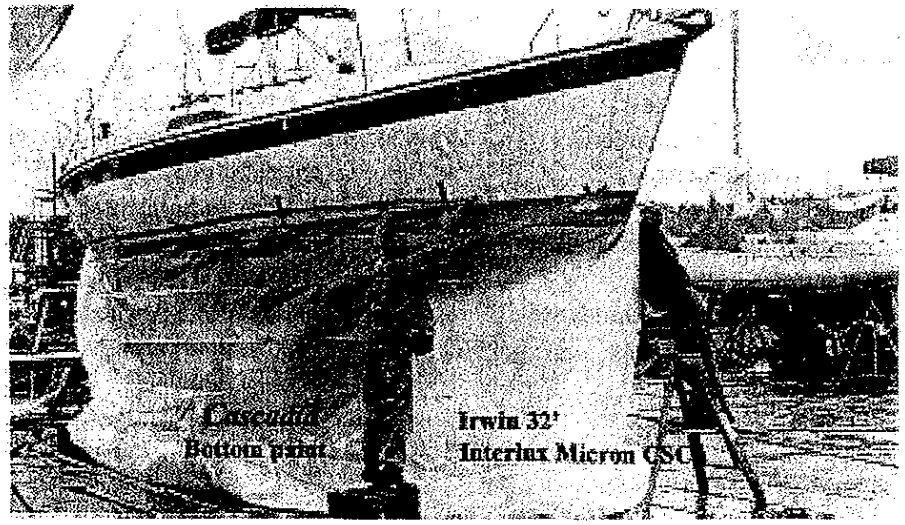
Dustless Sanding
Saves Money and Keeps Water Clean

In 1998, the Washington Department of Ecology, with the assistance of the Puget Soundkeeper Alliance, conducted a pilot project to assess all costs and environmental performance of two different bottom paint removal technologies. This demonstration project was co-sponsored by Mr. Neil Falkenburg of West Bay Marina, in Olympia, Washington. One side of the bottom of the project vessel was prepared with a vacuum sander while the other side was prepared with a traditional air rotary grinder. Then costs were compared.



The purpose of the demonstration was to determine if there were economic incentives to adopting dustless sanding technology in addition to the obvious environmental benefits. The NPDES Boatyard General permit is designed to control the release of pollutants into surface waters. The permit states:

> *When stripping, sanding, scraping, grinding, sandblasting, painting, coating and/or varnishing any portion of a vessel, all particles, oils, grits, dusts, flakes, chips, drips, sediments, debris and other solids shall be collected and managed to prevent their release into the environment and entry into waters of the state.*
>
> *Drop cloths, tarpaulins, structures, drapes, shrouding or other protective devices shall be secured around the vessel to collect all such material. The cleanup of all collected materials shall be routinely undertaken to prevent their release into the environment and entry into waters of the state. The use of vacuum sanders is recommended as a means to greatly reduce the amount of particulate released into the environment.*

The cost assessment conducted found boaters using vacuum sanders to prepare the bottom of a 32 foot sailboat for repainting could save $235 in material costs over the air rotary tool.

The economics are different for the boatyard than for an owner working on his boat. The boatyard must purchase the equipment. The Fein vacuum extractor 9-55-13 costs $250 and the Fein MSf 636-1 power head costs $535, for a total system cost of $785. The material cost savings on this project were $170. The system could be paid off in as little as five jobs. If the boatyard rented out the equipment at a rate of $50 per day, the system could be paid for in 16 rental days. If the purchase of the system coincided with the peak work season, the cost of the entire system could be recovered in just over two weeks.

Note: Special thanks are extended to Jeremiah Mitchel for his technical support to this project.
Partial funding for this project provided by a Public Participation Grant from the Washington State Department of Ecology.

Vacuum Sander

- ✓ Need only dust mask and eye protection.
- ✓ Sander safer and comfortable to use.
- ✓ Need only drop cloth
- ✓ Clean with dust completely contained in filter bag
- ✓ 98% dust-free, certified for lead abatement work.
- ✓ Sanding Pads last longer and plug less.
- ✓ Labor - $900.
- ✓ Material - $188 ($54 for boatyard).
- ✓ Total Costs - $1088

Traditional Air Rotary Tool

- ✓ Need respirator and protective coveralls.
- ✓ Safety equipment difficult to work in.
- ✓ Need drop cloth and plastic shrouding.
- ✓ Messy with large volume of solid wastes generated.
- ✓ More paint dust escapes due to positive pressure.
- ✓ Sanding pads gum up rapidly.
- ✓ Labor - $800.
- ✓ Materials - $424 ($224 for boatyard.)
- ✓ Total Costs - $1224

Discussion

All work was performed by qualified boatyard personnel and assigned a flat rate of $50 per hour. Boatyard permit requirements for tarping and shrouding were strictly adhered to. Material costs included duct tape, visqueen, sanding pads, filter bags, safety equipment and rental costs. Standard rental rates were used for equipment and respirator. Time to locate and rent equipment was not included.

Labor costs were similar, but vacuum sanding took slightly longer at 18 hours verses 16 hours. This was attributed to the size difference between the 6" vacuum sander pad and the 8" disc of the air rotary tool. There were significant material savings with the vacuum sander. This was a result of 168 fewer sanding pads gumming up with melted paint from frictional heat and less plastic and tape needed to shroud the vessel, in accordance with permit requirements.

Copper found in bottom paints is a major pollutant in stormwater runoff from boatyards; and a contaminant of marinas. The safe copper levels for our waters are in the low parts per billion while the copper in stormwater is measured in parts per million. The biggest problem is the do-it-yourselfer that walks away from a sanding job and leaves the mess to be blown by the wind or washed away by the rain. It makes no sense to spread the paint dust on the ground only to have to pick it up again. The volume of solid waste generated to contain the mess costs money to collect and dispose of. Vacuum sanders put 98% of the dust immediately into a filter bag, out of the elements and off others boats. Their use will keep your boatyard and marina a cleaner place. Consider the following:

- ❑ Prevent the transport of toxic paint dust into our lakes, streams and marine waters now, purchase a vacuum sander for your boatyard or marina.

Associated Earth Sciences, Inc.

January 19, 2006
Project No. KE05951A

Goodman Real Estate
2801 Alaskan Way, Suite 200
Seattle, Washington 98121

Attention: Mr. Matt Parent

Subject: Preliminary Geotechnical Feasibility Report
Yarrow Bay Marina
5207 Lake Washington Boulevard NE
Kirkland, Washington

Dear Mr. Parent:

We have prepared this letter to address the geotechnical feasibility of the subject project. We have previously performed a geotechnical study on the property for construction of a proposed office building on the east portion of the property. The previous study was performed in 2002 and was titled "Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report, Yarrow Bay Office Building" (KE02247). Our preliminary findings in this geotechnical feasibility report for the marina building project are based on subsurface information obtained for the previous study.

SITE AND PROJECT DESCRIPTION

The subject site is located at 5207 Lake Washington Boulevard NE in Kirkland, Washington. The site currently supports a marina building for support and fueling for moored boats. It is our understanding that the building will be completely removed and rebuilt in the northwest portion of the site. We understand that the new structure will be two stories with a basement and will likely use wood-frame or masonry construction. Project development is to include hazardous material storage in the basement of the proposed building. The existing fuel tanks on-site are expected to be relocated on-site and reused, and existing bulkheads may be modified to allow for alternative boat pier arrangements. We expect that new asphalt and/or concrete pavements will be constructed to the south and west of the proposed marina building. Foundations are expected to consist of either shallow conventional footings or piling with light to moderate foundation loads.

SUBSURFACE SOIL CONDITIONS

Subsurface soil conditions from our previous study indicate the presence of between 4 and 8 feet of loose, uncontrolled, undocumented fill overlying about 4 to 6 feet of alluvium consisting of medium dense, fine to medium sand. Below the alluvium is Possession Drift, a dense to hard, moist to saturated, fine to very fine sand to silt with very fine sand partings. Although the fill is not considered suitable for support of foundation units, we consider the Possession Drift material suitable for both conventional foundations and piling.

Ground water was encountered as shallow as 10 feet below existing site grades (elevation 20 feet) during our original explorations. Due to the proximity to Lake Washington and the fact that the ground water was encountered in soil interpreted to be alluvium, the ground water appears to be hydraulically connected to Lake Washington. Perched ground water should also be expected to be encountered elsewhere on the site within the existing fill soil.

The level of Lake Washington varies from a high of 22 feet to a low of 20 feet, as measured at the Ballard Locks. The highest lake levels occur in June and the lowest in December through February.

PRELIMINARY CONCLUSIONS AND RECOMMENDATIONS

Foundations

The proposed marina building will extend at least one story below existing grades. Design details are not available at this time; however, we expect that the new building will likely consist of wood-frame or masonry construction. We expect that between 10 and 12 feet of existing site soils will be excavated to allow for the construction of the basement. Temporary shoring and dewatering will likely be required as part of the anticipated lower level construction. Foundations for the proposed structure will include either shallow conventional foundations that extend through the existing fill soils, or if deeper fills are present, driven piling extending into bearing soils.

Conventional spread footings may be used for building support where medium dense or dense natural soil is encountered in the planned building excavation. Footings supported on these soils should have a minimum width of 16 inches and be designed using an allowable soil bearing pressure of 2,000 pounds per square foot (psf), including dead and live loads. Footing and slab subgrades must be protected from excess moisture and disturbance to maintain competent bearing surfaces. Inspections are recommended to verify the suitability of the footing subgrades prior to placing concrete. Footings supported on competent native soils or structural fill (minimum 95 percent compaction [ASTM:D 1557]) should experience less than ¾ inch total settlement and less than ½ inch differential settlement.

Where competent bearing soils cannot be reached by conventional footings, driven piling may be used. Piles should consist of 4-inch or larger, Schedule 40 steel pipe driven to refusal in the dense Possession Drift soils. Piling driven to refusal may be designed for a 20,000 pound allowable capacity subject to a load test at least two times the allowable pile load. Greater capacities can be generated using larger piles with suitable installation equipment. AESI will provide specific pile embedment refusal criteria and load test recommendations as the design develops. All steel piles should be provided with corrosion protection.

Geologic Hazards and Recommended Mitigation

Seismic Hazards

Seismic hazard areas are those areas which are susceptible to damage from earthquakes as a result of ground shaking, soil liquefaction-induced slope movement or settlement.

Based on the soils observed in our explorations, the shallow soils consist of loose to medium dense fill and medium dense alluvium, both of which are underlain by dense to hard Possession Drift. The Possession Drift and natural, medium dense soils are not considered liquefiable during design seismic events. Foundation elements supported on these sediments do not require liquefaction mitigation.

Guidelines presented in the 2003 *International Building Code* (IBC) Section 1615 may be used for project design. Information presented in Figure 1615(1) of the IBC indicates a mapped spectral acceleration for short periods of $S_s = 1.24$. Information presented in Figure 1615(2) of the IBC indicates a mapped spectral acceleration for a 1-second period of $S_1 = 0.42$. Based on the results of subsurface exploration and on an estimation of soil properties at depth utilizing available geologic data, Site Class "C" in conformance with Table 1615.1.1 of the IBC may be used. These values correspond to site coefficients $F_a = 1.0$ and $F_v = 1.4$ in conformance with IBC Tables 1615.1.2(1) and 1615.1.2(2), respectively.

Erosion Hazards

The near-surface site soils consist of loose, fine to medium sand (fill and/or alluvium) that, if exposed to concentrated water, would be susceptible to erosion. Erosion control efforts, such as maintaining vegetation cover, implementing and maintaining an erosion control plan during construction, and controlling surface water runoff both during and after construction will be crucial to mitigate the erosion effects and subsequent off-site transport of turbid water.

Further Studies

Additional exploration borings in the vicinity of the planned marina building are recommended to characterize subsurface soil and ground water conditions. AESI is preparing a scope and budget for this exploration work and a design-level geotechnical report.

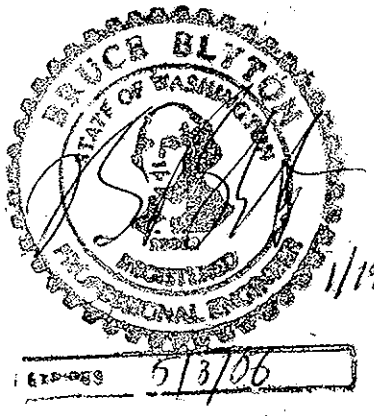
During the construction phase of the project, the existing fuel storage tanks are to be removed and relocated on-site. We recommend that AESI be present during the removal to observe construction activities and document the removal. Prior to underground storage tank (UST) removal, the owner must coordinate with and provide a licensed UST removal contractor to conduct the excavation.

When the UST is removed, the contents must be either stored or removed to an approved disposal facility. Provided the tanks are suitable for reuse, we anticipate that the UST tanks will be stored on-site during construction activities. If the tanks are not suitable for reuse, they should be disposed of at an approved disposal facility. Removal and disposal of any diesel-impacted soil should be performed during the initial excavations. AESI will not determine the suitability of the existing tanks for reuse on the site.

CLOSURE

We have enjoyed working with you on this preliminary study and are confident that these recommendations will aid in the successful completion of the project. If you should have any questions or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington



FOR

Edwardo Garcia, P.E.
Senior Staff Engineer

Bruce L. Blyton, P.E.
Principal Engineer

cc: Phil Goldenman
Waterfront Construction, Inc.
205 NE Northlake Way, Ste. 230
Seattle, Washington 98105
Fax: 206-548-1022

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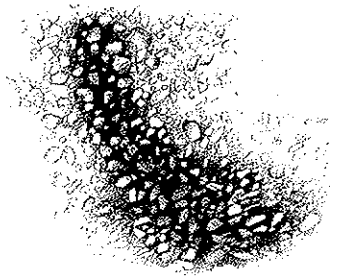
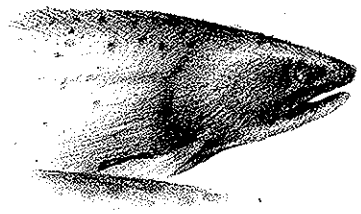
Geotechnical Engineering

Water Resources



Solid and Hazardous Waste



Ecological/Biological Sciences

Geologic Assessments

Associated Earth Sciences, Inc.

Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report

YARROW BAY OFFICE BUILDING

Kirkland, Washington

Prepared for

Marina Suites at Yarrow Bay
c/o Waterfront Construction, Inc.

Project No. KE02247A
June 24, 2002

Associated Earth Sciences, Inc.

June 24, 2002
Project No. KE02247A

Marina Suites at Yarrow Bay
c/o Waterfront Construction, Inc.
205 NE Northlake Way, Suite 230
Seattle, Washington 98105

Attention: Mr. Paul Wilcox

Subject: Subsurface Exploration, Geologic Hazard, and Preliminary Geotechnical Engineering Report
Yarrow Bay Office Building
5207 Lake Washington Boulevard NE
Kirkland, Washington

Dear Mr. Wilcox:

We are pleased to present the enclosed copies of the subject report. This report summarizes the results of our subsurface exploration, geologic hazards, and geotechnical engineering studies, and offers preliminary recommendations for the design of Yarrow Bay office building.

We have enjoyed working with you on this study, and are confident that the recommendations presented in this report will aid in the successful completion of your project. If you should have any questions, or if we can be of additional help to you, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

Bruce L. Blyton, P.E.
Principal Engineer

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SUBSURFACE EXPLORATION, GEOLOGIC HAZARD, AND PRELIMINARY GEOTECHNICAL ENGINEERING REPORT

YARROW BAY OFFICE BUILDING

Kirkland, Washington

Prepared for:
Marina Suites at Yarrow Bay
c/o Waterfront Construction, Inc.
205 NE Northlake Way, Suite 230
Seattle, Washington 98105

Prepared by:
Associated Earth Sciences, Inc.
911 5th Avenue, Suite 100
Kirkland, Washington 98033
425-827-7701
Fax: 425-827-5424

June 24, 2002
Project No. KE02247A

I. PROJECT AND SITE CONDITIONS

1.0 INTRODUCTION

This report presents the results of our subsurface exploration, geologic hazard, and geotechnical engineering study for the proposed Yarrow Bay office building. The site layout, including the location of explorations completed for this study, is presented on the Site and Exploration Plan, Figure 1. As development plans and construction techniques are developed, the conclusions and recommendations contained in this report should be reviewed and modified, or verified, as necessary.

1.1 Purpose and Scope

The purpose of this study was to provide subsurface data to be used in the preliminary design of the proposed office building. Our study included a review of available geologic literature, drilling exploration borings, and completing geologic studies to assess the type, thickness, distribution, and physical properties of the subsurface sediments and shallow ground water conditions. Geologic hazards evaluations and geotechnical engineering studies were also conducted to determine the suitable geologic hazard mitigation techniques, the type of suitable foundation, allowable foundation soil bearing pressures, anticipated settlements, basement/retaining wall lateral pressures, floor support recommendations, and drainage considerations. This report summarizes our current fieldwork and offers hazard mitigation and development recommendations based on our present understanding of the project.

1.2 Authorization

Written authorization to proceed with this study was granted by Mr. Paul Wilcox of Waterfront Construction, Inc. on May 10, 2002. Our study was accomplished in general accordance with our scope of work letter dated April 29, 2002. This report has been prepared for the exclusive use of the Marina Suites at Yarrow Bay and their agents, for specific application to this project. Within the limitations of scope, schedule, and budget, our services have been performed in accordance with generally accepted geotechnical engineering and engineering geology practices in effect in this area at the time our report was prepared. No other warranty, expressed or implied is made. Our observations, findings, and opinions are a means to identify and reduce the inherent risks to the owner.

2.0 PROJECT DESCRIPTION

This report was completed with an understanding of the project based on preliminary site sketches provided by the architect, Mithun, Inc. A boundary and topographic survey of the

existing conditions of the property entitle "New Lot 1, Yarrow Bay Marina" by Horton Dennis & Associates, Inc. February 27, 1997 was also available. We understand that the proposed development will consist of construction of a new office building, including two stories of underground parking (elevation 32 feet and 41 feet), office/parking at elevation 50 feet, and office space at elevation 62 feet and 74 feet. Construction of the lower floors will require cuts on the order of 35 feet below the elevation of Lake Washington Boulevard NE. Shoring will be required on the north and east sides of the proposed development. Other construction and design details were not available at the time of this report.

The property was located at 5207 Lake Washington Boulevard NE in Kirkland, Washington. The property generally sloped down from Lake Washington Boulevard NE (on the east) to Lake Washington, which borders the property on the west side. An approximate 8-foot-high rockery wall was located on the east side of the property, providing grade separation between Lake Washington Boulevard NE and the subject property. A series of gravel drive areas cross the site, creating level benches for boat and trailer parking. Along the west side of the property are the offices of the active Yarrow Bay Marina. An asphalt drive along the south side of the property provides access to the marina. The ground surface ranged from generally level to 1.5H:1V (Horizontal:Vertical) in between the level benches. These steeper slope areas were limited to approximately 6 to 8 vertical feet. Total elevation change across the property was on the order of 32 feet. Vegetation on the areas not paved consisted primarily of grasses.

A small cast-in-place concrete basement structure is located near the mid-section of the south side of the proposed building area. This structure is currently unused, and appears to be a remnant of an earlier residence/structure on the property.

3.0 SUBSURFACE EXPLORATION

Our field study included drilling a series of exploration borings to gain information regarding subsurface conditions in the area of the proposed office building. The various types of sediments, as well as the depths where characteristics of the sediments changed, are indicated on the exploration logs presented in the Appendix of this report. The depths indicated on the logs where conditions changed may represent gradational variations between sediment types in the field. The explorations were located generally within the footprint of the proposed office building.

The conclusions and recommendations presented in this report are based on the five exploration borings completed for this study. The number, locations, and depths of the explorations were accomplished within site and budgetary constraints. Because of the nature of exploratory work below ground, extrapolation of subsurface conditions between field explorations is necessary. It should be noted that differing subsurface conditions sometimes may be present between exploration locations due to the random nature of deposition and the

alteration of topography by past grading or filling. The nature and extent of any variations between the field explorations may not become fully evident until construction. If variations are observed at that time, it may be necessary to re-evaluate specific recommendations in this report and make appropriate changes.

3.1 Exploration Borings

The exploration borings were completed by advancing a 3^3/$_8$-inch inside-diameter, hollow-stem auger with a truck-mounted drill rig. During the drilling process, samples were obtained at generally 2½- or 5-foot intervals. The exploration borings were continuously observed and logged by a geotechnical engineer from our firm. The exploration logs presented in the Appendix are based on the field logs, drilling action, and inspection of the samples secured.

Disturbed but representative samples were obtained by using the Standard Penetration Test (SPT) procedure in accordance with ASTM:D 1586. This test and sampling method consists of driving a standard 2-inch outside-diameter, split-barrel sampler a distance of 18 inches into the soil with a 140-pound hammer that free falls a distance of 30 inches. The number of blows for each 6-inch interval is recorded, and the number of blows required to drive the sampler the final 12 inches is known as the Standard Penetration Resistance ("N") or blow count. If a total of 50 blows are recorded within one 6-inch interval, the blow count is recorded as 50 blows for the number of inches of penetration. The resistance, or N-value, provides a measure of the relative density of granular soils or the relative consistency of cohesive soils; these values are plotted on the attached exploration boring logs.

The samples obtained from the split-barrel sampler were classified in the field and representative portions placed in watertight containers. The samples were then transported to our laboratory for further visual classification, as necessary.

4.0 SUBSURFACE CONDITIONS

Subsurface conditions within the footprint of the proposed office building were inferred from the field explorations accomplished for this study, visual reconnaissance of the site, review of available geologic literature, and review of the topographic survey map. The following section presents more detailed subsurface information.

4.1 Stratigraphy

Fill

Fill soils (those not naturally placed) were encountered in each of the five exploration borings completed for this study. The fill ranged in thickness from 4½ to 8 feet. As noted on the

exploration logs, the fill varied from loose to medium dense, moist, brown to oxidized gray sand with variable amounts of silt and gravel. These fill materials vary in both quality and depth site. The fill likely originated from previous grading activities on the site and from construction of Lake Washington Boulevard NE. The existing fill soil is not considered suitable for structural support.

