List, or other native species approved by the Kirkland. All remaining site significant trees shall be maintained in perpetuity, and tree removal will be allowed only for hazardous and nuisance trees.

-Since previous city work practices on other developments in the HP zone have not been managed properly per KZC 70 and in hopes of assuring practices and goals outlined in the HPO and in Kirkland's Urban Forest Mgmt Plan (KUFMP) it's important at this site a complete tree/plant inventory and assessment report be prepared by a qualified tree professional. Report must include: information on tree species, diameter at breast height, health condition, location, and the required critical root zone (CRZ) should be collected. Would it be possible to get copies of these documents prior to final permit issuance? Once the city arborist has reviewed the developer hired arborist report the report must then be reviewed by a 3rd party hired by the city and paid for by the developer due to historical issues of decision made by the city contract arborist.

-Tree removal: Since this area is environmentally sensitive areas removal of trees in this landslide/erosive area and their buffers should be prohibited. If applicant wants to remove a tree I feel a qualified geologist or geotechnical engineer certify that the tree can be safely removed or the proposal can be designed so the landslide/erosion hazard risk to the property or adjacent property is eliminated or mitigated. Any plan or proposal to remove a tree from this sensitive area must go through a process which would include both planning and a hearing examiner's approval.

-Tree/plant replacement plan: Any tree/plant replaced must be included in a tree/plant replacement plan which shall show the location(s) and species of the new tree(s)/plants and must be submitted prior to permit issuance. Tree/plant replacement plan shall include the number of required replacement trees/plants, number shall be determined by the number of trees that will, within twenty years, achieve tree canopy coverage equal to or greater than the minimum canopy coverage goal of the city. Plan shall also include assurances new trees/plants survive. To assure this a city or city hired Qualified Tree Professional shall undertake annual site visits at the expense of the applicant and submit annual progress reports to planning for the five years that the permit is valid. Changes to the approved plan may only be made with approval of both planning and a Qualified Tree Professional. No plants on King County's noxious weed or weeds of concern lists (including ivy, laurels and holly) shall be allowed to be planted at this site.

- Stop Work Order. If a violation of the HPO or KUFMP the building official may suspend site work stop work order. The building official shall remove the stop work order when the City determines that the violation has been corrected or when the City has reached an agreement with the violator regarding rectification of the violation.

-Stormwater: The City has a surface water utility goal to manage surface water and stormwater so that it reduces flooding, water quality is improved, stormwater infrastructure is protected and aquatic habitat conditions are improved. This project does not meet or reflect these goals. Surface water, from the area of this this property is tight lined directly to Denny Creek that flows into Lk Wa 200 yds downstream. The run off from this property, which runs off surfaces such as rooftops (which can contain toxic moss killer), paved roads (which has oil on the surface) and from yards that often have phosphate fertilizer applied to them. Stormwater site plans must include on site water quality treatment to protect fish habitat and I feel should include Dept of Ecology's best management practices (BMP). Site stormwater plan must also include report and actions, prepared by a geotechnical professional to assure downhill properties will not be flooded and/or negatively impacted in other ways due to area surface water having less areas to be naturally absorbed into the land. Site stormwater plan must also show required improvements to the existing stormwater infrastructure down from this property. I feel Improvements to this system should and should include Dept of Ecology (DOE) best management practices (BMP) such as: raingardens, silva cell treatment/flow control

facilities, bioretention devices, or flow through water decontamination solutions. New onsite and off site stormwater treatment applications will help Kirkland achieve mandates as directed by Ecology and help achieve the city's stormwater goals.

-Education: I feel the city should use this development application to help the city reach it's tree and stormwater goals. I feel the city should educate the developer through the permit process to teach the economic and social benefit of applying tree and stormwater BMP within the permit process. This plan should include a section where the city educates the applicant to the economic business value and the social value of retaining trees. These actions could increase the economic value of the developers project while allowing the city to achieve it's mandates and attain it's tree canopy & stormwater goals by retaining site trees. The education could include below findings from the Center of Urban Forest Research-UC Davis:

A-Increase property value: A 24 inch Doug Fir will raise the property value by $128/year. Real estate agents have long known that trees can increase the "curb appeal" of properties thereby increasing sale prices. Research has verified this by showing that home buyers are willing to pay more for properties with ample versus few or no trees. We now have formula's and calculators to establish these values.

B-Stormwater: A 24 inch Doug Fir will intercept 2,964 gallons of stormwater runoff this year. Trees act as mini-reservoirs, controlling runoff at the source. Trees reduce runoff by: Intercepting and holding rain on leaves, branches and bark, Increasing infiltration and storage of rainwater through the tree's root system, Reducing soil erosion by slowing rainfall before it strikes the soil. Urban stormwater runoff washes chemicals (oil, gasoline, salts, moss killers, phosphate fertilizers etc.) from surfaces such as roadways, roofs and yards into Lake Wa 300 yards away. The more impervious the surface (e.g., concrete, asphalt, rooftops), the more quickly pollutants are washed into Lake Washington. Aquatic life and the health of our entire ecosystem can be adversely effected by this process.

C-CO2 sequestering: A 24 inch Doug Fir will reduce atmospheric carbon by 466 pounds. Trees educe atmospheric carbon. They sequester CO2 in their roots, trunks, stems and leaves while they grow, and in wood products after they are harvested. Most car owners of an "average" car (mid-sized sedan) drive 12,000 miles generating about 11,000 pounds of CO2 every year. Trees near buildings can reduce heating and air conditioning demands, thereby reducing emissions associated with power production.

-Noxious weeds: I feel any plant on King County's Noxious Weed list or Weeds of Concern list (including ivy, laurels and holly) shall not be planted at this property.

-ROW: All trees in the right of way must be retained. For utility ingress best new tunnelling science must used to allow for street tree retention.

Christian, it's my hope you will enforce the spirit and intent of the hpo which states, 'All significant trees, as defined in KZC 95, must be retained', on this project.

Thank you,

Ken Goodwin
Finn Hill Neighborhood Alliance-Member

72nd Ave NE
7206 Northeast
129th Street
NE 129th St
NE 129th St
NE 129th St
74th Ave NE

September 8, 2017

Mr. Christian Geitz
Project Planner, City Planning & Bldg. Dept.
123 5th Ave.
Kirkland, WA 98033

RE: Case No. SUB17-00450 Application

Dear Mr. Geitz,

At your invitation we are hereby giving our comments regarding this proposed land short plat addressed as 7206 NE. 129th street, Kirkland, WA 98034. As 40 year residents residing across the street from this plat of land we are concerned about this action in a number of ways which I will elaborate on:

- **Drainage and wetlands**
- **Retention of natural vegetation**
- **Impact on Wildlife**
- **Lot and house design**

Drainage and wetlands – there is an open ditch across the road from us which overflows on heavy rain days and comes directly down my driveway, as my elevation is below that of said property. An old street water main broke once and almost flooded us out. Can the existing water pipes withstand the requirements of 8 new homes? And when the new sewer pipes were put in some years ago all the removed soil was put in large piles on said property for some time, and when partially removed the land was leveled out, thereby filling in and over any wetland that may have existed previously. That wetland assessment needs to be redone and reviewed. Impervious surfaces such as home sites and driveways will further increase water run-off and erosion.

Retention of Natural Vegetation - there are large specimen type trees, namely madrona, cedar, maple, fir, alder and unique trees such as cherry and others that should be tagged and saved. Native birds and animals use these for their homes, and gather food here. Reducing those and allowing more clear cutting will put a hole in the ecosystem, notwithstanding the reduction in intrinsic value.

Impact on Wildlife – Over the years this land has been the home for woodpeckers, finches, song birds, crows, robins, occasionally a snow owl or deer, squirrels, rabbits, frogs, garter snakes and many other creatures we've seen. Removing this habitat will remove them and change the ecosystem.

Lot and house design – The overall average lot size and make up of house design in the area should be complemented by any development of this land. The proposals we see in the cookie cutter rectangular lots and so called green house designs of the ISOLA Homes builder goes against all of this, and we strenuously object. Reducing the number of lots to 6

or 4 would put lot size back into perspective, and a more pleasing house design with more cohesive curb appeal would help. Also this single 129th street serves some 55 homes or more and carries a huge amount of **traffic**, considering about two + vehicles per household - plus service trucks, friends, relatives, school buses, delivery and emergency vehicles, etc., etc., and is not meant to be an arterial or freeway as the many speeders think it is. This 129th road is dangerous at times, even as the quiet back street neighborhood road it is supposed to be. Now add additional vehicles and traffic to and from all these new proposed houses and you ask why we are very concerned?

We thank you for the opportunity to share our history, input and concerns with your and the staff that is, and will oversee, this development proposal.

Sincerely,

Brian and Paula Jaeger
7241 NE. 129th Street
Kirkland, WA 98034
425-772-9226

September 6, 2017

Mr. Christian Geitz, Planner
Land Use Management Division
Planning and Building Department
123 - 5th Avenue
Kirkland WA 98033

SUBJECT: Comments on Preliminary Subdivision Proposal SUB17-00450

Dear Mr. Geitz:

This letter provides our comments on the preliminary subdivision proposed for the property located at 7206 NE 129th Street, Kirkland, WA 98034.

Density and lot size/shape

Isola Homes proposes to subdivide a 2.04-acre parcel into 8 lots. The property is zoned RSA-4, which allows a maximum of 4 units per acre, subject to environmental conditions and other planning provisions. While Kirkland's plan and zoning ordinance allow this density, the area surrounding the proposed subdivision is largely developed with larger lots. The neighborhood was developed under King County planning and zoning standards, with most of the area zoned for three units per acre. The four lots immediately north of the subject property are 22,000 sf, 14,800 sf, 30,600 sf, and 32,001 sf. The area immediately east is comprised of 24 lots, each approximately 14,400 sf (1/3 acre). To the south, directly across NE 129th Street, developed lots are 19,177 sf, 15,141 sf, 13,965 sf, and 16,317 sf. To the west, across 72nd Avenue NE the lots are 104,000 sf, 18,000 sf, and 30,000 sf. Within the proposed subdivision, Lots 2-8 would be 10,751 square feet each (Lot 1 would be somewhat larger). Though this proposal is consistent with the blanket zoning which covers most of northwest Kirkland, the subdivision would not be consistent with development patterns in the surrounding neighborhood, most of which is already developed. In addition to the lot size issue, the shape of proposed lots (55' by 195') is not consistent with existing patterns nearby. Most of the developed lots in the surrounding community are closer to square, and provide more than 100 feet of street frontage for each home. The subject proposal would produce a much more urban pattern of homes on long, narrow lots, with each lot only 55 feet wide. This will not blend well with existing homes. For the reasons discussed above, we believe the subject property should be developed at no more than 3 units per acre, which would yield 6 lots rather than 8.

