California Tree and Landscape Consulting, Inc.
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October 3, 2025

Barghausen Consulting Engineers, Inc.
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OAK RESOURCES TECHNICAL REPORT

Re: BCE #21863; Arco; 4100 Durock Road; APN 109-080-001; County of El Dorado, California

Summary
Leslie Burnside of Barghausen Consulting Engineers, on behalf of the property owner, contacted California Tree and Landscape Consulting Inc. to inventory and evaluate the trees within 50' of development for purposes of evaluating the impacts to the trees from the proposed preliminary grading plan by Barghausen Consulting Engineers[1]. The property is located at 4100 Durock, Shingle Springs and is subject to the jurisdiction of the County of El Dorado, California. (See Supporting Information, Appendix 1 – Tree Location Map.)

R. Cory Kinley, ISA# WE-9717A, visited the property on April 8, 2022 to evaluate the trees and onsite conditions. A total of nine (9) protected trees were evaluated. Three (3) trees were included from neighboring parcels because they may be impacted by the proposed development[2]. Tyler Thomson, ISA Certified Arborist #12751A, revisited the site on November 5, 2024 and inventoried 8 additional trees. All the trees surveyed are protected according to the County of El Dorado Oak Resources Conservation Ordinance No. 5061.

TABLE 1 – Tree Removal and Mitigation

		Interior Live Oak, *Quercus wislizenii*	Blue Oak, *Quercus douglasii*	Trunk Diameter Inches/Inches Requiring Mitigation
Individual Native Oak Trees				
Individual Oak Trees to be Removed, >6" and <24"		3	0	27
Trees to be removed >24" and <36"		0	0	0
Heritage Trees				
Heritage Trees to be removed		0	0	0[3]

[1] Preliminary Grading Plan- Sheet No. PG (not dated, provided 12/03/24)

[2] CalTLC is not a licensed land surveyor. Tree ownership was not determined. Conclusions within this report are based on existing fences or other landmarks which may not represent the actual property boundary.

[3] Tree #7759 is an off-site Heritage tree (42" Total Diameter). An additional $19,278.00 in mitigation fees will be required if the required protection zone shown in Appendix 1 cannot be met. In addition, since this tree does NOT belong to the subject property, permission from the property owner would be required for removal of the tree.

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Oak Woodlands				
Acreage of Lot/Oak Woodland Acres	3.69/0			
Acreage of Oak Woodlands to be Impacted or Removed	0			

In lieu fees: Costs based on Removal of Oak Woodlands	Not Applicable
Individual Trees Impacted or to be removed	27” x $153.00 = $4,131.00
Total	$4,131.00

See Appendix 2 for Information on Each Individual Tree & Appendix 5 for Tree Protection Information

While the total encroachment for Tree #7759 is estimated at ~25% the remainder of the tree is undisturbed and with proper excavation monitored by the project arborist and root pruning the tree should not suffer any adverse effects.

It should be noted that the south boundary area has several substandard size oaks trees and numerous foothill pine trees of various sizes.

Observations

The site has a previously graded pad covering approximately 1 acre where the development is proposed. There is no oak woodland on the site. The parcel is primarily foothill pine, *Pinus sabiniana*, chemise, *Adenostoma fasciculatum*, coyote brush, *Baccharis pilularis*, and poison oak, *Toxicodendron diversilobum*. Several interior live oak, *Quercus wislizeni* and a few blue oak, *Quercus* douglasii, were noted. There are seventeen (17) protected trees inventoried within 50’ of the proposed development area. Seven (7) of the inventoried trees are off-site including the Heritage tree. (See Supporting Information, Appendix 1 – Tree Protection Plan.)

Three (3) protected trees that meet the minimum size requirements are proposed for removal totaling 27” in diameter. Mitigation for these trees is $153.00 per diameter inch for a total of $4,131.00.

Methods

The protected trees evaluated as part of this report have a numbered tag that was placed on each one that is 1-1/8” x 1-3/8", green anodized aluminum, “acorn” shaped, and labeled: CalTLC, Auburn, CA with 1/4” pre-stamped tree number and Tree Tag. They are attached with a natural-colored aluminum 10d nail, installed at approximately 6 feet above ground level on the approximate north side of the tree. The tag should last ~10-20+ years depending on the species, before it is enveloped by the trees’ normal growth cycle.

