Permits

EXHIBIT # 10

Reasonable Economic Use Application

LAKE FOREST PARK
Washington
17425 Ballinger Way NE
Lake Forest Park, WA 98155
206-368-5440

Permit # 2020-REU-0002

Type of Project:	Single Family Residential		
Property Owner:	Khoa Ha		
Owner Mailing Address:	7629 199TH ST SW LYNNWOOD WA 98036		
Phone:	206-235-0854	**Email:**	khoa.ha628@gmail.com
Property Address:	Vacant Land (No assigned address) Lake Forest Park, WA 98155		
Tax Parcel No:	4024100380		
Legal Description:	~~LAKE~~ FOREST PARK 3RD ADD, PLat Block: 23, Plat Lot: 10		
Owner's Authorized Agent:	Jacob Strobl		
Authorized Agent Address:	3923 N 31st St, Tacoma, WA 98407		
Authorized Agent Phone:	206-661-3622	**Email:**	jacob@strobldesign.com

PERMIT APPLICATION FEES

Fees must be paid at time of application

Reasonable Economic Use Request	– $ 4,000
Land Use Public Notice Signage Fee	– $ 200
Additional Signage Fee - ---------- $25/ea.	
SEPA – *Separate application & fee, if required*	----------
SUBTOTAL	
Technology Fee ---------- 5% of Total	210-00
TOTAL FEES	4410-00

Staff use

RECEIVED
Date Stamp
JAN 24 2020
City of Lake Forest Park

Paid Stamp
PAID
1/24/20

The applicant may be responsible for additional fees related to engineering and legal expenses

Please provide the requested information:
(Attach additional sheets if necessary)

EXHIBIT # 18.1

Zoning Classification:	RS 20000
Is the site within 200 feet of shoreline?	NO
Comprehensive Plan Designation:	Conservation Residential, Low
Check known utilities/services to the site:	☐ gas ☑ electric ☑ water ☑ sewer ☐ cable ☐ garbage ☐ phone ☐ other:

What are the known Environmentally Critical Areas on the site? (steep, slopes, wetlands, etc	Wetland A Category III, Wetland B Category III,

From what sections of LFP Critical Areas code are you requesting an exception? LFP MC Sections:	16.16

Describe the nature of proposal. Indicate as much specific information as possible. i.e. What is proposed? What is the extent of the variance request?	Proposed single family house and driveway access to existing vacant site with wetlands present.

Describe the character of the site. Is the site sloped or flat? Is the site wooded and vegetated, cleared or landscaped? What is the current use of the site? Describe the surrounding areas (undeveloped, residential, commercial)	Wooded vacant lot, gentle slope, wetlands present, surrounding properties have single family houses.

What is the current use of the site? Describe the surrounding areas (commercial, undeveloped, residential)	Vacant lot, surrounding properties have single family houses.

Describe any mitigating factors that limit the project's impacts, such as open space, landscaping, traffic mitigation or screening?	Minimal house footprint located at the front of the site to reduce the project impact and length of driveway.

EXHIBIT # 18.1

When the application of the sensitive areas requirements would preclude an owner from making any reasonable economic use of the owner's property, then an exception may be applied for. The Hearing Examiner may grant an exception from the requirements of Chapter 16.16 of the Lake Forest Park Municipal Code only to the minimum necessary extent to allow for reasonable economic use of the applicant's property.

The Hearing Examiner may not exempt regional retention/detention surface water management facilities from stream buffer or wetland buffer requirements of Chapter 16.16 of the Lake Forest Park Municipal Code, whenever those buffers provide critical or outstanding habitat for herons, raptors or state, federal or locally designated endangered or threatened species, unless the applicant clearly establishes that the facility will protect the public health and safety and either will repair damaged natural resources or will not adversely affect such critical or outstanding habitat.

All of the following criteria must be met before a reasonable use exception may be granted. Applications must include a thorough response to the following criteria. **Applications that do not provide a unique and thorough response to these criteria will be considered incomplete:**

1. Application of the requirements of Chapter 16.16 of the Lake Forest Park Municipal Code will deny all reasonable use of the property.
2. There is no other reasonable economic use with less impact on the sensitive area.
3. The proposed development does not pose an unreasonable threat to the public health, safety, or welfare, on or off the proposed site and is consistent with the general purposes of this chapter and the comprehensive plan. 4. Any alteration is the minimum necessary to allow for reasonable economic use of the property.

The applicant must provide the following submittal requirements. Two paper copies and one digital copy of all materials are required.

It is important to note: It is the responsibility of the applicant to prove that all criteria are met in order for the Hearing Examiner to consider approval of the application.

In addition, the following must be provided:

- [x] A **site-plan** that is accurate, legible and drawn to scale (a recent survey may be required), and provides the following:
  - [x] The existing dimensions and lot size, proposed dimensions and lot size
  - [x] Identify adjacent streets, existing and proposed access
  - [x] Identify existing and proposed structures and distances to property lines
  - [x] Location of proposed alterations or improvements
  - [x] Location of any critical areas on or near the site
  - [x] Location of any open space or preservation areas
  - [x] Location of any significant trees (6" diameter or greater)
  - [ ] If possible, locate drainage channels, sewer and water lines
  - [ ] Identify existing and proposed easements
  - [ ] Elevation plans, if applicable
- [ ] **Preliminary Drainage Plan** (required for some proposals). This should be prepared by professional engineer licensed in the State of Washington. Drainage requirements, systems and techniques must comply with the King County Surface Water Design Manual, as adopted by the City of Lake Forest Park

EXHIBIT # 18.3

Release / Hold Harmless Agreement

I, the undersigned, his/her heirs and assigns, in consideration for City processing the application agrees to release, indemnify, defend and hold the City of Lake Forest Park harmless from any and all damages and/or claims for damages, including reasonable attorney's fees, arising from any action or inaction as based in whole or in part upon false, misleading or incomplete information furnished by the applicant, his agents or employees.

The undersigned acknowledges that this application is for a permit from the City of Lake Forest Park; that any permit issued by the City as a result of this application establishes only that the applicant's project complies with City ordinances and regulations; and that other State and Federal laws and regulations, particularly the Endangered Species Act, U.S.C. 16.31, et. seq., may apply to this project. The undersigned further acknowledges and accepts responsibility for complying with such other laws and regulations and agrees to release the City of Lake Forest Park, indemnify and defend it from any claim, damages, injuries, or judgments, including reasonable attorney's fees, arising from or related to violations of such other laws or regulations.

Qualified Professional Requirements

For each section of this application that was required to be prepared by a professional, please include a Statement of Qualification along with this application.

Permission to Enter Subject Property

I, the undersigned, grant his/her or its permission for public officials and staff of the City of Lake Forest Park to enter the subject property for the purpose of inspection and posting attendant to this application.

Date: 1/13/20

Signature of Applicant, Owner, or Representative:

Questions?

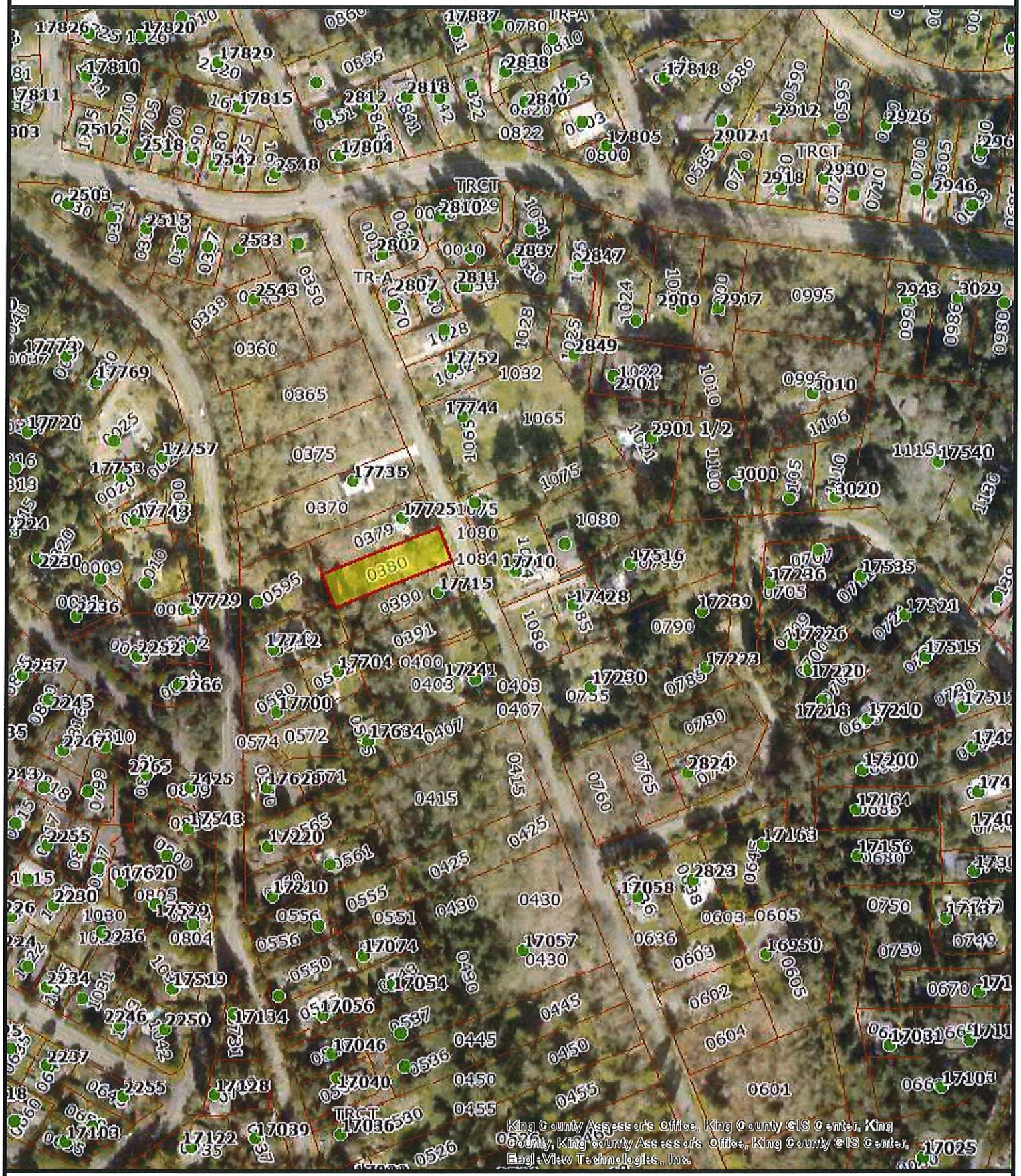
For more information, please contact the Planning Department
aplanner@cityoflfp.com
206-957-2837

Access to Information

Electronic versions of all forms, permits, applications, and codes are available on the Lake Forest Park website:
http://www.cityoflfp.com/
Paper copies of all of the above are available at City Hall:
17425 Ballinger Way Northeast, Lake forest Park, WA 98155

EXHIBIT # 19.8

King County



Date: 6/27/2023

N

King County

GEOTECH
CONSULTANTS, INC.

2401 10th Ave E
Seattle, Washington 98102
(425) 747-5618

September 5, 2019

JN 19312

Khoa Ha
P.O. Box 148
Lynnwood, Washington 98046

EXHIBIT # 20.0

via email: khoa.ha628@gmail.com

Subject: **Transmittal Letter – Geotechnical Engineering Study**
Proposed New Residence
17719 – 28th Avenue Northeast
Lake Forest Park, Washington

Dear Mr. Ha,

Attached to this transmittal letter is our geotechnical engineering report for the proposed new residence to be constructed in Lake Forest Park, Washington. The scope of our services consisted of exploring site surface and subsurface conditions, and then developing this report to provide recommendations for general earthwork and design considerations for foundations, retaining walls, subsurface drainage, and temporary excavations. This work was authorized by your acceptance of our proposal, P-10322, dated August 2, 2019.

The attached report contains a discussion of the study and our recommendations. Please contact us if there are any questions regarding this report, or for further assistance during the design and construction phases of this project.

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

D. Robert Ward, P.E.
Principal

MKM/DRW:kg

EXHIBIT # 20.1

GEOTECHNICAL ENGINEERING STUDY
Proposed New Residence
17719 – 28th Avenue Northeast
Lake Forest Park, Washington

This report presents the findings and recommendations of our geotechnical engineering study for the site of the proposed new residence to be located in Lake Forest Park.

Development of the property is in the planning stage, and detailed plans were not available to us at the time of this study. However, we were provided with a preliminary site plan prepared by Strobl Design LLC dated February 27, 2019 and topographic survey prepared by Pacific Coast Surveys, Inc. dated December 30, 2018. Based on this, and from conversations with Mr. Ha, we understand that the proposed development will consist of constructing a new residence on the existing, vacant property. The residence will be located east of the center of the lot, and is planned to be three stories in height. A new driveway will extend from the existing drive apron off 28th Avenue Northeast to an attached garage. Two trellises are shown extending off the northwestern and southeastern corners of the residences, and a pervious deck is shown extending off the southwestern corner of the residence at its second floor. Proposed setbacks of 7.5 feet are proposed from the north and south property lines, and 20-foot setbacks from the east and west property lines are shown, even though the proposed residence will be set back much farther than these minimum setbacks. No basement is being proposed, and the lowest floor elevation will likely be near the existing ground surface.

If the scope of the project changes from what we have described above, we should be provided with revised plans in order to determine if modifications to the recommendations and conclusions of this report are warranted.

SITE CONDITIONS

SURFACE

The Vicinity Map, Plate 1, illustrates the general location of the site in Lake Forest Park. The rectangular shaped site has approximate dimensions of 73.5 feet in the north-south direction, and 260 feet in the east-west direction. The site is bordered to the north, south and west by residential properties, and to the east by 28th Avenue Northeast. The adjacent properties all contain single-family residences located greater than 10 feet from the property lines. The adjacent southern and western lots are situated at a higher elevation than the subject site, and contain one and two story residences. Only the southern lot appears to be underlain by a partial footprint basement that daylights to the east. The adjacent northern residence is set at roughly the same elevation as the site, and contains a two story single family residence.

The site is currently vacant, and was once part of the adjacent northern lot. Much of the lot is covered with bushes, grass, and thick underbrush. Several mature trees are scattered throughout the lot. The only signs of previous development are noted in the central portion of the property, where an old basketball hoop and concrete slab were found. A lid to a decommissioned septic tank was also found while onsite. We understand that this septic system was once used to service the adjacent northern property. Small streams were observed to extend through the approximate northern and southern property lines, before turning southward near the eastern perimeter of the property where a small concrete culvert had been previously installed. The provided topographic

survey shows that this culvert continues under 28th Avenue Northeast to the eastern side of the right-of-way where the stream continues downhill. The survey also indicates that the approximate western half of the site is a designated wetland.

Contour information for the eastern half of the site was obtained from the supplied topographic map, and the remaining western half of the site's topographic contours were obtained from King County's iMap. Based on these, the grade across the property slopes downward from west to east, with a total elevation change of approximately 40 feet across the approximate 260-foot length of the property. Much of the site (roughly the eastern three-quarters) is inclined at approximately 10 to 12 percent. Only the western edge of the site is inclined at a steeper grade, with inclinations ranging from 30 to 36 percent within the site boundary. However, based on iMap, a steeper slope, having an inclination of about 40 to 60 percent, rises to the west on the adjacent property. This steep slope is shown to be about 50 to 60 feet tall. We obtained a City of Lake Forest Park Critical Areas Map indicates that the western edge of the site, and entire upslope, western adjacent lot is mapped as a Steep Slope Area. Based on the information in the City of Lake Forest Park Building Code, the whole of the western slope adjacent to the subject site meets the criteria for a Steep Slope Area. It should be noted that the preliminary siting location for the proposed residence will be situated at least 110 feet from the approximate toe of this mapped Steep Slope Area. Observations made while onsite indicated that this slope was covered in heavy underbrush and trees. No signs of deep-seated instability were observed while onsite.

SUBSURFACE

The subsurface conditions were explored by excavating three test pits at the approximate locations shown on the Site Exploration Plan, Plate 2. Our exploration program was based on the proposed construction, anticipated subsurface conditions and those encountered during exploration, and the scope of work outlined in our proposal.

The test pits were excavated on August 21, 2019 with a tracked excavator. A geotechnical engineer from our staff observed the excavation process, logged the test pits, and obtained representative samples of the soil encountered. "Grab" samples of selected subsurface soil were collected from the backhoe bucket. The Test Pit Logs are attached to this report as Plates 3 and 4.

Soil Conditions

The three test pits were excavated within in the area of the proposed residence. Beneath a surface layer of topsoil, the test pits encountered native, loose silty sand, sandy organic silt, and sand were encountered. The upper soils were observed to be dry of optimum moisture content, and increased in moisture with depth. Past depths of 5 to 7 feet, moderate to heavy groundwater seepage was encountered in the native, loose sands. Furthermore, heavy caving was observed below depths of 2 to 7 feet in the test pits. The loose, very wet sands extended to the maximum explored depth of 7 to 8 feet, where the excavator was unable to continue deeper due to the excessive groundwater and caving soils. Logs of nearby test borings at the approximate intersection of Northeast 178th Street and 29th Avenue Northeast indicate that this loose, very wet sand is underlain by very dense and hard silt with layers of compressed peat at an approximate depth of 17 feet.

EXHIBIT # 20.3

Groundwater Conditions

Moderate to heavy groundwater seepage was observed below a depth of 5 to 7 feet in the test pits. It should be noted that groundwater levels vary seasonally with rainfall and other factors.

The stratification lines on the logs represent the approximate boundaries between soil types at the exploration locations. The actual transition between soil types may be gradual, and subsurface conditions can vary between exploration locations. The logs provide specific subsurface information only at the locations tested. The relative densities and moisture descriptions indicated on the test pit are interpretive descriptions based on the conditions observed during excavation.

