



## PUBLIC NOTICE OF APPLICATION

### April 13, 2015

- File Nos.:** CAO15-001 and SEP15-001
- Description of Request:** Notice is hereby given that a Reasonable Use Exception application and State Environmental Policy Act (SEPA) Checklist has been filed with the City of Mercer Island to locate a single family residence in a Category III wetland and its associated buffer, and in a Type 2 watercourse buffer. The subject 37,554 square foot lot is significantly encumbered by critical areas and their associated buffers. The proposed residence and appurtenances would result in 5,595 square feet of impervious surface and a total building area of 3,102 square feet, including the garage.
- Applicant :** Bill Summers for MI Treehouse, LLC
- Location of Property:** 5637 East Mercer Way, Mercer Island WA 98040;  
Identified by King County Assessor tax parcel identification number 1924059312
- Other Associated Permits:** Review of the project under the State Environmental Policy Act, file SEP15-001
- Applicable Development Regulations:** Pursuant to Mercer Island City Code (MICC) 19.15.010(E), applications for reasonable use exceptions are required to be processed as Discretionary Actions, with the Hearing Examiner as the decision authority. Processing requirements for Discretionary Actions are further detailed in MICC 19.15.020. Reasonable use exception procedures are detailed in MICC 19.07.030(B)(1). SEPA procedures are detailed in MICC 19.07.120. Criteria for reasonable use exceptions are detailed in MICC 19.07.030(B)(3).
- SEPA Compliance:** An initial evaluation of the proposed project for probable significant adverse environmental impacts has been conducted. The City expects to issue a SEPA Determination of Non-Significance (DNS) for this project. The optional DNS process, as specified in WAC 197-11-355, is being used. The proposal may include mitigation measures under applicable codes, and the project review process may incorporate or require mitigation measures regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for the specific proposal may be obtained upon request.
- Studies and/or Environmental Documents:** The following were submitted to the City as part of the subject application: Critical Areas Study by Sewall Wetland Consulting, Inc.; Geotechnical Engineering Study by GeoGroup NW, Inc.; SEPA environmental checklist
- Written Comments:** **This may be your only opportunity to comment on the environmental impacts of this proposal.** Written comments on this proposal may be submitted to the City of Mercer Island **on or before Monday, April 27, 2015 at 5:00 p.m.** either in person or mailed to the City of Mercer Island, 9611 SE 36<sup>th</sup> Street, Mercer Island, WA 98040-3732. Only those persons who submit written comments within the fourteen (14) day comment period or who testify at the future open record public hearing will become parties of record on this action; and only parties of record will receive a notice of the decision and have the right to appeal. Any party may request a copy of the decision, once made.
- Public Hearing:** Pursuant to MICC 19.15.020(F), the applicant is required to participate in an open record public hearing in front of the Hearing Examiner. The date for the open record public hearing has yet to be determined. When a date is established, the open record hearing will be advertised in a future public notice.

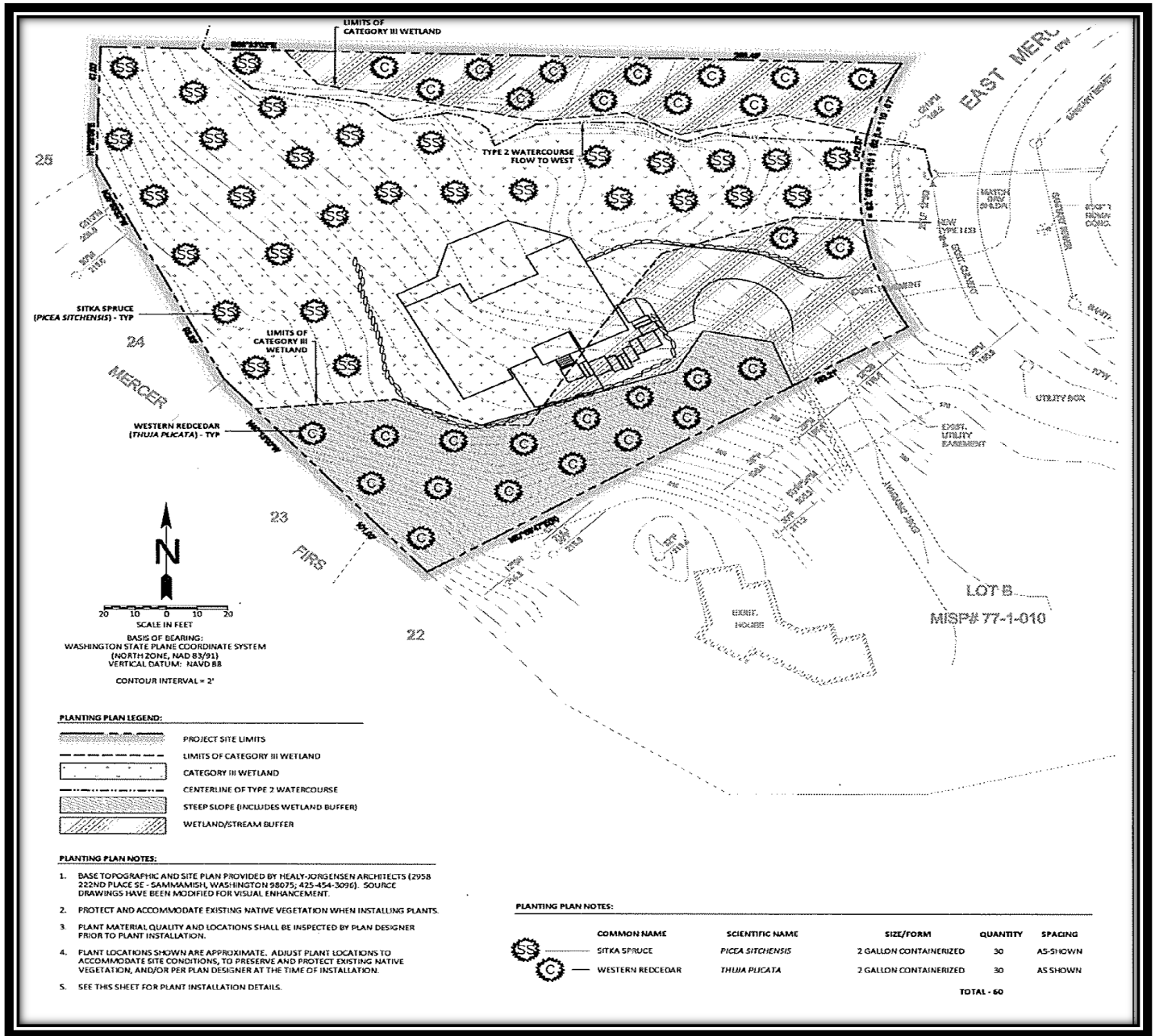
You may review the application on file for this matter at the City of Mercer Island, Development Services Group, 9611 SE 36<sup>th</sup> Street, Mercer Island, Washington.

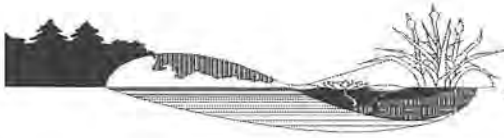
Written comments and/or requests for additional information should be referred to:

Travis Saunders, Senior Planner  
 Development Services Group  
 City of Mercer Island  
 9611 SE 36th Street  
 Mercer Island, WA 98040  
 (206) 275-7717  
 travis.saunders@mercergov.org

Date of Application: January 15, 2015  
 Determined to Be Complete: March 30, 2015  
 Bulletin Notice: April 13, 2015  
 Date Mailed: April 13, 2015  
 Date Posted on Site: April 13, 2015  
 Comment Period Ends: 5:00PM on April 27, 2015

### PROPOSED SITE PLAN





**Sewall Wetland Consulting, Inc.**

PO Box 880  
Fall City, WA 98024

Phone: 253-859-0515

RECEIVED

MAR 18 2015

CITY OF MERCER ISLAND  
1100 1/2 COMMUNITY SERVICE

March 5, 2015

Bill Summers  
PO Box 261  
Medina, WA 98039

RE: 5637 Mercer Way – *Revised* Critical Areas Report  
SWC Job#14-207

## **1.0 INTRODUCTION**

This report describes our observations of any jurisdictional wetlands, streams and buffers on or within 200' of the proposed single family home located at 5637 East Mercer Way in the City of Mercer Island, Washington (the "site").

The site is an irregular shaped 0.88 acre parcel (Parcel #192405-0312) consisting of an east sloping site located within the SE ¼ of Section 19 Township 24 North, Range 5 East of the W.M.

## **METHODOLOGY**

Ed Sewall of Sewall Wetland Consulting, Inc. inspected the site November 6, 2014. The site was reviewed using delineation methodology described in the *Corps of Engineers Wetlands Delineation Manual* (Environmental Laboratory, 1987), and the *Western Mountains, Valleys and Coast region Supplement* (Version 2.0) dated June 24, 2010, as required by the US Army Corps of Engineers.

Wetland Ratings were determined using the *Washington State Wetlands Rating System for Western Washington* Publication #04-06-025 dated August 2004 as well as the associated rating forms revised in 2006 & 2008.



*Above and below: Vicinity map of the site.*



Soil colors were identified using the 1990 Edited and Revised Edition of the **Munsell Soil Color Charts** (Kollmorgen Instruments Corp. 1990).

The *Washington State Wetlands Identification and Delineation Manual* and the *Corps of Engineers Wetlands Delineation Manual/Regional Supplement* all require the use of the three-parameter approach in identifying and delineating wetlands. A wetland should support a predominance of hydrophytic vegetation, have hydric soils and display wetland hydrology. To be considered hydrophytic vegetation, over 50% of the dominant species in an area must have an indicator status of facultative (FAC), facultative wetland (FACW), or obligate wetland (OBL), according to the National List of Plant Species That Occur in Wetlands: Northwest (Region 9) (Reed, 1988). A hydric soil is "a soil that is saturated, flooded, or ponded long enough during the growing season to develop anaerobic conditions in the upper part". Anaerobic conditions are indicated in the field by soils with low chromas (2 or less), as determined by using the Munsell Soil Color Charts; iron oxide mottles; hydrogen sulfide odor and other indicators. Generally, wetland hydrology is defined by inundation or saturation to the surface for a consecutive period of 12.5% or greater of the growing season. Areas that contain indicators of wetland hydrology between 5%-12.5% of the growing season may or may not be wetlands depending upon other indicators. Field indicators include visual observation of soil inundation, saturation, oxidized rhizospheres, water marks on trees or other fixed objects, drift lines, etc. Under normal circumstances, indicators of all three parameters will be present in wetland areas.

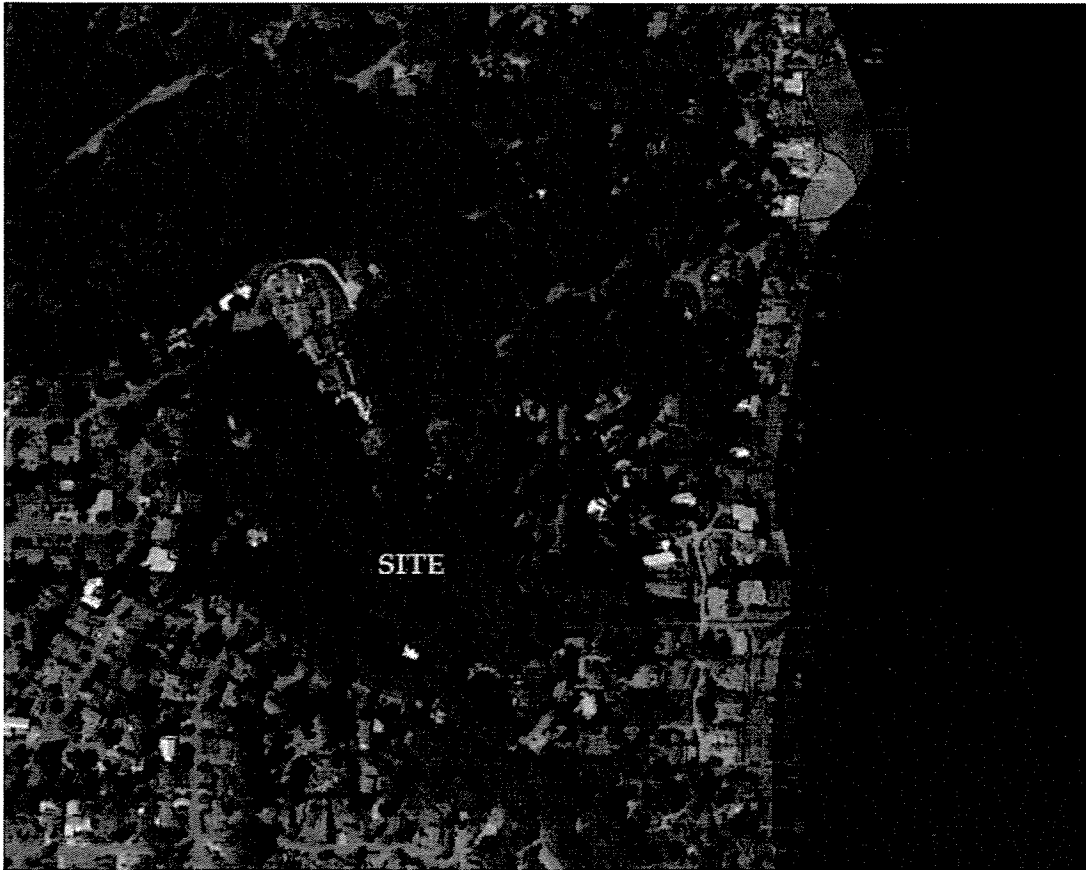
## **OBSERVATIONS**

### *Existing Site Documentation.*

Prior to visiting the site, a review of several natural resource inventory maps was conducted. Resources reviewed included the National Wetland Inventory Map and the NRCS Soil Survey online mapping and Data and the King County iMap website with wetland and stream layers activated.

### **National Wetlands Inventory (NWI)**

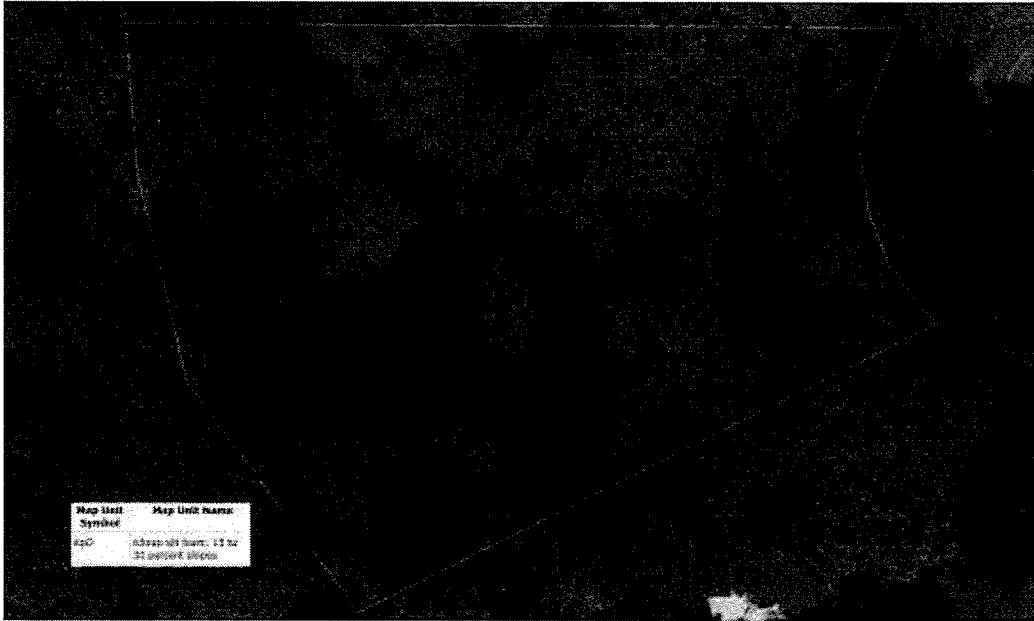
There are no wetlands mapped on or near the site on the NWI mapping for area of the site.



*Above: NWI Map of the study area*

### **Soil Survey**

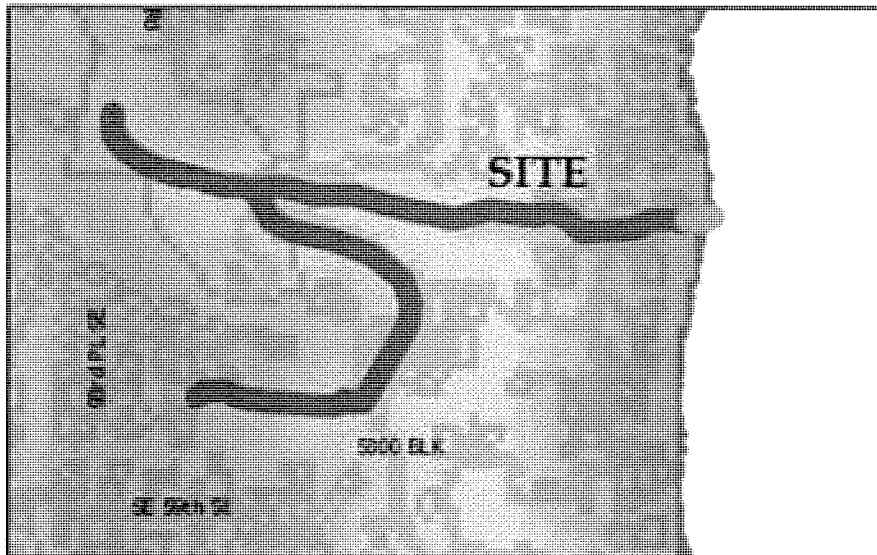
According to data on file with the NRCS Soil Survey, the site as mapped as Kitsap silt loam 15%-30% slopes. Kitsap soils are a moderately well-drained soils formed in lacustrine deposits. Kitsap soils are not considered "hydric" soils according to the publication Hydric Soils of the United States (USDA NTCHS Pub No.1491, 1991).



*Above: NRCS Soil map of the study area.*

### **City of Mercer Island Water Inventoried Watercourses**

The City of Mercer Island stream inventory shows a perennial flowing non-fish bearing stream also known as a Type 2 watercourse with a 50' buffer.



*Above: Mercer Island Stream Inventory of the site*

## **Field observations**

The site consists of a bowl shaped parcel sloping to the east with a stream and associated slope type wetlands associated with the stream. The site is generally forested, although a quarry spall driveway accesses the site off an existing paved driveway which passes through the site.

The site has steep slopes to the south as well as an undulating topography in the vicinity of the stream. The site is covered by a mix of red alder, western hemlock and some big leaf maple. Understory species include sword fern, red huckleberry, salmonberry and some stinging nettle.

Soil pits excavated in the upland portion of the site were found to have dry, gravelly loam soils with soil colors of 10YR 3/3-3/4. Soils were found to be dry within the upper 16" during our wet season observations.

### *Wetlands*

As previously mentioned, a slope type wetland covers most of the site outside the steep slopes. Below is a description of these wetlands;

### **Wetland A**

Wetland A consists of a forested slope type wetland that covers most of the site. This wetland was previously flagged by Wetland resources in 2004 and the delineation was found to still be accurate.

This slope-type wetland is vegetated with a mix of red alder, salmonberry, lady fern, skunk cabbage and some creeping buttercup. red-osier dogwood and lady fern.

Soil pits excavated within the wetland revealed a silt loam with a soil color of 2.5Y 2.5/1 with few, fine faint redoximorphic concentrations. Soils within the wetland were saturated at the surface during our wet season observation period.

Using the US Fish and Wildlife Wetland Classification Method (Cowardin et al. 1979), this wetland contains areas that would be classified as PFO1C.



Using the WADOE Wetland Rating system and rating the wetland as a depressional wetland, this wetland scored a total of 34 points with 18 for habitat. This indicates a Category III wetland. According to City of Mercer Island Municipal Code (MIMC) Chapter 19.07.080.C.1, Category III wetlands have a 50' standard buffer.

### ***Stream A***

As previously mentioned, a small perennial stream flows easterly along the north side of the site. This stream originates in seeps from the bordering slope wetlands and flows somewhat steeply to the east where it cascades over a bank into a catch basin and then a culvert under Mercer Way. The stream flows in a 100' long culvert which is a barrier to any fish migration up through the culvert. As a result, this small channel has been mapped as the City as a Type 2 watercourse. Based upon MIMC Chapter 19.07.070.B.1, Type 2 watercourses have a 50' standard buffer.

### ***Wildlife Habitat Conservation Areas***

A review of the site revealed no state or federally listed species on or near the site. A review of the Washington State Department of Fish and Wildlife Priority Mapping system was conducted for the site. This mapping identifies state listed species as well as areas considered by WDFW to be "priority habitats". The mapping of the area of the site revealed no listed state or federal species utilizing the site. It does show and area to the north of the site as part of a "biodiversity corridor" (*purple shading*), which is a densely forested area with some steep slopes.

### ***Functions and Values***

Wetland A is a forested wetland and as such provides habitat to numerous species that tolerate being within close proximity to humans. The wetland main function is as a groundwater discharge point, which allows groundwater to reach the surface and provide hydrological support to the Type 2 watercourse passing through the site.



*Above: WDFW Priority Habitat mapping of the area of the site.*

## **PROPOSED PROJECT**

The proposed project is the construction of a single family residence as current zoning allows. As previously described, the site is highly encumbered by critical areas including a stream, associated wetland, buffers and steep slopes. There is no part of the site located outside of these critical areas. As a result, in order to build a home on this site the application of MIMC Chapter 19.07.030.B "*Allowed alterations and reasonable use exception*" must be utilized. As described in this section of Code;

### *B. Reasonable Use Exception.*

*1. Application Process. If the application of these regulations deny reasonable use of a subject property, a property owner may apply to the hearing examiner for a reasonable use exception pursuant to permit review, public notice and appeal procedures set forth in Chapter 19.15 MICC.*

*2. Studies Required. An application for a reasonable use exception shall include a critical area study and any other related project documents, such*

*as permit applications to other agencies, and environmental documents prepared pursuant to the State Environmental Policy Act.*

*3. Criteria. The hearing examiner will approve the application if it satisfies all of the following criteria:*

*a. The application of these regulations deny any reasonable use of the property. The hearing examiner will consider the amount and percentage of lost economic value to the property owner;*

The application of the standard regulations regarding wetlands, streams, steep slopes and buffers would not allow construction of a home on the site. The only feasible location to build a home will impact some wetland and buffer.

*b. No other reasonable use of the property has less impact on critical areas. The hearing examiner may consider alternative reasonable uses in considering the application;*

The site is zoned for a single family home use and there is no other alternative reasonable use of the site.

*c. Any alteration to critical areas is the minimum necessary to allow for reasonable use of the property;*

The following mitigation sequencing was conducted to determine the most appropriate impacts and mitigation;

This sequencing requires addressing the following criteria;

*a. Avoid any disturbances to the wetland or buffer;*

The entire site is wetland and buffer. There is no way to develop the site under any reasonable scenario without impacting both wetlands and buffers.