A Level 2 – Basic Visual Assessment was performed in accordance with the International Society of Arboriculture’s best management practices. This assessment level is limited to the observation of conditions and defects which are readily visible. Additional limiting factors, such as blackberries, poison oak, and/or debris piled at the base of a tree can inhibit the visual assessment.

Tree Location: The GPS location of each tree was collected using the ESRI’s ArcGIS collector application on an Apple iPhone or Android device. The data was then processed in ESRI’s ArcMap to produce the tree location map.

Tree Measurements: DBH (diameter breast high) is normally measured at 4’6” (above the average ground height for “Urban Forestry”), but if that varies then the location where it is measured is noted. A steel diameter tape was used to measure the DBH for all trees. A Stanley laser distance meter was used to measure distances and/or pacing was used to estimate canopy measurements. Canopy radius measurements may also have been estimated due to obstructions, such as steep slopes or other trees.

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TERMS

Field Tag #	The pre-stamped tree number on the tag which is installed at approximately 6 feet above ground level on the north side of the tree.
Old Tag #	If additional field tags are found on the trees and are legible, they are listed here.
Species	The species of a tree is listed by our local and correct common name and botanical name by genus (capitalized) and species (lower case). Oaks frequently cross-pollinate and hybridize, but the identification is towards the strongest characteristics.
DBH	Diameter breast high' is normally measured at 4'6" (above the average ground height for "Urban Forestry"), but if that varies then the location where it is measured is noted in the next column "measured at"
Measured at	Height above average ground level where the measurement of DBH was taken
Canopy radius	The farthest extent of the crown composed of leaves and small twigs. Most trees are not evenly balanced. This measurement represents the longest extension from the trunk to the outer canopy. The dripline measurement is from the center point of the tree and is shown on the Tree Location Map as a circle. This measurement can further define a protection zone if specified in the local ordinance as such or can indicate if pruning may be required for development.
Protected Root Zone	The radius of the protected root zone is a circle equal to the trunk diameter inches converted to feet and factored by tree age, condition and health pursuant to the industry standard. Best Management Practices: Managing Trees During Construction, the companion publication to the Approved American National Standard, provides guidance regarding minimum tree root protection zones for long term survival. In instances where a tree is multi-stemmed the protected root zone is equal to the extrapolated diameter (sum of the area of each stem converted to a single stem) factored by tree age, condition and health.
Arborist Rating	Subjective to condition and is based on both the health and structure of the tree. All of the trees were rated for condition, per the recognized national standard as set up by the Council of Tree and Landscape Appraisers and the International Society of Arboriculture (ISA) on a numeric scale of 5 (being the highest) to 0 (the worst condition, dead) as in Chart A. The rating was done in the field at the time of the measuring and inspection.

No problem(s)	Excellent	**5**	No problems found from a visual ground inspection. Structurally, these trees have properly spaced branches and near perfect
No apparent problem(s)	Good or Fair to Good	**4**	The tree is in good condition and there are no apparent problems that a Certified Arborist can see from a visual ground inspection. If potential structural or health problems are tended to at this stage future hazard can be reduced and more serious health problems can be averted.
Minor problem(s)	Fair	**3**	The tree is in fair condition. There are some minor

			structural or health problems that pose no immediate danger. When the recommended actions in an arborist report are completed correctly the defect(s) can be minimized or eliminated and/or health can be improved.
Major or uncorrectable problems (2)	Fair to Poor	**2**	The tree has major problems. If the option is taken to preserve the tree, additional evaluation to identify if health or structure can be improved with correct arboricultural work including, but not limited to: pruning, cabling, bracing, bolting, guying, spraying, mistletoe removal, vertical mulching, fertilization, etc. Additionally, risk should be evaluated as a tree rated 2 may have structural conditions which indicate there is a high likelihood of some type of failure. Tree rated 2 should be removed if these additional evaluations will not be performed.
Extreme problem(s)	Poor	**1**	The problems are extreme. This rating is assigned to a tree that has structural and/or health problems that no amount of work or effort can change. The issues may or may not be considered a dangerous situation.
Dead	Dead	**0**	This indicates the tree has no significant sign of life.