Alluvium

Below the surficial fill soil in EB-2, the soil was interpreted to be alluvium. This unit consisted of medium dense, moist to wet, greenish gray to tan, fine to medium sand with trace to some silt and trace gravel. This material was deposited by the nearby Lake Washington when the elevation of the water surface was higher than present day. The alluvium would be suitable for support of lightly loaded structures and for drive areas, following proper preparation.

Possession Drift

Below the alluvium in EB-2 and below the surficial fill soil in EB-1, EB-3, EB-4, and EB-5, the soil was interpreted to be Possession Drift. These sediments generally consisted of dense to hard, moist to saturated, fine to very fine sand to silt with very fine sand partings. Possession Drift was deposited in the Late Pleistocene prior to the arrival of the Vashon-age ice sheet. The unit extended below the termination depth of the exploration borings. This soil is considered suitable for structural support.

The above geologic interpretation of the subsurface soil is not in strict agreement with published geologic literature for the area. The *Geologic Map of the Kirkland Quadrangle, Washington* by James P. Minard (1983) shows the site as being underlain by modified land (i.e., fill soil). The *Geologic Map of Surficial Deposits in the Seattle 30' x 60' Quadrangle, Washington* by James C. Yount, James P. Minard, and Glenn R. Dembroff, 1993, also shows the site as being underlain by modified land. The Possession Drift and alluvium deposits identified within our explorations are not shown in the area of the site on either map. Modified/filled land may exist off-site in the immediate shoreline area and north of the site in the vicinity of the Carillon Point development area.

4.2 Hydrology

The alluvium within EB-2 became wet to saturated at a depth of approximately 10 feet (elevation 20 feet). This may be a localized wet zone of perched water as ground water was not encountered within the nearby EB-1. However, due to the proximity to Lake Washington and the fact that the ground water was encountered in soil interpreted to be alluvium, the ground water in EB-2 appears to be hydraulically connected to Lake Washington. Perched

ground water may also be encountered elsewhere on the site within the uncontrolled existing fill soil.

No ground water was encountered within EB-3, which was located at an approximate elevation of 44 feet. This exploration boring was terminated at 26.5 feet (elevation 17.5 feet).

Ground water was encountered within EB-4 at a depth of approximately 25 feet (elevation 30 feet) and within EB-5 at a depth of approximately 27 feet (elevation 31 feet). While drilling into the saturated zone of these exploration borings, heaving soils were encountered. This ground water was interpreted to represent the actual water table in the area. The aquifer appears to be confined (under hydrostatic pressure), as the elevation of the water within EB-4 continued to rise after completion of the exploration boring. In EB-4, the water surface rose to an elevation of approximately 41 feet and was accompanied by approximately 9 feet of heave within the hollow-stem augers.

The level of Lake Washington varies from a high of 22 feet to a low of 20 feet, as measured at the Ballard Locks. The highest lake levels occur in June and the lowest in December through February.

II. GEOLOGIC HAZARDS AND MITIGATIONS

The following discussion of potential geologic hazards is based on the geologic, slope, and ground water conditions as observed and discussed herein. The approximate western half of the site lies within a Seismic Hazard area, according to City of Kirkland *Sensitive Areas Maps*. The upper, western portion of the site is mapped by the City as a moderate Landslide and Erosion Hazard Area. The discussion will be limited to potential seismic, land sliding or mass wasting, and erosion hazards.

5.0 SEISMIC HAZARDS AND RECOMMENDED MITIGATION

Earthquakes occur in the Puget Lowland with great regularity. The majority of these events are small and are usually not felt. However, large earthquakes do occur, as evidenced by the 1949, 7.2 magnitude event, the 1965, 6.5 magnitude event, and the 2001, 6.8 magnitude event. The 1949 earthquake appears to have been the largest in this area during recorded history. Evaluation of earthquake return rates indicates that an earthquake of the magnitude between 5.5 and 6.0 is likely within a given 25- to 40-year period.

Generally, there are four types of potential geologic hazards associated with large seismic events: 1) surficial ground rupture; 2) seismically induced landslides; 3) liquefaction; and 4) ground motion. The potential for each of these hazards to adversely impact the proposed project is discussed below.

5.1 Surficial Ground Rupture

The nearest known fault trace to the project is the Seattle fault. Recent studies by the U.S. Geological Survey (e.g., Johnson et al., 1994, *Origin and Evolution of the Seattle Fault and Seattle Basin, Washington*, Geology, v.22, p. 71-74; and Johnson et al., 1999, *Active Tectonics of the Seattle Fault and Central Puget Sound Washington – Implications for Earthquake Hazards*, Geological Society of America Bulletin, July 1999, v.111, n. 7, p. 1042-1053) suggest that an east-to-west-trending thrust fault zone (Seattle fault) may project about 4 miles south of the project site. The recognition of this fault is relatively new, and data pertaining to it are limited, with the studies still ongoing. According to the U.S. Geological Survey studies, the latest movement of this fault was about 1,100 years ago when about 20 feet of surficial displacement took place. This displacement can presently be seen in the form of raised, wave-cut beach terraces along Alki Point in West Seattle and along Restoration Point at the south end of Bainbridge Island. The recurrence interval of movement along these fault systems is still unknown, although it is hypothesized to be in excess of several thousand years.

Due to the suspected long recurrence interval, the potential for ground rupture is considered to be low during the expected life of the structure. It is our opinion, based on existing geologic

data, that the risk of surface rupture impacting the proposed project is low and no mitigations are recommended.

5.2 Seismically Induced Landslides

The site gradually slopes down to the west at an approximate slope of 7H:1V. There are steeper areas on the site in between the gravel drives for boat parking. These steeper areas are inclined at an approximate 1.5H:1V slope. However, the vertical height of these slopes is 6 to 8 feet. Additionally, glacially consolidated soil (below a thin layer of surficial fill soil) was encountered within the explorations completed for this study. Therefore, the landslide risk is considered low and no mitigations are necessary. Shoring will be required along the north and east sides of the site. Shoring is discussed in Section 9.0 of this report.

5.3 Liquefaction

Liquefaction is a condition where loose, saturated, typically sandy soils lose shear strength when subjected to high intensity, cyclic loads, such as occur during earthquakes. The resulting reduction in strength can cause differential foundation settlements and slope failures. Loose, saturated, fine-grained sands that cannot dissipate the buildup of pore water pressure are the predominant type of sediments subject to liquefaction.

The encountered stratigraphy has a low potential for liquefaction due to the hard to very dense condition of the soil and the absence of adverse ground water conditions. Ground water was encountered at a shallow depth in EB-2. However, the soil was medium dense and the water was not encountered in nearby exploration borings. As such, no liquefaction mitigations are required.

5.4 Ground Motion

Based on the site stratigraphy and visual reconnaissance of the site, in our opinion, earthquake damage to the proposed structures founded on a suitable bearing strata would likely be caused by the intensity and acceleration associated with the event and not any of the above-discussed impacts. Structural design of the building should follow *Uniform Building Code* (UBC) standards and take into consideration stress caused by seismically induced earth shaking using a Seismic Zone Factor (Z) of 0.3 (Table 16-I) and Soil Profile Type S_D (Table 16-J).

6.0 EROSION HAZARDS AND MITIGATION

To mitigate the erosion hazard potential and off-site sediment transport during and after construction, we would recommend the following:

1. All storm water from impermeable surfaces, including roadways and roofs, should be tightlined into approved facilities.

2. Clean water entering construction areas should be collected and routed around disturbed areas and released below construction limits in accordance with applicable permits.

3. Temporary sediment catchment/treatment facilities should be constructed to intercept and treat any sediment-laden water from the construction area.

4. To the extent possible, existing paved access surfaces should be left intact and used during construction. Exposed soil that will be subject to repeated ingress/egress traffic should be covered with a layer of crushed quarry rock of asphalt treated base (ATB).

5. Check dams should be used along drainage swales, and silt fences should be placed along the lower elevations of clearing on the property.

6. If possible, construction should proceed during the drier periods of the year and disturbed areas should be re-vegetated as soon as possible. Temporary erosion control measures should be maintained until permanent erosion control measures are established.

7. Soils that are to be reused around the site should be stored in such a manner as to reduce erosion. Protective measures may include, but are not necessarily limited to, covering with plastic sheeting, the use of low stockpiles in flat areas, or the use of hay bales/silt fences. Due to the limited space on the site, it is not anticipated that large quantities of excess soil will be stockpiled on-site.

III. DESIGN RECOMMENDATIONS

7.0 INTRODUCTION

Our explorations indicate that, from a geotechnical standpoint, the parcel is suitable for the proposed development provided that the recommendations contained herein are properly followed. The bearing stratum is relatively shallow in most areas and conventional spread footing foundations may be used for structural support. Overexcavation is anticipated to be necessary to reach bearing soil in the northwest corner of the building. Moderate ground water seepage is expected at excavation level in the eastern portion of the building. Shallow swales/sumps are expected to be capable of collecting and controlling the seepage during construction. Conventional wall, footing, and sub-slab drainage (eastern half of the building) are recommended for permanent control of seepage. Shoring will be required along the north and east sides of the excavation. Soldier piling (cantilever and tied-back) is recommended for this site.

8.0 SITE PREPARATION

Old foundations presently on the site that are under building areas or not part of future plans should be removed. Any buried utilities should also be removed or relocated if they are under building areas. The resulting depressions should be backfilled with structural fill (if they are below planned building excavation levels) as discussed under the *Structural Fill* section.

Site preparation of planned building and road/parking areas should include removal of all trees, brush, debris, and any other deleterious material. Additionally, the upper organic topsoil should be removed and the remaining roots grubbed. Areas where loose surficial soils exist due to grubbing operations should be considered as fill to the depth of disturbance and treated as subsequently recommended for structural fill placement.

Existing fill should be stripped down to the underlying medium dense to very dense/hard natural soil. Since the density of the soil is variable, random soft pockets may exist and the depth and extent of stripping can best be determined in the field by the geotechnical engineer or engineering geologist. We recommend that pavement and slab areas be proof rolled with a loaded dump truck to identify any soft spots; soft areas should be overexcavated and backfilled with structural fill.

Some areas of the site will require overexcavation to expose suitable bearing soil, such as in the vicinity of EB-2. At the location of EB-2, overexcavation on the order of 13 feet may be required. The upper 12 inches of the exposed soils should then be recompacted to 90 percent

of ASTM:D 1557. The area could then be backfilled to footing subgrade elevation with structural fill as discussed in the section on *Structural Fill*.

8.1 Temporary Cut Slopes

In our opinion, stable construction slopes should be the responsibility of the contractor and should be determined during construction based on local conditions encountered at that time. For estimating purposes, however, we anticipate that temporary, unsupported cut slopes in the existing fill and the alluvium can be planned at a maximum slope of 1.5H:1V. Temporary, unsupported cut slopes in the underlying Possession Drift can be planned at a maximum slope of 1H:1V. If ground water seepage is encountered during construction, the temporary slopes may have to be laid back at a shallower inclination, or protected with crushed rock to reduce piping of the sediments. As is typical with earthwork operations, some sloughing and raveling may occur and cut slopes may have to be adjusted in the field. In addition, WISHA/OSHA regulations should be followed at all times.

8.2 Site Disturbance

The on-site soils contain a high percentage of fine-grained material that makes them moisture-sensitive and subject to disturbance when wet. The contractor must use care during site preparation and excavation operations so that the underlying soils are not softened. If disturbance occurs, the softened soils should be removed and the area brought to grade with structural fill. Consideration should be given to protecting access and staging areas with an appropriate section of crushed rock or ATB. We recommend leaving as much existing asphalt as is possible to serve as an access road.

If crushed rock is considered for the access and staging areas, it should be underlain by an engineering stabilization fabric to reduce the potential of fine-grained materials pumping up through the rock and turning the area to mud. The fabric will also aid in supporting construction equipment, thus reducing the amount of crushed rock required. We recommend that at least 10 inches of rock be placed over the fabric; however, due to the variable nature of the near-surface soils and differences in wheel loads, this thickness may have to be adjusted by the contractor in the field.

8.3 Construction Dewatering

Ground water was encountered while drilling EB-2, EB-4, and EB-5 at approximate elevations 7 feet, 30 feet, and 30 feet, respectively. As such, seepage into the building excavation (finish floor at approximate elevation 32), particularly in the eastern portion in the representative areas of EB-4 and EB-5, is likely. Since the sediments are predominately very fine sands and silts, the flow rates per unit area are expected to be small. Dewatering can therefore be

planned to be accomplished by placing a series of shallow perimeter swales/ditches with open sumps that can be pumped, as necessary, to keep water outside the main work area.

Ground water seepage and associated caving/heaving conditions are expected at greater depths and will likely be encountered in the solider pile holes. Use of temporary casing, drilling, fluid, and/or maintaining a compensating head of water on these deeper-drilled shafts will likely be required to keep the holes open during drilling and placement/grouting of the piling.

Permanent drainage for the building envelope (footing, wall, and sub-slab drains) should be provided as discussed in Section 14.0, *Drainage Considerations*, and Section 9.6, *Wall Drainage*.

9.0 SHORING

Excavation for construction of the proposed office building will require maximum vertical cuts of approximately 28 feet along the north and east sides of the footprint of the building. Along the east side, an existing 8-foot-high rockery wall provides grade separation between the upper Lake Washington Boulevard NE and the site. It is anticipated that this rockery may be left intact, and a shoring wall placed west of the rockery base. This wall would extend approximately 28 feet below the current rockery base. This section of the report presents preliminary design criteria for design of shoring for the excavation.

The most common method of shoring used in the Puget Sound area consists of wide-flange steel beams (soldier piles). For excavations of approximately 15 feet or less, the soldier piles typically may be cantilevered without the use of tiebacks or bracing. Soldier piles are placed in pre-drilled holes that extend below the bottom of the excavation. The portion of each soldier pile extending below the bottom of the excavation is grouted in place with sufficient strength concrete to transmit the load from the soldier beams into the soil below the excavation level. The upper portion of the soldier pile is then backfilled with a relatively weak grout so that it may be removed as necessary for placement of lagging.

During drilling, ground water flow, caving, and possible heaving conditions should be expected. Use of drilling fluids, water heading, and/or temporary casing of the holes should therefore be anticipated to complete the holes. Loose materials and drilling fluids should be removed/displaced prior to/during concrete placement.

Shoring may be designed to resist active lateral earth pressures. An active earth pressure condition theoretically assumes that the wall is allowed to yield laterally approximately one-tenth of 1 percent of the wall height. This small amount of yielding typically results in some minor settlement behind the wall. Considering the dense nature of the glacial sediments underlying the site, it is anticipated that the influence of wall deflection during construction

should be minimal. If minor settlement does occur, we estimate it will occur within a distance behind the wall equal to the height of the wall. The tolerance for settlement should be decided upon before completing the shoring design.

For excavations of 15 feet or less, the soldier piles typically may be cantilevered without the use of bracing. For wall heights such that a cantilever wall is not feasible, the wall will have to be anchored as the excavation progresses. We recommend anchoring the wall using tiebacks. A tieback system usually consists of drilling behind the soldier pile wall at an angle below horizontal and installing high strength rods or cables with a grout anchor. Easements will have to be obtained for any necessary tieback anchors. The anchor holes should be drilled in a manner to minimize loss of ground and not endanger adjacent anchors, surrounding subgrades, or buried utilities due to subsidence. Any permanent shoring elements should be provided with suitable corrosion protection.

9.1 Lateral Earth Pressures for Retained Soil

For a cantilever shoring system, the applied lateral pressure can be represented by a triangular pressure distribution termed as an equivalent fluid density. We have provided equivalent fluid densities for shoring design based on a level backslope. Surcharge loads from Lake Washington Boulevard NE have been added for design of the east shoring wall. Pressure distributions are shown on the attached Figure 2. The active pressure distribution should be assumed to be applied over the pile spacing above the base of the excavation. Below the base of the excavation, the active pressure should be applied over one concreted soldier pile diameter.

9.2 Passive Soil Resistance

To resist lateral loads, an allowable passive equivalent fluid unit weight of 350 pounds per cubic foot (pcf) should be used for design assuming the soldier piles are embedded in undisturbed, dense to hard Possession Drift sediments. The piles in the vicinity of EB-2 should be designed to accommodate overexcavation to approximate elevation 18 to reach bearing soils in this area. The passive fluid pressure can be assumed to act over two concreted pile diameters. The passive envelope should be truncated to neglect the first 2 feet of pile penetration below the base of the lowest adjacent excavation elevation. The passive pressure presented incorporates a factor of safety of at least 2.0.

9.3 Vertical Pile Loads

Soldier piles for shoring are typically set in pre-augured holes and backfilled with lean or structural concrete. Vertical loads on piles could be resisted by a combination of friction and end bearing. We recommend an allowable side friction value of 400 pounds per square foot (psf) and an end bearing value of 30 kips per square foot (ksf) for design. Side friction should

be neglected within the upper 2 feet below the base of the excavation. The 10 ksf end bearing value is predicated on embedment of at least 10 feet below the base of the excavation and assumes penetration into the dense to hard Possession Drift sediments. These values include a factor of safety of at least 1.5. Embedment depths of soldier piles below final excavation level must be designed to provide adequate lateral and/or kickout resistance to horizontal loads and satisfy moment equilibrium.

9.4 Tiebacks

Tieback anchors will be necessary for lateral support of the higher segments of the soldier pile wall. Any permanent anchors should be provided with double corrosion protection. The tieback anchors may be designed with a tentative allowable tieback-soil adhesion of 1,000 psf when the anchor is located in glacially consolidated soil (such as the Possession Drift). The anchors must extend behind the no-load zone as defined on Figure 2.

Tieback anchors should be constructed with centralizers/spacers along the bonded length to keep the anchor centered within the drilled hole. Tiebacks should also be fitted with a bond breaker, such as solid PVC pipe, in the no-load zone.

Anchor tests must be performed to verify that the design resistance is available on the installed anchors. A common anchor testing program would consist of at least two 200 percent verification tests of the design or allowable load in each major soil unit, plus proof loading every production anchor to 130 percent of the design load. These tests should conform to the recommendations of the Post-Tensioning Institute for verification testing and proof loading of production anchors. Anchor tests and their results should be observed and recorded by a representative of Associated Earth Sciences, Inc. (AESI). Anchors should be locked off at 100 percent of the design loads. The anchors should be designed to fail by anchor pullout rather than by yielding steel.

9.5 Lagging

We recommend that the soldier piles be spaced at maximum distance of 8 feet on-center. The entire space between the piles should be temporarily retained using treated wood lagging. Lagging should be designed for 50 percent of the lateral loads. This reduced value is due to "soil arching" between the piles. Soils should be excavated from between the piles to facilitate placement of the wood lagging over the full retained soil height. Voids behind the lagging must be backfilled with washed pea gravel or clean, free-draining sand and gravel material.

9.6 Wall Drainage

Saturated conditions were encountered during our subsurface exploration program. Therefore, seepage within the retained height is expected. Backfilling of the voids behind the lagging with

a free-draining material will allow collected water to seep through the lagging. However, where the wall will have a permanent concrete facing, a drainage composite between the lagging and the concrete facing should be installed to provide an outlet for the accumulated seepage. Weep holes through the concrete facing and collection pipes at the wall base should also be provided.

9.7 Inspections

Since completion of the piling and tiebacks takes place below ground, the judgment and experience of the geotechnical engineer or his field representative must be used as a basis for determining the acceptability of each pile. Consequently, the use of the presented design information requires that a qualified geotechnical engineer or engineering geologist from our firm inspect all piles and shoring installation. AESI, acting as the owner's field representative, would keep records of pertinent installation data. A final summary report would then be distributed following completion of pile installation.

9.8 Monitoring

A survey of the surrounding structures and other critical reference points should be performed prior to construction activities. These points should then be accurately monitored, both horizontally and vertically by a licensed surveyor, until the excavation is complete and permanent walls are constructed. A photographic and/or video survey is also recommended for surrounding structures to document their condition prior to development. This monitoring would act to provide early notice of site settlement and provide an accurate record of pre-construction site conditions.

10.0 STRUCTURAL FILL

Structural fill may be necessary to establish desired grades, backfill around foundations, and for utility trench backfill. All references to structural fill in this report refer to subgrade preparation, fill type, and placement and compaction of materials as discussed in this section. If a percentage of compaction is specified under another section of this report, the value given in that section should be used.

After overexcavation/stripping has been performed to the satisfaction of the geotechnical engineer/engineering geologist, the upper 12 inches of exposed ground should be recompacted to at least 90 percent of the modified Proctor maximum density using ASTM:D 1557 as the standard. If the subgrade contains too much moisture, adequate recompaction may be difficult or impossible to obtain and should probably not be attempted. In lieu of recompaction, the area to receive fill should be blanketed with washed rock or quarry spalls to act as a capillary break between the new fill and the wet subgrade. Where the exposed ground remains soft and

further overexcavation is impractical, placement of an engineering stabilization fabric may be necessary to prevent contamination of the free-draining layer by silt migration from below.

After recompaction of the exposed ground is tested and approved, or a free-draining rock course is laid, structural fill may be placed to attain desired grades. Structural fill is defined as non-organic soil, acceptable to the geotechnical engineer, placed in maximum 8-inch loose lifts with each lift being compacted to at least 95 percent of ASTM:D 1557. In the case of roadway and utility trench filling, the backfill should be placed and compacted in accordance with the City of Kirkland codes and standards. The top of the compacted fill should extend horizontally outward a minimum distance of 3 feet beyond the location of footings or roadway edges before sloping down at a maximum angle of 2H:1V.

