunk for root cutting should be adjusted according to trunk diameter, species tolerance to root loss, tree age, health and site condition”.

In general, root cutting that occurs at a distance less than six times the diameter of a tree should be undertaken by hand digging and hand (or Sawzall), root pruning. These methods help mitigate root loss impacts.

Construction Impacts to Subject Trees

Four protected trees will be highly impacted by the new project and their removal will be necessary. This includes trees T1, liquidambar, and T4,T5, and T6 podocarpus, (Image #9).

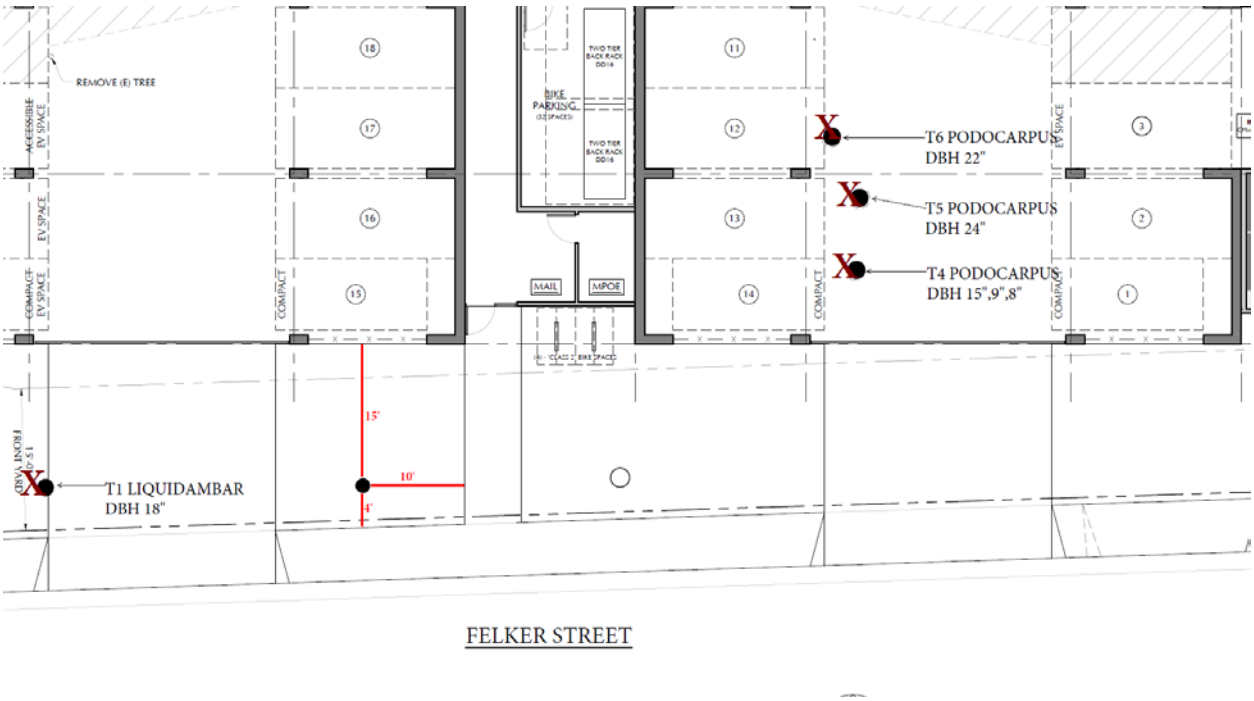

Image #9 – Tree T1, liquidambar and trees T4, T5 & T6, podocarpus, are within construction element footprint.

Tree T1 is within the driveway footprint and trees T4,T5, and T6 are within the building footprint.

Construction Impacts to Subject Trees, Continued:

Trees T2, liquidambar and T7, cedar will be moderately impacted, and can be incorporated into the project, (Image #10).

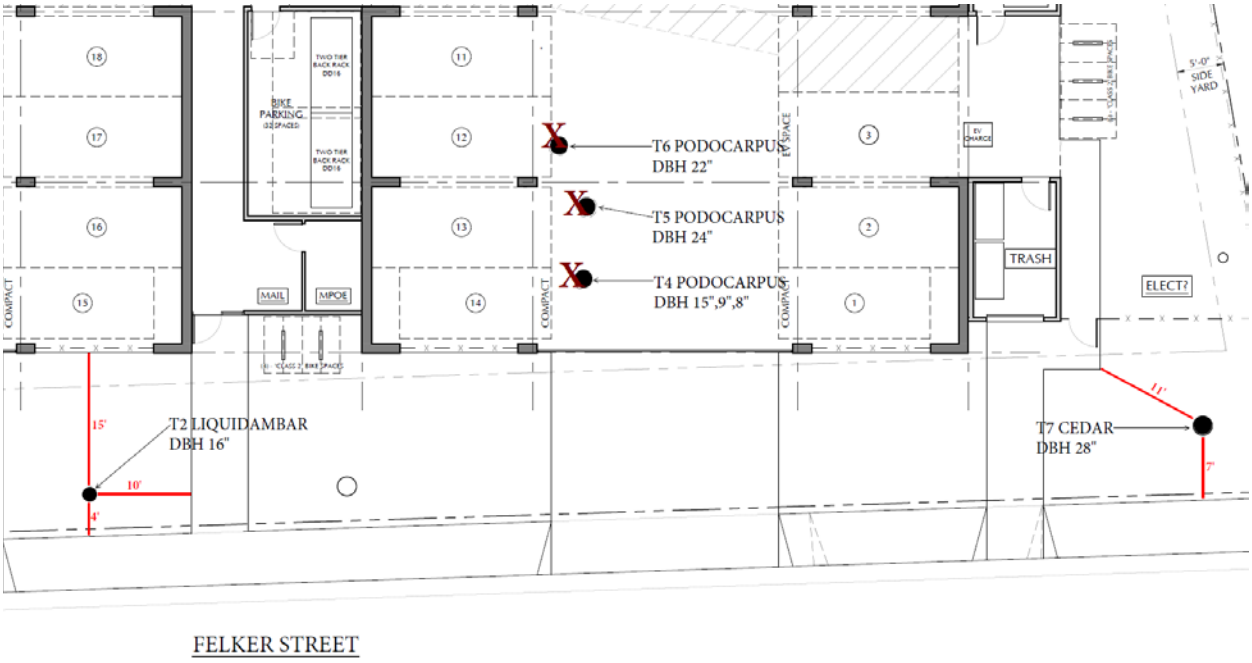

Image #10 – Tree T2, liquidambar and tree T7, cedar, distance to construction elements.

