

**Stormwater Drainage Report
274xx 62nd Avenue SE
Mercer Island, Washington
KC Tax Parcel #217450-3231
Permit #: 2402-xxx**

Prepared For:

**BV Homes, LLC
Attn.: Vann Lanz
317 4th Street
Kirkland, Washington 98033
206-499-1277
Vann@Inlbuilds.com**

September 16, 2024

Prepared By:

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Section 1: Project Narrative:

The subject property is located within the East Seattle neighborhood on the west of Mercer Island. The subject property abuts and takes access from the 61st Avenue SE on the east side of the property. The subject property is a vacant property with gravel parking area and several stored items. The subject property slopes from 61st Avenue SE towards the west property line. There are public facilities within 61st Avenue Se that will be used by the proposed new residence; gas, water, sewer, access, power, and cable service. The public storm system within 61st Avenue SE is at an un-useable elevation for the subject property. The proposed drainage connection for the proposed new impervious surfaces on the subject property will be to drain through the property to the west and connect into the public storm drainage system within 60th Avenue SE.

The site soils are characterized between Vashon Glacial Till and infeasible for infiltration type BMPs by geotech Consultants, LLC. The Geotechnical Evaluation is attached within this Report. City staff has determined that on-site detention is not required for this new development provided there is adequate capacity to flow into Lake Washington to the west. Adequate capacity has been determined and indicated within Minimum Requirement #4, attached.

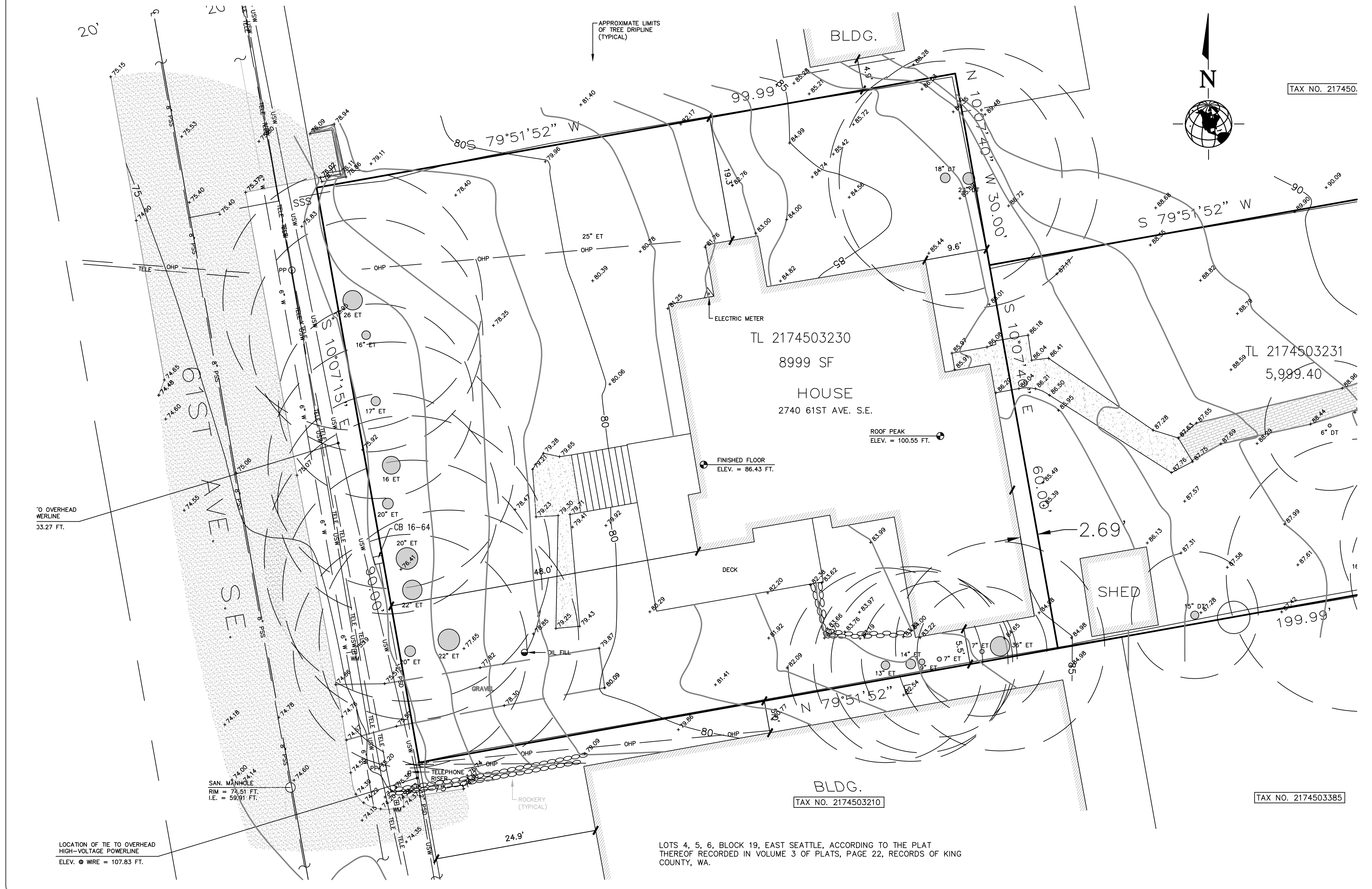
The property was visited in August and September 2024 to verify runoff patterns and possible storm water discharge options. The downstream system to Lake Washington was reviewed and walked, where possible.