Tree retention and native vegetation

The subject property is within the Holmes Point Overlay area, which requires each parcel to set aside 25% to preserve native trees/vegetation. The preliminary tree retention and removal plans show two "groves" of native trees which the city recommends be retained by the developer. We agree with this recommendation. However, preliminary plans propose the removal of 5 mature Pacific Madrona trees along the frontage of NE 129th Street, with a sixth Madrona (tree #126) to be saved. We recommend all six Pacific Madrona trees be saved. These trees are not common on Finn Hill, and we consider them to be "specimen" trees. Most of the remaining native trees are Douglas fir, western red cedar, and big leaf maple, and are found nearly everywhere in western Washington. To the extent that the existing firs, cedars, and maples can meet the Holmes Point Overlay requirement, or provide other landscape benefits, we support their retention. However, we believe these six Pacific Madrona trees should be specifically identified and protected as part of the subdivision and development process.

Madrona trees looking north across NE 129th Street

Madrona Trees along NE 129th Street

These Madronas are truly magnificent trees – arguably the most stunning natural features on the property. One final note: because they're located close to the property line along NE 129th Street, these trees could be saved without affecting the proposed building sites. They all appear to be located within the 20-foot front yard setback requirement.

Drainage and wetlands

The developer's preliminary wetland assessment found no evidence of wetlands, based on their cursory review of hydrology, plants, and soils on the site. However, residents of surrounding properties have witnessed significant excessive water leaving the site, not only after heavy rain. The existing drainage ditch along the north side of NE 129th Street very often runs full of water for long periods during the winter. This ditch has overrun its capacity, sheeted across the road, and flooded properties on the south side of the road numerous times. The culvert on the north side of NE 129th Street which carries surface water from the property eastward under 74th Avenue NE is clear of debris and is not the cause of the standing water often found along the south edge of the subject property.

One reason the preliminary wetland assessment may have found no apparent wetlands on the property may be because any existing wetland may have been buried by imported soil during construction of sewers in the area by the now Northshore Utility District (NUD). During this construction, large amounts of soil were stockpiled in the center of the subject property (in the vicinity of proposed Lots 5-8). This stockpiling was approved under a temporary easement provided by the former owner (Bill Birdsall). At the termination of the sewer project, the excess soil was not completely removed. As a result, any previous wetland could still remain buried beneath the imported soil. We therefore recommend a more in-depth wetland review prior to approval of the currently proposed subdivision. One final note: on September 1, 2017, after one of the driest summers on record, the green "wetland-like" grasses shown below were seen along the southern edge of the open grassy area near Lots 6-8. This seems to indicate the presence of water close to the surface. Nothing else could reasonably explain the presence of these plants in this location after the current 4-month drought. We therefore recommend the wetland consultant take a closer look at this area.

WETLAND VEGETATION ON PROPERTY – SEPTEMBER 2017

Details for lot 8

Our home is located at 12921 – 74th Avenue NE. Our property abuts Lot 8 of the proposed subdivision. The current proposal shows the retention of grove 1 along the north boundary of Lots 1-6, and retention of existing trees at the north end of Lot 7. These trees and understory vegetation will meet the Holmes Point Overlay requirements and provide an excellent buffer for properties to the north. However, the preliminary tree retention plan fails to show a clump of existing trees near the north edge of Lot 8. These 3 trees are currently surrounded by dense blackberry bushes, making it difficult to identify or measure them. We believe these are Alder trees measuring 6-8 inches in diameter at chest height, making them significant (see photo). As part of the subdivision proposal, we would like these trees to be retained. We therefore ask the city to instruct the owner's arborist to assess these trees and save them as part of the tree retention plan. If these trees can be saved, we suggest removal of several other trees (#102, 103, 104, and 105) which abut the north edge of Grove 2.

ALDER TREES NEAR NORTH END OF PROPOSED LOT 8

ALDER TREES ON PROPOSED LOT 8 – WE REQUEST THEY BE SAVED

These trees are superfluous to meeting the Holmes Point Overlay requirements (grove 2 would more than satisfy this 25% need). In addition, trees 102-105 are located in the path of the driveway access to Lot 8 as currently proposed (access to Lot 8 would be via an easement across Lots 6 and 7, leaving grove 2 intact).

Retention of the Alder trees along the north edge of Lot 8 and the removal of trees 102-105 would allow the future house on Lot 8 to be moved further to the south and closer to the center of the lot. This would still retain the grove 2 buffer along NE 129th Street and would provide a larger back yard for Lot 8. It would enhance privacy for the house on Lot 8 and for our property, which is just across the fence from Lot 8. Lastly, we recommend the area of native vegetation in the far northeast corner of Lot 8 be retained. This area contains filbert trees and other shrubs that filter rain water, and provide a buffer for neighboring properties.

Thank you for providing the neighboring property owners with the information we need to thoughtfully review the proposed subdivision. Thanks as well for allowing us the chance to provide our comments and suggestions. As the project review and approval process moves forward, we would be happy to meet with the city and or the developer to discuss our thoughts. Our goal is to help produce a more positive outcome for the existing neighborhood and for the future residents.

In summary, we recommend the following:

- Reduce density to 3 units per acre, for a total of 6 lots on the property
- Save the Pacific Madrona trees along NE 129th Street
- Conduct a more in-depth analysis of potential wetlands on the site
- Implement our suggestions for Lot 8

Sincerely,

Stephen Kiehl Christine Kiehl

Stephen and Christine Kiehl
12921 – 74th Avenue NE
Kirkland, WA 98034
1-425-823-4693
cskiehl@comcast.net

cc: Eric Shields, Planning and Building Director

Christian Geitz

From: Barry McDermott <b.mcdermott13@gmail.com>
Sent: Monday, September 11, 2017 4:59 PM
To: Christian Geitz
Subject: RE: permit number SUB17-00450

Good afternoon,

I have several concerns about the planned development at 7206 NE 129th Street. They are as follows.

Surface water. The NE corner of this subdivision has standing surface water most of the year. It remains damp during the summer months. During heavy winter rain storms, water ponds along the northern boundary line. My concern is that serious ponding wiil extend onto my property should incomplete or incorrect steps be taken to mitigate surface water runoff.

Tree retention. Having seen the proposed tree retention plan for this property, I am concerned that once the developer has permit in hand he or she will clear cut this plat, pay whatever penalties, if any, and roll them into the projects overhead costs. I have been in the residential construction business for over twenty years and don't seen how eight homes can be built here while retaining theses trees. There just isn't room.

Property access. For some reason, the developer believes he/she has an easement across my property. This is definitely not the case. Please inform them. I have posted my property and am installing an access gate.

Thank you for you time and attention in these matters.

Sincerely.

Barry McDermott
12918 72nd Ave NE
Kirkland, WA 98034

206-390-2736

Christian Geitz
Planner
Planning and Building Department
City of Kirkland

September 9, 2017

Subject: Preliminary Subdivision Proposal SUB17-00450

Dear Mr. Geitz,

We reside across 129th Street immediately South of the proposed subdivision at 7206 NE 129th Street. We have a number of concerns about the effect the proposal will have on the ecology, traffic and aesthetics of the neighborhood.

Ecology

The proposal to remove trees will not only devastate the Madronas that are currently there but will be detrimental to the large numbers of birds that make their home on the property. These birds include pileated woodpeckers, owls and robins whose habitats are becoming increasingly more difficult to find in King County. The removal of the shrubs that surround these trees will almost certainly mean that the possums, coyotes, raccoons, deer, rabbits and mountain beavers will no longer be seen on the property.

We are also concerned that removal of the shrubbery will increase groundwater flow and adversely affect the already unstable drainage system that frequently overflows onto our property.

Traffic

The street already has a fairly large number of vehicles using it as it is the only vehicular access for approximately 55 homes. Eight additional houses will obviously significantly increase the number of vehicles and make walking more hazardous in an area that has a large number of local pedestrians. The current traffic does not always keep to the required speed limit so perhaps a review of the speed limits and controls would be appropriate.
We would also request that there be no on street parking made available. The street is not very wide and we have no desire to weave around parked vehicles to use our driveway.

Aesthetics

The proposed houses for this development are of a contemporary design and, while we appreciate their use of sustainable materials and their environmental awareness, the layout of the lots and style of the houses are not in keeping with the rest of the neighborhood. Eight essentially identical lots with almost identical houses on them would be more suited to an urban setting not the wooded suburban setting we bought into and live in today.

In conclusion we are requesting that the City of Kirkland reviews the proposed plans with great care and takes into consideration the history and information provided by the current residents.

Thank you for your time and consideration.

Sincerely,

Alastair and Ursula Nicol
7233 NE 129th Street
Kirkland, WA 98034

Christian Geitz

From: Rocky <rocke@4speeds.net>
Sent: Tuesday, September 05, 2017 6:05 PM
To: Christian Geitz
Subject: Comments on permit number SUB17-00450

From:

David L. Speed

7102 NE 132nd Street

Kirkland, WA 98034

Christian;

Subdivision of the property located at 7206 NE 129th Street in Kirkland will degrade the character of the neighborhood from a large lot surburban neighborhood on a cul-de-sac to a higher density neighborhood for the benefit of real estate developers at the cost to the existing taxpayers (and voters).

These subdivision applicants have been granted in the past and the effect has reached the maximum tolerable level for this area.

What planning will handle solid waste removal? This is a problem on my street now (NE 132nd Street). Power is a problem in this neighborhood

Additional traffic on a street with no sidewalks will endanger pedestrians.

There is but a single entrance and exit point into this area. Does this meet the requirements for safety and disaster response?

Additional traffic will be introduced to the trail crossing and un-permitted parking area between Big Finn Hill Park and the woodlands adjoining St Edwards.

Additional traffic will be directed onto the intersection at Juanita which is a somewhat blind curve.

I see no mitigating efforts being made by the developers for reducing the current quality of life.

Please deny this application.

In addition, current zoning ordinances are not being enforced in this area, a subject that I will address separately.

David Speed

12835 72nd Ave NE
Kirkland, WA 98034
August 30, 2017

Christian Geitz
123 5t Ave
Kirkland, WA 98033

Re: SUB17-00450

Dear Christian,

We want to express our interest and concerns about the proposed subdivision.