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

THIS SECTION CONTAINS A SUMMARY OF OUR STUDY AND FINDINGS FOR THE PURPOSES OF A GENERAL OVERVIEW ONLY. MORE SPECIFIC RECOMMENDATIONS AND CONCLUSIONS ARE CONTAINED IN THE REMAINDER OF THIS REPORT. ANY PARTY RELYING ON THIS REPORT SHOULD READ THE ENTIRE DOCUMENT.

The test pits conducted for this study encountered loose, native soils extending to the maximum explored depths of 7 to 8 feet beneath the ground surface. Furthermore, very wet, caving soils were encountered at relatively shallow depths beneath the ground surface, near the proposed foundation elevations. The loose native soils have a potential to settle excessively when subjected to new loading from new foundation and structural loads and have an elevated potential to liquefy under the ground motions of a large earthquake. All new foundation loads need to bear on suitable bearing soil. Considering the subsurface conditions encountered, and the considerable depth to suitable bearing soils found in the nearby boring logs, we recommend that the proposed residence be supported on a system of small diameter pipe piles that are driven through the upper, loose soils to refusal in the underlying dense native soils. We also recommend that the floor slab be supported by the pipe pile foundations. An expanded discussion can be found in the ***Pipe Piles*** section of this report.

It is possible that some settlement of the ground surrounding pile-supported residence will occur over time. In order to reduce the potential problems associated with this, we recommend the following:

* Fill to the desired site grades several months prior to constructing on-grade slabs, walkways, and pavements around the buildings. This allows the underlying soils to undergo some consolidation under the new soil loads before final grading is accomplished.

* Connect all in-ground utilities beneath the floor slabs to the pile-supported floors or grade beams. This is intended to prevent utilities, such as sewers, from being pulled out of the floor as the underlying soils settle away from the slab. Hangers or straps can be poured into the floors and grade beams to carry the piping. The spacing of these supporting elements will depend on the distance that the pipe material can span unsupported.

* Construct all entrance walkways as reinforced slabs that are doweled into the grade beam at the door thresholds. This will allow the walkways to ramp down and away from the building as they settle, without causing a downset at the threshold.

* Isolate on-grade elements, such as walkways or pavements, from pile-supported foundations and columns to allow differential movement.

The proposed development will be set back approximately 110 feet from the toe of steep western slope and will be. The proposed development will be located in a relatively flat area well outside of the default 50-foot buffer per Lake Forest Park Code (Section 16.16.310) from the toe of the western steep slope. Because of this, and because the new residence will be founded upon pipe piles that are driven into the underlying dense core of the site, we believe that the approximate 110-foot setback from the steep western slope is very suitable for the proposed development. We would recommend that a 60-foot buffer (equal to the highest part of the western slope) and a 15-foot building setback – this 75-foot overall setback is much less than the 110 feet provided.

The excavation for the proposed residence is not planned to be extensive at this time, as no basement has been proposed. Based on the soils encountered in the test pits, a temporary excavation inclination no steeper than a 1.5:1 (Horizontal:Vertical) is appropriate for the soils above the groundwater table. If excavations need to extend beneath the groundwater levels encountered in our test pits, we recommend that the excavations are shored to mitigate the impact of cave-ins. We do not recommend that vertical cuts be made into the onsite soils, as caving was observed above the groundwater table in the upper loose soils as well. Further recommendations are presented in the ***Excavations and Slopes*** section of this report.

The onsite soils that will be excavated for the new residence are silty, fine-grained, contain organics, are not free-draining, and have moisture contents that are elevated. We don not recommend that the onsite soils be re-sed for structural fill and imported, free-draining granular fill be utilized if structural fill is needed for the project. In addition, due to the shallow groundwater table, we do not recommend that concentrated infiltration or dispersion systems be utilized for this project. All stormwater runoff should be tightlined offsite to the appropriate facilities.

The erosion control measures needed during the site development will depend heavily on the weather conditions that are encountered. We anticipate that a silt fence will be needed around the downslope sides of any cleared areas. Existing pavements, ground cover, and landscaping should be left in place wherever possible to minimize the amount of exposed soil. Rocked staging areas and construction access roads should be provided to reduce the amount of soil or mud carried off the property by trucks and equipment. Trucks should not be allowed to drive off of the rock-covered areas. Cut slopes and soil stockpiles should be covered with plastic during wet weather. Following clearing or rough grading, it may be necessary to mulch or hydroseed bare areas that will not be immediately covered with landscaping or an impervious surface. On most construction projects, it is necessary to periodically maintain or modify temporary erosion control measures to address specific site and weather conditions.

The drainage and/or waterproofing recommendations presented in this report are intended only to prevent active seepage from flowing through concrete walls or slabs. Even in the absence of active seepage into and beneath structures, water vapor can migrate through walls, slabs, and floors from the surrounding soil, and can even be transmitted from slabs and foundation walls due to the concrete curing process. Water vapor also results from occupant uses, such as cooking, cleaning, and bathing. Excessive water vapor trapped within structures can result in a variety of undesirable conditions, including, but not limited to, moisture problems with flooring systems, excessively moist

air within occupied areas, and the growth of molds, fungi, and other biological organisms that may be harmful to the health of the occupants. The designer or architect must consider the potential vapor sources and likely occupant uses, and provide sufficient ventilation, either passive or mechanical, to prevent a build up of excessive water vapor within the planned structure.

Geotech Consultants, Inc. should be allowed to review the final development plans to verify that the recommendations presented in this report are adequately addressed in the design. Such a plan review would be additional work beyond the current scope of work for this study, and it may include revisions to our recommendations to accommodate site, development, and geotechnical constraints that become more evident during the review process.

We recommend including this report, in its entirety, in the project contract documents. This report should also be provided to any future property owners so they will be aware of our findings and recommendations.

SEISMIC CONSIDERATIONS

Loose, very wet native soils were revealed beneath the ground surface at depths of 5 to 7 feet in all three of the test pits. These wet to saturated soils have been demonstrated to have a moderate to high liquefaction potential during a large earthquake (code defines this as an MCE, which is discussed below). Thus, in accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type F. The ASCE allows for an exemption to reduce the Type F classification to a Type E classification if the building period is less than 0.5 seconds. No structural analysis has been completed yet, but we anticipate that the proposed residence will consist of relatively lightly loaded, timber construction, and will have a building period not exceeding 0.5 seconds. For a Site Class E, as noted in the USGS website, the mapped spectral acceleration value for a 0.2 second (S_s) and 1.0 second period (S_1) equals 1.25g and 0.48g, respectively.

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) during an earthquake be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The MCE peak ground acceleration adjusted for site class effects (F_{PGA}) equals 0.45g. The soils beneath the site are susceptible to seismic liquefaction under the ground motions of the MCE because of the presence of near-surface groundwater. We anticipate that the approximate total ground settlement that could result if liquefaction were to occur would be on the order of 5 to 10 inches. However, the recommendations presented in this report are intended to prevent catastrophic foundation collapse of the proposed residence if liquefaction were to occur. The intent is not to prevent damage or ensure continued function of the residence after the design seismic event.

EXHIBIT # 20.6

PIPE PILES

Three- or 4-inch-diameter pipe piles driven with a 850- or 1,100- or 2,000-pound hydraulic jackhammer to the following final penetration rates may be assigned the following compressive capacities. Please note that these allowable capacities have been lowered slightly to account for the potential for seismic induced down-drag during a liquefaction event and the loose condition of the upper soils.

INSIDE PILE DIAMETER	FINAL DRIVING RATE (850-pound hammer)	FINAL DRIVING RATE (1,100-pound hammer)	FINAL DRIVING RATE (2,000-pound hammer)	ALLOWABLE COMPRESSIVE CAPACITY
3 inches	10 sec/inch	6 sec/inch	2 sec/inch	5 tons
4 inches	16 sec/inch	10 sec/inch	4 sec/inch	8 tons

Note: The refusal criteria indicated in the above table are valid only for pipe piles that are installed using a hydraulic impact hammer carried on leads that allow the hammer to sit on the top of the pile during driving. If the piles are installed by alternative methods, such as a vibratory hammer or a hammer that is hard-mounted to the installation machine, numerous load tests to 200 percent of the design capacity would be necessary to substantiate the allowable pile load. The appropriate number of load tests would need to be determined at the time the contractor and installation method are chosen.

As a minimum, Schedule 40 pipe should be used. The site soils contain groundwater at a shallow depth and have an elevated corrosion potential. Considering this, it is our opinion that corrosion protection, such as galvanizing, is necessary for the pipe piles.

Pile caps and grade beams should be used to transmit loads to the piles. Isolated pile caps should include a minimum of two piles to reduce the potential for eccentric loads being applied to the piles. Subsequent sections of pipe can be connected with slip or threaded couplers, or they can be welded together. If slip couplers are used, they should fit snugly into the pipe sections. This may require that shims be used or that beads of welding flux be applied to the outside of the coupler.

Lateral loads due to wind or seismic forces may be resisted by passive earth pressure acting on the vertical, embedded portions of the foundation. For this condition, the foundation must be either poured directly against relatively level, undisturbed soil or be surrounded by level compacted fill. We recommend using a passive earth pressure of 250 pounds per cubic foot (pcf) for this resistance. If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. We recommend a safety factor of at least 1.5 for the foundation's resistance to lateral loading, when using the above ultimate passive value.

EXHIBIT # 20.7

FOUNDATION AND RETAINING WALLS

Retaining walls backfilled on only one side should be designed to resist the lateral earth pressures imposed by the soil they retain. The following recommended parameters are for walls that restrain level backfill:

PARAMETER	VALUE
Active Earth Pressure *	40 pcf
Passive Earth Pressure	250 pcf
Soil Unit Weight	125 pcf

Where: pcf is Pounds per Cubic Foot, and Active and Passive Earth Pressures are computed using the Equivalent Fluid Pressures.

*** For a restrained wall that cannot deflect at least 0.002 times its height, a uniform lateral pressure equal to 10 psf times the height of the wall should be added to the above active equivalent fluid pressure. This applies only to walls with level backfill.**

The design values given above do not include the effects of any hydrostatic pressures behind the walls and assume that no surcharges, such as those caused by slopes, vehicles, or adjacent foundations will be exerted on the walls. If these conditions exist, those pressures should be added to the above lateral soil pressures. Where sloping backfill is desired behind the walls, we will need to be given the wall dimensions and the slope of the backfill in order to provide the appropriate design earth pressures. The surcharge due to traffic loads behind a wall can typically be accounted for by adding a uniform pressure equal to 2 feet multiplied by the above active fluid density. Heavy construction equipment should not be operated behind retaining and foundation walls within a distance equal to the height of a wall, unless the walls are designed for the additional lateral pressures resulting from the equipment.

The values given above are to be used to design only permanent foundation and retaining walls that are to be backfilled, such as conventional walls constructed of reinforced concrete or masonry. It is not appropriate to use the above earth pressures and soil unit weight to back-calculate soil strength parameters for design of other types of retaining walls, such as soldier pile, reinforced earth, modular or soil nail walls. We can assist with design of these types of walls, if desired.

The values for friction and passive resistance are ultimate values and do not include a safety factor. Restrained wall soil parameters should be utilized the wall and reinforcing design for a distance of 1.5 times the wall height from corners or bends in the walls, or from other points of restraint. This is intended to reduce the amount of cracking that can occur where a wall is restrained by a corner.

Wall Pressures Due to Seismic Forces

The surcharge wall loads that could be imposed by the design earthquake can be modeled by adding a uniform lateral pressure to the above-recommended active pressure. The recommended surcharge pressure is 8**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

EXHIBIT # 20.3

Retaining Wall Backfill and Waterproofing

Backfill placed behind retaining or foundation walls should be coarse, free-draining structural fill containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter. The percentage of particles passing the No. 4 sieve should be between 25 and 70 percent. A minimum 12-inch width of free-draining gravel or drainage composite similar to Miradrain 6000 should be placed against the backfilled retaining walls. The gravel or drainage composites should be hydraulically connected to the foundation drain system. Free-draining backfill should be used for the entire width of the backfill where seepage is encountered. For increased protection, drainage composites should be placed along cut slope faces, and the walls should be backfilled entirely with free-draining soil. The later section entitled ***Drainage Considerations*** should also be reviewed for recommendations related to subsurface drainage behind foundation and retaining walls.

The purpose of these backfill requirements is to ensure that the design criteria for a retaining wall are not exceeded because of a build-up of hydrostatic pressure behind the wall. Also, subsurface drainage systems are not intended to handle large volumes of water from surface runoff. The top 12 to 18 inches of the backfill should consist of a compacted, relatively impermeable soil or topsoil, or the surface should be paved. The ground surface must also slope away from backfilled walls at one to 2 percent to reduce the potential for surface water to percolate into the backfill.

Water percolating through pervious surfaces (pavers, gravel, permeable pavement, etc.) must also be prevented from flowing toward walls or into the backfill zone. Foundation drainage and waterproofing systems are not intended to handle large volumes of infiltrated water. The compacted subgrade below pervious surfaces and any associated drainage layer should therefore be sloped away. Alternatively, a membrane and subsurface collection system could be provided below a pervious surface.

It is critical that the wall backfill be placed in lifts and be properly compacted, in order for the above-recommended design earth pressures to be appropriate. The recommended wall design criteria assume that the backfill will be well-compacted in lifts no thicker than 12 inches. The compaction of backfill near the walls should be accomplished with hand-operated equipment to prevent the walls from being overloaded by the higher soil forces that occur during compaction. The section entitled ***General Earthwork and Structural Fill*** contains additional recommendations regarding the placement and compaction of structural fill behind retaining and foundation walls.

The above recommendations are not intended to waterproof below-grade walls, or to prevent the formation of mold, mildew or fungi in interior spaces. Over time, the performance of subsurface drainage systems can degrade, subsurface groundwater flow patterns can change, and utilities can break or develop leaks. Therefore, waterproofing should be provided where future seepage through the walls is not acceptable. This typically includes limiting cold-joints and wall penetrations, and using bentonite panels or membranes on the outside of the walls. There are a variety of different waterproofing materials and systems, which should be installed by an experienced contractor familiar with the anticipated construction and subsurface conditions. Applying a thin coat of asphalt emulsion to the outside face of a wall is not considered waterproofing, and will only help to reduce moisture generated from water vapor or capillary action from seeping through the concrete. As with any project, adequate ventilation of basement and crawl space areas is important to prevent

a buildup of water vapor that is commonly transmitted through concrete walls from the surrounding soil, even when seepage is not present. This is appropriate even when waterproofing is applied to the outside of foundation and retaining walls. We recommend that you contact an experienced envelope consultant if detailed recommendations or specifications related to waterproofing design, or minimizing the potential for infestations of mold and mildew are desired.

BUILDING FLOORS

The building floors should be constructed to be supported by the pipe pile foundations. Alternatively, the building floor could be constructed as a framed floor atop a crawlspace. Even where the exposed soils appear dry, water vapor will tend to naturally migrate upward through the soil to the new constructed space above it. This can affect moisture-sensitive flooring, cause imperfections or damage to the slab, or simply allow excessive water vapor into the space above the slab. All interior slabs-on-grade should be underlain by a capillary break drainage layer consisting of a minimum 4-inch thickness of clean gravel or crushed rock that has a fines content (percent passing the No. 200 sieve) of less than 3 percent and a sand content (percent passing the No. 4 sieve) of no more than 10 percent. Pea gravel or crushed rock are typically used for this layer.

As noted by the American Concrete Institute (ACI) in the *Guides for Concrete Floor and Slab Structures*, proper moisture protection is desirable immediately below any on-grade slab that will be covered by tile, wood, carpet, impermeable floor coverings, or any moisture-sensitive equipment or products. ACI recommends a minimum 10-mil thickness vapor retarder for better durability and long term performance than is provided by 6-mil plastic sheeting that has historically been used. A vapor retarder is defined as a material with a permeance of less than 0.3 perms, as determined by ASTM E 96. It is possible that concrete admixtures may meet this specification, although the manufacturers of the admixtures should be consulted. Where vapor retarders are used under slabs, their edges should overlap by at least 6 inches and be sealed with adhesive tape. The sheeting should extend to the foundation walls for maximum vapor protection.

If no potential for vapor passage through the slab is desired, a vapor *barrier* should be used. A vapor barrier, as defined by ACI, is a product with a water transmission rate of 0.01 perms when tested in accordance with ASTM E 96. Reinforced membranes having sealed overlaps can meet this requirement.

We recommend that the contractor, the project materials engineer, and the owner discuss these issues and review recent ACI literature and ASTM E-1643 for installation guidelines and guidance on the use of the protection/blotter material.

EXCAVATIONS AND SLOPES

Temporary excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Also, temporary cuts should be planned to provide a minimum 2 to 3 feet of space for construction of foundations, walls, and drainage. Vertical cuts should not be made near property boundaries, or existing utilities and structures. It is important that vertical cuts not be made at the base of sloped cuts. Based upon Washington Administrative Code (WAC) 296, Part N, the soil at the subject site would generally be classified as Type C. Therefore, temporary cut slopes greater than 4 feet in height should not be excavated at an inclination steeper than 1.5:1 (Horizontal:Vertical), extending continuously between the top and the bottom of a cut. As stated in

the ***General*** section, we do not recommend that excavations extend beneath the groundwater table, unless adequate shoring and dewatering systems are implemented to brace the excavation due to the high caving potential of these soils.

The above-recommended temporary slope inclination is based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface runoff be directed away from the top of temporary slope cuts. Cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that loose soil can cave suddenly and without warning and moderate to heavy caving was observed in our test pits excavated for this study. Excavation, foundation, and utility contractors should be made especially aware of this potential danger. These recommendations may need to be modified if the area near the potential cuts has been disturbed in the past by utility installation, or if settlement-sensitive utilities are located nearby.

All permanent slopes in the development areas should be inclined no steeper than 2.5:1 (H:V). To reduce the potential for shallow sloughing, any fill soil must be compacted to the face of these slopes. This can be accomplished by overbuilding the compacted fill and then trimming it back to its final inclination. Adequate compaction of the slope face is important for long-term stability and is necessary to prevent excessive settlement of patios, slabs, foundations, or other improvements that may be placed near the edge of the slope.