The project will be evaluated for storm water treatment and control using the Amended December 2014 SWMMWW (DOE Manual).

VICINITY MAP



PORTION OF THE NE 1/4, SE 1/4, SECTION 24, TWP. 24 N., RGE. 4 E., W.M.
MERCER ISLAND, WASHINGTON



TAX NO. 217450.

TL 2174503231
5,999.40

TAX NO. 2174503210

TAX NO. 2174503385

LOTS 4, 5, 6, BLOCK 19, EAST SEATTLE, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 3 OF PLATS, PAGE 22, RECORDS OF KING COUNTY, WA.

RECORDER'S CERTIFICATE
Filed for record this ____ day of _____, 20__ at __M, in Volume ____ of _____ at page ____ at the request of Dan M. Touma.

County Auditor Deputy

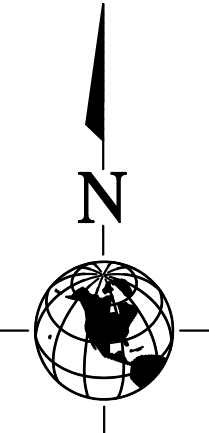
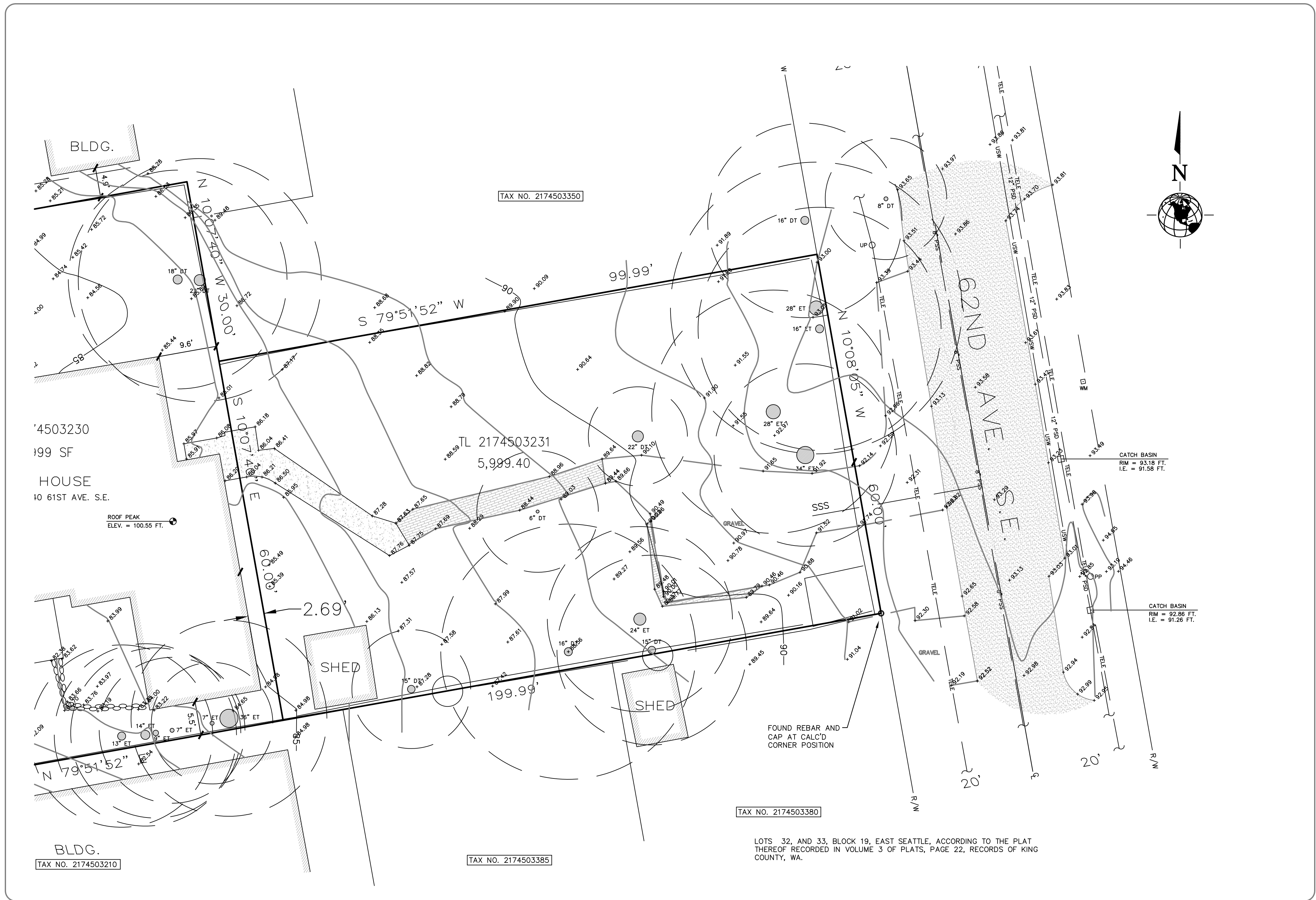
SURVEYOR'S CERTIFICATE
This map correctly represents a survey made by me or under my direction in conformance with the requirements of the Survey Recording Act at the request of Vann Lanz in July of 2023.