*b. Minimize any wetland or buffer impacts;*

In order to minimize impacts, the site plan has been designed to utilize the existing driveway access point and has pushed the reasonable size

home foot print as far away from the stream as is possible. The site plan also utilizes pin piles, which are not considered wetland fill, to minimize actual wetland impact. Buffer impacts have been minimized by having no lawn or landscaped areas, and having just the bare essentials, being the driveway and the home structure itself.

*c. Restore any wetlands or buffer impacted or lost temporarily; and*

This is not possible as the construction of a home is a permanent impact.

*d. Compensate for any permanent wetland or buffer impacts by one of the following methods:*

*i. Restoring a former wetland and provide buffers at a site once exhibiting wetland characteristics to compensate for wetlands lost;*

This is not possible as there are no “former” wetlands on the site.

*ii. Creating new wetlands and buffers for those lost; and*

This is not possible as there is no room to create new wetlands, or buffers on the site.

*iii. Enhancing wetlands that have reduced function;*

The wetlands on-site are proposed to be enhanced with an under planting of native conifers as well as the removal of weedy species and old trash and abandoned pipes in the wetland and stream. This will restore a conifer dominated component to this wetland and buffer area as well as remove exotic blackberry and English ivy from these critical areas. The addition of a conifer component will restore this wetland to a probable historic condition of being dominated by conifers. Currently the wetland is vegetated primarily with broadleaf species such as red alder which are early successional species. Conifers will provide denser cover and improved habitat for wildlife, as well as more shade to the site keeping surface waters cooler, which ultimately benefit fish species in the receiving water of the Type 2 watercourse.

Other factors to consider in this Reasonable Use review are;

1. Although zoned to permit two single family residences, only one is

proposed.

2. The square footage of the proposed residence is only 2,200 square feet (approx.), which is 51% of the 4,300 square foot average size of a new single family residence built on Mercer Island in 2013-2014 (See the attached single family permit summary attached hereto as Exhibit "A").

3. The house is sited on the most level portion of the property, outside of the applicable 50 foot watercourse buffer.

4. To further minimize the impact of the house's construction, it will be supported by a series of pin piles which both minimizes site disruption and interference with the property's natural drainage.

5. Excavation will be limited to the extent necessary to build the house and related driveway.

6. The property's impervious surfaces have been restricted to a total of Approximately 5,600 square feet, 10% of which are existing.

7. Only 15% of the lot will be covered, which represents less than 42% permitted by code.

In order to reduce impacts to the wetland, the home will be constructed on "pin piles" which are generally not considered a "fill" of wetlands. The home will be elevated above the wetland so no filling other than the driving of the piles through the soil will be needed for the home. A minor amount of fill will occur from the proposed driveway. The driveway will be located over the current location of the quarry spall driveway that exists on the site, further reducing impacts.

*d. Impacts to critical areas are mitigated to the greatest extent reasonably feasible consistent with best available science;*

In order to mitigate for the minimal impacts to the sites wetlands from the project, we are proposing under planting with conifers (sitka spruce and cedar) throughout the wetland in an area equal to the area of coverage by the project within the critical areas, to enhance the plant community within this wetland as well as removal of any blackberry and English ivy in the vicinity of the home. The proposed use of pin piles is the least impactful way to construct on a site like this and leaves all but

the vegetation intact within the area of the home construction, greatly reducing any loss of wetland function.

*e. The proposal does not pose an unreasonable threat to the public health, safety, or welfare; and*

The proposed construction of a home on the site will not impact public health or safety and will utilize the latest construction techniques to minimize impacts to critical areas.

*f. The inability of the applicant to derive reasonable use of the property is not the result of actions by the applicant after the effective date of this chapter.*

The ability of the owner to derive reasonable use of the property is not the result of any action at any time by the owner, and solely the fact that the site is covered by critical areas.

### **Stormwater**

Stormwater from the new impervious surfaces on-site will be collected in a stormwater vault under the driveway and discharged to an existing culvert along the east end of the driveway. This water will then drain through the existing roadside ditch to the stream. This should mimic existing drainage patterns on the site.

Once approval of the proposed conceptual mitigation is received, a final detailed mitigation plan will be provided to the city for review and approval.

If you have any questions in regards to this report or need additional information, please feel free to contact me at (253) 859-0515 or at [esewall@sewallwc.com](mailto:esewall@sewallwc.com) .

Sincerely,  
Sewall Wetland Consulting, Inc.



Ed Sewall  
Senior Wetlands Ecologist PWS #212

## **REFERENCES**

City of Mercer Island Municipal Code

Cowardin, L., V. Carter, F. Golet, and E. LaRoe. 1979. Classification of Wetlands and Deepwater Habitats of the United States. U.S. Fish and Wildlife Service, FWS/OBS-79-31, Washington, D. C.

Environmental Laboratory. 1987. Corps of Engineers Wetlands Delineation Manual, Technical Report Y-87-1. U. S. Army Corps of Engineers Waterways Experiment Station, Vicksburg, Mississippi.

Muller-Dombois, D. and H. Ellenberg. 1974. Aims and Methods of Vegetation Ecology. John Wiley & Sons, Inc. New York, New York.

Munsell Color. 1988. Munsell Soil Color Charts. Kollmorgen Instruments Corp., Baltimore, Maryland.

National Technical Committee for Hydric Soils. 1991. Hydric Soils of the United States. USDA Misc. Publ. No. 1491.

Reed, P., Jr. 1988. National List of Plant Species that Occur in Wetlands: Northwest (Region 9). 1988. U. S. Fish and Wildlife Service, Inland Freshwater Ecology Section, St. Petersburg, Florida.

Reed, P.B. Jr. 1993. 1993 Supplement to the list of plant species that occur in wetlands: Northwest (Region 9). USFWS supplement to Biol. Rpt. 88(26.9) May 1988.

USDA NRCS & National Technical Committee for Hydric Soils, September 1995. Field Indicators of Hydric Soils in the United States - Version 2.1

Western Mountains, Valleys and Coast Regional Supplement (Version 2.0) dated June 24, 2010. USACOE

Washington State Wetlands Rating System for Western Washington Publication #04-06-025 dated August 2004, Revised 2008.



**Above: Site as viewed from Mercer Way**

**Below: looking north across site near existing driveway entrance**

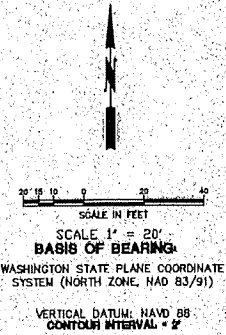
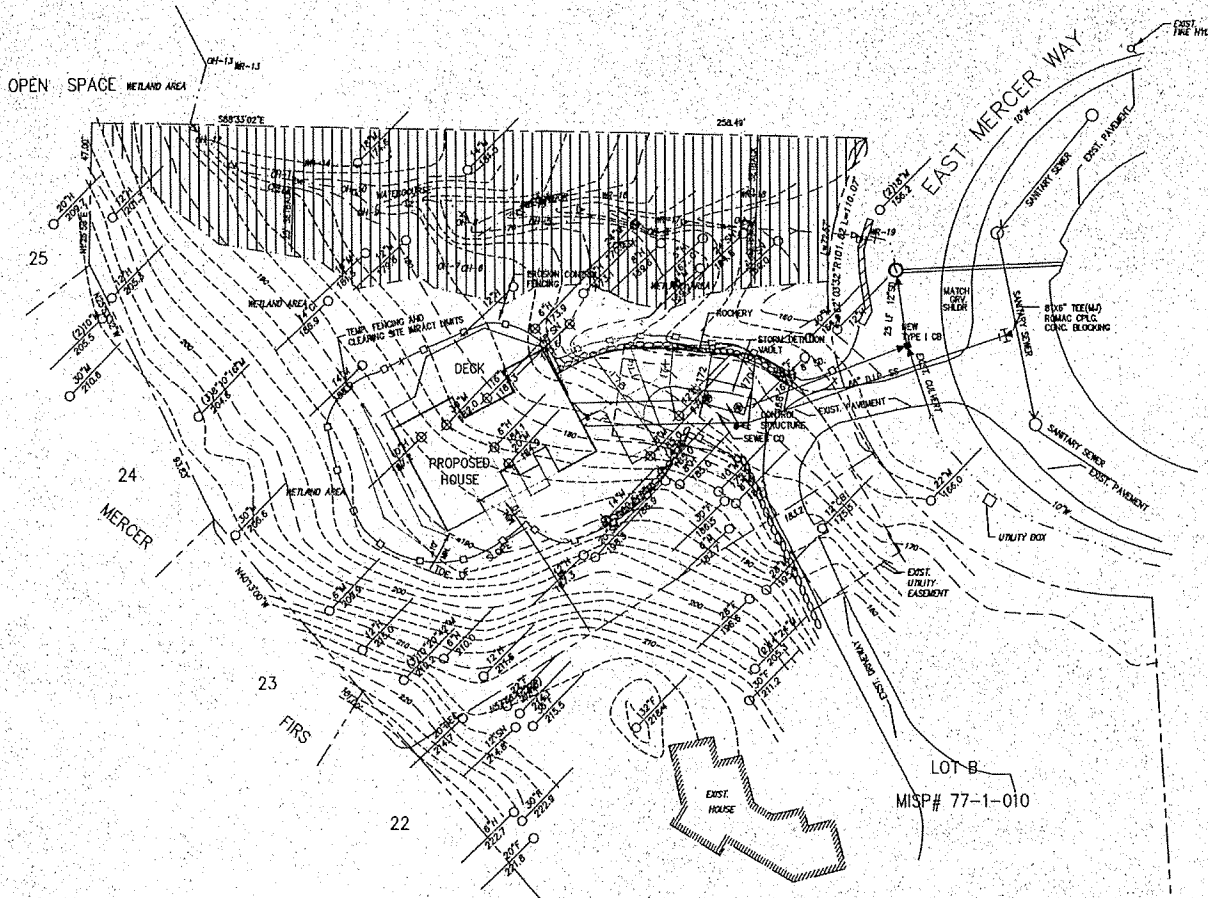






**Above: Existing quarry spall access driveway which leads to proposed building site**

A PORTION OF GOVERNMENT LOT 3, OF SECTION 19, TOWNSHIP 24 NORTH, RANGE 5 EAST, W.M., KING COUNTY, WASHINGTON



LEGAL DESCRIPTION

PARCEL A OF GREG HEWITT SHORT PLAT WSP NO. 77-1-010, AS RECORDED UNDER RECORDING NUMBER 197703310851, RECORDS OF KING COUNTY, STATE OF WASHINGTON.

REFERENCES:

1. PARCEL A OF GREG HEWITT SHORT PLAT WSP NO. 77-1-010, AS RECORDED UNDER RECORDING NUMBER 197703310851, RECORDS OF KING COUNTY, STATE OF WASHINGTON.
2. MERCER FIRS IN VOLUME 79 OF PLATS, PAGE 70, UNDER FILE NUMBER 19650421801883.
3. HARKWOOD RIDGE IN VOLUME 78 OF PLATS, PAGE 81, UNDER FILE NUMBER 195410275804212.

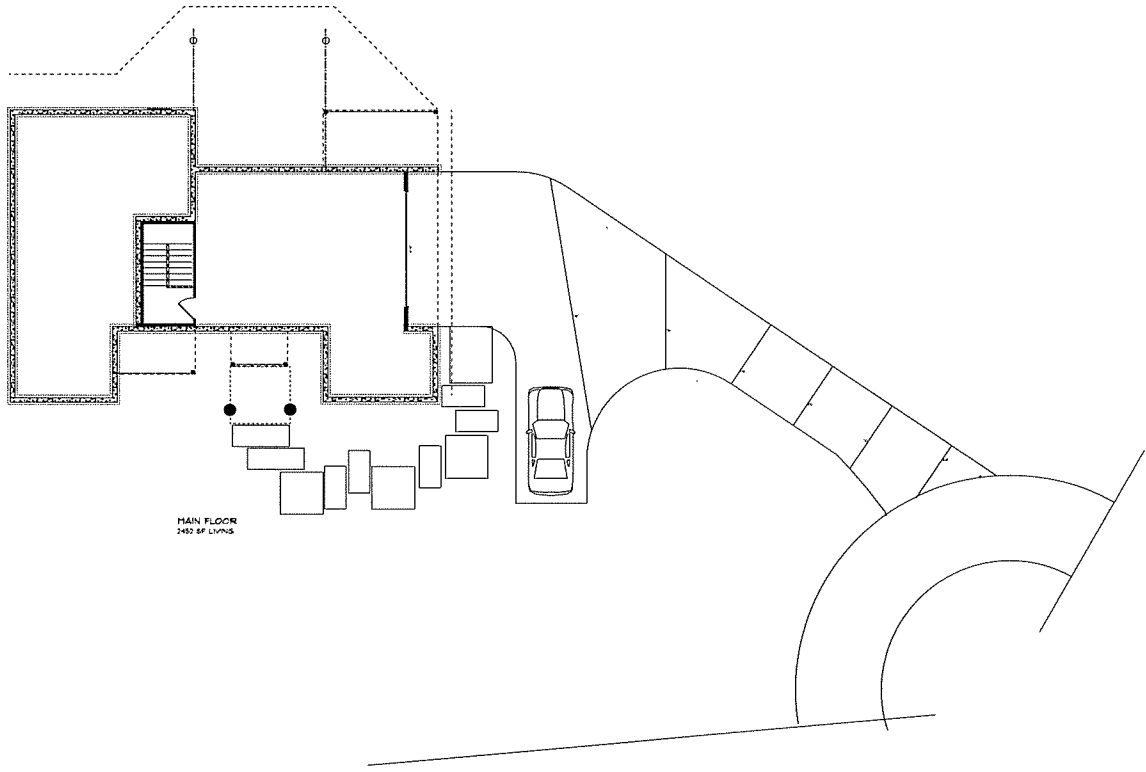
NOTES:

1. LEGAL DESCRIPTION, EASEMENTS, COVENANTS, CONDITIONS AND RESTRICTIONS WERE PROVIDED BY CLIENT. IT SHOULD BE NOTED THAT IN PREPARING THIS SURVEY MAP, CHS ENGINEERS, LLC HAS NOT CONDUCTED AN INDEPENDENT TITLE SEARCH NOR IS CHS AWARE OF ANY TITLE ISSUES AFFECTING THE PROPERTY OTHER THAN THOSE SHOWN ON THIS MAP. CHS HAS WHOLLY RELIED ON THE ABOVE REFERENCED TITLE REPORT TO PREPARE THIS SURVEY AND THEREFORE QUALIFIES THE MAP'S ACCURACY AND COMPLETENESS TO THAT EXTENT.
2. BASIS OF BEARING: WASHINGTON STATE PLANE COORDINATE SYSTEM (NORTH ZONE, NAD 83/91)
3. VERTICAL DATUM: HAYD 88 DATUM
4. UTILITIES OTHER THAN THOSE SHOWN MAY EXIST ON THE SITE. UNDERGROUND UTILITY LOCATIONS SHOWN HEREON ARE TAKEN FROM A COMPILATION OF PUBLIC RECORDS AND VISIBLE FIELD EVIDENCE. WE ASSUME NO LIABILITY FOR THE ACCURACY OF THE PUBLIC RECORDS. UNDERGROUND UTILITY LOCATIONS ARE ONLY APPROXIMATE. UNDERGROUND CONNECTIONS ARE SHOWN AS STRAIGHT LINES BETWEEN VISIBLE SURFACE LOCATIONS BUT MAY CONTAIN BENDS OR CURVES NOT SHOWN. FIELD VERIFICATION IS NECESSARY PRIOR TO OR DURING ANY CONSTRUCTION.

SITE PLAN

SHEET #1  
01-08-15

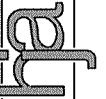
BOUNDARY / TOPOGRAPHIC SURVEY		No. Data Bl./Cul.
5637 EAST MERCER WAY MERCER ISLAND, WA		SHEET 1 OF 1
SUMMERS DEVELOPMENT		Job No. 001411
CHS ENGINEERS, LLC 18257 BELLEVUE ROAD SUITE 101 BELLEVUE, WA 98008-3828 TEL: (425) 887-9898 FAX: (425) 874-9384 www.chsengineers.com		Date / Date Checked / Date 11-14



MAIN FLOOR  
2452 SF LIVING



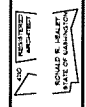
425.643.3296  
HEALEY-JORGENSEN  
ARCHITECTS  
2908 222ND PL. SE, SAMMAMISH, WA 98075



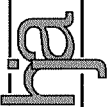
Mt. Treehouse, LLC,  
5631 EAST MERCER WAY  
MERCER ISLAND, WA.

PROJECT NO. 14-014  
DATE 02-14

SHEET NO. 2



42443-0006  
**HEALEY-JORGENSEN ARCHITECTS**  
 2983 22ND PL SE, BAINBRIDGE, WA 98003



Mill Treehouse, LLC,  
 5631 EAST MERCER WAY,  
 MERCER ISLAND, WA.

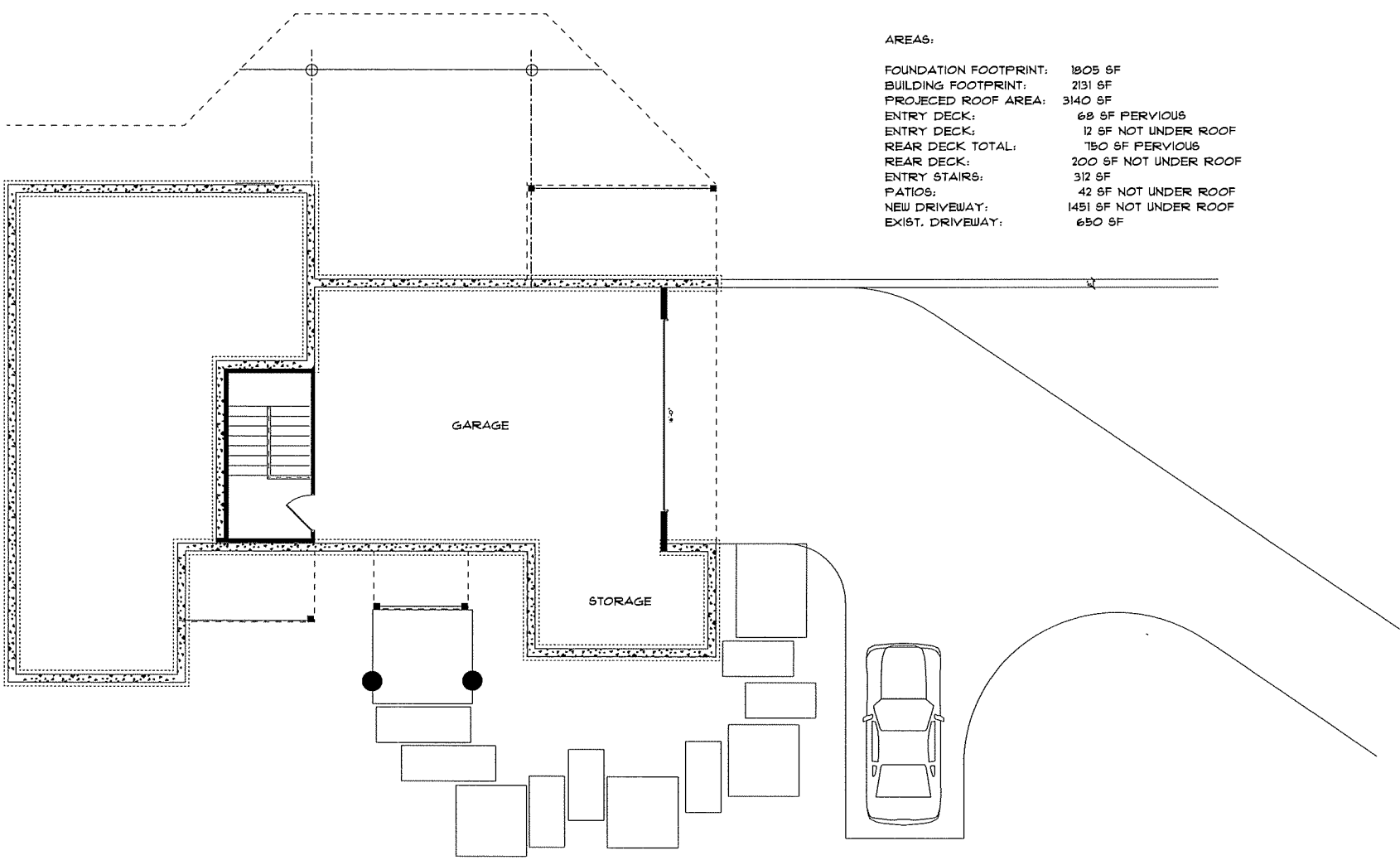
**BASEMENT PLAN**

SCALE 1/4" = 1'-0"

DATE	10-01-14
PROJECT NO.	14-014
SHEET NO.	3

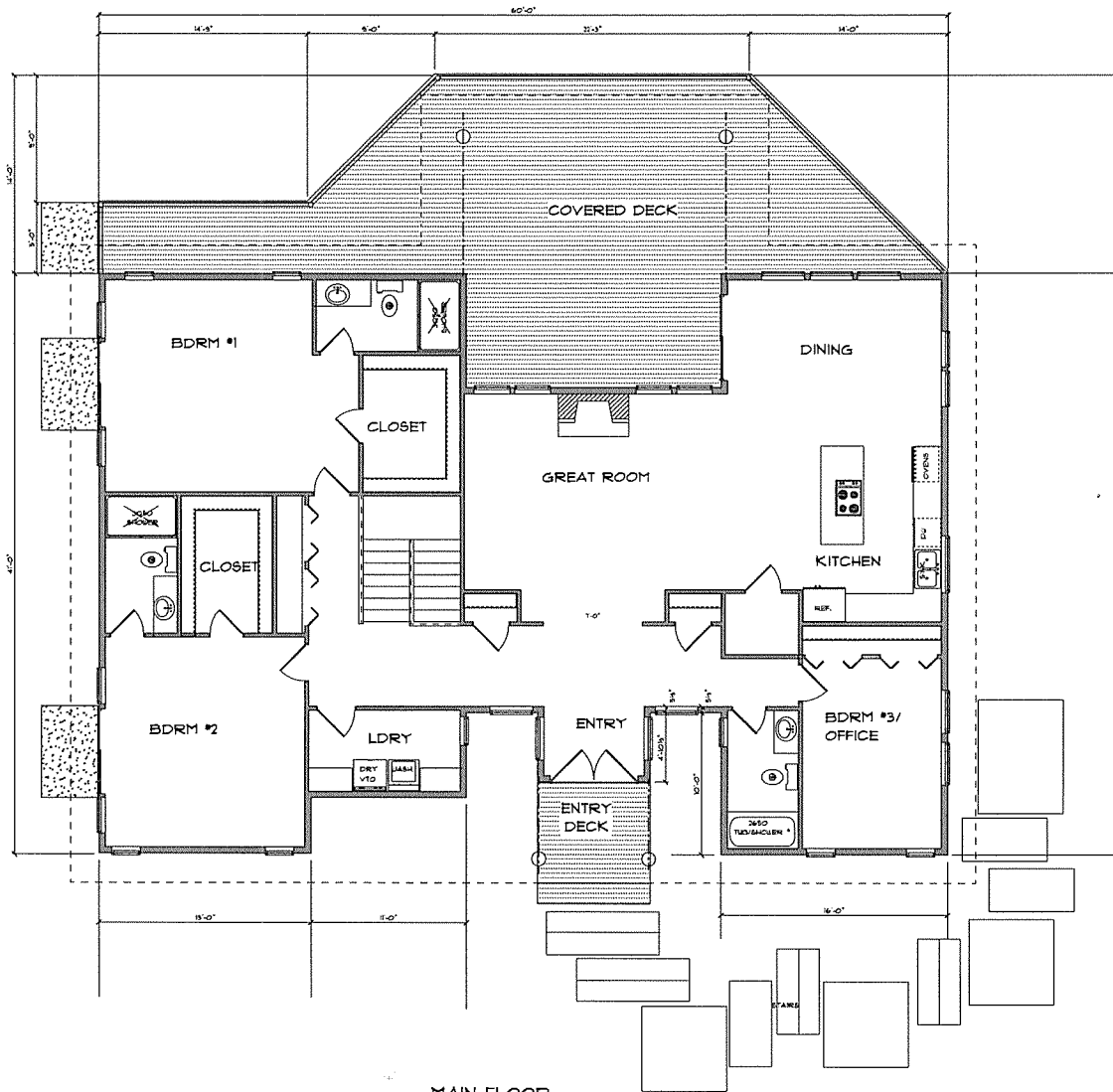
**AREAS:**

FOUNDATION FOOTPRINT:	1805 SF
BUILDING FOOTPRINT:	2131 SF
PROJECTED ROOF AREA:	3140 SF
ENTRY DECK:	68 SF PERVIOUS
ENTRY DECK:	12 SF NOT UNDER ROOF
REAR DECK TOTAL:	750 SF PERVIOUS
REAR DECK:	200 SF NOT UNDER ROOF
ENTRY STAIRS:	312 SF
PATIOS:	42 SF NOT UNDER ROOF
NEW DRIVEWAY:	1451 SF NOT UNDER ROOF
EXIST. DRIVEWAY:	650 SF