Water should not be allowed to flow uncontrolled over the top of any temporary or permanent slope. All permanently exposed slopes should be seeded with an appropriate species of vegetation to reduce erosion and improve the stability of the surficial layer of soil.

DRAINAGE CONSIDERATIONS

Footing drains should be used where: (1) crawl spaces or basements will be below a structure; (2) a slab is below the outside grade; or, (3) the outside grade does not slope downward from a building. Drains should also be placed at the base of all earth-retaining walls. These drains should be surrounded by at least 6 inches of 1-inch-minus, washed rock that is encircled with non-woven, geotextile filter fabric (Mirafi 140N, Supac 4NP, or similar material). At its highest point, a perforated pipe invert should be at least 6 inches below the bottom of a slab floor or the level of a crawl space. The discharge pipe for subsurface drains should be sloped for flow to the outlet point. Roof and surface water drains must not discharge into the foundation drain system. A typical footing drain detail is attached to this report as Plate 5. For the best long-term performance, perforated PVC pipe is recommended for all subsurface drains. Clean-outs should be provided for potential future flushing or cleaning of footing drains.

Drainage inside the building's footprint should also be provided if the building floor of the residence is below the existing ground. A typical underslab drainage detail is attached to this report as Plate 6.

As a minimum, a vapor retarder, as defined in the ***Building Floors*** section, should be provided in any crawl space area to limit the transmission of water vapor from the underlying soils. Crawl space grades are sometimes left near the elevation of the bottom of the footings. As a result, an outlet drain is recommended for all crawl spaces to prevent an accumulation of any water that may

bypass the footing drains. Providing a few inches of free draining gravel underneath the vapor retarder is also prudent to limit the potential for seepage to build up on top of the vapor retarder.

Groundwater was observed during our field work. If seepage is encountered in an excavation, it should be drained from the site by directing it through drainage ditches, perforated pipe, or French drains, or by pumping it from sumps interconnected by shallow connector trenches at the bottom of the excavation.

The excavation and site should be graded so that surface water is directed off the site and away from the tops of slopes. Water should not be allowed to stand in any area where foundations, slabs, or pavements are to be constructed. Final site grading in areas adjacent to the residence should slope away at least one to 2 percent, except where the area is paved. Surface drains should be provided where necessary to prevent ponding of water behind foundation or retaining walls. A discussion of grading and drainage related to pervious surfaces near walls and structures is contained in the ***Foundation and Retaining Walls*** section.

GENERAL EARTHWORK AND STRUCTURAL FILL

All building and pavement areas should be stripped of surface vegetation, topsoil, organic soil, and other deleterious material. The stripped or removed materials should not be mixed with any materials to be used as structural fill, but they could be used in non-structural areas, such as landscape beds.

Structural fill is defined as any fill, including utility backfill, placed under, or close to, a building, or in other areas where the underlying soil needs to support loads. All structural fill should be placed in horizontal lifts with a moisture content at, or near, the optimum moisture content. The optimum moisture content is that moisture content that results in the greatest compacted dry density. The moisture content of fill is very important and must be closely controlled during the filling and compaction process.

The allowable thickness of the fill lift will depend on the material type selected, the compaction equipment used, and the number of passes made to compact the lift. The loose lift thickness should not exceed 12 inches, but should be thinner if small, hand-operated compactors are used. We recommend testing structural fill as it is placed. If the fill is not sufficiently compacted, it should be recompacted before another lift is placed. This eliminates the need to remove the fill to achieve the required compaction. The following table presents recommended levels of relative compaction for compacted fill:

LOCATION OF FILL PLACEMENT	MINIMUM RELATIVE COMPACTION
Beneath walkways	95%
Filled slopes and behind retaining walls	90%
Beneath pavements	95% for upper 12 inches of subgrade; 90% below that level

Where: Minimum Relative Compaction is the ratio, expressed in percentages, of the compacted dry density to the maximum dry density, as determined in accordance with ASTM Test Designation D 1557-91 (Modified Proctor).

EXHIBIT # 20.12

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the test pits are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in test pits. Subsurface conditions can also vary between exploration locations. Such unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

This report has been prepared for the exclusive use of Khoa Ha and his representatives, for specific application to this project and site. Our conclusions and recommendations are professional opinions derived in accordance with our understanding of current local standards of practice, and within the scope of our services. No warranty is expressed or implied. The scope of our services does not include services related to construction safety precautions, and our recommendations are not intended to direct the contractor's methods, techniques, sequences, or procedures, except as specifically described in our report for consideration in design. Our services also do not include assessing or minimizing the potential for biological hazards, such as mold, bacteria, mildew and fungi in either the existing or proposed site development.

ADDITIONAL SERVICES

In addition to reviewing the final plans, Geotech Consultants, Inc. should be retained to provide geotechnical consultation, testing, and observation services during construction. This is to confirm that subsurface conditions are consistent with those indicated by our exploration, to evaluate whether earthwork and foundation construction activities comply with the general intent of the recommendations presented in this report, and to provide suggestions for design changes in the event subsurface conditions differ from those anticipated prior to the start of construction. However, our work would not include the supervision or direction of the actual work of the contractor and its employees or agents. Also, job and site safety, and dimensional measurements, will be the responsibility of the contractor.

During the construction phase, we will provide geotechnical observation and testing services when requested by you or your representatives. Please be aware that we can only document site work we actually observe. It is still the responsibility of your contractor or on-site construction team to verify that our recommendations are being followed, whether we are present at the site or not.

EXHIBIT # 20.13

The following plates are attached to complete this report:

Plate 1	Vicinity Map
Plate 2	Site Exploration Plan
Plates 3 - 4	Test Pit Logs
Plate 5	Typical Footing Drain Detail
Plate 6	Typical Underslab Drainage Detail

We appreciate the opportunity to be of service on this project. Please contact us if you have any questions, or if we can be of further assistance.

Respectfully submitted,

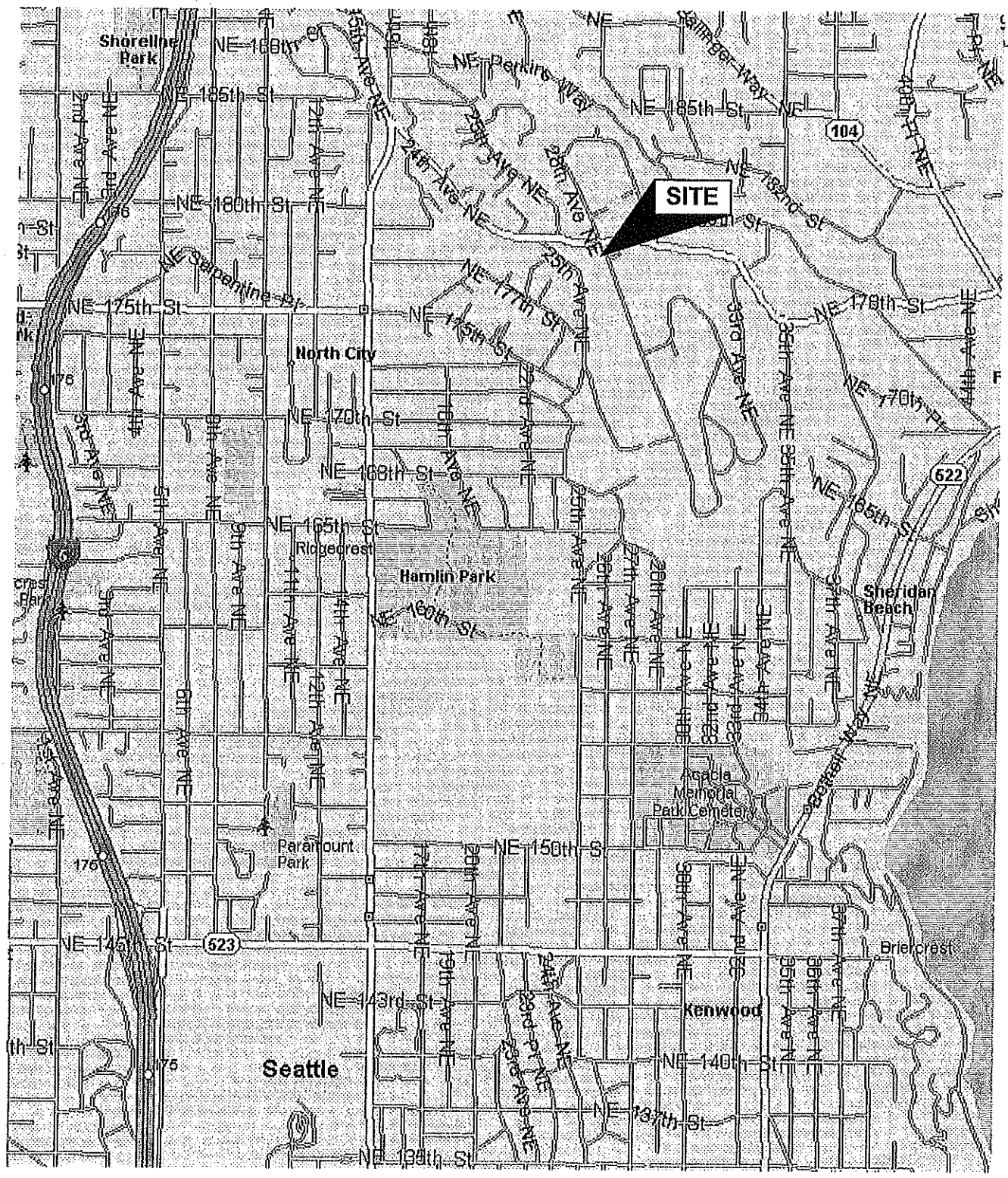
GEOTECH CONSULTANTS, INC.

09/05/19

D. Robert Ward, P.E.
Principal

MKM/DRW:kg

EXHIBIT # 20.1



(Source: Microsoft MapPoint, 2013)

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CONSULTANTS, INC.

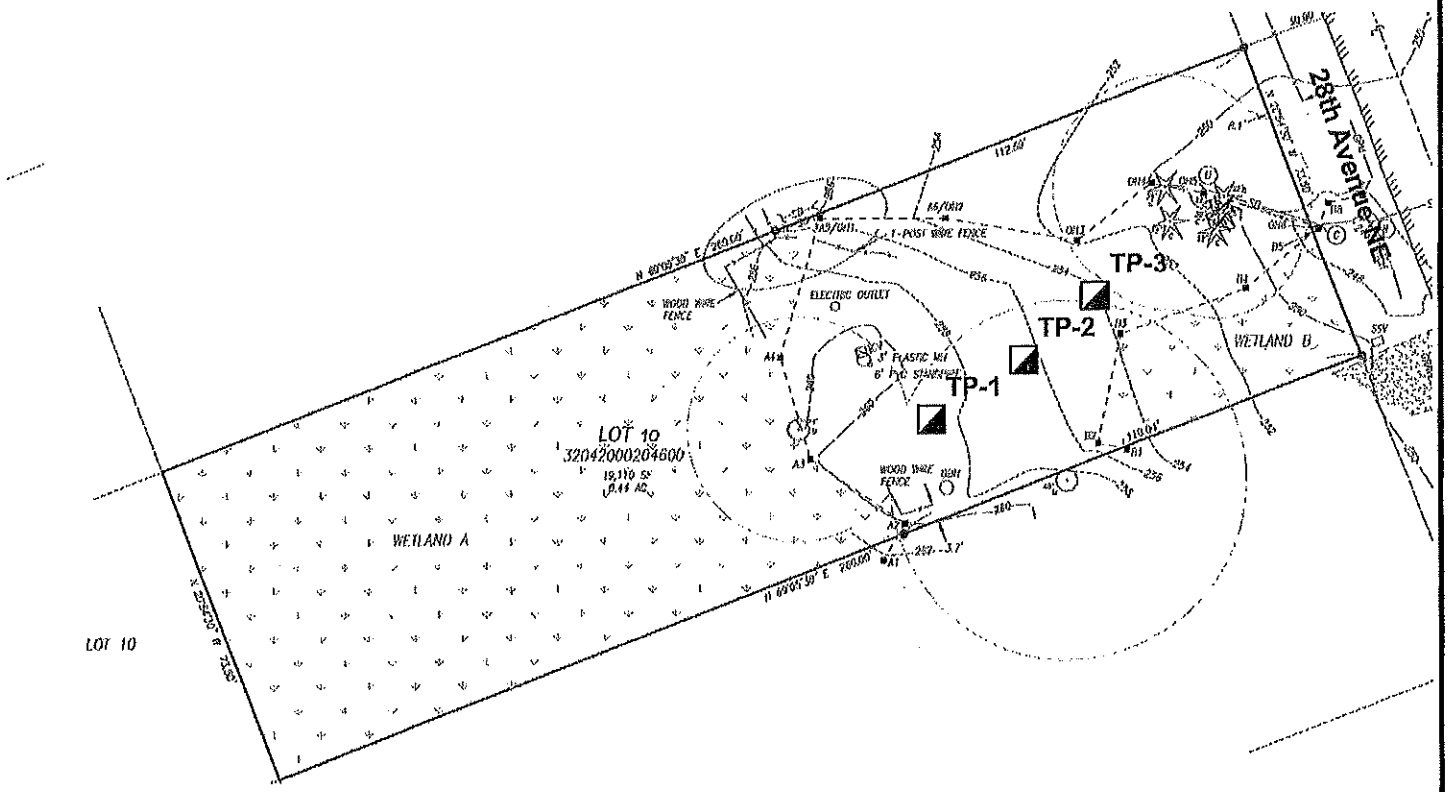
VICINITY MAP

17719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job No:	Date:		Plate:
19312	Sept. 2019		1

NORTH

EXHIBIT # 20.15



Legend:

Test Plt Location

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SITE EXPLORATION PLAN

17719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job No:	Date:		Plate:
19312	Sept. 2019	No Scale	2

TEST PIT 1

EXHIBIT # 20.16

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			FILL	Topsoil: -large stump and decayed organics
			SM OL	Dark-brown, silty SAND / sandy organic SILT with fibrous roots, fine-grained, moist, loose -becomes very moist, gravelly
5		▼	SP	Blue-gray, gravelly SAND with silt, fine to medium-grained, wet, loose -becomes very wet
10				

* **Test Pit terminated at 8 feet on August 21, 2019.**
* **Groundwater seepage was observed at 6 feet during excavation.**
* **Heavy caving was observed below 2 feet during excavation.**

TEST PIT 2

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			SM	Topsoil: Brown, silty SAND with roots, fine-grained, dry, very loose -with streaks of orange
5		▼	SP	Blue-gray, gravelly SAND, fine to medium-grained, very moist, loose -becomes wet -becomes very wet -becomes saturated, gravelly
10				

* **Test Pit terminated at 7.5 feet on August 21, 2019.**
* **Heavy groundwater seepage was observed at 7 feet during excavation.**
* **Excessive caving was observed below 7 feet during excavation.**

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TEST PIT LOG

7719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job	Date:	Logged by:	Plate:
19312	Sept. 2019	MKM	3

TEST PIT 3

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			SP	Brown mottled orange SAND with trace silt, fine-grained, very moist, loose
				-becomes blue-gray and dark-brown with organics, very moist to wet
				-becomes slightly gravelly, loose to medium-dense
				-becomes wet, fine to coarse-grained, gravelly
5		▼		-becomes very wet
10				

EXHIBIT # 20.17

* **Test Pit terminated at 7 feet on August 21, 2019 due to heavy groundwater and caving**
* **Heavy groundwater seepage was observed at 5 feet during excavation.**
* **Caving was observed below 4 feet during excavation.**

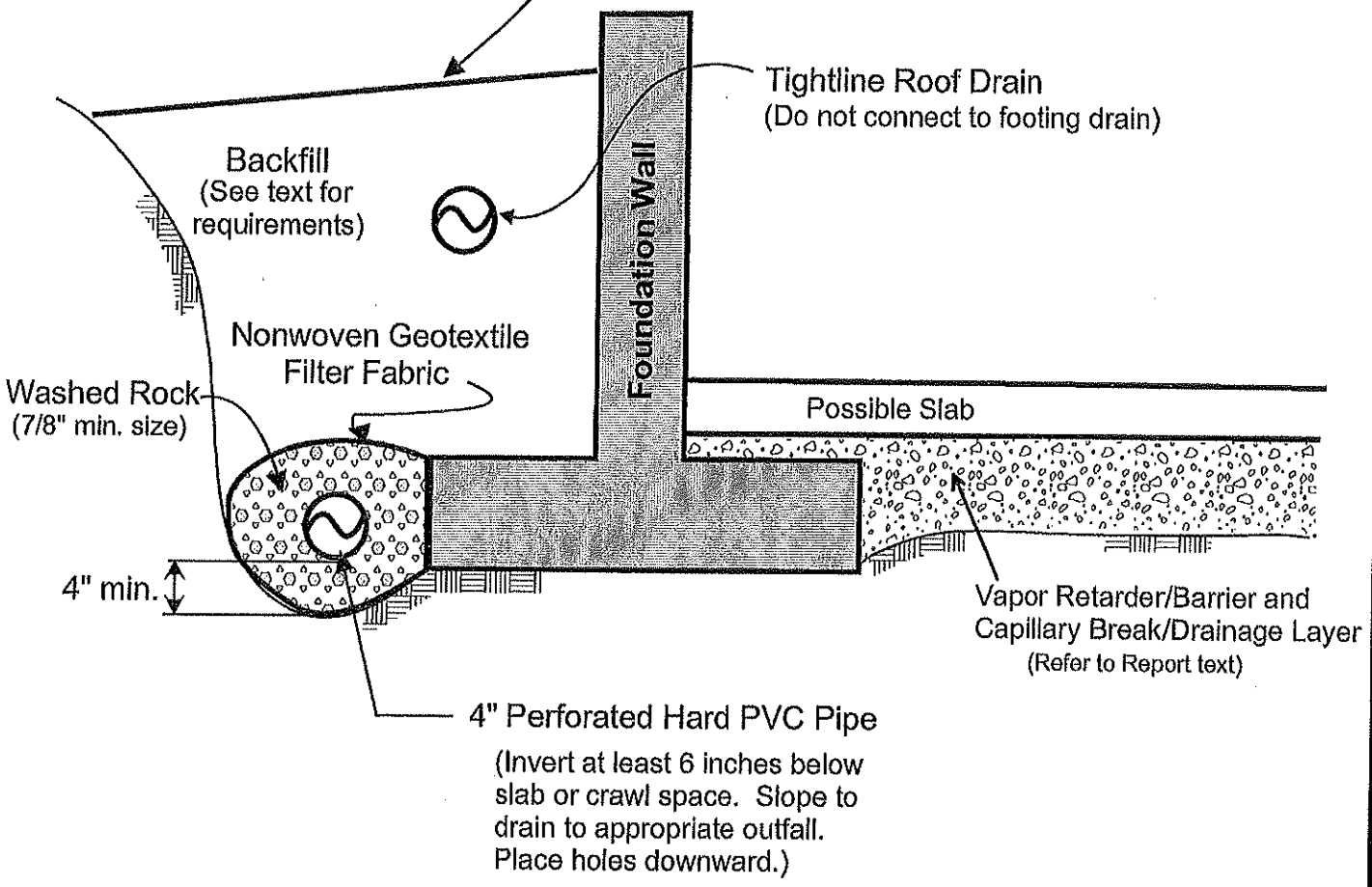
GEOTECH CONSULTANTS, INC.