Daniel M. Touma
Certificate No. 38992

BOUNDARY SURVEY
FOR
TAX LOT 2174503230

DWN BY RF	DATE 7/20/24	JOB NO. 1019-008
CHKD BY DMT	SCALE 1" = 10'	SHEET 1 OF 1

TOUMA ENGINEERS AND LAND SURVEYORS, PLLC
330 SW 43rd STREET SUITE K412
RENTON WA 98057
206-304-3567



'4503230
199 SF
HOUSE
10 61ST AVE. S.E.

ROOF PEAK
ELEV. = 100.55 FT.

BLDG.
TAX NO. 2174503210

TAX NO. 2174503350

TL 2174503231
5,999.40

TAX NO. 2174503380

TAX NO. 2174503385

LOTS 32, AND 33, BLOCK 19, EAST SEATTLE, ACCORDING TO THE PLAT THEREOF RECORDED IN VOLUME 3 OF PLATS, PAGE 22, RECORDS OF KING COUNTY, WA.

RECORDER'S CERTIFICATE
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TOUMA ENGINEERS AND LAND SURVEYORS, PLLC
330 SW 43rd STREET SUITE K412
RENTON WA 98057
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Section 2: Site Evaluation

Total Lot Area = 5,999 square feet (0.1377 acres)

EXISTING CONDITIONS

Impervious:

Shed roof area = 126 sq. feet

Walkway = 304 sq. feet

Gravel driveway/parking area = 649 sq. feet ((PGHS))

Subtotal: 1,079 sq. feet

Pervious:

Lawn, trees, landscaping = *4,920 sq. feet*

DEVELOPED CONDITIONS

Impervious (hard) surfaces:

House roof area w/overhang = 1,917 sq. feet

Uncovered driveway = 657 feet ((PGHS))

Uncovered patio/walkway = 401 sq. feet

Total Impervious (Hard) Surfaces = 2,975 sq. feet

Pervious Surfaces:

Ex. Lawn, trees, landscaping = *869 sq. feet*

Added landscaping = 2,155 sq. feet

Total Pervious Surfaces = 3,024 square feet

((PGHS)) -Pollution Generating Hard Surface

Summary of Project Information

Project Site Area	5,999 square feet
Existing Impervious Area	1,079 sq. feet
Existing Impervious Coverage	18.0%
New Impervious Area	2,044 sq. feet
Replaced Impervious Area	931 sq. feet (see attached New Impervious Map – next page)
New plus Replaced Impervious	2,975 square feet
Proposed Impervious Area	2,975 square feet
Converted pervious: Native to lawn	0 sq. feet
Converted pervious: Native to pasture	0 sq. feet
Total Area of Land Disturbance	5,200 square feet

The existing property has less than 35% (18.0%) impervious coverage and the total proposed project new plus replaced impervious surfaces will be less than 5,000 (2,975) square feet; using Figure I-2.4.1 – "Flow Chart for Determining Minimum Requirements for New Development" page 37, 2014 Stormwater Management Manual for Western Washington, Minimum Requirements #1 – #5 apply to this project.