We are in an older neighborhood with one-off houses and larger lot sizes that is feeling many growing pains as homes are sold and bulldozed to be replaced with developments of matching homes placed as tightly as possible. This brings us to one of our concerns about the proposed configuration of lots. They are all long, extremely narrow lots. To smoothly fit into the neighborhood, wider lots with more street frontage would be better. Perhaps this subdivision could be done with an interior road with lots off each side?

Trees are certainly a concern as well. The drawings I have seen show which trees are to be left at least initially. We are hoping the developers will be expected to follow the Holmes Point Overlay rules that the rest of the neighbors are forced to observe. We are fearful that all that will be left after construction begins is the two little groves of trees.

Perhaps our largest concern has to do with surface water. The property is dry now after almost 3 months without rain, but it had areas with standing water all last winter with only one small area of the lot covered with impermeal surfaces. We were told one interested developer backed out when he found due to wetlands, he could only build 6 houses, not 8. (As a neighbor, 6 sure sounds better than 8. We really liked having one house there…) What is planned to manage the surface water? Will there be a vault or pond? Down the street they've put in a huge crater-like pond for the new development. After this dry summer, water is still present in that pond, the perfect habitat for mosquitoes. Many of us have sump pumps in our homes to manage the surface water; adding more water to run towards us is frightening. The neighborhood experienced a large landslide last October; we are quite sensitive when it comes to water management.

Thank you for your work on assuring changes to our neighborhood are positive.

Sincerely,
Tami and Joel Palmer
jtrpalmer3@gmail.com

Christian Geitz

From: Whit <whitmec@gmail.com>
Sent: Sunday, September 10, 2017 9:53 PM
To: Christian Geitz
Subject: Public Comment for permit number SUB17-00450

Christopher Whitmer
12965 76th Ave NE
Kirkland, WA 98034
whitmec@gmail.com

To Christian Geitz, Project Planner, City of Kirkland;

Please accept this as a public comment for the subject permit.

It's unfortunate that once again I provide public comment to yet another subdivision request in the Finn Hill area and Kirkland in general. This chopping up of our city and specifically our quiet neighborhood seems to continue once again. And like previous subdivisions in the area, the City of Kirkland will undoubtedly grant the permit and we'll see another wonderful piece of our neighborhood scalped of trees and chopped up into foolishly small lots for inevitably poorly constructed homes for decidedly milk toast buyers. Seemingly, the City of Kirkland has no vested interest in denying the permit because that would be lost revenue for the City. I shake my head at this process really, but hope you, Christian, can act reasonably and look beyond the potential revenue and the zone code ordinances and to ask yourself if the addition of EIGHT homes in this area is reasonable for the area. I challenge you to come first hand and look at the site and ask yourself if this subdivision (if developed) can reasonably sustain and positively impact the area.

Of particular consideration I hope you take great care in oversight of Ms. Wagner and The Blueline Group to ensure they follow all laws and codes. Like other recent subdivisions in the area, promises by permit applicants of retaining old growth and protected trees and maintaining the landscape are happily agreed to. But when it comes to site clearing and the heavy equipment shows up…away go the trees with only a fine for the permit holders to pay. They get what they want and past the cost onto the saps that purchase the new homes. And what are the neighborhoods left with? A landscape that is no longer Kirkland but starts to look like the dregs of Renton or New Castle.

I would ask that you gain documented assurances that Ms. Wagner and The Blueline Group will oversee their developers and contractors directly to ensure they operate within the City code and that the City routinely observe and oversee in person. Other subdivision developments in the area are famous for unreasonable street closures, construction equipment noise and material delivery at all hours leading to exhaustive stress for those who live around the area.

I would ask to have Ms. Wagner's or other Blueline Group's phone number be made available to all persons submitting a public comment so that we may call them directly if (when) their construction equipment operates past reasonable hours. Previous calls to Kirkland Police at nearby subdivision sites seem to be put at the bottom of the response list and frankly, the situation should never get to the point of noise completes.

I finally ask that Ms. Wagner and Blueline Group show proof of financial capacity to develop the site, specifically the landscaping. Of specific expectation should be a voluntary fund to be held in escrow with the City for area revegetation should Blueline Group finances dissolve before the developed of the site are

complete. This would help ensure if the developers fail (as many do) the neighbors of the site are not left with piles of bare dirt or similar to look at.

In closing, I'd like to once again appeal to your reasonable sensibilities Christian to see the area and come to the same conclusion as nearly all (actually it is ALL) neighbors have concluded…that this development is foolish and would severely negatively impact the surrounding area.

Thank you for your time and consideration.

Wetland Resources, Inc.

Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance

9505 19th Avenue S.E.
Suite 106
Everett, Washington 98208
(425) 337-3174
Fax (425) 337-3045

July 10, 2017

Isola Homes
Attn: Alex Mason
1518 1st Avenue South #301
Seattle, WA 98134

RE: Determination Report for 7206 NE 129th Street in Kirkland, Washington

Wetland Resources, Inc. (WRI) conducted site investigations on June 16 and 21, 2017, to locate and evaluate jurisdictional wetlands and streams on and in the vicinity of the 2.04-acre site located at 7206 NE 129th St, in Kirkland, WA (tax parcel 4055700755). The site is located at the corner of 72nd Avenue NE and NE 129th Street.

The subject site is on a plateau, south of Big Finn Hill Park and slopes gently to the south. To the east and the south of the site are steeper ravines, leading down to Lake Washington. Surrounding land use is primarily single-family residential. The property is forested in the northwest and southeast portions. The remaining portions of the property contain a single-family residence, a greenhouse, maintained lawn, and landscaping. Review of historical aerials show that a section of the eastern side of the site was cleared and graded between 2002 and 2003 (see attached aerial photos).

Western Washington received record levels of precipitation between October 2016 and May 2017. Data collected at SeaTac shows precipitation levels in April and May were well above the average monthly normal levels, and a large rain event (0.58 inches) occurred on June 15.

METHODOLOGY AND RESULTS

Prior to conducting the site investigation, public resource information was reviewed to gather background information on the subject property and the surrounding area in regards to wetlands, streams, and other critical areas. These sources included the USFWS National Wetlands Inventory (NWI), USDA-NRCS Web Soil Survey, City of Kirkland interactive mapping tool, WDFW SalmonScape mapping tool, WDNR Forest Practices Application Mapping Tool (FPAMT), and WDFW Priority Habitat and Species (PHS) Interactive Map.

- The nearest feature displayed by NWI is a stream located approximately 280 feet west of the subject property. No wetlands are displayed on or in the vicinity of the subject property.

- NRCS maps soils in the vicinity of the subject property as Alderwood gravelly sandy loam 8 to 15 percent slopes.
- The City of Kirkland interactive map does not display any critical areas on the subject site. A landslide hazard area is shown to the west of the site.
- WDFW SalmonScape does not display any streams on or in the vicinity of the subject site.
- The nearest feature displayed by FPAMT is the stream mapped on NWI to the west of the subject site. It is shown as a Type N (non-fish) stream.
- WDFW PHS does not display any sensitive areas on or in the vicinity of the subject property.

Wetland conditions were evaluated and delineated using routine methodology described in the *Corps of Engineers Wetlands Delineation Manual* (*Final Report*; January 1987), except where superseded by the *2010 Regional Supplement to the Corps of Engineers Wetland Delineation Manual: Western Mountains, Valleys, and Coast Region* (*Version 2.0*, referred to as 2010 Regional Supplement). Our findings are consistent with these manuals. The following criteria descriptions were used in the boundary determination:

1.) Examination of the site for hydrophytic vegetation (species present and percent cover);
2.) Examination of the site for hydric soils;
3.) Determining the presence of wetland hydrology

DETERMINATION FINDINGS/RESULTS

Within the forested area in the north side and southeast corner of the property, vegetation includes: big-leaf maple (*Acer macrophyllum*), western red cedar (*Thuja plicata*), madrone (*Arbutus menziesii*), Indian plum (*Oemleria cerasiformis*), English holly (*Ilex aquifolium*), English ivy (*Hedera helix*), and Himalayan blackberry (*Rubus armeniacus*). Ornamental plant species are present in the area around the house.

Soils within the forested areas are generally very dark brown (10YR 2/2) sandy loam in upper layer, with dark yellowish brown (10YR 3/4 or 3/6) sandy loam to sandy gravelly loam in the sublayer. Soils in these areas did not meet any hydric soil indicators. During the June 21 site visit, soils in these areas were dry within the upper 18 inches.

Vegetation within the cleared area in the eastern half of the site includes: red top agrostis (*Agrostis gigantea*), self-heal (*Prunella vulgaris*), creeping buttercup (*Ranunculus repens*), velvet grass (*Holcus lanatus*), hairy cat's ear (*Hypochaeris radicata*), and strawberry (*Fragaria* sp.). There is a stand of small red alder (*Alnus rubra*) adjacent to the south side of the clearing.

The soil profile in this area was disturbed, and according to the Geotechnical Engineering Study by Geotech Consultants, Inc. dated March 21, 2017, there is 1 to 2 feet of fill material over the native soils in a portion of the eastern area of the site. Chunks of concrete, black plastic, and other debris were encountered while digging soil-sampling pits in this area. Soils within this area are generally very dark grayish brown (10YR 3/2) in the upper layer, with a dark grayish brown (10YR 4/2) matrix containing dark yellowish brown redoximorphic concentrations in the

sublayer. The sampled soils were a sandy clay loam throughout the profile. During the June 16 site investigation, soils in this area were moist. No saturation or high water table was observed.

CONCLUSIONS

No wetlands were identified on the subject site or in the immediate vicinity. The vegetation and soils within the cleared area in the eastern half of the site have been previously disturbed. As noted by Geotech Consultants, Inc., the upper layer of the soil did not form in place. Considering no other area of the site was disturbed at the time this area was cleared and graded, the fill material was imported from off-site. Redoximorphic features observed in this soil are concentrations, not active features such as oxidized rhizospheres. Oxidized rhizospheres were not observed in any of the sampled soils.

Due to the record levels of precipitation Western Washington received between October 2016 and May 2017, the vast majority of the wetlands WRI observed in June 2017 contained saturation or high groundwater levels within the upper 12 inches of the soil surface. Considering the June 16 site visit was conducted after a prolonged period of above normal rainfall and the day after a record rain event (0.58 inches on June 15), it is expected that any wetland areas on-site would have contained saturated soils or a high water table.