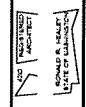


**BASEMENT FLOOR**

STAIRS	134 SF
GARAGE	831 SF
TOTAL	971 SF



MAIN FLOOR  
2131 SF LIVING



424.424.5006  
HEALEY-JORGENSEN  
ARCHITECTS  
2098 SADDLE Pt. SE, HAMMAMTCH, VA 22075

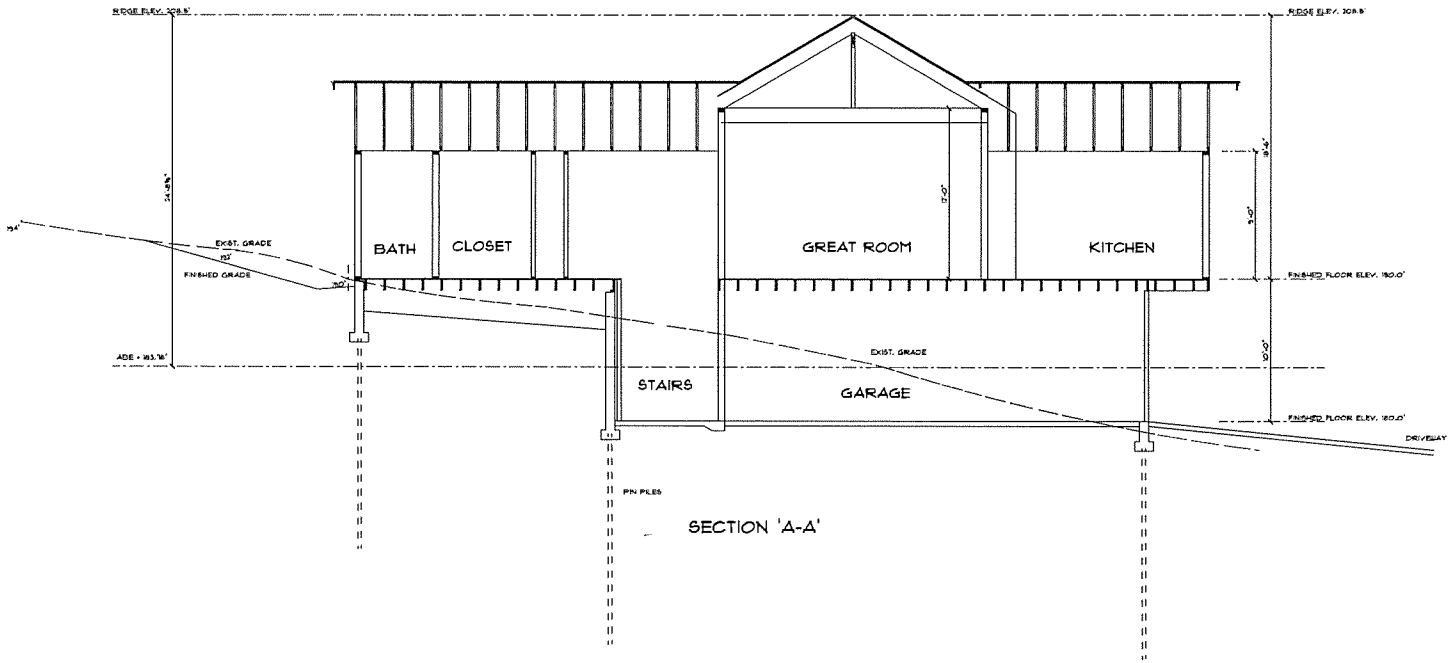


Mill Treehouse, LLC,  
5631 EAST MERCER WAY  
MERCER ISLAND, WA.

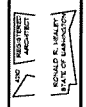
MAIN FLOOR

DATE  
10-14  
PROJECT NO.  
14-014  
SHEET NO.

4



SECTION 'A-A'



42464-2006  
**HEALEY-JORGENSEN ARCHITECTS**  
 2582 22ND PLACE, SAMMAMISH, WA 98075



**HA Treelands, LLC,**  
 5637 EAST MERCER WAY  
 MERCER ISLAND, WA.

SECTION 'A-A'

DATE: 10-03-14  
 PROJECT NO.: 14-014  
 SHEET NO.: 6





424.64.3008  
HEALEY-JORGENSEN  
ARCHITECTS  
2009 ZENITH BL. BELTSVILLE, MD 20814

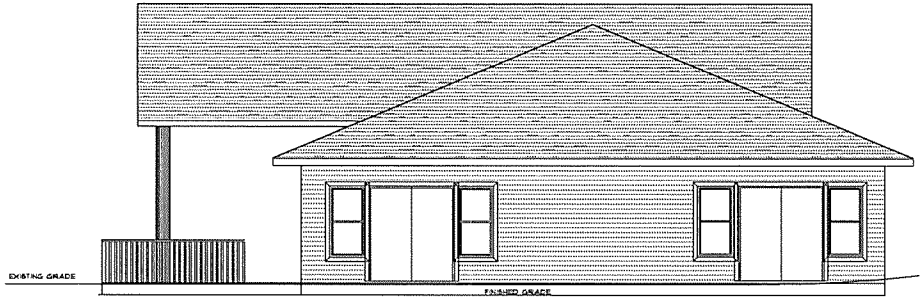


MT Theelhouse, LLC,  
5631 EAST MERCER WAY  
MERCER ISLAND, WA

EAST - WEST ELEVATIONS

DATE  
03-14  
PROJECT NO.  
14-014  
SHEET NO.  
8

SCALE 1/4" = 1'-0"



WEST ELEVATION



EAST ELEVATION



Wetland name or number A

**WETLAND RATING FORM - WESTERN WASHINGTON**  
 Version 2 - Updated July 2006 to increase accuracy and reproducibility among users  
 Updated Oct 2008 with the new WDFW definitions for priority habitats

Name of wetland (if known): Wet A - Murr Key Date of site visit: 11-6-14  
 Rated by Ed Semell Trained by Ecology? Yes  No  Date of training \_\_\_\_\_  
 SEC: \_\_\_ TOWNSHIP: \_\_\_ RNOE: \_\_\_ Is S/I/R in Appendix D? Yes \_\_\_ No \_\_\_  
 Map of wetland unit: Figure \_\_\_ Estimated size .25 ac

**SUMMARY OF RATING**

Category based on **FUNCTIONS** provided by wetland

I \_\_\_ II \_\_\_ III  IV \_\_\_

Category I = Score >=70  
 Category II = Score 51-69  
 Category III = Score 30-50  
 Category IV = Score < 30

Score for Water Quality Functions	<u>10</u>
Score for Hydrologic Functions	<u>6</u>
Score for Habitat Functions	<u>18</u>
<b>TOTAL score for Functions</b>	<b><u>34</u></b>

Category based on **SPECIAL CHARACTERISTICS** of wetland

I \_\_\_ II \_\_\_ Does not Apply

**Final Category** (choose the "highest" category from above)

III

**Summary of basic information about the wetland unit**

Wetland Unit Name	Wetland HGM Class
Estuarine	Depressional
Natural Heritage Wetland	Riverine
Bog	Lake-Fridge
Mature Forest	Slope
Old Growth Forest	Flats
Coastal Lagoon	Freshwater Tidal
Interdunal	
None of the above	<input checked="" type="checkbox"/> Check if unit has multiple HGM classes present

Wetland name or number A

Does the wetland unit being rated meet any of the criteria below?

If you answer YES to any of the questions below you will need to protect the wetland according to the regulations regarding the special characteristics found in the wetland.

Check list for Wetlands that May Need Additional Protection (in addition to the protection recommended for its category)	YES	NO
SP1. Has the wetland unit been documented as a habitat for any Federally listed Threatened or Endangered animal or plant species (ITE species)? For the purposes of this rating system, "documented" means the wetland is on the appropriate state or federal database.		<input checked="" type="checkbox"/>
SP2. Has the wetland unit been documented as habitat for any State listed Threatened or Endangered animal species? For the purposes of this rating system, "documented" means the wetland is on the appropriate state database. Note: Wetlands with State listed plant species are categorized as Category I Natural Heritage Wetlands (see p. 19 of data form).		<input checked="" type="checkbox"/>
SP3. Does the wetland unit contain individuals of Priority species listed by the WDFW for the state?		<input checked="" type="checkbox"/>
SP4. Does the wetland unit have a local significance in addition to its functions? For example, the wetland has been identified in the Shoreline Master Program, the Critical Areas Ordinance, or in a local management plan as having special significance.		<input checked="" type="checkbox"/>

To complete the next part of the data sheet you will need to determine the Hydrogeomorphic Class of the wetland being rated.

The hydrogeomorphic classification groups wetlands into those that function in similar ways. This simplifies the questions needed to answer how well the wetland functions. The Hydrogeomorphic Class of a wetland can be determined using the key below. See p. 24 for more detailed instructions on classifying wetlands.

Wetland name or number A

### Classification of Wetland Units in Western Washington

If the hydrologic criteria listed for each question do not apply to the entire unit being rated, you probably have a unit with multiple HGM classes. In this case, identify which hydrologic criteria in questions 1-7 apply, and go to Question 8.

- Are the water levels in the entire unit usually controlled by tides (i.e. except during floods)?  
 NO - go to 2  YES - the wetland class is Tidal Fringe  
 If yes, is the salinity of the water during periods of annual low flow below 0.5 ppt (parts per thousand)? YES - Freshwater Tidal Fringe NO - Saltwater Tidal Fringe (Estuarine)  
*If your wetland can be classified as a Freshwater Tidal Fringe use the forms for Riverine wetlands. If it is Saltwater Tidal Fringe it is rated as an Estuarine wetland. Wetlands that were called estuarine in the first and second editions of the rating system are called Salt Water Tidal Fringe in the Hydrogeomorphic Classification. Estuarine wetlands were categorized separately in the earlier editions, and this separation is being kept in this revision. To maintain consistency between editions, the term "Estuarine" wetland is kept. Please note, however, that the characteristics that define Category I and II estuarine wetlands have changed (see p. ).*
- The entire wetland unit is flat and precipitation is the only source (>90%) of water to it. Groundwater and surface water runoff are NOT sources of water to the unit.  
 NO - go to 3  YES - The wetland class is Flats  
 If your wetland can be classified as a "Flats" wetland, use the form for Depressional wetlands.
- Does the entire wetland unit meet both of the following criteria?  
 The vegetated part of the wetland is on the shores of a body of permanent open water (without any vegetation on the surface) at least 20 acres (8 ha) in size;  
 At least 30% of the open water area is deeper than 6.6 ft (2 m)?  
 NO - go to 4  YES - The wetland class is Lake-fringe (Lacustrine Fringe)
- Does the entire wetland unit meet all of the following criteria?  
 The wetland is on a slope (slope can be very gradual).  
 The water flows through the wetland in one direction (unidirectional) and usually comes from seeps. It may flow subsurface, as sheetflow, or in a swale without distinct banks.  
 The water leaves the wetland without being impounded?  
 NOTE: Surface water does not pond in these type of wetlands except occasionally in very small and shallow depressions or ballmound hummocks (depressions are usually <5 ft diameter and less than 1 foot deep).  
 NO - go to 6  YES - The wetland class is Slope

Wetland name or number A

- Does the entire wetland unit meet all of the following criteria?  
 The unit is in a valley, or stream channel, where it gets inundated by overbank flooding from that stream or river  
 The overbank flooding occurs at least once every two years.  
 NOTE: The riverine unit can contain depressions that are filled with water when the river is not flooding.  
 NO - go to 6  YES - The wetland class is Riverine
- Is the entire wetland unit in a topographic depression in which water ponds, or is saturated to the surface, at some time during the year. This means that any outlet, if present, is higher than the interior of the wetland.  
 NO - go to 7  YES - The wetland class is Depressional
- Is the entire wetland unit located in a very flat area with no obvious depression and no overbank flooding. The unit does not pond surface water more than a few inches. The unit seems to be maintained by high groundwater in the area. The wetland may be ditched, but has no obvious natural outlet.  
 NO - go to 8  YES - The wetland class is Depressional
- Your wetland unit seems to be difficult to classify and probably contains several different HGM classes. For example, seeps at the base of a slope may grade into a riverine floodplain, or a small stream within a depressional wetland has a zone of flooding along its sides. GO BACK AND IDENTIFY WHICH OF THE HYDROLOGIC REGIMES DESCRIBED IN QUESTIONS 1-7 APPLY TO DIFFERENT AREAS IN THE UNIT (make a rough sketch to help you decide). Use the following table to identify the appropriate class to use for the rating system if you have several HGM classes present within your wetland. NOTE: Use this table only if the class that is recommended in the second column represents 10% or more of the total area of the wetland unit being rated. If the area of the class listed in column 2 is less than 10% of the unit, classify the wetland using the class that represents more than 90% of the total area.

Hydrologic Regime	Wetland Class
Slope + Riverine	Riverine
Slope + Depressional	Depressional
Slope + Lake-fringe	Lake-fringe
Depressional + Riverine along stream within boundary	Depressional
Depressional + Lake-fringe	Depressional
Salt Water Tidal Fringe and any other class of freshwater wetland	Treat as ESTUARINE under wetlands with special characteristics

If you are unable still to determine which of the above criteria apply to your wetland, or if you have more than 2 HGM classes within a wetland boundary, classify the wetland as Depressional for the rating.

Wetland name or number A

Slime Wetlands		Points
Maximum score: 100 points. Indicate the wetland unit functions it achieves. Use the following definitions.		0-100
S 1. Does the wetland unit have the potential to improve water quality? (see p. 69)		
S	S 1.1 Characteristics of average slope of unit: Slope is 1% or less (a 1% slope has a 1 foot vertical drop in elevation for every 100 ft horizontal distance) points = 3 Slope is 1% - 2% points = 2 Slope is 2% - 5% points = 1 Slope is greater than 5% points = 0	0
S	S 1.2 The soil 2 inches below the surface (or duff layer) is clay or organic (use NRCS definitions) YES = 3 points NO = 0 points	3
S	S 1.3 Characteristics of the vegetation in the wetland that trap sediments and pollutants: Choose the points appropriate for the description that best fits the vegetation in the wetland. Dense vegetation means you have trouble seeing the soil surface (> 75% cover), and uncut means not grazed or mowed and plants are higher than 6 inches. Dense, uncut, herbaceous vegetation > 90% of the wetland area points = 6 Dense, uncut, herbaceous vegetation > 1/2 of area points = 3 Dense, woody, vegetation > 1/4 of area points = 1 Dense, uncut, herbaceous vegetation > 1/4 of area points = 0 Does not meet any of the criteria above for vegetation Aerial photo or map with vegetation polygons	2
S Total for S 1 Add the points in the boxes above		5
S 2. Does the wetland unit have the opportunity to improve water quality? (see p. 67)		
Answer YES if you know or believe there are pollutants in ground water or surface water coming into the wetland that would otherwise reduce water quality in streams, lakes or groundwater downgradient from the wetland. Note which of the following conditions provide the sources of pollutants. A unit may have pollutants coming from several sources, but any single source would qualify as opportunity.		
<ul style="list-style-type: none"> <li>— Grazing in the wetland or within 150ft</li> <li>— Untreated stormwater discharges to wetland</li> <li>— Filled fields, logging, or orchards within 150 feet of wetland</li> <li>— Residential, urban areas, or golf courses are within 150 ft upslope of wetland</li> <li>— Other</li> </ul>		multiplier
YES (multiplier is 2) NO multiplier is 1		2
S TOTAL - Water Quality Functions Multiply the score from S1 by S2 Add score to table on p. 1		10
Comments		

Wetland name or number A

Slime Wetlands		Points
Maximum score: 100 points. Indicate the wetland unit functions it achieves. Use the following definitions.		0-100
S 3. Does the wetland unit have the potential to reduce flooding and stream erosion? (see p. 69)		
S	S 3.1 Characteristics of vegetation that reduces the velocity of surface flows during storms. Choose the points appropriate for the description that best fit conditions in the wetland. (stems of plants should be thick enough (usually > 1/8th), or dense enough, to remain erect during surface flows) Dense, uncut, rigid vegetation covers > 90% of the area of the wetland. points = 6 Dense, uncut, rigid vegetation > 1/2 area of wetland points = 3 Dense, uncut, rigid vegetation > 1/4 area points = 1 More than 1/4 of area is grazed, mowed, filled or vegetation is not rigid points = 0	6
S	S 3.2 Characteristics of slope wetland that holds back small amounts of flood flows: The slope wetland has small surface depressions that can retain water over at least 10% of its area. YES points = 2 NO points = 0	0
S Add the points in the boxes above		6
S 4. Does the wetland have the opportunity to reduce flooding and erosion? (see p. 70)		
Is the wetland in a landscape position where the reduction in water velocity it provides helps protect downstream property and aquatic resources from flooding or excessive and/or erosive flows? Note which of the following conditions apply:		
— Wetland has surface runoff that drains to a river or stream that has flooding problems		multiplier
— Other		multiplier
(Answer NO if the major source of water is controlled by a reservoir (e.g. wetland is a seep that is on the downstream side of a dam))		1
YES multiplier is 2 NO multiplier is 1		2
S TOTAL - Hydrologic Functions Multiply the score from S 3 by S 4 Add score to table on p. 1		12
Comments		

Wetland name or number A

These questions apply to wetlands of all HUC30 classes		POINTS
<b>H 1. Does the wetland unit have the potential to provide habitat for many species?</b>		
<b>H 1.1 Vegetation structure (see p. 74)</b> Check the types of vegetation classes present (as defined by Cowardin). Size threshold for each class is 1/4 acre or more than 10% of the area (if unit is smaller than 2.5 acres). <input type="checkbox"/> Aquatic bed <input type="checkbox"/> Emergent plants <input checked="" type="checkbox"/> Scrub/shrub (areas where shrubs have >30% cover) <input checked="" type="checkbox"/> Forested (areas where trees have >30% cover) If the unit has a forested class check if: <input checked="" type="checkbox"/> The forested class has 3 out of 5 strata (canopy, sub-canopy, shrubs, herbaceous, moss/ground-cover) that each cover 20% within the forested polygon Add the number of vegetation structures that qualify. If you have: 4 structures or more points = 4 3 structures points = 2 2 structures points = 1 1 structure points = 0 Map of Cowardin vegetation classes.		Figure <u>2</u>
<b>H 1.2. Hydroperiods (see p. 73)</b> Check the types of water regimes (hydroperiods) present within the wetland. The water regime has to cover more than 10% of the wetland or 1/4 acre to count. (see text for descriptions of hydroperiods) <input type="checkbox"/> Permanently flooded or inundated 4 or more types present points = 3 <input type="checkbox"/> Seasonally flooded or inundated 3 types present points = 2 <input type="checkbox"/> Occasionally flooded or inundated 2 types present points = 1 <input checked="" type="checkbox"/> Saturated only 1 type present points = 0 <input checked="" type="checkbox"/> Permanently flowing stream or river in, or adjacent to, the wetland <input checked="" type="checkbox"/> Seasonally flowing stream in, or adjacent to, the wetland <input type="checkbox"/> Lake-fringe wetland = 2 points <input type="checkbox"/> Freshwater tidal wetland = 2 points Map of hydroperiods		Figure <u>1</u>
<b>H 1.3. Richness of Plant Species (see p. 75)</b> Count the number of plant species in the wetland that cover at least 10 ft <sup>2</sup> . (different patches of the same species can be combined to meet the size threshold) You do not have to name the species. Do not include Eurasian Milfoil, reed canarygrass, purple loosestrife, Canadian Thistle If you counted: > 19 species points = 2 5 - 19 species points = 1 < 5 species points = 0 List species below if you want to:		Figure <u>1</u>

Total for page 4

Wetland name or number A

<b>H 1.4. Interspersion of habitats (see p. 76)</b> Decide from the diagrams below whether interspersion between Cowardin vegetation classes (described in H 1.1), or the classes and unvegetated areas (can include open water or mudflats) is high, medium, low, or none.		Figure <u>1</u>
<p>None = 0 points    Low = 1 point    Moderate = 2 points    High = 3 points</p> <p>[riparian braided channels]</p> <p>NOTE: If you have four or more classes or three vegetation classes and open water the rating is always "High". Use map of Cowardin vegetation classes.</p>		Figure <u>1</u>
<b>H 1.5. Special Habitat Features (see p. 77)</b> Check the habitat features that are present in the wetland. The number of checks is the number of points you put into the next column. <input checked="" type="checkbox"/> Large, downed, woody debris within the wetland (>4in. diameter and 6 ft long). <input checked="" type="checkbox"/> Standing snags (diameter at the bottom > 4 inches) in the wetland <input type="checkbox"/> Undercut banks are present for at least 6.6 ft (2m) and/or overhanging vegetation extends at least 3.3 ft (1m) over a stream (or ditch) in, or contiguous with the unit, for at least 33 ft (10m) <input type="checkbox"/> Stable steep banks of fine material that might be used by beaver or muskrat for denning (>30degree slope) OR signs of recent beaver activity are present (cut shrubs or trees that have not yet turned gray/brown) <input type="checkbox"/> At least 1/4 acre of thin-stemmed persistent vegetation or woody branches are present in streams that are permanently or seasonally inundated. (structures for egg-laying by amphibians) <input type="checkbox"/> Invasive plants cover less than 25% of the wetland area in each stratum of plants NOTE: The 20% stated in early printings of the manual on page 78 is an error.		Figure <u>3</u>
<b>H 1. TOTAL Score - potential for providing habitat</b> Add the scores from H1.1, H1.2, H1.3, H1.4, H1.5		Figure <u>8</u>
Comments		

