DEVELOPMENT SERVICES DEPARTMENT
ENVIRONMENTAL COORDINATOR
450 110th Ave NE., P.O. BOX 90012
BELLEVUE, WA 98009-9012

OPTIONAL DETERMINATION OF NON-SIGNIFICANCE (DNS) NOTICE MATERIALS

The attached materials are being sent to you pursuant to the requirements for the Optional DNS Process (WAC 197-11-355). A DNS on the attached proposal is likely. This may be the only opportunity to comment on environmental impacts of the proposal. Mitigation measures from standard codes will apply. Project review may require mitigation regardless of whether an EIS is prepared. A copy of the subsequent threshold determination for this proposal may be obtained upon request.

File No. 15-121137-LO

Project Name/Address: Zhao Residence/799 96th Ave SE

Planner: Drew Folsom

Phone Number: *425) 452-4441

Minimum Comment Period: November 12/2015

Materials included in this Notice:

☒ Blue Bulletin
☒ Checklist
☒ Vicinity Map
☐ Plans
☐ Other:

OTHERS TO RECEIVE THIS DOCUMENT:
☒ State Department of Fish and Wildlife / Sterwart.Reinbold@dfw.gov; Christa.Heller@dfw.wa.gov;
☒ State Department of Ecology, Shoreline Planner N.W. Region / Jobu461@ecy.wa.gov; sepaunit@ecy.wa.gov
☒ Army Corps of Engineers Susan.M.Powell@nws02.usace.army.mil
☒ Attorney General ecyolyef@atg.wa.gov
☒ Muckleshoot Indian Tribe Karen.Walter@muckleshoot.nsn.us; Fisheries.fileroom@muckleshoot.nsn.us

ENVIRONMENTAL CHECKLIST

10/9/2009

Thank you in advance for your cooperation and adherence to these procedures. If you need assistance in completing the checklist or have any questions regarding the environmental review process, please visit or call Development Services (425-452-6800) between 8 a.m. and 4 p.m., Monday through Friday (Wednesday, 10 to 4). Assistance for the hearing impaired: Dial 711 (Telecommunications Relay Service).

INTRODUCTION

Purpose of the 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 City of Bellevue identify impacts from your proposal (and to reduce or avoid impacts from the proposal, if it can be done) and to help the City decide whether an EIS is required.

Instructions for Applicants:

This environmental checklist asks you to describe some basic information about your proposal. 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." Giving 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 Planner in the Permit Center 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. Include reference to any reports on studies that you are aware of which are relevant to the answers you provide. The City may ask you to explain your answers or provide additional information reasonably related to determining if there may be significant adverse impacts.

Use of a Checklist for Nonproject Proposals: *A nonproject proposal includes plans, policies, and programs where actions are different or broader than a single site-specific proposal.*

For nonproject proposals, complete the Environmental Checklist even though you may answer "does not apply" to most questions. In addition, complete the Supplemental Sheet for Nonproject Actions available from Permit Processing.

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.

Attach an 8 ½" x 11 vicinity map which accurately locates the proposed site.

DF 10/1/15

BACKGROUND INFORMATION

Property Owner: LAKE GARDEN DEVELOPMENT LLC

Proponent: Tong Wang

Contact Person: Tong Wang
(If different from the owner. All questions and correspondence will be directed to the individual listed.)

Address: 7512 NE 155th St
Kenmore WA 98028

Phone: (425) 485-3791

Proposal Title: Zhao's residence

Proposal Location: 799 96th Ave SE, Bellevue WA 98004
(Street address and nearest cross street or intersection) Provide a legal description if available.
MEYDENBAUER HEIGHTS REPLAT BUILDING 1
Please attach an 8 ½" x 11" vicinity map that accurately locates the proposal site.

Give an accurate, brief description of the proposal's scope and nature:

1. General description: To build a 6,177 sf single family house
2. Acreage of site: 0.45 AC
3. Number of dwelling units/buildings to be demolished: N/A
4. Number of dwelling units/buildings to be constructed: 1
5. Square footage of buildings to be demolished: N/A
6. Square footage of buildings to be constructed: 6,177 sf
7. Quantity of earth movement (in cubic yards): 34 cy
8. Proposed land use: R
9. Design features, including building height, number of stories and proposed exterior materials:
   Average building height 33'-9". Three stories. Exterior material is stucoo.
10. Other
    N/A

Estimated date of completion of the proposal or timing of phasing:

September, 2016 to complete.

Do you have any plans for future additions, expansion, or further activity related to or connected with this proposal? If yes, explain.

N/A

DF 10/1/15

List any environmental information you know about that has been prepared, or will be prepared, directly related to this proposal.

N/A

Do you know whether applications are pending for governmental approvals of other proposals directly affecting the property covered by your proposal? If yes, explain. List dates applied for and file numbers, if known.

N/A

List any government approvals or permits that will be needed for your proposal, if known. If permits have been applied for, list application date and file numbers, if known.

N/A

Please provide one or more of the following exhibits, if applicable to your proposal.
(Please check appropriate box(es) for exhibits submitted with your proposal):

☐ Land Use Reclassification (rezone) Map of existing and proposed zoning

☒ Preliminary Plat or Planned Unit Development
Preliminary plat map

☒ Clearing & Grading Permit
Plan of existing and proposed grading
Development plans

☑ Building Permit (or Design Review)
Site plan
Clearing & grading plan

☐ Shoreline Management Permit
Site plan

A. ENVIRONMENTAL ELEMENTS

1. Earth

a. General description of the site: ☐ Flat ☑ Rolling ☐ Hilly ☑ Steep slopes ☐ Mountains ☐ Other

b. What is the steepest slope on the site (approximate percent slope)? 45%

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

grave

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

N/A

DF 10/1/1

e. Describe the purpose, type, and approximate quantities of any filling or grading proposed. Indicate source of fill.

about 34 cy to excavate

f. Could erosion occur as a result of clearing, construction, or use? If so, generally describe.