27xx 62nd Avenue SE

TAX NO. 2174503350

TAX NO. 2174503380

TAX NO. 2174503385



REPLACED IMPERVIOUS SURFACES
931 SQ. FEET



GRAPHIC SCALE

1 inch = 10 feet



FLOW CHART FIGURE II-2.4.1

Figure I-2.4.1 Flow Chart for Determining Requirements for New Development

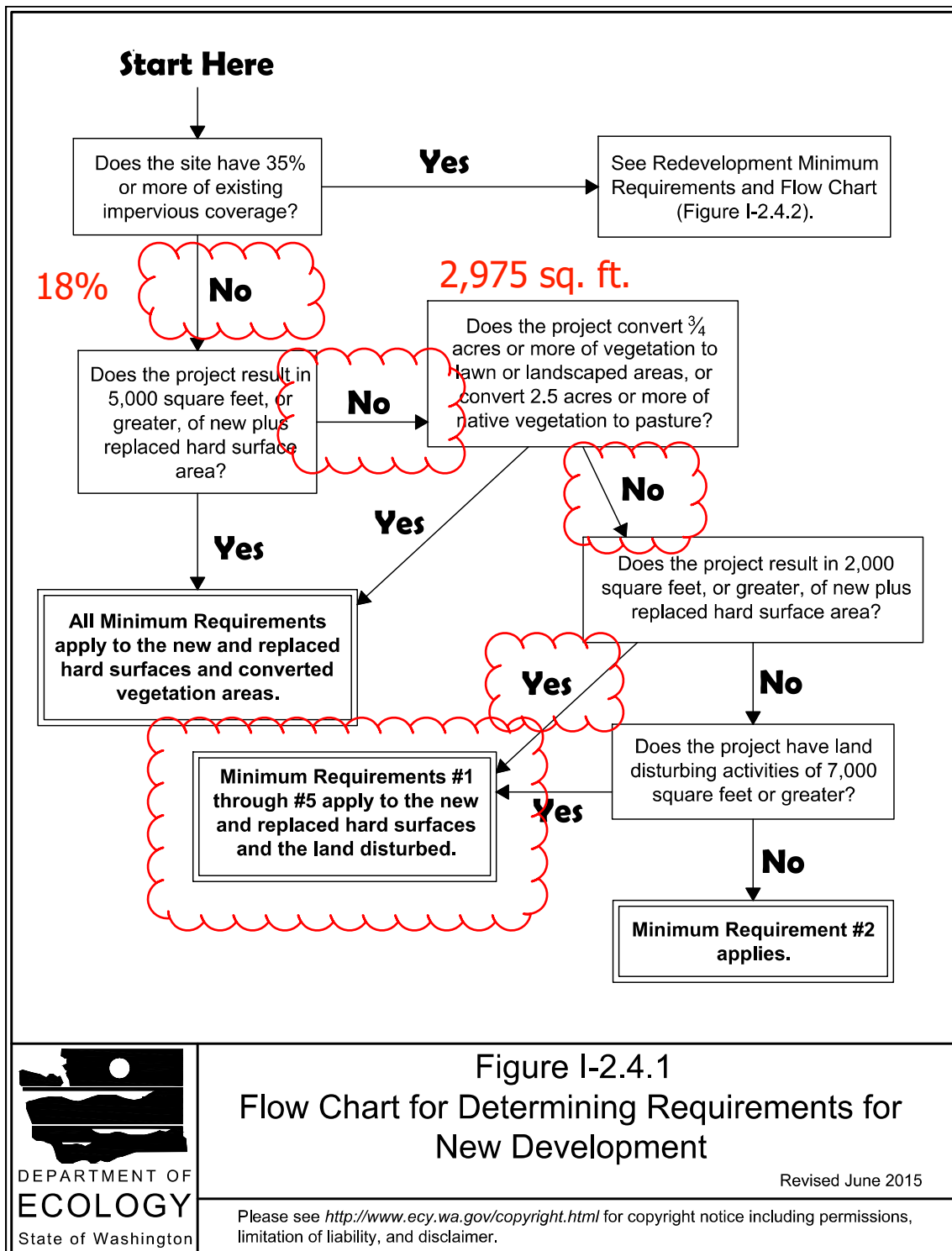


Figure I-2.4.1
Flow Chart for Determining Requirements for
New Development

Revised June 2015

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Section 3: Minimum Requirements

Based upon the Flow Chart Figure I-2.4.1 and I-2.4.2 (Amended December 2014 SWMMWW, DOE Manual), all Minimum Requirements 1-5 apply to this project.