TEST PIT LOG

7719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job	Date:	Logged by:	Plate:
19312	Sept. 2019	MKM	4

EXHIBIT # 20.18



NOTES:

(1) In crawl spaces, provide an outlet drain to prevent buildup of water that bypasses the perimeter footing drains.

(2) Refer to report text for additional drainage, waterproofing, and slab considerations.

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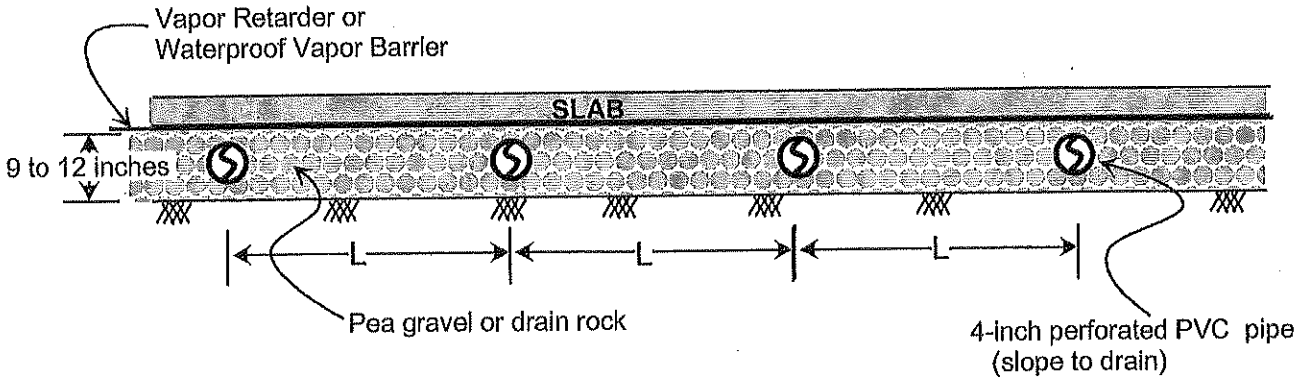
FOOTING DRAIN DETAIL

17719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job No:	Date:		Plate:
19312	Sept. 2019		5

EXHIBIT # 20.19



NOTES:

(1) Refer to the report text for additional drainage and waterproofing considerations.
(2) The typical maximum underslab drain separation (L) is 15 to 20 feet.
(3) No filter fabric is necessary beneath the pipes as long as a minimum thickness of 4 inches of rock is maintained beneath the pipes.
(4) The underslab drains and foundation drains should discharge to a suitable outfall.

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TYPICAL UNDERSLAB DRAINAGE
17719 - 28th Avenue Northeast
Lake Forest Park, Washington

Job No:	Date:		Plate:
19312	Sept. 2019		6

EXHIBIT # 21.0

17719 28th Ave NE
Lake Forest Park, Washington, 98155

Preliminary Technical Information Report (TIR)

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SEAN MICHAEL MALLON
STATE OF WASHINGTON
40514
REGISTERED
PROFESSIONAL ENGINEER
12/27/19

Prepared By: Travis Cheshire
Reviewed By: Sean Mallon, P.E.
Prepared: December 2019

EXHIBIT # 21.1

Table of Contents

EXHIBIT # 21.2

Executive Summary

This Preliminary technical information report (TIR) supports the reasonable use exception application for a proposed single-family residence in Lake Forest Park. The City of Lake Forest Park adopted King County's 2016 Surface Water Design Manual (KCSWDM) to regulate development impacts to the community's natural and man-made stormwater resources. The KCSWDM and Addendum define drainage requirements for development projects within the City.

Location:

The project site is located on an approximate 19,110 SF parcel zoned RS 20000 and owned by Mr. Khoa Ha. The parcel number is 4024100380 at the address of 17719 28th Ave NE in the city of Lake Forest Park, Washington. See **figure 1** for site location map. The property is surrounded by other residential properties. The property is currently undeveloped and consists of a variety of native vegetation.

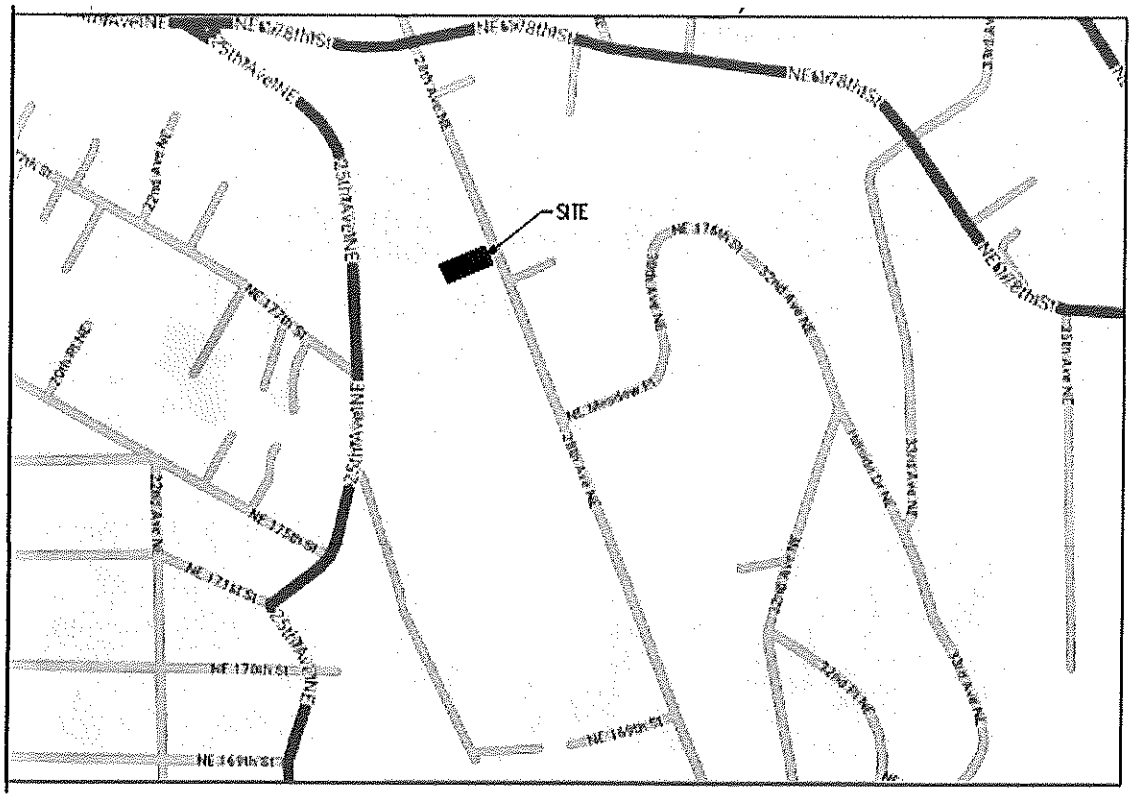


Figure 1 - Site Location

Location: 17719 28th Ave NE
Parcel/Tax Lot: 4024100380
Size: 19,110 SF
City, County, State: Lake Forest Park, King County, Washington
Governing Agency: Lake Forest Park
Design Criteria: King County Surface Water Management Design Manual (KCSWDM), 2016 Edition

Section 1 – Project Overview

EXHIBIT # 21.3

Existing Conditions

The property is located in the City of Lake Forest Park. The parcel is undeveloped and contains mostly native vegetation. The majority of the site includes wetlands and associated buffers.

The property slopes from west to east ranging from flat to 30%. The existing runoff sheet flows off the property to the roadside ditch on the west side of 28th Ave NE. There is some off-site run-on from the forested area to the west of the subject parcel.

Soils

According to the NRCS Soil Survey map, the soil is classified as Urban land – Alderwood complex and Alderwood-Everett-Urban land complex which primarily consists of gravelly sandy loam. The soil is dense with very low to moderately low infiltration.

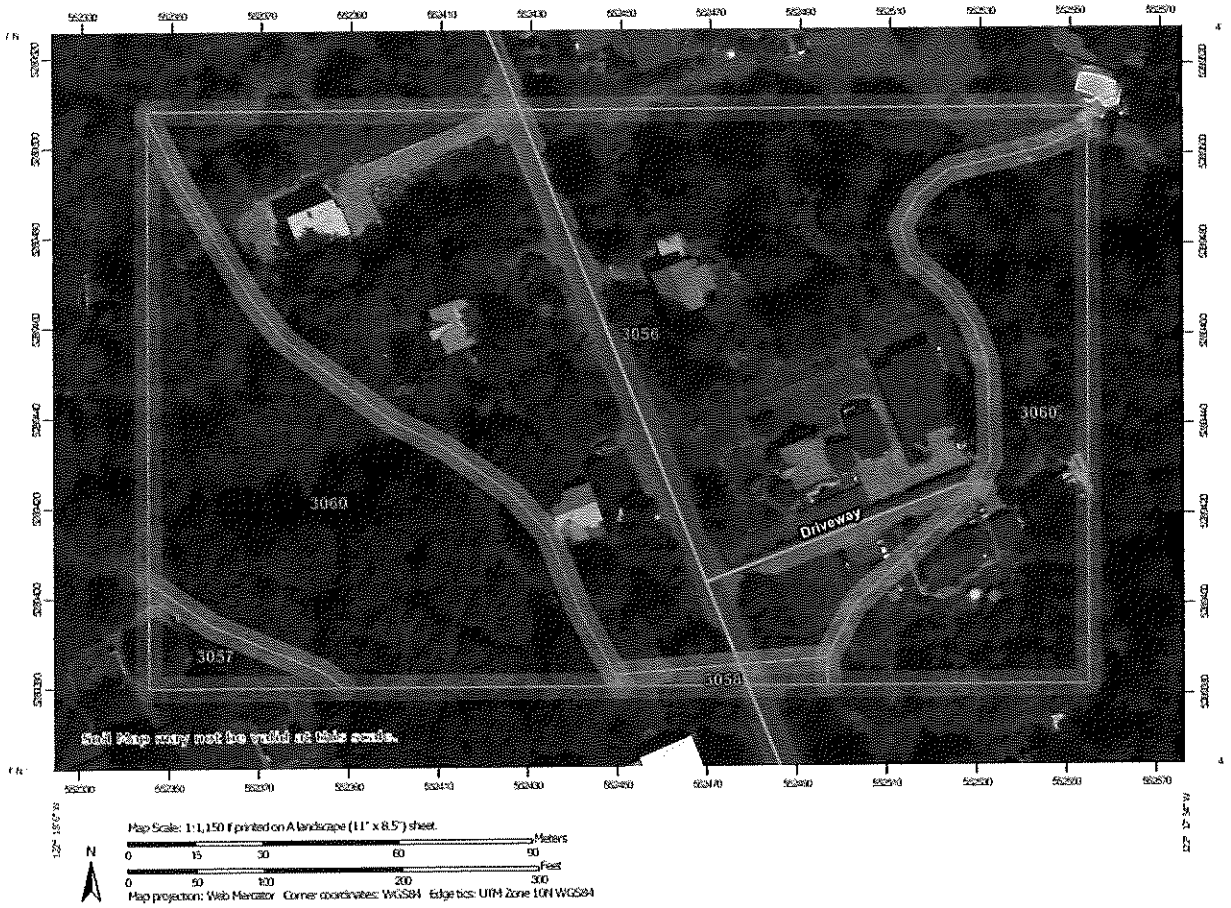


EXHIBIT # 21.4

Section 2 – Conditions and Requirements Summary

The subject lot is less than 22,000 SF and the proposed residential development is under 5000 sf of total impervious area. The design will incorporate Appendix C, Section of the King County Surface Water Design Manual as adopted by the City of Lake Forest Park. The residential home will be on the front half of the site.

The total proposed clearing for the residential development is around 6000 SF, which complies with the maximum of 50% of the site. Because the lot is less than 22,000 SF, it is subject to the Small Lot BMP Requirements in Appendix C of the Surface Water Design Manual. Therefore, all proposed impervious surface (1,392 SF) is targeted for application of flow control BMPs. The balance of the site consists of pervious surfaces and is less than 50% of the site so no flow control BMPs are required.

Section 3 – Flow Control, LID, and Design

Flow Control

To address the requirements for mitigation of target impervious surface, the applicability and feasibility of full dispersion and infiltration were considered. Due to site topography, limiting impacts to wetlands, as well as soil conditions, these methods were considered infeasible. To implement basic dispersion, the roof downspouts of the proposed house will be dispersed through the use of splash blocks and to a minimum 50-foot vegetated flow path (to the north and south of the proposed driveway) with slopes no steeper than 15% as indicated on the attached Plan.

The driveway will consist of pervious concrete with a minimum of 6" of drain rock designed per section C.2.6.1.

Erosion and Sedimentation Control

In order to prevent erosion and trap sediments within the project site, the following BMPs will be implemented (A detailed ESC plan will be submitted as part of the permit application package).

- Clearing limits will be clearly delineated.
- A construction exit will be utilized until the site is stabilized.
- All areas which have been cleared will be stabilized with mulch or other methods when not actively being worked on.
- Silt fence will be installed along the down gradient perimeter of the site prior to any clearing activities.
- Sediment traps will be added if weather conditions require additional controls while grading.
- A construction sequence will be included on ESC plans.

EXHIBIT # 21.5

Appendix A – Site Plan

EXHIBIT # 22.0

Urban Forestry Services

BARTLETT CONSULTING

Divisions of The F.A. Bartlett Tree Expert Company

Title: **Ha Residence Project -**
ISA Level 2 Basic Tree Risk Assessment
& Construction Impact Assessment with Tree Planting Plan
Parcel #4024100380
Lake Forest Park, WA. 98155

Prepared for: Khoa Ha
7629 199th St. SW
Lynnwood, WA. 98036

Prepared by: Urban Forestry Services | Bartlett Consulting
Tyler P. Holladay
ISA Certified Arborist® #PN-8100A
ISA Tree Risk Assessment Qualified

Reviewed By: Christina Pfeiffer, Consultant

RECEIVED
OCT 20 2020
City of Lake Forest Park

Contents:

Date: October 6, 2020

Summary

Nine (9) significant trees and surrounding tree canopy on Parcel #4024100380, a 19,110 ft² property in Lake Forest Park, Washington were assessed as a part of an ISA Level 2 Basic Tree Risk Assessments and construction impact assessments for construction of a single-family residence.

One (1) assessed tree is classified as Exceptional, as defined by Lake Forest Park Municipal Code (LFPMC) 16.14.030 and is recommended for retention. Tree protection is required for all retained trees onsite.

15119 McLean Road
Mount Vernon, WA 98273

Office: 360.428.5810
Fax: 360.428.1822
Cell: 360.770.9921

Email: jbarborinas@bartlett.com
www.urbanforestryservices.com

Four (4) significant trees are recommended for removal due to their proximity to planned driveway construction.

One (1) significant tree on adjacent property and near the footprint of the planned residence will need to be pruned to provide clearance for construction. Pruning should be done by an ISA Certified Arborist® according to ANSI A300 Pruning Standards and in coordination with the owner of the tree.

Post construction canopy retention is estimated to be 44% (8,498 ft²). Mitigation is required to achieve the City of Lake Forest Park 58% minimum canopy retention requirement for this site (LFPMC 16.14.070). A tree planting plan is included in this report which will bring the canopy coverage above the required percentage.