No

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

32% impervious coverage

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

See engineer plans

Erosion control further mitigated per BCC 23.76.090 "Erosion and Sediment Control" DF

2. AIR

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

N/A

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

N/A

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

N/A

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.

N/A

(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.

N/A

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(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.

N/A

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

N/A

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

N/A

(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.

N/A

b. Ground

(1) Will ground water be withdrawn, or will water be discharged to ground water? Give general description.

N/A

(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.

N/A

c. Water Runoff (Including storm water)

(1) Describe the source of runoff (including storm water) 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.

All runoff water will be collected to public system

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

N/A

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

See engineer plans

4. Plants

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

- [x] deciduous tree: alder, maple, aspen, other
- [ ] evergreen tree: fir, cedar, pine, other
- [x] shrubs
- [ ] grass
- [ ] pasture
- [ ] crop or grain
- [ ] wet soil plants: cattail, buttercup, bulrush, skunk cabbage, other
- [ ] water plants: water lily, eelgrass, milfoil, other
- [ ] other types of vegetation

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

trees

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

N/A

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

Add trees and grass

5. ANIMALS

a. Check or circle 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:
- [ ] Mammals: deer, bear, elk, beaver, other:
- [ ] Fish: bass, salmon, trout, herring, shellfish, other:

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

N/A

c. Is the site part of a migration route? If so, explain.

N/A

d. Proposed measures to preserve or enhance wildlife, if any:

N/A

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 need? Describe whether it will be used for heating, manufacturing, etc.

Electric and natural gas

b. Would your project affect the potential use of solar energy by adjacent properties? If so, generally describe.

N/A

c. What kinds of energy conservation features are included in the plans of the proposal? List other proposed measures to reduce or control energy impacts, if any:

Efficiency window, low-u value insulation and tankless

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.

N/A

(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)?

N/A

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

Construction, normal business hour

(3) Proposed measures to reduce or control noise impacts, if any:

N/A

Noise further mitigated per BCC 9.18 "Noise Control"

8. Land and Shoreline Use

a. What is the current use of the site and adjacent properties?

Residence

b. Has the site been used for agriculture? If so, describe.

N/A

c. Describe any structures on the site.

N/A

d. Will any structures be demolished? If so, what?

N/A

e. What is the current zoning classification of the site?

R1.8

f. What is the current comprehensive plan designation of the site?

N/A

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

N/A

h. Has any part of the site been classified as an “environmentally sensitive” area? If so, specify.

N/A

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

4

j. Approximately how many people would the completed project displace?

N/A

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

N/A

i. Proposed measures to ensure the proposal is compatible with existing and projected land uses and plans, if any:

N/A

9. Housing

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

1. high

b. Approximately how many units, if any, would be eliminated? Indicate whether high, middle, or low-income housing.

N/A

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 building material(s) proposed?

33'-9". stucoo

b. What views in the immediate vicinity would be altered or obstructed?

N/A

c. Proposed measures to reduce or control aesthetic impacts, if any:

N/A

11. Light and Glare

a. What type of light or glare will the proposal produce? What time of day would it mainly occur?

N/A

b. Could light or glare from the finished project be a safety hazard or interfere with views?

N/A

c. What existing off-site sources of light or glare may affect your proposal?

N/A

d. Proposed measures to reduce or control light or glare impacts, if any:

N/A

12. Recreation

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

Public park

b. Would the proposed project displace any existing recreational uses? If so, describe.

N/A

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.

N/A

b. Generally describe any landmarks or evidence of historic, archeological, scientific, or cultural importance known to be on or next to the site.

N/A

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.

N/A

b. Is site currently served by public transit? If not, what is the approximate distance to the nearest transit stop?

N/A

c. How many parking spaces would be completed project have? How many would the project eliminate?

4. no parking will be elimiated

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).

N/A

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

N/A

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

N/A

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

N/A

15. Public Services

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

N/A

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

N/A

16. Utilities

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

electricity, natural gas, water, sanitary sewer and storm water

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.

N/A

Signature

The above answers 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.....Date Submitted 06/08/2015.....

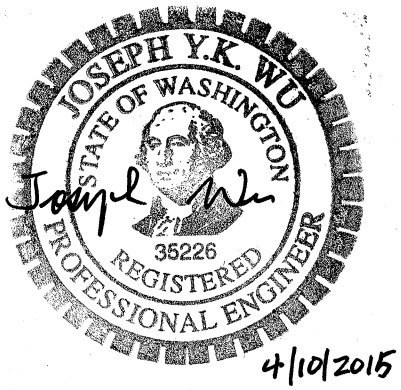
10/1/15

GEOTECHNICAL ENGINEERING STUDY

PROPOSED SINGLE-FAMILY BUILDING
7XX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

Prepared for

T&S Design Associates
7512 NE 155th Street
Kenmore, WA 98028
susu@t&sdesigner.com



4/10/2015

by

Pioneer Engineering, Inc.
P. O. Box 33628
Seattle, WA 98133
Josephwu.pe@gmail.com

April 10, 2015

PROJECT DESCRIPTION

The proposed development consists of constructing a three-story single family residence and two attached garages at the south end of the cul-de-sac of 96th Avenue Southeast in Bellevue, Washington. The general location of the site is shown on Figure 1.