Section I-2.5.1 Minimum Requirement #1 – Preparation of Stormwater Site Plans

A Stormwater site plan (drainage plan) has been prepared for this project together with construction details for installation of the proposed drainage control system. The Stormwater site plans and drainage narrative shall be submitted and reviewed by the City of Mercer Island as part of the building permit application.

Section I-2.5.2 Minimum Requirement #2 - Construction Storm Water Pollution Prevention Plan (CSWPP)

A Construction Stormwater Pollution Prevention Plan (CSWPP) has been prepared and included within this Report. The CSWPP plan shall include construction installation of erosion control, establish a construction access, preservation of existing vegetation during construction, and protection of existing drainage inlets. This will include but not limited to: the use of the existing gravel driveway and parking area (on the east side) to provide construction access from 62nd Avenue SE; installing filter fabric silt fencing along the down gradient property lines (west and south); installation of filter socks within the public catch basin located within 61st Avenue SE; retention of native vegetated areas including tree/vegetation retention within the side (south) and front (east) yards; and the use straw or chipped materials placed over exposed disturbed soils to prevent runoff from carrying solids.

Section I-2.5.3 Minimum Requirement #3 - Source Control of Pollution

Source control BMP's will be utilized to contain pollution generating runoff. No concrete washout will be allowed on the property during construction. No fuel materials will be placed or stored on site during construction.

Section I-2.5.4 Minimum Requirement #4 - Preservation of Natural Drainage Systems and Outfalls

The subject property slopes from a high point at the northeast corner along 61st Avenue SE at elevation 93.00 feet. The southeast corner along 61st Avenue SE is elevation 91.80. The property slopes towards the westerly property line to a low point in the southwest corner at elevation 84.75. The property slopes 7% from the northeast towards the southwest. The existing hard surfaces on the property sheet flow towards the southwest corner. The natural drainage outfall from the subject property is sheet flow towards the southwest corner.

The existing drainage runoff from the subject property leaves the property at the southwest corner and flows over the neighboring property to the west (2740 61st Avenue SE) before entering the easterly shoulder of 61st Avenue SE. The drainage flows south along the easterly shoulder to the intersection of SE 28th Street and 61st Avenue SE. The drainage runoff is collected within City catch basin #16-16 in the northeast corner of the intersection. The drainage then flows west within a 12" concrete storm pipe to an open roadside ditch along the north side of SE 28th Street; just west of the driveway serving 2760 SE 28th Street. The roadside ditch is overgrown with weeds but show no indications of overtopping or flooding due to lack of capacity. The downstream drainage enters a 12" concrete pipe at the northeast corner of SE 28th Street and 60th Avenue SE and continues to flow west. The drainage crosses the north side of 60th Avenue SE and is within catch basins and conveyance pipes within the dead-end location of SE 28th Street and Calkins Landing Park. The downstream system outfalls into a well-vegetated channel on the south side of the Park and flows to an outfall into Lake Washington to the west.

The subject property was visited in August and September 2024 to review and evaluate on-site drainage patterns and walk and review the downstream system. The downstream system consists of catch basins, open roadside ditch, and conveyance pipes before discharging into Lake Washington at Calkins Landing Park. The downstream, where accessible, has no indications of flooding, overtopping, scouring.

