

FULL DRAINAGE REPORT
for
Saffold Garage & ADU

PFN _____

ISSUE DATE: September 18, 2023

REVISION DATE:

PREPARED BY:

Nicholaus B. Breske

REVIEWED BY:

Randolph R. Sleight, P.E.



10/30/23

CLIENT

Hank Saffold
19139 84th Ave. W Unit B
Edmonds, WA 98026
206-930-3867

ENGINEER

WESI Land Use Consultants
9740 Evergreen Way
Everett, WA 98204
425-356-2700

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Minimum Requirement # 1: Stormwater Site Plan

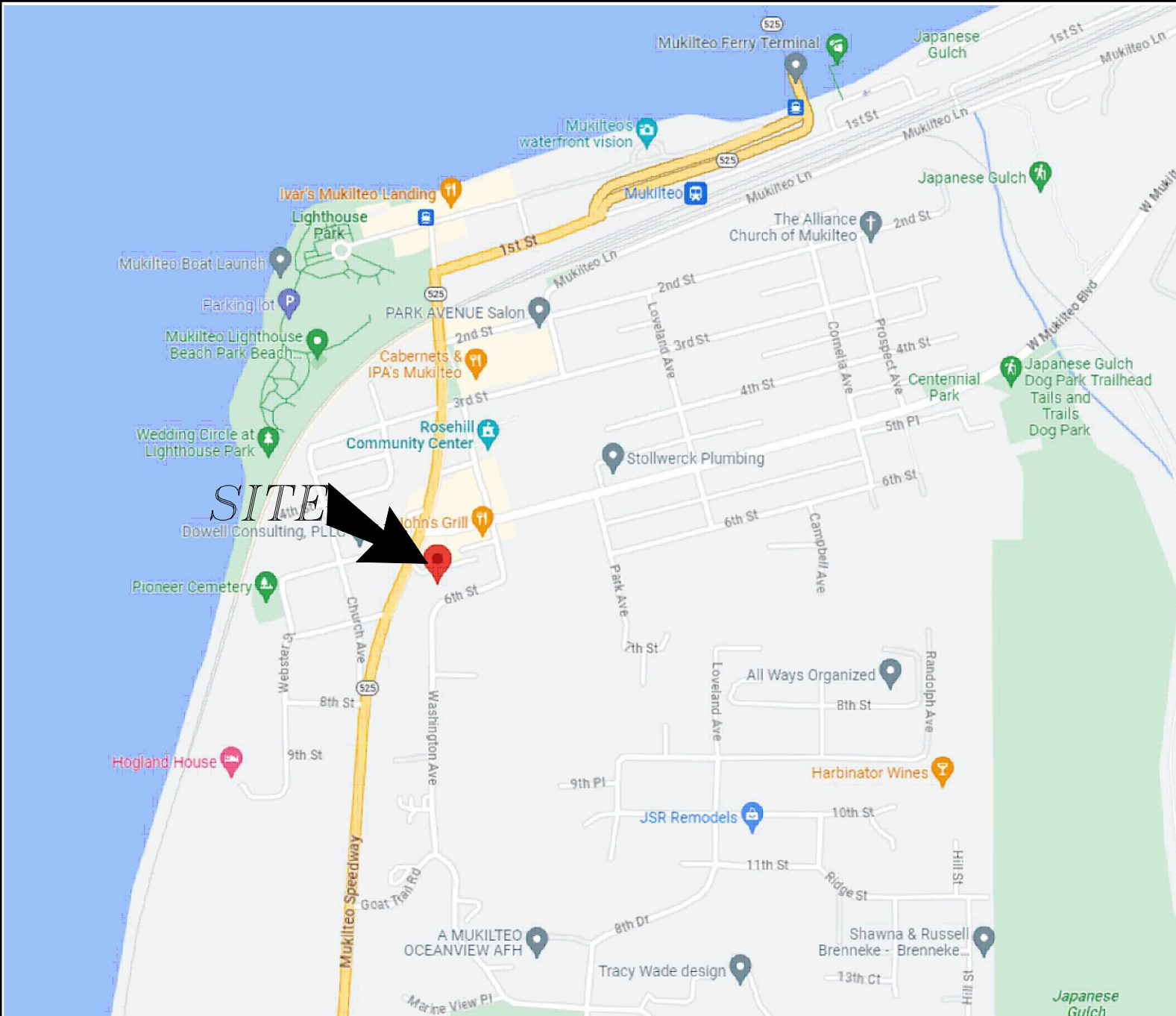
Executive Summary

On-site improvements consist of clearing/grading on the East side and Northern Face of the existing building to accommodate a Garage and ADU on top. A New driveway and access point is proposed to provide ingress/egress to the living units. A small walking path has been proposed to provide accessibility around the entirety of the buildings.

Drainage mitigation for roof area will be provided by a combination of dispersion trench and perforated stub out where dispersion is infeasible. The driveway is design to provide sheet flow dispersion along the east side of the driveway. Disturbed pervious areas will be amended per BMP T5.13. The project is to be designed to the 2019 Stormwater Management Manual for Western Washington.

Existing Conditions Summary

The property is one tax parcel, containing partial tree cover and residential lawn. The property has an existing gravel driveway accessing Washington Ave. On-site slopes are moderate to steep, a pad has been cut into the slope as part of the original house construction. The site generally slopes from the southeast side to the northwest.