Tree T2, a 16” diameter liquidambar, is 10’ from the new walkway and 4’ from new sidewalk, (if installed). Four feet is within the trees critical root zone. The tree will suffer some root loss from the new sidewalk and new entry walkway, can tolerate the loss, and will require tree protection measures to reduce root loss impacts.

Tree T7 a 28” diameter cedar, is 11’ from the new walkway and 7’ from new sidewalk, (if installed). Seven feet is within the trees critical root zone. The tree will suffer some root loss from the new sidewalk and new entry walkway, can tolerate the loss, and will require tree protection measures to reduce root loss impacts.

Construction Impacts to Subject Trees, Continued:

Tree T4-A, silver dollar gum will have moderate construction impacts, (Image #11).

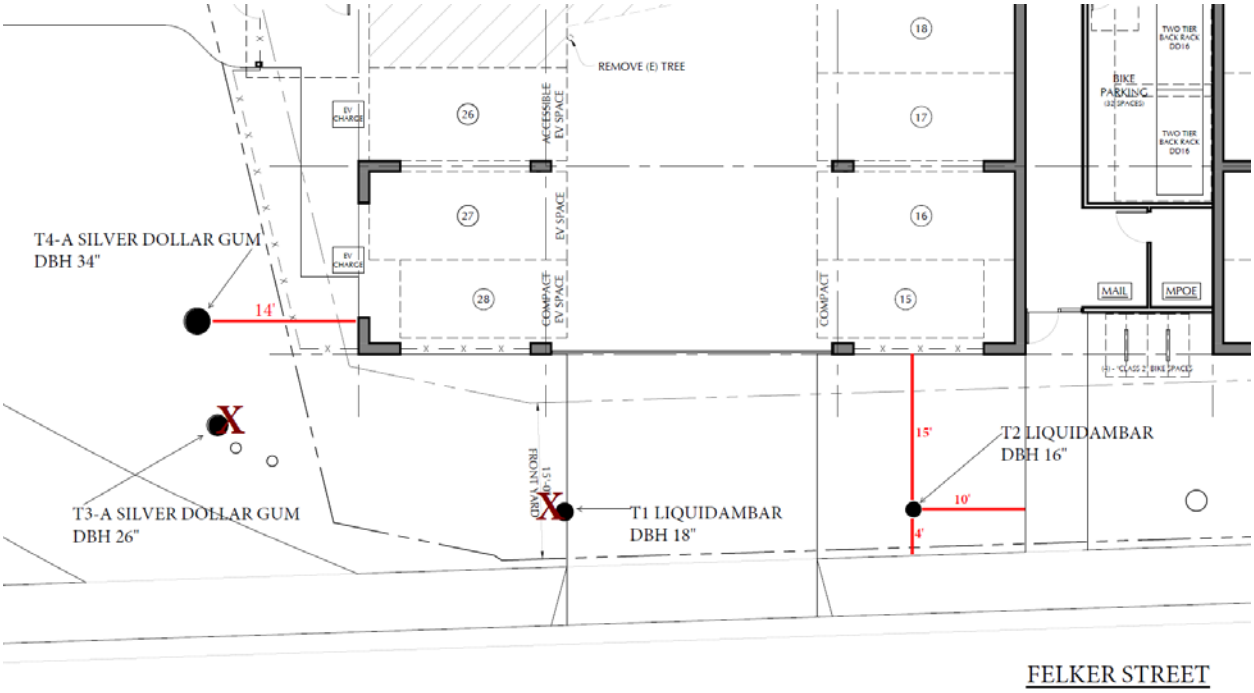

Image #11 – Tree T4-A, silver dollar gum, distance to new building.

Tree T4-A, a 34" silver dollar gum, will be within 14-feet of the new building. This is within the trees critical root zone. The tree will suffer some root loss, can tolerate the loss and will require tree protection measures, to reduce root loss impacts. Canopy clearance pruning will be necessary to allow space for construction of new building.

Tree T8-A, a 48" diameter blue gum eucalyptus, (not shown in image 11), will be 45-feet from the new building. This is outside the tree protection zone. Any root loss for this tree will be minor. The tree canopy overhangs the existing building by 8-feet. Construction of the new building will be about 8-feet from the tree canopy edge. No clearance pruning for construction of the new building should be necessary.

Construction Impacts to Subject Trees, Continued:

Three multi-trunked Carolina laurel cherry trees grow in a row along the east fence line. The trees are in fair condition and are below protected size. The preliminary plan indicates the trees are to be preserved. Impacts to these trees cannot be evaluated until the final civil plans are completed. Possible construction elements affecting these trees include hardscape and storm drain lines. These elements would need to be a minimum of 4-feet from the trees if they are to be retained. Carolina laurel cherry T12, has an unbalanced canopy with a weight bias towards the new building and would need clearance pruning to allow building construction.