USE OF THIS REPORT

This Wetland Determination Report is supplied to Isola Homes, as a means of determining the presence of on-site and adjacent critical areas, as required by the City of Kirkland. This report is based largely on readily observable conditions and, to a lesser extent, on readily ascertainable conditions. No attempt has been made to determine hidden or concealed conditions.

The laws applicable to critical areas are subject to varying interpretations and may be changed at any time by the courts or legislative bodies. This report is intended to provide information deemed relevant in the applicant's attempt to comply with the laws now in effect.

This report conforms to the standard of care employed by wetland ecologists. No other representation or warranty is made concerning the work or this report and any implied representation or warranty is disclaimed.

Wetland Resources, Inc.

Meryl A. Kamowski

Meryl Kamowski
Senior Ecologist

Enclosures: Historical Aerial Photographs
USACE Wetland Determination Data Forms
Existing Conditions Map

HISTORIC AERIALS
ISOLA HOMES
7206 NE 129TH ST
KIRKLAND, WA

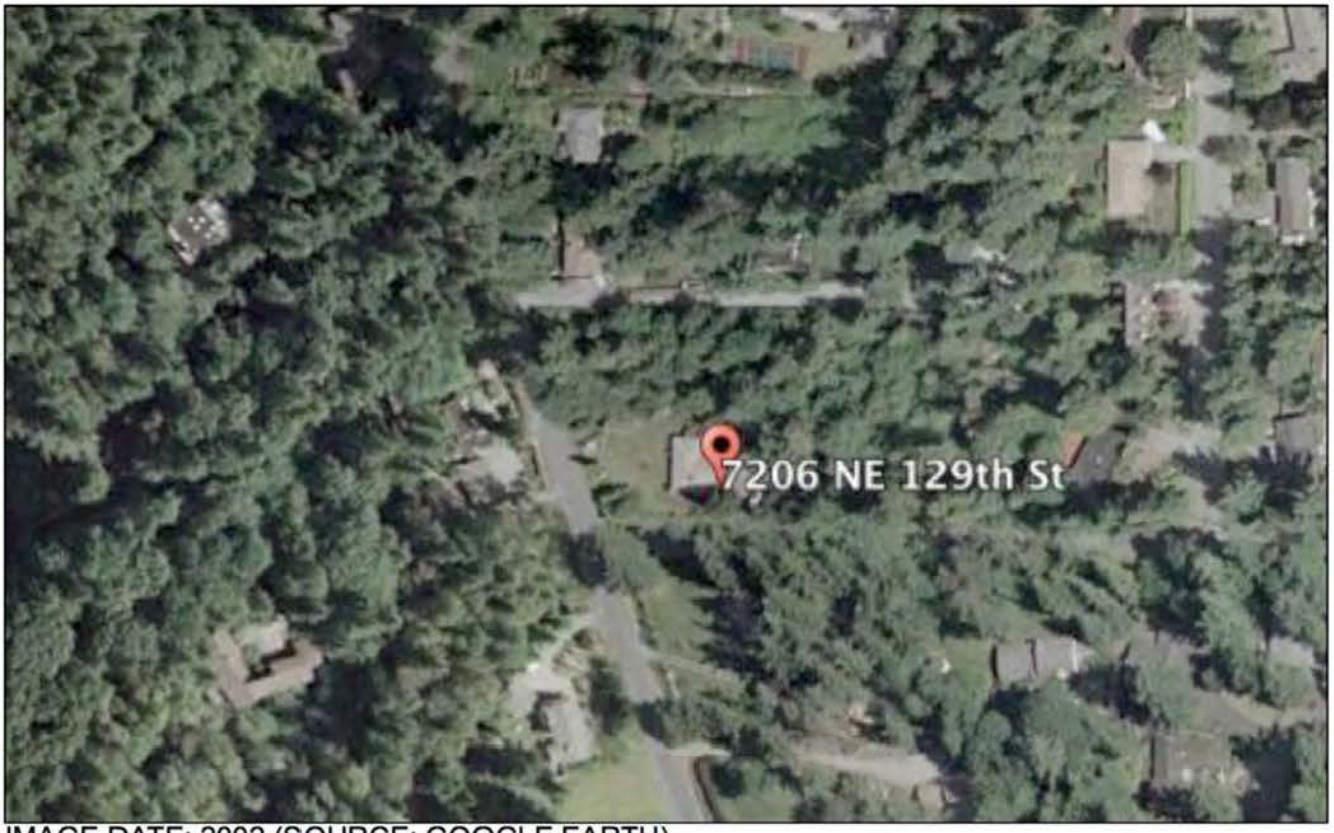


IMAGE DATE: 2002 (SOURCE: GOOGLE EARTH)

IMAGE DATE: 2003 (SOURCE: GOOGLE EARTH)

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 17047 City/County: Kirkland/King Co Sampling Date: 6-21-17

Applicant/Owner: Isola Homes State: WA Sampling Point: S1

Investigator(s): JG/MK Section, Township, Range: S25-T26N-R04E-WM

Landform (hillslope, terrace, etc.): toe of slope Local relief (concave, convex, none): none Slope (%): 5

Subregion (LRR): LRR A Lat: 47.717 Long: -122.245 Datum: NAD83

Soil Map Unit Name: Alderwood gravelly sandy loam, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	35	Y	FAC
2. Acer macrophyllum	15	Y	FACU
3. Arbutus menziesii	10	N	UPL
4.			
	60	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Oemleria cerasiformis	10	Y	FACU
2. Ilex aquifolium	5	Y	FACU
3. Corylus cornuta	5	Y	FACU
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Hedera helix	95	Y	FACU
2.			
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 5

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 6 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 17% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	35	x 3 = 105
FACU species	130	x 4 = 520
UPL species	10	x 5 = 50
Column Totals:	175 (A)	675 (B)

Prevalence Index = B/A = 3.8

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S1

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-7	10YR 2/2	100					Sandy Loam	
7-16	10YR 3/6	100					Sa Gr Lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 17047 City/County: Kirkland/King Co Sampling Date: 6-21-17

Applicant/Owner: Isola Homes State: WA Sampling Point: S2

Investigator(s): JG/MK Section, Township, Range: S25-T26N-R04E-WM

Landform (hillslope, terrace, etc.): hillslope Local relief (concave, convex, none): none Slope (%): 10

Subregion (LRR): LRR A Lat: 47.717 Long: -122.245 Datum: NAD83

Soil Map Unit Name: Alderwood gravelly sandy loam, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Thuja plicata	40	Y	FAC
2. Alnus rubra	30	Y	FAC
3. Acer macrophyllum	5	N	FACU
4.			
	75	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Oemleria cerasiformis	10	Y	FACU
2.			
3.			
4.			
5.			
	10	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Hedera helix	80	Y	FACU
2. Ranunculus repens	10	N	FAC
3.			
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	90	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 0

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 2 (A)

Total Number of Dominant Species Across All Strata: 4 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 50% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	80	x 3 = 240
FACU species	95	x 4 = 380
UPL species		x 5 = 0
Column Totals:	175 (A)	620 (B)

Prevalence Index = B/A = 3.5

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

SOIL

Sampling Point: S2

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-8	10YR 3/2	100					Sandy Loam	
8-16	10YR 3/6	98					Sandy loam	Charcoal present
	10YR 4/2	2	10YR 3/4	5	C	M		

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

Soil dry throughout profile. Sublayer contains small inclusions (1-2" in size, approximately 2%) of 10YR 4/2 with redox concentrations of 10YR 3/4. This sublayer looks like the native soil and fill matrices were mixed together.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of hydrology; soil dry throughout profile

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 17047 Isola - NE 129th St. City/County: Kirkland/King Co. Sampling Date: 6-16-17

Applicant/Owner: Isola Homes State: WA Sampling Point: S3

Investigator(s): JG Section, Township, Range: S25-T26N-R04E-WM

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): _____

Subregion (LRR): LRR A Lat: 47.717 Long: -122.245 Datum: _____

Soil Map Unit Name: Alderwood gravelly sandy loam, 8-15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☑, Soil ☑, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☑ No ☐	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Alnus rubra	10	Y	FAC
2. Populus balsamifera	5	Y	FAC
3. Acer macrophyllum	trace	N	
4.			
	15	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Rubus armeniacus	5	Y	FAC
2.			
3.			
4.			
5.			
	5	= Total Cover	
Herb Stratum (Plot size: m)			
1. Agrostis gigantea	40	Y	FAC
2. Ranunculus repens	20	Y	FAC
3. Prunella vulgaris	10	N	FACU
4. Holcus lanatus	5	N	FAC
5. Juncus effusus	5	N	FACW
6. Rumex acetosella	5	N	FACU
7. Fragaria sp	5	N	FACU
8. Juncus tenuis	5	N	FAC
9. Unknown sedge	5	N	
10. Plantago lanceolata	trace	N	FACU
11. Trifolium repens	trace	N	FAC
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum _____

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 5 (A)

Total Number of Dominant Species Across All Strata: 5 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 100 (A/B)

Prevalence Index worksheet:

Total % Cover of:	Multiply by:
OBL species _____	x 1 = 0
FACW species _____	x 2 = 0
FAC species _____	x 3 = 0
FACU species _____	x 4 = 0
UPL species _____	x 5 = 0
Column Totals: 0 (A)	0 (B)

Prevalence Index = B/A = _____

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☑ No ☐

Remarks:

Additional herb -- Hypochaeris radicata, trace, FACU

SOIL

Sampling Point: S3

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-6	10YR 3/2	100					Sa Cl Lo	
6-16	10YR 4/2	95	10YR 3/4	5	C	M	Sa Cl Lo	

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):
Type:
Depth (inches):

Hydric Soil Present? Yes ☐ No ☑

Remarks:
While the color profile looks like a Depleted Matrix, this area contains 12-12" of fill material above the native soil (per the report by Geotech Consultants, Inc. dated March 21, 2017). This soil was imported between 2002 and 2003 when the area was cleared and graded, and did not form in place.

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches):
Water Table Present? Yes ☐ No ☑ Depth (inches):
Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches):

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:
Rainfall recorded at SeaTac for June 15 was 0.58 inches.