Wetland name or number A

<p><b>H 2. Does the wetland unit have the opportunity to provide habitat for many species?</b></p> <p><b>H 2.1 Buffers</b> (see p. 80) Choose the description that best represents condition of buffer of wetland unit. The Highest scoring criterion that applies to the wetland is to be used in the rating. See text for definition of "undisturbed."</p> <ul style="list-style-type: none"> <li>— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% of circumference. No structures are within the undisturbed part of buffer. (relatively undisturbed also means no-grazing, no landscaping, no daily human use) Points = 5</li> <li>— 100 m (330 ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt; 50% circumference. Points = 4</li> <li>— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt;95% circumference. Points = 4</li> <li>— 100 m (330ft) of relatively undisturbed vegetated areas, rocky areas, or open water &gt; 25% circumference. Points = 3</li> <li>— 50 m (170ft) of relatively undisturbed vegetated areas, rocky areas, or open water for &gt; 50% circumference. Points = 3</li> </ul> <p>If buffer does not meet any of the criteria above</p> <ul style="list-style-type: none"> <li>— No paved areas (except paved trails) or buildings within 25 m (80ft) of wetland &gt; 95% circumference. Light to moderate grazing, or lawns are OK. Points = 2</li> <li>— No paved areas or buildings within 50m of wetland for &gt;50% circumference. Points = 2</li> <li>— Light to moderate grazing, or lawns are OK. Points = 1</li> <li>— Heavy grazing in buffer. Points = 1</li> <li>— Vegetated buffers are &lt;2m wide (6.6ft) for more than 55% of the circumference (e.g. filled fields, paving, basalt bedrock extend to edge of wetland) Points = 0.</li> <li>— Buffer does not meet any of the criteria above. Points = 1</li> </ul> <p style="text-align: center;">Aerial photo showing buffers</p>		Figure _____
<p><b>H 2.2 Corridors and Connections</b> (see p. 81)</p> <p>H 2.2.1 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 150 ft wide, has at least 30% cover of shrubs, forest or native undisturbed prairie, that connects to estuaries, other wetlands or undisturbed uplands that are at least 250 acres in size? (dams in riparian corridors, heavily used gravel roads, paved roads, are considered breaks in the corridor). YES = 4 points (go to H 2.3) NO = go to H 2.2</p> <p>H 2.2.2 Is the wetland part of a relatively undisturbed and unbroken vegetated corridor (either riparian or upland) that is at least 50ft wide, has at least 30% cover of shrubs or forest, and connects to estuaries, other wetlands or undisturbed uplands that are at least 25 acres in size? OR a Lake-fringe wetland, if it does not have an undisturbed corridor as in the question above? YES = 1 points (go to H 2.3) NO = H 2.2.3</p> <p>H 2.2.3 Is the wetland:          within 3 mi (5km) of a brackish or salt water estuary OR          within 3 mi of a large field or pasture (&gt;40 acres) OR          within 1 mi of a lake greater than 20 acres?          YES = 1 point NO = 0 points</p>		3
<p>Total for page <u>4</u></p>		1

Wetland name or number A

<p><b>H 2.3 Near or adjacent to other priority habitats listed by WDFW</b> (see new and complete descriptions of WDFW priority habitats, and the counties in which they can be found, in the PHS report <a href="http://wdfw.wa.gov/habitatlist.htm">http://wdfw.wa.gov/habitatlist.htm</a>) Which of the following priority habitats are within 330 ft (100m) of the wetland unit? NOTE: the connections do not have to be relatively undisturbed.</p> <ul style="list-style-type: none"> <li>— Aspen Stands: Pure or mixed stands of aspen greater than 0.4 ha (1 acre).</li> <li>— Biodiversity Areas and Corridors: Areas of habitat that are relatively important to various species of native fish and wildlife (full descriptions in WDFW PHS report p. 152).</li> <li>— Herbaceous Halts: Variable size patches of grass and forbs on shallow soils over bedrock.</li> <li>— Old-growth/mature forests (Old-growth types of <i>Saradus cecilia</i>) Stands of at least 2 tree species, forming a multi-layered canopy with occasional small openings; with at least 20 trees/ha (8 trees/acre) &gt; 81 cm (32 in) dbh or &gt; 200 years of age. (Mature forests) Stands with average diameters exceeding 53 cm (21 in) dbh; crown cover may be less than 100%; crown cover may be less than 100%; decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth; 80 - 200 years old west of the Cascade crest.</li> <li>— Oregon white Oak: Woodlands Stands of pure oak or oak/cedar associations where canopy coverage of the oak component is important (full descriptions in WDFW PHS report p. 158).</li> <li>— Riparian: The area adjacent to aquatic systems with flowing water that contains elements of both aquatic and terrestrial ecosystems which mutually influence each other.</li> <li>— Westside Freshets: Herbaceous, non-forested plant communities that can either take the form of a dry prairie or a wet prairie (full descriptions in WDFW PHS report p. 161).</li> <li>— Instream: The combination of physical, biological, and chemical processes and conditions that interest to provide functional life history requirements for instream fish and wildlife resources.</li> <li>— Nearshore: Relatively undisturbed nearshore habitats. These include Coastal Nearshore, Open Coast Nearshore, and Puget Sound Nearshore. (full descriptions of habitats and the definition of relatively undisturbed are in WDFW report: pp. 167-169 and glossary in Appendix A).</li> <li>— Caves: A naturally occurring cavity, recess, void, or system of interconnected passages under the earth in soil, rock, ice, or other geological formations and is large enough to contain a human.</li> <li>— Cliffs: Greater than 7.6 m (25 ft) high and occurring below 5000 ft.</li> <li>— Talus: Homogenous areas of rock rubble ranging in average size 0.15 - 2.0 m (0.5 - 6.5 ft), composed of basalt, andesite, and/or sedimentary rock, including riprap slides and mine tailings. May be associated with cliffs.</li> <li>— Snags and Logs: Trees are considered snags if they are dead or dying and exhibit sufficient decay characteristics to enable cavity excavation/use by wildlife. Priority snags have a diameter at breast height of &gt; 51 cm (20 in) in western Washington and are &gt; 2 m (6.5 ft) in height. Priority logs are &gt; 30 cm (12 in) in diameter at the largest end, and &gt; 6 m (20 ft) long.</li> </ul> <p>If wetland has 3 or more priority habitats = 4 points          If wetland has 2 priority habitats = 3 points          If wetland has 1 priority habitat = 1 point No habitats = 0 points</p> <p>Note: All vegetated wetlands are by definition a priority habitat but are not included in this list. Nearby wetlands are addressed in question H 2.4</p>		3
---	--	---

Wetland name or number A

H 2.4 Wetland Landscape (choose the one description of the landscape around the wetland that best fits) (see p. 84)	7
There are at least 3 other wetlands within 1/2 mile, and the connections between them are relatively undisturbed (light grazing between wetlands OK, as is lake shore with some boating, but connections should NOT be bisected by paved roads, fill, fields, or other development. points = 5	
The wetland is Lake-fringe on a lake with little disturbance and there are 3 other lake-fringe wetlands within 1/2 mile. points = 5	
There are at least 3 other wetlands within 1/2 mile, BUT the connections between them are disturbed. points = 3	
The wetland is Lake-fringe on a lake with disturbance and there are 3 other lake-fringe wetlands within 1/2 mile. points = 3	
There is at least 1 wetland within 1/2 mile. points = 2	
There are no wetlands within 1/2 mile. points = 0	
H 2. TOTAL Score - opportunity for providing habitat Add the scores from H2.1, H2.2, H2.3, H2.4	3
TOTAL for H 1 from page 14	10
Total Score for Habitat Functions - add the points for H 1, H 2 and record the result on p. 1	8
	18

Wetland name or number A

**CATEGORIZATION BASED ON SPECIAL CHARACTERISTICS**

Please determine if the wetland meets the attributes described below and circle the appropriate answers and Category.

Wetland Type	Category
<p>Check off any criteria that apply to the wetland. Circle the Category when the appropriate criteria are met.</p> <p>SC 1.0 Estuarine wetlands (see p. 86)</p> <p>Does the wetland unit meet the following criteria for Estuarine wetlands?</p> <ul style="list-style-type: none"> <li>— The dominant water regime is tidal,</li> <li>— Vegetated, and</li> <li>— With a salinity greater than 0.5 ppt.</li> </ul> <p>YES = Go to SC 1.1      NO <input checked="" type="checkbox"/></p>	
<p>SC 1.1 Is the wetland unit within a National Wildlife Refuge, National Park, National Estuary Reserve, Natural Area Preserve, State Park or Educational, Environmental, or Scientific Reserve designated under WAC 332-30-151?</p> <p>YES = Category I      NO go to SC 1.2</p>	Cat. I
<p>SC 1.2 Is the wetland unit at least 1 acre in size and meets at least two of the following three conditions? YES = Category I    NO = Category II</p> <ul style="list-style-type: none"> <li>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing, and has less than 10% cover of non-native plant species. If the non-native <i>Spartina</i> spp. are the only species that cover more than 10% of the wetland, then the wetland should be given a dual rating (II/III). The area of <i>Spartina</i> would be rated a Category II while the relatively undisturbed upper marsh with native species would be a Category I. Do not, however, exclude the area of <i>Spartina</i> in determining the size threshold of 1 acre.</li> <li>— At least 1/4 of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</li> <li>— The wetland has at least 2 of the following features: tidal channels, depressions with open water, or contiguous freshwater wetlands.</li> </ul>	<p>Cat. I</p> <p>Cat. II</p> <p>Dual rating III</p>

Wetland name or number A

<p><b>SC 2.0 Natural Heritage Wetlands (see p. 87)</b> Natural Heritage wetlands have been identified by the Washington Natural Heritage Program/DNR as either high quality undisturbed wetlands or wetlands that support state Threatened, Endangered, or Sensitive plant species.</p> <p>SC 2.1 Is the wetland unit being rated in a Section/Township/Range that contains a Natural Heritage wetland? (this question is used to screen out most sites before you need to contact WNH/DNR) S/TR information from Appendix D ___ or accessed from WNH/DNR web site ___</p> <p>YES ___ - contact WNH/DNR (see p. 79) and go to SC 2.2      NO <input checked="" type="checkbox"/></p> <p>SC 2.2 Has DNR identified the wetland as a high quality undisturbed wetland or as a site with state threatened or endangered plant species? YES = Category I      NO ___ not a Heritage Wetland</p>	Cat. I
<p><b>SC 3.0 Bogs (see p. 87)</b> Does the wetland unit (or any part of the unit) meet both the criteria for soils and vegetation in bogs? Use the key below to identify if the wetland is a bog. If you answer yes you will still need to rate the wetland based on its functions.</p> <p>1. Does the unit have organic soil horizons (i.e. layers of organic soil), either peats or mucks, that compose 16 inches or more of the first 32 inches of the soil profile? (See Appendix B for a field key to identify organic soils)? Yes - go to Q. 3      No - go to Q. 2</p> <p>2. Does the unit have organic soils, either peats or mucks that are less than 16 inches deep over bedrock, or an impermeable hardpan such as clay or volcanic ash, or that are floating on a lake or pond? Yes - go to Q. 3      No - Is not a bog for purpose of rating</p> <p>3. Does the unit have more than 70% cover of mosses at ground level, AND other plants, if present, consist of the "bog" species listed in Table 3 as a significant component of the vegetation (more than 30% of the total shrub and herbaceous cover consists of species in Table 3)? Yes - Is a bog for purpose of rating      No - go to Q. 4</p> <p>NOTE: If you are uncertain about the extent of mosses in the understory you may substitute that criterion by measuring the pH of the water that seeps into a hole dug at least 10" deep. If the pH is less than 5.0 and the "bog" plant species in Table 3 are present, the wetland is a bog.</p> <p>1. Is the unit forested (&gt; 30% cover) with sitka spruce, subalpine fir, western red cedar, western hemlock, lodgepole pine, quaking aspen, Englemann's spruce, or western white pine, WITH any of the species (or combination of species) on the bog species plant list in Table 3 as a significant component of the ground cover (&gt; 30% coverage of the total shrub/herbaceous cover)?</p> <p>2. YES = Category I      No ___ Is not a bog for purpose of rating</p>	Cat. I

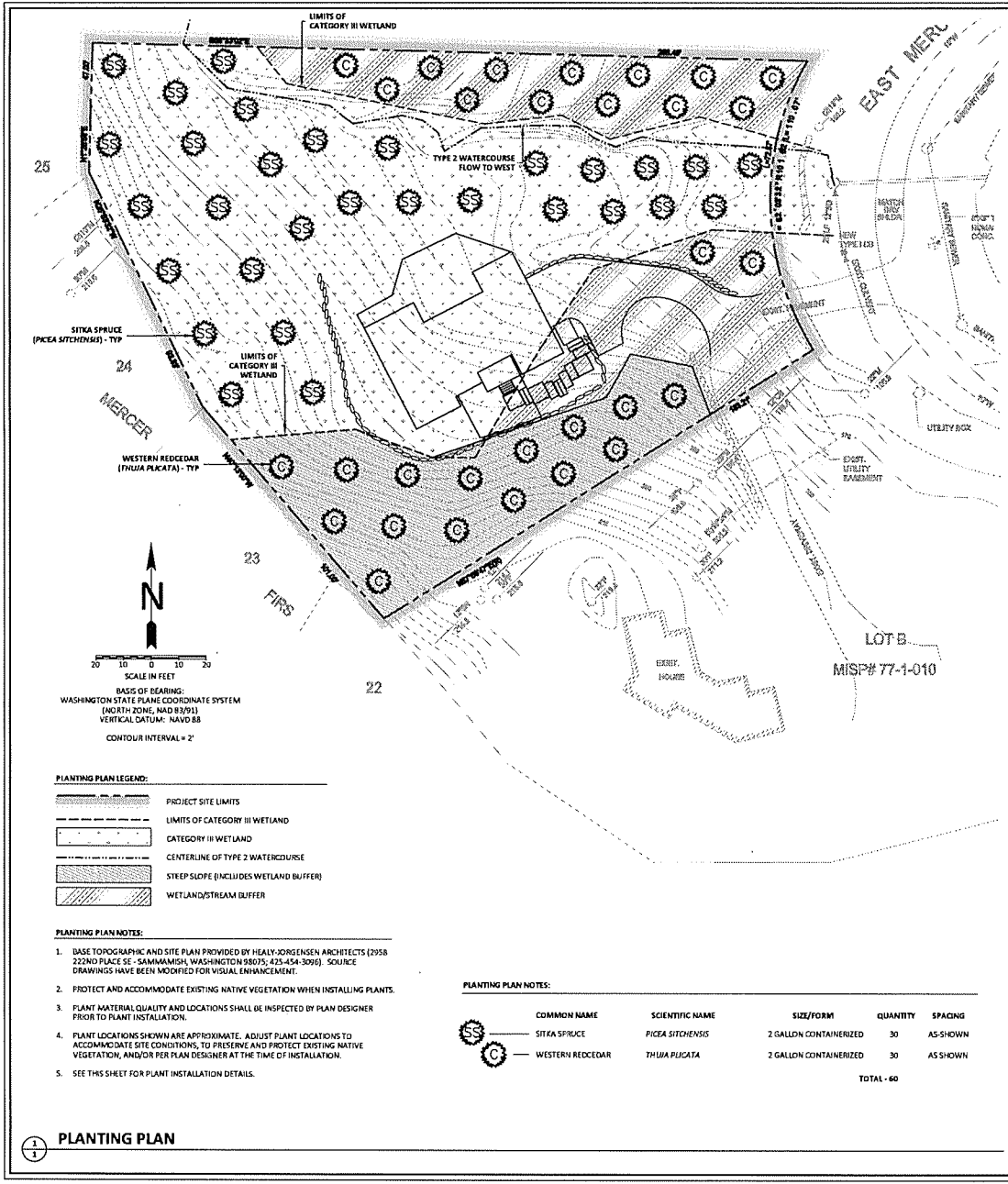
Wetland name or number A

<p><b>SC 4.0 Forested Wetlands (see p. 90)</b> Does the wetland unit have at least 1 acre of forest that meet one of these criteria for the Department of Fish and Wildlife's forests as priority habitats? If you answer yes you will still need to rate the wetland based on its functions.</p> <p>— Old-growth forests: (west of Cascade crest) Stands of at least two tree species, forming a multi-layered canopy with occasional small openings; with at least 8 trees/acre (20 trees/hectare) that are at least 200 years of age OR have a diameter at breast height (dbh) of 32 inches (81 cm) or more.</p> <p>NOTE: The criterion for dbh is based on measurements for upland forests. Two-hundred year old trees in wetlands will often have a smaller dbh because their growth rates are often slower. The D/FW criterion is and "OR" so old-growth forests do not necessarily have to have trees of this diameter.</p> <p>— Mature forests: (west of the Cascade Crest) Stands where the largest trees are 80 - 200 years old OR have average diameters (dbh) exceeding 21 inches (53cm), crown cover may be less than 100%, decay, decadence, numbers of snags, and quantity of large downed material is generally less than that found in old-growth.</p> <p>YES = Category I      NO ___ not a forested wetland with special characteristics</p>	Cat. I
<p><b>SC 5.0 Wetlands in Coastal Lagoons (see p. 91)</b> Does the wetland meet all of the following criteria of a wetland in a coastal lagoon?</p> <p>— The wetland lies in a depression adjacent to marine waters that is wholly or partially separated from marine waters by sandbanks, gravel banks, shingle, or, less frequently, rocks</p> <p>— The lagoon in which the wetland is located contains surface water that is saline or brackish (&gt; 0.5 ppt) during most of the year in at least a portion of the lagoon (needs to be measured near the bottom)</p> <p>YES = Go to SC 5.1      NO ___ not a wetland in a coastal lagoon</p> <p><b>SC 5.1</b> Does the wetland meets all of the following three conditions?</p> <p>— The wetland is relatively undisturbed (has no diking, ditching, filling, cultivation, grazing), and has less than 20% cover of invasive plant species (see list of invasive species on p. 74).</p> <p>— At least ¼ of the landward edge of the wetland has a 100 ft buffer of shrub, forest, or un-grazed or un-mowed grassland.</p> <p>— The wetland is larger than 1/10 acre (4350 square feet)</p> <p>YES = Category I      NO = Category II</p>	Cat. II

Wetland name or number A

<p><b>SC 6.0 Interdunal Wetlands (see p. 93)</b>          Is the wetland unit west of the 1889 line (also called the Western Boundary of Upland Ownership or WBUO)?          YES - go to SC 6.1                      NO - not an interdunal wetland for rating  <i>If you answer yes you will still need to rate the wetland based on its functions.</i></p> <p>In practical terms that means the following geographic areas:</p> <ul style="list-style-type: none"> <li>• Long Beach Peninsula- lands west of SR 103</li> <li>• Grayland-Westport- lands west of SR 105</li> <li>• Ocean Shores-Copalis- lands west of SR 115 and SR 109</li> </ul> <p>SC 6.1 Is the wetland one acre or larger, or is it in a mosaic of wetlands that is one acre or larger?          YES = Category II                      NO - go to SC 6.2</p> <p>SC 6.2 Is the unit between 0.1 and 1 acre, or is it in a mosaic of wetlands that is between 0.1 and 1 acre?          YES = Category III</p>	<p>Cat. II</p> <p>Cat. III</p>
<p><i>Category III wetlands are those that are not in the geographic areas listed above and are not in the geographic areas listed above and are not in the geographic areas listed above.</i></p> <p>NA</p>	





### MONITORING PLAN & MAINTENANCE PLAN

**ENHANCEMENT PLAN GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS**

ENHANCEMENT PLAN GOALS, OBJECTIVES, AND PERFORMANCE STANDARDS ARE OUTLINED IN TABLE 1-1 (BELOW). THE GOALS AND OBJECTIVES OF THIS PLAN ARE CONSIDERED ACHIEVED WHEN THE PERFORMANCE STANDARDS ARE SATISFIED.

**MONITORING PLAN**

**AS-BUILT**

FOLLOWING COMPLETION OF THE WORK SHOWN ON THIS PLAN, A QUALIFIED PROFESSIONAL SHALL PREPARE AN AS-BUILT OF THE COMPLETED WORK. THE AS-BUILT SHALL SUMMARIZE THE COMPLETED WORK AS WELL AS ANY DEVIATIONS FROM THE APPROVED VERSION OF THIS PLAN.

BASELINE MONITORING DATA SHALL BE COLLECTED AT THE TIME OF THE AS-BUILT (SEE "ANNUAL COMPLIANCE MONITORING" FOR FIELD DATA COLLECTION REQUIREMENTS). PERMANENT PHOTO POINTS SHALL BE ESTABLISHED AT THE TIME OF THE AS-BUILT TO PHOTOGRAPHICALLY DOCUMENT REPRESENTATIVE CONDITIONS WITHIN BUFFER AREAS. BASELINE MONITORING AND PHOTOGRAPHS SHALL BE SUBMITTED WITH THE AS-BUILT.

THE AS-BUILT AND BASELINE MONITORING DATA SHALL BE SUBMITTED TO THE CITY OF MERCER ISLAND NO LATER THAN 30 DAYS FROM THE DATE THAT THE WORK SHOWN ON THIS PLAN HAS BEEN COMPLETED.

**ANNUAL MONITORING**

FOLLOWING ACCEPTANCE OF THE AS-BUILT BY THE CITY OF MERCER ISLAND, ANNUAL COMPLIANCE MONITORING SHALL BE COMPLETED FOR A PERIOD OF FIVE (5) YEARS. ANNUAL COMPLIANCE MONITORING SHALL BE COMPLETED BY A QUALIFIED PROFESSIONAL AND SHALL COMPRISE A SITE INVESTIGATION IN AUGUST OR SEPTEMBER AND REPORTING TO THE CITY OF MERCER ISLAND BY NOVEMBER 30 OF EACH MONITORING YEAR.

MONITORING SHALL COMPRISE A QUANTITATIVE ASSESSMENT OF CONDITIONS WITHIN BUFFER AREAS FOR PURPOSES OF EVALUATING THE CURRENT YEAR'S SUCCESS STANDARDS. AT THE TIME OF EACH MONITORING, THE FOLLOWING INFORMATION SHALL BE COLLECTED WITHIN BUFFER AREAS AND ASSESSED RELATIVE TO THE SUCCESS STANDARDS ESTABLISHED FOR THE PROJECT:

- THE CONDITION OF INSTALLED PLANT STOCK INCLUDING SURVIVORSHIP, HEALTH AND VIGOR, THE NATIONAL FOR POOR CONDITIONS, IF PRESENT, WILL BE DETERMINED.