Impact Level

Impact level rates the degree a tree may be impacted by construction activity and is primarily determined by how close the construction procedures occur to the tree. Construction impacts are rated as low, moderate, high. The quantity of trees assigned for each category (low, moderate, high), is indicated below:

Impact Rating (Protected Trees)

- Low - 3
- Moderate – 3
- High - 4

Protected Trees Recommended for Removal Due to High Construction Impacts

Four Trees-

T1, liquidambar,T4,T5, & T6 podocarpus

Mitigation Measures for Retained Trees

The trees retained on this project will require some or all the following methods to protect them from the impacts described above and to minimize root loss during the construction phases.

- Tree Protection Fencing
- Hand trenching.
- Supervised root pruning.

Tree protection specifications are included on the, **Tree Protection Plan, Sheet T1.** ***This plan sheet shall become an element of the final plan set.***

Replacement Trees

As mitigation for trees removed, replacement trees will be required for the **four** protected trees recommended for removal. Based on the preliminary site plan, there is room to plant replacement trees throughout the new site plan.

One 24" box or three 15-gallon replacement tree is required for each "protected" tree removed. Replacement trees should be planted away from structures and where they have enough room to develop. Do not install trees where overhead wire exist. The trees must receive supplemental irrigation equal to their establishment requirements for the first two years.

- Applicants may elect to pay an in-lieu fee to the tree trust fund of $150 for off- site mitigation. (Contribution to the Tree Trust Fund are used to purchase street trees, trees for projects, etc.)

Protected Trees on Adjacent Property (City of Santa Cruz?)

The following comments are to the attention of the Parks Urban Forester/ Arborist, at the City of Santa Cruz.

Two protected silver dollar gum (T3-A & T4-A), grow on the adjacent property and have canopies that overhang the new project limits. Tree T3-A, a 26" diameter gum, is a mature tree in poor condition. Significant tip and branch dieback can be seen, and the tree is in decline. It has had several limb failures between 8" and 10" in diameter. Targets in the event of failures include frequent bike and pedestrian traffic. Once the new building is built, the grounds on the west edge of the property will be a target.

Tree T4-A, a 34" diameter gum with an even larger branching structure and canopy spread than T3-A, has also dropped several limbs, some recently. The tree is in fair health but also shows some tip dieback.

Because of its poor condition, pattern of limb breakage, and the frequency of use by bicyclists and pedestrians, I recommend the removal of tree T3-A. Consideration should also be given to the removal of tree T4-A, or risk reduction pruning performed, because of a pattern of limb breakage. However, this tree will provide a significant visual buffer from the new building.

Tree Protection Specifications & Recommended Sequence

(These specifications are included on the Tree Protection Plan, sheet T1)

Demolition Phase:

1. Clearance Pruning – Clearance pruning of tree T4-A, silver dollar gum to allow space for construction of new building shall be performed using industry standards of workmanship as established in the Best Management Practices of the International Society of Arboriculture (ISA), and the American National Standards Institute, Safety Requirements in Arboriculture Operations ANSI Z133-2017. Contractor licensing and insurance coverage shall be verified. *Pruning should be done to achieve a minimum of 5 feet clearance from the building.*
2. CMU Wall Removal -Removal of CMU wall adjacent to tree T7 cedar shall be by hand methods. A jack hammer may be used on footing. No use of machinery is permitted.
3. Tree Protection Fencing - Install Tree Protection Fencing, in location indicated on Tree Protection Plan Sheet T1, prior to beginning of demolition.

Construction Phase:

1. Utilities / Gas, Sewer, Water or Electrical – Utilities shall be routed as far as feasible from the trunk of T2, liquidambar and T7 cedar. Any excavation for a utility line that is within the canopy dripline of tree T2, liquidambar or T7 cedar, shall be by hand methods. Any roots found less than 2” in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2” in diameter or greater, the root shall be retained with the root “bridging” the trench, and the pipe shall be installed under or over the root.
2. New Building – Excavation for new foundation adjacent to tree T4-A, silver dollar gum, shall be by hand methods, (*see tree protection plan Sheet T1, for location*). Stake foundation location adjacent to tree T4-A. Hand trench and root prune. Any roots found less than 2” in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2” in diameter or greater, they shall be pruned under supervision of the Project Arborist. Roots shall be pruned by methods indicated on Tree Protection Plan sheet T1, Pre-Construction Root Pruning. No use of machinery is permitted.
3. New Sidewalk, Driveway & Walkways - Excavation for the new sidewalk, driveway and walkway edges closest to trees T2, liquidambar,T7, cedar, and T4-A silver dollar gum, shall be accomplished by hand methods (*see tree protection plan Sheet T1, for location*). The depth of the trench shall equal the depth required for excavation of the new sidewalk or entry walkway. Any roots found less than 2” in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2” in diameter or greater, they shall be pruned under supervision of the Project Arborist. Roots shall be pruned by methods indicated on Tree Protection Plan sheet T1, Pre-Construction Root Pruning.

CONCLUSION

- The *Tree Assessment Chart*, Appendix A is the condensed reference guide to inform all tree management decisions for the trees evaluated.
- An existing commercial building will be demolished and a new 4-story, 32-unint apartment building will be constructed at 150 Felker Street, Santa Cruz.
- Eighteen trees on or near the property were surveyed, including ten “protected” trees.
- Four“ protected” trees including T2, liquidambar, T7, cedar, T4-A, silver dollar gum and T6-A blue gum eucalyptus, are in either good or fair condition, and are suitable for incorporation into the project.
- Six “protected” trees including T1 & T3 liquidambar, T4,T5 & T6 podocarpus,and T3-A silver dollar gum are in poor condition, or will be highly impacted and their removal will be necessary.
- “Protected” trees retained will be moderately impacted, and will require mitigation methods to reduce construction impacts, including tree protection fencing and other treatments.
- If removals are permitted, replacement trees will be required.

RECOMMENDATIONS

1. Obtain all necessary permits prior to removing or significantly altering any trees on site.
2. Follow tree protection specifications on Tree Protection Plan, sheets T1and T2.