According to the preliminary architectural plans prepared 02/10/2015 by T&S Design Associates and a boundary and topographic survey plan provided 02/26/2015 by Greene Land Surveying, the residence will be constructed in the approximately central portion of the site, accessible from 96th Avenue Southeast. The basement floor is set at El. 159', the main floor at El. 170' and the upper floor at El. 181'. Both garages' finish floor is set at El. 169.5'. Slabs of the basement and garage will be poured on grade. Up to about 10 feet of excavation will be required to reach the slab subgrade at the basement's northeast corner, and about 6 feet of fill to the crawl space bottom (El. 153') of the basement's mid-southwest corner.

SCOPE OF WORK

The purpose of this geotechnical engineering study is to characterize the subsurface soil and water conditions by three test hole explorations, and use such information obtained to provide recommendations for the development. To achieve the purpose, the scope of our services specifically comprises the following items:

1. Explore subsurface conditions with three test holes (TH-1 through TH-3) to a maximum depth of 5 feet. The underlying soils encountered are visually classified;
2. Collect soil samples at selected depths and seal them in sampling bags for further examination;
3. Perform a site reconnaissance to observe and document existing surface features;
4. Review geologic and surficial soil conditions at the site, based on a geologic map;
5. Prepare a written report to address our findings, conclusions and recommendations for engineered fill and compaction, foundation support, retaining walls, cut and fill slopes and evaluation of on-site soils for backfilling.

SITE CONDITIONS

Surface Conditions

The site is an irregular-shaped vacant property bounded to the north by 96th Avenue Southeast, adjoining private properties to the east and west, and fronting the north boundary of Chism Park. It encompasses an area of 0.45 acre (19,788 square feet).

Topographically, the site is situated in the mid-hill of a broad regional slope descending southwesterly to the park and beach flat of Lake Washington. Locally within the site, the ground surface descends mildly and southerly from the cul-de-sac to the site's mid-portion, and then turns southwesterly and drops moderately toward the southwest corner. Coniferous and deciduous trees flock in the northern portion of the site, but scatter in sporadic dots in the southern. The remaining open space is covered with berry, weed and other groundcover.

Geologic Mapping

The *Preliminary Geologic Map of Seattle and Vicinity, Washington*, by H. H. Waldron, B. A. Liesch, D. R. Mullineaux, and D. R. Crandell, published by U. S. Geological Survey in 1962, was referenced for the geologic and soil conditions at the site. According to this map, the site is mapped in a close proximity to the contact of Vashon Till (Q_t) and Older Sand (Q_{os}).

Vashon Till was deposited directly by glacial ice during the most recent glaciation as it advanced over an eroded, irregular surface of older formations and sediments. It is a very dense mixture of unsorted clay, silt, sand, gravel, and scattered cobbles and boulders, often referred to as "hard pan". This soil unit is generally of high shear strength able to support light to medium residential structures.

Older Sand was laid down by slow-moving meltwater streams from the advancing but distant Vashon glacier. It contains a wide variety of soils ranging from fine silty sand to clean coarse sand with gravel, cobble and occasional boulders, which is a typical fluvial deposit in a glacial environment. It had been overridden by about 3,000 feet of ice over one or several glaciers,

and the relative density of this soil unit is dense to very-dense in its undisturbed, natural state. This soil unit is generally of high permeability appropriate for a stormwater infiltration facility.

Subsurface Exploration

On March 28, 2015, subsurface conditions were explored with three test holes to a maximum depth of 5 feet. These holes were dug using a shovel and a post-hole digger. An additional test hole (A-1) close to TH-3 was dug for a simplified field infiltration test. Locations of the holes were determined by tape measuring with reference to existing surface features shown on the survey plan. Approximate locations of these holes are shown on Figure 2.

Subsurface exploration was continuously monitored by an engineer from our firm who documented the underlying soil and water conditions encountered, maintained a log of each hole, obtained representative soil samples, and observed pertinent site features. The final test hole logs represent our interpretations of subsurface conditions explored. The stratification lines in the logs indicate approximate boundaries between soil types. Actual transitions may be more gradual in the natural geologic setting. The soils encountered are visually classified in general accordance with Unified Soil Classification System (USCS) as shown on Figure 3.

Subsurface Soils

The first two test holes (TH-1 and TH-2) encountered fairly consistent soil conditions: 10 to 12 inches of dark brown organic topsoil, underlain by 24 to 32 inches of medium-stiff to stiff, brownish gray sandy silt with some orange oxidation staining and a trace of gravel. It is a typical weathered Vashon Till deposit. Underlying the weathered till is very-stiff, relatively unweathered light gray sandy silty, with a trace of gravel to the termination depth. TH-3 and A-1 encountered 12 inches of topsoil, underlain by medium-dense to dense, light brown, fine to medium silty sand with some coarse gravel to the depth explored. Gravel content appeared to increase with depth in this soil unit. The soil conditions in these two holes revealed native deposits of Older Sand. More information for subsurface soil conditions are presented in test hole logs (Figures 4 and 5).

Groundwater Conditions

No groundwater was encountered in all test holes during exploration. However, it should be noted that groundwater levels generally fluctuate with seasons, depending on the amount of precipitation and surface runoff, denseness of vegetative cover on the ground, purpose of land use, and other factors.

DISSCUSSIONS AND RECOMMENDATIONS

Based on the soil and groundwater conditions encountered in our subsurface exploration, it is our opinion that, from a geotechnical engineering viewpoint, the site is suitable for the proposed development if recommendations in this report are closely followed.