The contractor should note that any proposed fill soils must be evaluated by AESI prior to their use in fills. This would require that we have a sample of the material 48 hours in advance to perform a Proctor test and determine its field compaction standard. Soils in which the amount of fine-grained material (smaller than the No. 200 sieve) is greater than approximately 5 percent (measured on the minus No. 4 sieve size) should be considered moisture-sensitive. Use of moisture-sensitive soil in structural fill should be limited to favorable dry weather and dry subgrade conditions. The on-site soils generally contained significant amounts of silt and are considered moisture-sensitive. In addition, construction equipment traversing the site when the soils are wet can cause considerable disturbance. If fill is placed during wet weather or if proper compaction cannot be obtained, a select import material consisting of a clean, free-draining gravel and/or sand should be used. Free-draining fill consists of non-organic soil with the amount of fine-grained material limited to 5 percent by weight when measured on the minus No. 4 sieve fraction.

A representative from our firm should inspect the stripped subgrade and be present during placement of structural fill to observe the work and perform a representative number of in-place density tests. In this way, the adequacy of the earthwork may be evaluated as filling progresses and any problem areas may be corrected at that time. It is important to understand that taking random compaction tests on a part-time basis will not ensure uniformity or acceptable performance of a fill. As such, we are available to aid the owner in developing a suitable monitoring and testing frequency.

11.0 FOUNDATIONS

11.1 Bearing Pressures

Spread footings may be used for foundation support when founded on medium dense to hard natural soils or structural fill placed as previously discussed. To limit the potential for differential settlements, we recommend that building foundations (columns, perimeter walls,

interior bearing walls) be founded on the undisturbed very dense/hard sand/silt (Possession Drift) sediments. Footings supported on these soils may be designed for an allowable bearing pressure of 6,000 psf including both dead and live loads. An increase of one-third may be used for short-term wind or seismic loading.

In the vicinity of EB-2, overexcavation to an estimated elevation of 18 feet is anticipated to reach bearing soils. Footings may be stepped down to reach bearing soil or the excavation backfilled with lean concrete/controlled density fill (CDF) to reach design elevation. We recommend at least partial backfill to bring footing levels above lake level and seepage zones. Lean mix/CDF should extend beyond the footing perimeters a distance equal to at least one-half the fill depth. The lean mix/CDF should have a 28-day compressible strength equal to 400 pounds per square inch (psi). These materials should be sampled and tested by a concrete test lab at the time of placement.

For secondary structures (landscape walls, lightly loaded entry canopy columns, etc.), an allowable bearing pressure of 2,000 psf may be used for design purposes, including both dead and live loads. These footings may be placed on medium dense/medium stiff natural soils, or structural fill. An increase of one-third may be used for short-term wind or seismic loading.

11.2 Base Friction

Footings may be designed using a base friction coefficient of 0.35. This is an allowable value and includes a factor of safety of at least 1.5.

11.3 Minimum Depth

All footings should be buried at least 18 inches into the surrounding soil for frost protection. However, all footings must penetrate to the prescribed bearing stratum and no footing should be founded in or above loose, organic, or existing fill soils. Building footings should have a minimum width of 24 inches.

It should be noted that the area bounded by lines extending downward at a 1H:1V inclination from any footing must not intersect another footing or intersect a filled area that has not been compacted to at least 95 percent of ASTM:D 1557. In addition, a 1.5H:1V line extending down from any footing must not daylight because sloughing or raveling may eventually undermine the footing. Thus, footings should not be placed near the edge of steps or cuts in the bearing soils.

11.4 Subgrade Protection

Although the bearing soils are very dense/hard, they are subject to softening when exposed to moisture and disturbance. Depending on weather and ground water seepage conditions at the time of construction, a concrete "mud mat" may be used to protect the bearing surfaces.

11.5 Foundation Settlement

Anticipated settlement of footings founded on approved bearing sediments or approved structural fill should be on the order of ¾ inch. However, disturbed soil not removed from footing excavations prior to footing placement could result in increased settlements.

11.6 Footing Inspections

All footing areas should be inspected by AESI prior to placing concrete to verify that the design bearing capacity of the soils has been attained and that construction conforms to the recommendations contained in this report. Such inspections may be required by the City of Kirkland. Perimeter footing drains should be provided as discussed under the section on *Drainage Considerations*.

12.0 RETAINING WALLS

Permanent basement walls should be designed for the same lateral earth pressure as the shoring walls (35 pcf equivalent fluid), plus any applicable surcharge loadings (traffic, slopes, adjacent structures, etc).

Other cantilever retaining walls (landscape walls, etc.) may also be designed for a 35 pcf equivalent fluid density. Rigid, braced walls should be designed for an equivalent fluid of 50 pcf, plus any applicable surcharges.

Wall backfill must be free-draining (minimum 5 percent passing the No. 200 sieve, based on the minus No. 4 sieve fraction) and footing drains/weep holes provided for the above values to apply.

13.0 FLOOR SUPPORT

A slab-on-grade floor may be used over structural fill or natural sediments. Where moisture migration through the floor slab is to be controlled, the floor should be cast atop a minimum of 4 inches of pea gravel or washed ½-inch to 1-inch (no fines) crushed rock to act as a capillary break. A polyethylene plastic vapor barrier should also be used under the floor to help prevent

passage of moisture vapor through the floor. Based on American Concrete Institute recommendations, we suggest placing a 2- to 3-inch layer of clean sand over the vapor barrier to protect the barrier and to allow some moisture loss through the bottom of the slab to aid in the curing process.

Where ground water seepage is encountered at the slab subgrade elevation, installation of a sub-slab drainage system is recommended, as discussed in Section 14.0, *Drainage Considerations*.

14.0 DRAINAGE CONSIDERATIONS

14.1 Foundation Drains

Permanent foundation walls should be provided with a drain at the base of the footing elevation. Drains should consist of rigid, perforated, PVC pipe surrounded by washed pea gravel. The level of the perforations in the pipe should be set approximately 2 inches below the bottom of the footing and the drain should be constructed with sufficient gradient to allow gravity discharge away from the building.

14.2 Retaining Wall Drainage

All retaining walls should be lined with a minimum 12-inch-thick washed gravel blanket, a synthetic drainage composite, or backfilled with free-draining fill to within 2 feet of the ground surface. Drainage materials must be hydraulically connected to a footing drain or weep holes at the wall base. In planning, exterior grades adjacent to walls should be sloped downward away from the structure to achieve surface drainage.

If permanent foundation walls are cast directly against the shoring walls, proper drainage should be provided to control moisture and prevent the buildup of hydrostatic pressure against the wall. At a minimum, we recommend that a synthetic drainage medium, such as Enkadrain or Miradrain, be installed at regular spacings on the face of the soldier pile wall. The drainage medium should then be covered with plastic sheeting (12-mil minimum thickness) prior to concrete placement. The drainage medium should discharge to a permanent drainage system either on the inside or outside of the permanent foundation wall. The drainage system should consist of a rigid, perforated PVC pipe, fully enveloped in washed pea gravel. The drainage pipe should be tightlined to an approved discharge. The drainage pipe and tightline should be sloped to the gravity drain.

14.3 Sub-Slab Drains

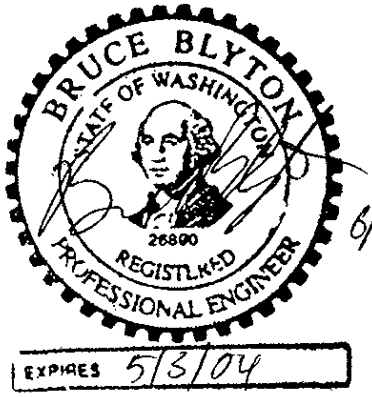
In the approximate eastern half of the building, EB-4 and EB-5 encountered free ground water at approximate elevation 30. The maximum seepage level may be higher than this observation and could exceed the planned basement finish floor elevation of 32. We therefore recommend that sub-slab drains be planned for the eastern portion of the building. These drains typically consist of a series of perforated drainpipes spaced at regular intervals (15 to 25 feet) and sloped to initiate flow to a collection point(s). The pipes are bedded in shallow trenches dug below the slab subgrade and backfilled with pea gravel/drain rock. Flow volumes are typically sufficiently small to be accommodated by 6-inch-diameter pipe. The lateral extent of slab subdrains may be adjusted for conditions observed during excavation of the basement level.

15.0 PROJECT DESIGN AND CONSTRUCTION MONITORING

We are available to provide additional consultation as the project design develops and possibly changes from that upon which this report is based. We are also available to provide geotechnical engineering monitoring services during construction. In the event that variations in subsurface conditions become apparent during construction, engineering decisions may have to be made in the field.

We have enjoyed working with you on this study and are confident these recommendations will aid in the successful completion of your project. Should you have any questions, or require further assistance, please do not hesitate to call.

Sincerely,
ASSOCIATED EARTH SCIENCES, INC.
Kirkland, Washington

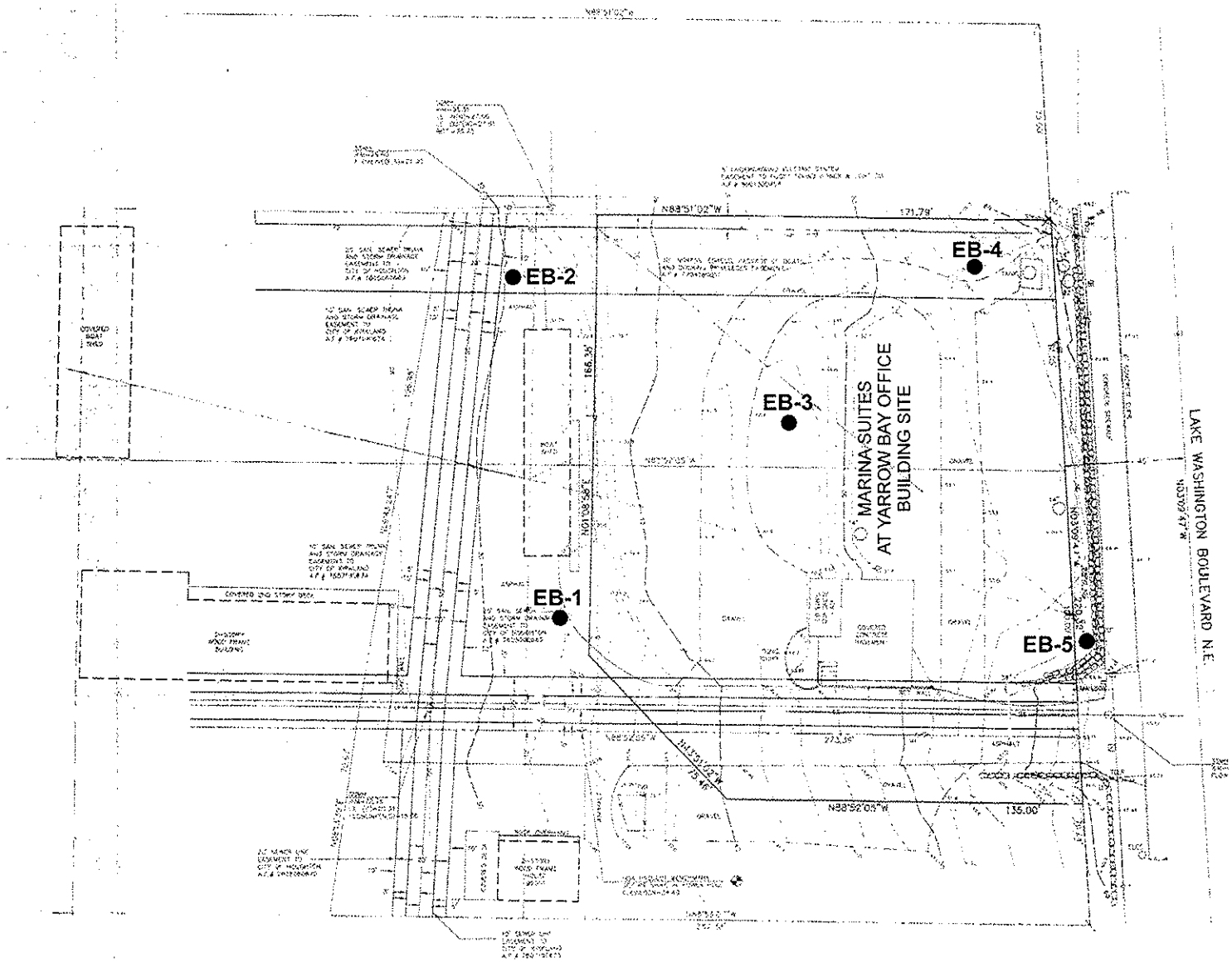


6/24/02

Melissa A. Magnuson, P.E.
Project Engineer

Bruce L. Blyton, P.E.
Principal Engineer

Attachments: Figure 1: Site and Exploration Plan
Figure 2: Soldier Pile Retaining Wall Design Criteria
Appendix: Exploration Logs



LEGEND

EB-1 ● Approximate location of exploration boring

N

0 60

SCALE IN FEET

REFERENCE: HORTON DENNIS & ASSOCIATES, INC., 2/27/97.

Associated Earth Sciences, Inc.

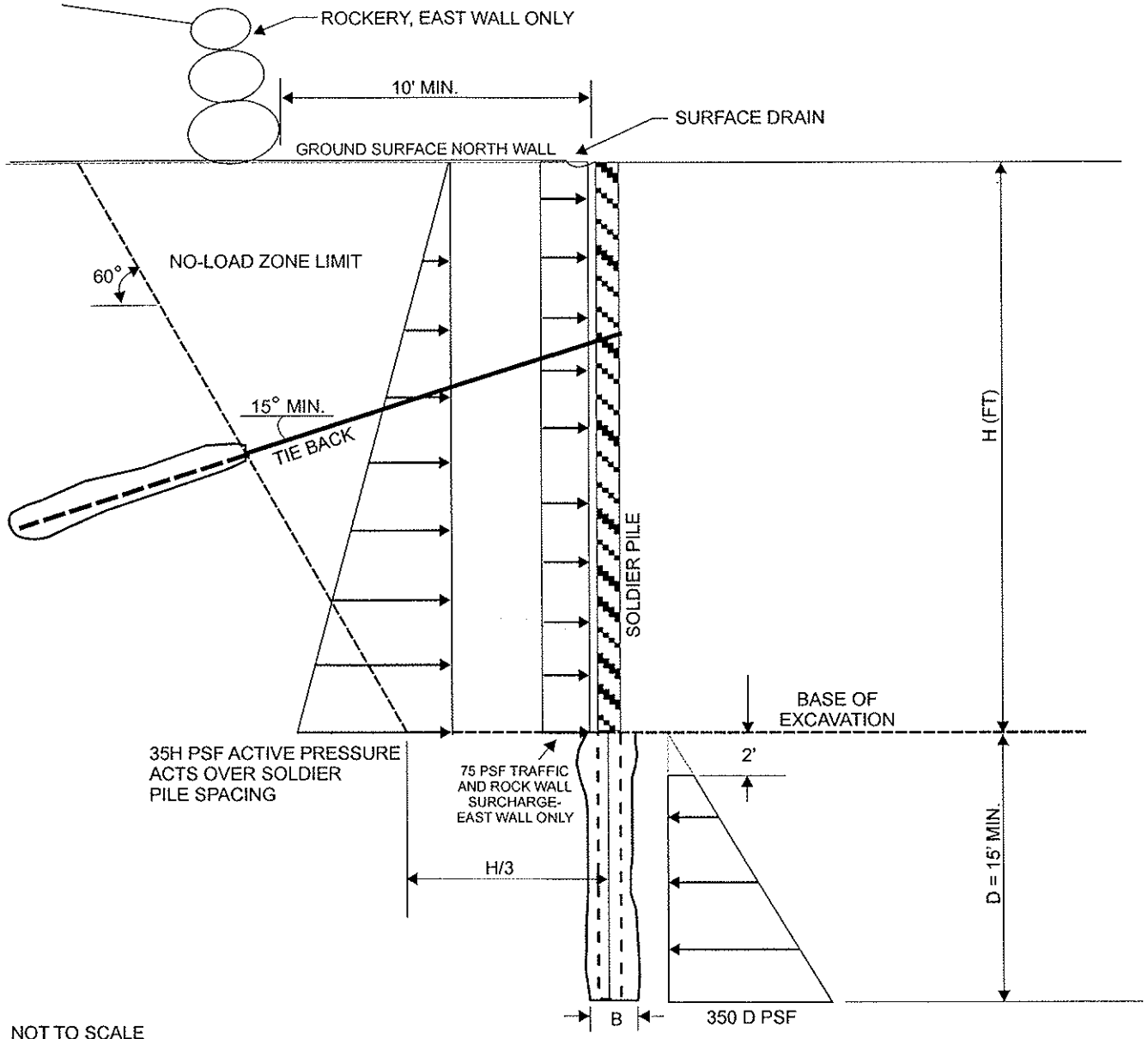
SITE AND EXPLORATION PLAN
YARROW BAY OFFICE BUILDING
KIRKLAND, WASHINGTON

FIGURE 1

DATE 6/02

PROJ. NO. KE02247A

02247 yarrow bay office bldg\02247-site.cdr page1

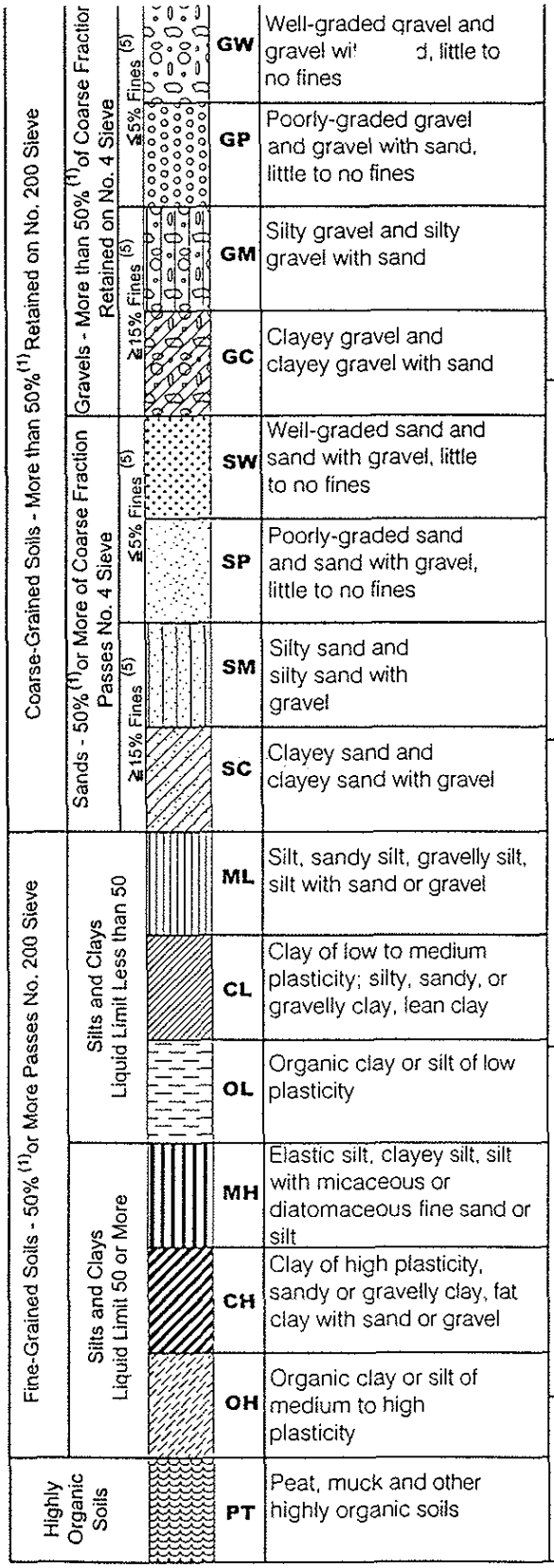


NOT TO SCALE

NOTES:

1. Diagram is illustrative of east and north shoring walls.
2. Soldier pile embedment depth "D" should consider necessary vertical capacity, kickout, and overturning resistance.
3. All tiebacks should be prestressed to 130 percent of design load and locked off at 100 percent of design load. Tieback anchor zone is to be located behind the no-load zone. Two or three tiebacks should be proof-tested to 200 percent of design load per Post-Tensioning Institute guidelines. Sufficient tendons should be provided for test loads.
4. Allowable tieback - soil adhesion = 1000 psf in glacially consolidated soil; includes factor of safety of 2.
5. Passive pressures include a factor of safety of 2.
6. Allowable skin friction of soldier pile = 400 psf. Allowable end bearing = 30 ksf with minimum 10' penetration into glacially consolidated sediment.
7. Diagram does not include hydrostatic pressures and assumes walls are suitably drained to prevent buildup of hydrostatic pressure.
8. Fifty percent of pressures may be used for design of lagging between piles, due to soil arching (8' maximum center-to-center pile spacing).
8. Diagram does not include pressures due to surface surcharges from any adjacent structures. These pressures must be provided by the structural engineer.