Respectfully submitted,

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150 Felker Street, Santa Cruz

Tree Assessment Chart - Appendix A

Suitability for Preservation Ratings:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment

Retention or Removal Code:

RT: Retain Tree
RI: Remove Due to Construction Impacts
I.M. Impacts Can Be Mitigated With Pre-Construction Treatments
R.C.: Remove Due to Condition

Protected Tree City of Santa Cruz Any tree 14 inches or greater in diameter measured at 4.5 feet above grade. Street trees regardless of size.

Tree #	Species	Trunk Diameter @ 54 inches a.g.	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T1	liquidambar (*Liquidambar styraciflua*)	18"	Yes	65'X25'	Fair	Fair	Fair	15'	High (Within driveway footprint)	R.I.	
T2	liquidambar	16"	Yes	65'X20'	Fair	Fair	Fair	15'	Moderate (Root loss, excavation)	R.T.,I.M.	

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150 Felker Street, Santa Cruz

Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 12 inches a.g.	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T3	liquidambar	24"	Yes	65'X25'	Fair-Poor	Poor	Poor	15'	N/A	R.C.	Four 6"-9" scaffolds broken with deadwood and decay.
T4	podocarpus (*Afrocarpus falcatus*)	15",9",8"	Yes	50'x15'	Fair	Fair	Fair	18'	High (Within building footprint)	R.I.	5 degree trunk lean. Co-dominant trunks with included bark.
T5	podocarpus	24"	Yes	65'X25'	Fair	Fair	Fair	18'	High (Within building footprint)	R.I.	Co-dominant trunks with included bark.
T6	podocarpus	22"	Yes	65'X25'	Fair	Fair	Fair	18'	High (Within building footprint)	R.I.	10 degree trunk lean. Co-dominant trunks with included bark.
T7	incense cedar (*Calocedrus decurren* s)	28"	Yes	65'X15'	Good	Good	Good	20'	Moderate (Root loss, excavation)	R.T.,I.M.	
T8	Carolina laurel cherry (*Prunus caroliniana*)	9",7",6",5"	No	20'X15'	Fair	Fair	Fair	10'	Moderate - High (Root loss, excavation)	R.T., I.M.	Co-dominant trunks at 4' above grade. Deadwood and decay in trunk and one scaffold.

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150 Felker Street, Santa Cruz

Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 4.5'	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
T9	Carolina laurel cherry	10",9",8"	No	30'X15'	Fair	Fair	Fair	10'	Moderate - High (Root loss, excavation)	R.T., I.M.	Co-dominant trunks at 3' above grade. 8" limb tear out with deadwood and decay.
T10	Carolina laurel cherry	7",7",5",5"	No	30'X15'	Fair	Fair	Fair	10'	Moderate - High (Root loss, excavation)	R.T., I.M.	Co-dominant trunks at 2' above grade. If retained will need some canopy clearance pruning from new building.
T11	Colorado blue spruce *(Picea pungens 'Glauca'*)	6"	No	30'X10'	Fair	Fair	Fair	10'	Moderate (Root loss, excavation)	R.T.	
T12	Carolina laurel cherry	12"	No	35'X20	Fair	Fair	Fair	10'	High (Within building foundation)	R.I.	
				Trees On Adjacent Property							
T1-A	coast live oak (*Quercus agrifolia*)	13"	No	40'X10'	Fair	Fair	Fair	10'	Low	R.T.	Grows 2' from tree T2-A. Unbalanced canopy with weight bias towards street. Rough trunk a sign of sycamore borer.
T2-A	coast live oak	12"	No	40'X10'	Fair	Fair	Fair	10'	Low	R.T.	Grows 2' from tree T1-A. Unbalanced canopy with weight bias towards street.

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150 Felker Street, Santa Cruz

Tree Assessment Chart - Appendix A

Tree #	Species	Trunk Diameter @ 4.5'	Protected Tree	Crown Height & Spread	Health Rating	Structural Rating	Suitability for Preservation (Based Upon Condition)	Tree Protection Zone (in feet)	Construction Impacts (Rating & Description)	Retention or Removal Code	Comments
Trees On Adjacent Property											
T3-A	silver dollar gum (*Eucalyptus polyanthemos*)	26"	Yes	55'X25'	Poor	Poor	Poor	18'	Low	R.C.	Thin canopy. Significant tip and branch dieback. 10" and 8" limb tear outs with deadwood. Canopy overhangs existing building 10'. If retained canopy clearance pruning (10'-12'), from new building will be necessary.
T4-A	silver dollar gum	34"	Yes	60'X35'	Fair - Poor	Poor	Poor	23'	Moderate (Root loss, excavation)	R.T.,I.M.	Thin canopy. Some tip and branch dieback. Multiple limb tear outs. Canopy overhangs existing building 10'. If retained canopy clearance pruning (10'-12'), from new building will be necessary.
T5-A	coast live oak	13"	No	30'X15'	Good	Fair	Good	10'	Low	R.T.	Missing bark lower trunk.
T6-A	blue gum eucalyptus (*Eucalyptus globulus*)	48"	Yes	75'X40'	Fair	Fair	Fair	23'	Low	R.T.	Canopy overhangs existing building 8'.

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11/14/2021

APPENDIX B – CRITERIA FOR TREE ASSESSMENT CHART

Following is an explanation of the data used in the tree evaluations. The data is incorporated in the *Tree Assessment Chart, Appendix A.*

Trunk Diameter and Number of Trunks:

Trunk diameter as measured at 4.5 feet above grade. The number of trunks refers to a single or multiple trunked tree. Multiple trunks are measured at 4.5 feet above grade.