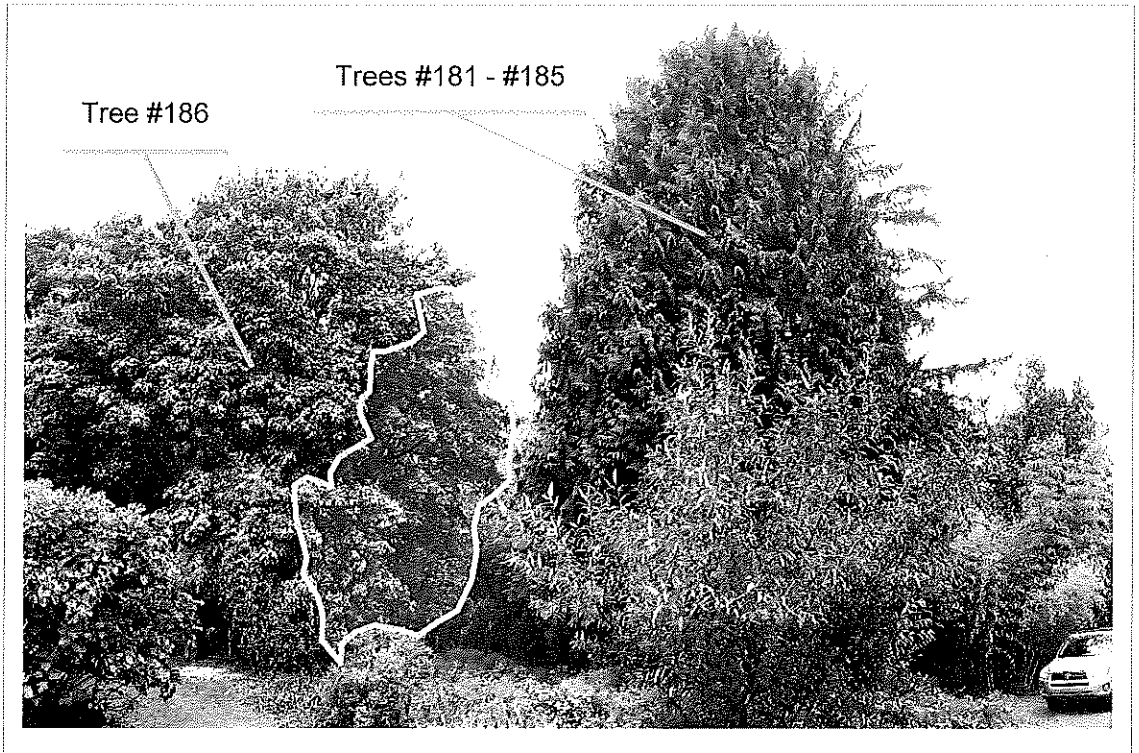


Photo 1: A view of Parcel #4024100380 from 28th Ave NE, looking west. A large bigleaf maple, Tree #186, on neighboring property will require significant pruning (shown in yellow) for clearance with the planned construction. Pruning should be done in coordination with the owner of the tree. Do not top this tree; LFPMC prohibits the topping of significant trees. Trees #181, #182, #183 and #185 are recommended for removal due to severe construction impacts.

EXHIBIT # 22.2

Introduction

As requested by Khoa Ha, on June 10th, 2020, I assessed nine (9) trees on and directly adjacent to parcel #4024100380 in Lake Forest Park, Washington. This assessment seeks to fulfil City of Lake Forest Park requirements for information about trees impacted by the proposed construction onsite. During my site visit, I completed an International Society of Arboriculture (ISA) Level 2 Basic Tree Risk assessment as well as a construction impact assessment for tree removal and retention. Mr. Ha is planning to construct a single-family residence on this property.

This report was requested in response to recent feedback from the City in a July 9, 2020 compliance and consistency review of Mr. Ha's application (2020-RUE-0001) for reasonable use exceptions. In this review, the Acting City Arborist, Miles Becker of Urban Forestry Services highlighted the incompleteness of an arborist report authored by Brooke K. Sullivan of Back to Nature Design (BTND). The BTND report failed to satisfy many of the basic requirements required for development in Lake Forest Park.

This report provides the required comprehensive inventory with fixed tags for each tree; size (DBH), species and condition information; Critical Root Zone (CRZ) impact analysis; tree removal and retention recommendations; a tree protection plan for retained trees; canopy coverage analysis and goals; and a tree replacement plan.

Each tree was marked in the field with aluminum numerical tags. The trees are identified by these numbers on the enclosed Tree Assessment Site Plan and Tree Assessment Matrix. Only trees potentially impacted by the planned work limits as indicated in the plans provided were tagged. Detailed Information on the vigor, structure, and defects of each of the nine (9) trees, included in this assessment can be found in the enclosed Tree Assessment Matrix.

Findings and Recommendations

Parcel #4024100380 is comprised of wetland and steep slope critical areas. Much of the site contains soft and saturated soils. A small creek meanders through the northwest edge of the parcel and exits the parcel under an existing driveway via a structural stream passage. Three (3) western red cedar (*Thuja plicata*) #181, #182 and #183 are growing atop this structure.

The lot is 19,110 square feet. For a site of this size, the City planning regulations require a minimum 58% (11,083 ft²) of canopy coverage. The site is currently under the required minimum, at roughly 53% (10,261 ft²) coverage. Planned improvements to the property will further reduce this existing coverage to roughly 44% (8,498 ft²). Tree planting is required to achieve the City's canopy goals (per Code16.14.070)

At this time, the portion of this site planned for development is partially clear and relatively level, mostly populated by Himalayan blackberry *(Rubus armeniacus)*, bamboo *(Bambuseae spp.)*, non-native grass species and English ivy *(Hedera helix)*.

Groups of native tree species comprise the majority of the canopy cover surrounding the level area. This includes a group of western red cedar on the lower elevations of the parcel's north-end, and groups of bigleaf maple *(Acer macrophyllum)* throughout the upper slope of the parcel's south-end. Two significant non-native trees are allocated near the center of the parcel: a small blue spruce *(Picea pungens)* and an English walnut *(Juglans regia)*.

Many of the trees on the upper slope, mostly bigleaf maple and one (1) English walnut, have curved or leaning trunks caused by root ball rotation in the soil and the growth of the leaders curving back to vertical toward the light. The resulting curve near the bottom of the trunk is sometimes referred to as a 'pistol butt' and is a common indicator of soil movement on a slope.

Photo 2: A view looking south at the neighboring bigleaf maple, tree #186. This tree will require pruning and tree protection.

One (1) large bigleaf maple, #186, on neighboring property to the southeast will experience construction impacts to its canopy and CRZ. The planned footprint of Mr. Ha's home extends into the Interior Critical Root Zone (ICRZ) and the planned height of the residence will require significant clearance pruning on the northwest side of the tree (Photo 1). While not classified as exceptional as defined by the City, it is worth mentioning that the tree exhibits remarkable size, form and structure for the species.

Overall, the set of assessed trees are in good condition, exhibiting fair to good vigor and fair to good structure. All nine (9) trees assessed received risk of failure ratings of Low.

Specific findings and recommendations include:

1. **Removal of four trees due to construction.**

    - Trees #181, #182, #183, and #185 will experience severe construction impacts, with a substantial area of their CRZ impacted. I do not expect these trees to

survive the impact of the planned construction and recommend their removal. See the attached *CRZ Explanation*.

- The stumps of these four (4) removed trees shall be cut low to the ground and left in-place to avoid damage to the surrounding root systems of retained trees, which could occur if the stumps and roots were removed with an excavator or backhoe. Leaving the stumps in place will also avoid disturbing the nearby stream and its culvert. "Stumps of removed trees shall not be removed from the ground, and all vegetation cut shall remain within the critical area or buffer. Woody debris of removed trees shall be lopped and scattered so as not to smother native vegetation." (LFPMC 16.14.080)
- Care should be taken during removal to not damage retained trees or their root zones.
- Tree removal shall be completed by a qualified tree removal specialist who has signed and submitted "...a statement acknowledging the city's tree protection requirements...on a form approved by the City" (LFPMC 16.14.140).
- Tree removal activities shall adhere to ANSI Z133.1 safety standards.

2. **Pruning of three trees.**

- Trees #184 and #187 will likely need to be pruned to provide overhead clearance and prevent damage from construction vehicles.
- Tree #186 on neighboring property will likely need to be pruned to provide clearance for planned building height.
    - Care should be taken while working around this tree to ensure it can remain safe and viable.
    - Prune in the natural system for crown and branch reduction. Effort should be made, where possible to maintain good form and structure throughout the canopy.
    - I recommend coordination with the owner of the tree before pruning.
- "Significant and protected trees shall not be topped" (LFPMC 16.14.110). Topping is the indiscriminant cutting of branches that leaves stubs. This is not an appropriate technique in this case as it will result in undue stress and undesirable suckering and shoot growth.
- All pruning shall be in accordance with the ANSI A300 Pruning Standards, the ANSI Z133.1 safety standards, and performed by an ISA Certified Arborist®.
- Upon request a UFS|BC Consultant can be on-site during pruning activities to ensure alignment with these recommendations.

3. **Tree Protection for five trees.**

- Trees #184 and #186 through #189 are close to the project work limits and will require protection through the completion of construction.
- Tree protection must be installed and follow LFPMC 16.14.090 *Tree Protection and Design Measures.* I also recommended that the attached *General Tree Protection Guidelines* be followed; these standards of protection exceed some

of the City requirements and provide more comprehensive tree protection measures.

- The location of tree protection fencing is shown in the attached *Tree Assessment Site Plan.*
  Note: This ISA Level 2 Basic Tree Risk Assessment made assumptions onsite, based on the provided plans, to measure the limits of construction and which trees were to be impacted or retained. We cannot guarantee the accuracy of the retained tree locations relative to the actual limits of disturbance.
- The location of the fencing should be confirmed in the field by an ISA Certified Arborist® in consultation with the builder and the fencing installed prior to the start of work. Construction is excluded from portions of the retained tree ICRZs to avoid significant impacts that would lead to tree instability, decline and death.
- As required by the LFPMC 16.14.060, part C, the City's Qualified Tree Professional shall attend the pre-project conference to discuss tree protection.

4. Canopy Retention and Enhancement Requirement

The assessment of retained canopy was completed remotely using 2019 King County high resolution aerial imagery and GIS analysis methods. See the attached *Tree Canopy Assessment Site Plan*. Areas known to contain declining trees and poor canopy condition were excluded from the calculation of canopy coverage.

Canopy coverage summary:

- 58% (11,083 ft²) canopy cover is required for this 19,110 ft² site.
- The current pre-development canopy coverage is roughly 53% (10,261 ft²)
- The estimated retained canopy cover after clearing and grading is roughly 44% (8,498 ft²)
- A minimum 2,585 ft² of additional canopy coverage is required in the form of tree mitigation planting.

Mitigation planting:

- I recommend planting five (5) bigleaf maple trees throughout the partially forested southwest half of the parcel to achieve canopy coverage requirements.
- Based on the LFP General Tree List, Five (5) bigleaf maple trees have a coverage potential of 1590 ft² per tree. This would theoretically provide an additional 7,950 ft² of coverage within 30-years. However, given the existing coverage of the site, a more realistic estimate is around 4,500 ft².

- Planting five (5) bigleaf maples after construction will bring the total canopy coverage of the parcel to roughly 68% (13,000 ft²), exceeding LFP canopy goals for the site.
- A detailed Tree Planting Plan is provided below.

Tree Planting Plan

The removal of trees due to construction impacts reduces the canopy coverage of Parcel #4024100380 to below an acceptable level.

Replanting Plan Objectives:

1. To comply with Lake Forest Park canopy coverage goals by restoring the canopy coverage on-site to a point that will meet or exceed 58% (11,083 ft²) within 30-years.
2. Plant five (5) bigleaf maple trees to achieve roughly 68% (13,000 ft²) canopy cover.
3. Maintain a natural forested condition with a diversity of native species and a varied canopy structure typical for the local region.

Performance Standards:

- Survival of 100% of installed trees before reaching significant size (6-inch DBH). Trees that die prior to meeting the definition of significant must be replaced by a tree that meets or exceeds the goals intended by the tree initially planted.
- A 6-foot radius area around each installed plant shall be free of non-native (including naturalized) plant species.

Methods

Plant Material and Planting Specifications:

Plant material should be obtained from local native plant nurseries whenever possible, or grown from stock local to this region. Containerized or balled and burlap planting stock shall meet the minimum standards for size and quality according to the current edition of the ANSI Z60.1 Standard for Nursery Stock.

Five (5) bigleaf maple trees have been selected from the LFP General Tree List to mitigate canopy coverage. Existing soil, moisture and light conditions, as well as native species observed to thrive in the vicinity, informed the selection of the species

- Acquire nursery stock that is 2-inch caliper or greater.
- Current Best Management Practices shall be used in selecting, transporting, storage, and installation of the trees.

Site Preparation and Installation:

All phases of site preparation and installation shall follow current Best Management Practices. Erosion and siltation of storm water are to be prevented. All exposed soil shall be covered immediately with 4 to 6-inches of woodchip mulch. Work procedures within the proposed mitigation areas should follow the preparation and installation schedules shown in Table 3. Preparation procedures include the removal of non-native and invasive plants in the restoration area, which should be done before all other work.

Table 3: Preparation and installation schedule

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Site Prep						■	■	■	■	■		
Planting	■	■	■	■							■	■

Restoration work shall only be done for the area defined in this Tree Planting Plan and as shown on the attached Tree Canopy Assessment Site Plan. The following standards shall be followed during site preparation and plant installation:

Removal of invasive and aggressive non-native species:

- Non-native plants and grasses should be identified and managed according to King County Noxious Weed Regulations and Best Management Practices. At a minimum, this plan requires that the non-native plants be removed, including digging out roots and disposal of the debris off-site, within a 6-foot radius surrounding each installed tree.
- Mechanical removal or herbicide application may be required to attain successful weed control. An aquatic permit and applicator license may be required for this location. Contact the King County Noxious Weed Control Board for guidance and management recommendations.

Plant Installation:

Tree planting should take place between mid-October and mid-April. The following standards shall be followed during plant installation:

- Trees are to be planted throughout Planting Area 'A' (See the Tree Canopy Assessment Site Plan) in a way that evenly distributes them and will allow them to

completely fill the space within thirty years. I recommend a minimum spacing of 25-feet-on-center.
- All trees must be inspected for quality by a qualified arborist or ecological restoration specialist before installation.
- Mulch shall be applied across a 6-foot radius around each tree, following initial weeding in year 1 and subsequently until establishment. The mulch shall be laid to maintain a total depth of 4 to 6-inches.
- Do not place mulch within 4-inches of tree trunks. Do not bury stems or trunks in mulch.
- All plant material installed on-site should be marked with colored flagging tape for identification.
- After planting is complete, the site shall be inspected to verify all plants are installed according to design and are in good health.

Maintenance and Monitoring

Maintenance:

- Removal of non-native weedy species or herbaceous material within a six foot radius of new trees and shrubs shall be done a minimum of two times each year, in early and late spring, over the span of 5-years or until the trees reach significant size (6-inches DBH). More frequent weeding may be needed if there is aggressive growth of invasive plant species.
- Manual weed removal (hand pulling or digging-out) is recommended over chemical control, though herbicide may be needed to attain successful control. An aquatic permit and applicator license may be required for this location.
- Non-native trees and native black cottonwood *(Populus trichocarpa)* and red alder (*Alnus rubra)* are not suitable species and any seedlings of these trees should be removed from the area.
- Mulch shall be applied across a 6-foot radius around each tree at planting and following initial weeding in year 1, and subsequently as needed, until establishment. The mulch shall be laid to maintain a total depth of 4 to 6-inches.
- LFP requires supplemental watering until the trees are independently viable. However, due to the damp environment of the site, irrigation will likely be unnecessary.

Table 4: Annual schedule of primary maintenance tasks.

Task	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sept	Oct	Nov	Dec
Weeding												
Watering												
Monitoring												

Table 5: Scheduled maintenance tasks for 5-year establishment period and beyond.

Task	Year 1	2	3	4	5
Monitoring					
Invasive species and noxious weed control					
Watering					
Replacement of dead or dying trees					

Monitoring by either an ISA Certified Arborist®, a qualified biologist, or ecological restoration specialist shall occur annually during the establishment period.

Urban Forestry Services | Bartlett Consulting, or a similarly qualified firm shall provide the monitoring and monitoring reports for the five years. A monitoring report shall include:

- The number of trees in place and survival rates.
- Information on volunteer native and invasive non-native species. Natural regeneration of appropriate native species may be counted towards the performance standards.
- Reporting on any disturbance or inappropriate activities on-site.
- Photographic documentation for each component of the monitoring.
- Analysis of the progress toward establishment of the installed trees and shrubs in the critical area based on the performance standards in this plan.
- Recommendations for maintenance, including native species substitutions of failed trees.

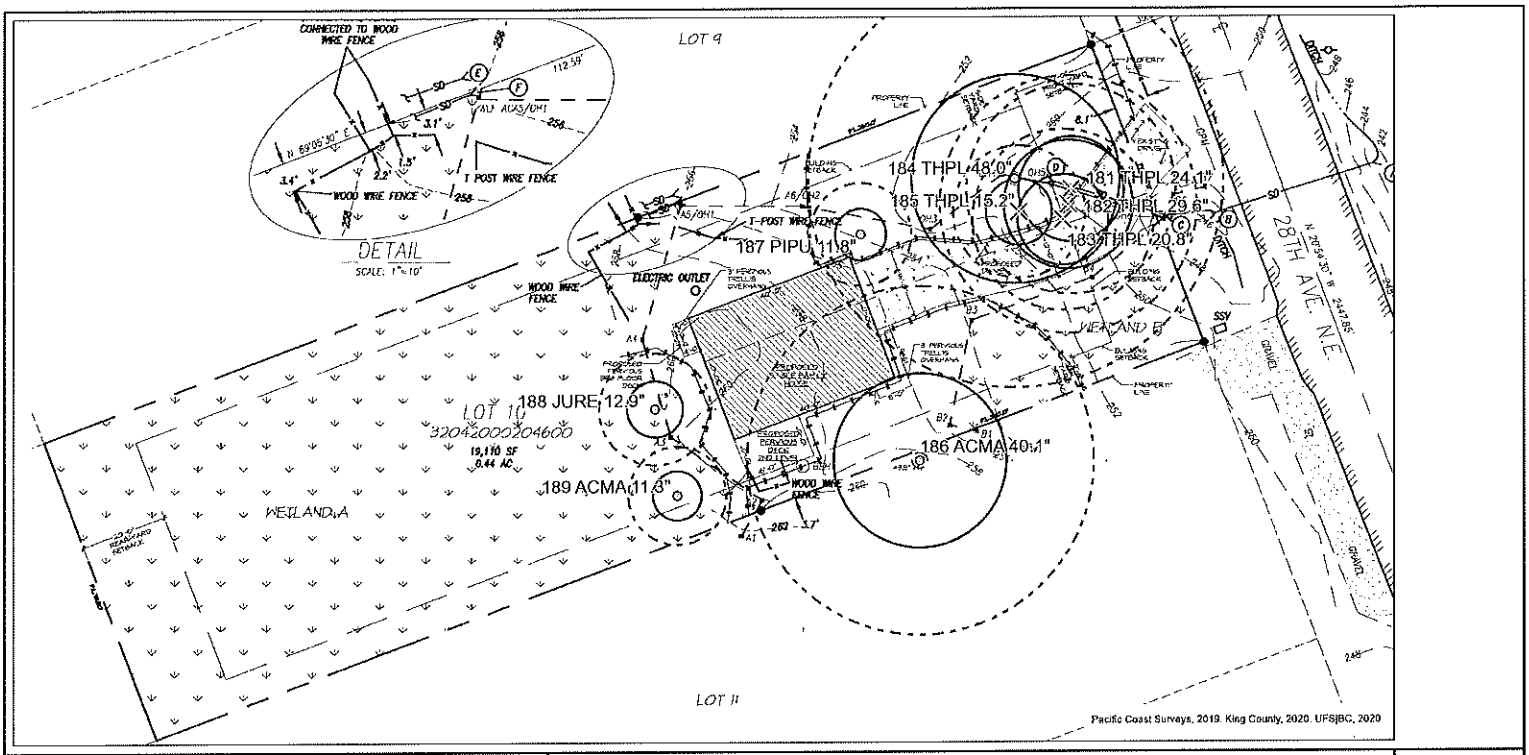
Let me know if you have any questions regarding this ISA Level 2 Basic Tree Risk Assessment, construction impact Assessment and tree planting plan.