APPENDIX



Terms Describing Relative Density and Consistency

	Density	(2) blows/foot
Coarse-Grained Soils	Very Loose	0 to 4
	Loose	4 to 10
	Medium Dense	10 to 30
	Dense	30 to 50
	Very Dense	>50
	Consistency	**SPT (2) blows/foot**
Fine-Grained Soils	Very Soft	0 to 2
	Soft	2 to 4
	Medium Stiff	4 to 8
	Stiff	8 to 15
	Very Stiff	15 to 30
	Hard	>30

Test Symbols

G = Grain Size
M = Moisture Content
A = Atterberg Limits
C = Chemical
DD = Dry Density
K = Permeability

Component Definitions

Descriptive Term	Size Range and Sieve Number
Boulders	Larger than 12"
Cobbles	3" to 12"
Gravel	3" to No. 4 (4.75 mm)
Coarse Gravel	3" to 3/4"
Fine Gravel	3/4" to No. 4 (4.75 mm)
Sand	No. 4 (4.75 mm) to No. 200 (0.075 mm)
Coarse Sand	No. 4 (4.75 mm) to No. 10 (2.00 mm)
Medium Sand	No. 10 (2.00 mm) to No. 40 (0.425 mm)
Fine Sand	No. 40 (0.425 mm) to No. 200 (0.075 mm)
Silt and Clay	Smaller than No. 200 (0.075 mm)

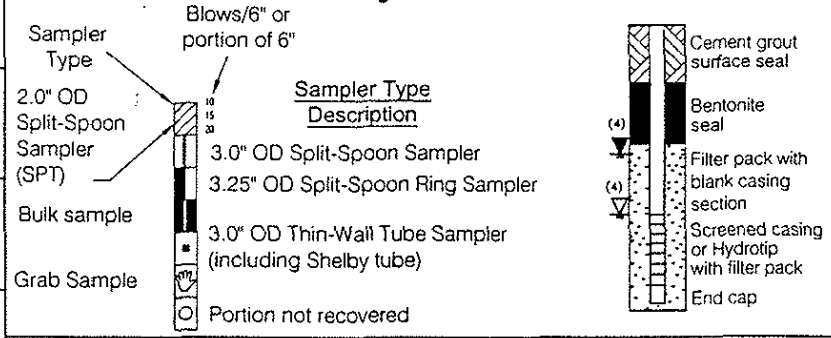
(3) Estimated Percentage

Component	Percentage by Weight
Trace	<5
Few	5 to 10
Little	15 to 25
With	- Non-primary coarse constituents: ≥ 15% - Fines content between 5% and 15%

Moisture Content

Dry - Absence of moisture, dusty, dry to the touch
Slightly Moist - Perceptible moisture
Moist - Damp but no visible water
Very Moist - Water visible but not free draining
Wet - Visible free water, usually from below water table

Symbols



(1) Percentage by dry weight
(2) (SPT) Standard Penetration Test (ASTM D-1586)
(3) In General Accordance with Standard Practice for Description and Identification of Soils (ASTM D-2488)
(4) Depth of groundwater
▼ ATD = At time of drilling
▽ Static water level (date)
(5) Combined USCS symbols used for fines between 5% and 15%

Classifications of soils in this report are based on visual field and/or laboratory observations, which include density/consistency, moisture condition, grain size, and plasticity estimates and should not be construed to imply field or laboratory testing unless presented herein. Visual-manual and/or laboratory classification methods of ASTM D-2487 and D-2488 were used as an identification guide for the Unified Soil Classification System.

blocks\log_key.dwg 11/02/01

Associated Earth Sciences, Inc.

Exploration Log Key

FIGURE
A-1

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE02247A	EB-1	1 of 1

Project Name	Yarrow Bay Office Building	Ground Surface Elevation (ft)	~ 32
Location	Kirkland, WA	Datum	N/A
Driller/Equipment	Gregory Drilling / CME 85	Date Start/Finish	05/29/02,05/30/02
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
				Possession Drift					
5		S-1		Moist, gray, very fine to fine SAND with trace fine gravel.			4 19 32	▲51	
10		S-2		Moist, gray, very fine to fine SAND, with trace fine gravel.			50/5"	▲50/5"	
15		S-3		Moist, gray, very fine SAND with trace gravel.			11 34 50/5"	▲84/11"	
20		S-4		Moist, gray, very fine SAND with trace gravel.			15 41 45	▲86	
				Bottom of exploration boring at 21.5 feet					
25									
30									
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: MAM

Approved by:

AESIBOR 02247A-1.GPJ June 4, 2002

Associated Earth Sciences, Inc.

Explora n Log

Project Number	Exploration Number	Sheet
KE02247A	EB-2	1 of 1

Project Name: Yarrow Bay Office Building
Location: Kirkland, WA
Driller/Equipment: Gregory Drilling / CME 85
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft): ~ 30
Datum: N/A
Date Start/Finish: 05/29/02,05/30/02
Hole Diameter (in):

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
		S-1		Moist, gray and brown SAND with some silt, trace gravel.			3 3 3	▲6	
5		S-2		**Alluvium** Moist to wet, greenish gray, fine to medium SAND with trace silt and gravel.			3 7 7	▲14	
10		S-3		Wet to saturated, tan, medium SAND with some silt, trace gravel.			3 3 10	▲13	
				Possession Drift					
15		S-4		Wet to saturated, gray, fine SAND, trace silt.			14 21 32	▲53	
20		S-5		Moist, gray SILT with very fine sand partings grading to wet, gray SAND with trace organics, in tip.		▼	4 10 15	▲25	
25		S-6		Saturated, gray, fine SAND, trace silt.			14 23 24	▲47	
				Bottom of exploration boring at 26.5 feet					
30									
35									

Sampler Type (ST):
- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture
▽ Water Level ()
▼ Water Level at time of drilling (ATD)

Logged by: MAM
Approved by:

AESIBOR 02247A-1.GPJ June 4, 2002

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE02247A	EB-5	1 of 1

Project Name	Yarrow Bay Office Building	Ground Surface Elevation (ft)	~ 44
Location	Kirkland, WA	Datum	N/A
Driller/Equipment	Gregory Drilling / CME 85	Date Start/Finish	05/29/02,05/30/02
Hammer Weight/Drop	140# / 30"	Hole Diameter (in)	

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
5		S-1		**Possession Drift** Moist, brown, fine to very fine SAND with trace silt and gravel.			14 35 50/3"	▲85/9"	
10		S-2		Moist, gray SILT with very fine sand partings.			11 11 14	▲25	
15		S-3		Moist, gray, SILTY very fine SAND.			10 21 30	▲51	
20		S-4		Moist, gray SILT with very fine sand partings.			6 8 14	▲22	
25		S-5		Moist, gray SILT with fine sand partings.			7 15 21	▲36	
				Bottom of exploration boring at 26.5 feet					
30									
35									

Sampler Type (ST):

- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture

- Water Level ()
- Water Level at time of drilling (ATD)

Logged by: MAM

Approved by:

AESIBOR 02247A-1.GPJ June 4, 2002

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration	Sheet
KE02247A	EB-4	1 of 1

Project Name: Yarrow Bay Office Building
Location: Kirkland, WA
Driller/Equipment: Gregory Drilling / CME 85
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft): ~ 55
Datum: N/A
Date Start/Finish: 05/29/02,05/30/02
Hole Diameter (in):

Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
5		S-1		Moist, slightly oxidized gray, SILTY fine SAND with trace gravel.			4 12 16	▲28	
				Possession Drift					
10		S-2		Moist grading to wet, gray, SILTY fine SAND with trace gravel.			21 45 50/5"		▲95/11"
15		S-3		Moist, gray SILT with some fine to very fine sand.			6 12 17	▲29	
20		S-4		Moist, gray SILT with very fine sand partings.			6 16 22	▲38	
25		S-5		Saturated, gray, fine to very fine SAND, trace silt.		▼	17 33 50/5"		▲83/11"
30		S-6		Saturated, gray, fine SANDY SILT.			16 22 26		▲48
35		S-7		~ 6" heave at 35'. Saturated, gray, fine SAND.			16 37 50/5"		▲87/11"
40		S-8		9' heave at 40'. Saturated, gray, fine SAND.			6 25 50/5"		▲75/11"
				Bottom of exploration boring at 41.5 feet					

Sampler Type (ST):
- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture
Water Level ()
Water Level at time of drilling (ATD)

Logged by: MAM
Approved by:

AESIBOR 02247A-1.GPJ June 4, 2002

Associated Earth Sciences, Inc.

Exploration Log

Project Number	Exploration Number	Sheet
KE02247A	EB-5	1 of 1

Project Name: Yarrow Bay Office Building
Location: Kirkland, WA
Driller/Equipment: Gregory Drilling / CME 85
Hammer Weight/Drop: 140# / 30"

Ground Surface Elevation (ft): ~ 58
Datum: N/A
Date Start/Finish: 05/29/02,05/30/02
Hole Diameter (in):

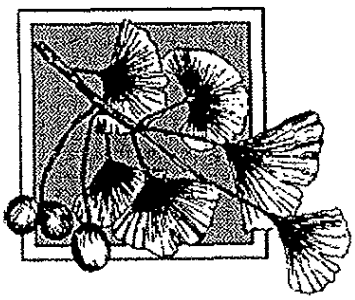
Depth (ft)	ST	Samples	Graphic Symbol	DESCRIPTION	Well Completion	Water Level	Blows/6"	Blows/Foot (10 20 30 40)	Other Tests
				Fill					
				Large rocks in upper 4'.					
5		S-1		Moist, oxidized gray, SILTY SAND with gravel.			8 7 7	▲14	
				Possession Drift					
10		S-2		Moist, gray, SILTY SAND with gravel.			11 34 50/5"		▲84/11"
15		S-3		Moist, gray, fine SAND with some silt, trace fine gravel.			27 50/5"		▲50/5"
20		S-4		Moist, gray SILT with trace fine gravel.			5 12 19	▲31	
25		S-5		Moist, gray, SILTY very fine SAND.		▼	7 19 28		▲47
30		S-6		Saturated, gray, fine SAND.			15 24 33		▲57
35		S-7		Saturated, gray, very fine to fine SAND.			12 24 29		▲53
40		S-8		Saturated, gray, very fine to fine SAND.			22 29 35		▲64
				Bottom of exploration boring at 41.5 feet					

Sampler Type (ST):
- 2" OD Split Spoon Sampler (SPT)
- 3" OD Split Spoon Sampler (D & M)
- Grab Sample
- No Recovery
- Ring Sample
- Shelby Tube Sample

M - Moisture
▽ Water Level ()
▼ Water Level at time of drilling (ATD)

Logged by: MAM
Approved by:

AESIBOR 02247A-1.GPJ June 4, 2002



Favero Greenforest
Registered Consulting Arborist #379
4547 South Lucile Street, Seattle WA 98118 206-723-0656

Arborist Report

For trees at

Yarrow Bay Marina
5207 Lake Washington Boulevard NE
Kirkland, WA 98033

Prepared for: **Yarrow Bay Marina**, and
Marina Suites, LLC Partnership

Prepared by: GREENFOREST, Inc.
Favero Greenforest, M. S.

4547 South Luclie Street
Seattle WA 98118
206-723-0656
240-201-7351 (fax)

greenforestinc@mindspring.com

Date: 12/21/2005

INTRODUCTION

Yarrow Bay Marina and Marina Suites, LLC Partnership proposes development at the existing marina site at 5207 Lake Washington Boulevard NE in Kirkland, WA. The City of Kirkland requires that trees with stems greater than six inches diameter be inventoried and inspected. The information from the inspection is used by the City Arborist in the permitting and approval process.

Mr. Phil Goldenman, Permit Coordinator for Waterfront Construction Company contacted me on December 13, 2005 regarding my services and availability on this project. I met with him on the 14th to review the site and the plans. I received a signed service agreement from Mr. Matt Partner of Goodman Real Estate on December 16, retaining my services for this tree inspection.

OBSERVATIONS

I visited the site December 19 and 20, 2005. I inspected 59 trees, 19 of which stand on the Marina property or the abutting street Right-Of-Way. The remaining 40 trees stand on the adjacent properties to the north and to the south. These adjacent trees of significant size (6" DBH or greater) are included in this survey inspection. Their branches (dripline) extend across the property boundary. Construction could negatively affect some trees, and this inspection establishes their current condition providing a baseline in the event that problems with these trees arise in future.

Nearly all of the trees in this inspection stand along a property boundary at the perimeter of the parcel. The trees along the north boundary consist mostly of young conifers: Incense cedar (*Calocedrus decurrens*) and coast redwood (*Sequoia sempervirens*). These trees appear to have been installed as screening by Carillon Point. They appear to have good structure and health; however, four of the cedars have chlorotic foliage. A willow (*Salix hookeriana)*, black cottonwood (*Populus trichocarpa*) and bigleaf maple (*Acer macrophyllum*) also stand along this boundary. These are native deciduous species and appear to have grown naturally in their location.

Trees along the street ROW consist of a group of native black cottonwoods, and two specimen weeping willows (*Salix babylonica*). A third willow, a seedling black locust (*Robinia pseudoacacia*) and a purple leaf plum (*Prunus cerasifera*) are obvious single trees in the center of the parcel. All appear in good health and structure.

A line of young conifers also screens the south property boundary along the Breakwater Condominiums. These trees include Leyland cypress (*x Cupressocyparis Leylandii*), pine (*Pinus nigra*), Western red-cedar (*Thuja plicata)* and Douglas-fir (*Pseudotsuga menziesii*). Although these trees appear healthy, many are girdled by support wires and burlap ties that were not removed after planting. Some have girdling roots and are obviously poorly rooted.

In addition to the conifers, two large deciduous trees stand along this southern boundary. In the SE corner of the parcel is a 60" diameter Chinese elm (*Ulmus parvifolia*) tree. Although this tree appears

to have received little or no maintenance over the past several years, it is a beautiful tree with excellent structure.

A large bigleaf maple stands between the elm and the shore. This tree has been pruned to raise its crown. It appears healthy and has good form.

A cluster of deciduous trees stands near the shore at the SW corner of the site. A weeping willow is located just off the property at the shoreline. This tree leans west over the water. The other trees are black locust and walnut (*Juglans regia)*. All have been previously topped. Two trees did not recover from a severe topping and are dead. The remaining trees have grown new crowns.

TREE INSPECTION

I stapled an aluminum tag to each tree indicating tree number, DBH (stem diameter 4.5 feet from ground) and tree name or abbreviation.

I visually inspected each tree from the ground and rated both health and structure. (See table below.) I excavated soil and debris from the base of the trees on Marina property and inspected for decay or defects at the rootcrown. No invasive procedures were performed on trees outside the Marina property.

I recorded visible defects and notes pertinent to each tree. I determined limits of disturbance and tree viability as required by City of Kirkland for all Marina trees. For the trees on the adjacent parcels, the limits of disturbance are assumed to be the property line unless indicated otherwise by the City. No determination of viability was made for the adjacent trees.

The following table lists 19 trees growing on the Marina site. Trees are identified by:

Tree number

Species (common name)

DBH (stem diameter in inches measured 4.5 feet from the ground)

Dripline measured in feet (as defined by City code)

Structure and health rating ('1' indicates no visible problems or defects, '2' indicates minor visible problems or defects that may require attention if the tree is retained, and '3' indicates significant visible problems or defects and tree removal is recommended)

Viability (as defined by City code)

Visible defects obvious structural defects or diseases at time of inspection.

Notes other observations.

Tree No.	Species	DBH	Dripline	Structure	Health	Viable	Visible Defects	Notes
115	Cottonwood	12	18	1	1	Yes		
130	Willow	26	15	2	1	Yes	Deadwood greater than 2" diameter in canopy.	
131	Willow	28	30	2	1	Yes	Ditto	
132	Willow	26	22	2	1	Yes	Ditto	
133	Black locust	6	10	1	1	Yes		Ivy growing on trunk.
134	Plum	10	16	1	1	Yes		Ivy growing on trunk.
135	Walnut	12	14	2	1	Yes	Previously topped	No buttress visible.
136	Black locust	20	22	2	1	Yes	Lean	Lean appears self correcting. No buttress visible.
137	Dead tree	36	0	3	3	No	Previously topped	Tree is dead.
138	Dead tree	9	0	3	3	No	Previously topped	Tree is dead.
139	Black locust	9	20	2	1	Yes	Previously topped	Ivy growing on trunk.
140	Black locust	12	20	2	1	Yes	Previously topped	Ivy growing on trunk.
141	Walnut	20	22	2	1	Yes	Previously topped	Chain wrapped around base of trunk is causing girdling. Carefully remove chain to avoid bark injury and prevent further girdling.
152	Bigleaf maple	36	30	1	1	Yes		
159	Elm	60	30	2	1	Yes	Deadwood greater than 2" diameter in canopy.	
126	Cottonwood	15	24	1	1	Yes		
127	Cottonwood	24	24	2	1	Yes	Multiple stem attachments.	
128	Cottonwood	22	24	1	1	Yes		
129	Cottonwood	12	24	2	1	Yes	Suppressed canopy.	

SUMMARY

Two of 19 trees on the Marina parcel are not viable. The remaining trees appear to be in good or better health and structure.

The attached table lists the inspection data for all 59 trees.

Assumptions & Limiting Conditions

1) A field examination of the site was made December 20, 2005. My observations and conclusions are as of that date.

2) Care has been taken to obtain all information from reliable sources. All data has been verified insofar as possible; however, the consultant/arborist can neither guarantee nor be responsible for the accuracy of information provided by others.

3) Unless stated other wise: 1) information contained in this report covers only those trees that were examined and reflects the condition of those trees at the time of inspection; and 2) the inspection is limited to visual examination of the subject trees without dissection, excavation, probing, or coring. There is no warranty or guarantee, expressed or implied that problems or deficiencies of the subject tree may not arise in the future.

4) All trees possess the risk of failure. Trees can fail at any time, with or without obvious defects, and with or without applied stress. A complete evaluation of the potential for this (a) tree to fail requires excavation and examination of the base of the subject tree. Permission of the current property owner must be obtained before this work can be undertaken and the hazard evaluation completed.

5) The consultant/appraiser shall not be required to give testimony or to attend court by reason of this report unless subsequent contractual arrangements are made.

6) Loss or alteration of any part of this report invalidates the entire report.

7) This report and any values/opinions expressed herein represent the opinion of the consultant/appraiser, and the consultant's/appraiser's fee is in no way contingent upon the reporting of a specified value, a stipulated result, the occurrence of a subsequent event, nor upon any finding to be reported.

Sincerely,
GreenForest, Inc.

Favero Greenforest

Digitally signed by Favero Greenforest
DN: cn=Favero Greenforest, c=US
Reason: I am the author of this document
Date: 2005.12.22 12:09:58 -08'00'

By Favero Greenforest, M. S.
ASCA Registered Consulting Arborist #379
ISA Certified Arborist # PN –0143

Attached Table. Inspection data for all trees.

Tree No.	Site	Tree Species	DBH	Dripline	Structure	Health	Viable	Defects	Notes	Limits of disturbance			
										North	East	South	West
101	CP	Willow	12	16	1	1				~	~	PL	~
102	CP	Redwood	12	9	1	1				~	~	PL	~
103	CP	Redwood	12	10	1	1			Not on survey.	~	~	PL	~
104	CP	Incense cedar	16	8	1	1			Not on survey.	~	~	PL	~
105	CP	Incense cedar	14	6	1	1				~	~	PL	~
106	CP	Incense cedar	12	7	1	2		Chlorotic foliage		~	~	PL	~
107	CP	Incense cedar	12	6	1	2		Chlorotic foliage		~	~	PL	~
108	CP	Incense cedar	9	5	1	2		Chlorotic foliage		~	~	PL	~
109	CP	Incense cedar	10	6	1	2		Chlorotic foliage		~	~	PL	~
110	CP	Incense cedar	14	6	1	1				~	~	PL	~
111	CP	Redwood	18	10	1	1				~	~	PL	~
112	CP	Redwood	9	8	1	1				~	~	PL	~
113	CP	Redwood	18	10	1	1				~	~	PL	~
114	CP	Redwood	16	10	1	1				~	~	PL	~
116	CP	Redwood	14	8	1	1				~	~	PL	~
117	CP	Incense cedar	14	5	1	1				~	~	PL	~
118	CP	Incense cedar	18	8	1	1				~	~	PL	~
119	CP	Incense cedar	14	8	1	1				~	~	PL	~
120	CP	Incense cedar	18	8	1	1				~	~	PL	~
121	CP	Incense cedar	16	6	1	1				~	~	PL	~
122	CP	Redwood	18	10	1	1				~	~	PL	~
123	CP	Redwood	14	10	1	1				~	~	PL	~
124	CP	Bigleaf maple	18	16	3	2		Deadwood/Decay	Stem	~	~	PL	~

Tree No.	Site	Tree Species	DBH	Dripline	Structure	Health	Viable	Defects	Notes	Limits of disturbance			
										North	East	South	West
125	CP	Redwood	6	7	1	1				~	~	PL	~
115	**Marina**	Cottonwood	12	18	1	1	Yes			PL	10	10	10
130	**Marina**	Willow	26	15	2	1	Yes	Deadwood		12	Rock ery	12	10
131	**Marina**	Willow	28	30	2	1	Yes	Deadwood		15	15	15	15
132	**Marina**	Willow	26	22	2	1	Yes	Deadwood		12	12	Found-ation	Retain ing wall
133	**Marina**	Black locust	6	10	1	1	Yes		Ivy on trunk	6	6	6	6
134	**Marina**	Plum	10	16	1	1	Yes		Ivy on trunk	8	8	8	8
135	**Marina**	Walnut	12	14	2	1	Yes	Topped	No buttress flare visible	8	8	8	8
136	**Marina**	Black locust	20	22	2	1	Yes	Lean	Self corrected, flare absent	12	12	12	Shore
137	**Marina**		36		3	3	**No**	Dead					
138	**Marina**		9		3	3	**No**	Dead					
139	**Marina**	Black locust	9	20	2	1	Yes	Topped	Ivy on trunk.	8	8	8	8
140	**Marina**	Black locust	12	20	2	1	Yes	Topped	Ivy on trunk.	10	10	10	10
141	**Marina**	Walnut	20	22	2	1	Yes	Topped	Chain around base	12	14	PL	Shore
152	**Marina**	Bigleaf maple	36	30	1	1	Yes			12	12	PL	12
159	**Marina**	Elm	60	30	2	1	Yes		Deadwood in canopy	15	ROW	PL	20
126	**ROW**	Cottonwood	15	24	1	1	Yes			Pl	Rock ery	12	12
127	**ROW**	Cottonwood	24	24	2	1	Yes	Multiple attachment		Pl	Rock ery	12	12
128	**ROW**	Cottonwood	22	24	1	1	Yes			12	Rock ery	12	12