Health Ratings:

Good: A healthy, vigorous tree, reasonably free of signs and symptoms of disease

Fair: Moderate vigor, moderate twig and small branch dieback, crown may be thinning and leaf color may be poor

Poor: Tree in severe decline, dieback of scaffold branches and/or trunk, most of foliage from epicormics

Structure Ratings:

Good: No significant structural defects. Growth habit and form typical of the species

Fair: Moderate structural defects that might be mitigated with regular care

Poor: Extensive structural defects that cannot be abated.

Suitability for Preservation Ratings:

Rating factors:

Tree Health: Healthy vigorous trees are more tolerant of construction impacts such as root loss, grading and soil compaction, then are less vigorous specimens.

Structural integrity: Preserved trees should be structurally sound and absent of defects or have defects that can be effectively reduced, especially near structures or high use areas.

Tree Age: Over mature trees have a reduced ability to tolerate construction impacts, generate new tissue and adjust to an altered environment. Young to maturing specimens are better able to respond to change.

Species response: There is a wide variation in the tolerance of individual tree species to construction impacts.

Rating Scale:

Good: Trees in good health and structural condition with potential for longevity on the site

Fair: Trees in fair health and/or with structural defects that may be reduced with treatment procedures.

Poor: Trees in poor health and/or with poor structure that cannot be effectively abated with treatment. Trees can be expected to decline or fail regardless of construction impacts or management . The species or individual may possess characteristics that are incompatible or undesirable in landscape settings or unsuited for the intended use of the site.

Construction Impacts:

Rating Scale:

High: Development elements proposed that are located within the Tree Protection Zone that would severely impact the health and /or stability of the tree. The tree impacts cannot be mitigated without design changes. The tree may be located within the building footprint.

Moderate: Development elements proposed that are located within the Tree Protection Zone that will impact the health and/or stability of the tree and can be mitigated with tree protection treatments.

Low: Development elements proposed that are located within or near the Tree Protection Zone that will have a minor impact on the health of the tree and can be mitigated with tree protection treatments.

None: Development elements will have no impact on the health and stability of the Tree.

Tree Protection Zone (TPZ):

Defined area within which certain activities are prohibited or restricted to prevent or minimize potential injury to designated trees, particularly during construction or development.