WETLAND DETERMINATION DATA FORM – Western Mountains, Valleys, and Coast Region

Project/Site: 17047 City/County: Kirkland/King Co Sampling Date: 6-21-17

Applicant/Owner: Isola Homes State: WA Sampling Point: S4

Investigator(s): JG/MK Section, Township, Range: S25-T26N-R04E-WM

Landform (hillslope, terrace, etc.): _____ Local relief (concave, convex, none): none Slope (%): <5

Subregion (LRR): LRR A Lat: 47.717 Long: -122.245 Datum: NAD83

Soil Map Unit Name: Alderwood gravelly sandy loam, 8 to 15 percent slopes NWI classification: None

Are climatic / hydrologic conditions on the site typical for this time of year? Yes ☑ No ☐ (If no, explain in Remarks.)

Are Vegetation ☐, Soil ☐, or Hydrology ☐ significantly disturbed? Are "Normal Circumstances" present? Yes ☑ No ☐

Are Vegetation ☐, Soil ☐, or Hydrology ☐ naturally problematic? (If needed, explain any answers in Remarks.)

SUMMARY OF FINDINGS – Attach site map showing sampling point locations, transects, important features, etc.

Hydrophytic Vegetation Present?	Yes ☐ No ☑	**Is the Sampled Area within a Wetland?** Yes ☐ No ☑
Hydric Soil Present?	Yes ☐ No ☑	
Wetland Hydrology Present?	Yes ☐ No ☑	

Remarks:

VEGETATION – Use scientific names of plants.

Tree Stratum (Plot size: 5m)	Absolute % Cover	Dominant Species?	Indicator Status
1. Acer macrophyllum	25	Y	FACU
2.			
3.			
4.			
	25	= Total Cover	
Sapling/Shrub Stratum (Plot size: 3m)			
1. Rubus armeniacus	10	Y	FAC
2. Oemleria cerasiformis	10	Y	FACU
3.			
4.			
5.			
	20	= Total Cover	
Herb Stratum (Plot size: 1m)			
1. Rubus ursinus	Trace	N	FACU
2. Geranium rob	Trace	N	FACU
3. Geum macrophyllum	Trace	N	FAC
4.			
5.			
6.			
7.			
8.			
9.			
10.			
11.			
	95	= Total Cover	
Woody Vine Stratum (Plot size:)			
1.			
2.			
	0	= Total Cover	

% Bare Ground in Herb Stratum 80

Dominance Test worksheet:

Number of Dominant Species That Are OBL, FACW, or FAC: 1 (A)

Total Number of Dominant Species Across All Strata: 3 (B)

Percent of Dominant Species That Are OBL, FACW, or FAC: 33% (A/B)

Prevalence Index worksheet:

Total % Cover of:		Multiply by:
OBL species	0	x 1 = 0
FACW species	0	x 2 = 0
FAC species	10	x 3 = 30
FACU species	35	x 4 = 140
UPL species	10	x 5 = 50
Column Totals:	55 (A)	220 (B)

Prevalence Index = B/A = 4

Hydrophytic Vegetation Indicators:

- ☐ Rapid Test for Hydrophytic Vegetation
- ☐ Dominance Test is >50%
- ☐ Prevalence Index is ≤3.0[1]
- ☐ Morphological Adaptations[1] (Provide supporting data in Remarks or on a separate sheet)
- ☐ Wetland Non-Vascular Plants[1]
- ☐ Problematic Hydrophytic Vegetation[1] (Explain)

[1]Indicators of hydric soil and wetland hydrology must be present, unless disturbed or problematic.

Hydrophytic Vegetation Present? Yes ☐ No ☑

Remarks:

Moss 20%

SOIL

Sampling Point: S4

Profile Description: (Describe to the depth needed to document the indicator or confirm the absence of indicators.)

Depth (inches)	Matrix Color (moist)	Matrix %	Redox Features Color (moist)	Redox %	Type[1]	Loc[2]	Texture	Remarks
0-10	10YR 2/2	100					Sandy Loam	
10-14	10YR 3/6	100					Sandy Loam	Moist

[1]Type: C=Concentration, D=Depletion, RM=Reduced Matrix, CS=Covered or Coated Sand Grains. [2]Location: PL=Pore Lining, M=Matrix.

Hydric Soil Indicators: (Applicable to all LRRs, unless otherwise noted.)

- ☐ Histosol (A1)
- ☐ Histic Epipedon (A2)
- ☐ Black Histic (A3)
- ☐ Hydrogen Sulfide (A4)
- ☐ Depleted Below Dark Surface (A11)
- ☐ Thick Dark Surface (A12)
- ☐ Sandy Mucky Mineral (S1)
- ☐ Sandy Gleyed Matrix (S4)
- ☐ Sandy Redox (S5)
- ☐ Stripped Matrix (S6)
- ☐ Loamy Mucky Mineral (F1) (**except MLRA 1**)
- ☐ Loamy Gleyed Matrix (F2)
- ☐ Depleted Matrix (F3)
- ☐ Redox Dark Surface (F6)
- ☐ Depleted Dark Surface (F7)
- ☐ Redox Depressions (F8)

Indicators for Problematic Hydric Soils[3]:

- ☐ 2 cm Muck (A10)
- ☐ Red Parent Material (TF2)
- ☐ Very Shallow Dark Surface (TF12)
- ☐ Other (Explain in Remarks)

[3]Indicators of hydrophytic vegetation and wetland hydrology must be present, unless disturbed or problematic.

Restrictive Layer (if present):

Type:_____

Depth (inches):_____

Hydric Soil Present? Yes ☐ No ☑

Remarks:

HYDROLOGY

Wetland Hydrology Indicators:

Primary Indicators (minimum of one required; check all that apply)

- ☐ Surface Water (A1)
- ☐ High Water Table (A2)
- ☐ Saturation (A3)
- ☐ Water Marks (B1)
- ☐ Sediment Deposits (B2)
- ☐ Drift Deposits (B3)
- ☐ Algal Mat or Crust (B4)
- ☐ Iron Deposits (B5)
- ☐ Surface Soil Cracks (B6)
- ☐ Inundation Visible on Aerial Imagery (B7)
- ☐ Sparsely Vegetated Concave Surface (B8)
- ☐ Water-Stained Leaves (B9) (**except MLRA 1, 2, 4A, and 4B**)
- ☐ Salt Crust (B11)
- ☐ Aquatic Invertebrates (B13)
- ☐ Hydrogen Sulfide Odor (C1)
- ☐ Oxidized Rhizospheres along Living Roots (C3)
- ☐ Presence of Reduced Iron (C4)
- ☐ Recent Iron Reduction in Tilled Soils (C6)
- ☐ Stunted or Stressed Plants (D1) (**LRR A**)
- ☐ Other (Explain in Remarks)

Secondary Indicators (2 or more required)

- ☐ Water-Stained Leaves (B9) (**MLRA 1, 2, 4A, and 4B**)
- ☐ Drainage Patterns (B10)
- ☐ Dry-Season Water Table (C2)
- ☐ Saturation Visible on Aerial Imagery (C9)
- ☐ Geomorphic Position (D2)
- ☐ Shallow Aquitard (D3)
- ☐ FAC-Neutral Test (D5)
- ☐ Raised Ant Mounds (D6) (**LRR A**)
- ☐ Frost-Heave Hummocks (D7)

Field Observations:

Surface Water Present? Yes ☐ No ☑ Depth (inches): _____

Water Table Present? Yes ☐ No ☑ Depth (inches): _____

Saturation Present? (includes capillary fringe) Yes ☐ No ☑ Depth (inches): _____

Wetland Hydrology Present? Yes ☐ No ☑

Describe Recorded Data (stream gauge, monitoring well, aerial photos, previous inspections), if available:

Remarks:

No evidence of hydrology

EXISTING CONDITIONS MAP

ISOLA HOMES - NE 129TH ST

PORTION OF SECTION 25, TOWNSHIP 26N, RANGE 04E, W.M.

LEGEND

PROPERTY BOUNDARY

S4 DATA SITES

Scale 1" = 60'

0 30 60 90 120

Wetland Resources, Inc.
Delineation / Mitigation / Restoration / Habitat Creation / Permit Assistance
9505 19th Avenue S.E. Suite 106 Everett, Washington 98208
Phone: (425) 337-3174
Fax: (425) 337-3045
Email: mailbox@wetlandresources.com

Existing Conditions Map
Isola Homes - NE 129th St
City of Kirkland

Isola Homes
Attn: Alex Mason
1518 1st Ave S. #301
Seattle, WA 98034

Sheet 1/1
WRI Job#: 17047
Drawn by: MK
Date: 7.1[illegible].2017

ATTACHMENT 6
SUB17-00450

GEOTECH
CONSULTANTS, INC.

2401 10th Ave E
Seattle, Washington 98102
(425) 747-5618 FAX (425) 747-8561

March 21, 2017

JN 17088

Isola Homes
1518 First Avenue South, Suite 301
Seattle, Washington 98134

Attention: Alex Mason *via email: alex.mason@isolacm.com*

Subject: **Transmittal Letter – Geotechnical Engineering Study**
Proposed Townhomes
7206 Northeast 129th Street
Kirkland, Washington

Dear Mr. Mason:

We are pleased to present this geotechnical engineering report for the residential development to be constructed in Kirkland, Washington. The scope of our services consisted of exploring site surface and subsurface conditions, and then developing this report to provide recommendations for general earthwork and design criteria for foundations and retaining walls. This work was authorized by your acceptance of our proposal dated February 23, 2017.

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

Respectfully submitted,

GEOTECH CONSULTANTS, INC.

James H. Strange, P.E.
Associate

cc: **Malsam Tsang** – Marc Malsam
via email: marcm@malsam-tsang.com

JHS: mw

GEOTECHNICAL ENGINEERING STUDY
Proposed Townhomes
7206 Northeast 129th Street
Kirkland, Washington

This report presents the findings and recommendations of our geotechnical engineering study for the site of the proposed residential development to be located in the Juanita area of Kirkland.

We were provided with an undated preliminary site plan. Based on this plan, we understand that the development will consist of 8 detached houses on the 8-lot subplat. The houses would generally be on the southern edge of the lots (accessed off of Northeast 129th Street) and are anticipated to be shallowly founded without basements. The existing house will be demolished.

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

SITE CONDITIONS

SURFACE

The Vicinity Map, Plate 1, illustrates the general location of the site in the Highlands neighborhood. The site is bordered to the west by 72nd Avenue Northeast, to the north by the driveway to adjacent single family residences, and to the south by Northeast 129th Street. Adjacent residences are also located to the east. None of the adjacent residences are within 10 feet from the common property lines.