27xx 61st Avenue SE – Site and Downstream Photos

Photo #1 – Subject property from 61st Avenue SE – viewing west



Photo #2 – Subject property from 61st Avenue SE – viewing southeast corner



Photo #3 – Frontage along 61st Avenue SE – viewing south (subject property to right)



Photo #4 – Southwest corner of 2740 60th Avenue SE



Photo #5 – West side of 60th Avenue SE at Southwest corner of 2740 60th Avenue SE – viewing south



Photo #6 – West side of 60th Avenue SE – viewing south



Photo #7 – Inlet City CB #16-16 at northeaasty corner of SE 28th Street & 60th Avenue SE



Photo #8 – Open roadside ditch on north side of SE 28th Street – viewing west



Photo #9 – Open ditch inlet at northeast corner of SE 28th Street & 60th Avenue SE



Photo #10 – City CB #16-11 within parking area of Calkins Landing Park (north side)



Photo #11 – City CB #16-13 within Landing Park (north side)



Photo #12 – Vegetated channel on south side of Calkins Landing Park – viewing southwest



Photo #13 – Outfall into Lake Washington at beach head



Photo #14 – Outfall into Lake Washington at beach head



Section I-2.5.5 Minimum Requirement #5 - On-Site Stormwater Management

The proposed project drainage shall be evaluated using "List #1, On-Site Stormwater Management BMPs for projects triggering Minimum Requirements #1 - #5" – DOE Volume 1, chapter 2, pages 56-57. A Geotechnical Evaluation was prepared and is attached to this Report in Appendix A.

List #1

*Lawn and landscape areas BMP T5.13 – **feasible*** - The use of Post-Construction Soil Quality and Depth shall be implemented within areas of the property that are not covered by hard surfaces and were disturbed during condition.

Roofs:

1.a. *Full Dispersion BMP T5.30 – **infeasible*** due to lack of available 100' of vegetated flow path downgradient from the roof area to the west.

1.b. *Downspout Full Infiltration BMP T5.10A – **infeasible*** due to lack of permeable soils. From Geotech Consultants Report – "...that infiltration of runoff from imperious surfaces is infeasible for this site."

2.a. *Rain Garden/Bioretention BMP T5.14A – **infeasible*** due to a perched high ground water table as indicated within Geotech Consultants Report.

2.b. *Bioretention Cells BMP T7.30 - **infeasible*** due to a perched high ground water table as indicated within Geotech Consultants Report.

3. *Downspout Dispersion System BMP T5.10B – **infeasible*** due to lack of available 50' flow path downgradient of the downspout leaders.

4. *Perforated Pipe Connection BMP T5.10C - **infeasible*** - see comment 1.b. above. Impermeable soils.

Other Hard Surfaces:

1. *Full Dispersion BMP T5.30 – **infeasible*** due to lack of available 100' of vegetated flow path downgradient from the other hard surfaces.

2.a. *Permeable Pavement BMP T5.15 – **infeasible*** - see comment 1.b. above. Impermeable soils.

2.b. *Rain Garden/Bioretention BMP T7.30 – **infeasible*** due to a perched high ground water table as indicated within Geotech Consultants Report.

3.a. *Sheet Flow Dispersion BMP T5.12 – **infeasible*** due to lack of available 25 feet of flow path downgradient from driveway.

3.b. *Concentrated Flow Dispersion BMP T5.11 - **infeasible*** due to lack of available flow path downgradient from other hard surfaces.

There are no available BMPs to provide treatment of the roof area or other hard surfaces. Therefore, a connection to the public storm system within 60th Avenue SE will be provided.

Appendix A: Geotechnical Evaluation

November 13, 2023

JN 23396

GM Investment Group, LLC
P.O. Box 32
Fall City, Washington 98024

Attention: Will Mentor
via email: wmentor@gm-ig.com

Subject: **Foundation Design Criteria and Evaluation of Infiltration Feasibility**
Proposed Residence and DADU
2740 – 61st Avenue S.E.
Mercer Island, Washington

Greetings:

This report presents our geotechnical conclusions related to foundation design and the feasibility of onsite infiltration of storm water for the planned redevelopment of the subject lot. On November 12, 2023, the undersigned principal geotechnical engineer visited the site to assess the subsurface conditions. The west and east sides of the lot abut 61st Avenue S.E. and 62nd Avenue S.E., respectively. The existing residence is located in the western portion of the lot. The subject property, as well as the surrounding lots, generally slopes gently down toward the west. There are no steep slopes on, or near, the site. Our review of the Mercer Island GIS indicates that there are no mapped geologic Critical Areas on the site, or in the surrounding area.

Our firm has previously conducted subsurface explorations and observed foundation excavations for several projects within a one block radius of the subject property. Four test holes were completed on the property at the approximate locations shown on the attached Site Exploration Plan. These test holes found topsoil and a layer of heavily-weathered silt overlying dense, glacially-compressed silt. These are typical soil conditions for the area. No groundwater seepage was encountered in the test holes. However, perched seepage is often found on top of the dense silt following extended wet weather.