We anticipate the residence will be located within Vashon Till deposits. The northeastern portion of the day-light basement will be supported on firm Vashon Till deposits; the southwestern, on up to about 6 feet of engineered fill over till deposits. With an effort to minimize or eliminate the adverse effect that may be arisen from variations of these two soils, the bearing capacity of engineered fill should be used for foundation design. It is advisable that earthwork be started and completed in the official dry season, in order to reduce the negative impacts by precipitation. Vashon Till deposits generally encourage the use of open-cut excavation during construction when space allows. Storm runoff may be drained using an infiltration facility in the area of Older Sand deposits.

ENGINEERED FILL AND COMPACTION

Engineered fill is the material placed under footings, on-grade slabs and pavements where it withstands loads. Engineered fill should be free of organic, construction debris and other deleterious substances. It should consist of clean soils with individual particles not greater than 4 inches in size. On-site Vashon Till deposits containing a significant amount of fines (silt and clay particles) are difficult to be compacted to meet the criteria in wet weather conditions. On-site Older Sand deposits generally containing an insignificant amount of fines are easy to meet the compaction criteria in all weather conditions. If the quantity of these sandy deposits is not adequate for backfilling, granular, free-draining materials such as 2-inch-minus washed rock with no more than 5 percent of fines should be imported for use in structural areas.

Engineered fill should be placed per loose lift not more than 10 inches in thickness, and compacted to meet the required percentage of maximum dry density determined by ASTM D1557 (Modified Proctor Method) as summarized in the following table:

Applicable Area	Maximum Dry Soil Density
Under Footings	95%
Under Driveway and on-Grade Slab	95% for upper 2 feet, 90% below
Basement Wall Backfill	95% for upper 3 feet, 90% below
Utility Trench Backfill	95% for upper 4 feet, 90% below

Controlled Density Fill (CDF) may be used as an alternative for engineered fill. CDF (a flowable, self compacting, rigid setting and low density material) is generally used in over-excavation in the footing or utility trenches. Wherever applicable, there is neither the compaction effort required to densify this fill, nor density tests needed to ensure compliance with the criteria. Its flowability enables this material to displace standing water in a footing (or utility) trench and access difficult spots. CDF has a typical minimum slump of 10 inches and a 30-day compressive strength of 200 pounds per square inch (psi) or less. Low compressive strength allows CDF for easy excavation in case of any design alteration during construction.

CUT AND FILL SLOPES

Under no circumstances should cut slopes be greater than the limits specified by the safety regulations of local, state, and federal government, if worker have to perform the construction work in the foundation and utility trenches.

Any unsupported temporary cut greater than 4 feet in height should be sloped no steeper than 1H:1V in topsoil, Older Sand, and weathered Vashon Till; 3/4H:1V in relatively unweathered Vashon Till. The bottom 4 feet may be cut vertically into very-stiff or firmer unweathered Vashon Till deposits. These recommended inclinations of excavation are based on the assumption that no groundwater will be encountered during excavation. If groundwater is encountered during excavation, work should be halted immediately and our on-site representative informed to re-evaluate slope stability. Permanent cut or fill slopes should have an inclination no steeper than 2H:1V.

FOUNDATION SUPPORT

Conventional Spread Footings

Foundations are constructed of individual spread (square or circular) footings and continuous strip footings bearing on very-stiff Vashon Till deposits or on adequately-compacted engineered fill over these till deposits should be able to provide adequate foundation support. Individual footings are usually used to support columns, and continuous footings, bearing walls. For footings constructed as recommended above, our design criteria for these foundations are summarized below:

> *Allowable soil bearing pressure for spread (or strip) footings poured on stiff Vashon Till deposits should be no more than 2,300 pounds per square foot (psf); no more than 1,500 psf on engineered fill over such Vashon Till deposits.*

Minimum depth to bottom of perimeter footing below adjacent exterior finish grade should be at least 18 inches to reduce the risk of the foundation damage by the frost effect.

Interior footings supporting bearing walls or bracing walls should have a minimum depth of 12 inches from the top of the on-grade floor slab to the bottom of the footing.

Minimum width of continuous footings should be 16 inches; minimum width of individual footings, 24 inches; minimum footing thickness, 12 inches.

Design Parameters

Retaining walls unrestrained to displace or rotate at the top should be designed using an "active" soil pressure of 35 pounds per cubic foot (pcf) of equivalent fluid density (EFD), while basement walls restrained to displace and rotate at the top using an "at-rest" soil pressure of 53 pounds pcf of EFD, both assuming backfill is well-drained and level.

The friction force between the foundation and the subgrade, and the passive soil pressure acting on the under-grade portion of the foundation provide resistance to lateral loads. For better development of this resistance, the foundation must be poured directly against stiff or hard Vashon Till deposits or against engineered fill of adequate compaction. We recommend that a passive soil pressure, 315 pcf of EFD and a coefficient of friction, 0.40, be used to calculate passive soil resistance. Please note these two values are ultimate and unfactored. Proper factors of safety should be applied in design.

Seismic Design Considerations

Design of residential buildings should be in compliance with the standards and specifications stated in 2012 International Building Code (2012 IBC). Based on the 2012 IBC, the site is located in a zone of Seismic Design Category D with a classified Site Class D.