TAX ACCOUNT NO.(S):

00534700000500

SITE ADDRESS:

514 WASHINGTON AVE.
MUKILTEO, WA 98275



**WESI
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(425)
356-2700

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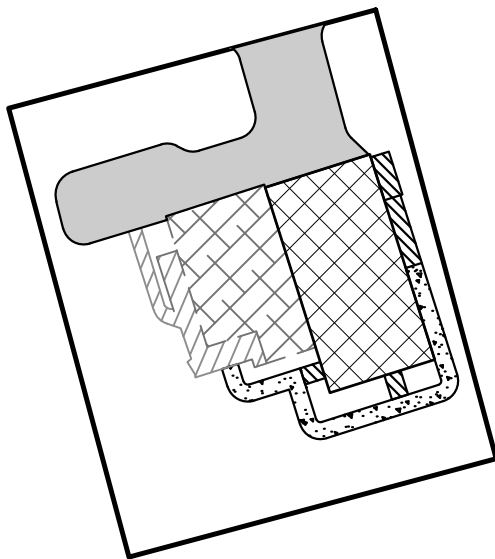
* 9740 EVERGREEN WAY * EVERETT * WA * 98204 *

VISIT OUR WEBSITE AT: WWW.WESI.CO

VICINITY MAP FOR HANK SAFFOLD

SE 1/4, NW 1/4, SEC.04, T.28N, R.04E, W.M.
MUKILTEO, WASHINGTON

DRAWN BY NBB	DATE 10/24/23	REV. BY	DATE	PROJECT MANAGER R. SLEIGHT	SCALE NTS
DRAWING FILE NAME 181742A_MASTER.DWG	CHECKED BY RRS	F.B. NO. -	JOB NUMBER 18-1742-A		



PROPOSED ROOFTOP/MEMBRANE DECK = 1,325 SF



PROPOSED ASPHALT DRIVEWAY = 1,452 SF



PROPOSED CONCRETE WALKWAY = 386 SF



PROPOSED STAIRS AND DECKING = 159 SF

TOTAL PROPOSED IMPERVIOUS AREA = 3,322 SF



EXISTING ROOFTOP = 890 SF



EXISTING CONCRETE = 300 SF

TOTAL EXISTING IMPERVIOUS AREA = 1,190 SF

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HARDSCAPE EXHIBIT FOR HANK SAFFOLD

SE 1/4, NW 1/4, SEC.04, T.28N, R.04E, W.M.
MUKILTEO, WASHINGTON

DRAWN BY NBB	DATE 10/24/23	REV. BY	DATE	PROJECT MANAGER R. SLEIGHT	SCALE 1"=50'
DRAWING FILE NAME 181742A_MASTER.DWG	CHECKED BY RRS	F.B. NO. -	JOB NUMBER 18-1742-A		

Upstream Analysis

The topography of the site is Steep to moderate. Minor sheet flows are expected from residential lawn on parcels to the south and east. No other upstream flows appeared to enter the site and no sources of erosion were observed.