Notes	Provide notable details about each tree which are factors considered in the determination of the tree rating including: (a) condition of root crown and/or roots; (b) condition of trunk; (c) condition of limbs and structure; (d) growth history and twig condition; (e) leaf appearance; and (f) dripline environment. Notes also indicate if the standard tree evaluation procedure was not followed (for example - why dbh may have been measured at a location other than the standard 54”). Additionally, notes will list any evaluation limiting factors such as debris at the base of a tree.
Actions	Recommended actions to increase health and longevity.
Development Impacts	Projected development impacts are based solely on distance relationships between tree location and grading. Field inspections and findings during the project at the time of grading and trenching can change relative impacts. Closely followed guidelines and requirements can result in a higher chance of survival, while requirements that are overlooked can result in a dramatically lower chance of survival. Impacts are measured as follows:

Impact Term:	**Long Term Result of Impact:**
Negligible	Tree is unlikely to show any symptoms. Chance of survival post development is excellent. Impacts to the Protected Root Zone are less than 5%.
Minor	Tree is likely to show minor symptoms. Chance of survival post development is good. Impacts to the Protected Root Zone are less than 15% and species tolerance is good.

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Moderate	Tree is likely to show moderate symptoms. Chance of survival post development is fair. Impacts to the Protected Root Zone are less than 35% and species tolerance is good or moderate.
Severe	Tree is likely to show moderate symptoms annually and a pattern of decline. Chance of long term survival post development is low. Impacts to the Protected Root Zone are up to 50% and species tolerance is moderate to poor.
Critical	Tree is likely to show moderate to severe symptoms annually and a pattern of decline. Chance of long term survival post development is negligible. Impacts to the Protected Root Zone are up to 80%.

DISCUSSION

Trees need to be protected from normal construction practices if they are to remain healthy and viable on the site. Our recommendations are based on experience and the County ordinance requirements. Post construction tree longevity is often determined during development by the willingness of the contractor and subcontractors to adhere to the recommendations. Root zones must remain intact and viable, despite heavy equipment being on site, and the need to install foundations, driveways, underground utilities, and landscape irrigation systems. The most effective methodology for preserving trees is exclusion. Simply walking and driving on soil has serious consequences for tree health and accordingly, exclusionary fencing in the most appropriate location will be the most important recommendation for protecting trees during development.

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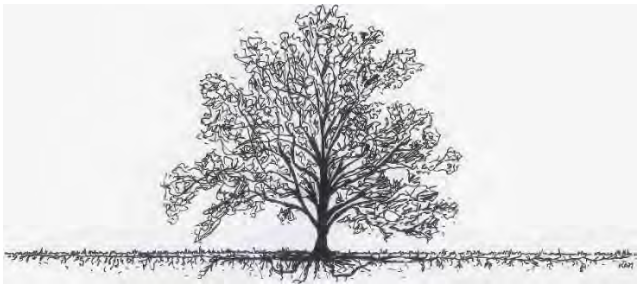
The arborist recommendation for where to place the exclusionary fencing is based on Best Management Practices[4] and experience working in the development industry. The majority of a tree's roots are contained in a radius from the main trunk outward approximately two to three times the canopy of the tree. These roots are located in the top 6" to 3' of soil. It is a common misconception that a tree underground resembles the canopy. The correct root structure of a tree is in the drawing below. All plants' roots need both water and air for survival.



Root structure of a mature tree, shown as twice the canopy in the top 3-4' of the soil

Arborist Classifications

Arboriculture is a broad industry and there are different types of Arborists with different qualifications.

Tree Removal and/or Pruning Companies. These companies may be licensed by the State of California to do business, but they do not necessarily know any of the science of tree growth and response to pruning or root impacts.
Arborists. Arborist is a broad term. It is intended to mean someone with specialized knowledge of trees.

[4] (Smiley, 2008)

ISA Certified Arborist: An International Society of Arboriculture Certified Arborist is someone who has been trained and tested to have specialized knowledge of trees. You can look up certified arborists at the International Society of Arboriculture website: isa-arbor.org.
Consulting Arborist: An American Society of Consulting Arborists Registered Consulting Arborist is someone who has been trained and tested to have specialized knowledge of trees and trained and tested to provide high quality reports and documentation. You can look up registered consulting arborists at the American Society of Consulting Arborists website: https://www.asca-consultants.org/

The **project arborist** for your development project is a consulting arborist with experience in interpretation of the County ordinances and requirements, preparation of Tree Protection Plans, onsite supervision of mechanical equipment during grading near trees, and communications with the County regarding tree preservation issues. The project arborist is responsible for notification to the County of the anticipated impacts to the individual trees and woodlands, as well as, verification of the actual impacts at the end of the project. The project arborist will provide an unbiased professional opinion as to the likelihood of survival of the trees retained during development.