The site is composed of a single parcel of land that is developed with a single family residence located on the southwestern portion of the lot. The building consists of a single story over a shallow foundation. A paved parking area is located along the south side of the eastern end of the house. The undeveloped areas of the site are vegetated with grass lawn and landscaping bushes. The ground surface within the site slopes gently down toward the south, with a change in elevation of less than 10 feet across the property. No steep slopes are located within or adjacent to the site.

SUBSURFACE

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

The test pits were excavated on February 28, 2017 using a rubber-tracked backhoe. A geotechnical engineer from our staff conducted the explorations, logged the holes, and obtained representative samples of the soil encountered. The Test Pit Logs are attached to this report as Plates 3 through 5.

Soil Conditions

The test pits encountered topsoil and loose fill that consisted of silty sand with gravel. The fill extended to depths of 1 to 2 feet, and was only encountered in Test Pits 4 and 5. The topsoil or fill was underlain by red-brown, silty sand with gravel that was generally very moist to wet and loose. This weathered soil was underlain by dense to very dense, cemented, silty sand (Glacial Till) at depths of about 2.5 to 4 feet below existing grades. This very dense silty sand is glacially compressed and is known locally as Glacial Till. The Glacial Till extended to the base of all of the test pits at depths of 3 to 4.5 feet.

Groundwater Conditions

Perched groundwater seepage was observed in all but one of the test pits (TP-1). The depth to the perched groundwater varied from 1 to 3.5 feet across the test pits. It should be noted that groundwater levels vary seasonally with rainfall and other factors. We anticipate that groundwater could be found in more permeable soil layers and between the near-surface looser soil and the underlying denser soil.

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

CONCLUSIONS AND RECOMMENDATIONS

GENERAL

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

The test pits conducted for this study encountered loose fill and weathered soils overlying dense to very dense glacial till at depths of 2.5 to 4 feet below grade. Conventional footings bearing on the dense, native glacial till or on structural fill placed above the till will provide suitable support to the proposed structures. The on-site native sand soils are silty in nature, and are thus very moisture-sensitive. When wet, these soils can become softened from equipment and foot traffic. Therefore, if footings are constructed during wet weather, or when the soils are wet, it will be necessary to protect bearing surfaces with a layer of imported, clean crushed rock to prevent disturbance of the footing subgrades. The non-organic, silty sand soils can be reused as structural fill, provided that they can be dried out sufficiently, are placed in dry weather and are at, or near, the optimum moisture content. These soils wet and unusable at the time of digging our test pits. The silty sand soils should not be placed in direct contact with foundation walls. Any fill soils encountered on site should not be used as structural fill.

The dense silty soils that underlie the site at approximately 2.5 to 4 feet below existing grades have very low capacity for infiltration, and indeed we encountered perched groundwater in nearly all of

the test pits. Therefore, infiltration of concentrated stormwater in deep facilities is not feasible for the project.

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

The drainage and/or waterproofing recommendations presented in this report are intended only to prevent active seepage from flowing through concrete walls or slabs. Even in the absence of active seepage into and beneath structures, water vapor can migrate through walls, slabs, and floors from the surrounding soil, and can even be transmitted from slabs and foundation walls due to the concrete curing process. Water vapor also results from occupant uses, such as cooking and bathing. Excessive water vapor trapped within structures can result in a variety of undesirable conditions, including, but not limited to, moisture problems with flooring systems, excessively moist air within occupied areas, and the growth of molds, fungi, and other biological organisms that may be harmful to the health of the occupants. The designer or architect must consider the potential vapor sources and likely occupant uses, and provide sufficient ventilation, either passive or mechanical, to prevent a build up of excessive water vapor within the planned structure.

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

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

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site soil profile within 100 feet of the ground surface is best represented by Site Class Type C (Very Dense Soil Site Class). The site soils that will support the structures are not susceptible to seismic liquefaction because of their dense nature.

CONVENTIONAL FOUNDATIONS

The proposed structure can be supported on conventional continuous and spread footings bearing on undisturbed, medium-dense, native soil, or on structural fill placed above this competent native

soil. See the section entitled ***General Earthwork and Structural Fill*** for recommendations regarding the placement and compaction of structural fill beneath structures. Adequate compaction of structural fill should be verified with frequent density testing during fill placement. Prior to placing structural fill beneath foundations, the excavation should be observed by the geotechnical engineer to document that adequate bearing soils have been exposed.

We recommend that continuous and individual spread footings have minimum widths of 12 and 16 inches, respectively. Exterior footings should also be bottomed at least 18 inches below the lowest adjacent finish ground surface for protection against frost and erosion. The local building codes should be reviewed to determine if different footing widths or embedment depths are required. Footing subgrades must be cleaned of loose or disturbed soil prior to pouring concrete. Depending upon site and equipment constraints, this may require removing the disturbed soil by hand.

Depending on the final site grades, overexcavation may be required below the footings to expose competent native soil. Unless lean concrete is used to fill an overexcavated hole, the overexcavation must be at least as wide at the bottom as the sum of the depth of the overexcavation and the footing width. For example, an overexcavation extending 2 feet below the bottom of a 2-foot-wide footing must be at least 4 feet wide at the base of the excavation. If lean concrete is used, the overexcavation need only extend 6 inches beyond the edges of the footing.

An allowable bearing pressure of 3,000 pounds per square foot (psf) is appropriate for footings supported on competent native soil. A one-third increase in this design bearing pressure may be used when considering short-term wind or seismic loads. For the above design criteria, it is anticipated that the total post-construction settlement of footings founded on competent native soil will be about one-inch, with differential settlements on the order of one-half-inch in a distance of 30 feet along a continuous footing with a uniform load.

Lateral loads due to wind or seismic forces may be resisted by friction between the foundation and the bearing soil, or by passive earth pressure acting on the vertical, embedded portions of the foundation. For the latter condition, the foundation must be either poured directly against relatively level, undisturbed soil or be surrounded by level, well-compacted fill. We recommend using the following ultimate values for the foundation's resistance to lateral loading:

PARAMETER	ULTIMATE VALUE
Coefficient of Friction	0.50
Passive Earth Pressure	350 pcf

Where: pcf is Pounds per Cubic Foot, and Passive Earth Pressure is computed using the equivalent fluid density.

If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. We recommend maintaining a safety factor of at least 1.5 for the foundation's resistance to lateral loading, when using the above ultimate values.

FOUNDATION AND RETAINING WALLS

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

PARAMETER	VALUE
Active Earth Pressure *	35 pcf
Passive Earth Pressure	350 pcf
Coefficient of Friction	0.50
Soil Unit Weight	130 pcf

Where: pcf is Pounds per Cubic Foot, and Active and Passive Earth Pressures are computed using the equivalent fluid pressures.

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

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

The values given above are to be used to design only permanent foundation and retaining walls that are to be backfilled, such as conventional walls constructed of reinforced concrete or masonry. It is not appropriate to use the above earth pressures and soil unit weight to back-calculate soil strength parameters for design of other types of retaining walls, such as soldier pile, reinforced earth, modular or soil nail walls. We can assist with design of these types of walls, if desired. The passive pressure given is appropriate only for a shear key poured directly against undisturbed native soil, or for the depth of level, well-compacted fill placed in front of a retaining or foundation wall. The values for friction and passive resistance are ultimate values and do not include a safety factor. Restrained wall soil parameters should be utilized for a distance of 1.5 times the wall height from corners or bends in the walls. This is intended to reduce the amount of cracking that can occur where a wall is restrained by a corner.

Wall Pressures Due to Seismic Forces

The surcharge wall loads that could be imposed by the design earthquake can be modeled by adding a uniform lateral pressure to the above-recommended active pressure. The recommended surcharge pressure is 7**H** pounds per square foot (psf), where **H** is the design retention height of the wall. Using this increased pressure, the safety factor against sliding and overturning can be reduced to 1.2 for the seismic analysis.

Retaining Wall Backfill and Waterproofing

Backfill placed behind retaining or foundation walls should be coarse, free-draining structural fill containing no organics. This backfill should contain no more than 5 percent silt or clay particles and have no gravel greater than 4 inches in diameter. The percentage of particles passing the No. 4 sieve should be between 25 and 70 percent. If the native sandy

is used as backfill, a drainage composite similar to Miradrain 6000 should be placed against the backfilled retaining walls. The drainage composites should be hydraulically connected to the foundation drain system.

The purpose of these backfill requirements is to ensure that the design criteria for a retaining wall are not exceeded because of a build-up of hydrostatic pressure behind the wall. Also, subsurface drainage systems are not intended to handle large volumes of water from surface runoff. The top 12 to 18 inches of the backfill should consist of a compacted, relatively impermeable soil or topsoil, or the surface should be paved. The ground surface must also slope away from backfilled walls to reduce the potential for surface water to percolate into the backfill. Water percolating through pervious surfaces (pavers, gravel, permeable pavement, etc.) must also be prevented from flowing toward walls or into the backfill zone. The compacted subgrade below pervious surfaces and any associated drainage layer should therefore be sloped away. Alternatively, a membrane and subsurface collection system could be provided below a pervious surface.

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

The above recommendations are not intended to waterproof below-grade walls, or to prevent the formation of mold, mildew or fungi in interior spaces. Over time, the performance of subsurface drainage systems can degrade, subsurface groundwater flow patterns can change, and utilities can break or develop leaks. Therefore, waterproofing should be provided where future seepage through the walls is not acceptable. This typically includes limiting cold-joints and wall penetrations, and using bentonite panels or membranes on the outside of the walls. There are a variety of different waterproofing materials and systems, which should be installed by an experienced contractor familiar with the anticipated construction and subsurface conditions. Applying a thin coat of asphalt emulsion to the outside face of a wall is not considered waterproofing, and will only help to reduce moisture generated from water vapor or capillary action from seeping through the concrete. As with any project, adequate ventilation of basement and crawl space areas is important to prevent a build up of water vapor that is commonly transmitted through concrete walls from the surrounding soil, even when seepage is not present. This is appropriate even when waterproofing is applied to the outside of foundation and retaining walls. We recommend that you contact an experienced envelope consultant if detailed recommendations or specifications related to waterproofing design, or minimizing the potential for infestations of mold and mildew are desired.

The ***General***, ***Slabs-On-Grade***, and ***Drainage Considerations*** sections should be reviewed for additional recommendations related to the control of groundwater and excess water vapor for the anticipated construction.