Tree No.	Site	Tree Species	DBH	Dripline	Structure	Health	Viable	Defects	Notes	Limits of disturbance			
										North	East	South	West
129	**ROW**	Cottonwood	12	24	2	1	Yes	Crown suppressed		12	Rock ery	8	10
142	BWC	Weeping willow	24	14	2	1		Lean	Retaining wall acts as fulcrum		~	~	~
143	BWC	Leyland cypress	6	6	1	1				PL	~	~	~
144	BWC	Douglas-fir	6	6	1	1				PL	~	~	~
145	BWC	Leyland cypress	8	6	1	1				PL	~	~	~
146	BWC	Pine	10	8	1	1				PL	~	~	~
147	BWC	Douglas-fir	6	6	2	1		Lean	Self corrected.	PL	~	~	~
148	BWC	Western red-cedar	18	8	1	1				PL	~	~	~
149	BWC	Leyland cypress	10	8	1	1				PL	~	~	~
150	BWC	Leyland cypress	8	10	1	1				PL	~	~	~
151	BWC	Leyland cypress	9	9	2	1		Lean	Self corrected	PL	~	~	~
153	BWC	Pine	9	6	1	1				PL	~	~	~
154	BWC	Leyland cypress	14	8	2	2		Stem decay		PL	~	~	~
155	BWC	Leyland cypress	8	6	2	1		Girdled	Stem	PL	~	~	~
156	BWC	Leyland cypress	9	6	1	1				PL	~	~	~
157	BWC	Leyland cypress	8	6	2	1		Girdled	Stem	PL	~	~	~
158	BWC	Pine	7	5	2	1		Girdled	Rootcrown	PL	~	~	~

CP – Carillon Point property
BWC – Breakwater Condominium property
ROW – Street Right-OF-Way
PL – Property Line
Bold type indicates tree on Marina Property

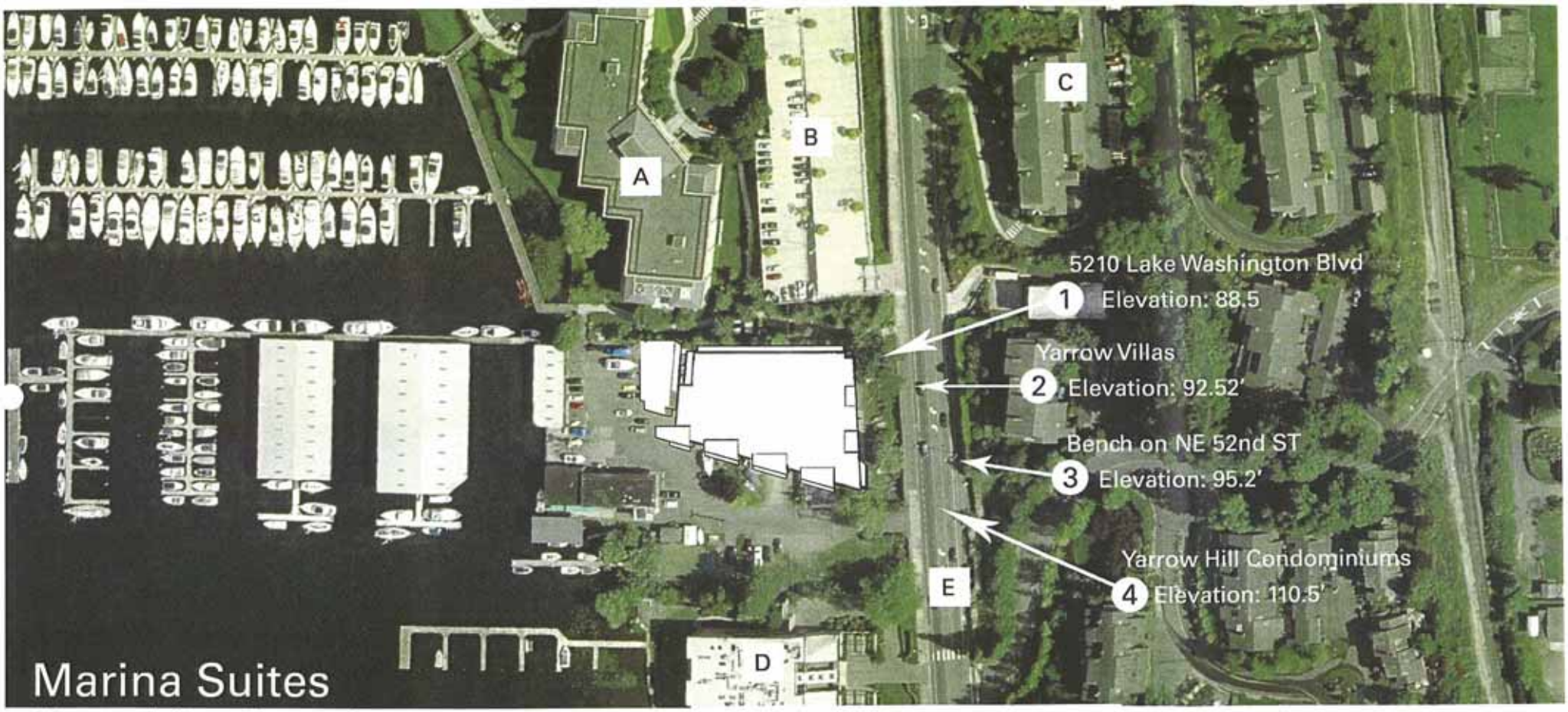
Marina Suites

Kirkland, Washinton

WOLLINS COERMAN

VIEW STUDIES: November 30, 2005

Revised December 8, 2005

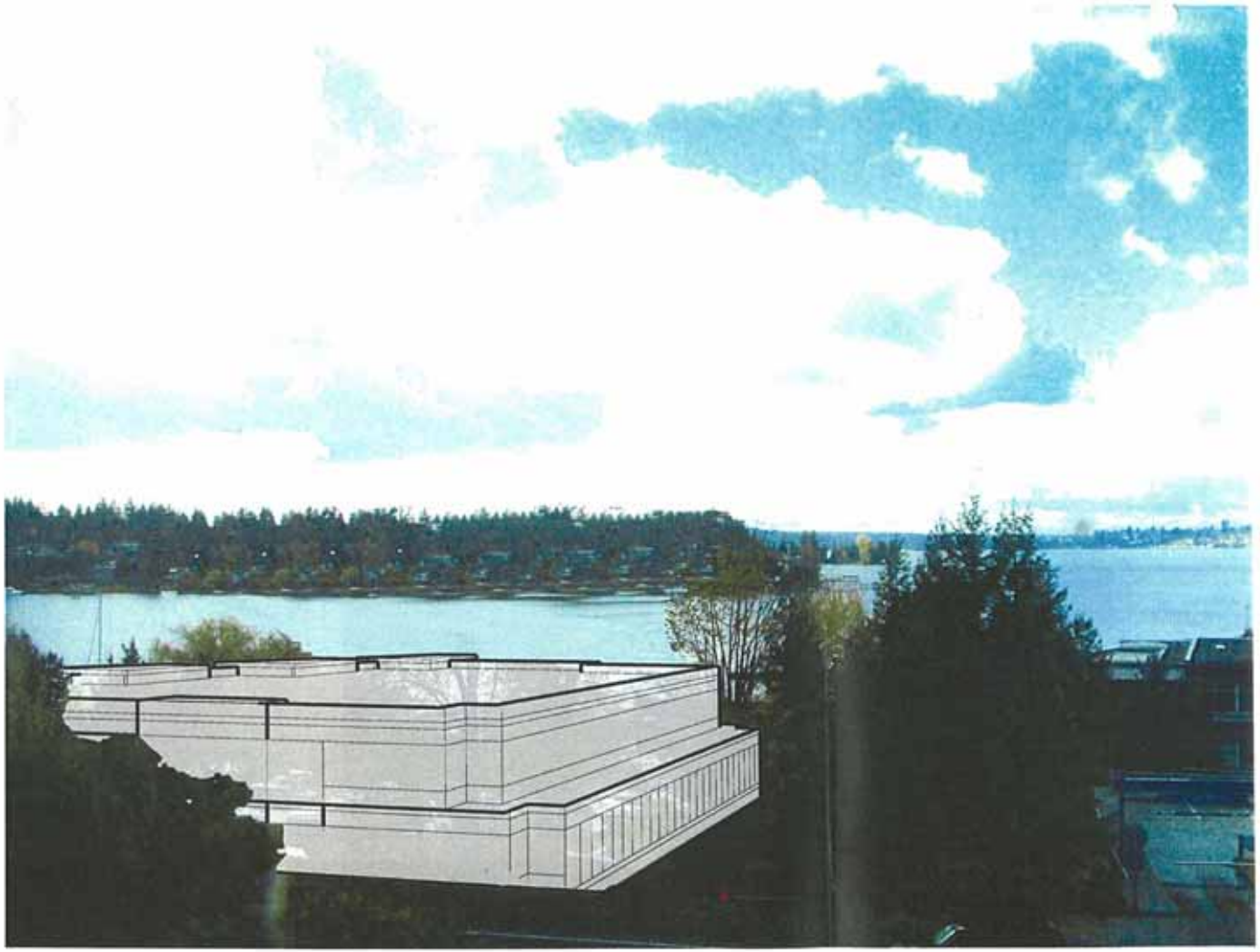


Marina Suites

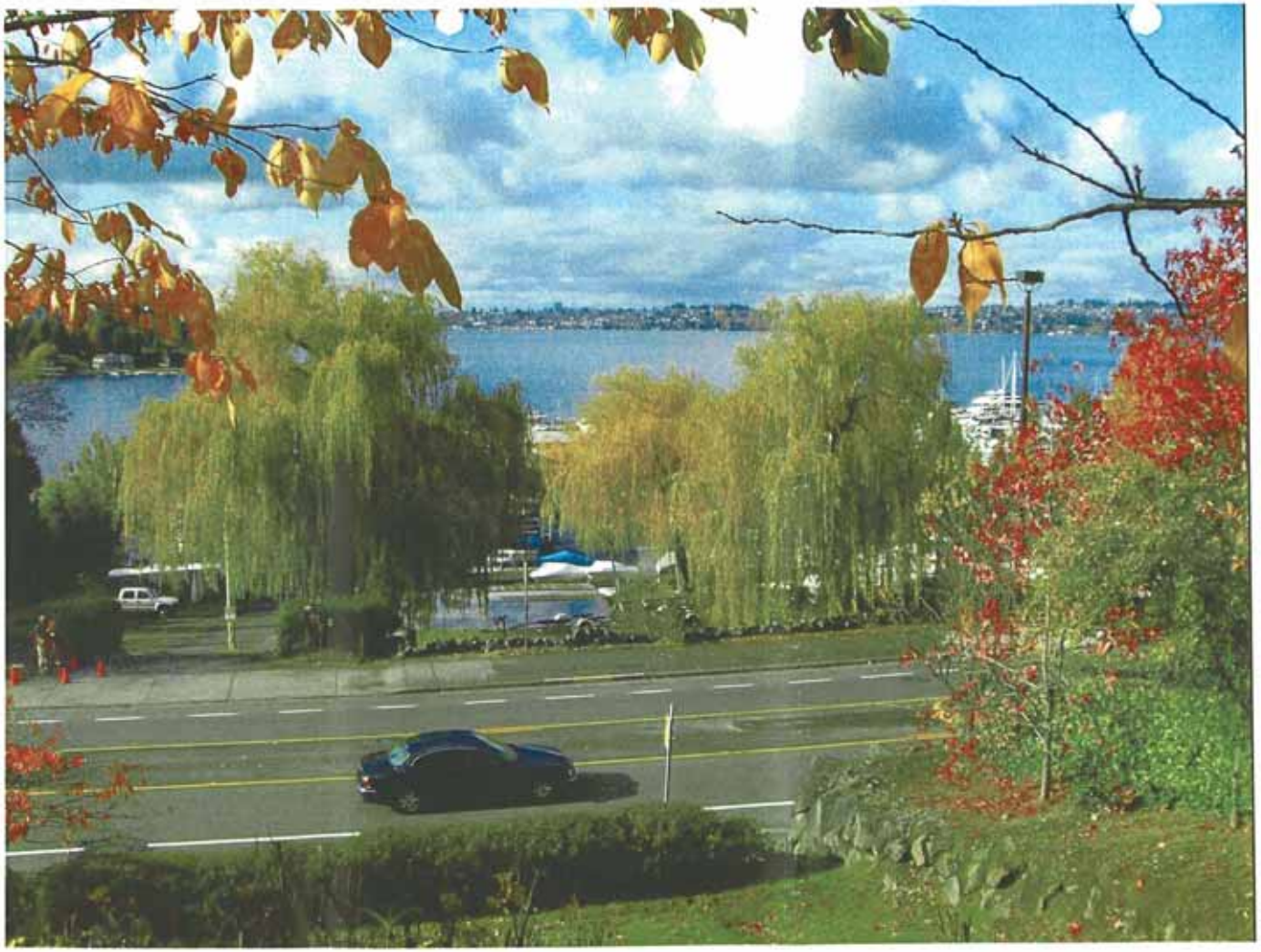
Key to View Locations

A. Carillon Point Office Building
B. Carillon Point Parking Garage
C. Yarrow Hill Condominiums
D. Breakwater Condominiums
E. Lake Washington Boulevard