Clearance Pruning & Mechanical Damage

The removal of lower foliage from a tree to prevent limb breakage by equipment is often necessary but can cause a significant reduction in the long-term viability of a tree due to fungal infection at the site of the wound. In addition, trees without adequate protection may sustain mechanical damage. Any wound can be an entry site for disease.

Fungi cause all decay of living trees. Decay is considered a disease because cell walls are altered, wood strength is affected, and living sapwood cells may be killed. Fungi decay wood by secreting enzymes. According to Evaluation of Hazard Trees in Urban Areas (Matheny, 1994) decay is a critical factor in the stability of the tree. As decay progresses in the trunk, the stem becomes a hollow tube or cylinder rather than a solid rod. This change is not readily apparent to the casual observer. Trees require only a small amount of bark and wood to transport water, minerals, and sugars. Interior heartwood can be eliminated (or degraded) to a great degree without compromising the transport process. Therefore, trees can contain significant amounts of decay without showing decline symptoms in the crown.

The project arborist should review any proposed pruning and directly supervise the pruning for adherence to industry standard practices.

RECOMMENDATIONS: SUMMARY OF TREE PROTECTION MEASURES

1. Project Arborist: California Tree & Landscape Consulting, Inc. (CalTLC) Edwin Stirtz, ed@caltlc.com (916) 878-0299. Contact the project arborist for access inside the Tree Protection Areas and Onsite Inspections as required.
2. The project arborist is required to inspect the tree protection fencing prior to grading and/or grubbing for compliance with the required protection zones. In particular, within the protected area for the offsite Heritage tree. Due to the proximity of the proposed work to the protected trees and the property line tree protective fencing will be installed on the property line.
3. Clearance pruning should include removal of all the lower foliage that may interfere with equipment PRIOR to having grading or other equipment on site. The Project Arborist should approve the extent of foliage elevation and oversee the pruning to be performed by a contractor who is an ISA Certified Arborist.

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4. Any and all work to be performed inside the protected root zone fencing shall be supervised by the project arborist.

Report Prepared by:

Caroline Nicholas
Arborist Assistant

Project Arborist:

Edwin E. Stirtz
Consulting Arborist
ISA Certified Arborist #WE-0510AM, TRAQ

Enc.: Appendix 1 – Map of Tree Locations & Tree Protections
Appendix 2 – Tree Information Data
Appendix 3 – General Practices for Tree Protection
Appendix 4 – Site Photographs

Bibliography

International Society of Arboriculture. (2015). *Glossary of Arboricultural Terms.* Champaign: International Society of Arboriculture.
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Tree Care Industry Association. (2017). *Tree, Shrub, and Other Woody Plant Management - Standard Practices (Pruning).* Londonderry: Tree Care Industry Association.
Urban, J. (2008). *Up by the Roots.* Champaign: International Society of Arboriculture.