EXHIBIT # 22.10

Literature Cited

ISA Tree Risk Assessment Manual, 2nd ed., Dunster, L., Smiley, T., Matheny, N., and Lilly, S. 2017 International Society of Arboriculture.
ISA Best Management Practice, Tree Risk Assessment, Smiley, T., Matheny, N., and Lilly, S. 2011 International Society of Arboriculture.
ISA Best Management Practice, Managing Trees During Construction, Fite, K. Smiley, T. 2008 International Society of Arboriculture.
Tree Risk Assessment in Urban Areas and Urban /Rural Interface, Dunster, J. 2009 Pacific Northwest Chapter, International Society of Arboriculture.

EXHIBIT # 22.11



Urban Forestry Services
BARTLETT CONSULTING

Ha Residence Project
Parcel #4024100380
28th Ave NE.
Tree Assessment Site Plan

Lake Forest Park, WA. 98155

Species Code Description:

Tree identification is comprised of:

1. Tree Number (Example "114")
2. Species Codes (Example "POTR")
3. Diameter (Example "43.6" ")

Example: "114 POTR 43.6"

Species Code:

ACMA: bigleaf maple *(Acer macrophyllum)*

JURE: English walnut *(Juglans regia)*

PIPU: blue spruce *(Picea pungens)*

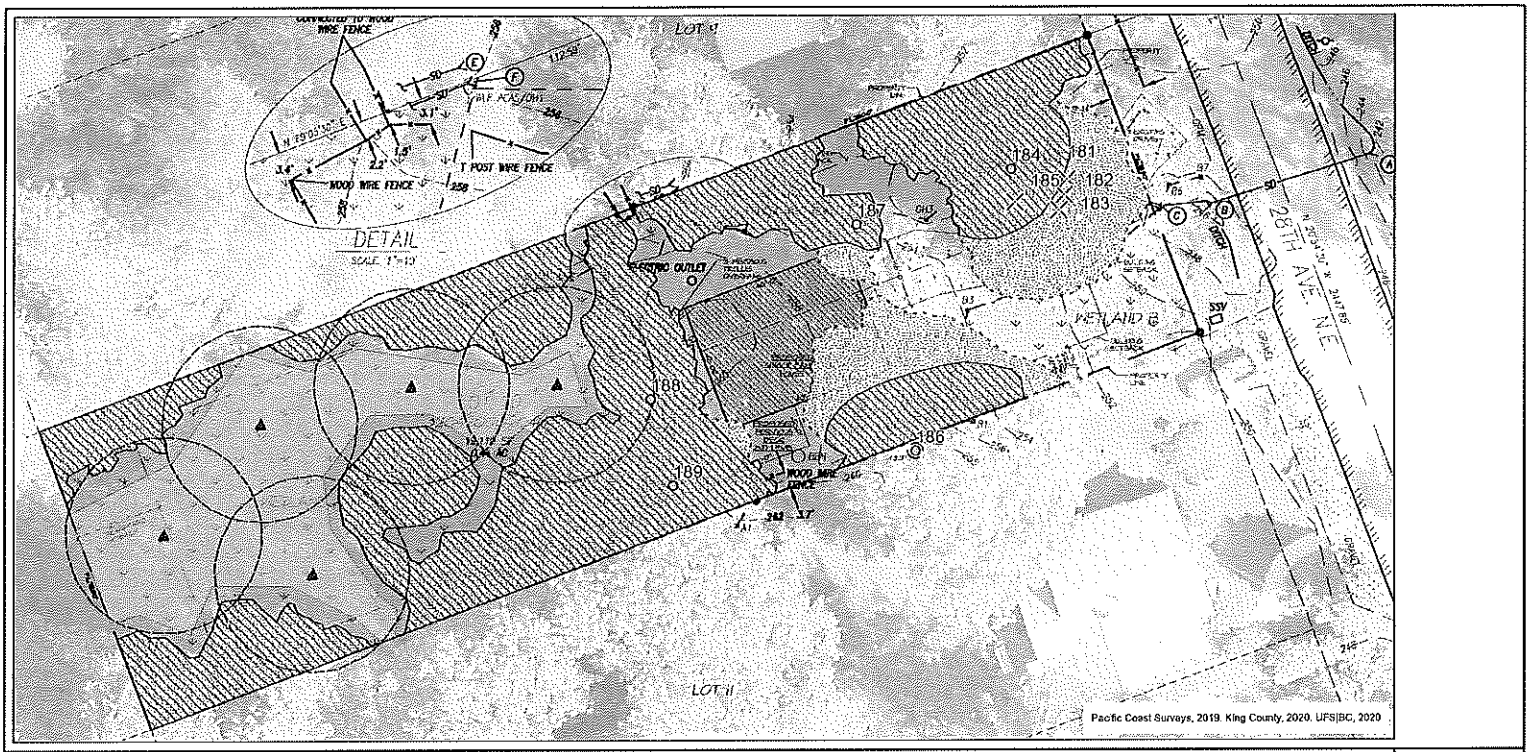
THPL: western red cedar *(Thuja plicata)*

Symbols: (Approximate locations)

- Tree to be retained
- Tree to be removed
- Tree Protection Fencing
- Critical Root Zone (CRZ)
- Interior Critical Root Zone (ICRZ)

October 2020

EXHIBIT # 22.12



Urban Forestry Services
BARTLETT CONSULTING

Ha Residence Project
Parcel #4024100380
28th Ave NE.
Canopy Assessment Site Plan

Lake Forest Park, WA. 98155

Symbols: (Approximate locations)

- bigleaf maple (*A. macrophyllum*) to be planted, including 30-year canopy coverage **
- Tree mitigation planting area
- Post-construction canopy cover
- 2019 canopy cover
- O Tree to be retained
- X Tree to be removed

** Based on the LFP General Tree List, Five (5) bigleaf maple trees have a coverage potential of 1590 ft² per tree. This would theoretically provide an additional 7,950 ft² of coverage within 30-years. However, given the existing coverage of the site, a more realistic estimate is around 4,500 ft².

October 2020

EXHIBIT #22.13

Urban Forestry Services
BARTLETT CONSULTING
Division of The F.A. Bartlett Tree Expert Company

Tree Assessment Matrix

Ha, Khoa

Urban Forestry Services | Bartlett Consulting
15119 McLean Road
Mount Vernon, WA 98273

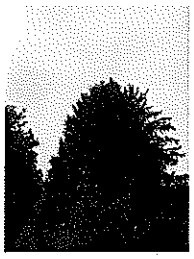
Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
181	Western red cedar *Thuja plicata*	24.1	11.8	24.1	Good	Good	Low	Medium Significant	Remove tree - construction impacts

Notes/ Defects: This tree is within 5-feet of creek to the southwest. The tree is part of a group of three other cedars situated on top of a structure that allows the creek passage. This tree will be impacted by the construction of a driveway directly to the east of the tree. English ivy is growing on the trunk and within the critical root zone.




Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
182	Western red cedar *Thuja plicata*		11.5	29.6	Good	Good	Low	Medium Significant	Remove tree - construction impacts

Notes/ Defects: This multi-stem tree is within 5-feet of creek to the southwest. The tree is part of a group of three other cedars situated on top of a structure that allows the creek passage. This tree will be impacted by the construction of a driveway directly to the east of the tree. English ivy is growing on the trunk and within the critical root zone.

Date: 9/30/2020
Field Work Completed: 9/24/2020

EXHIBIT # 22.14

Urban Forestry Services
BARTLETT CONSULTING
Subsidiary of The F.A. Bartlett Tree Expert Company

Tree Assessment Matrix

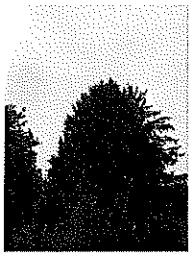
Ha, Khoa

Urban Forestry Services | Bartlett Consulting
15119 McLean Road
Mount Vernon, WA 98273

Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
183	Western red cedar *Thuja plicata*	20.8	11.8	20.8	Good	Good	Low	Medium Significant	Remove tree - construction impacts

Notes/ Defects

This tree is within 7-feet of creek to the west. The tree is part of a group of three other cedars situated on top of a structure that allows the creek passage. This tree will be impacted by the construction of a driveway directly to the east of the tree. English ivy is growing on the trunk and within the critical root zone. This tree has a subtle lean to the south east.

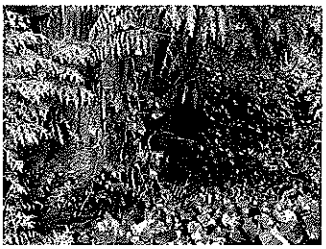



Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
184	Western red cedar *Thuja plicata*	48.0	17.8	48.0	Fair to Good	Good	Low	Medium	Retain tree Clearance pruning Tree Protection Required

Notes/ Defects

This is an Exceptional Tree, as defined by LFPMC 16.14.030. Ivy is growing throughout the route zone and onto the stem. The crown/canopy is a bit more thin in the interior of the tree likely due to Ivy growth in the upper canopy minor die back and deadwood throughout. The tree is growing directly next to the creek. Consider retention for this tree removal would be extremely impactful to the surrounding creek and neighboring property.



Date: 9/30/2020
Field Work Completed: 9/24/2020

EXHIBIT # 22.15

Urban Forestry Services
BARTLETT CONSULTING

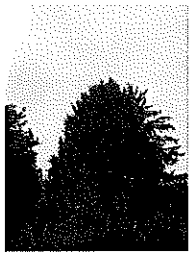
Tree Assessment Matrix

Ha, Khoa

Urban Forestry Services | Bartlett Consulting
15119 McLean Road
Mount Vernon, WA 98273

Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
185	Western red cedar *Thuja plicata*	15.2	12.3	15.2	Good	Good	Low	Medium Significant	Remove tree - construction impacts

Notes/ Defects: This tree is within 9-feet of the creek to the west. This tree will be impacted by the construction of a driveway directly to the east of the tree. English ivy is growing on the trunk and within the critical root zone. The trunk of this tree is significantly bowed, likely light related (phototropism).

Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
186	Bigleaf maple *Acer macrophyllum*		35.0	40.1	Fair to Good	Good	Low	Medium Significant	Retain tree Clearance pruning Tree Protection Required

Notes/ Defects: This is a very nice specimen growing on the neighbors property. Planned developments are very close to the tree. Extreme adherence to tree protection will be required to safely retain. Clearance pruning will be required on the west side of the tree to allow for the construction of Mr. Ha's planned home. This pruning should be done carefully and strategically as to not harm or dramatically disfigure the tree.




Date: 9/30/2020
Field Work Completed: 9/24/2020

EXHIBIT # 22.16

Urban Forestry Services
BARTLETT CONSULTING

Tree Assessment Matrix

Ha, Khoa

Urban Forestry Services | Bartlett Consulting
15119 McLean Road
Mount Vernon, WA 98273

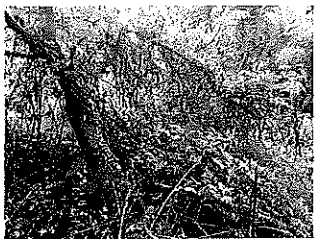
Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
187	Colorado blue *Picea pungens*	11.8	10.0	11.8	Poor to Fair	Fair to Good	Low	Medium Significant	Retain tree Tree Protection Required

Notes/ Defects: This tree is within 5 feet Of the creek to the west. Ivy is growing throughout the critical root zone and on the main stem. Significant deadwood exists up to approximately 25-feet, above this point the canopy is normal. A corkscrew Willow is leaning against the tree and situated to the north across the way from the creek.




Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
188	English walnut *Juglans regia*	12.9	15.5	12.9	Good	Fair to Good	Low	Medium Significant	Retain tree Tree Protection Required

Notes/ Defects: This tree has a significant lean to the west. The lean appears to have been initially caused by an slight uprooting event in the past. the lean now appears to be stable. the soil in this area is very saturated and considered a wetland.




Date: 9/30/2020
Field Work Completed: 9/24/2020

EXHIBIT # 22.17

Urban Forestry Services
BARTLETT CONSULTING
Division of The F.A. Bartlett Tree Expert Company

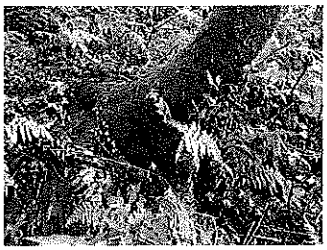
Tree Assessment Matrix

Ha, Khoa

Urban Forestry Services | Bartlett Consulting
15119 McLean Road
Mount Vernon, WA 98273

Tree	Species	DBH (in)	Drip Rad.	CRZ (ft)	Vigor	Structure	Risk	Pres Value	Recommendations
189	Bigleaf maple *Acer macrophyllum*	11.3	16.0	11.3	Fair to Good	Good	Low	Medium Significant	Retain tree Tree Protection Required
Notes/ Defects	This tree appears to have slightly uprooted at one time, and has since corrected it self resulting in a bow and a slight lean to the north. The soil in this are is very saturated and contains rabbit? tunnels and holes throughout the area.								



Date: 9/30/2020
Field Work Completed: 9/24/2020

EXHIBIT # 22.18

Urban Forestry Services

BARTLETT CONSULTING

Divisions of The F.A. Bartlett Tree Expert Company

General Tree Protection Guidelines

With Critical Root Zone Explanation Attachment

1. **Responsibilities**: These Guidelines pertain to any disturbance, use or activity within the Critical Root Zone of any retained tree on this project. See attached **Critical Root Zone Explanation** for reference. The owner's arborist and general contractor shall meet onsite before any site work begins, to review and designate the most appropriate methods to be used to protect the retained trees during construction.

   These guidelines apply to work provided by all contractors and sub-contractors on the project.

   The project consulting arborist shall be contacted prior to any work that may need to enter the tree protection fencing. At least two days notice shall be provided to the project consulting arborist. A proposed method for work shall be provided to the arborist. This method shall be reviewed by the project consulting arborist and either approval and / or comments provided by the project consulting arborist prior to commencing works within the tree protection area. He or she should be notified within 8 hours should any injury occur to any protected tree or its larger roots (greater than 2-inch diameter) so that appropriate assessment and/or treatment may be made.

2. **Soil Disturbance:** No soil disturbance shall take place before tree protection fences are installed. All evaluated trees to be retained within these areas are clearly illustrated on the Site Plan.

3. **Designated Tree Removals:** The owner's arborist and contractor shall confirm on site which trees are to be removed and those to be retained. Directional felling and removal of trees will be completed with great care to avoid any damage to the trunks, limbs, and critical root zones of the retained trees.

4. **The Tree Protection Site Plan,** when provided, shows the recommended location of the Tree Protection Fence (TPF). Immediately after the clearing limits and grading stakes are set in the field, the owner's arborist, during review and discussion with the contractor, will make a final determination on the tree protection requirements depending on construction limits and estimated impact on major roots and soil condition. The arborist may adjust clearing limits in the field so that, in his/her opinion, tree roots and soils are protected while necessary work can proceed.

5. **The Tree Protection Fence** (TPF) shall be installed along the clearing limits, with special consideration of the Critical Root Zone (CRZ) of trees to be preserved. The CRZ of a tree is generally described as an area equal to 1-foot radius for every 1-inch diameter of tree. For example, a 10-inch diameter tree has a CRZ of 10-foot radius. Work within the CRZ may be limited to hand work or alternate method of construction.

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Cell: 360.770.9921

Email: jbarborinas@bartlett.com
www.urbanforestryservices.com

The Tree Protection Fence (TPF) shall be constructed with steel posts driven into the ground with 6-ft. chain link fence attached. Upon consultation with the contractor, the arborist shall determine the placement of the fence and the extent and method of clearing that may be done near preserved trees. Additional follow-up determinations may be required as work progresses on the project. See attached **Critical Root Zone Explanation.**

No parking, storage, dumping, or burning of materials is allowed beyond the clearing limits or within the Tree Protection Fence.

The TPF shall not be moved without authorization by the owner's arborist or City Arborist. The TPF shall remain in place for the duration of the project.

Work within this area shall be reviewed with and approved by the owner's arborist. Call Urban Forestry Services| Bartlett Consulting at 360-428-5810 with questions.

6. **Silt Fence:** If a silt fence is required to be installed within the Critical Root Zone of a retained tree, the bottom of the silt fence shall not be buried in a trench, but instead, folded over and placed flat on the ground. The flat portion of the silt fence shall be covered with gravel or soil for anchorage.