Tree Protection Plan
150 Felker Street, Santa Cruz

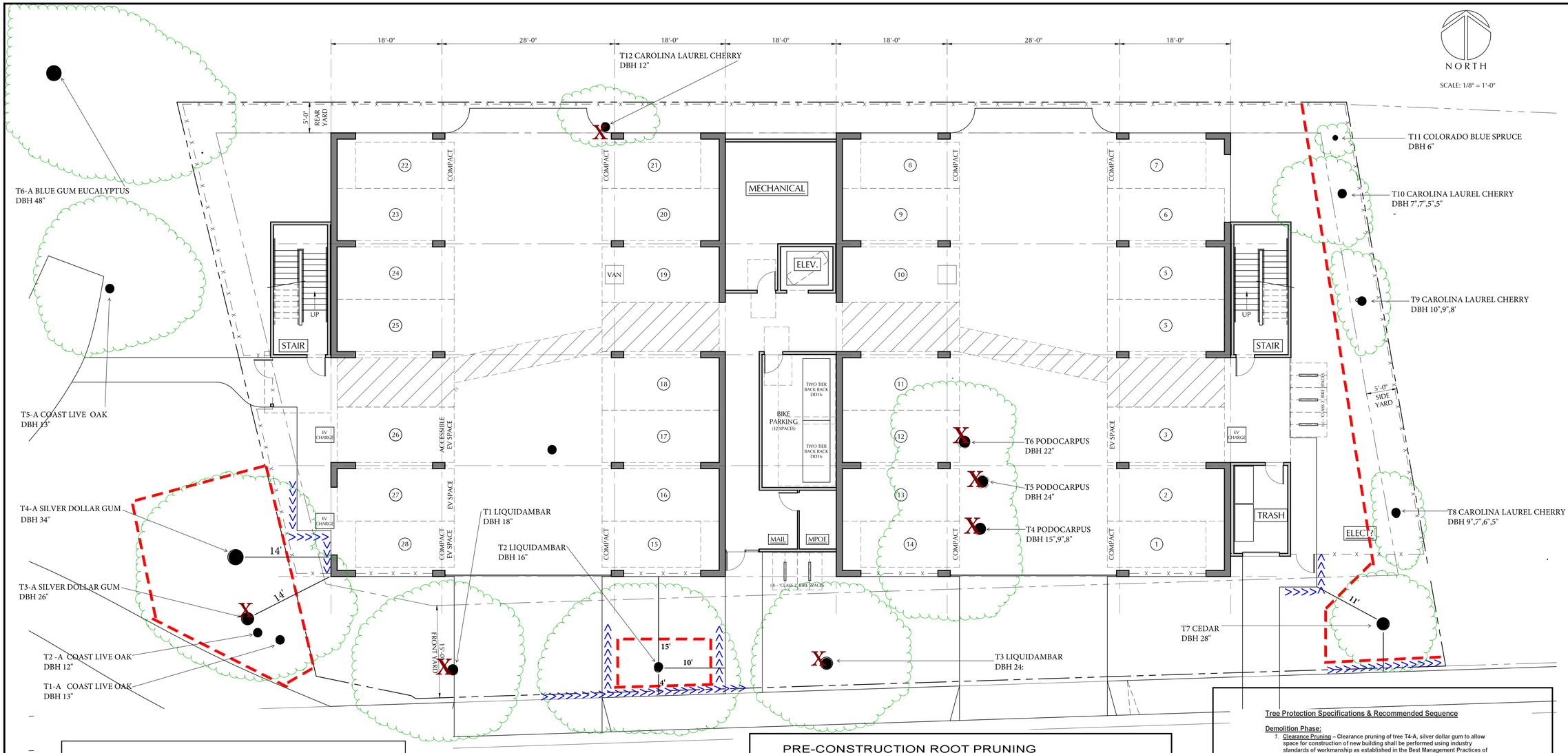
K.F.
11/15 2021

APN: 008-181-23

Sheet T1
of 1 sheet

NORTH

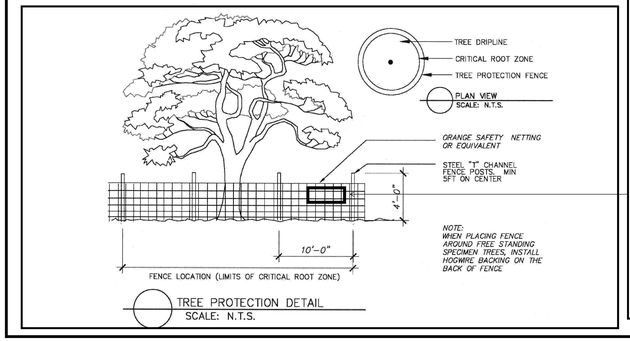
SCALE: 1/8" = 1'-0"



FELKER STREET

Legend

- Tree Location
- Tree Protection Fencing
- Tree Canopy Extents
- Hand Trenching & Root Pruning >>>>>>>>>>>>
- Remove Tree X



Warning

Tree Protection Zone

Keep Out

NOTICE: PROTECTIVE FENCING IS REQUIRED ON THIS JOB SITE.
REMOVAL OR DAMAGE OF THIS FENCING MAY RESULT IN A FINE

This sign must be prominently displayed. Fencing may not be moved or removed without permission of the Project Arborist.
During demolition and construction, all reasonable steps necessary to prevent damage, or the destruction of protected trees is required. Failure to comply with all precautions may result in a STOP WORK order being issue by the regulating agency.

No Entry without Project Arborist Authorization
Kurt Fouts –Arborist Consultant- 831 – 359 -3607

PRE-CONSTRUCTION ROOT PRUNING

Excavation shall only occur within the TPZ (Tree Protection Zone), of retained trees, when designated by the Project Arborist. Excavations within (or outside of the TPZ, as designated), the Tree Protection Zone, will be performed by hand in order to preserve roots. Pruning of roots 2" in diameter or greater shall be conducted under the supervision of the Project Arborist. These activities will be documented, and a monitoring report will be provided to the City Arborist.

Trenches for root pruning will be hand dug according to locations shown on Tree Protection Plan sheet:

- Trenches will be dug one foot behind staking on tree side of stakes.
- The depth of the trench will equal the depth required for installation of the adjacent element.
- Cleanly prune any roots encountered smaller than 2" in diameter. Use lopper, hand saw, or Sawzall. A sharp spade may be used for palm roots.
- The pruned roots should be backfilled before the end of the day. If this is not feasible, the roots shall be covered with burlap layers or carpeting and kept moist until the trench is backfilled.
- If roots are encountered 2" in diameter or greater, the Project Arborist shall be notified, and a determinations shall be made to prune the root or retain it depending on site specific conditions.

Tree Protection Specifications & Recommended Sequence

Demolition Phase:

1. Clearance Pruning – Clearance pruning of tree T4-A, silver dollar gum to allow space for construction of new building shall be performed using industry standards of workmanship as established in the Best Management Practices of the International Society of Arboriculture (ISA), and the American National Standards Institute, Safety Requirements in Arboriculture Operations ANSI Z133-2017. Contractor licensing and insurance coverage shall be verified. *Pruning should be done to achieve a minimum of 5 feet clearance from the building.*
2. CMU Wall Removal -Removal of CMU wall adjacent to tree T7 cedar shall be by hand methods. A jack hammer may be used on footing. No use of machinery is permitted.
3. Tree Protection Fencing - Install Tree Protection Fencing, in location indicated on Tree Protection Plan Sheet T1, prior to beginning of demolition.

Construction Phase:

1. Utilities / Gas, Sewer, Water or Electrical – Utilities shall be routed as far as feasible from the trunk of T2, liquidambar and T7 cedar. Any excavation for a utility line that is within the canopy dripline of tree T2, liquidambar or T7 cedar, shall be by hand methods. Any roots found less than 2" in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2" in diameter or greater, the root shall be retained with the root "bridging" the trench, and the pipe shall be installed under or over the root.
2. New Building – Excavation for new foundation adjacent to tree T4-A, silver dollar gum, shall be by hand methods, (*see tree protection plan Sheet T1, for location*). Stake foundation location adjacent to tree T4-A. Hand trench and root prune. Any roots found less than 2" in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2" in diameter or greater, they shall be pruned under supervision of the Project Arborist. Roots shall be pruned by methods indicated on Tree Protection Plan sheet T1, Pre-Construction Root Pruning. No use of machinery is permitted.
3. New Sidewalk, Driveway & Walkways - Excavation for the new sidewalk, driveway and walkway edges closest to trees T2, liquidambar,T7, cedar, and T4-A silver dollar gum, shall be accomplished by hand methods (*see tree protection plan Sheet T1, for location*). The depth of the trench shall equal the depth required for excavation of the new sidewalk or entry walkway. Any roots found less than 2" in diameter, shall be cleanly pruned with loppers, hand saw or Sawzall. If roots are encountered 2" in diameter or greater, they shall be pruned under supervision of the Project Arborist. Roots shall be pruned by methods indicated on Tree Protection Plan sheet T1, Pre-Construction Root Pruning.

Additional tree protection information can be found in arborist report dated, 11/15/2021.

Base map provided by William Kempf Architects, Santa Cruz, CA

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Glossary of Terms

Basal rot: decay of the lower trunk, trunk flare, or buttress roots.

Canker: Localized diseased area on stems, roots and branches. Often sunken and discolored.