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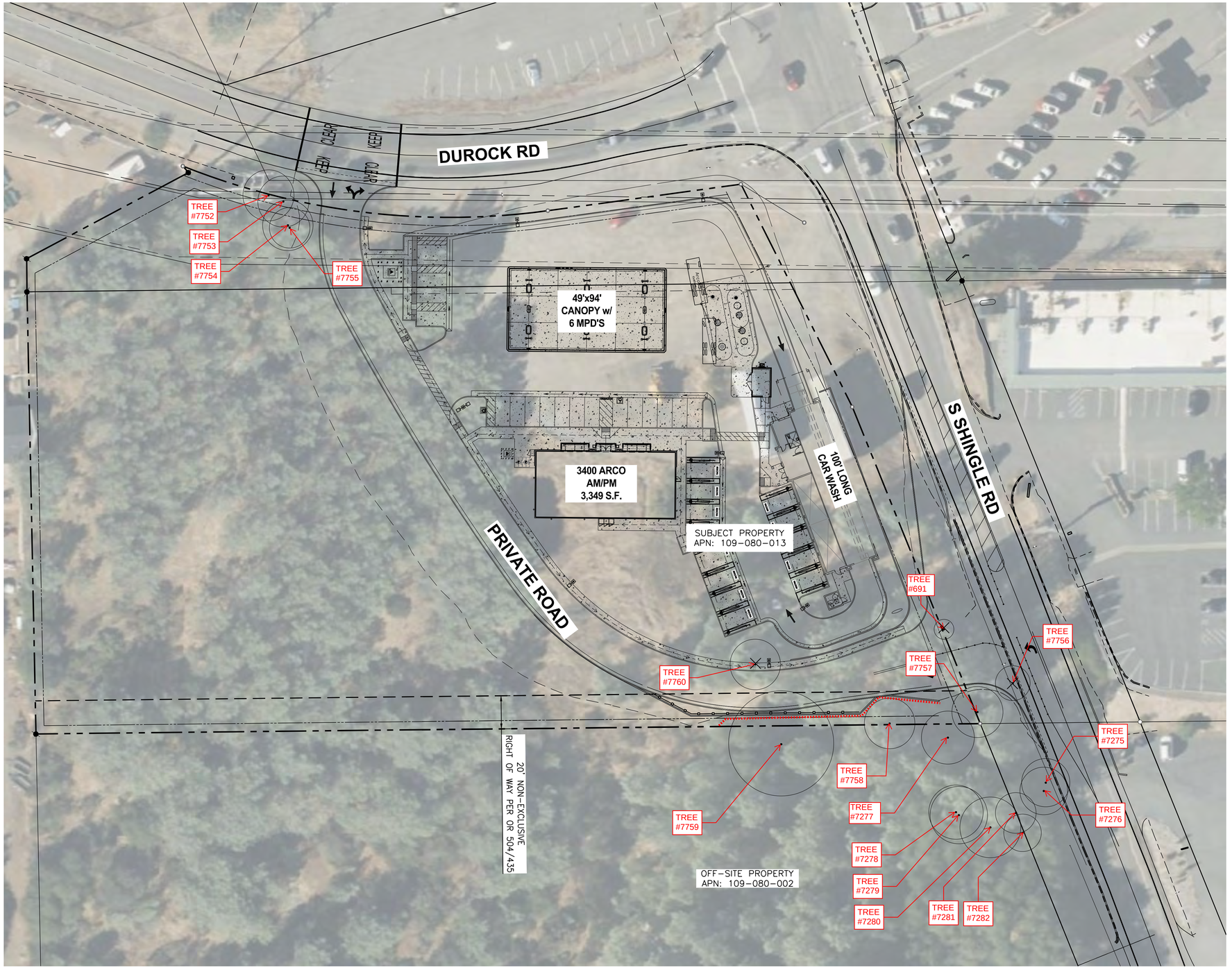
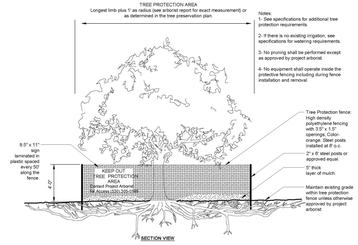
TREE IMPACT EXHIBIT

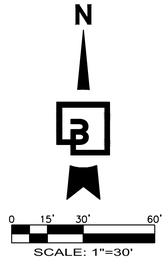




S-X TREE PROTECTION

Due to the proximity of the proposed work to the protected trees and the property line, tree protective fencing will be installed on the property line.

Tree Protection Fencing



Preliminary Not For Construction

CLIENT:

bp

ARCO

BP WEST COAST PRODUCTS, LLC

Barghausen
Consulting Engineers, Inc.

18215 72nd Avenue South
Kent, WA 98032
425.251.6222
barghausen.com

NO.	DATE	REVISION DESCRIPTION
7	01/13/23	CUP SUBMITTAL
6	02/08/24	CUP RESUBMITTAL
5	07/29/24	2ND CUP RESUBMITTAL
4		
3		
2		
1		
0		

SEAL:

DEVELOPMENT INFORMATION:

ARCO NTI

3400 am/pm FUEL CANOPY w/ 6 MPD's CAR WASH

SITE ADDRESS:

4100 DUROCK RD
@ S SHINGLE ROAD
SHINGLE SPRINGS, CALIFORNIA

FACILITY #TBD

DESIGNED BY:	ALLIANCE Z&DM:
CHECKED BY:	BP REPM:
DRAWN BY:	ALLIANCE PM:
VERSION: - -	PROJECT NO: 21863

DRAWING TITLE:

SHEET NO:

APPENDIX 2 – TREE INFORMATION DATA

Tag #	SWCA Tag #	Protected By Code	Significant Oak Trees >24"-35"	Heritage Oak Trees >36"	Offsite	Species Common Name	Species Botanical Name	DBH (in.)	DBH Multi-Stem (in.)	Measured At (in.)	Canopy Radius (ft.)	Arborist Rating	Notes	Dvlpmnt Status	Impacts
691		Yes	No	No	No	Interior live oak	*Quercus wislizeni*	9	6, 3	54	5	3-Minor Problems	Suppressed, multi stem at ground.	Proposed for Removal.	N/A
7275	QW01	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	14	9, 5	54	14	2-Major Structure or health problems	On slope, 5 feet from S Shingle Rd. Codominant at 1 foot, inclusion and 20% bark loss present. Unbalanced main stems with moderate bark loss throughout. Poor taper/balance. Fair foliage health. Crown moderately suppressed.	Retain.	No encroachment depicted.
7276	QW02	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	9.5		54	14	3-Minor Problems	On slope. Good base, structure and vigor. Moderately suppressed crown.	Retain.	No new encroachment depicted, existing curb and pavement within CRZ.
7277	QW08	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	8.5		54	16	2-Major Structure or health problems	Obscured base from heavy debris. Leans heavy east. Poor crown ratio and trunk taper. Healthy foliage, fair vigor.	Retain.	No encroachment depicted, protect in place -fence CRZ.
7278	QW07	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	9.6		54	16	3-Minor Problems	5 inch low stem connected to flare. Fair flare. Fair crown balance and density. Moderately suppressed crown.	Retain.	No encroachment depicted.

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Tag #	SWCA Tag #	Protected By Code	Significant Oak Trees >24"-35"	Heritage Oak Trees >36"	Offsite	Species Common Name	Species Botanical Name	DBH (in.)	DBH Multi-Stem (in.)	Measured At (in.)	Canopy Radius (ft.)	Arborist Rating	Notes	Dvlpmnt Status	Impacts
7279	QW06	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	7.6		54	17	2-Major Structure or health problems	Fair flare, buried northeast. Overextended branch with included bark attachment at 2 feet. Moderate/high amount of dead branches. Suppressed crown. Fair/low vigor.	Retain.	No encroachment depicted.
7280	QW05	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	8.6		54	18	3-Minor Problems	Good flare. Lower trunk leans moderately southwest, corrects mostly around 8 feet. Fair crown balance and density. Fair vigor.	Retain.	No encroachment depicted.
7281	QW04	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	6.3		54	12	2-Major Structure or health problems	Buried flare. Unbalanced base. One-sided crown southwest, severely suppressed. High amount of dead branches. Fair foliage health.	Retain.	No encroachment depicted.
7282	QW03	Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	8.1		54	11	2-Major Structure or health problems	Flush cuts on base. unbalanced crown. high amount of small dead branches. swollen crown stems with	Retain.	No encroachment depicted.

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Tag #	SWCA Tag #	Protected By Code	Significant Oak Trees >24"-35"	Heritage Oak Trees >36"	Offsite	Species Common Name	Species Botanical Name	DBH (in.)	DBH Multi-Stem (in.)	Measured At (in.)	Canopy Radius (ft.)	Arborist Rating	Notes	Dvlpmnt Status	Impacts
													moderate/severe bark loss.		
7752		Yes	No	No	Offsite	Interior live oak	*Quercus wislizeni*	10			15	3 Fair - Minor Problems	On south facing bank along Durock. Crowded, growing under transmission lines.	Retain.	Minor encroachment from driveway grading. Fence CRZ.
7753		Yes	No	No	No	Interior live oak	*Quercus wislizeni*	10			15	3 Fair - Minor Problems	On south facing bank along Durock. Crowded, growing under transmission lines.	Retain.	Minor encroachment from driveway grading. Fence CRZ.
7754		Yes	No	No	No	Interior live oak	*Quercus wislizeni*	6			15	3 Fair - Minor Problems	Bottom of south facing bank along Durock. Crowded, growing under transmission lines. Significant suppression dieback lower canopy.	Retain.	Moderate encroachment from driveway grading. Fence CRZ & monitor grading, root prune as necessary.
7755		No	No	No	No	Interior live oak	*Quercus wislizeni*	5			12	2 Major Structure or Health Problems	Bottom of south facing bank along Durock. Crowded, growing under transmission lines. Suppressed, severe lean.	Retain.	Moderate encroachment from driveway grading. Fence CRZ & monitor grading, root prune as necessary.
7756		Yes	No	No	Yes	Interior live oak	*Quercus wislizeni*	12	3,3,2,2,2		10	2 Major Structure or Health Problems	Along shoulder of South Shingle Rd. Multi stem at ground, weak attachments. Suppressed, crowded.	Proposed for Removal, within proposed driveway footprint.	N/A