A DIRECT COUNT INVENTORY AND ASSESSMENT OF INSTALLED PLANT STOCK SHALL BE USED TO EVALUATE PLANT STOCK CONDITIONS. IN ADDITION, PHOTOGRAPHS OF BUFFER AREAS SHALL BE TAKEN FROM THE PERMANENT PHOTO POINTS ESTABLISHED DURING THE AS-BUILT.

THE RESULTS OF EACH MONITORING ASSESSMENT SHALL BE SUMMARIZED IN A WRITTEN REPORT AND SUBMITTED TO THE CITY OF MERCER ISLAND NO LATER THAN NOVEMBER 30 OF THE RESPECTIVE MONITORING YEAR.

**CONTINGENCY PLAN**

SHOULD ANY COMPLIANCE MONITORING ASSESSMENT REVEAL THAT THE PERFORMANCE STANDARDS FOR THE RESPECTIVE YEAR ARE NOT SATISFIED, THE PERMITTEE SHALL WORK WITH THE CITY OF MERCER ISLAND TO DEVELOP A CONTINGENCY PLAN TO ADDRESS THE DEFICIENCIES. CONTINGENCY PLANS CAN INCLUDE, BUT ARE NOT LIMITED TO, THE FOLLOWING ACTIONS:

- ADDITIONAL PLANT INSTALLATION;
- EROSION CONTROL;
- HERBIVORY PROTECTION;
- MODIFICATION TO THE IRRIGATION REGIME, AND/OR
- PLANT SUBSTITUTIONS OF TYPE, SIZE, QUANTITY, AND LOCATION.

SUCH CONTINGENCY PLAN SHALL BE SUBMITTED TO THE CITY OF MERCER ISLAND BY JANUARY 31 OF ANY YEAR WHEN DEFICIENCIES ARE DISCOVERED. UNLESS OTHERWISE APPROVED BY THE CITY OF MERCER ISLAND, ACTIONS SPECIFIED ON AN APPROVED CONTINGENCY PLAN MUST BE COMPLETED WITHIN 60 DAYS. IF THE FAILURE IS SUBSTANTIAL, THE CITY OF MERCER ISLAND MAY EXTEND THE COMPLIANCE MONITORING PERIOD FOR THE ENHANCEMENT WORK.

**MAINTENANCE PLAN**

THIS SECTION PROVIDES A GENERAL OVERVIEW OF THE MAINTENANCE PROGRAM NECESSARY TO ENSURE THE PERFORMANCE STANDARDS ESTABLISHED FOR THIS PLAN ARE SATISFIED.

**GENERAL MAINTENANCE**

INSTALLED PLANTS SHALL BE MAINTAINED AT REGULAR INTERVALS DURING THE MONITORING PERIOD TO PROMOTE THE SUCCESSFUL ESTABLISHMENT AND VIGOROUS GROWTH OF THE INSTALLED PLANT STOCK.

GENERAL MAINTENANCE SHALL INCLUDE:

- RE-APPLYING BARK MULCH TO MAINTAIN A 6" MINIMUM APPLIED THICKNESS - YEAR 1 ONLY.
- THE PRUNING OF INSTALLED PLANTS TO REMOVE DEAD WOOD AND PROMOTE VIGOROUS PLANT GROWTH AND PROPER FORM.
- THE REPLACEMENT OF PLANTS THAT APPEAR TO BE IN DISTRESS AND/OR DISEASED.
- THE REMOVAL OF TRASH, LITTER, AND/OR OTHER NON-DECOMPOSING DEBRIS.

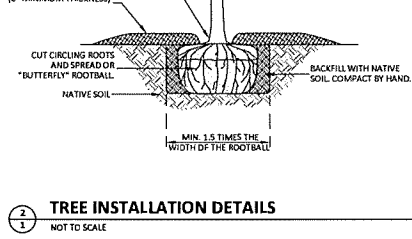
GENERAL MAINTENANCE WORK SHALL OCCUR MONTHLY DURING THE GROWING SEASON AND/OR AT A FREQUENCY OTHERWISE NECESSARY TO ENSURE THE SUCCESSFUL ESTABLISHMENT AND VIGOROUS GROWTH OF THE INSTALLED PLANTS.

**TABLE 1-1: GOALS, OBJECTIVES, MONITORING SCHEDULE, & PERFORMANCE STANDARDS**

GOAL	OBJECTIVE	SCHEDULE	PERFORMANCE STANDARDS
TO SUCCESSFULLY ENHANCE ON-SITE WETLAND AND BUFFER AREAS USING NATIVE PLANT SPECIES.	TO INSTALL AND SUCCESSFULLY ESTABLISH 60 NATIVE CONIFER TREE SPECIES.	AUGUST OR SEPTEMBER OF YEARS 1, 2, 3, 4, & 5 FOLLOWING PLANT INSTALLATION	<ul style="list-style-type: none"> <li>100% SURVIVAL BY INSTALLED PLANT STOCK AFTER THE FIRST GROWING SEASON (YEAR 1). THIS STANDARD CAN BE MET THROUGH PLANT ESTABLISHMENT OR REPLANTING, AS NECESSARY, TO ACHIEVE THE REQUIRED PLANT NUMBERS.</li> <li>85% SURVIVAL BY INSTALLED PLANT STOCK AFTER THE FIFTH GROWING SEASON (YEAR 5).</li> </ul>

**GENERAL NOTES:**

- WORK SHALL CONFORM TO ANY AND ALL APPLICABLE PERMITS AND/OR APPROVED CONSTRUCTION DRAWINGS.
- WORK SHALL BE COMPLETED BY PERSONS EXPERIENCED IN THE ENHANCEMENT WORK SHOWN ON THESE DRAWINGS.
- BEFORE THE START OF CONSTRUCTION, A PRE-CONSTRUCTION MEETING MUST BE HELD BETWEEN MERCER ISLAND, THE OWNER, AND THE PLAN DESIGNER.
- A COPY OF THESE APPROVED DRAWINGS MUST BE ON THE JOB SITE WHENEVER CONSTRUCTION IS IN PROGRESS.
- SITE CONDITIONS MAY VARY BASED ON SEASON AND/OR TIME OF YEAR. THE CONSTRUCTION CONTRACTOR SHALL ACCOMMODATE REALIZED AND ANTICIPATED SITE CONDITIONS WHEN COMPLETING THE WORK SHOWN ON THESE DRAWINGS.



Sewall Wetland Consulting, Inc.  
 27641 Conquest Way SW #2, Gringtop, WA 98042 | 336-839-9333 | Fax 336-862-4732

**CRITICAL AREA ENHANCEMENT PLAN**  
 - MITREHOUSE LLC -  
 5637 EAST MERCER WAY  
 MERCER ISLAND, WASHINGTON

DATE: 03/04/2015  
 JOB NUMBER: 14-206  
 DESIGN BY: ES  
 DRAWN BY: LARC  
 CHECK BY: ES

**Planting Plan, Notes, Details, & Monitoring Plan**

SHEET: **1** of **1**



RECEIVED

MAR 16 2015

CITY OF MERCER ISLAND  
DEVELOPMENT SERVICES

**GEOTECHNICAL ENGINEERING STUDY  
PROPOSED RESIDENCE  
5637 EAST MERCER WAY  
MERCER ISLAND, WASHINGTON**

**G-3837**

Prepared for

**Mr. William C. Summers  
Treehouse MI, LLC  
P.O. Box 261  
Medina, Washington 98039**

**March 13, 2015**

**GEO Group Northwest, Inc.  
13240 NE 20th Street, Suite 10  
Bellevue, Washington 98005  
Phone: (425) 649-8757 / Fax: (425) 649-8758**

March 13, 2015

G-3837

Mr. William C. Summers  
MI Treehouse, LLC  
P.O. Box 261  
Medina, Washington 98039

Subject: Geotechnical Engineering Study  
Proposed Residence  
5637 East Mercer Way  
Mercer Island, Washington

Dear Mr. Summers:

GEO Group Northwest, Inc., is pleased to submit this geotechnical engineering report entitled "Geotechnical Engineering Study, Proposed Residence, 5637 East Mercer Way, Mercer Island, Washington." This report presents our findings, conclusions, and recommendations from investigation activities that we have completed at the above-subject project site for your proposed construction of a single-family residence.

We explored subsurface soil conditions at the site by drilling two exploratory soil borings. Soils encountered in the borings typically consisted of loose, fine sand and silty sand underlain by medium dense to dense, unsaturated silt. Groundwater was encountered at or near the ground surface in both of the borings.

The site soils encountered in the borings will not be suitable to directly support foundations due to their loose and wet condition. Also, due to the presence of groundwater seepage from the

March 13, 2015

G-3837

Mr. William C. Summers - MI Treehouse, LLC

Page ii

slopes on the south part of the site, substantial excavation into the soils at the site is not recommended, particularly in the area where wet, loose soil conditions are present.

It is our opinion that the proposed residence can be supported vertically on a system of small-diameter steel pipe piles that are founded in the dense silty soils below the site. Lateral support for the residence can be achieved either by using battered pipe piles or by using helical anchors.

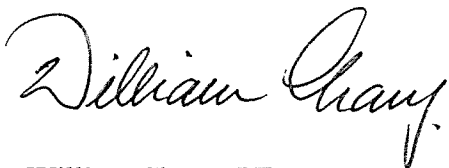
As an alternative, we considered the use of conventional spread footings bearing on a 3-foot thick layer of crushed rock and geotextile fabric to support the residence. Upon closer analysis, however, we have concluded that such an approach may not adequately mitigate potential soil settlement and soil liquefaction problems.

Our recommendations, along with other geotechnical aspects of the project, are discussed in more detail in the text of the attached report.

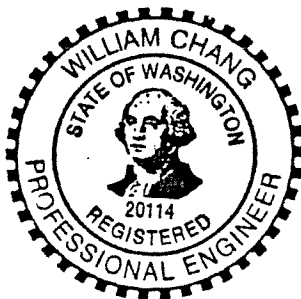
We appreciate this opportunity to have been of service to you on this project. We look forward to working with you as the project progresses. Should you have any questions regarding this report or need additional consultation, please feel free to call us.

Sincerely,

GEO Group Northwest, Inc.



William Chang, PE.  
Principal



GEO Group Northwest, Inc.

**TABLE OF CONTENTS**

PROJECT NO. G-3837

	Page
<b>1.0 INTRODUCTION .....</b>	<b>1</b>
1.1 Project Description .....	1
1.2 Scope of Investigation .....	1
<b>2.0 SITE CONDITIONS .....</b>	<b>2</b>
2.1 Site Description .....	2
2.2 Proposed Development .....	3
2.3 Geologic Overview .....	3
2.4 Geologic Hazard Areas Review .....	3
<b>3.0 SITE INVESTIGATION .....</b>	<b>4</b>
3.1 1999 Site Investigation .....	4
3.2 2015 Site Reconnaissance .....	4
<b>4.0 SEISMICITY .....</b>	<b>5</b>
3.1 Puget Sound Seismic History .....	5
3.2 Site Seismic Design Classification .....	5
3.3 Liquefaction Assessment .....	6
<b>5.0 CONCLUSIONS AND RECOMMENDATIONS .....</b>	<b>6</b>
5.1 General .....	6
5.2 Grading and Earthwork .....	7
5.3 Building Support .....	10
5.4 Building Floors .....	13
5.5 Conventional Basement and Retaining Walls .....	13
5.6 Drainage .....	15
5.7 Pavement Subgrade .....	15
<b>6.0 GEOLOGIC HAZARD AREA STATEMENT OF RISK .....</b>	<b>15</b>
<b>7.0 LIMITATIONS .....</b>	<b>16</b>

**TABLE OF CONTENTS (CONTINUED)**

PROJECT NO. G-3837

	Page
<b>8.0 ADDITIONAL SERVICES .....</b>	<b>16</b>

**PLATES**

- Plate 1 - Site Location Map
- Plate 2 - Site Plan
- Plate 3 - Proposed Residence Plan
- Plate 4 - Proposed Residence Section
- Plate 5A - North & South Elevations
- Plate 5B - East & West Elevations
- Plate 6 - Typical Basement and Retaining Wall Backfill and Drainage

**ATTACHMENTS**

- Attachment A - Boring Logs

**GEOTECHNICAL ENGINEERING STUDY  
PROPOSED RESIDENCE  
5637 EAST MERCER WAY  
MERCER ISLAND, WASHINGTON**

**G-3837**

**1.0 INTRODUCTION**

**1.1 Project Description**

GEO Group Northwest, Inc., has completed a geotechnical engineering study for the proposed development of a single-family residence on the property at 5637 E. Mercer Way, Mercer Island, Washington.

**1.2 Scope of Investigation**

The tasks we completed for this study included the following:

Year 1999:

1. Conducted a subsurface investigation at the site consisting of drilling two soil borings. The borings were drilled in the approximate proposed location the proposed residence at the time of the investigation;
2. Performed laboratory testing on soil samples collected from the borings, and prepared boring logs;
3. Performed engineering analysis for foundation support, grading considerations, earthwork criteria for on-site soils and imported soils, and pavement section design; and
4. Prepared a geotechnical report of our findings, conclusions, and recommendations.

**GEO Group Northwest, Inc.**



Year 2015:

1. Performed a reconnaissance of the project site to update our knowledge of current site conditions;
2. Reviewed and updated, where appropriate, the findings, conclusions, and recommendations contained in our previous reports (our 1999 report and an updated 2005 report) for the project site; and
3. Prepared this new geotechnical report of our findings, conclusions, and recommendations for the currently proposed residence for the project site.

## **2.0 SITE CONDITIONS**

### **2.1 Site Description**

The project site is located on the west side of the 5600 block of East Mercer Way on Mercer Island, Washington, as shown on Plate 1 - Site Location Map. The site is bordered to the south by a single family residence (5643 East Mercer Way). A small stream flows from west to east across the northern part of the site. Lake Washington is located approximately 0.2 miles east of the site.

The site consists of an irregular shaped lot that comprises about 38,700 square feet. The site generally slopes downward toward the north and northeast toward a ravine with an east-running stream on the north side of the site. Elevations on site range between approximately 158 feet at stream course in the northeast corner and approximately 226 feet at the south corner which is on a steeply rising slope (with inclinations up to approximately 75 percent). The existing conditions and topography on the site are illustrated in Plate 2 - Site Plan.

## **2.2 Proposed Development**

We understand the proposed residence is planned to be located on the relatively less steeply sloped middle part of the site, as illustrated in Plate 3 - Proposed Residence Plan. Slopes in this area have inclinations up to approximately 28 percent. The proposed floor elevation for the residence currently are 180 feet for the basement/garage and 190 feet for the main floor of the residence, as illustrated in Plate 4 - Proposed Residence Section. Elevation views of the proposed residence are presented in Plate 5A - North & South Elevations and Plate 5B - East & West Elevations.

## **2.3 Geologic Overview**

According to the Geologic Map of Mercer Island, Washington, by Troost, K.G. and A.P. Wisher, published October 2006, the surficial geology in the site vicinity is mapped as consisting of Quaternary-age Advance Outwash Sand (Qva) on the geologic map. These soils typically consist of fine to medium grained sand with occasional silty layers. These soils typically are underlain with a relatively impermeable silt unit, referred to as Lawton Clay on the geologic map. The map also indicates that landslide deposits are located on and in the immediate vicinity of the site.

Groundwater typically accumulates in the lower portion of the outwash sand unit where it is underlain by the impermeable silt. This water then forms springs and seeps on slopes where the contact between the units is exposed. Under these conditions, the sand soils commonly are susceptible to instability such as landslides or earthflows.

## **2.4 Geologic Hazard Areas Review**

According to information available from the City of Mercer Island GIS Portal, geologic hazard areas have been mapped as present at the site. These areas include erosion, steep slope, potential slide, and seismic hazards.

### **3.0 SITE INVESTIGATION**

#### **3.1 1999 Subsurface Investigation**

A GEO Group Northwest geologist supervised the drilling of two exploratory soil borings (B-1 and B-2) on August 10, 1999. The borings were completed by using a manually portable drilling rig and were located in the middle portion of the site, as indicated in Plate 2 - Site Plan. The boring locations were estimated by using a roll tape and by visual reference to existing site features noted on the topographic survey that was provided to us.

Soils encountered in the borings typically consisted of a surficial layer of soft, wet, mucky fine silty sand topsoil. The topsoil was underlain with loose to medium dense, wet, fine grained, silty sand and sand. These soils were found to a depth of approximately 14 feet (equivalent to approximate elevation 173 feet in boring B-1 and approximately 20 feet (equivalent to approximately elevation 156 feet) in boring B-2. These soils were underlain with medium dense, damp to moist silt with occasional lenses of silty fine sand to the bottom depths of both borings. Logs of the soil borings are provided in Attachment 1 to this report.

Groundwater seepage was observed at the surface during our explorations at the site. Saturated soils were present approximately from ground surface to the bottom of boring B-1 at 15 feet deep, and heaving action of the wet sand into the borehole prevented further drilling of the boring. Saturated soils were encountered in boring B-2 from near ground surface to approximately 20 feet deep, but the heaving action of the wet sand was able to be mitigated.

During our activities, we also observed the presence of groundwater seepage at the base of the steep slope in the south part of the site (from southwest to southeast of the location of boring B-1).

#### **3.2 2015 Site Reconnaissance**

On March 9, 2015, we performed a reconnaissance of the site to update our knowledge of the site conditions. We observed that the site appears to have not been substantially modified since the time of our 1999 investigation activities. We observed that the ground surface conditions were

similar to those we had found during the previous investigation, with presence of soft, wet, mucky sand on the middle part of the site below the base of the steep slope. We did not observe evidence of landslides on the site since the time of our previous investigation activities, such as exposed scarps, or apparent freshly exposed soils.

#### **4.0 SEISMICITY**

##### **4.1 Puget Sound Seismic History**

The project site is located within the Seattle metropolitan area. The greater Puget Sound region historically has experienced a number of small to moderate earthquakes and occasional strong shocks. Historical records for the region indicate that the Olympia earthquake of April 13, 1949, with a Richter magnitude of 7.1, produced ground-shaking of intensity VIII on the Modified Mercalli Scale near its epicenter. The Seattle-Tacoma earthquake of April 29, 1965, had a Richter magnitude of 6.5 and produced a ground-shaking of intensity IV to VIII near its epicenter. The most recent significant event, the Nisqually earthquake of February 28, 2001, with a Richter magnitude of 6.8, also produced ground shaking with intensities up to VIII. This level of ground-shaking is estimated to be the maximum that has occurred in the region during the approximately 160 years of the historic record.

##### **4.2 Site Seismic Design Classification**

Per the procedures specified in Section 1615 of the 2012 International Building Code (IBC), we conclude that the project site should be assigned a seismic design classification of Site Class F due to the presence of up to approximately 20 feet of potentially liquefiable soils (as discussed below in **Section 4.3 - Liquefaction Assessment**). However, the soils below a depth of approximately 20 feet are very dense and are suitable for assigning Site Class C (Very Dense Soil profile) to the proposed development of the site if the structures are fully supported on the deeper, very dense soils.

### **4.3 Liquefaction Assessment**

Liquefaction is a phenomenon where loose granular materials below the water table temporarily behave as a liquid due to strong shaking or vibrations, such as earthquakes. Clean, loose and saturated granular materials are the soil types susceptible to liquefaction phenomena.

During our site investigation, subsurface soil consisted of wet, very loose to medium dense fine sand, silty fine sand, and silt. Water saturated loose sandy soils were encountered from ground surface to approximately 15 to 20 feet in the borings. Therefore, it is our opinion that the shallow subsurface sandy soils at the site are susceptible to liquefaction, based on the observed soil types, densities, and moisture contents. Soils at depths below approximately 20 feet are not likely to be susceptible to liquefaction, because these soils consist primarily of unsaturated silt, based on the information obtained during our investigation.

## **5.0 CONCLUSIONS AND RECOMMENDATIONS**

### **5.1 General**

Based on the findings from our site investigation activities, it is our opinion that the site can be developed with a single-family residence. However, due to the presence of wet, loose sandy soils at the site and the presence of steep slopes exhibiting groundwater seepage at the site, we recommend that the residence be supported on a deep foundation system comprised of small-diameter steel pipe piles and possibly helical soil anchors that are driven into the dense underlying soils and are connected to a system of grade beams.

We also recommend that the proposed residence be designed such that the least possible amount of disturbance is made to the site soils on the steep slope area and below the steep slope area where wet, loose sands are present. For this reason, we recommend that site grading be minimized to only the amount that is necessary to achieve construction access and to construct the improvements (including the driveway) consistent with permit requirements. The residence could be built essentially at-grade or on an above-grade pile-supported deck, for example. Excavations in areas where wet, soft soils are present will need to be gently sloped or supported,

and accumulation of groundwater seepage in such excavations is likely and will need to be mitigated.

Our recommendations regarding geotechnical aspects of the proposed development are presented in the following sections of this report. These subjects include site preparation and earthwork, building support, site drainage, and pavements.

## **5.2 Grading and Earthwork**

### Site Preparation

Disturbance to the site soils should be kept to a minimum, and no disturbance should occur within 25 feet of the stream in the north part of the site. Erosion control measures should be implemented around areas disturbed by construction activity to prevent sediment-laden surface runoff from being discharged off-site.

To provide equipment access to the site and to the building area, we recommend that a temporary entrance pad be used to bridge over the soft soils at the site and also provide drainage to the subgrade. To prepare working pad, the surface soils should be excavated to a depth of at least two feet below existing grade. A layer of woven geotextile filter fabric, such as Mirafi 600X or equivalent, should be placed over the subgrade prior to placing the quarry spalls, to provide separation of materials and pad reinforcement.

### Site Work During Wet Weather

We understand that earthwork at the project site may be subject to a seasonal moratorium, per City of Mercer Island development regulations. Under these circumstances, earthwork at the site should not be performed during the period from October 1 to March 31, and the site should be stabilized against potential development-related earth movement, erosion, or off-site sedimentation before the start of the moratorium period.

### Temporary Erosion and Sediment Control

Implementing and maintaining effective temporary erosion and sediment control measures should be performed by the contractor during construction. Clearing and grading should be limited to areas where construction will occur, to the extent possible. Temporary erosion control should be installed downhill from areas disturbed by construction activity to prevent sediment-laden runoff from being discharged off site. We recommend that sediment traps, filter fabric fences, check dams, straw mulch, hay bales, stabilized construction entrances, wash pads, and other appropriate erosion control devices be used to provide temporary sediment and erosion control.

### Temporary Excavation and Slopes

Under no circumstances should temporary excavation slopes be greater than the limits specified in local, state and federal government safety regulations. Temporary cuts greater than four feet in height should be sloped at an inclination no steeper than 2.5H:1V (Horizontal:Vertical) in medium dense to dense unsaturated soils, and no steeper than 1H:1V in the stiff unsaturated silt soils, unless specifically reviewed and approved by the geotechnical engineer. Excavations into saturated soils should be avoided where possible, because engineered support of such cuts (such as with shoring) will probably be required. Permanent cut and fill slopes at the site should be inclined no steeper than 2.5H:1V in non-saturated, competent soils.