Critical Root Zone (CRZ): Area of soil around a tree where a minimum number of roots considered critical to the structural stability or health of the tree are located. CRZ determination is sometimes based on the drip line or a multiple of the DBH, but because root growth can be asymmetric due to site conditions, on-site investigation may be required.

Codominant branches/stems: Forked branches (or trunks), nearly the same size in diameter, arising from a common junction and lacking a normal branch union, may have included bark.

Crown: Upper part of a tree, measured from the lowest branch, including all branches and foliage.

Defect: An imperfection, weakness, or lack of something necessary. In trees defects are injuries, growth patterns, decay, or other conditions that reduce the tree's structural strength.

Diameter at breast height (DBH): Measurement of trunk diameter at 4.5 feet above grade.

Frass: Fecal material and/or wood shavings produced by insects.

Included Bark Attachments (crotches): Branch/limb or limb /trunk, or codominant trunks originating at acute angles from each other. Bark remains between such crotches, preventing the development of axillary wood. The inherent weakness of such attachments increases with time, through the pressure of opposing growth and increasing weight of wood and foliage, often resulting in failure.

Live Crown Ratio (LCR): Ratio of the the crown length (live foliage), to total tree height.

Scaffold branches: Permanent or structural branches that form the scaffold architecture or structure of a tree.

Suppressed: Trees that have been overtopped and occupy an understory position within a group or grove of trees. Suppressed trees often have poor structure.

Tree Protection Zones (TPZ): Defined area within which certain activities are prohibited of restricted to prevent or minimize potential injury to designated trees, especially during construction or development.

Trunk flare: Transition zone from trunk to roots where the trunk expands into the buttress or structural roots.

This Glossary of Terms was adapted from the *Glossary of Arboricultural Terms* (ISA, 2015)

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Matheny, N. and Clark, J. Evaluation of Hazard Trees in Urban Areas. Champaign, IL: Wadley Graphix Corp. c.1994

Smiley, E.T., Matheny, N., Lilly, S. Tree Risk Assessment – Best Management Practices, Champaign, ILL: International Society of Arboriculture c. 2011

Costello, L., Perry, E., & Matheny,N, Abiotic Disorders of Landscape Plants: *A Diagnostic Guide* Oakland, CA:UC/ANR Publications (Publication 3420) c.2003.

Appendix F - TREE PROTECTION GUIDELINES AND RESTRICTIONS

Protecting Trees During Construction:

1) Before the start of site work, equipment or materials move in, clearing, excavation, construction, or other work on the site, every tree to be retained shall be securely fenced- off as delineated in approved plans. Such fences shall remain continuously in place for the duration of the work undertaken in connection with the development.

2) If the proposed development, including any site work, will encroach upon the tree protection zone, special measures shall be utilized, as approved by the project arborist, to allow the roots to obtain necessary oxygen, water, and nutrients.

3) Underground trenching shall avoid the major support and absorbing tree roots of protected trees. If avoidance is impractical, hand excavation undertaken under the supervision of the project arborist may be required. Trenches shall be consolidated to service as many units as possible. Boring/tunneling under roots should be considered as an alternative to trenching.

4) Concrete or asphalt paving shall not be placed over the root zones of protected trees, unless otherwise permitted by the project arborist.

5) Artificial irrigation shall not occur within the root zone of native oaks, unless deemed appropriate on a temporary basis by the project arborist to improve tree vigor or mitigate root loss.

6) Compaction of the soil within the tree protection zone shall be avoided.

7) Any excavation, cutting, or filling of the existing ground surface within the tree protection zone shall be minimized and subject to such conditions as the project arborist may impose. Retaining walls shall likewise be designed, sited, and constructed to minimize their impact on protected trees.

8) Burning or use of equipment with an open flame near or within the tree protection zone shall be avoided. All brush, earth, and other debris shall be removed in a manner that prevents injury to the tree.

9) Oil, gas, chemicals, paints, cement, stucco or other substances that may be harmful to trees shall not be stored or dumped within the tree protection zone of any protected tree, or at any other location on the site from which such substances might enter the tree protection zone of a protected tree.

10) Construction materials shall not be stored within the tree protection zone of a protected tree.

Project Arborist Duties and Inspection Schedule:

The project arborist is the person(s) responsible for carrying out technical tree inspections, assessment of tree health, structure and risk, arborist report preparation, consultation with designers and municipal planners, specifying tree protection measures, monitoring, progress reports and final inspection.
A qualified project arborist (or firm) should be designated and assigned to facilitate and insure tree preservation practices. He/she/they should perform the following inspections:

Inspection of site: Prior to equipment and materials move in, site work, demolition, landscape construction and tree removal: The project arborist will meet with the general contractor, architect / engineer, and owner or their representative to review tree preservation measures, designate tree removals, delineate the location of tree protection fencing, specify equipment access routes and materials storage areas, review the existing condition of trees and provide any necessary recommendations.

Inspection of site: During excavation or any activities that could affect trees: Inspect site during any activity within the Tree Protection Zones of preserved trees and any recommendations implemented. Assess any changes in the health of trees since last inspection.

Final Inspection of Site: Inspection of site following completion of construction. Inspect for tree health and make any necessary recommendations.

Kurt Fouts shall be the Project Arborist for this project. All scheduled inspections shall include a brief Tree Monitoring report, documenting activities and provided to the City Arborist.

Tree Protection Fencing

Tree Protection fencing shall be installed prior to the arrival of construction equipment or materials. Fence shall be comprised of six -foot chain link fence mounted on eight - foot tall, 1 and 7/8-inch diameter galvanized posts, driven 24 inches into the ground and spaced on a minimum of 10-foot centers. Once established, the fence must remain undisturbed and be maintained throughout the construction process until final inspection.

A final inspection by the City Arborist at the end of the project will be required prior to removing any tree protection fencing.