SLABS-ON-GRADE

The building floors can be constructed as slabs-on-grade atop competent native soil, or on structural fill. The subgrade soil must be in a firm, non-yielding condition at the time of slab construction or underslab fill placement. Any soft areas encountered should be excavated and replaced with select, imported structural fill.

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

As noted by the American Concrete Institute (ACI) in the *Guides for Concrete Floor and Slab Structures*, proper moisture protection is desirable immediately below any on-grade slab that will be covered by tile, wood, carpet, impermeable floor coverings, or any moisture-sensitive equipment or products. ACI also notes that vapor *retarders* such as 6-mil plastic sheeting have been used in the past, but are now recommending a minimum 10-mil thickness for better durability and long term performance. A vapor retarder is defined as a material with a permeance of less than 0.3 perms, as determined by ASTM E 96. It is possible that concrete admixtures may meet this specification, although the manufacturers of the admixtures should be consulted. Where vapor retarders are used under slabs, their edges should overlap by at least 6 inches and be sealed with adhesive tape. The sheeting should extend to the foundation walls for maximum vapor protection. If no potential for vapor passage through the slab is desired, a vapor *barrier* should be used. A vapor barrier, as defined by ACI, is a product with a water transmission rate of 0.01 perms when tested in accordance with ASTM E 96. Reinforced membranes having sealed overlaps can meet this requirement.

The ***General***, ***Permanent Foundation and Retaining Walls***, and ***Drainage Considerations*** sections should be reviewed for additional recommendations related to the control of groundwater and excess water vapor for the anticipated construction.

EXCAVATIONS AND SLOPES

No excavated slopes are anticipated other than for utility trenches. Excavation slopes should not exceed the limits specified in local, state, and national government safety regulations. Temporary cuts to a depth of about 4 feet may be attempted vertically in unsaturated soil, if there are no indications of slope instability. However, vertical cuts should not be made near property boundaries, or existing utilities and structures. Based upon Washington Administrative Code (WAC) 296, Part N, the soil at the subject site would generally be classified as Type B. Therefore, temporary cut slopes greater than 4 feet in height should not be excavated at an inclination steeper than 1:1 (Horizontal:Vertical), extending continuously between the top and the bottom of a cut.

The above-recommended temporary slope inclination is based on the conditions exposed in our explorations, and on what has been successful at other sites with similar soil conditions. It is possible that variations in soil and groundwater conditions will require modifications to the inclination at which temporary slopes can stand. Temporary cuts are those that will remain

unsupported for a relatively short duration to allow for the construction of foundations, retaining walls, or utilities. Temporary cut slopes should be protected with plastic sheeting during wet weather. It is also important that surface runoff be directed away from the top of temporary slope cuts. Cut slopes should also be backfilled or retained as soon as possible to reduce the potential for instability. Please note that sand or loose soil can cave suddenly and without warning. Excavation, foundation, and utility contractors should be made especially aware of this potential danger. These recommendations may need to be modified if the area near the potential cuts has been disturbed in the past by utility installation, or if settlement-sensitive utilities are located nearby.

All permanent cuts into native soil should be inclined no steeper than 2:1 (H:V). Water should not be allowed to flow uncontrolled over the top of any temporary or permanent slope. All permanently exposed slopes should be seeded with an appropriate species of vegetation to reduce erosion and improve the stability of the surficial layer of soil.

DRAINAGE CONSIDERATIONS

Footing drains should be used at the base of all perimeter and basement footings. Drains should also be placed at the base of all earth-retaining walls. These drains should be surrounded by at least 6 inches of 1-inch-minus, washed rock that is encircled with non-woven, geotextile filter fabric (Mirafi 140N, Supac 4NP, or similar material). At its highest point, a perforated pipe invert should be at least 6 inches below the bottom of a slab floor or the level of a crawl space. The discharge pipe for subsurface drains should be sloped for flow to the outlet point. Roof and surface water drains must not discharge into the foundation drain system. A typical drain detail is attached to this report as Plate 6. For the best long-term performance, perforated PVC pipe is recommended for all subsurface drains.

As a minimum, a vapor retarder, as defined in the ***Slabs-On-Grade*** section, should be provided in any crawl space area to limit the transmission of water vapor from the underlying soils. Crawl space grades are sometimes left near the elevation of the bottom of the footings. As a result, an outlet drain is recommended for all crawl spaces to prevent an accumulation of any water that may bypass the footing drains. Providing even a few inches of free draining gravel underneath the vapor retarder limits the potential for seepage to build up on top of the vapor retarder.

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

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

GENERAL EARTHWORK AND STRUCTURAL FILL

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

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

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

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

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

Structural fill that will be placed in wet weather should consist of a coarse, granular soil with a silt or clay content of no more than 5 percent. The percentage of particles passing the No. 200 sieve should be measured from that portion of soil passing the three-quarter-inch sieve.

LIMITATIONS

The conclusions and recommendations contained in this report are based on site conditions as they existed at the time of our exploration and assume that the soil and groundwater conditions encountered in the hand auger holes are representative of subsurface conditions on the site. If the subsurface conditions encountered during construction are significantly different from those observed in our explorations, we should be advised at once so that we can review these conditions and reconsider our recommendations where necessary. Unanticipated conditions are commonly encountered on construction sites and cannot be fully anticipated by merely taking samples in hand auger holes. Subsurface conditions can also vary between exploration locations. Such

unexpected conditions frequently require making additional expenditures to attain a properly constructed project. It is recommended that the owner consider providing a contingency fund to accommodate such potential extra costs and risks. This is a standard recommendation for all projects.

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

ADDITIONAL SERVICES

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

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

The following plates are attached to complete this report:

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

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

Respectfully submitted,

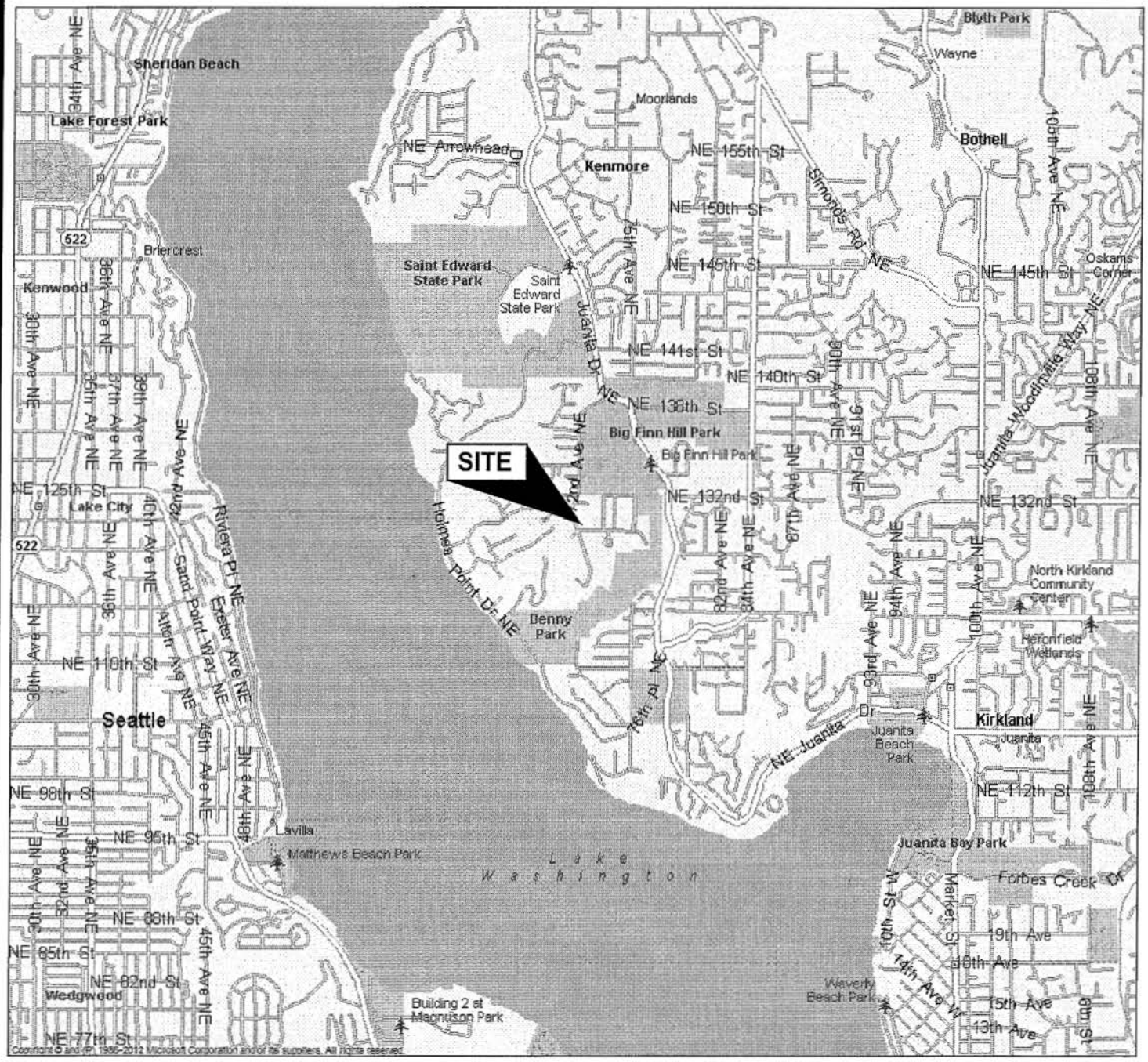
GEOTECH CONSULTANTS, INC.