Based on the location of the site (Latitude: 47.60182, Longitude: -122.21100 from King County iMap), the values of 0.2-second and 1-second spectral response accelerations are computed for seismic design parameters from an interactive tool at the USGS website (http://earthquake.usgs.gov/designmaps/us/application.php). These design values and corresponding site coefficients are listed below:

Regional Earthquake Ground Motion for the 0.2-Second Spectral Response Acceleration $S_S = 1.335\ g$

Regional Earthquake Ground Motion for the 1-Second Spectral Response Acceleration, $S_1 = 0.514\ g$

Regional Earthquake Ground Motion for the 0.2-Second Spectral Response Design Parameter, Site Class D $S_{DS} = 0.890\ g$

Regional Earthquake Ground Motion for the 1-Second Spectral Response Design Parameter, Site Class D $S_{D1} = 0.514\ g$

Site Coefficient F_a as a Function of Site Class and Mapped Spectral Response Acceleration at a 0.2-second Period (S_s) $F_a = 1.00$

Site Coefficient F_v as a Function of Site Class and Mapped Spectral Response Acceleration at a 1-Second Period (S_1) $F_v = 1.50$

Wall Drainage

A drainage system should be installed along the basement wall. This system may consist of a 4-inch-diameter minimum, rigid, perforated PVC pipe with its invert placed slightly below the footing bottom, and bedded on at least 3-inch-thick washed rock (5/8-inch in size) and covered with a minimum of 6 inches of same rock containing no more than 2 percent of fines. Such rock should be wrapped with a layer of durable non-woven geotextile such as Mirafi 140N. The drain pipe should have a sufficient gradient to generate flow by gravity. A drain mat such as Mirafi G100N should be placed to the full depth of the wall and hydraulically connected to the pipe. A typical wall drainage system is illustrated on Figure 6.

Damp-Proofing

A damp-proof coating composed of a bituminous coating, or 3 pounds per square yard of acrylic modified cement, or 1/8-inch coating of surface-bonding mortar in compliance with ASTM C887, should be applied to the under-grade portion of the basement wall.

LIMITATIONS

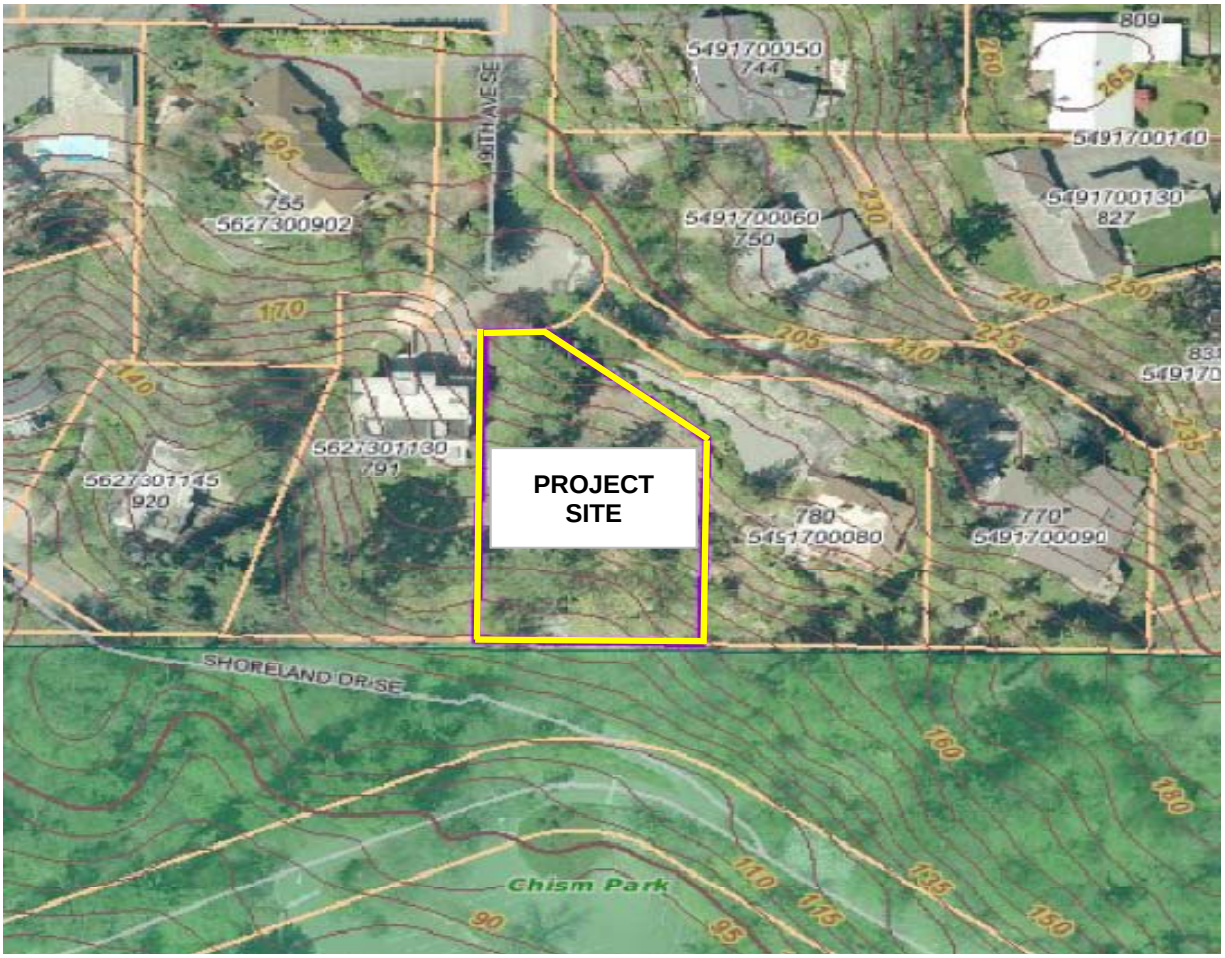
This report has been prepared for the specific application to this project for the exclusive use of Susu Ji and Tong Wang of T&S Design Associates and their authorized personnel. The conclusions and recommendations in this report, however, should not be construed as a warranty of the subsurface conditions. Our geotechnical recommendations are based on the soil conditions encountered in the test holes, engineering analyses, and our experience and engineering judgment. The recommendations are professional opinions 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 local areas. No warranty, expressed or implied, is made.