We recommend that temporary and permanent cuts in the soils on or in proximity to the steep slope on the southern part of the site be avoided where possible (and not extend into saturated soils where they are necessary), due to the loose and wet soil conditions in this area.

Surface runoff should not be allowed to flow uncontrolled over the top of slopes into the excavated area. During wet weather, exposed cut slopes should be covered with plastic sheeting during construction to minimize erosion. We recommend that a GEO Group Northwest, Inc., representative be on site during excavation of cut slopes to evaluate slope stability, due to the anticipated presence of groundwater seepage and loose soil conditions.

### Structural Fill

All structural fill material used to achieve design site elevations below the building area and below non-structurally supported sidewalks, driveways, and patios, should meet the requirements for structural fill. During wet weather conditions, material to be used as structural fill should have the following specifications:

1. Be free draining, granular material containing no more than five (5) percent fines (silt and clay-size particles passing the No. 200 mesh sieve);
2. Be free of organic material and other deleterious substances;
3. Have a maximum size of three (3) inches in diameter.

The fill material should be placed at or near the optimum moisture content. The optimum moisture content is the water content in soil that enables the soil to be compacted to the highest dry density for a given compaction effort.

We anticipate that the on-site material will be unsuitable in its existing condition for use as structural fill, due to its high moisture content and the presence of silt and organics in much of the material. During dry weather, however, any compactable non-organic soil may be used as structural fill, provided the material is near its optimum moisture content for compaction purposes. It should be noted that an imported granular fill material may provide more uniformity and be easier to compact to structural fill specifications.

If the on-site soils are to be used as engineered structural fill, it will be necessary to segregate the topsoil and any other organic- or debris from the soil. Also, the soil will need to be moisture conditioned to bring it near to its optimum moisture content for compaction. Once it is suitably prepared, the soil will then need to be protected from weather and from contamination with unsuitable materials until it is used.

Structural fill should be placed in thin horizontal lifts not exceeding 10 inches in loose thickness. In areas having slopes greater than 15 percent, horizontal benches should be cut to competent native soil before the fill is placed, in order to prevent possible later lateral movement. Structural



fill under building areas (including foundation and slab areas), should be compacted to at least 95 percent of the maximum density, as determined by ASTM Test Designation D-1557-91 (Modified Proctor). Structural fill under pavements should be compacted to at least 90 percent of the maximum density, except for the top one foot which should be compacted to at least 95 percent. We recommend that GEO Group Northwest, Inc., be retained to evaluate the suitability of structural fill material and to monitor the compaction work during construction for quality assurance of the earthwork.

### **5.3 Building Support**

Based on the results from our investigation activities, it is our opinion that the proposed residence should be supported on a deep foundation system that is founded in the dense silty soils that were encountered in the borings completed for this study. Such a foundation system can consist of small-diameter steel pipe piles and possibly helical anchors to support a system of structural grade beams. The pipe piles can provide vertical support to the residence; lateral support to the residence can be provided either by battered pipe piles or by helical anchors.

#### Small-Diameter Pipe Piles

Pipe piles are typically installed by driving them with a jackhammer or other pneumatic-type hammer to a condition where the resistance of the soils encountered essentially terminate the advance of the piles (this condition is called "refusal"). The depth at which refusal is achieved is dependent upon 1) the type of pipe and hammer that are used, 2) the characteristics of the subsurface soil, and 3) the allowable load-bearing capacity to be provided by the pile.

We estimate that refusal depths for the piles will be in the range of about 25 to 30 feet. These estimated depths are based on the anticipation that substantial thicknesses of very stiff to hard silt soils or dense sand soils are present below depths of about 20 feet at the site. Due to the shallow groundwater conditions at the site, we recommend that galvanized pipe be used for the piles.

The following available driving hammers, pipe sizes, allowable bearing capacities, and installation refusal criteria are recommended for supporting the residence:

**Pipe Pile Design Criteria**

<b>Pipe Diameter</b>	<b>Pipe Specification</b>	<b>Hammer Weight Class</b>	<b>Hammer Type</b>	<b>Refusal Criteria*</b>	<b>Allowable Capacity</b>
2 inch	Schedule 80	140 pound	jackhammer	60 sec/inch	2 tons
3 inch	Schedule 40	650 pound	TB225**	12 sec/inch	6 tons
3 inch	Schedule 40	850 pound	TB325**	10 sec/inch	6 tons
4 inch	Schedule 40	850 pound	TB325**	16 sec/inch	10 tons
4 inch	Schedule 40	1100 pound	TB425**	10 sec/inch	10 tons
6 inch	Schedule 40	1500 pound	TB425**	20 sec/inch	15 tons

\* = Maximum penetration rate to be sustained through at least 3 consecutive minutes of driving

\*\* = Teledyne pneumatic hammer model number, or equivalent

We estimate that the maximum total post-construction settlement should be one-half (1/2) inch or less. No reduction in pile capacities is required if the pile spacing is at least three times the pile diameter. A one-third increase in the above allowable pile capacities can be used when considering short-term transitory wind or seismic loads.

Vertical pipe piles do not generate significant lateral capacities. Instead, lateral forces can be resisted by passive earth pressure acting on grade beams or footings and by friction with the subgrade soils, where acceptable subgrade soil conditions are present. To fully mobilize the passive pressure resistance, the grade beams or footings must be constructed directly against competent native soil or compacted fill. For these conditions, our recommended allowable passive soil pressure for lateral resistance is 350 pcf equivalent fluid weight. A coefficient of friction of 0.35 may be used between a competent native soil or compacted fill subgrade and the foundation.

We note that the loose, wet sand soils in the proposed residence location are not acceptable for providing the above-recommended condition, and would need to be replaced with an acceptable pad of compacted fill. Other options for resisting lateral loads include using either battered pipe piles or helical anchors. Recommendations regarding helical anchors are provided below.

The performance of pipe piles is dependent on how and to what bearing stratum the piles are installed. Since a completed pile in the ground cannot be observed, it is critical that judgment and experience be used as a basis for determining the driving refusal and acceptability of a pile. Therefore, we recommend that GEO Group Northwest, Inc., be retained to monitor the pile installation operation, collect and interpret installation data and verify suitable bearing stratum. We also suggest that the contractor's equipment and installation procedures be reviewed by GEO Group Northwest, Inc., prior to pile installation to help mitigate problems which may delay the progress of the work.

#### Helical Anchors

The foundation for the proposed residence can be horizontally restrained by installing helical anchors into the underlying soil. Helical anchors, such as those developed by the A. B. Chance Company and Atlas Systems, Inc., consist of a steel square shaft with one or more helices on the anchor shaft. Lateral loads can be resisted by installing additional helical anchors either perpendicular to the slope face or at an inclination of 30 degrees from vertical.

The ultimate capacity for helical anchors should be determined and verified in the field by a geotechnical engineer based on the installation torque that is achieved during installation. For Chance helical anchors, the ultimate capacity can be determined by the following empirical relationship:

$$QULT = Kt * T$$

where  $Kt$  is the empirical factor (= 10 ft<sup>-1</sup> for square shaft anchors); and  $T$  is the installation torque.

The allowable capacity of the Chance helical anchor may also be developed when sufficient torque is recorded during installation. For example, based on the empirical correlation developed by the A. B. Chance Company, an installation torque of 4,000 ft-lbs roughly correlates to an ultimate capacity of 20 tons. Thus, the allowable capacity for the installed anchor with a factor of safety of 2 with respect to its ultimate capacity is approximately 10 tons.

Based on the soil conditions encountered in the borings, we anticipate that the anchors may need to extend a minimum distance of about 15 feet into the underlying soils below the residence in order to attain acceptable load capacity. The allowable capacity of 5 tons for the anchors is based on a factor of safety of 2.0 with respect to the ultimate tensile capacities, developed behind a 15 feet long no-load zone for the anchors.

The performance of helical anchors is dependent on the method and to what bearing stratum the anchors are installed. Since a completed anchor in the ground cannot be observed, it is critical that judgment and experience be used as a basis for determining the acceptability of an anchor. Therefore, we recommend that GEO Group Northwest, Inc., be retained to monitor the anchor installation operations, collect and interpret installation data, and verify acceptable loading capacity for the anchor has been attained.

#### **5.4 Building Floors**

We recommend that building floors be structurally supported and connected to the foundation system.

#### **5.5 Conventional Concrete Basement and Retaining Walls**

GEO Group Northwest, Inc., anticipates that the proposed residence may have a daylight basement level, based on the preliminary plans we have seen for the proposed residence. Therefore, our recommendations regarding conventional concrete basement and retaining walls are provided below for your information. The following recommendations apply to walls that retain fully drained soils. If basement or retaining walls will be retaining saturated soils, then we should be consulted to provide applicable design parameters.

Conventional concrete retaining walls that are free to rotate on top should be designed for an active soil pressure. Permanent retaining walls that are restrained horizontally at the top (such as basement walls) are considered unyielding and should be designed for a lateral soil pressure under the at-rest condition. The walls should be supported on dense, native soils or structural fill. Soil parameters for the wall design are as follows:

Active Earth Pressure

35 pcf, equivalent fluid pressure, for level ground behind the wall;

50 pcf, equivalent fluid pressure, for 2H:1V backslope behind the wall

At-Rest Earth Pressure

45 pcf, equivalent fluid pressure, for level ground behind the wall;

60 pcf, equivalent fluid pressure, for 2H:1V backslope behind the wall

Passive Earth Pressure

350 pcf, equivalent fluid pressure, for medium dense to dense soil and structural fill.

Base Friction

0.35 for undisturbed, dense soil or structural fill.

Surcharge loads imposed on walls by traffic (including construction vehicles), nearby structures, or other conditions, should be added to the active and at-rest earth pressures stated above. Also, downward sloping ground in front of walls should be considered with regard to potentially reducing the value of the allowable passive earth pressure stated above.

To prevent the buildup of hydrostatic pressure behind permanent basement or conventional retaining walls, we recommend that a vertical drain mat, Miradrain 6000 or equivalent, be used to facilitate drainage behind the wall. The drain mat core is placed against the wall with the filter fabric side facing the backfill. The drain mat should extend from the finished surface grade, down to the footing drain. In addition to the vertical drain mat, a prism of clean, granular, free draining structural backfill material at least 18 inches wide should be placed against the wall. The free-draining backfill should extend downward to the footing drain.

The top 12 inches of the fill behind the wall should consist of compacted and relatively impermeable soil. This cap material can be separated from the underlying more granular drainage material by a geotextile fabric, if desired. Alternatively, the surface can be sealed with asphalt or concrete paving. The surface should be sloped to drain away from the building wall. A schematic illustration of the wall and drainage system is presented in Plate 6 - Basement and Retaining Wall Backfill and Drainage.

The backfill in areas adjacent to concrete retaining walls should be compacted with hand held equipment or a hoe-pack. Heavy compacting machines (such as a vibratory roller) should not be allowed within a horizontal distance to the wall equivalent to one half the wall height, unless the walls are designed with the added surcharge.

### **5.6 Drainage**

The finished ground at the site should be graded such that surface water is directed off the site. Water should not be allowed to stand in any area where footings, slabs or pavements are to be constructed. During construction, loose surfaces should be sealed at night by compacting the surface to reduce the potential for moisture infiltration into the soils. Final site grades should allow drainage away from the building. We suggest that the ground be sloped at a gradient of three percent for a distance of at least ten feet away from the building except in areas that are to be paved.

### **5.7 Pavement Subgrade**

We recommend that the driveway for the new residence be supported on a thickened base of compacted ballast rock (at least 24" thick) that is underlain and overlain with a layer of woven geotextile fabric, such as Mirafi 500X or equivalent. The pavement section can then be constructed over the upper layer of geotextile. The pavement section can consist of at least 6 inches of base course overlain with at least 2 inches of asphalt.

## **6.0 GEOLOGIC HAZARD AREA STATEMENT OF RISK**

Based on the results from our geotechnical investigation of the project site and our review of the current plans for the proposed residence, it is our opinion that the geologic hazard area will be modified, or the development has been designed, so that the risk to the lot and adjacent property is eliminated or mitigated such that the site is determined to be safe, provided that the recommendations in this report are properly implemented.

## **7.0 LIMITATIONS**

This report has been prepared for the specific application to the proposed development of the site described herein, and for the exclusive use of Mr. William C. Summers of MI Treehouse, LLC, and his authorized representatives or agents. We recommend that this report be included in its entirety in the project contract documents for reference during construction.

Our findings and recommendations stated herein are based on field observations, our experience and judgment. The recommendations are our professional opinion derived in a manner consistent with the level of care and skill ordinarily exercised by other members of the profession currently practicing under similar conditions in this area and within the budget constraint. No warranty is expressed or implied. In the event the soil condition vary during site work, GEO Group Northwest, Inc. should be notified and the above recommendation should be re-evaluated.

## **8.0 ADDITIONAL SERVICES**

We recommend that GEO Group Northwest Inc. be retained to perform a general review of the final design and specifications of the proposed development to verify that the earthwork, foundation, drainage, pavement, and other geotechnical recommendations are properly interpreted and incorporated into the design and construction documents and are appropriate for the finalized layout of the proposed development.

We also recommend that GEO Group Northwest Inc. be retained to provide monitoring and testing services for geotechnically-related work during construction. A GEO Group Northwest, Inc., representative should observe geotechnically-related construction work for compliance with the geotechnical recommendations in this report, and should be available to discuss and recommend design changes, if needed, in the event substance conditions differ from those anticipated prior to the start of construction.

March 13, 2015

G-3837

Mr. William C. Summers - MI Treehouse, LLC

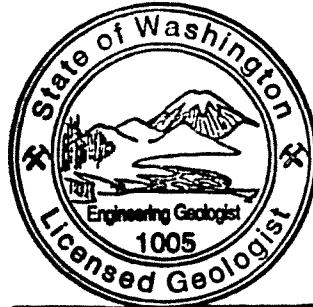
Page 17

Respectfully Submitted,

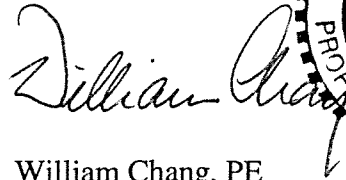
GEO Group Northwest, Inc.



Keith Johnson  
Project Geologist



**KEITH A. JOHNSON**



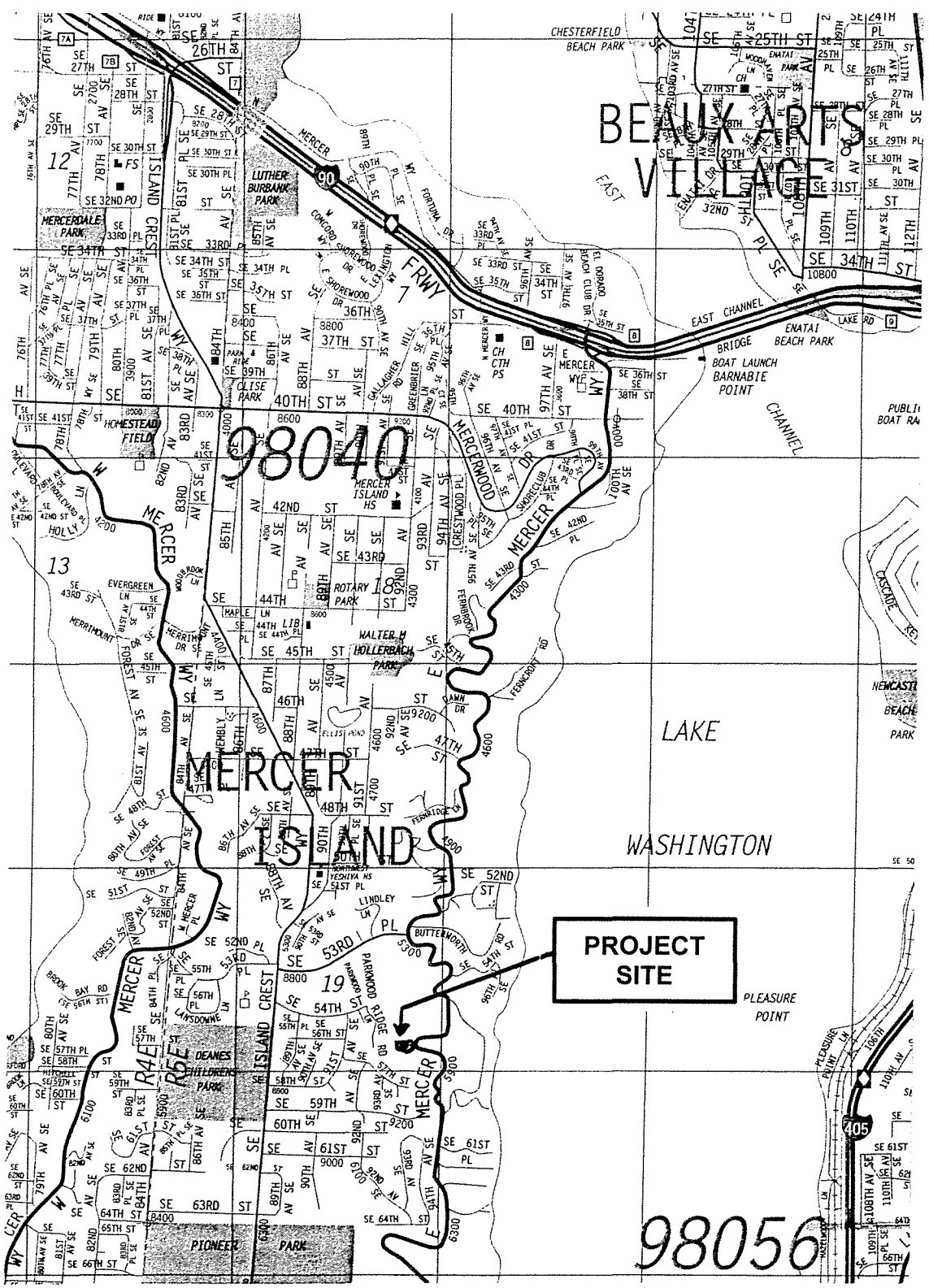
William Chang, PE  
Principal





**PLATES**

**G-3837**



Source: Thomas Guide, 2007.



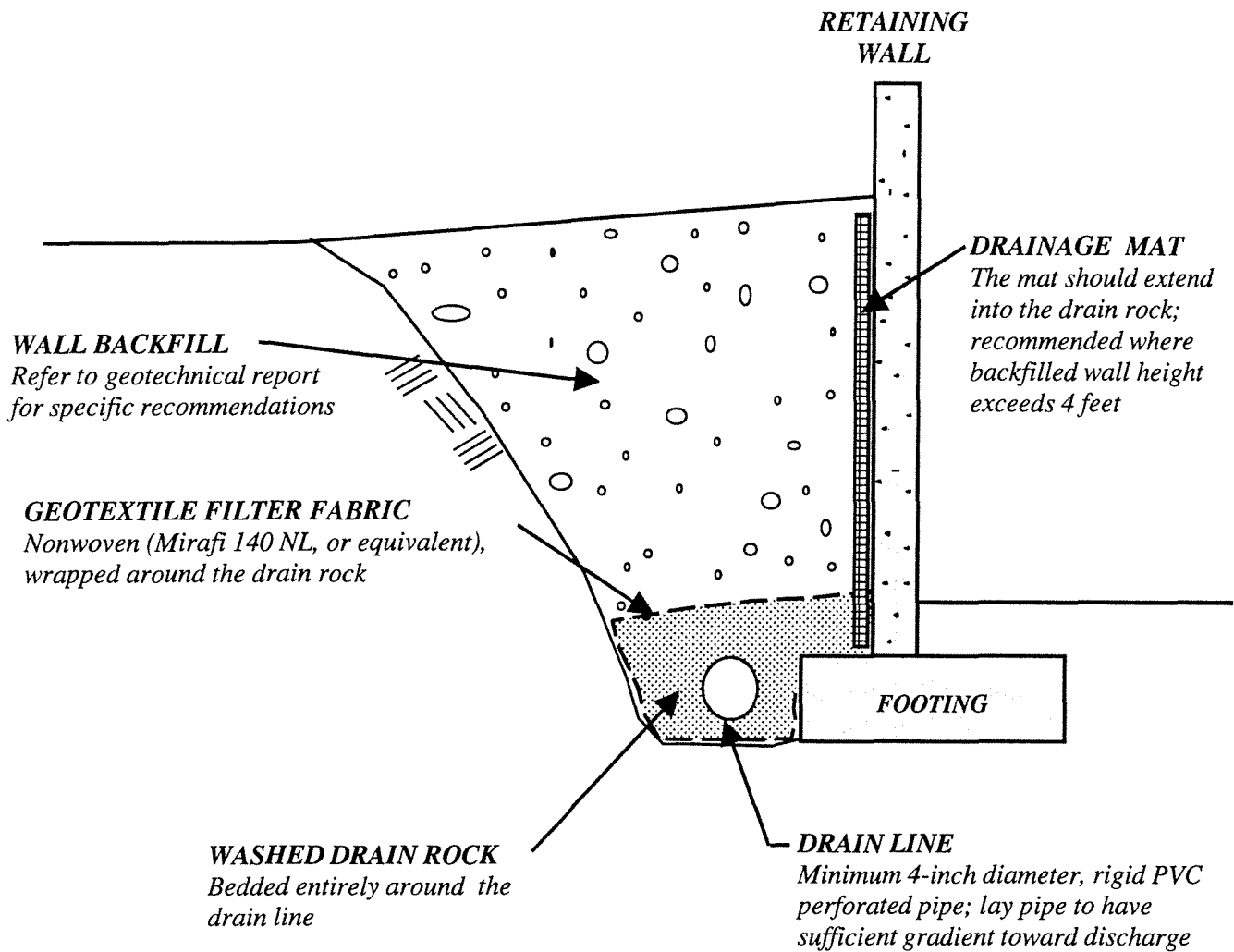
**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, & Environmental Scientists

**SITE LOCATION MAP**

PROPOSED RESIDENCE  
 5637 E. MERCER WAY  
 MERCER ISLAND, WASHINGTON

SCALE: 1" = 2,000'	DATE: 3/11/2015	MADE: KJ	CHKD: WC	JOB NO: G-3837	PLATE 1
--------------------	-----------------	----------	----------	----------------	---------



## NOT TO SCALE

### NOTES:

- 1.) Do not replace rigid PVC pipe with flexible corrugated plastic pipe.
- 2.) Perforated PVC pipe should be tight jointed and laid with perforations oriented downward. The pipe should be gently sloped to provide flow toward the tightline or discharge location.
- 3.) Do not connect other drain lines into the footing drain system.
- 4.) Backfill should meet structural fill specifications if it will support driveways, sidewalks, patios, or other structures. Refer to the geotechnical engineering report for structural fill recommendations.