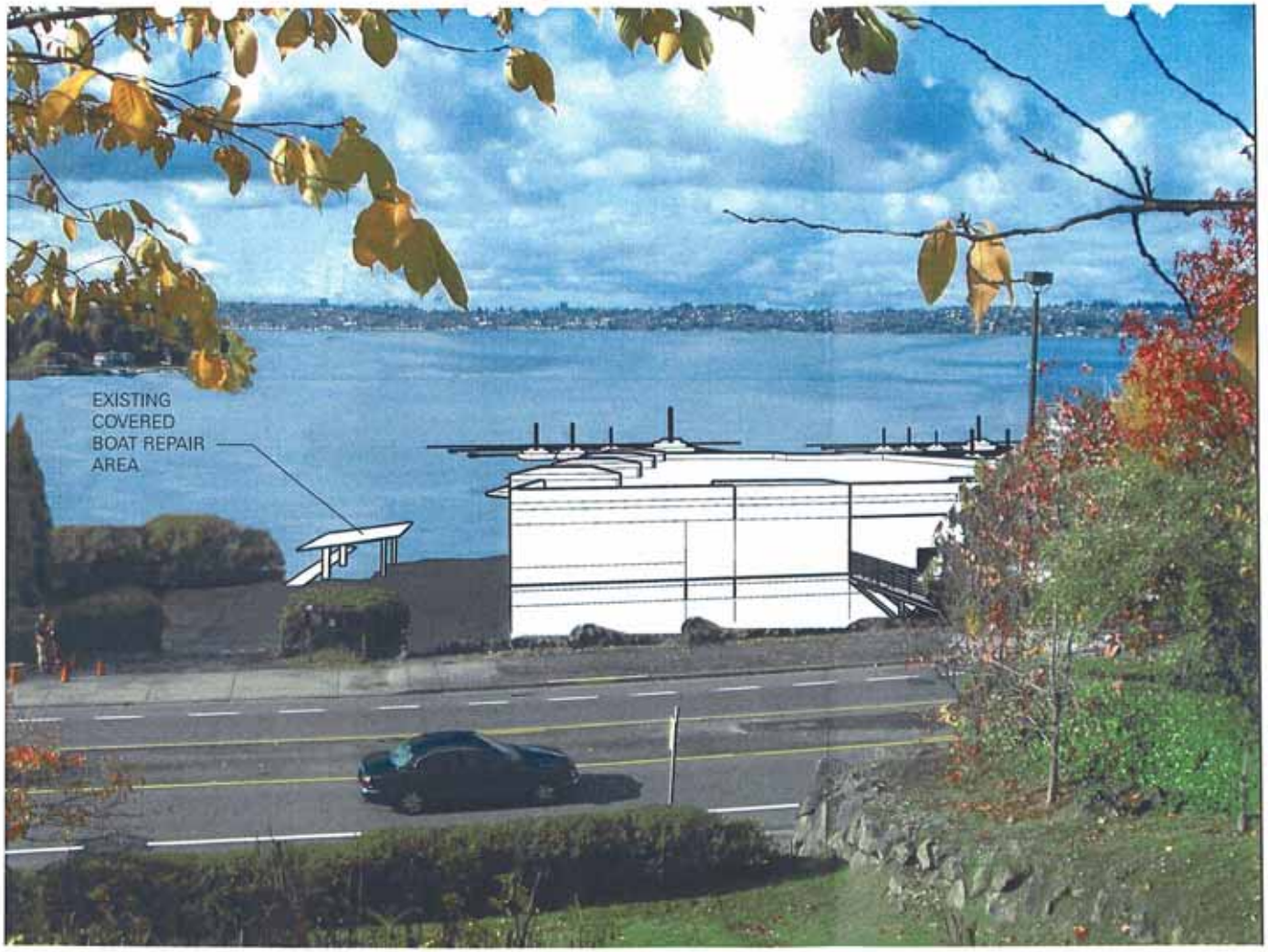
View 1 : From 5210 Lake Washington Blvd



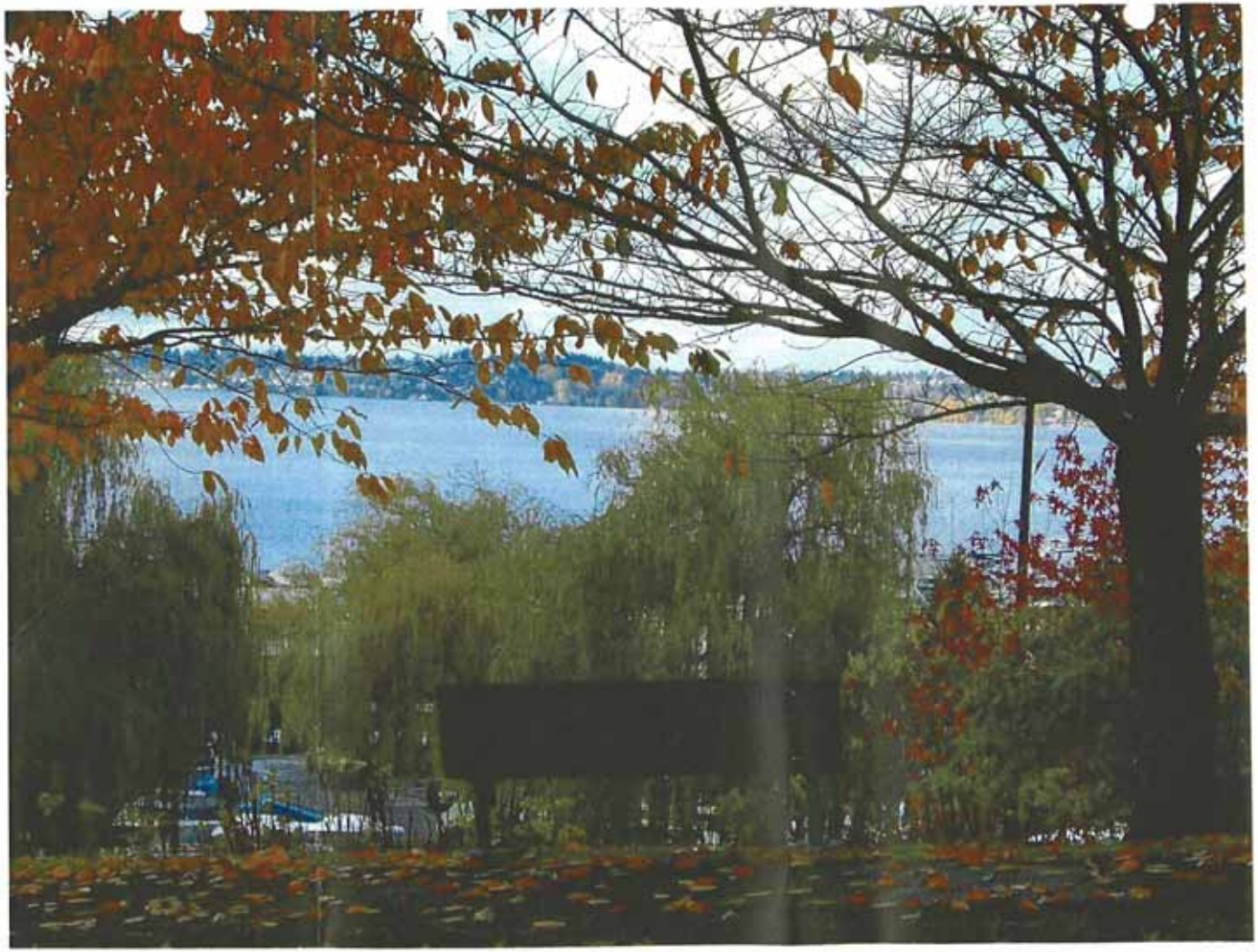
View 1 : From 5210 Lake Washington Blvd



View 2 : From Yarrow Villas

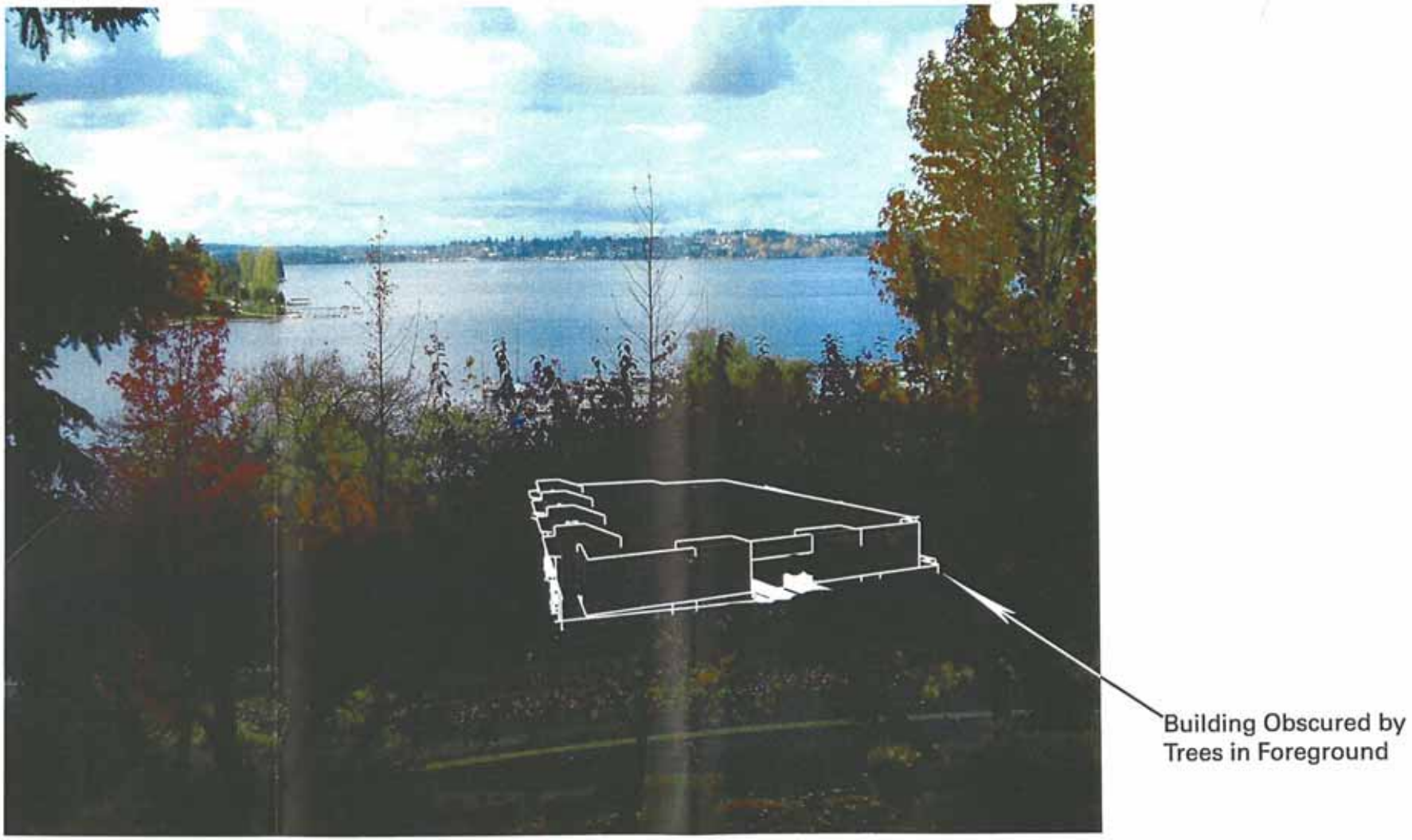


View 2 : From Yarrow Villas

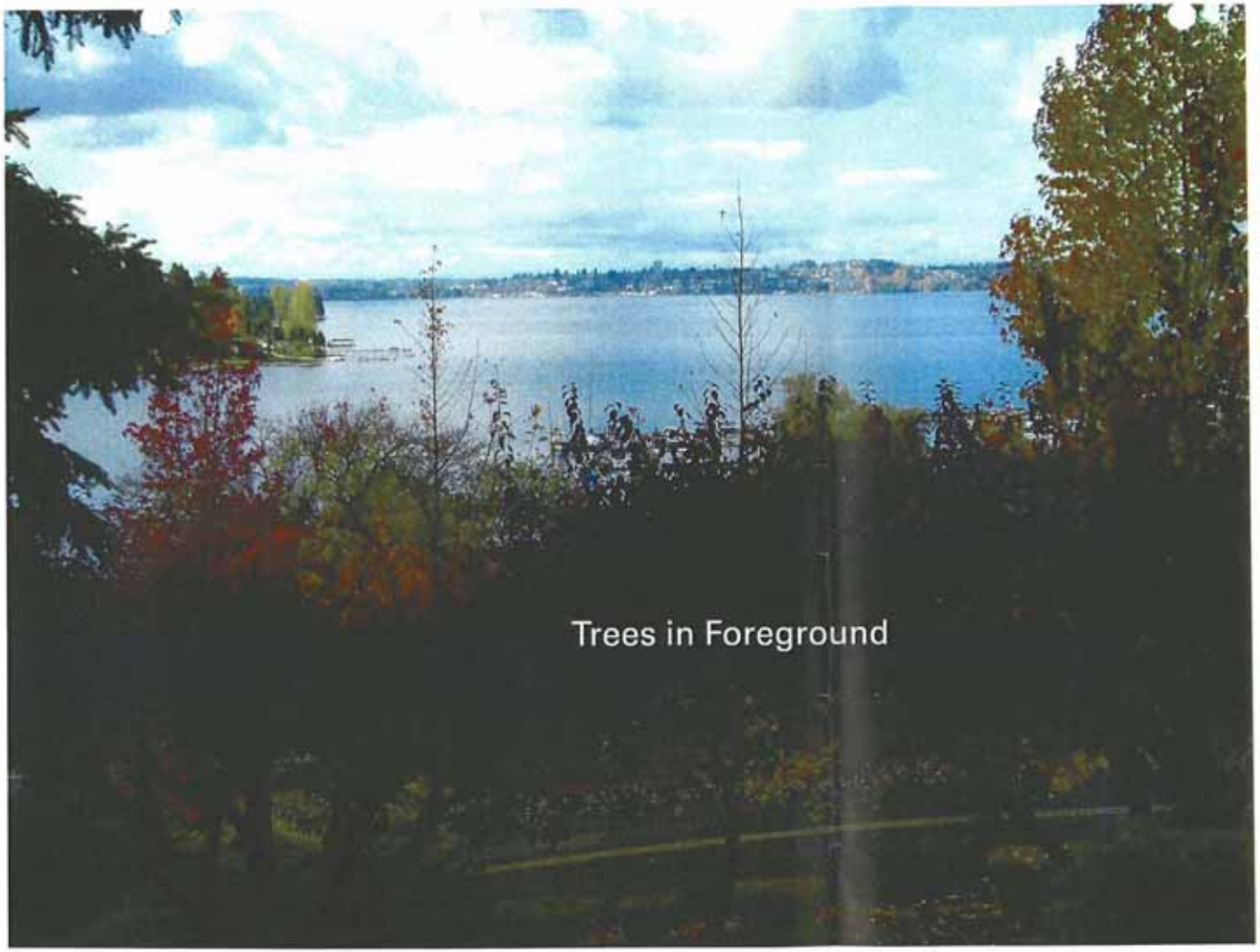


View 3 : From Bench Viewpoint

View 3 : From Bench Viewpoint



View 4 : From Yarrow Hill Condominiums



View 4 : Yarrow Hill Condominiums

Stacy Clauson

From: Hhrodgers@aol.com
Sent: Monday, April 10, 2006 2:49 PM
To: Stacy Clauson
Subject: Yarrow Bay Marina Project

Stacy, I'd like to go on record with the following comments regarding the Yarrow Bay Marina Project. Would you tell me if this e-mail will do that, or should I send a written letter? Thanks . . . Helen Rodgers

YARROW BAY MARINA PROJECT:

As an owner of one of the Breakwater condominiums directly adjacent to the proposed re-development of the Yarrow Bay Marina, I'd like to go on record with some comments and questions. While it is irrefutable that the owners of the marina have the right to develop their property in a way that benefits their business plan, I think it is incumbent on the city of Kirkland to do everything in its power to make sure these changes do not unreasonably affect and irreparably harm the quality of life of its immediate neighboring properties.

As a relative newcomer to the Breakwater, I would like to know more about the details of their plan regarding lot coverage, planning of building vs. parking space allotment and, most specifically, the exact nature of the proposed expansion of their docking facilities. In the one summer I've been here I've seen the abuse and wear-and-tear on our facility, the loss of reasonably expected privacy, the damage to our dock and the assumption of their customers that they can use our private dock for partying and loud behavior. They seem to feel they have the right to use the amenities they find there and it is not unusual to see Marina customers plugging into our electricity and using our hoses to wash their boats as they wait to purchase gas. The Marina staff has been made aware of this but, as far as I can see, they have done absolutely nothing to discourage this.

Since the project will change many aspects of the existing business, I would suggest that this would be the ideal time to address a way to mitigate this frequent and predictable infringement on the Breakwater residents' private property. I realize that open water is not considered private property but the configuration of their docking facilities as they exist guarantee the almost implied encouragement of their customers to feel that they are entitled to use our dock. Instead of extending a seemingly open invitation to intrude on private property, why can't this time of disrupted operation be used to relocate the entry to their gas dock to the north side of the property where it would co-exist with a like business and where the behavior of their customers is to be expected and can be managed without intruding on our private dock?

As I understand it, promises of mitigation have been made for years with no follow-through whatever, leading us to expect that the current protestations of planned mitigation will result in the same lack of attention and action even as they encroach ever further into our lives. I would ask that the city of Kirkland take these points under serious consideration and require a relocation of the entry to the Marina's gas dock to the north side of their property.

In the event that this does not happen, I think it is entirely reasonable to require that the proposed dock extension be configured that there will not seem to be a perceived connection to our private dock, as there seems to be now even with the current, smaller configuration.

Finally, I would ask that if the entry is not to be relocated, that the Marina be required to configure and identify a route into their facility which will make it clear that our dock is not part of the Marina entrance and not a logical and legal stopping off place for boats and their passengers as they wait in the gas line. I would ask specifically that there be serious and enforcible penalties written into place in the event that our current problems worsen.

We are taxpayers, too, and I think these legitimate concerns should be taken into account as plans are developed and considered.

Helen Rodgers
4823 Lake Washington Blvd. N.E.
The Breakwater, #8

ENCLOSURE 12.a
SHR06-00001

Kirkland, WA 98033
425.889.0323

Joan Schmidt
Breakwater Condominiums
4823 Lake Washington Blvd. NE, #7
Kirkland, WA 98033-7600

March 20, 2006

Stacy Clauson, Project Planner
City of Kirkland Department of Planning & Community Development
123 – 5th Avenue
Kirkland, WA 98033

RE: File Number SHR06-00001

To the Kirkland Department of Planning & Community Development:

As an owner of a condominium unit in the Breakwater, immediately south of the proposed developments for the Yarrow Bay Marina, I have several concerns:

1) – **The relocation of the marina's driveway.** Planned to be only 10 feet from our northern property line, the exiting and entrancing of hundreds of vehicles per day will cause **major traffic tie-ups, as we try to enter or leave our own property**. Lake Washington Blvd. is already difficult to negotiate into and out of our driveway with the current traffic! **Noise from that driveway** and **headlights shining into our building** are two more unimaginable concerns. Poor access devalues our property, not to mention our peace while we live here.

   SUGGESTION: Please relocate the new marina driveway/road further north of our property line than proposed, in order to reduce the negative noise and traffic impact of hundreds of cars per day impeding the use of our own driveway. A traffic signal will definitely become necessary also.

2) – **The Parking variance requested.** An inadequate number of parking spaces, both underground and surface, will create a much greater negative impact on our property than should ever be allowed by the city in a residential area. Yarrow Bay Marina boasts of the dual use of spaces, since "the office will need the parking during the week days and the marina will only need the parking on nights and weekends". From experience, having lived next door for 7-1/2 years, that idealistic notion will not be the case. The marina parking is packed during the spring, summer, and fall with boat repairs as well as boaters, day and night. We are talking about a commercial property bordering a residential one, with (again) headlights shining into our windows at night, dusk, and dawn. I refer to the exit pattern requested, from the parking garage, the surface parking, and the circle drive in front of the office building. Where will the "overflow" park? We have already had a problem with marina clients taking our few "visitor" parking spaces in front of our building.

   SUGGESTION: Please do not allow the requested variance. Instead, the project should be reduced in size so it can accommodate one hundred percent parking code requirements.

3) - **The proposed 3-foot hedge-fence on our northern property line.** Not good enough! **We NEED a 6-foot high solid fence to protect us from the noise pollution and headlights shining into our property!! This would be our only relief.**

4) – **The proposed entrance/exit for boaters to the marina's fuel and repair docks.** As with the proposed driveway, the proposed boater's marina entrance places the major activity of that commercial property immediately next to our quiet residential property. Both proposals are unfair to the Breakwater owners and guests.

> **SUGGESTION: Logically, the placement of both street and water entrances/exits to the marina businesses should be placed to the far north of the marina property, which borders another commercial marina and business site, not where they disturb a residential building.**
>
> **If the boat marina entrance is not repositioned to the north, then permits must be issued for the south side water barrier, to protect the Breakwater from the trespassers, waiting in fuel lines, from using and further damaging our dock!**

5) -- **The S.W. dock additions and expansions -- another big problem**. The additional boat slips will not only block access to the proposed fueling area, but it forces them onto our side and encourages trespass use and damage to our dock. The yachts and boats moored further to the south and west will destroy our views of the lake and all areas to the west.

> **SUGGESTION: If the dock extensions cannot be moved northward, no expansions should be permitted in this residential neighborhood. The lake and mountain views invited us to move here in the first place. Our escalating property values and resales are dependent on those views!**

6) – **The public walkway from Lake Washington Blvd. to the lakefront.** The Breakwater has enough public "lookie-loos" from the street-to-lake access on our south side. We do not want further access on our north side, which creates increased crime concerns for us. Further, because of the sloping grade, people walking to and from the lake would be able to look directly into our windows.

In conclusion, the entire Breakwater property will be gravely impacted by the Yarrow Bay Marina development as proposed. My fellow residents and I urge you to reconsider the plans for the good of us all. Happy neighbors make good neighbors.

Sincerely,

Joan Schmidt

Mrs. Joan Schmidt

John Barnett
4823 Lake Washington Blvd NE, #5
Kirkland, WA 98033
425-889-0207
March 17, 2006

Stacy Clauson
Planning & Community Development Dept.
City of Kirkland
123 Fifth Ave.
Kirkland, WA 98033

Dear Stacy,

Subject: Yarrow Bay Marina development proposal

We met on January 11, 2006, at the Yarrow Bay Marina (YBM) development explanation. I write as the president of the Breakwater Condo Homeowners' Association which is located at the above address.

Our property is immediately adjacent on the south to the YBM. Therefore, ours is more than a casual interest and concern. The following is a list of some of the ways this development will negatively impact our property:

[1] The increased traffic and parking will have the greatest negative impact on our property. This is the only area of the development where any type of variance is requested. The project should be reduced in size so it can accommodate one hundred percent parking code requirements. The plan includes 211 underground parking spaces and 45 surface parking spaces. They want to have a building and marina larger than the parking spaces they will have available. So if they follow present city zoning for the number of parking spaces required for building size, they will have to either have the marina or the office building or both smaller than planned. A certain number of parking spaces are required for the size of the office building and the size of the marina. They are trying to say they can dual use the spaces since the office will need the parking during the week days and they are saying the marina only needs the parking on weekends and nights. Since this is an area that will so negatively impact our property, the city should never allow any type of variance in this area. This is a situation of commercial property bordering residential property and the city should not allow any variances that would produce more of a negative impact upon the residential property. The traffic and parking are our greatest concern.

The plan includes 211 underground and 45 surface parking spaces. The office building would potentially be used for businesses with each of the businesses having approximately ten to

twenty clients per day. Thus there could be hundreds or more cars a day coming and going on a driveway ten feet from our property line.

When exiting the planned parking garage the cars will face directly south and thus the head lights will shine directly at our building. When using the circle drive in front of the office building, the car lights will shine directly into our building. When cars exit the surface parking again the lights will shine directly into our building.

[2] The plan for the development relocates the marina driveway connecting to Lake Washington Blvd. moving it to within ten feet of our northern property border, which is considerably closer to our border than it is presently. With hundreds of cars in and out the driveway ten feet from our property line the noise factor is unimaginable. Locating the driveway/road further to the north of our property line would ease some of the negative impact of the hundreds of cars per day driving within ten feet of our property line.

[3] The development will have a public walkway from Lake Washington Blvd to the lake. This walkway will touch upon our northern property line. This would be a further problem to us as the result of the grade/slope, public walking to and from the lake would be able to look directly into our windows.

[4] No matter how the development goes, they should include a six foot solid fence on our northern property border. We will be so negatively impacted by the increased traffic and car lights, etc., the fence is the only way we can have some relief.

[5] The marina expansion is an opportunity for us to request the access to the fueling and repair dock of the marina be changed. Presently the marina is accessed from the south, our side, the residential side. We have all experienced the extreme problems this has caused to our dock etc. This is an opportunity to request the marina be accessed from their northern side which borders another business, the Carillon Point Marina.

The YBM say they cannot do this. However, we all know anything can be engineered and done.

The YBM has agreed to request a permit for a rope type barrier in the water going westward along their southern water border to extend out well beyond the end of our dock. This could ease the pressure of boats coming to our dock while awaiting the line up for fuel at the marina. This may or may not occur depending if permits can be obtained. Although this a small remedy to our dock encroachment problem, our first priority request would be for the marina to use their northern border for an entrance.

[6] The proposal calls for additions to the present docks. Primarily the southwest portion of their present docks would be expanded. The addition of boats docked in this area would block the access for boats to go into the fueling area, and thus forcing the boat traffic more onto our side. Also additional boats moored in this area would block our views of the lake and all areas to the west.

[7] In addition to the increased traffic in and out of the YBM, there will be increased difficultly in exiting our property by car onto Lake Washington Blvd., and entering it. Even without greater numbers of cars using the YBM entrance, I have counted as many as 50 automobiles passing in front of our driveway exit as I waited for a clear spot to enter the street.

These are some of the problems we foresee. We ask that they be properly addressed and your decision communicated to us before construction is started.

Sincerely,

John Barnett

John Barnett
President, Breakwater Condo

Fred and LouAnn Freeburg
Breakwater Condominium
4823 Lake Washington Blvd. N.E. #6
Kirkland, WA 98033
March 15, 2006

Stacy Clauson
City of Kirkland Department of Planning and Community Development
123 5th Avenue
Kirkland, WA 98033

Re: file number SHR06-00001

After visiting the city planning department and attending a informational meeting, we have come to some conclusions regarding the impact of the Yarrow Bay Marina expansion will have on our property.

The following is a list of some of the ways this development will negatively impact our property:

[1] The increased traffic and parking will have the greatest negative impact on our property. We understand from the city this is the only area of the development where any type of variance is requested. The project should be reduced in size so it can accommodate one hundred percent parking code requirements. The plan includes 211 underground parking spaces and 45 surface parking spaces. YBM want to have a building and marina larger than the parking spaces they will have available. So if they follow present city zoning for the number of parking spaces required for building size, they will have to either have the marina or the office building or both smaller than planned. A certain number of parking spaces are required for the size of the office building and the size of the marina. YBM is trying to say they can dual use the spaces since the office will need the parking during the week days and they are saying the marina only needs the parking on weekends and nights. After living next door to the marina for a number of years we know that there is active cars and trucks coming and going for the marina during the day and during the night every day and this usage is intensified beginning with opening day May one and continuing throughout the summer months. YBM cannot defend the dual use proposal for the parking.
Since this is an area that will so negatively impact our property, the city should never allow any type of variance in this area. This is a situation of commercial property bordering residential property and the city should not allow any variances that would produce more of a negative impact upon the residential property. The traffic and parking are our greatest concern.

The plan includes 211 underground and 45 surface parking spaces. The office building would potentially be used for businesses with each of the businesses having approximately ten to twenty clients per day. Thus there could be hundreds or more cars a day coming and going on a driveway ten feet from our property

When exiting the planned parking garage the cars will face directly south and thus the head lights will shine directly at our building. When using the circle drive in front of

ENCLOSURE 12-d
SHR06-00001

the office building, the car lights will shine directly into our building. When cars exit the surface parking again the lights will shine directly into our building.

[2] The plan for the development relocates the marina driveway connecting to Lake Washington Blvd. moving it to within ten feet of our northern property border, which is considerably closer to our border than it is presently. The plans indicate the drive would be at higher elevation than it is presently. This elevation would further intensify the problems. With hundreds of cars in and out the driveway ten feet from our property line the noise factor is unimaginable. Locating the driveway/road further to the north of our property line would ease some of the negative impact of the hundreds of cars per day driving within ten feet of our property line.

[3] The YBM development road entering Lake Washington Blvd. is going to negatively impact Lake Washington Blvd., a street that is already extremely difficult for car traffic to enter or exit. This proposed drive way is less than 300 feet to the north from a large office driveway that dumps traffic onto Lake Wa. Blvd. Presently it is difficult to enter or exit to our condominium driveway from the Boulevard. There are many walkers and joggers who use the side walk. For a driver to watch for the pedestrians and to find an opening in the traffic pattern to be able to drive on to the street is challenging. Sometimes we have counted as many as fifty cars going by before there is an opening in traffic only to find that a person walking their dog is now in front of the car walking on the sidewalk and we have to wait for another fifty cars to go by before entering the street. The same is true when exiting the boulevard and attempting to turn into our driveway. To add hundreds of cars going and coming on the Lake Washington Blvd. from a driveway a few feet from our present driveway will certainly make the situation much worse.

[4] The development will have a public walkway from Lake Washington Blvd to the lake. This walkway will touch upon our northern property line. This would be a further problem to us as the result of the grade/slope. The public walking to and from the lake would be able to look directly into our windows. Our building presently has a public walkway on its southern border. If this was done our building would have two public walkways to the lake closer to our building than any other similar building along the Boulevard. Two public walkways this close together seem unfair to our property.

[5] No matter how the development goes, they should include a six foot solid fence on our northern property border. We will be so negatively impacted by the increased traffic and car lights, etc., the fence is the only way we can have some relief.

[6] The marina expansion is an opportunity for us to request the access to the fueling and repair dock of the marina be changed. Presently the marina is accessed from the south, our side, the residential side. All of the Breakwater residents have experienced the extreme problems this has caused to our dock and front yard by marina fuel dock traffic. It is always a problem, but unbearable on heavy boat usage days. People park their boats on our dock while waiting to be served at the marina. While they are parked on our dock they do such things as: hook to our hose and wash their boats, pee on our dock from various positions, go back and forth from our dock thru our gate to the marina and then back to their boat on our dock, regularly damage our lights, our stand pipe, our water connection, subject us to obscenities, loud music, yelling and provide a great danger to us when we attempt to us the water or our own boats and dock during this time. During these days, it is impossible to get in or out of our dock and we certainly do not allow our

children or even teens to use the beach or dock area. This is an opportunity to request the marina be accessed from their northern side which borders another business, the Carrillon Point Marina.