Subsurface soil and water conditions stated in this report may vary from those actually encountered during construction. If variations appear then, we should be retained to re-evaluate the recommendations of this report, and to verify or modify them in writing prior to proceeding with subsequent earthwork.

ADDITIONAL SERVICES

We recommend that Pioneer Engineering, Inc. (PEI) be retained to perform a general review of the final design and specifications of the proposed development, and to verify that our geotechnical recommendations have been properly interpreted and implemented in the design plans and construction documents.

We also recommend PEI be retained to provide monitoring services for geotechnical aspects of the construction work of this project. This is to observe compliance with the design concepts, specifications or recommendations and to allow for design changes in the event subsurface conditions differ from those anticipated prior to start of construction.



NTS

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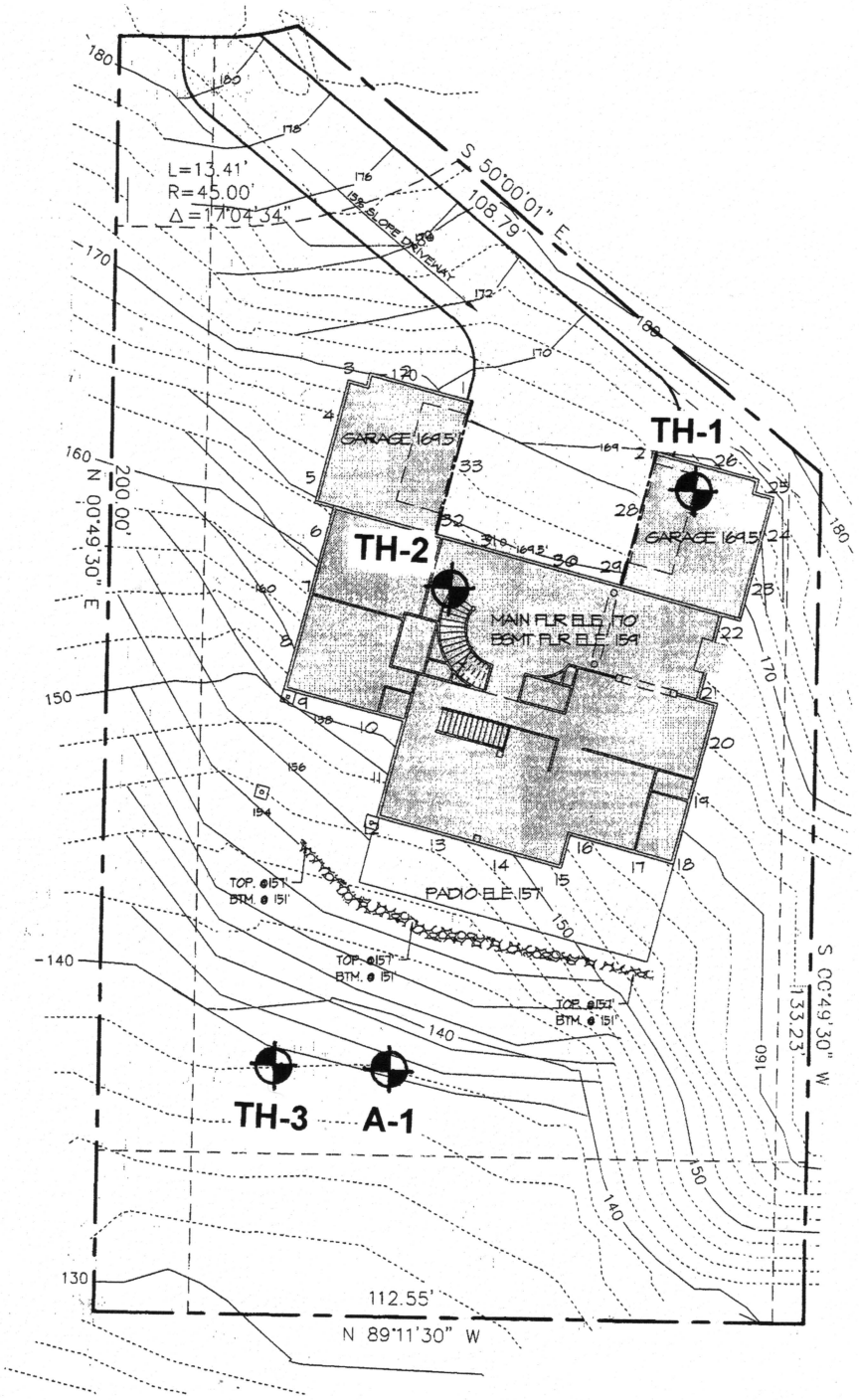
VICINITY MAP
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12	DATE 3/29/15	FIGURE 1



Scale: 1" = 30'

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SITE AND EXPLORATION PLAN
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12	DATE 3/29/15	FIGURE 2