**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, &  
Environmental Scientists

**TYPICAL BASEMENT AND RETAINING  
WALL BACKFILL AND DRAINAGE  
PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON**

SCALE NONE

DATE 3/11/2015

MADE KJ

CHKD WC

JOB NO. G-3837

PLATE 6

**ATTACHMENT A**

**G-3837**

**BORING LOGS**

# SOIL CLASSIFICATION & PENETRATION TEST DATA EXPLANATION

UNIFIED SOIL CLASSIFICATION SYSTEM (USCS)							
MAJOR DIVISION			GROUP SYMBOL	TYPICAL DESCRIPTION	LABORATORY CLASSIFICATION CRITERIA		
<b>COARSE-GRAINED SOILS</b>  More Than Half by Weight Larger Than No. 200 Sieve	<b>GRAVELS</b> (More Than Half Coarse Fraction is Larger Than No. 4 Sieve)	<b>CLEAN GRAVELS</b> (little or no fines)	<b>GW</b>	WELL GRADED GRAVELS, GRAVEL-SAND MIXTURE, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	$C_u = (D_{60} / D_{10})$ greater than 4 $C_c = (D_{30})^2 / (D_{10} * D_{60})$ between 1 and 3	
		<b>DIRTY GRAVELS</b> (with some fines)	<b>GP</b>	POORLY GRADED GRAVELS, AND GRAVEL-SAND MIXTURES LITTLE OR NO FINES		CLEAN GRAVELS NOT MEETING ABOVE REQUIREMENTS	
		<b>SANDS</b> (More Than Half Coarse Fraction is Smaller Than No. 4 Sieve)	<b>CLEAN SANDS</b> (little or no fines)	<b>SW</b>	WELL GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES	CONTENT OF FINES BELOW 5%	$C_u = (D_{60} / D_{10})$ greater than 6 $C_c = (D_{30})^2 / (D_{10} * D_{60})$ between 1 and 3
			<b>DIRTY SANDS</b> (with some fines)	<b>SP</b>	POORLY GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES		CLEAN SANDS NOT MEETING ABOVE REQUIREMENTS
	<b>DIRTY SANDS</b> (with some fines)		<b>SM</b>	SILTY SANDS, SAND-SILT MIXTURES	CONTENT OF FINES EXCEEDS 12%	ATTERBERG LIMITS BELOW "A" LINE with P.I. LESS THAN 4	
			<b>SC</b>	CLAYEY SANDS, SAND-CLAY MIXTURES		ATTERBERG LIMITS ABOVE "A" LINE with P.I. MORE THAN 7	
	<b>FINE-GRAINED SOILS</b>  Less Than Half by Weight Larger Than No. 200 Sieve	<b>SILTS</b> (Below A-Line on Plasticity Chart, Negligible Organics)	Liquid Limit < 50%	<b>ML</b>	INORGANIC SILTS, ROCK FLOUR, SANDY SILTS OF SLIGHT PLASTICITY		
			Liquid Limit > 50%	<b>MH</b>	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS, FINE SANDY OR SILTY SOIL		
<b>CLAYS</b> (Above A-Line on Plasticity Chart, Negligible Organics)		Liquid Limit < 50%	<b>CL</b>	INORGANIC CLAYS OF LOW PLASTICITY, GRAVELLY, SANDY, OR SILTY CLAYS, CLEAN CLAYS			
		Liquid Limit > 50%	<b>CH</b>	INORGANIC CLAYS OF HIGH PLASTICITY, FAT CLAYS			
<b>ORGANIC SILTS &amp; CLAYS</b> (Below A-Line on Plasticity Chart)		Liquid Limit < 50%	<b>OL</b>	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY			
		Liquid Limit > 50%	<b>OH</b>	ORGANIC CLAYS OF HIGH PLASTICITY			
HIGHLY ORGANIC SOILS			<b>Pt</b>	PEAT AND OTHER HIGHLY ORGANIC SOILS			

SOIL PARTICLE SIZE				
FRACTION	U.S. STANDARD SIEVE			
	Passing		Retained	
	Sieve	Size (mm)	Sieve	Size (mm)
SILT / CLAY	#200	0.075		
<b>SAND</b>				
FINE	#40	0.425	#200	0.075
MEDIUM	#10	2.00	#40	0.425
COARSE	#4	4.75	#10	2.00
<b>GRAVEL</b>				
FINE	0.75*	19	#4	4.75
COARSE	3*	76	0.75*	19
COBBLES	76 mm to 203 mm			
BOULDERS	> 203 mm			
ROCK FRAGMENTS	> 76 mm			
ROCK	> 0.76 cubic meter in volume			

GENERAL GUIDANCE FOR ENGINEERING PROPERTIES OF SOILS, BASED ON STANDARD PENETRATION TEST (SPT) DATA							
SANDY SOILS				SILTY & CLAYEY SOILS			
Blow Counts N	Relative Density, %	Friction Angle $\phi$ , degrees	Description	Blow Counts N	Unconfined Strength $q_u$ , tsf	Description	
0 - 4	0 - 15		Very Loose	< 2	< 0.25	Very soft	
4 - 10	15 - 35	26 - 30	Loose	2 - 4	0.25 - 0.50	Soft	
10 - 30	35 - 65	28 - 35	Medium Dense	4 - 8	0.50 - 1.00	Medium Stiff	
30 - 50	65 - 85	35 - 42	Dense	8 - 15	1.00 - 2.00	Stiff	
> 50	85 - 100	38 - 46	Very Dense	15 - 30	2.00 - 4.00	Very Stiff	
				> 30	> 4.00	Hard	



Group Northwest, Inc.

Geotechnical Engineers, Geologists, & Environmental Scientists

13240 NE 20th Street, Suite 10  
 Phone (425) 649-8757

Bellevue, WA 98005  
 Fax (425) 649-8758

# BORING NO. B-1

Logged By: KJ

Date Drilled: 8/10/1999

Surface Elev. 187 feet +/-

Depth ft.	USCS Code	Description	Sample		Blow Count per 6-inches	Water Content %	Other Tests & Comments
			Type	No.			
5	OL	Organic topsoil, very soft, wet, black.	I	S1	1,1,1 (N=2)	44.4	
	SM	SILTY SAND, very loose, wet, fine grained sand, 20-25% fines, trace black organics, occasional gray lenses, brown.	II	S2	1/12",1 (N=1)	27.0	
	SP-SM	SAND, loose, wet, 10% fines, fine grained, mottled gray and brown.	III	S3	1,2,3 (N=5)	28.0	
	SP-SM	As above, medium dense, 5-10% fines.	III	S4	5,6,6 (N=12)	29.2	
	SP-SM	As above, 2.5 feet of sand heave into hole.	III	S5	5,6,9 (N=15)	27.9	
15	SM	SILTY SAND, medium dense to dense, moist to wet, 20% fines, very fine to fine grained sand, brownish gray.	III	S6	9,15, 16,28 (N=31*)	25.8	
20	Bottom of boring: 17 feet. Drilling Method: Hollow-stem auger 0 to 17 feet. Sampling Method: 2-inch-O.D. standard penetration sampler driven using a 140 lb. hammer with a 30-inch drop.  Groundwater encountered near ground surface during drilling. Boring backfilled with bentonite chips.						
25							
30							
35							
40							

**LEGEND:** I 2" O.D. Split-Spoon Sampler  
 II 3" O.D. Shelby-Tube Sampler  
 III 3" O.D. California Sampler

GROUNDWATER  
 OBSERVATION WELL: seal  
 measured water level  
 well tip (screen)



**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, &  
 Environmental Scientists

## BORING LOG

PROPOSED RESIDENCE  
 5637 E. MERCER WAY  
 MERCER ISLAND, WASHINGTON

JOB NO. G-3837      DATE 3/11/2015      PLATE A2

# BORING NO. B-2

Logged By: KJ

Date Drilled: 8/10/1999

Surface Elev. 176 feet +/-

Depth ft.	USCS Code	Description	Sample		Blow Count per 6-inches	Water Content %	Other Tests & Comments
			Type	No.			
5	OL	Very soft, moist, black, organic topsoil and red decomposed wood, poor sample recovery.	I		1/18" (N=0)		Poor recovery.
	SP-SM	SAND, loose, wet, fine to medium grained, 10-15% fines, rust-colored oxide staining, some black organics, brown.	I	S1	1,2,2 (N=4)	34.6	
	SP-SM	As above, loose.	I	S2	4,3,5 (N=8)	23.6	
	SP-SM	As above, medium dense, trace coarse sand.	I	S3	4,7,9 (N=16)	21.4	
10	SP	As above, loose, 5% fines, fine grained, grayish brown.	I	S4	4,4,4 (N=8)	27.4	
15	SM	SILTY SAND, loose, wet, fine to medium grained sand, 20-25% fines, trace small wood chips, rare coarse sand, trace reddish oxide staining, dark gray.	I	S5	3,2,3 (N=5)	23.8	
20	ML	SILT, stiff, damp to moist, trace fine sand, contains wet sand lenses, dark gray.	I	S6	5,11,12 (N=23)	30.6	
25	ML	As above, occasionally laminated (some brown laminae and organics, some wet sand lenses.	I	S7	5,9,10 (N=19)	28.1	
30	Bottom of boring: 27 feet. Drilling Method: Hollow-stem auger 0 to 27 feet. Sampling Method: 2-inch-O.D. standard penetration sampler driven using a 140 lb. hammer with a 30-inch drop.  Groundwater encountered near ground surface during drilling. Boring backfilled with bentonite chips.						
35							
40							

**LEGEND:** 2" O.D. Split-Spoon Sampler  
 3" O.D. Shelby-Tube Sampler  
 3" O.D. California Sampler

GROUNDWATER  
OBSERVATION WELL: seal  
 measured water level  
 well tip (screen)



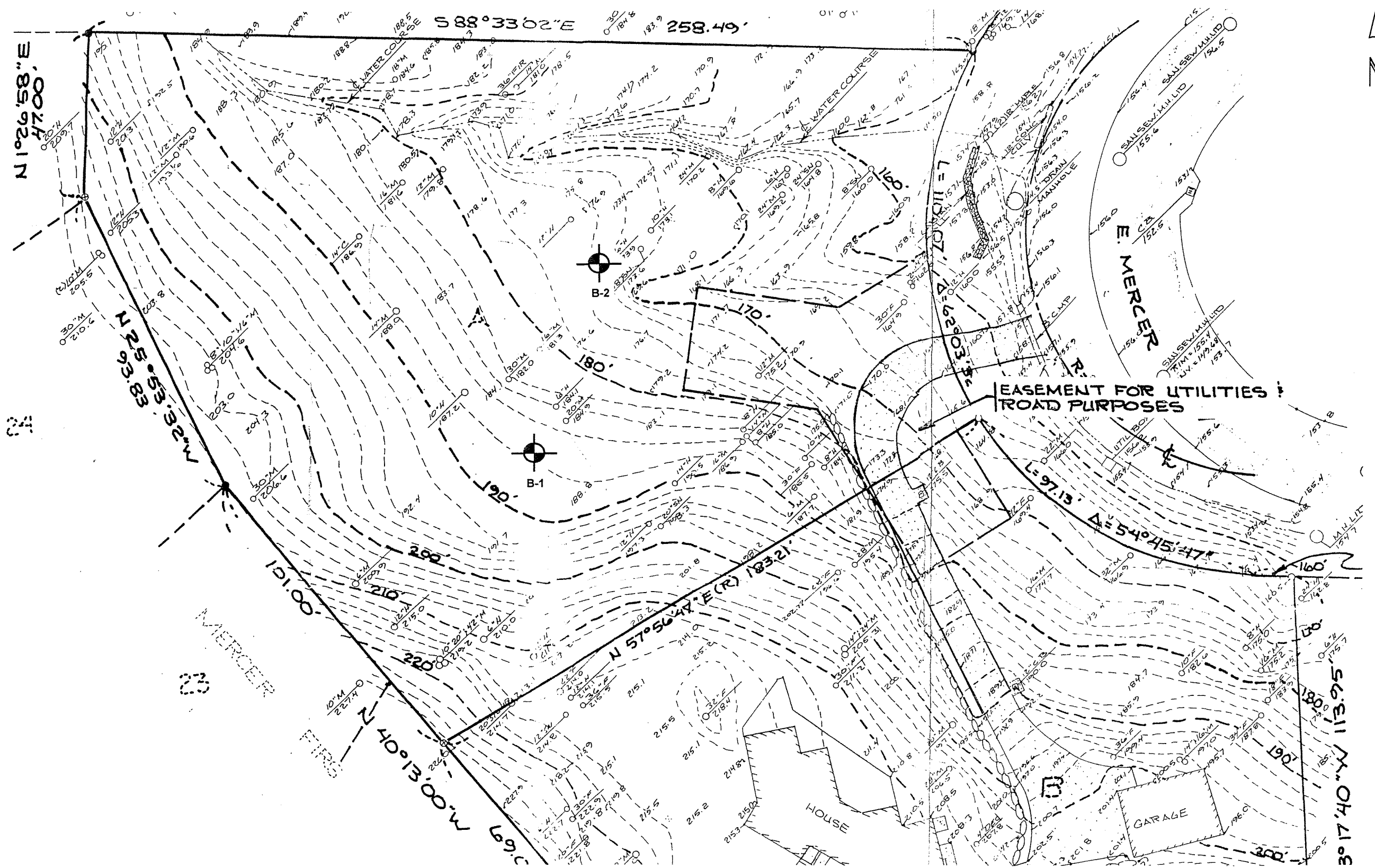
**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, &  
Environmental Scientists

## BORING LOG

PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON

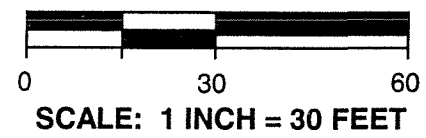
JOB NO. <u>G-3837</u>	DATE <u>3/11/2015</u>	PLATE <u>A3</u>
-----------------------	-----------------------	-----------------



**LEGEND**



EXPLORATORY SOIL BORING DRILLED BY GEO GROUP  
NORTHWEST (APPROXIMATE LOCATION)



**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, &  
Environmental Scientists

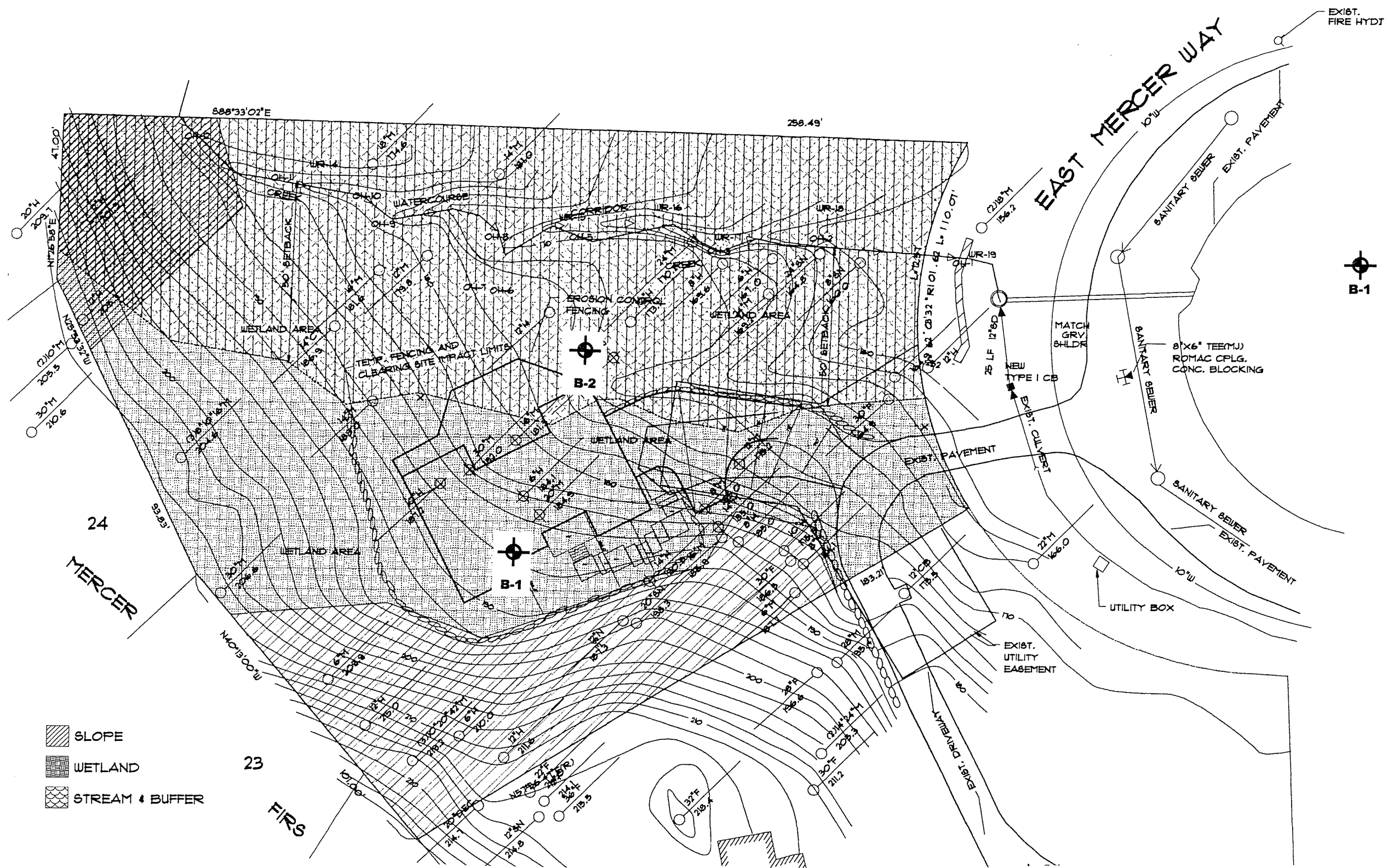
**SITE PLAN**

PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON


Source: Survey of a Portion of Lots A & B, Greg Newitt Short Plat (M.I.S.P. No. 77-1-010), by  
M.W. Marshall, Professional Land Surveyor, dated 1/16/98.

SCALE	1" = 30'	DRAWN BY	KJ	CHECKED BY	WC	DATE	3/10/2015	PROJECT NO.	G-3837	PLATE	2
-------	----------	----------	----	------------	----	------	-----------	-------------	--------	-------	---





**LEGEND**

 EXPLORATORY SOIL BORING (APPROXIMATE LOCATION)

**B-1**

 SLOPE

 WETLAND

 STREAM & BUFFER



**GEO Group Northwest, Inc.**

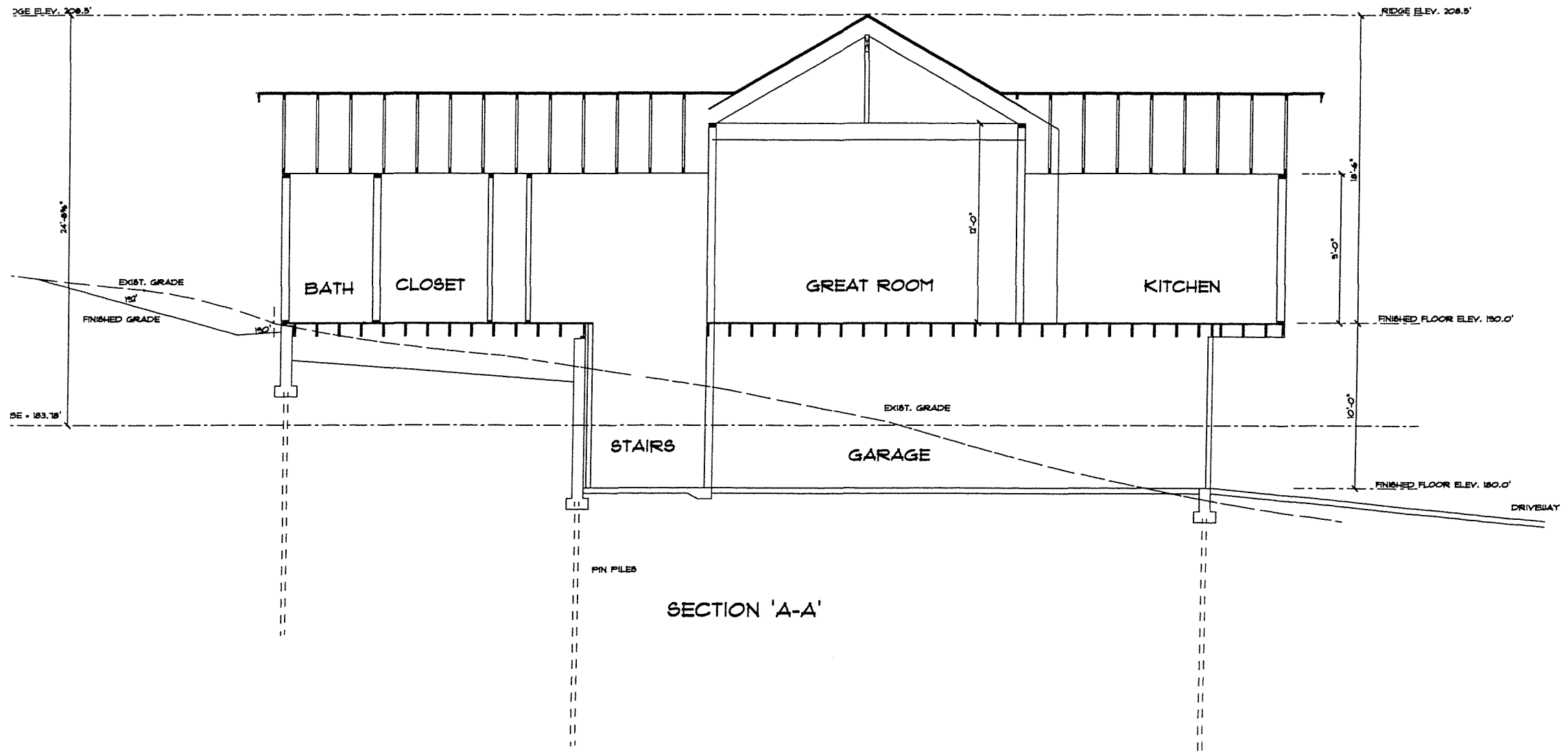
Geotechnical Engineers, Geologists, & Environmental Scientists

**PROPOSED DEVELOPMENT PLAN**


PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON

Source: Master Site Plan by Healy-Jorgensen Architects, dated 3/2/15.