The YBM say they cannot do this. However, we all know anything can be engineered and this can be done. This is the time to correct this injustice. The two marinas, Carrillon Point and Yarrow Bay, should accept the inconvenience since they are the ones profiting from it.

The YBM has agreed to request a permit for a rope type barrier in the water going westward along their southern water border to extend out well beyond the end of our dock. It is hoped this could ease the pressure of boats coming to our dock while awaiting the line up for fuel at the marina. We cannot be sure that there wouldn't be so many boats waiting to fuel that even with this barrier we would continue to have the same problems on our dock. Also this barrier may or may not occur depending if permits can be obtained. Although this a small remedy to our dock encroachment problem, our first priority request would be for the marina to use their northern border for an entrance.

[7] The proposal calls for additions to the present docks. Primarily the southwest portion of their present docks would be expanded. The addition of boats docked in this area would block the access for boats to go into the fueling area, and thus forcing the boat traffic more onto our side. Also additional boats moored in this area would block our views of the lake and all areas to the west.

In conclusion these seem to be our major concerns. Certainly the affect and impact of this proposed development on the residential neighbors, The Breakwater Condominium, needs to be considered. We trust the city will take our concerns into consideration when making decisions regarding our neighborhood.

Sincerely,

Fred Freeburg LouAnn Freeburg

Fred Freeburg LouAnn Freeburg

SEPA Appeal May 19,2006
Appeal for File No.: SHR06-00001 / SEP06-00004
Address of proposal: 5201 & 5207 Lake Washington Boulevard NE
Kirkland, WA 98033

We are writing to appeal some aspects of the proposed Yarrow Bay Marina development.

We are the Breakwater Condominium Board of Directors. [4823 Lake WA Blvd. NE Kirkland, WA 98033, bordering the proposed development directly to the south]. Board members: John Barnett, president; Joan Schmidt; and Fred Freeburg.

The following are the basic items in the Yarrow Bay Marina proposed development that we are appealing.

TRANSPORTATION

The methods used to evaluate and address the present traffic and the additional impact on traffic, as a result of the YBM proposed development, do not apply to our situation and therefore conclusions should not be drawn from such data. There are several reasons these methods of traffic evaluation do not adequately speak to our situation:

1]The Breakwater Condominium driveway and 52nd Street are almost but not quite directly across from each other on Lake Wash Blvd.N.E. As the result of this slight off set, it makes it much more difficult for anyone turning on to L.W. B. from either of these. A driver coming from either direction [52nd or the Breakwater driveway] is unable to be certain the oppositional driver has seen him because of the offset. Also both groups are competing for both of the turn lanes.

2]The increased traffic from the YBM will make it more difficult to access the turn lanes.

3] Lake WA Blvd has wonderful bicycle lanes on each side of the street. For numerous obvious reasons, these lanes are used a great deal. We saw no mention in any of the data regarding what impact YBM proposed development would have on these bicycle lanes.

4] Lake WA Blvd also has a multitude of pedestrian walkers, joggers, runners and dog walkers. We saw no mention of how these people enjoying the boulevard would be impacted. Not only were the pedestrians and bicyclers not mentioned as a part of the traffic survey, they were not mentioned as to their extreme impact on the so called "gaps" that were to be available to allow cars leaving and entering the boulevard.

5]Presently, some people who live in the area of 52nd St. and above Lake WA Blvd. avoid using 52nd to enter Lake WA Blvd. whenever possible. They journey the additional blocks and use 108th, in order to avoid the situation as it presently is, without the additional cars from the proposed development.

6]Cars going north or south, attempting to use the turn lanes for entering 52nd, leaving 52nd, entering the Breakwater Condo, or leaving the Breakwater are presently experiencing difficulty . Any additional traffic in the turn lanes of this area would only

make this area of LK WA Blvd. impossible to safely navigate.

7] The statement that the majority of vehicles exiting the Condominium turn right is not accurate. Please refer to Dept of Public Works Memorandum date 4/14/06 stating that "Based on the PM peak hour (time when street traffic is most congested) traffic count, the majority of vehicles exiting the Condominium turn right."

TREES

The Breakwater Condominium property maintains a small buffer of established trees between our residentially-zoned lot and the commercially zoned Yarrow Bay Marina property to the north. Work with backhoes and other such equipment would put the root systems of these trees in great danger, thus endangering the survival of the trees. The trees and thus root systems are located so close together that if one tree is killed during the construction process it would be impossible to plant another even small tree in its place with out killing the trees on either side. To protect the root system of these "screening trees" we request special care and distancing of at least five feet of all YBM construction equipment in order to protect the survival of these trees. We would suggest at least a five foot "green belt" with no construction allowed in that space to the north of our trees.

PARKING

We realize the parking requests for the YBM proposed development have received some special consideration from the various government agencies. We strongly object to any variations from the present codes.

LIGHTING

Requirements for lighting of this proposed development leave us more than concerned. The lighting poles for the daytime lighting were to be something like 20 feet tall, and the poles for the night time lighting were to be something like 12 feet tall. These numbers do not reflect the true height of the poles as they relate to the Breakwater, the neighbors to the south. As a result of the fill planned for the project, and thus the increased elevations, the portion of the property directly to the north of our building will be as much as 20 feet higher than our first level condominium. Thus the light pole height as specified, would be either 40 feet or 32 feet above us. Even though we are aware of possibilities for special directional lights, we remain concerned that we have nothing to show in the plans to indicate these lights would not be a huge negative factor to our residents.

WALKWAY

The proposed pedestrian path/walkway to the north of the Breakwater Condo and the south line of the YBM seems to be an unnecessary inclusion for the proposed development, given the existing walkway to the north of the YBM and another second walkway to the south of the Breakwater Condominium. We recommend this requirement for the project be eliminated since it causes the Breakwater residents to have a public walkway on each of our borders.

Removing the walkway requirement would allow the five feet necessary to protect our screening trees without causing the Yarrow Bay Marina proposed development to "give up" any additional space. We would not favor the removal of the walkway if it would mean the project [roadway and bulkheads and such] would simply be put closer to our buffer trees and our property.

VEGETATION BOARDER AND VIEW CORRIDORS

In order to help buffer the change from commercial to residential zoning, we request the proposed plantings on the southern portion of the YBM project be allowed to be more than three feet in height. This small addition next to our property would greatly enhance the buffer zone. The screening needs to be greater that three feet in height to give us any protection. In viewing the present plans for this area we find a great deal of a low growing ground cover plants and very few plants even three feet in height.

Using this present strip two and one half to three feet wide for plantings greater than three feet in height would not have any significant impact on the view corridor and would certainly help our situation.

MARINA DOCK EXPANSION

Yarrow Bay Marina is requesting additional docks as part of their proposed development. We oppose the building of the additional boat docks for the following reasons: The proposed additional docks are to be located on the south west corner of the marina lake coverage. Without this addition or as the situation exists today no boat travels on the marina water to get to the fueling dock located in the marina. In other words all boats coming to used the fueling dock or marina enter or come across the lake water to the south of the YBM water line. They use the water in front of the Breakwater Condo to access the fueling dock or any other service of the marina. The addition of the new proposed docks would cause boaters to come even more closely to the Breakwater dock.

It seems reasonable for a business to be able to use its easement for entering and exiting its business. The addition of these new docks would further prohibit their customers from staying out of the Breakwater water. A business should not be allowed to enhance their profit at the expense of residential neighbors.

To allow more dock expansion would also negatively impact the sought after "view corridors". Causing more building on the lake would only minimize the view of the lake.

We would be surprised if present day zoning would allow the lake coverage by the marina as it exists today. It is unthinkable to consider impacting the environment with more docks and lake coverage.

In conclusion, we appreciate the opportunity to ask for further scrutiny of these matters.

Breakwater Condominium Board of Directors

John Barnett, President

Joan Schmidt

Fred Freeburg

SEPA COMMENTS

FILE No. SHR06-00001 / SEP06-00004

Address or Location of proposal: 5201 & 5207 Lake WA Blvd. NE

City of Kirkland
Dept. of Planning and Community Development
123 Fifth Ave
Kirkland,WA 98033

From: LouAnn Freeburg
resident Breakwater Condominium, property directly to the south of the proposed development
4823 Lake WA Blvd. NE
Kirkland, WA 98033

I am generally concerned about the Yarrow Bay Marina proposed development and the negative effects it will have upon the neighbors to the south and to the lake. The following are the major reasons for my submitting comments regarding the Yarrow Bay Marina proposed development:

1] The Expansion of the docks at the marina

There are numerous reasons for objecting to the additional docks requested by the Yarrow Bay Marina proposed development. A major concern is for the environment and having more coverage of the lake. Another concern deals with boat traffic as it relates to the Breakwater. Presently the boat traffic accessing the marina travels across the lake water in front of the Breakwater Condo rather than across the lake water in front of the marina. This appears to be the result of so many docks and boats presently on the southern waters of the marina. Boat traffic is forced to travel thru the waters in front of the Breakwater. The addition of more docks on this southern side would only make the problem worse. By the boats swinging our way to feel a more open access to the marina, they come close to our dock. Also when ever there is any kind of a back up to get into the marina, boats tend to tie up to our dock while waiting their turn at the marina. Without going into all the grim details this results in people using our dock, urinating on our dock, and cursing at any one approaching our dock. It is not right to allow more docks and thus more lake coverage on the southern boarder of the marina which is our northern border. If these additional docks were allowed, boat traffic using the marina would be forced even closer to our dock and the boat traffic to the marina would use even more of the lake in front of our condo.

2] The Traffic

The methods used to evaluate the traffic on Lake Washington Blvd. are not appropriate to our situation. We have a most unique situation on Lake Washington Blvd.

and particularly in the area by the Yarrow Bay Marina, the Breakwater Condo and 52nd St.

Part of this unique situation is the two bicycle paths on each side of Lake WA Blvd. and the huge use of the sidewalk [located on our side of the street] by walkers, dog walkers, joggers, people pushing baby carriages, and so on. These two aspects, the pedestrians and the bicyclers, cause the situation of Lake Wash Blvd. to be much more complicated than might appear from a survey looking at traffic only. You see we have to cross several "lanes" composed of all the different pedestrians, and the bikers, and the automobile traffic before we can enter on the Lake WA Blvd.

Another part of the unique situation we experience in this part of Lake WA Blvd. is that the drive for the Breakwater and the 52nd St. are not exactly directly across from each other. Therefore when an automobile traveling south on Lake WA Blvd. is in the turn lane awaiting to turn left on to 52nd St. they are directly in front of the drive way for the Breakwater. Thus that car is prohibiting a Breakwater car from entering the turn lane. Surprising it happens frequently.

These are a few of the reasons for concern for the increased traffic caused by the Yarrow Bay Marina proposed development.

3] The Trees and Required Pathway/Walkway

The row of trees on our northern border are the only protection or buffer we will have from this new development. To even think of back hoes or any kind of construction within several feet [five or six] of these trees can only mean the roots systems will be harmed and the trees killed. The trees are so close together that if one or two were killed it would be impossible to replant a large tree without killing the trees on either side. We must be given some protection for these trees. Our property is zoned residential and the Yarrow Bay Marina property is zoned commercial. We needs some buffer between these two very different zoning designations.

As I understand, the present plans for the proposed development call for a pathway or walkway on the southern border of the property and thus on my northern border all the way from Lake WA Blvd. to Lake Washington. For several reason I request you give further thought to this walkway requirement and take it out of the proposal. One reason is we at the Breakwater presently have a public walkway on our southern border. We have a public walkway between our building and Lake Washington, and of course we have the public side walk on our eastern border. To put another public walkway on our northern border is a too much considering the size of our lot. There is presently a public walkway on the northern border of the Yarrow Bay Marina property.

Along with the above reasons for not having the walkway, I would ask you to consider again the buffer trees. With the walkway or pathway, [which as I understand is to be cement steps] right against our trees, our trees are going to be killed by construction [footings into the ground, cement steps etc.] on top of them. By omitting the walkway, the five foot could be used as a buffer to protect our trees. It could be a planted area to give us a little more of a buffer and a little more protection from a roadway and so on directly against our border.

4] The Work Day Schedule

As I understand the stipulations for work times presently upon the Yarrow Bay

Marina proposed development, they are from 7 am till 7 pm. I would request this time to be limited to end at something like no later than 5 pm. There will be plenty of truck and other equipment noise as well as dirt and dust throughout the day. We should have some relief by 5 pm at dinner time. I also understand that the work men do not plan on working until 7 pm so to put the stipulation of no later than 5 pm in writing into the requirements would not seem to bother anyone. It would give us a little protection for the work day times.

In conclusion, these are some of my concerns for the Yarrow Bay Marina proposed development. Thank you for the opportunity to bring them to your attention.

Sincerely,

LouAnn Freeburg

From: Karen Walter [mailto:Karen.Walter@muckleshoot.nsn.us]
Sent: Monday, May 15, 2006 3:25 PM
To: Eric Shields
Subject: Yarrow Bay Marina Determination of Non-Significance (DNS) SEP06-00004

Mr. Shields,
The Muckleshoot Indian Tribe Fisheries Division received the DNS and environmental checklist for the above referenced project. Based on our review of the checklist, several documents are cited as the response to various checklist questions. As a result, we do not have enough information to evaluate potential impacts to salmonids and their habitat associated with this project. To facilitate our review, we request a copy of the following documents prior to the SEPA comment deadline as follows:

1. April 2005 Biological Evaluation by The Watershed Company;
2. Yarrow Bay Marina project plan set and project description notes;
3. The approved shoreline restoration plan.

Also, according to the agency evaluation of the responses in section 11 –Light and Glare, it appears that the applicant may need to submit a light study. Do you know if this light study considers the potential for lighting to shine on Lake Washington and enhance potential salmonid predation opportunities by bass and other species? Did the City consider this potential impact?

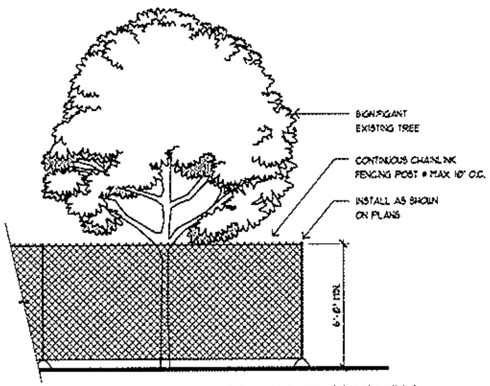
We would appreciate if someone could send us the requested documents electronically. If they are not available in an electronic format, then please send them to us at:

Muckleshoot Indian Tribe Fisheries Division
39015 172nd Ave SE
Auburn WA 98092

ATTN: Karen Walter

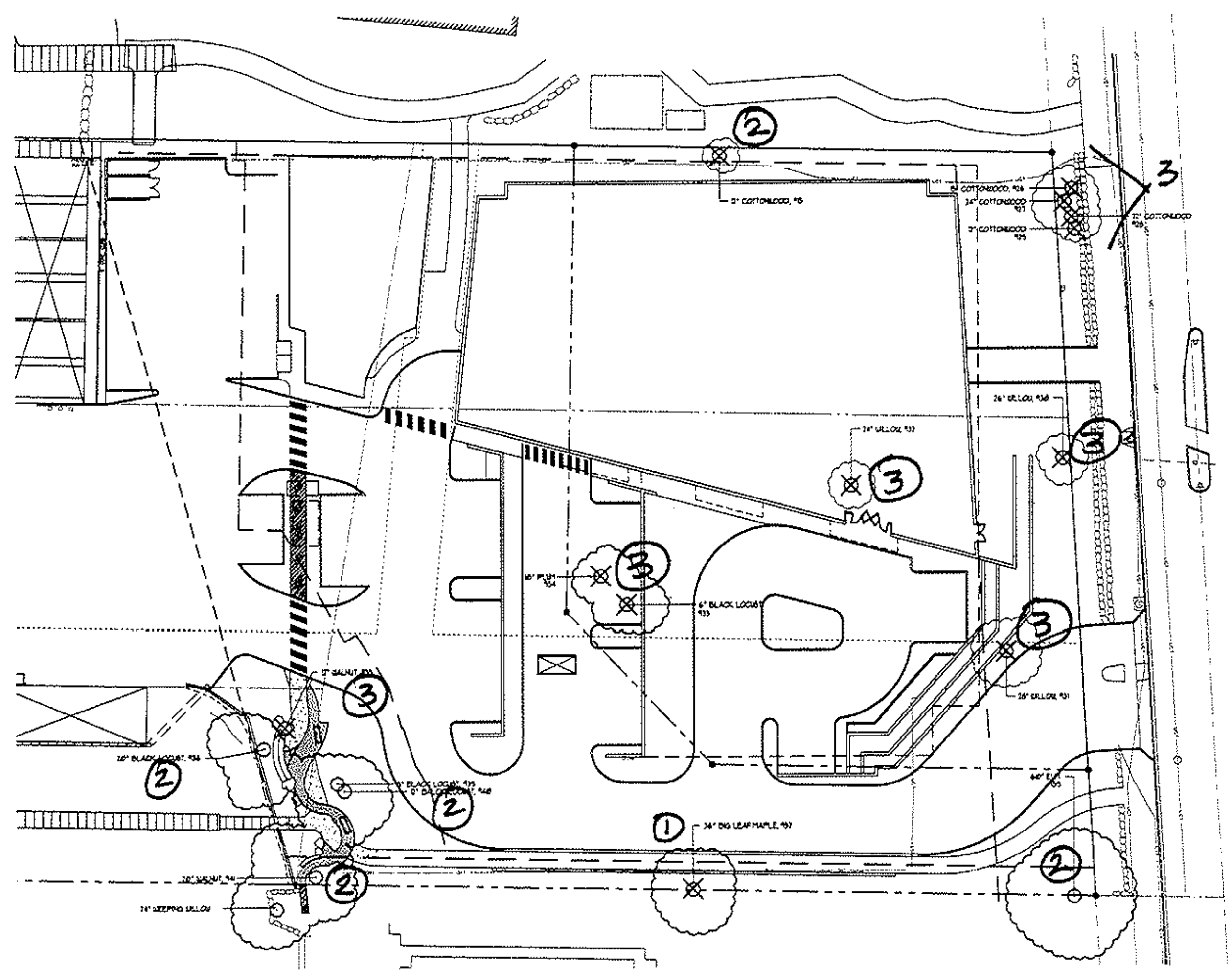
Thank you very much,
Karen Walter
Watershed and Land Use Planner
Muckleshoot Indian Tribe Fisheries Division
253-876-3116

ATTACHMENT 7.b
SEP2006-00001



1. SIX FOOT-HIGH TEMPORARY CHAINLINK FENCE SHALL BE PLACED AS SHOWN ON PLANS. FENCE SHALL COMPLETELY ENCIRCLE TREE(S). INSTALL FENCE POSTS USING PIER BLOCKS ONLY. AVOID DRIVING POSTS OR STAKES INTO MAJOR ROOTS.
2. TREATMENT OF ROOTS EXPOSED DURING CONSTRUCTION: FOR ROOTS OVER 1" IN DIAMETER DAMAGED DURING CONSTRUCTION, MAKE A CLEAN STRAIGHT CUT TO REMOVE DAMAGED PORTION OF ROOT. ALL EXPOSED ROOTS SHALL BE TEMPORARILY COVERED WITH DAMP BURLAP TO PREVENT DRYING, AND COVERED WITH SOILS AS SOON AS POSSIBLE.
3. WORK WITHIN PROTECTION FENCE SHALL BE DONE MANUALLY. NO STOCKPILING OF MATERIALS, VEHICULAR TRAFFIC, OR STORAGE OF EQUIPMENT OR MACHINERY SHALL BE ALLOWED WITHIN THE LIMIT OF THE FENCING.

(1) TREE PROTECTION DETAIL
NTS



SCALE: 1" = 20' - 0"

LEGEND

SIGNIFICANT TREE TO REMAIN	TOTAL EXISTING SIGNIFICANT TREES: 17 QTY.
SIGNIFICANT TREE TO BE REMOVED	SIGNIFICANT TREES TO BE REMOVED: 12 QTY.
	SIGNIFICANT TREES TO BE SAVED: 5 QTY.

Brumbaugh & Associates
Landscape Architecture

DATE	ISSUE
5/26/06	ADDENDUM B2 CP 1 AND 2
6/6/06	CITY COMMENTS

DESIGNED: SK
DRAWN: SK
CHECKED: RB
DATE: 1/20/06

TREE PLAN

MARINA SUITES
LAKE WASHINGTON BLVD.
KIRKLAND, WASHINGTON

L-1

2006-01

ATTACHMENT 8
SHR06-00001

Tree Typing by city's Urban Forester

Greenforest Incorporated

Consulting Arborist

7/5/2006

Stacy Clauson
Planning and Community Development
123 Fifth Ave
Kirkland, WA 98033

RE: Effects of the Proposed Public Boulevard-Shoreline Access Trail Construction on Property Line Trees and Roots at Marina Suites

Dear Ms. Clauson

The construction of a public access trail along the south property boundary is proposed at Yarrow Bay Marina. Several trees currently grow along this shared boundary, most of which stand on the Breakwater Condominium property.

> *Summary: the proposed sidewalk construction along the Marina Suites-Breakwater Condominium property boundary will have no negative effect on the retained trees.*

I met with project architect Annie Dobos and project manager Geoff Whitten on 6/30/06. I reviewed landscape plans prepared by Brumbaugh & Associates dated 6/16/06. The proposed trail will be constructed from the north side of the trees, and soil disturbance is limited to a cut no closer than five feet (5') north of the property line.

Two trees along this proposed trail stand on the Marina Suites parcel; a bigleaf maple (*Acer macrophyllum*) and a Chinese elm (*Ulmus parvifolia*). The remaining trees, which stand on the adjoining Breakwater Condominium property, include Leyland cypress (x *Cupressocyparis Leylandii*), pine (*Pinus nigra*), Western red-cedar (*Thuja plicata*) and Douglas-fir (*Pseudotsuga menziesii*).