UNIFIED SOIL CLASSIFICATION SYSTEM

MAIN DIVISIONS			GROUP SYMBOL	GROUP NAME
COARSE-GRAINED SOILS MORE THAN 50% RETAINED ON THE NO. 200 SIEVE	**GRAVEL** MORE THAN 50% OF COARSE FRACTION RETAINED ON THE NO. 4 SIEVE	CLEAN GRAVEL	**GW**	WELL-GRADED GRAVEL, FINE TO COARSE GRAVEL
			GP	POORLY-GRADED GRAVEL
		GRAVEL WITH FINES	**GM**	SILTY GRAVEL
			GC	CLAYEY GRAVEL
	SAND MORE THAN 50% OF COARSE FRACTION PASSING PASSING NO. 4 SIEVE	CLEAN SAND	**SW**	WELL-GRADED SAND, FINE TO COARSE SAND
			SP	POORLY-GRADED SAND
		SAND WITH FINES	**SM**	SILTY SAND
			SC	CLAYEY SAND
FINE-GRAINED SOILS MORE THAN 50% PASSING THE NO. 200 SIEVE	**SILT AND CLAY** LIQUID LIMIT LESS THAN 50%	INORGANIC	**ML**	SILT, SANDY SILT
			CL	LEAN CLAY
		ORGANIC	**OL**	ORGANIC SILT, ORGANIC CLAY
	SILT AND CLAY LIQUID LIMIT 50% OR MORE	INORGANIC	**MH**	SILT OF HIGH PLASTICITY, ELASTIC SILT
			CH	CLAY OF HIGH PLASTICITY, FAT CLAY
		ORGANIC	**OH**	ORGANIC SILT, ORGANIC CLAY
HIGHLY ORGANIC SOILS			**PT**	PEAT

NOTE:

1. FIELD CLASSIFICATION BASED ON VISUAL EXAMINATION OF SOIL IN GENERAL ACCORDANCE WITH ASTM D2488.
2. SOIL CLASSIFICATION USING LABORATORY TESTS IS BASED ON ASTM D2487.
3. DESCRIPTIONS OF SOIL DENSITY OR CONSISTENCY ARE BASED ON INTERPRETATION OF BLOW-COUNT DATA, VISUAL APPEARANCE OF SOILS, AND/OR TEST DATA.

SOIL MOISTURE INDICATORS:

DRY - ABSENCE OF MOISTURE, DUSTY, DRY TO THE TOUCH.

SLIGHTLY MOIST - TRACE MOISTURE, NOT DUSTY.

MOIST - DAMP, BUT NO VISUAL WATER.

VERY MOIST - VERY DAMP, MOISTURE FELT TO THE TOUCH.

WET - VISUAL FREE WATER OR SATURATED, USUALLY SOIL IS OBTAINED FROM BELOW WATER TABLE.

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USCS CHART
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12 | DATE 3/29/15 | FIGURE 3

TEST HOLE NO. TH-1

Logged By: JW Date: 3/28/15 Ground Elev. 172' ±

Depth ft.	USCS	Soil Description	Sample Type	Sample No.	(N) Blows/ ft.	W %	Other Test
		Dark brown, organic, moist, soft. (10" Topsoil)					
	ML	Brownish gray, sandy SILT, trace gravel, very moist, some orange oxidation staining, medium stiff to stiff. (weathered Vashon Till)					
	ML	Light gray, sandy SILT, some gravel, moist, very-stiff. (unweathered Vashon Till)					
5		Test hole terminated at 5 feet, no groundwater encountered during exploration.					
10							

TEST HOLE NO. TH-2

Logged By: JW Date: 3/28/15 Ground Elev. 163' ±

Depth ft.	USCS	Soil Description	Sample Type	Sample No.	(N) Blows/ ft.	W %	Other Test
		Dark brown, organic, moist, soft. (12" Topsoil)					
	ML	Brownish gray, sandy SILT, trace gravel, very moist, some orange oxidation staining, medium stiff to stiff. (weathered Vashon Till)					
	ML	Light gray, sandy SILT, some gravel, moist, very-stiff. (unweathered Vashon Till)					
5		Test hole terminated at 4.5 feet, no groundwater encountered during exploration.					
10							

LEGEND: SS - 2" O.D. Split-Spoon Sample
ST - 3" O.D. Shelby-Tube Sample
B - Bulk Sample

GROUNDWATER: ∇ Water Level

Seal

Observation Well Tip

Soil Sampling

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TEST HOLE LOGS
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12 DATE 3/29/15 FIGURE 4

TEST HOLE NO. TH-3

Logged By: JW Date: 3/28/15 Ground Elev. 138' ±

Depth ft.	USCS	Soil Description	Sample Type	Sample No.	(N) Blows/ ft.	W %	Other Test
		Dark brown, organic, moist, soft. (12" Topsoil)					
	SP-SM	Light brown, fine to medium SAND, some to trace silt, some coarse gravel, moist, medium-dense. (Older Sand) - Becomes dense @ 2', more coarse gravel.					
5		Test hole terminated at 5 feet, no groundwater encountered during exploration.					
10							

TEST HOLE NO. A-1

Logged By: JW Date: 3/28/15 Ground Elev. 138' ±

Depth ft.	USCS	Soil Description	Sample Type	Sample No.	(N) Blows/ ft.	W %	Other Test
		Dark brown, organic, moist, soft. (12" Topsoil)					
	SP-SM	Light brown, fine to medium SAND, some to trace silt, some coarse gravel, moist, medium-dense. (Older Sand)					
5		Test hole (12-inch diameter by 24-inch in depth) for a simplified field infiltration test per 2015 Storm and Surface Water Engineering Standards by City of Bellevue.					
10							

LEGEND: SS - 2" O.D. Split-Spoon Sample
ST - 3" O.D. Shelby-Tube Sample
B - Bulk Sample