SCALE 1" = 30'	DRAWN BY KJ	CHECKED BY WC	DATE 3/10/2015	PROJECT NO. G-3837	PLATE 3
----------------	-------------	---------------	----------------	--------------------	---------

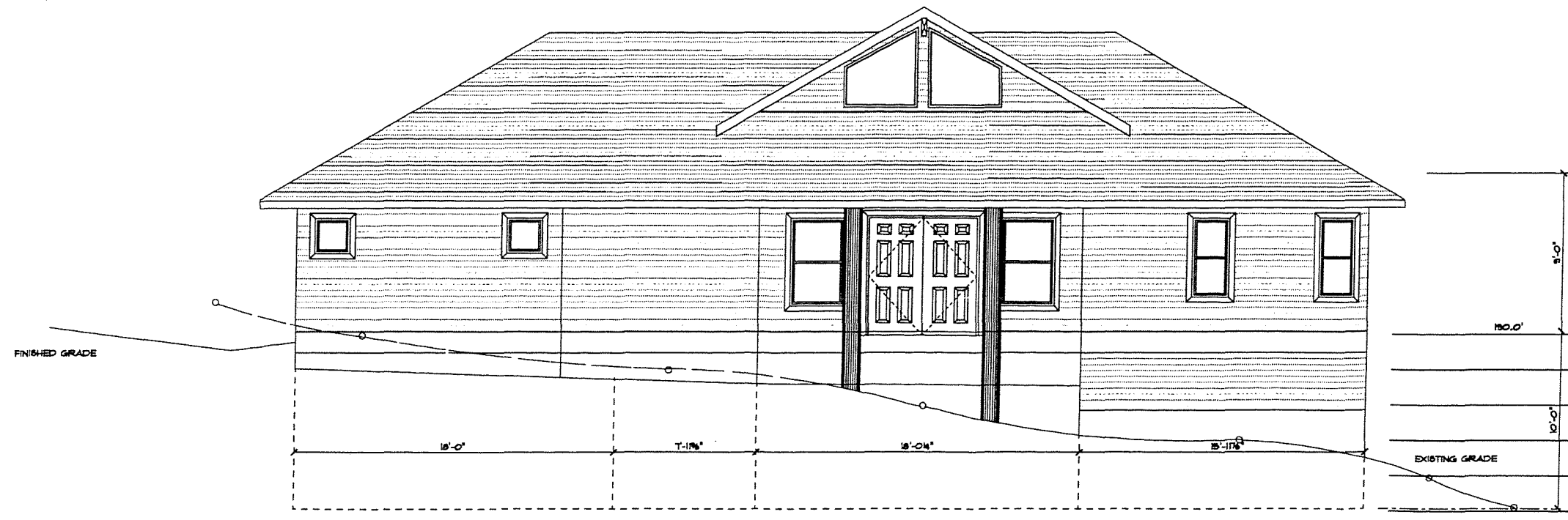


Source: Section A - A' by Healy-Jorgensen Architects, dated 10/1/14.

 <b>GEO Group Northwest, Inc.</b> Geotechnical Engineers, Geologists, & Environmental Scientists		<b>PROPOSED RESIDENCE SECTION</b>									
		PROPOSED RESIDENCE 5637 E. MERCER WAY MERCER ISLAND, WASHINGTON									
<b>SCALE</b>	1" = 8'	<b>DRAWN BY</b>	KJ	<b>CHECKED BY</b>	WC	<b>DATE</b>	3/10/2015	<b>PROJECT NO.</b>	G-3837	<b>PLATE</b>	4



NORTH ELEVATION



SOUTH ELEVATION



**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, & Environmental Scientists

**NORTH & SOUTH ELEVATIONS**

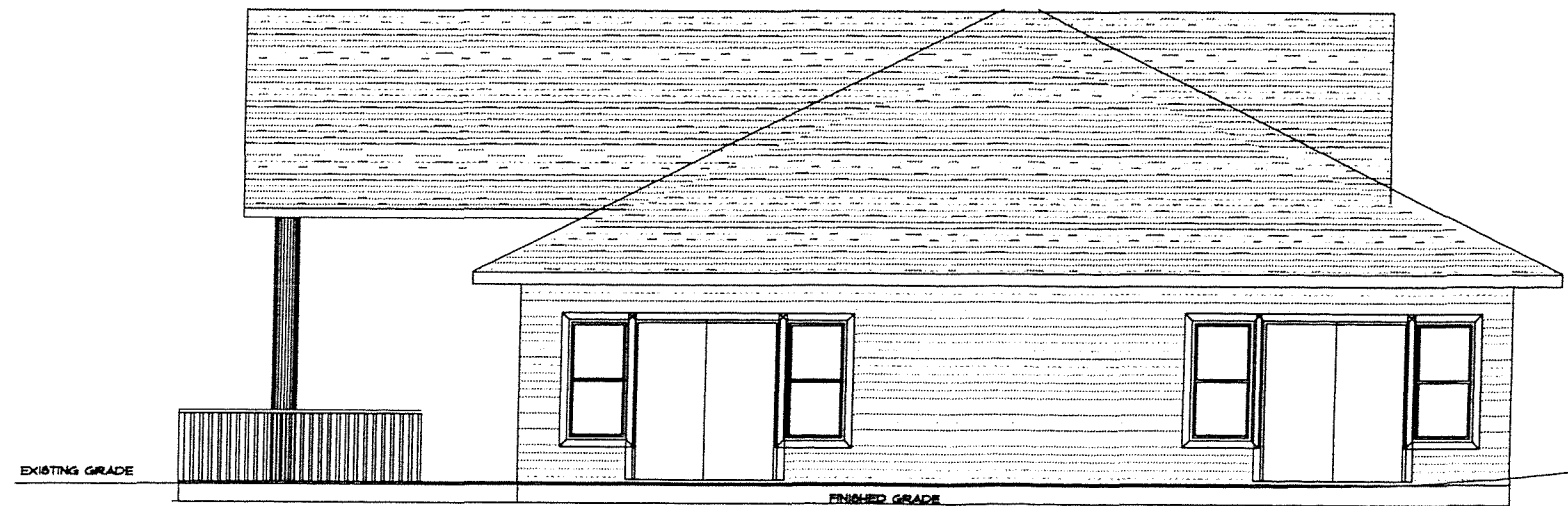
PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON

Source: North - South Elevations, by Healy-Jorgensen Architects, dated 10/1/14.

SCALE	1" = 8'	DRAWN BY	KJ	CHECKED BY	WC	DATE	3/10/2015	PROJECT NO.	G-3837	PLATE	5A
-------	---------	----------	----	------------	----	------	-----------	-------------	--------	-------	----



EAST ELEVATION



WEST ELEVATION

Source: East - West Elevations, by Healy-Jorgensen Architects, dated 10/1/14.



**Group Northwest, Inc.**

Geotechnical Engineers, Geologists, &  
Environmental Scientists

**EAST & WEST ELEVATIONS**

PROPOSED RESIDENCE  
5637 E. MERCER WAY  
MERCER ISLAND, WASHINGTON

SCALE	1" = 8'	DRAWN BY	KJ	CHECKED BY	WC	DATE	3/10/2015	PROJECT NO.	G-3837	PLATE	5B
-------	---------	----------	----	------------	----	------	-----------	-------------	--------	-------	----



**CITY OF MERCER ISLAND, DEVELOPMENT SERVICES GROUP**  
9611 S.E. 36 ST., MERCER ISLAND, WA 98040  
(206) 275-7605 FAX: (206) 275-7726  
WWW.MERCERGOV.ORG

## **ENVIRONMENTAL CHECKLIST - REVISED**

(WAC 197-11-960)

Date Received \_\_\_\_\_  
File No. \_\_\_\_\_  
Fee \_\_\_\_\_  
See Development Application for fees

### **Purpose of Checklist:**

The State Environmental Policy Act (SEPA), chapter 43.21C RCW, requires all governmental agencies to consider the environmental impacts of a proposal before making decisions. An environmental impact statement (EIS) must be prepared for all proposals with probable significant adverse impacts on the quality of the environment. The purpose of this checklist is to provide information to help you and the agency identify impacts from your proposal (and to avoid impacts from the proposal, if it can be done) and to help the agency decide whether an EIS is required.

### **Instructions for Applicants:**

This environmental checklist asks you to describe some basic information about your proposal. Governmental agencies use this checklist to determine whether the environmental impacts of your proposal are significant, requiring preparation of an EIS. Answer the questions briefly, with the most precise information known, or give the best description you can.

You must answer each question accurately and carefully, to the best of your knowledge. In most cases, you should be able to answer the questions from your own observations or project plans without the need to hire experts. If you really do not know the answer, or if a question does not apply to your proposal, write "do not know" or "does not apply." Complete answers to the questions now may avoid unnecessary delays later.

Some questions ask about governmental regulations, such as zoning, shoreline, and landmark designations. Answer these questions if you can. If you have problems, the governmental agencies can assist you.

The checklist questions apply to all parts of your proposal, even if you plan to do them over a period of time or on different parcels of land. Attach any additional information that will help describe your proposal or its environmental effects. The agency to which you submit this checklist may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impact.

### **Use of checklist for nonproject proposals:**

Complete this checklist for nonproject proposals, even though questions may be answered "does not apply." IN ADDITION, complete the SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS (part D).

For nonproject actions, the references in the checklist to the words "project", "applicant," and "property or site" should be read as "proposal," "proposer", and "affected geographic area," respectively.

### **A. BACKGROUND**

1. Name of proposed project, if applicable:

Single family residence.

2. Name of applicant: MI Treehouse, LLC

3. Address and phone number of applicant and contact person:

Bill Summers  
P.O. Box 261  
Medina, WA 98039  
(425) 454-3775

RECEIVED  
MAR 16 2015  
CITY OF MERCER ISLAND  
DEVELOPMENT SERVICES

- 4. Date checklist prepared: January 7, 2015.
- 5. Agency requesting checklist:  
City of Mercer Island.
- 6. Proposed timing or schedule (including phasing, if applicable):  
Construction: Spring 2015.
- 7. Do you have any plans for future additions, expansions, or further activity related to or connected with this proposal? If yes, explain.  
No.
- 8. List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.  
Revised Critical Areas Report prepared by Sewall Wetland Consultants, Inc. dated March 5, 2015, and a Geotechnical Engineering Study prepared by GEO Group Northwest dated March 13, 2015, a copy of which has been submitted.
- 9. Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain.  
None.
- 10. List any government approvals or permits that will be needed for your proposal, if known.  
Clearing & grading and construction permits.
- 11. Give brief, complete description of your proposal, including the proposed uses and the size of the project and site. There are several questions later in this checklist that ask you to describe certain aspects of your proposal. You do not need to repeat those answers on this page. (Lead agencies may modify this form to include additional specific information on project description.)  
Construction of a one-story single family residence, consisting of approximately 2,200 square feet, partially built over a two-car garage.
- 12. Location of the proposal. Give sufficient information for a person to understand the precise location of your proposed project, including a street address, if any, and section, township, and range, if known. If a proposal would occur over a range of area, provide the range or boundaries of the site(s). Provide a legal description, site plan, vicinity map, and topographic map, if reasonably available. While you should submit any plans required by the agency, you are not required to duplicate maps or detailed plans submitted with any permit applications related to this checklist.  
5637 East Mercer Way, legally described as: Lot A of City of Mercer Island Short Plat No. MI-77-1-010, as recorded on March 31, 1977, under Recording No. 7703310851.

*State & Federal  
permits  
may be  
required*

**B. ENVIRONMENTAL ELEMENTS****1. Earth**

a. General description of the site (check one): Flat, rolling, hilly, steep slopes, mountainous, other...

b. What is the steepest slope on the site (approximate percent slope)?  
66%.

c. What general types of soils are found on the site (for example, clay, sand, gravel, peat, muck)? If you know the classification of agricultural soils, specify them and note any prime farmland.

Kitsap silt loam & gravelly loam.

d. Are there surface indications or history of unstable soils in the immediate vicinity?  
If so, describe.

No.

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.  
Approximately 400 cubic yards of fill anticipated for the driveway construction.

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.  
No, except to a limited extent normally related to construction.

g. About what percent of the site will be covered with impervious surfaces after project construction (for example, asphalt or buildings)?

Approximately 15%.

h. Proposed measures to reduce or control erosion, or other impacts to the earth, if any:

Temporary erosion control measures normally related to construction of a single family residence. Replanting of all exposed soil.

**2. Air**

a. What types of emissions to the air would result from the proposal (i.e., dust, automobile, odors, industrial wood smoke) during construction and when the project is completed? If any, generally describe and give approximate quantities if known.

Small amount of emissions typically associated with single family construction.

b. Are there any off-site sources of emissions or odor that may affect your proposal? If so, generally describe.

No.

c. Proposed measures to reduce or control emissions or other impacts to air, if any:

None required.

**3. Water**

a. Surface:

1) Is there any surface water body on or in the immediate vicinity of the site (including year-round and seasonal streams, saltwater, lakes, ponds, wetlands)? If yes, describe type and provide names. If appropriate, state what stream or river it flows into.

A perennial flowing non-fish bearing stream, categorized as a type 2 watercourse and category 3 wetland.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR  
AGENCY USE ONLY

- 2) Will the project require any work over, in, or adjacent to (within 200 feet) the described waters? If yes, please describe and attach available plans.

Yes, see attached Plans and Wetland Report.

- 3) Estimate the amount of fill and dredge material that would be placed in or removed from surface water or wetlands and indicate the area of the site that would be affected. Indicate the source of fill material.

Approximately 300 cubic yards of material would be removed from the wetland and 400 filled, both related to the construction of the driveway & house.

- 4) Will the proposal require surface water withdrawals or diversions? Give general description, purpose, and approximate quantities if known.

No.

- 5) Does the proposal lie within a 100-year floodplain? If so, note location on the site plan.

No.

- 6) Does the proposal involve any discharges of waste materials to surface waters? If so, describe the type of waste and anticipated volume of discharge.

No.

b. Ground:

- 1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description, purpose, and approximate quantities if known.

No.

- 2) Describe waste material that will be discharged into the ground from septic tanks or other sources, if any (for example: Domestic sewage; industrial, [containing the following chemicals...]; agricultural; etc.). Describe the general size of the system, the number of such systems, the number of houses to be served (if applicable), or the number of animals or humans the system(s) are expected to serve.

None.

c. Water runoff (including stormwater):

- 1) Describe the source of runoff (including stormwater) and method of collection and disposal, if any (include quantities, if known). Where will this water flow? Will this water flow into other waters? If so, describe.

Roofs and driveway runoff collected and stored in a detention vault with discharge material to flow into existing watercourse. Runoff from existing slope will be disturbed to a minimal extent.

- 2) Could waste materials enter ground or surface waters? If so, generally describe.

No.

- d. Proposed measures to reduce or control surface, ground, and runoff water impacts, if any:

See response to c,1 above.



TO BE COMPLETED BY APPLICANT

EVALUATION FOR  
AGENCY USE ONLY

4. Plants

- ✓ a. Check or circle types of vegetation found on the site:

<input checked="" type="checkbox"/>	deciduous tree: alder, maple, aspen, other
<input checked="" type="checkbox"/>	evergreen tree: fir, cedar, pine, other
<input checked="" type="checkbox"/>	shrubs
<input type="checkbox"/>	grass
<input type="checkbox"/>	pasture
<input type="checkbox"/>	crop or grain
<input checked="" type="checkbox"/>	wet soil plants: cattail, buttercup, buirush, skunk cabbage, other
<input type="checkbox"/>	water plants: water lily, eelgrass, milfoil, other
<input type="checkbox"/>	other types of vegetation

- ✓ b. What kind and amount of vegetation will be removed or altered?

Clearing of a small amount of native vegetation which will be replaced and augmented in accordance with the Wetland Report.

- ✓ c. List threatened or endangered species known to be on or near the site.

None.

- ✓ d. Proposed landscaping, use of native plants, or other measures to preserve or enhance vegetation on the site, if any:

Native material will be replaced and augmented, supplemented by a small amount of new landscaping per wetland report.

5. Animals

- ✓ a. State any birds and animals which have been observed on or near the site or are known to be on or near the site:

Birds: hawk, heron, eagle, songbirds, other:                      None.  
Mammals: deer, bear, elk, beaver, other:  
Fish: bass, salmon, trout, herring, shellfish, other:

- ✓ b. List any threatened or endangered species known to be on or near the site.

None.

- ✓ c. Is the site part of a migration route? (If so, explain.)

No.

- ✓ d. Proposed measure to preserve or enhance wildlife, if any:

None.

6. Energy and natural resources

- ✓ a. What kinds of energy (electric, natural gas, oil, wood stove, solar) will be used to meet the completed project's energy needs? Describe whether it will be used for heating, manufacturing, etc.

Electric, natural gas and, to the extent feasible, solar.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR  
AGENCY USE ONLY

- ✓ b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.  
No.

- ✓ c. What kinds of energy conservation features are included in the plans of this proposal? List other proposed measures to reduce or control energy impacts, if any:  
None, except as required by applicable codes.

7. Environmental health

- ✓ a. Are there any environmental health hazards, including exposure to toxic chemicals, risk of fire and explosion, spill, or hazardous waste that could occur as a result of this proposal? If so, describe.  
No.

- ✓ 1) Describe special emergency services that might be required.  
N/A.

- ✓ 2) Proposed measures to reduce or control environmental health hazards, if any:  
N/A.

b. Noise

- ✓ 1) What types of noise exist in the area which may affect your project (for example: traffic, equipment, operation, other)?  
None.

- ✓ 2) What types and levels of noise would be created by or associated with the project on a short-term or a long-term basis (for example: traffic, construction, operation, other)? Indicate what hours noise would come from the site.  
Normal noises associated with single family construction.

- ✓ 3) Proposed measures to reduce or control noise impacts, if any:  
None.

8. Land and shoreline use

- ✓ a. What is the current use of the site and adjacent properties?  
Undeveloped except for concrete drive to adjoining property & a quarry spall driveway on site. Adjacent properties north is open space, east, west & south single family.

- ✓ b. Has the site been used for agriculture? If so, describe.  
No.

- ✓ c. Describe any structures on the site.  
None.

- ✓ d. Will any structures be demolished? If so, what?  
No.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR  
AGENCY USE ONLY

e. What is the current zoning classification of the site?  
R-15.

*R-15*  
f. What is the current comprehensive plan designation of the site?  
Single family residential.

g. If applicable, what is the current shoreline master program designation of the site?  
N/A.

*Type 2 water course  
Category III wetland  
erosion, seismic &  
slide hazards.  
steep slopes*  
h. Has any part of the site been classified as an "environmentally sensitive" area? If so, specify.  
As confirmed by the Wetland Report, virtually the entire site is classified as environmentally sensitive or setbacks.

i. Approximately how many people would reside or work in the completed project?  
2.

j. Approximately how many people would the completed project displace?  
None.

k. Proposed measures to avoid or reduce displacement impacts, if any:  
N/A.

l. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:  
All work will be done in accordance with applicable codes and regulations.

9. Housing

a. Approximately how many units would be provided, if any? Indicate whether high, middle, or low income housing.  
1 middle income residence.

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low income housing.  
None.

c. Proposed measures to reduce or control housing impacts, if any:  
N/A.

10. Aesthetics

a. What is the tallest height of any proposed structure(s), not including antennas? What is the principal exterior material(s) proposed?  
Approximately 28 feet from lowest floor to ridge; natural wood is anticipated to be the primary exterior material.

b. What views in the immediate vicinity would be altered or obstructed?  
None.

c. Proposed measures to reduce or control aesthetics impacts, if any:  
House will be of natural material & design, trees on site to be retained.

11. Light and glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?  
Normal produced by a single family residence.

✓ b. Could light or glare from the finished project be a safety hazard or interfere with views?  
No.

✓ c. What existing off-site sources of light or glare may affect your proposal?  
None.

✓ d. Proposed measures to reduce or control light and glare impacts, if any:  
N/A.

**12. Recreation**

✓ a. What designated and informal recreational opportunities are in the immediate vicinity?  
Parks and track.

✓ b. Would the proposed project displace any existing recreational uses? If so, describe.  
No.

✓ c. Proposed measures to reduce or control impacts on recreation, including recreation opportunities to be provided by the project or applicant, if any:  
N/A.

**13. Historic and cultural preservation**

✓ a. Are there any places or objects listed on, or proposed for, national, state, or local preservation registers known to be on or next to the site. If so, generally describe.  
No.

✓ b. Generally describe any landmarks or evidence of historic, archaeological, scientific, or cultural importance known to be on or next to the site.  
None.

✓ c. Proposed measures to reduce or control impacts, if any:  
N/A.

**14. Transportation**

✓ a. Identify public streets and highways serving the site, and describe proposed access to the existing street system. Show on site plans, if any.  
Existing driveway connected to East Mercer Way.

✓ b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?  
No; approximately 1 mile.

✓ c. How many parking spaces would the completed project have? How many would the project eliminate?  
2 surface and 2 garage.

TO BE COMPLETED BY APPLICANT

EVALUATION FOR AGENCY USE ONLY

NO

d. Will the proposal require any new roads or streets, or improvements to existing roads or streets, not including driveways? If so, generally describe (indicate whether public or private).

NO

e. Will the project use (or occur in the immediate vicinity of) water, rail, or air transportation? If so, generally describe.

typical single family trips

f. How many vehicular trips per day would be generated by the completed project? If known, indicate when peak volumes would occur.

none

g. Proposed measures to reduce or control transportation impacts, if any:

15. Public services

as needed for a single-family residence

a. Would the project result in an increased need for public services (for example; fire protection, police protection, health care, schools, other)? If so, generally describe.

none

b. Proposed measures to reduce or control direct impacts on public services, if any.

16. Utilities

✓

a. Circle utilities currently available at the site: electricity, natural gas, water, refuse service, telephone, sanitary sewer/septic system, other.

typical single family utilities

b. Describe the utilities that are proposed for the project, the utility providing the service, and the general construction activities on the site or in the immediate vicinity which might be needed.

C. SIGNATURE

I certify (or declare) under penalty of perjury under the laws of the State of Washington that the answers to the attached SEPA Checklist are true and complete to the best of my knowledge. I understand that the lead agency is relying on them to make its decision.

Signature: William C. Summers

Date Submitted: January 14, 2015/March 16, 2015

SEPA RULES

**D. SUPPLEMENTAL SHEET FOR NONPROJECT ACTIONS**

(do not use this sheet for project actions)

Because these questions are very general, it may be helpful to read them in conjunction with the list of the elements of the environment.

When answering these questions, be aware of the extent the proposal, or the types of activities likely to result from the proposal, would affect the item at a greater intensity or at a faster rate than if the proposal were not implemented. Respond briefly and in general terms.

1. How would the proposal be likely to increase discharge to water; emissions to air; productions, storage, or release of toxic or hazardous substances; or production of noise?

Proposed measures to avoid or reduce increases are:

2. How would the proposal be likely to affect plants, animals, fish, or marine life?

Proposed measures to protect or conserve plants, animals, fish, or marine life are:

3. How would the proposal be likely to deplete energy or natural resources?

Proposed measures to protect or conserve energy and natural resources are:

4. How would the proposal be likely to use or affect environmentally sensitive areas or areas designated (or eligible or under study) for governmental protection; such as parks, wilderness, wild and scenic rivers, threatened or endangered species habitat, historic or cultural sites, wetlands, floodplains, or prime farmlands?

Proposed measures to protect such resources or to avoid or reduce impacts are:

5. How would the proposal be likely to affect land and shoreline use, including whether it would allow or encourage land or shoreline uses incompatible with existing plans?

Proposed measures to avoid or reduce shoreline and land use impacts are:

6. How would the proposal be likely to increase demands on transportation or public services and utilities?

Proposed measures to reduce or respond to such demand(s) are:

7. Identify, if possible, whether the proposal may conflict with local, state, or federal laws or requirements for the protection of the environment.