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Tag #	SWCA Tag #	Protected By Code	Significant Oak Trees >24"-35"	Heritage Oak Trees >36"	Offsite	Species Common Name	Species Botanical Name	DBH (in.)	DBH Multi-Stem (in.)	Measured At (in.)	Canopy Radius (ft.)	Arborist Rating	Notes	Dvlpmnt Status	Impacts
7757		Yes	No	No	Yes	Blue Oak	*Quercus douglasii*	10			15	3 Fair - Minor Problems	Possibly offsite or shared. Buried flare, growing in a south facing bank. Good vigor.	Retain.	Minor encroachment from driveway grading. Fence CRZ.
7758		Yes	No	No	No	Blue Oak	*Quercus douglasii*	7			15	3 Fair - Minor Problems	Possibly offsite. Buried flare. Suppressed, crowded. Lower canopy significant dieback, leans south.	Retain.	Protect in -place. In impact area - no pruning will be necessary, the tree is far enough from the wall.
7759		**Yes**	**No**	**Yes**	**Yes**	**Interior live oak**	***Quercus wislizeni***	**42**	**12,11,9,10**		**30**	**2 Major Structure or Health Problems**	**Offsite. Tree has weak attachments with inclusions. Above average amount of dead wood.**	**Retain.**	**PROTECT DURING DEVELOPMENT by having the project arborist monitor the activities. Minor to moderate impact for retaining wall ~5' tall falls 10~ north of trunk. Monitor grading/excavation, root prune as necessary. 2 branches - 5" and 6" require removal to provide clearance over the new drive isle.**
7760		Yes	No	No	No	Interior live oak	*Quercus wislizeni*	6			15	3 Fair - Minor Problems	Growing out of a south facing bank. Significant lean, vigor good.	Proposed for Removal, at edge of proposed driveway.	N/A

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APPENDIX 3 – GENERAL PRACTICES FOR TREE PROTECTION

Definitions

Root zone: The roots of trees grow fairly close to the surface of the soil, and spread out in a radial direction from the trunk of tree. A general rule of thumb is that they spread 2 to 3 times the radius of the canopy, or 1 to 1 ½ times the height of the tree. It is generally accepted that disturbance to root zones should be kept as far as possible from the trunk of a tree.

Inner Bark: The bark on large valley oaks and coast live oaks is quite thick, usually 1" to 2". If the bark is knocked off a tree, the inner bark, or cambial region, is exposed or removed. The cambial zone is the area of tissue responsible for adding new layers to the tree each year, so by removing it, the tree can only grow new tissue from the edges of the wound. In addition, the wood of the tree is exposed to decay fungi, so the trunk present at the time of the injury becomes susceptible to decay. Tree protection measures require that no activities occur which can knock the bark off the trees.

Methods Used in Tree Protection:

No matter how detailed Tree Protection Measures are in the initial Arborist Report, they will not accomplish their stated purpose unless they are applied to individual trees and a Project Arborist is hired to oversee the construction. The Project Arborist should have the ability to enforce the Protection Measures. The Project Arborist should be hired as soon as possible to assist in design and to become familiar with the project. He must be able to read and understand the project drawings and interpret the specifications. He should also have the ability to cooperate with the contractor, incorporating the contractor's ideas on how to accomplish the protection measures, wherever possible. It is advisable for the Project Arborist to be present at the Pre-Bid tour of the site, to answer questions the contractors may have about Tree Protection Measures. This also lets the contractors know how important tree preservation is to the developer.

Root Protection Zone (RPZ): Since in most construction projects it is not possible to protect the entire root zone of a tree, a Root Protection Zone is established for each tree to be preserved. The minimum Root Protection Zone is the area underneath the tree's canopy (out to the dripline, or edge of the canopy), plus 10'. The Project Arborist must approve work within the RPZ.

Irrigate, Fertilize, Mulch: Supplemental irrigation, fertilization and or addition of mulch may be required at some point in time during the course of construction. The project arborist will recommend any or all of these mitigation measures as necessary during the course of construction.

Fence: Fence around the Root Protection Zone and restrict activity therein to prevent soil compaction by vehicles, foot traffic or material storage. The fenced area shall be off limits to all construction equipment, unless there is express written notification provided by the Project Arborist, and impacts are discussed and mitigated prior to work commencing. Due to the proximity of the proposed work to the protected trees and the property line tree protective fencing will be installed on the property line.

No storage or cleaning of equipment or materials, or parking of any equipment can take place within the fenced off area, known as the RPZ.