7. **CRZ over Hardscape:** Where the Critical Root Zone (CRZ) includes an area covered by hardscape, the TPF can be placed along the edge of the hardscape if and until it is removed. After hardscape removal, the available CRZ should be backfilled with topsoil up to 6 inches deep and protected with the TPF. Incorporation of topsoil into the existing sub-grade shall be determined by the consulting arborist. Where applicable a specification for topsoil will be provided or approved by Urban Forestry Services | Bartlett Consulting.

8. **Tree Protection Signs** shall be attached to the fence only and shall be shown as required on the Site Plan. They should read "Protect Critical Root Zone (CRZ) of trees to be retained. No soil disturbance, parking, storage, dumping, or burning of materials is allowed within the Tree Protection Barrier. " Monetary fines, based on the appraised dollar value of the retained trees may also be included on these signs. Telephone contact details for the project consulting arborist should also be included in the sign.

9. **Soil Protection within the Critical Root Zone (CRZ):** Where vehicular access, temporary work pad or storage pad is required within the CRZ of any preserved tree that is not protected with hardscape, the soil shall be protected with 18" of woodchips and/or plywood or metal sheets, or a combination of both, to protect from soil compaction and damage to roots of retained trees. A biodegradable coir mat netting is recommended to be placed on the existing grade before woodchip placement to protect the condition and confirm the location of the existing grade. The netting is a valuable benchmark upon removal of the material within the CRZ.

10. **Landscape Plans, Irrigation Design and Installation Details:** Great care shall be exercised when landscaping within the Critical Root Zone (CRZ) of any tree. Roots of preserved trees and

other vegetation shall not be damaged by planting or installation of irrigation lines. The owner's arborist shall review the Landscape Plan for any potential design and tree preservation conflicts and approve related irrigation and landscape installation activities within the CRZ of retained trees. A proposed method for work shall be provided to and approved by the arborist.

11. **Backfill and Grade Changes:** The owner's arborist will determine to what extent backfilling may be allowed within the Critical Root Zone of a preserved tree, and if needed, the specific material which may be used. Grade cuts are usually more detrimental than grade filling within the CRZ and shall be reviewed by the arborist well in advance of construction.

12. **Tree Maintenance and Pruning:** Trees recommended for maintenance and approved by the owner, shall be pruned for deadwood, low hanging limbs, and proper balance, as recommended for safety, clearance or aesthetics. All pruning shall be done by an International Society of Arboriculture Certified Arborist. *ANSI A300 American Standards for Pruning* shall be used. Limbs of retained trees within 10 feet or less, of any power line, depending on power line voltage, may only be pruned by a Utility Certified Arborist. This pruning must be coordinated with the local power company, as they may prefer to provide this pruning.

13. **Underground Utilities:** Utility installation within the Critical Root Zone (CRZ) of any retained tree shall be reviewed by the Project Consulting Arborist. A less root disturbing route or minimal impact installation method of utility installation may be discussed and recommended i.e. tunneling or trenchless excavation. Trenching through the Interior CRZ of a retained tree is not usually allowed. **See CRZ Explanation to differentiate between the Perimeter and Interior CRZ.** An Air spade and Vac Truck may be required when utility installation is mandatory near a retained tree or other methodology such as trenchless excavation.

14. **Root Pruning:** Required work may result in the cutting of roots of retained trees. Cutting roots 2" or greater should be avoided. Potential root pruning needs should be reviewed in advance with the Project Consulting Arborist to minimize potential root fracturing and other damage. Severed roots of retained trees shall be cut off cleanly with a sharp saw or pruning shears. Applying pruning paint on trunk or root wounds is not recommended. Severed roots shall be covered immediately after final pruning with moist soil or covered with mulch until covered with soil. Excavation equipment operators shall take extreme care not to hook roots and pull them back towards retained trees. In all cases, the excavator shall sit on ground outside of the CRZ. Soil excavation within the CRZ shall be under the direct supervision of the owner's arborist.

15. **Supplemental Tree Irrigation:** If clearing is performed during the summer, supplemental watering and/or mulching over the root systems within the Tree Protection Fencing of preserved trees may be required by the owner's arborist. The arborist should be notified of the proposed schedule for clearing and grading work. Supplemental watering and mulching over the root systems of roots impacted or stressed trees are strongly recommended to compensate for root loss and initiate new root growth. Long periods of slow drip irrigation will be most effective. A large coil of soaker hose starting at least 18" from the trunk and covering the Interior Critical Root Zone area is recommended. Water once per week and check soils for at least 12 inches infiltration. This work shall be under the direct supervision of the owner's arborist.

16. **Additional Measures:** Additional tree protection recommendations may be required and may be specified in Urban Forestry Services| Bartlett Consulting report(s).

17. **Tree Protection Monitoring:** The owner's arborist may be required to monitor work when disturbance occurs near retained trees and shall make periodic site visits to report to the owner and City if tree protection guidelines are being followed.

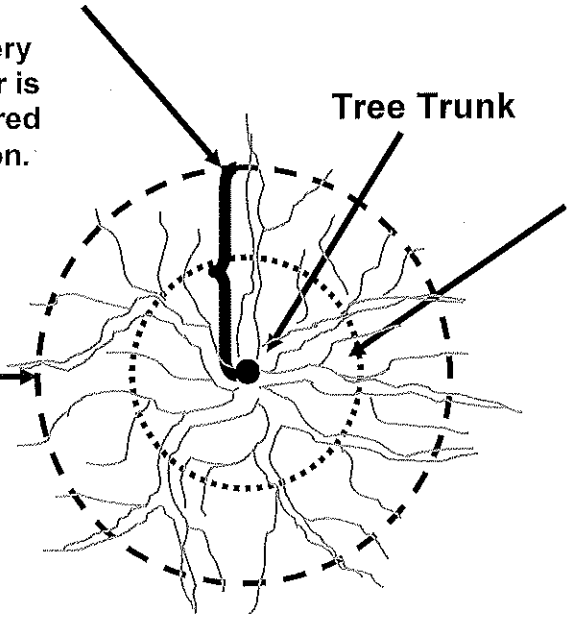
18. **Final Inspection:** The owner's arborist shall make a final site visit to report on retained tree condition following completed work and shall report to the city to release the bond, if necessary for the retained trees.

EXHIBIT # 22.22

Critical Root Zone (CRZ) =
12" Radius for every Tree inch diameter is generally considered optimum protection.

Perimeter Critical Root Zone (PCRZ) = the outer half of the CRZ

The greater the disturbance allowed in this area, the greater Post Care is required.



Interior Critical Root Zone (ICRZ) = the inner half of the CRZ
Protecting only this area would cause significant impact to the tree, potentially life threatening, and would require maximum Post Care Treatment to retain the tree. See Post Care Treatment below.

The Critical Root Zone (CRZ) of a tree is established on the basis of the trunk diameter. The CRZ is a circular area which has a radius of 12 inches for every inch diameter of trunk measured at 4.5 feet above grade. Root systems will vary both in depth and spread depending on size of tree, soils, water table, species and other factors. However, this CRZ description is generally accepted in the tree industry. Protecting this entire root zone area should result in no adverse impact to the tree, except for potentially increased exposure.

The above CRZ drawing has been further differentiated into the 'Perimeter' (PCRZ) and 'Interior' (ICRZ) to help define potential impact and required Post Care.

Generally, the full PCRZ is considered the optimum amount of root protection for a tree. As one encroaches into the "Perimeter CRZ, but not into the "Interior CRZ" the greater Post Care the tree would require to remain alive and stable. The 'Interior CRZ is half the radius of the full PCRZ. Disturbance into the ICRZ could destabilize or cause the tree to decline.

The full ICRZ should never be disturbed if the tree is to have any chance of survival. This 'Interior' CRZ would approximately equal the size of a rootball needed to transplant this tree which in turn would require extensive **Post Care** and possibly guying.

This Post Care Treatment would include but may not be limited to; regular irrigation, misting, root treatment with special root hormones or growth stimulants, mulching, guying and monitoring for several years. Lack of this treatment would be fatal to the tree.

Urban Forestry Services
BARTLETT CONSULTING
Divisions of The F.A. Bartlett Tree Expert Company

15119 McLean Rd.
Mount Vernon, WA 98273

Title: Critical Root Zone (CRZ) Explanation

Source: Urban Forestry Services | Bartlett Consulting
Jim Barborinas, ISA Certified Arborist PN-0135
ASCA Registered Consulting Arborist #356,
Tree Risk Assessor Qualified

Date: 2019 Not to Scale

BARTLETT TREE EXPERTS

EXHIBIT # 22.23

General Terms for Residential Consulting Services

The F.A. Bartlett Tree Expert Company ("**Bartlett Tree Experts**") provides tree-care and related consulting services to residential clients. The agreed upon "Work" has been expressed in a separate Client Agreement between Bartlett Tree Experts and the Client, and is identified within the portion of the Client Agreement communicating the Scope of the Work, the Goals, the Specifications, the Schedule of the Work, and the Payment Terms. These general terms combine with the approved Client Agreement and form the complete agreement between the parties.

Article 1
TREE RISK

1.1 **Tree Risk**

(a) The Client acknowledges that having trees on one's property involves risk, including the risk that a tree or tree limb might fall. As part of the Work, Bartlett Tree Experts may recognize the risk posed by failure of trees within the Scope of Work and recommend to the Client ways to reduce that risk, but the Client acknowledges that Bartlett Tree Experts cannot detect all defects and other conditions that present the risk of tree failure and cannot predict how all trees will respond to future events and circumstances. Trees can fail unpredictably, even if no defects or other conditions are apparent. Bartlett Tree Experts will not be responsible for damages caused by subsequent failure of a tree, or tree part, within or around the Scope of Work due to defects or other preexisting structural or health conditions.

(b) Unless the Work includes having Bartlett Tree Experts perform a tree risk assessment for designated trees, the Client acknowledges that in performing the Work Bartlett Tree Experts is not required to inspect and report to the Client on risks to, and risks posed by, trees on or near the Client's property.

(c) The Client also acknowledges that because trees are living organisms that change over time, the best protection against the risk associated with having trees on the Client's property is for the Client to arrange to have them inspected by a qualified arborist annually and after each major weather event to identify any defects or other conditions that present the risk of tree failure. Then, once inspected, the Client should review any possible defects or conditions that present the risk of failure and request recommendations for, and implement, remedial actions to mitigate the risks.

Article 2
THE WORK

2.1 **Ownership**

The Client states that all trees and other vegetation within the Scope of Work are owned by the Client or that the Owner has authorized the Client to include them within the Scope of Work.

2.2 **Specified Trees or Work**

The specific trees, shrubs, plant materials or work described in the Scope of Work or in the Agreement will be the only trees, shrubs, plant materials, or work included in the scope of the consultative services or Work performed by Bartlett for the Client.

2.3 **Insurance**

Bartlett Tree Experts states that it is insured for liability resulting from injury to persons or damage to property while performing the Work and that its employees are covered under workers' compensation laws.

2.4 **Compliance**

(a) Bartlett Tree Experts shall perform the Work competently and in compliance with the law and industry standards, including the American National Standards Institute's A-300 Standards for tree care.

2.5 **Access Over Roads, Driveways, and Walkways**

The Client shall arrange for Bartlett Tree Experts' representatives, vehicles, and equipment to have access during working hours to areas where the Work is to be performed. The Client shall keep roads, driveways, and walkways in those areas clear during working hours for the passage and parking of vehicles and equipment. Unless the Client Agreement states otherwise, Bartlett Tree Experts is not required to keep gates closed for animals or children.

2.6 **Personnel**

Bartlett Tree Experts will determine and provide the correct Bartlett personnel for completing the Work based scope of the project, the expertise needed, and the geographic location of the work, in order to meet the goals of the Client.

2.7 **Accuracy of Information Provided By the Client or By Third Parties Acting on Behalf of the Client**

(a) The Client acknowledges that Bartlett Tree Experts cannot be held responsible for the accuracy of or content of information provided by the Client or third parties acting on behalf of the Client, including but not limited to; the legal description of the property, issues of title and/or ownership of the property, software programs, property and property line locations and/or boundaries, or other pieces of information provided which are integral to the final outcome of the consulting Work.

(b) The Client agrees to correct any errors in any such inaccurate information that it or any third party acting on its behalf, provides Bartlett Tree Experts, once the inaccuracy is known, if such information will be necessary for Bartlett Tree Experts to base its final analysis, management plans, written reports, information or recommendations on for the finalization of the Work.

2.8 **Information Provided By Reliable Sources**

In certain circumstances, Bartlett Tree Experts may need to engage outside reliable sources to provide specialized information, cost estimates, or opinions. Bartlett Tree Experts will make every effort to engage reputable and reliable sources, and will communicate the use of these sources to the Client if such sources are used to help determine an integral part of the Work.

BARTLETT TREE EXPERTS

General Terms for Residential Consulting Services

2.9 **Tree Locations, Maps, Sketches, and Diagrams**

The Client acknowledges that Bartlett Tree Experts may use several means and methods to provide tree locations on maps, sketches, or drawings, and that the use of tree locations on maps, sketches, diagrams, and/or in pictures are intended to aid the Client in understanding the deliverables provided, and may not be to scale and should not be considered precise locations, engineering surveys, or architectural drawings.

2.10 **Global Positioning Systems**

The Client acknowledges that all global positioning system (GPS) devices used to locate trees, shrubs, and plant material, have some accuracy limitations, and regardless of the methodologies or software programs used to enhance the accuracy of the locations, there will always be some level of meter or sub meter locational discrepancies within any deliverable product.

2.11 **Advice, Opinions, Conclusions, and Recommendations**

(a) The Client Acknowledges that all advice, opinions, conclusions, and recommendations provided represent the professional objective opinion(s) of Bartlett Tree Experts; which are in no way predetermined, or biased toward any particular outcome.

(b) The Client acknowledges that all advice, opinions, conclusions, and recommendations provided verbally or in written format such as email, management plans, or reports will be based on the present status of the tree(s), property(s), environmental conditions, and industry standards. Any advice, opinions, conclusions, and recommendations provided do not take into account any future changes in environmental conditions or changes to current industry standards which are unknown and unforeseen at the time the Work is performed.

2.12 **Tree Risk Assessments and Inventories**

(a) If the Client Agreement is specifically for Bartlett Tree Experts to provide a *Level 1 Limited Visual*, *Level 2 Basic*, or *Level 3 Advanced assessment* of tree risk for any tree or group of trees for the Client in accordance with industry standards, the Client understands that any *risk ratings* and recommendations for mitigating such risks will be based on the observed defects, conditions, and factors at the time of the tree risk assessment or inventory.

(b) The Client acknowledges that any recommendations made to mitigate risk factors will be made in accordance with industry best practices and standards, but that the decision to implement the recommended mitigation or remove the risk factors rests solely with the Client.

(c) The Client understands that all *risk ratings* used are intended to assist the Client with understanding the potential for tree or tree part failure, and are not meant to be used to declare any tree or tree part to be safe or free from any defect. As such, the Client should not infer that any tree not identified as having an *imminent* or *probable likelihood of failure*, or not identified with a *moderate*, *high*, or *extreme risk rating*, or not having a condition rating of *poor* or *dead* is "safe" or will not fail in any manner.

(d) The Client understands that it is the Client's responsibility to ensure that the assessed tree or trees are continually inspected and reassessed periodically, or after any major weather event, in order to ensure that risk rating information is kept current, and to enter any changes to risk ratings or mitigation measures to the inventory or tracking system used by the Client.

2.13 **Tree or Plant Value Appraisals**

(a) The Client acknowledges that tree appraisal is not an exact science. If the Client Agreement is for Bartlett Tree Experts to provide the Client with an appraisal estimate of cost or value, or estimated tree asset value, for specified trees or plant materials, the Client understands that those estimates will be based on a combination of visible conditions at the time of appraisal, information or pictures provided by the Client, local knowledge, information and/or cost estimates provided by local nurseries or plant wholesalers, information and/or costs provided by tree care or landscape installation and maintenance companies, industry best practices, and/or asset value software.

(b) The Client understands that while any such appraisal will be based on one or several accepted industry methods of appraising plant material values, the appraised values provided may or may not be accepted as the final value by third parties, or decision makers in disputes over plant values, such as courts, arbitrators, insurers, or mediation efforts.

2.14 **Local and Tree-Related Permits**

Unless the Client Agreement states differently, the Client is responsible for obtaining and paying for all required local or tree related permits required. If the Work stated in the Client Agreement involves Bartlett Tree Experts submitting for, or assisting the Client in submitting for, any kind of local or tree-related permit, the Client understands that Bartlett Tree Experts cannot guarantee the successful outcome. If Bartlett Tree Experts submits a local or tree permit application on behalf of the Client, the Client must provide all necessary information for Bartlett to make such a submittal, and the Client will be responsible for paying for, or reimbursing Bartlett Tree Experts for, all fees and expenses related to the application process, regardless of the outcome.

2.15 **Expert Witness and Testimony**

The Client acknowledges that unless the Scope of Work in Client Agreement is specifically to perform Expert Witness services and testimony for the Client, then nothing in the Client Agreement will obligate Bartlett Tree Experts to perform Expert Witness services or provide expert testimony for or on behalf of the Client.

2.16 **Environmental Benefits Assessments**

(a) The Client understands that Bartlett Tree Experts may use one or more software, or other programs, developed by other companies or government agencies, which are designed to help provide estimates on the environmental benefits of trees, shrubs, or other plant materials if the Work involves providing an environmental benefit assessment for the Client.

(b) The Client acknowledges that while Bartlett Tree Experts will be responsible for the correct collection and input of data into any such software or other program used to help estimate

environmental benefits of trees, shrubs, and other plant materials, the determinations of the data made by any such program may vary based on the method, software, type, year, or version used at any given time. The Client understands that any such method, software, type, year, or version used is meant to provide a sound, scientific method to help the Client understand the environmental benefits of the collected data.