The following is a log of the four test holes:

Depth (feet)	Description
0 – 1.0	Topsoil
1.0 – 2.5	Orangish-brown, mottled SILT, low plasticity, very moist, loose
2.5 – 3.5	Grayish-brown SILT, low plasticity, very moist, dense

No seepage was observed in the test holes.

CONCLUSIONS AND RECOMMENDATIONS

Based on the conditions observed in the test holes and surrounding excavations, and our previous experience with other projects in the immediate vicinity, it is our professional opinion that conventional foundations can be utilized for the proposed residence and DADU. All footing areas

will have to be excavated down to the dense, native, glacially-compressed soil. This may require overexcavation below the planned footing grades. We recommend that the footings be excavated using a smooth bucket, in order to prevent the subgrade disturbance that can result from the teeth on an excavator's bucket. Where overexcavation below the planned footing grades is necessary, the additional excavation can be backfilled to the planned footing grade using compacted quarry spalls or railroad ballast rock.

The silt soils will be easily disturbed once they are exposed. As a result, we recommend that the footing subgrades be protected with a layer of clean crushed gravel, in order to prevent disturbance and softening of the bearing soils during the placement of foundation forms and rebar.

SEISMIC CONSIDERATIONS

In accordance with the International Building Code (IBC), the site class within 100 feet of the ground surface is best represented by Site Class Type D (stiff soil).

The IBC and ASCE 7 require that the potential for liquefaction (soil strength loss) be evaluated for the peak ground acceleration of the Maximum Considered Earthquake (MCE), which has a probability of occurring once in 2,475 years (2 percent probability of occurring in a 50-year period). The dense, glacially-compressed soil that will support the foundations is not susceptible to seismic liquefaction under the ground motions of the MCE.

CONVENTIONAL FOUNDATIONS

The proposed structures can be supported on conventional continuous and spread footings bearing on undisturbed, dense soil, or on compacted crushed rock structural fill placed above this competent native soil. Prior to placing any structural fill beneath foundations, the excavation should be observed by the geotechnical engineer or building inspector to document that adequate bearing soils have been exposed.

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

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

An allowable bearing pressure of 2,500 pounds per square foot (psf) is appropriate for footings supported on competent native soil. A one-third increase in this design bearing pressure can be used when considering short-term wind or seismic loads. For the above design criteria, it is anticipated that the total post-construction settlement of footings founded on competent native soil

will be less than one inch, with differential settlements on the order of one-half-inch in a distance of 25 feet along a continuous footing with a uniform load.

Lateral loads due to wind or seismic forces may be resisted by friction between the foundation and the bearing soil, or by passive earth pressure acting on the vertical, embedded portions of the foundation. For the latter condition, the foundation must be either poured directly against relatively level, undisturbed soil or be surrounded by level, well-compacted fill.

We recommend using the following ultimate values for the foundation's resistance to lateral loading:

PARAMETER	ULTIMATE VALUE
Coefficient of Friction	0.40
Passive Earth Pressure	300 pcf

Where: pcf is Pounds per Cubic Foot, and Passive Earth Pressure is computed using the Equivalent Fluid Density.

If the ground in front of a foundation is loose or sloping, the passive earth pressure given above will not be appropriate. The above ultimate values for passive earth pressure and coefficient of friction do not include a safety factor.

EVALUATION OF INFILTRATION FEASIBILITY

The dense soil known to underlie this area, and which was observed in the test hole is glacially compressed.

There are no large or continuous pore spaces in the glacially-compressed silt that can transmit water. This soil is essentially impermeable, preventing water from percolating downward, which often causes a perched water table to form following extended heavy rainfall. This perched groundwater condition has been encountered previously on nearby sites.

Considering the observed soil conditions, and the likely presence of seasonal shallow perched groundwater, it is our professional opinion that infiltration of runoff from impervious surfaces is infeasible for this site. Attempting to infiltrate or disperse runoff from impervious surfaces on the site would only increase the potential for surface and subsurface drainage problems on neighboring properties, as well as the adjacent streets.

Please contact us if you have any questions regarding this report.

Respectfully submitted,
GEOTECH CONSULTANTS, INC.