The bigleaf maple tree stands half way down the property line. This tree will not survive the proposed construction and is scheduled to be removed.

The elm tree stands in the SE corner of the parcel, and the shoreline access trail will curve around the outside of its dripline. This tree will not be negatively impacted by the proposed trail construction.

4547 South Lucile Street, Seattle, WA 98118 Tel. 206-

Based on my earlier inspection and report (dated 12/21/05), many of the conifer trees on the adjoining property are girdled by support wires and burlap ties that were not removed when the trees were planted. In addition to girdling on their stems, many of these trees have girdling roots and are obviously poorly rooted.

It is my opinion that because these conifer trees are relatively small and young, their roots are at a distance where they will not be affected by the proposed boulevard-shoreline access trail construction. Because of the girdling and improper planting, these trees will likely decline over time, and some may fail because of their defective root systems, and not as a result of the proposed construction.

Sincerely,

GreenForest, Inc.

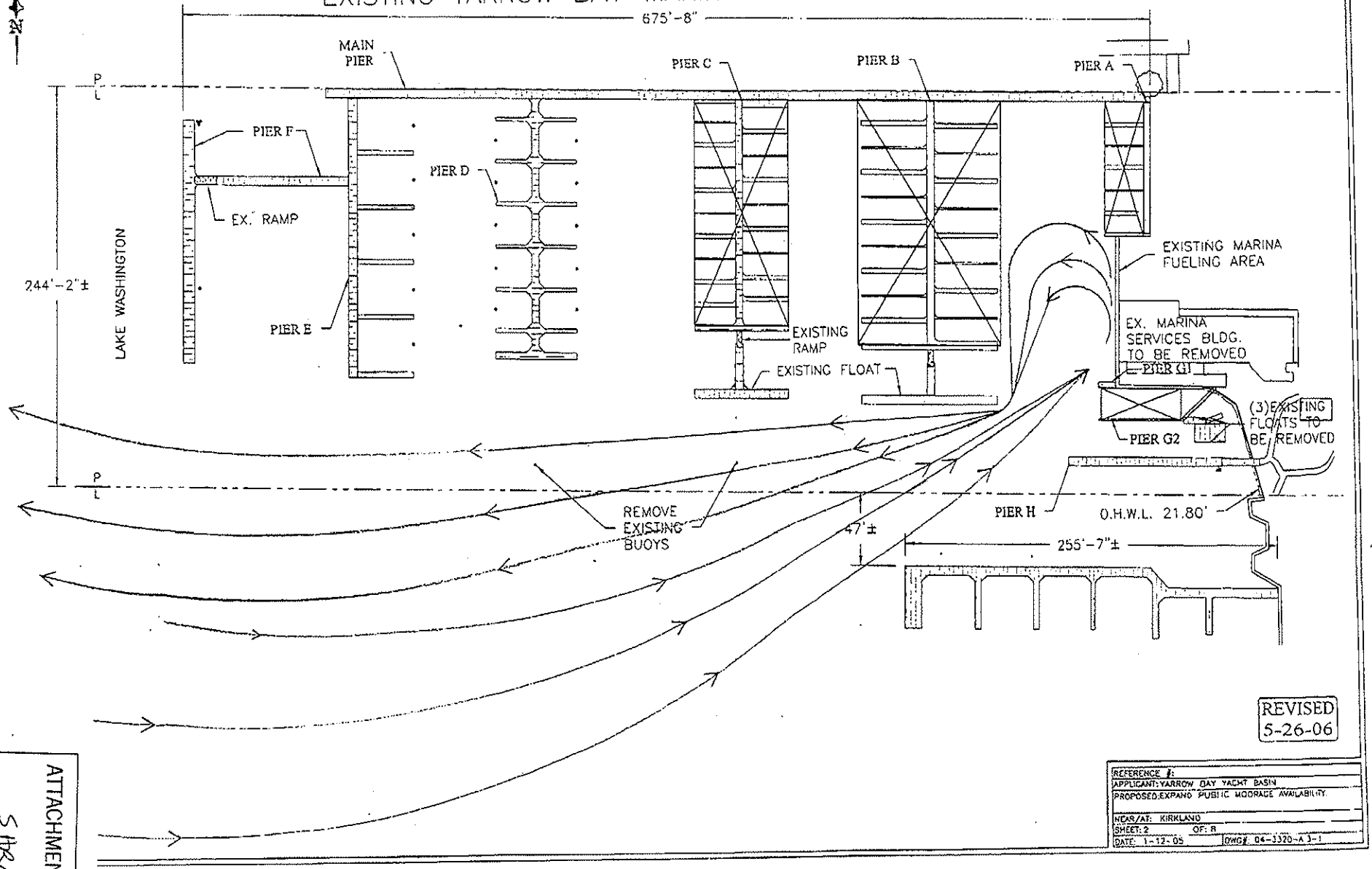
Favero Greenforest

Digitally signed by Favero Greenforest
DN: cn=Favero Greenforest, c=US
Reason: I am the author of this document
Date: 2006.07.05 14:39:18 -07'00'

By Favero Greenforest, M. S.

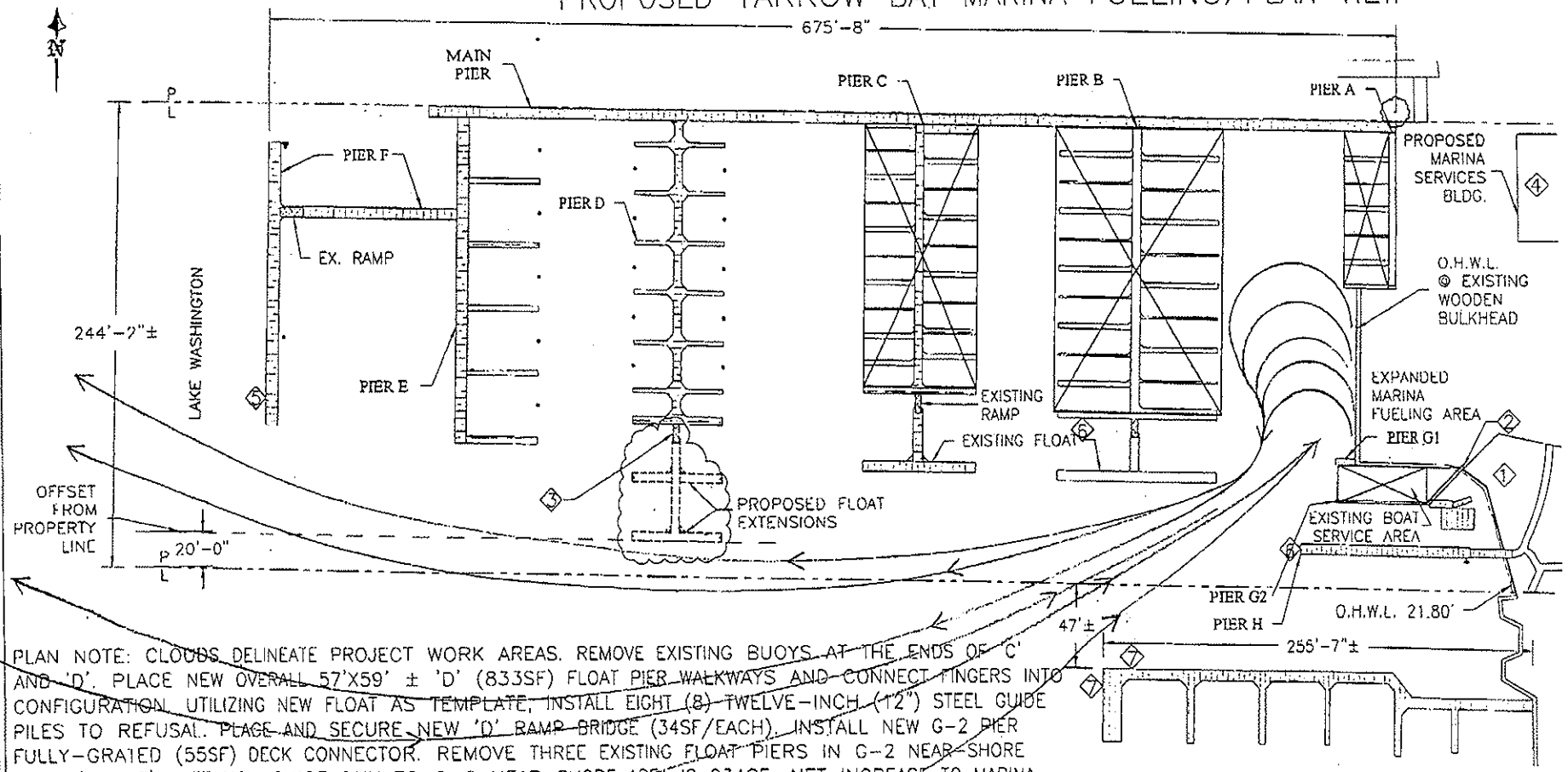
ASCA Registered Consulting Arborist #379
ISA Certified Arborist # PN -0143

EXISTING YARROW BAY MARINA FUELING/PLAN VIEW



ATTACHMENT 10
5th 06-0001

PROPOSED YARROW BAY MARINA FUELING/PLAN VIEW



PLAN NOTE: CLOUDS DELINEATE PROJECT WORK AREAS. REMOVE EXISTING BUOYS AT THE ENDS OF 'C' AND 'D'. PLACE NEW OVERALL 57'X59' ± 'D' (833SF) FLOAT PIER WALKWAYS AND CONNECT FINGERS INTO CONFIGURATION, UTILIZING NEW FLOAT AS TEMPLATE; INSTALL EIGHT (8) TWELVE-INCH (12") STEEL GUIDE PILES TO REFUSAL. PLACE AND SECURE NEW 'D' RAMP BRIDGE (34SF/EACH). INSTALL NEW G-2 PIER FULLY-GRATED (55SF) DECK CONNECTOR. REMOVE THREE EXISTING FLOAT PIERS IN G-2 NEAR-SHORE AREA (289SF). NET NON-SHADE GAIN TO G-2 NEAR-SHORE AREA IS 234SF. NET INCREASE TO MARINA DECKING IS 1184SF.

① SEE: PLANTING PLAN ADDENDUM B

② PROPOSED G-2 WALKWAY

③ NEW RAMP TO PROPOSED 'D' FLOAT PIER

④ SEE: ADDENDUM D

⑤ PROPOSED SIGN: SLOW TO 5 MPH: NO WAKE. STAY NORTH OF BUOYS.

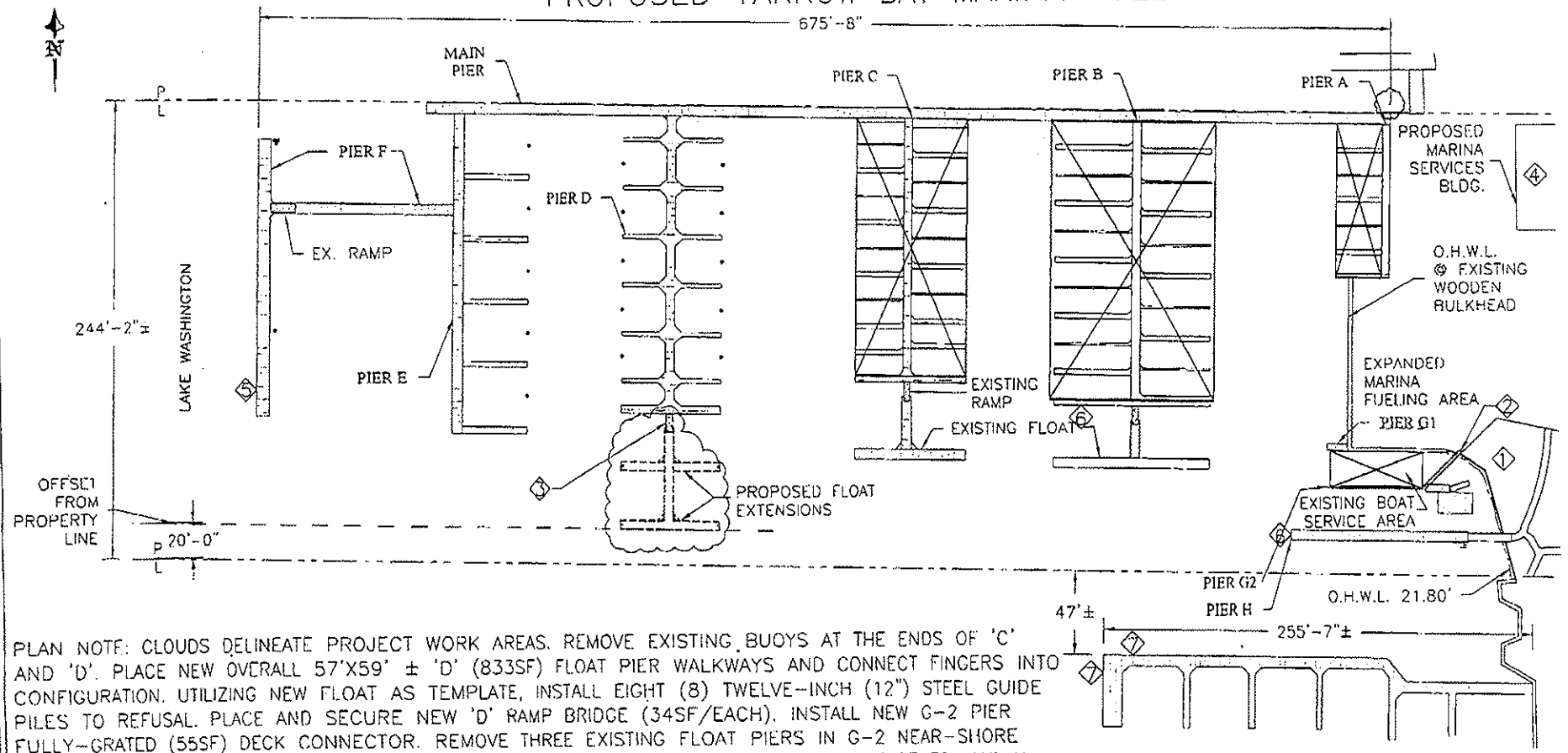
⑥ PROPOSED SIGN: BOATS FOR FUELING SHALL NOT TIE TO NEIGHBORING DOCKS. YARROW BAY MARINA STAFF WILL ENFORCE.

⑦ PROPOSED SIGN: ABSOLUTELY NO PUBLIC BOATING TIE-UPS TO THIS PRIVATE PIER. TRESPASSERS WILL BE REFUSED FUELING SERVICE.

REVISED 5-26-06

REFERENCE #:	
APPLICANT: YARROW BAY YACHT BASIN	
PROPOSED: EXPAND PUBLIC MOORAGE AVAILABILITY.	
NEAR/AT: KIRKLAND	
SHEET: 3	OF: 8
DATE: 1-12-05	DWG#: 04-1320-A.3-1

PROPOSED YARROW BAY MARINA FUELING PLAN VIEW



PLAN NOTE: CLOUDS DELINEATE PROJECT WORK AREAS. REMOVE EXISTING BUOYS AT THE ENDS OF 'C' AND 'D'. PLACE NEW OVERALL 57'X59' ± 'D' (833SF) FLOAT PIER WALKWAYS AND CONNECT FINGERS INTO CONFIGURATION. UTILIZING NEW FLOAT AS TEMPLATE, INSTALL EIGHT (8) TWELVE-INCH (12") STEEL GUIDE PILES TO REFUSAL. PLACE AND SECURE NEW 'D' RAMP BRIDGE (34SF/EACH). INSTALL NEW G-2 PIER FULLY-GRATED (55SF) DECK CONNECTOR. REMOVE THREE EXISTING FLOAT PIERS IN G-2 NEAR-SHORE AREA (289SF). NET NON-SHADE GAIN TO G-2 NEAR-SHORE AREA IS 234SF. NET INCREASE TO MARINA DECKING IS 1184SF.

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DDENDUM D

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REVISED 5-26-06

REFERENCE #:	
APPLICANT: YARROW BAY YACHT BASIN	
PROPOSED:EXPAND PUBLIC MOORAGE AVAILABILITY.	
NEAR/AT: KIRKLAND	
SHEET: 3	OF: 8
DATE: 1-12-05	DWG#: 01-3120-A (-)

ATTACHMENT 11
SHR04-0004

William Popp Associates *Transportation Engineers/Planners*

(425) 401-1030
FAX (425) 401-2125
e-mail: info@wmpoppassoc.com

June 1, 2006

To: Project Team

From: William Popp Jr.
William Popp Associates

Subject: SEPA Appeal May 19, 2006
File No.: SHR06-0001/SEP06-0004
Marina Suites 5201 & 5207 Lake Washington Boulevard NE

The following are my responses to Transportation and Parking regarding the subject SEPA appeal.

TRANSPORTATION

1. The Breakwater Condominium Driveway

The primary concern regarding this issue is the slight offset of the Breakwater Driveway and NE 52nd St. I have several comments regarding this:

a) With all due respect, if the driveway alignment is perceived as a concern, it should be noted that this is a pre-existing condition that the Marina Suites project is not estimated to worsen.
b) In reviewing the geometric conditions of the intersection, the centerline of the Breakwater Driveway is approximately 14 feet north of the centerline for NE 52nd St. This slight offset however works to the advantage of opposing sidestreet left turns from the driveway and NE 52nd St in that these two left turn movements now directly oppose each other which is a common practice design for intersection left turn channelization. Such is the case for the opposing left turns on Lake Washington Blvd. If the side streets were aligned based on roadway centerlines, then the opposing left turns would be offset.
c) The offset condition may be a more valid concern if the Breakwater driveway volumes where greater, especially the thru movement. As it stands, the traffic counts conducted in August 2005 indicated there was 1 vehicle exiting the Breakwater driveway to the north, 1 exiting to the south, and 1 entering from the south. Assuming turn movement delays of approximately 1 minute (actual estimated delays ranged between 45 and 50 seconds), traffic activity from the Breakwater would occur only 3 minutes during the peak hour. The remaining 57 minutes there would be not activity at this driveway. This vehicle activity should be considered insignificant when considering competing demand on the arterial turn lanes.

ATTACHMENT 12
SHR06-0001

d) Vehicles heading east through the intersection from Breakwater to NE 52nd St would have to meander through the intersection due to the offset. However, based on traffic counts there are no vehicles that come or go from the east. Furthermore, the volume exiting the Breakwater is assumed to be very small for all hours throughout a typical day. Based on ITE rates for Luxury Condominium/Townhouse, and assuming 8 units, the trips generated during the AM and PM street peaks would be no more than 4 vehicles, and no more than 5 vehicles for the peak hour of the site which is presumed to be sometime between 10am and 3pm.

e) The appeal notes that both groups (Breakwater traffic from driveway and traffic from NE 52nd St) are competing for both of the turn lanes. This is not true for exiting situations. Vehicles exiting the Breakwater turning left would potentially use the center two-way left-turn (TWTL) lane north of the intersection and the NE 52nd St left turns would potentially use the TWTL south of the intersection. For opposing vehicles turning left from Lake Washington Blvd to either Breakwater or NE 52nd St, the space between the two movements in decreased due to the offset alignment however both vehicles could turn simultaneously with a 4-foot gap between them – assuming a 35-foot inside radius for each vehicle.

f) The use of the TWTL by Breakwater residences would consist of northbound left turns in and eastbound left turns out. Competing movements would include the westbound left turn out from NE 52nd St and the southbound left turn to NE 52nd St. The Marina Suites project traffic would not use the TWTL south of NE 52nd St. Marina Suites project traffic will use the TWTL north of NE 52nd St and it is estimated there will be some overlapping traffic (northbound left turns into the Marina Suites driveway and southbound left turns to NE 52nd St) in the TWTL section between these two cross streets. However, the queuing (95th percentile) for either left turn movement is estimated to be only 1 vehicle and the space between the two vehicles is estimated to be approximately 100 feet.

g) It is important to note that the purpose of a TWTL is to serve multiple low volume type driveways along a roadway allowing vehicles to store in the center prior to finishing a turn movement. This is currently how the TWTL on Lake Washington Blvd operates.

2. *The increased traffic from the Yarrow Bay Marina will make it more difficult to access the turn lanes.*

The traffic increase on Lake Washington Blvd as a result of the Yarrow Bay Marina project is estimated to be 63 vehicles during the PM peak hour and 52 vehicles during the AM peak hour. The background growth on Lake Washington Blvd attributable to surrounding City approved pipeline development is 243 vehicles during the PM peak hour and 157 vehicles during the AM peak hour.

The comment in general is true since increasing traffic on the major street will theoretically increase the delay for side street movements. Based on the level of service analysis for the Lake Washington Blvd/NE 52nd St/Breakwater driveway intersection, the level of service grade remains LOS E. The increase in delay for the west leg (Breakwater) is only 1.7 seconds per vehicle and 1.5 seconds per vehicle for the east leg (NE 52nd St). These delay increases should be considered insignificant.

3. *Bicycle Impacts*

Based on multiple observations, the bicycle activity along this section of Lake Washington Blvd is considered as relatively light to medium; up to 30 bicycles per hour. The level of service analysis assumes 1 thru lane in each direction. Even though there is also the bike lane, the analysis assumes the critical lane approach and thus the vehicle lane becomes the critical case.

This driveway is considered as no different from any other driveway in that all vehicle laws would apply. Vehicles entering and exiting the site would be required to yield to all vehicle and bicycle traffic. The level of service calculations would reflect this.

4. *Pedestrian-Bicycle Activity*

Pedestrian activity is factored into the level of service analysis for the project driveway. The analysis assumed 20 pedestrians per hour northbound and 20 pedestrians per hour southbound. The pedestrian count does not assume grouped pedestrians. Based on field observations, these estimates were assumed to be appropriate for this vicinity of Lake Washington Blvd.

It is important to note that the proposed driveway to the Yarrow Bay Marina is being designed to include a 6 foot median (or pedestrian refuge area) between the entrance and exit lanes that should provide some relief across the project driveway.