2.17 **Tree and Property Hazards and Safety Issues**

The Client understands that in no way does Bartlett Tree Experts imply, nor should the Client infer that Bartlett Tree Experts assumes the responsibility for inspecting, identifying, and correcting tree or property hazards or safety issues on or near the Client's property, or conducting tree risk assessments, for which the Client Agreement does not specify, during the course of any of its ongoing consultative or other activities related to this Agreement.

2.18 **Remote Sensing and Tree Canopy Assessments**

(a) If the Work requires Bartlett Tree Experts to evaluate aerial imagery to classify land cover classes, classify random points, or create or manipulate shapefile boundaries, the Client understands that certain factors can prohibit the accuracy of the final Work product, such as; the availability of imagery, files, and shapefiles for the property or site from reliable sources, the accuracy and quality of imagery, files, or shapefiles obtained from reliable sources or provided by the Client, the date of when the imagery, files, or shapefiles were taken or created, and the ability for a person to visually discern the difference between the pixels of aerial imagery.

(b) If such factors inhibit the accuracy of the Work, Bartlett Tree Experts may choose to conduct visual assessments, or use other means, to verify or classify points or imagery into the required specifications. If such alternate methods are used, Bartlett Tree Experts will communicate the use of such methods to the Client in the final work product. If it is not possible or feasible to use alternative methods, then the Client acknowledges that the final work product may have some gaps in accuracy.

2.19 **Use of Drones and Drone-Related Equipment**

(a) If the Work specifies the use of Drones or Drone-related equipment to help collect information, the Client acknowledges that in some cases the use of Drones and Drone-related equipment can provide detailed information, imagery, views, and pictures of a tree(s) or property(s); however, in some cases, not all aspects of a tree(s) or property(s) can be seen or accessed by a Drone. The Client understands that this technology can be limited and should not be used by the Client as the sole decision-making criteria, but rather one of many factors used by the Client in the decision-making process.

(b) The Client agrees that other methods of obtaining the required information must be included in the Client Agreement, and may be required to be utilized, in addition to or separate from the use of Drones or Drone related equipment in the event that the limitations are too severe to perform the required Work.

2.20 **Decay Detection Devices**

(a) The Client acknowledges that all decay detecting devices have limitations, and the use of any such device should be used to supplement information regarding the decay within a tree or trees, and not as the sole source of information.

(b) If the Work requires the use of a decay detection device, unless the Client Agreement specifies the type of device, Bartlett Tree Experts will decide the most appropriate type of decay detecting device to use based on the conditions present and the information needed to supplement and complete the Work.

2.21 **Diagnostic Services**

Bartlett Tree Experts may offer diagnostic services as a means of attempting to isolate certain plant pest or soil problems for the Client, and determining the most logical possibility as to the cause of the condition of the trees, shrubs, or plants in question. The Client understands that in some cases government quarantines may prohibit samples from being sent to a diagnostic clinic, and in some cases, determinations on samples may be inconclusive.

2.22 **Tree Preservation, Tree Protection, and Construction and Site Monitoring**

(a) If the Work includes Bartlett Tree Experts conducting or providing tree preservation or tree protection evaluations, tree impact evaluations, recommendations, specifications, and/or documents required by the governing agency, the Client understands that Bartlett Tree Experts will review the project, materials or plans that are provided by the Client, combined with industry best practices and current tree conditions, to arrive at the recommendations and specifications. The Client also understands that trees are living organisms and that even following all industry best practices and specifications cannot guarantee that a tree will survive construction impacts, which may include but are not limited to soil compaction, root damage, inadequate soil moisture, and decrease in tree stability.

(b) If the Work includes Bartlett Tree Experts conducting or providing tree monitoring during project construction, the Client understands that Bartlett Tree Experts will review the project, materials, or plans that are provided by the Client and/or described by the Client representative at the site, and provide recommendations to the Client to assist with tree preservation or protection, but that the Client will be responsible for ensuring the implementation of such recommendations by the Client or any third parties.

2.23 **Irrigation and Recycled Water Assessments**

(a) If the Work requires Bartlett Tree Experts to provide irrigation or recycled water assessments as a means of aiding the Client with their tree care needs, the assessments will be provided using the best known site conditions, the best available water quality information, or the best available water quality test results provided to Bartlett Tree Experts; however, the Client acknowledges that Bartlett Tree Experts cannot provide information on water source, delivery systems, water chemistry, water quality testing methodology, or distribution systems.

2.24 **Bird, Water Fowl, and Wildlife Habitat Assessments**

If the Work requires Bartlett Tree Experts to provide bird, water fowl, and wildlife habitat assessments or identifications

as a means of aiding the Client with their tree care needs and wildlife considerations, the assessments will be based on known site conditions and available industry bird, waterfowl, and wildlife management information.

2.25 **Endangered or Protected Species and Habitats**

(a) If the Work is for Bartlett Tree Experts to identify trees or plant materials that may be endangered or protected species, or to identify trees or plant materials that may be primary or secondary habitat for endangered or protected species, or to provide any analysis for a project that may affect any endangered species or protected species or its habitat, then Bartlett Tree Experts will base all reports and information on the existence of any known endangered or protected species and known habitats using government approved endangered or protected species or habitat information.

(b) The Client acknowledges that Bartlett Tree Experts cannot be responsible for identifying unknown endangered species or habitats.

2.26 **Wetland and Riparian Habitat Mapping**

The Client understands that if the Work involves wetland or riparian habitat mapping, such maps will require the Client to provide the tree or plant species considered to be the primary or secondary habitat for the specific species of animal in question, and such maps will be limited to the species information provided as it overlays within the known designated wetland areas.

2.27 **Representation Services**

If the Work involves a member of Bartlett Tree Experts acting as a representative for, or decision-maker for, the Client, including but not limited to activities such as reviewing, approving or declining tree-related permits, plants, designs, or selections submitted by third parties, then the Client agrees to be the final decision-maker in the event of a third party appeal of an adverse decision or recommendation made by Bartlett Tree Experts with respect to granting or denying a tree related permit, plant, design, or selection submitted by a third party. The Client also agrees to defend Bartlett Tree Experts against any claims made by third parties regarding such decisions or recommendations, and represent the decisions and recommendations of Bartlett Tree Experts, as if such decisions or recommendations were made by the Client.

2.28 **Integrated Pest Management**

(a) If the Work includes consultation for integrated pest management services, the Client understands that the final product may involve recommendations for plant health care treatments that will be tailored to meet the Client's needs for specific trees, shrubs, turf areas, or plants. In creating these recommendations, Bartlett Tree Experts will consider the Client's objectives, priorities, budgetary concerns, plant materials, site conditions, pest and disease infestation levels and the expectations of those levels, and timing issues.

(b) The Client acknowledges that such recommendations may involve one or more inspections of specific plants to help determine insect and disease concerns, the sampling of specific plant materials or soil areas, an understanding of the cultural needs of certain plants, consideration of biological control concepts and limitations (natural and/or introduced predators), recommended improvements to physical site conditions, or the use of pesticide treatments. The integrated pest management service does not combine all possible controls and concepts for every tree, shrub, turf area, or plant, but rather it considers the most reasonable option or options for control of and mitigation of insect and disease damages to the specific trees, shrubs, turf areas or plants as designated by the Client to meet the Client's goals.

(c) The Client understands and acknowledges that during the course of an integrated pest management program, as inspections are taking place, and treatments or other services are being performed to certain trees or shrubs, not every tree or shrub inspected will require a specific treatment or other service, and in fact, some trees or shrubs may not require any specific treatment or other service throughout the course of a season to maintain health and vigor if the inspections show insignificant pest thresholds, and sound environmental and cultural conditions.

(d) The Client also understands that tree, shrub, plant and turf inspections conducted during the integrated pest management program are for the purpose of determining plant health issues and, insect and disease thresholds; and are not conducted for the purposes of determining tree, shrub, plant, or turf safety.

2.29 **Plant Species Selection**

If the Work involves Bartlett Tree Experts providing advice and guidance on plant species selection to aid the Client with their landscape site needs, Bartlett Tree Experts will provide the advice and guidance based on the known site conditions, the available plant species locally at the time, and the plant species characteristics. The Client will be responsible for the planting and maintenance, and ensuring the survival of such plant selections in the landscape.

2.30 **Trees and Subsidence Assessments**

(a) If the Work involves Bartlett Tree Experts providing an assessment of relationship between certain trees or tree parts and the subsidence or movement of a building or structure, the Client understands that certain inferences and assumptions will be made given the location, visibility, soil and drainage conditions, size, species, and condition of the tree or trees, and other factors, in order to perform the Work in the least intrusive manner possible.

(b) Bartlett Tree Experts recommends that the Client reviews any tree related report recommendations, prior to having the work completed, with their structural engineer or other qualified building contractor to help the client determine any potential adverse impact to the buildings or structures.

2.31 **Investigation of Covenants, Easements, Constraints, or Restrictions**

The Client is responsible for investigating and identifying to Bartlett Tree Experts any covenants, easements, constraints, or other restrictions to the title or deed on the property that may adversely impact Bartlett Tree Experts' ability to perform the Work.

2.32 **Cancellation**

If the Client cancels or reduces the Work after the Work has started, the Client shall pay Bartlett Tree Experts for all the items of the Work that have been completed and all reasonable costs Bartlett Tree Experts has incurred in preparing to perform the remainder of the Work.

2.33 **Payment**

The Client shall pay for the Work when the Client receives Bartlett Tree Experts' invoice for the Work, unless specific payment terms have been agreed upon by the parties. If any amount remains unpaid 30 days after the date of the invoice or any period stated in the Client Agreement, whichever is longer, as a service charge the unpaid amount will accrue interest at the rate of 1.5% per month (or 18% per year) or the maximum rate permitted by law, whichever is lower. The Client shall reimburse Bartlett Tree Experts for any expenses (including attorneys' fees and court costs) it incurs in collecting amounts that the Client owes under the Client Agreement.

Article 3
TREE CONDITIONS

3.1 **Cables, Braces and Tree-Support Systems**

The Client acknowledges that cables, braces or tree-support systems are intended to reduce the risk associated with tree part breakage by providing supplemental support to certain areas within trees and in some cases by limiting the movement of leaders, limbs, or entire trees, and are intended to mitigate the potential damage associated with tree part breakage; but that such supplemental support systems cannot eliminate the risk of breakage or failure to trees or tree parts entirely, and future breakage and damage is still possible

(a) The Client acknowledges that for cables, braces or tree-support systems to function optimally, the Client must arrange for them to be inspected and maintained by a qualified arborist periodically and after each major weather event.

3.2 **Lightning Protection Systems**

(a) The Client acknowledges that lightning protection systems are intended to direct a portion of the electricity from a lightning strike down through the system into the ground, and mitigate the potential damage to the tree from a lightning strike, but that such systems cannot prevent damage to structures, nor can such systems prevent damage to trees caused by lightning entirely.

(b) The Client acknowledges that for lightning protection systems to function optimally, the Client must arrange for them to be inspected and maintained by a qualified arborist periodically and after each major weather event.

3.3 **Recreational Features**

(a) The Client acknowledges that Bartlett Tree Experts recommends stopping the use of, and removing, any tree house, ropes course, swing, or other recreational feature attached to a tree. Regardless of the health or condition of the tree, such features might be unsuited for the intended use or might place unpredictable forces on the feature or the tree, resulting in failure of the feature or the tree and injury to persons or damage to property. Bartlett Tree Experts is not responsible for the consequences of use of any such feature.

(b) The Client acknowledges that if a recommendation is made to mitigate an observed and immediate safety issue on a tree with any such device or feature attached, such as the removal of a dead, dying, or broken limb that could fall and injure a person or damage property, the Client should not infer that following the recommendation and mitigating the immediate safety issue makes the tree in question safe for the use of the attached device or feature.

3.4 **Root Pruning**

In the right circumstances, root pruning is a valuable and necessary service, but it might pose a risk to the health and structural integrity of trees. To limit that risk, Bartlett Tree Experts performs root pruning to industry standards, but the Client acknowledges that the health and structural integrity of trees within the Scope of Work might nevertheless be adversely affected by any root pruning performed as part of the Work. Bartlett Tree Experts shall assist the Client in understanding the risks involved before opting for root pruning, but the Client will be responsible for deciding to proceed with root pruning.

3.5 **Stumps, Stump Grinding, Tree Grates**

The Client acknowledges that if any recommendations call for the removal of certain trees, that the remaining stumps may present tripping hazards, and that it is the Client's responsibility to remove any such tripping hazard, whether such hazard is created by the stump, the grindings if the stump is ground down, or any tree grates that exist.

3.6 **Client Trees in Hazardous Condition**

If the Client Agreement specifies that one or more trees within the Scope of Work are in hazardous condition, have an *extreme*, *high* or *moderate risk rating*, or should be removed for safety reasons, the Client acknowledges that removing those trees would prevent future damage from trees or tree limbs falling. If the Client requests that one or more of those trees be pruned instead of removed, the Client acknowledges that although pruning might reduce the immediate risk of limbs falling, it does not preclude the possibility of future limb, stem, or root failure. Bartlett Tree Experts is not responsible for any such future failure.

3.7 **Trees in Poor Health or a Severe State of Decline**

The Client acknowledges that if a tree is in poor health or in a severe state of decline, Bartlett Tree Experts cannot predict how that tree will respond to any recommended plant health care or soil care and fertilization treatment and might not be able to prevent that tree from getting worse or dying.

3.8 **Trees Planted and Maintained by Other Contractors**

The Client acknowledges that if trees within the Scope of Work were recently planted or are being maintained by one or more other contractors or if one or more other contractors will be watering and providing services with respect to trees within

the Scope of Work, how those trees respond to treatment in the course of the Work might be unpredictable, and Bartlett Tree Experts cannot be responsible for the health of such trees or plants.

3.9 **Trees with Cones and Large Seed Pods**

The Client acknowledges that large tree cones or seedpods on some trees can become dislodged and fall without notice, creating a hazard to persons or property. If the Client has the type of tree on their property that produces large, heavy cones or seedpods, and the Client does not wish to remove the tree, Bartlett Tree Experts recommends that the Client marks off and restricts the area under and near the tree from pedestrian and vehicle traffic whenever possible, places a warning sign near the tree, remains aware of the hazardous conditions the falling cones can create, and inspects the tree annually and removes any observable cones if possible in order to mitigate the potential for damage from falling cones.

3.10 **Fire Damage**

(a) Regardless of the species, trees exposed to fire can suffer structural damage that goes beyond whatever external damage might be visible. Fire can cause cracking and brittleness in tree structure and integrity; it can make pre-existing defects worse; it can make roots less stable; and it can weaken the overall health of the tree, making it susceptible to disease and pest infestations. The effects of fire damage are unpredictable and difficult to determine. Bartlett Tree Experts is not responsible for any injury to persons or damage to property resulting from services performed on fire-damaged trees as part of the Work.

(b) The Client acknowledges that if trees and shrubs on the Client's property have been exposed to fire, the Client should have qualified arborist periodically inspect trees and shrubs on the property for fire damage.

Article 4
MISCELLANEOUS

4.1 **Client Responsibilities**

(a) The Client is responsible for the maintenance of the Client's trees, shrubs, and turf and for all decisions as to whether or not to prune, remove, or conduct other types of tree work on each respective tree, or when to prune, remove, or conduct other tree work on any respective tree, and all decisions related to the safety of each respective tree, shrub, and turf area.

(b) Nothing in this Agreement creates an ongoing duty of care for Bartlett Tree Experts to provide safety maintenance or safety inspections in and around the Client's property. It is the responsibility of the Client to ensure the safety of its trees and landscape, and to take appropriate actions to prevent any future tree or tree part breakage or failures, or otherwise remove any hazardous conditions which may be present or may develop in the future.

4.2 **Severability**

If any portion of this Client Agreement is found to be unenforceable, then only that portion will be stricken from the Client Agreement, and the remainder of the Client Agreement will remain enforceable.

4.3 **Unrelated Court Proceedings**

The Client acknowledges that Bartlett Tree Experts has prepared the Client Agreement solely to help the Client understand the Scope of Work and the related costs. If a court subpoenas Bartlett Tree Experts' records regarding, or requires that a Bartlett representative testify about, the Client Agreement or the Work in connection with any Proceeding to which Bartlett Tree Experts is not a party or in connection with which Bartlett Tree Experts has not agreed to provide expert testimony, the Client shall pay Bartlett Tree Experts Two Hundred Dollars ($200.00) per hour for time spent by Bartlett representatives in collecting and submitting documents for those Proceedings and attending depositions or testifying as part of those Proceedings.

4.4 **Third Party Liability**

The Client acknowledges that the use of any management plans created, reports written, recommendations, maps, sketches, and conclusions made are for the Client's use and are not intended to benefit or cause damage to any third party. Bartlett Tree Experts accepts no responsibility for any damages or losses suffered by any third party or by the Client as a result of decisions made or actions based upon the use of reliance of the management plans created, reports written, recommendations, maps, sketches, and conclusions made by any third party.

4.5 **Limitation of Liability**

The maximum liability of Bartlett Tree Experts for any losses incurred by the Client arising out of the Client Agreement or Bartlett Tree Experts' performance of the Work will be the amount paid by the Client for the Work, except in the case of negligence or intentional misconduct by Bartlett Tree Experts.

4.6 **Use of Information**

The Client acknowledges that the information provided within the Client Agreement and any deliverables provided is solely for the use of the Client for the intended purpose of helping the Client understand and manage their tree care needs. All deliverables must be used as a whole, and not separated or used separately for other purposes.

4.5 **Conflicting Terms**

If these terms conflict with the rest of the Client Agreement, the rest of the Client Agreement will prevail. If these terms conflict with any other Client documentation, terms, or purchase order agreement, then the Client Agreement and these terms will prevail.

4.6 **Entire Agreement**

The Client Agreement with these terms constitutes the entire understanding between the parties regarding Bartlett Tree Experts' performance of the Work and supersedes all other agreements, whether written or oral, between the parties.