Marc R. McGinnis, P.E.
Principal



Attachments: Vicinity Map, Site Exploration Plan

11/13/2023

MRM:kg

NORTH



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(Source: Microsoft MapPoint, 2013)

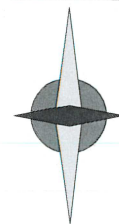


**GEOTECH
CONSULTANTS, INC.**

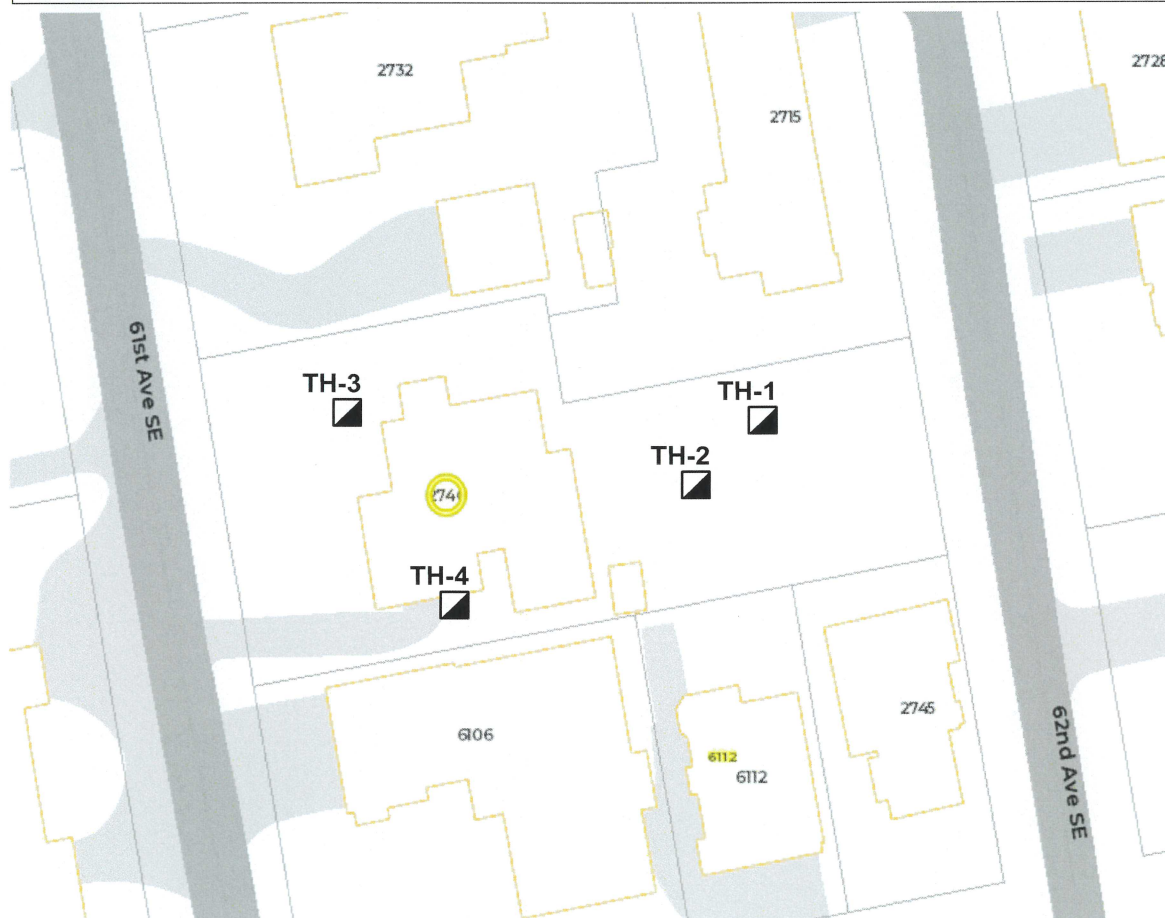
VICINITY MAP
 2740 - 61st Avenue S.E.
 Mercer Island, Washington

<i>Job No:</i> 23396	<i>Date:</i> Nov. 2023	<i>Plate:</i> 1
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NORTH



City of Mercer Island



Legend

- Address
- Building
- Property Line
- Docks
- Freeway
- Major Street
- Street
- Paved Driveway
- Paved Road
- Paved Parking Area
- Parks
- Lake Washington

Legend:

- ▣ Test Hole Location

**GEOTECH
CONSULTANTS, INC.**

SITE EXPLORATION PLAN
 2740 - 61st Avenue S.E.
 Mercer Island, Washington

<i>Job No:</i> 23396	<i>Date:</i> Nov. 2023	<i>No Scale</i>	<i>Plate:</i> 2
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