Tree Protection Signs

All sections of fencing should be clearly marked with signs stating that all areas within the fencing are Tree Protection Zones and that disturbance is prohibited.

Monitoring

Any trenching, construction or demolition that is expected to damage or encounter tree roots should be monitored by the project arborist or a qualified ISA Certified Arborist and should be documented.

The site should be evaluated by the project arborist or a qualified ISA Certified Arborist after construction is complete, and any necessary remedial work that needs to be performed should be noted.

Root Pruning

Root pruning shall be supervised by the project arborist. When roots over two inches in diameter are encountered they should be pruned by hand with loppers, handsaw, reciprocating saw, or chain saw rather than left crushed or torn. Roots should be cut beyond sinker roots or outside root branch junctions and be supervised by the project arborist. When completed, exposed roots should be kept moist with burlap or backfilled within one hour.

Tree Work Standards and Qualifications

All tree work, removal, pruning, planting, shall be performed using industry standards of workmanship as established in the Best Management Practices of the International Society of Arboriculture (ISA) and the American National Standards Institute series, *Safety Requirements in Arboriculture Operations* ANSI Z133-2017,

Contractor licensing and insurance coverage shall be verified.

During tree removal and clearance, sections of the Tree Protection Fencing may need to be temporarily dismantled to complete removal and pruning specifications. After each section is completed, the fencing is to be re-installed.

Trees to be removed shall be cut into smaller manageable pieces consistent with safe arboricultural practices, and carefully removed so as not to damage any surrounding trees or structures. The trees shall be cut down as close to grade as possible. Tree removal is to be performed by a qualified contractor with valid City Business/ State Licenses and General Liability and Workman's Compensation insurance.

Development Site Tree Health Care Measures

RECOMMENDED TO PROVIDE OPTIMUM GROWING CONDITIONS, PHYSIOLOGICAL INVIGORATION AND STAMINA, FOR PROTECTION AND RECOVERY FROM CONSTRUCTION IMPACT.

Establish and maintain TPZ fencing, trunk and scaffold limb barriers for protection from mechanical damage, and other tree protection requirements as specified in the arborist report.

Project arborist to specify site-specific soil surface coverings (wood chip mulch or other) for prevention of soil compaction and loss of root aeration capacity.

Soil, water and drainage management is to follow the ISA BMP for "Managing Trees During Construction" and the ANSI Standard A300(Part 2)- 2011 Soil Management (a. Modification, b. 'Fertilization, c. Drainage.)

Fertilizer / soil amendment product(s) amounts and method of application to be specified by certified arborist.

City of Santa Cruz

9.56.040 HERITAGE TREE AND HERITAGE SHRUB DESIGNATION.

Any tree, grove of trees, shrub or group of shrubs, growing on public or private property within the city limits of the city of Santa Cruz which meet(s) the following criteria shall have the “heritage” designation:

(a) Any tree which has a trunk with a circumference of forty-four inches (approximately fourteen inches in diameter or more), measured at fifty-four inches above existing grade;

(b) Any tree, grove of trees, shrub or group of shrubs which have historical significance, including but not limited to those which were/are:

(1) Planted as a commemorative;

(2) Planted during a particularly significant historical era; or

(3) Marking the spot of an historical event.

(c) Any tree, grove of trees, shrub or group of shrubs which have horticultural significance, including but not limited to those which are:

(1) Unusually beautiful or distinctive;

(2) Old (determined by comparing the age of the tree or shrub in question with other trees or shrubs of its species within the city);

(3) Distinctive specimen in size or structure for its species (determined by comparing the tree or shrub to average trees and shrubs of its species within the city);

(4) A rare or unusual species for the Santa Cruz area (to be determined by the number of similar trees of the same species within the city);

(5) Providing a valuable habitat; or

(6) Identified by the city council as having significant arboricultural value to the citizens of the city.

ASSUMPTIONS AND LIMITING CONDITIONS

1. Any legal description provided by the appraiser/consultant is assumed to be correct. No responsibility is assumed for matters legal in character nor is any opinion rendered as the quality of any title.
2. The appraiser/consultant can neither guarantee nor be responsible for accuracy of information provided by others.
3. The appraiser/consultant shall not be required to give testimony or to attend court by reason of this appraisal unless subsequent written arrangements are made, including payment of an additional fee for services.
4. Loss or removal of any part of this report invalidates the entire appraisal/evaluation.
5. 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(s) to whom it is addressed without written consent of this appraiser/consultant.
6. This report and the values expressed herein represent the opinion of the appraiser/consultant, and the appraiser/consultant's fee is in no way contingent upon the reporting of a specified value nor upon any finding to be reported.
7. Sketches. Diagrams. Graphs. Photos. Etc., in this report, being intended as visual aids, are not necessarily to scale and should not be construed as engineering reports or surveys.
8. This report has been made in conformity with acceptable appraisal/evaluation/diagnostic reporting techniques and procedures, as recommended by the International Society of Arboriculture.
9. When applying any pesticide, fungicide, or herbicide, always follow label instructions.
10. No tree described in this report was climbed, unless otherwise stated. We cannot take responsibility for any defects which could only have been discovered by climbing. A full root collar inspection, consisting of excavating around the tree to uncover the root collar and major buttress roots, was not performed, unless otherwise stated. We cannot take responsibility for any root defects which could only have been discovered by such an inspection.

CONSULTING ARBORIST DISCLOSURE STATEMENT

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 risk of living near trees, Clients may choose to accept or disregard the recommendations of the arborist, or to seek additional advice.

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 specified period of time. Likewise, remedial treatments, like medicine, cannot be guaranteed.

Trees can be managed, but they cannot be controlled. To live near trees is to accept some degree of risk. The only way to eliminate all risk associated with trees is to eliminate all trees.

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MEMBER
INTERNATIONAL SOCIETY OF ARBORICULTURE
ISA
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