The fence should be highly visible, and stout enough to keep vehicles and other equipment out. I recommend the fence be made of orange plastic protective fencing, kept in place by t-posts set no farther apart than 6'.

In areas of intense impact, a 6' chain link fence is preferred.

In areas with many trees, the RPZ can be fenced as one unit, rather than separately for each tree.

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Where tree trunks are within 3' of the construction area, place 2" by 4" boards vertically against the tree trunks, even if fenced off. Hold the boards in place with wire. Do not nail them directly to the tree. The purpose of the boards is to protect the trunk, should any equipment stray into the RPZ.

Elevate Foliage: Where indicated, remove lower foliage from a tree to prevent limb breakage by equipment. Low foliage can usually be removed without harming the tree, unless more than 25% of the foliage is removed. Branches need to be removed at the anatomically correct location in order to prevent decay organisms from entering the trunk. For this reason, a contractor who is an ISA Certified Arborist should perform all pruning on protected trees.[5]

Expose and Cut Roots: Breaking roots with a backhoe, or crushing them with a grader, causes significant injury, which may subject the roots to decay. Ripping roots may cause them to splinter toward the base of the tree, creating much more injury than a clean cut would make. At any location where the root zone of a tree will be impacted by a trench or a cut (including a cut required for a fill and compaction), the roots shall be exposed with either a backhoe digging radially to the trunk, by hand digging, or by a hydraulic air spade, and then cut cleanly with a sharp instrument, such as chainsaw with a carbide chain. Once the roots are severed, the area behind the cut should be moistened and mulched. A root protection fence should also be erected to protect the remaining roots, if it is not already in place. Further grading or backhoe work required outside the established RPZ can then continue without further protection measures.

Protect Roots in Deeper Trenches: The location of utilities on the site can be very detrimental to trees. Design the project to use as few trenches as possible, and to keep them away from the major trees to be protected. Wherever possible, in areas where trenches will be very deep, consider boring under the roots of the trees, rather than digging the trench through the roots. This technique can be quite useful for utility trenches and pipelines.

Protect Roots in Small Trenches: After all construction is complete on a site, it is not unusual for the landscape contractor to come in and sever a large number of "preserved" roots during the installation of irrigation systems. The Project Arborist must therefore approve the landscape and irrigation plans. The irrigation system needs to be designed so the main lines are located outside the root zone of major trees, and the secondary lines are either laid on the surface (drip systems), or carefully dug with a hydraulic or air spade, and the flexible pipe fed underneath the major roots.

Design the irrigation system so it can slowly apply water (no more than ¼" to ½" of water per hour) over a longer period of time. This allows deep soaking of root zones. The system also needs to accommodate infrequent irrigation settings of once or twice a month, rather than several times a week.

Monitoring Tree Health During and After Construction: The Project Arborist should visit the site at least twice a month during construction to be certain the tree protection measures are being followed, to monitor the health of impacted trees, and make recommendations as to irrigation or other needs. After construction is complete, the arborist should monitor the site monthly for one year and make recommendations for care where needed. If longer term monitoring is required, the arborist should report this to the developer and the planning agency overseeing the project.

Chemical Treatments: The owner or developer shall be responsible to contact an arborist with a pesticide applicators license to arrange for an application of a root enhancing hormone, such as Paclobutrazol, to mitigate the stress produced by the development **prior to grading**. Additionally, at the discretion of the project arborist, an insect infestation preventative for both boring insects and leaf feeding insects and/or fungal preventative for leaf surfaces may be required. Roots pruned during the course of performing a cut may be required to be treated with a bio-fungicide such as Bio-Tam.

[5] International Society of Arboriculture (ISA), maintains a program of Certifying individuals. Each Certified Arborist has a number and must maintain continuing education credits to remain Certified.

APPENDIX 4 – SITE PHOTOGRAPHS by R. Cory Kinley, April 8, 2022

View of gravel pad area and tree line facing west.

View of gravel pad area and tree line facing south.

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View south of gravel pad area facing west.

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The majority of the site consisted of Gray Pine with understory trees and shrubs; including sporadic undersized native oaks.

Off site heritage-size interior live oak located adjacent to the south property line.

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SITE PHOTOGRAPHS by Tyler Thomson, November 5, 2024

Shows Trees #7275 & #7276, from left to right

Shows Tree #7275

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Shows Trees #7278 & #7279, from left to right

Shows Trees #7282 & #7281, from left to right

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