GROUNDWATER: ∇ Water Level

Seal

Observation Well Tip

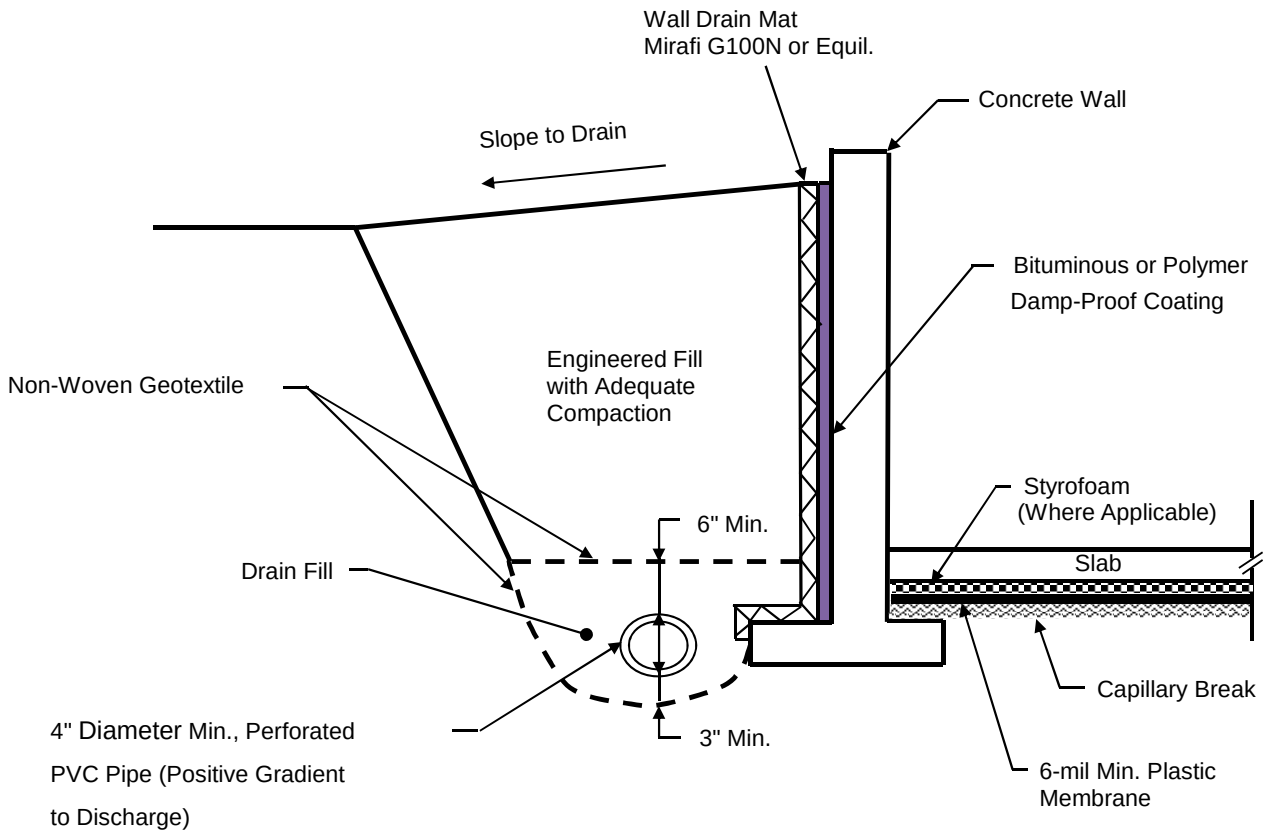
Soil Sampling

PIONEER ENGINEERING, INC.

Geotechnical Engineering · Earth Science · Water Resources

TEST HOLE LOGS
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12 DATE 3/29/15 FIGURE 5



Not to Scale

Notes:

1. Engineered fill should consist of clean soils with individual particles no larger than 4 inches in size, and contain no organic and other deleterious substances.
2. Engineered fill should be placed in lifts no more than 10 inches thick in loose state, and be compacted to attain the maximum dry density determined by ASTM D1557 (Modified Proctor Method).
3. The top 3 feet of engineered fill should be compacted to at least 95 percent of maximum dry density, and 90 percent for the remaining.
4. The drain pipe should be a rigid, perforated PVC pipe behind wall.
5. A 6-mil plastic membrane should be placed over the capillary break as a vapor retarder.
6. Drain fill and Capillary break should consist of clean 5/8-inch crushed rock containing no more than 2 percent of fines.
7. The damp-proof coating should consist of a bituminous coating, or 3 pounds per square yard of acrylic modified cement, or 1/8 inch coat of surface-bonding mortar in compliance with ASTM C887.

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TYPICAL WALL DRAIN
PROPOSED SINGLE-FAMILY RESIDENCE
7XXX - 96TH AVENUE SE
BELLEVUE, WASHINGTON

PROJ. NO. G15A12	DATE 3/29/15	FIGURE 6

Vicinity Map

City Parks
Parcels

Meydenbauer Beach Park
Downtown Park
Chism Beach Park
Killa Gl Pa

SE 5TH ST
101ST AVE SE
102ND AVE SE
105TH AVE SE
BELLEVUE WAY SE
SE 6TH ST
SE 7TH ST
SHORELAND DR SE
SE 11TH ST
DETWILLER LN
97TH PL SE
CEDAR CREST LN
SE 13TH ST
104TH AVE SE
SE 15TH ST
SE 16TH ST
100TH AVE SE
102ND AVE SE
104TH A

Locator Map

520
405
90

0 739 1,479

Scale 1:8,872 Feet

The City of Bellevue does not guarantee that the information on this map is accurate or complete. This data is provided on an "as is" basis and disclaims all warranties.

Map Generated on: 10/28/2015