JAMES HOUSTON STRANGER
STATE OF WASHINGTON
36094
REGISTERED
PROFESSIONAL ENGINEER

3/21/17

James H. Stranger, Jr., P.E.
Associate

JHS:mw



(Source: Microsoft MapPoint, 2013)

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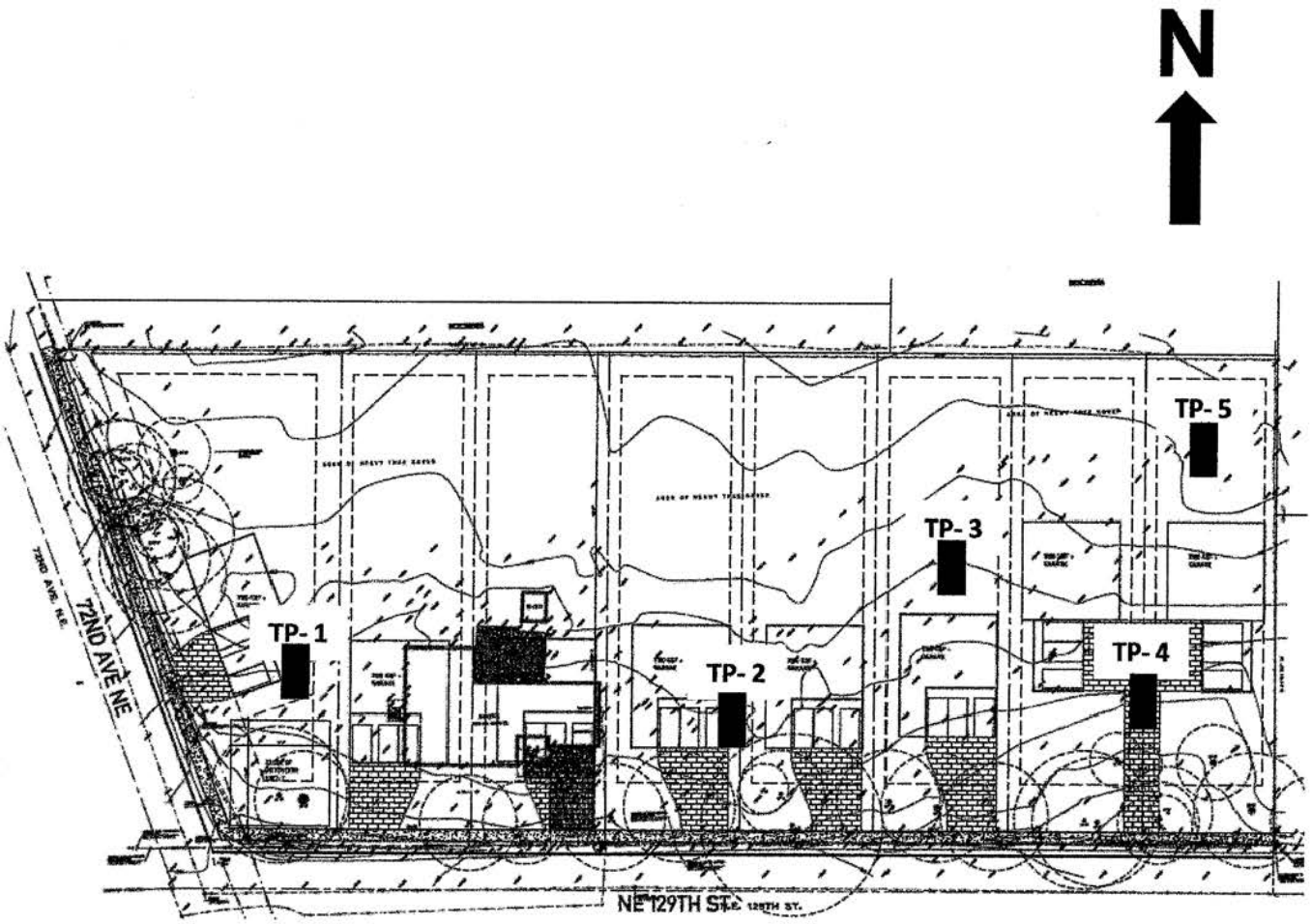
VICINITY MAP

7206 Northeast 129th Street
Kirkland, Washington

Job No:	Date:		Plate:
17088	Mar. 2017		1



- Approximate Test Pit Location

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Site Exploration Plan

7206 Northeast 129th Street
Kirkland, Washington

Job	Date:	Scale:	Plate:
17088	Mar. 2017	Not to Scale	2

TEST PIT 1

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			SM	Topsoil Rust-brown, silty gravelly SAND with cobbles, fine to medium-grained, moist, loose -becomes gray, cemented, dense to very dense **(GLACIAL TILL)**

5

10

* **Test Pit terminated at 3.5 feet on February 28, 2017.**
* **No groundwater seepage was observed during excavation.**
* **No caving observed during excavation.**

TEST PIT 2

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
		▼	SM	Topsoil Red-brown silty, gravelly SAND with cobbles and roots, fien to medium-grained, moist, loose -becomes wet -becomes gray, cemented, moist, dense to very dense **(GLACIAL TILL)**

5

10

* **Test Pit terminated at 3 feet on February 28, 2017.**
* **Perched groundwater seepage was observed at 2 feet during excavation.**
* **No caving observed during excavation.**

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TEST PIT LOG

7206 Northeast 129th Street
Kirkland, Wasington

Job	Date:	Logged by:	Plate:
17088	Mar. 2017	ASM	3

TEST PIT 3

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
		▼	SM	Topsoil Red-brown gravelly, silty SAND with roots, fine to medium-grained, moist, loose -becomes wet -becomes gray, cemented, moist, no roots, dense to very dense **(GLACIAL TILL)**

5

10

* **Test Pit terminated at 3 feet on February 28, 2017.**
* **Perched groundwater seepage was observed at 2 feet during excavation.**
* **Caving observed at 2 feet during excavation.**

TEST PIT 4

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
		▼	FILL	Topsoil and dark-gray silty SAND with gravel and plastic debris, fine to medium-grained, moist, loose **(FILL)**
			SM	Red-brown silty, gravelly SAND with roots, fine to medium-grained, wet, loose -becomes gray, cemented, no roots, moist, dense to very dense **(GLACIAL TILL)**

5

10

* **Test Pit terminated at 3.5 feet on February 28, 2017.**
* **Groundwater seepage was observed at 1 foot during excavation.**
* **No caving observed during excavation.**

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TEST PIT LOG

7206 Northeast 129th Street
Kirkland, Wasington

Job	Date:	Logged by:	Plate:
17088	Mar. 2017	ASM	4

TEST PIT 5

Depth (ft.)	Moisture Content (%)	Water Table	USCS	Description
			FILL	Brown silty SAND with gravel, fine to medium-grained, moist, loose **(FILL)**
				Topsoil
		▼	SM	Red-brown silty SAND with gravel and roots, fine to medium-grained, moist, loose
				-becomes wet
5				-becomes gray, cemented, no roots, moist, dense to very dense **(GLACIAL TILL)**
10				

* **Test Pit terminated at 4.8 feet on February 28, 2017.**
* **Groundwater seepage was observed at 3.5 feet during excavation.**
* **Caving observed at 3.5 feet during excavation.**

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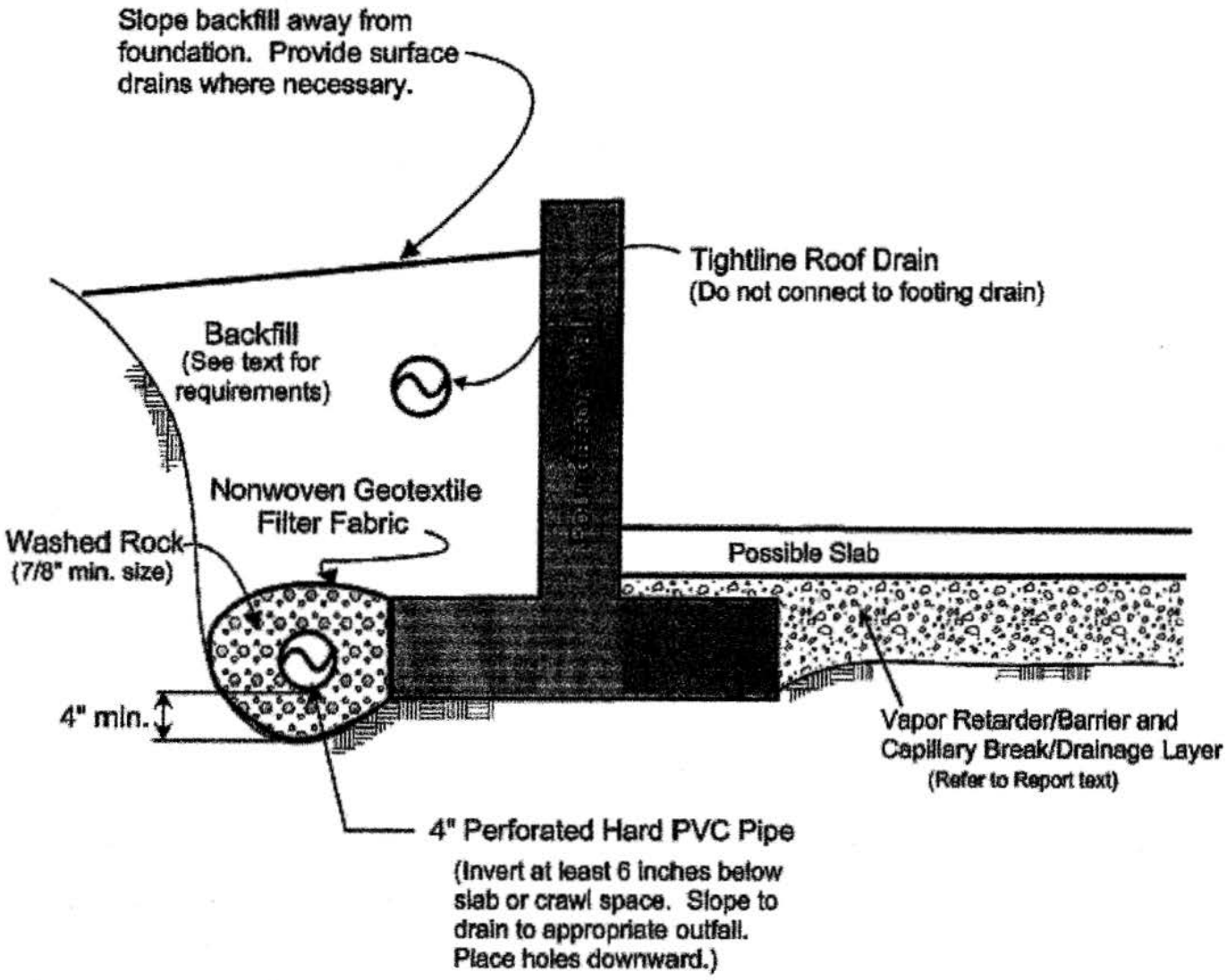
TEST PIT LOG

7206 Northeast 129th Street
Kirkland, Wasington

Job	Date:	Logged by:	Plate:
17088	Mar. 2017	ASM	5



NOTES:

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

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

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Typical Footing Drain

7206 Northeast 129th Street
Kirkland, Washington

Job	Date:	Scale:	Plate:
17088	Mar 2017	Not to Scale	6