Downstream Analysis

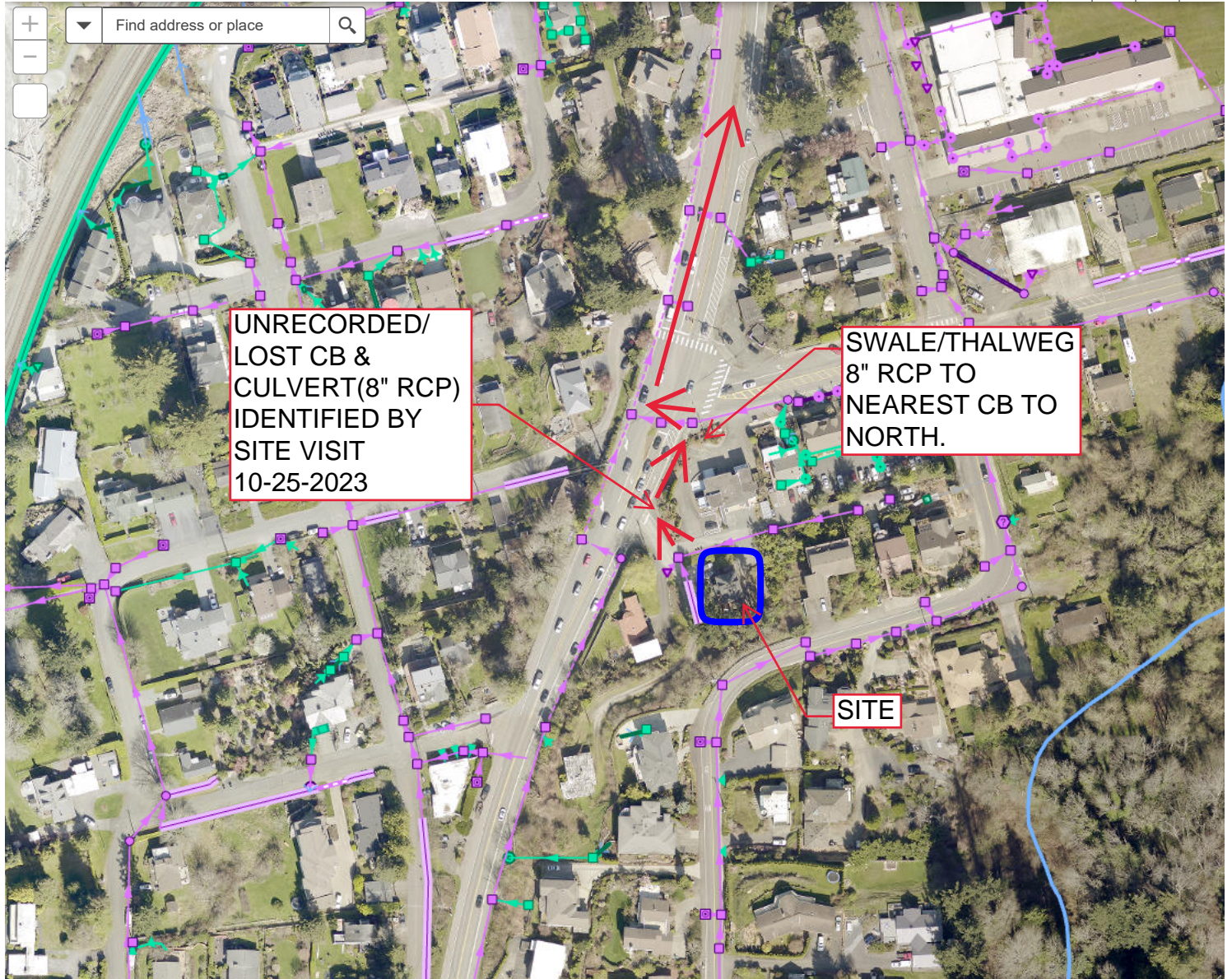
A downstream analysis was provided by Nicholas Breske of WESI on October 25, 2023.

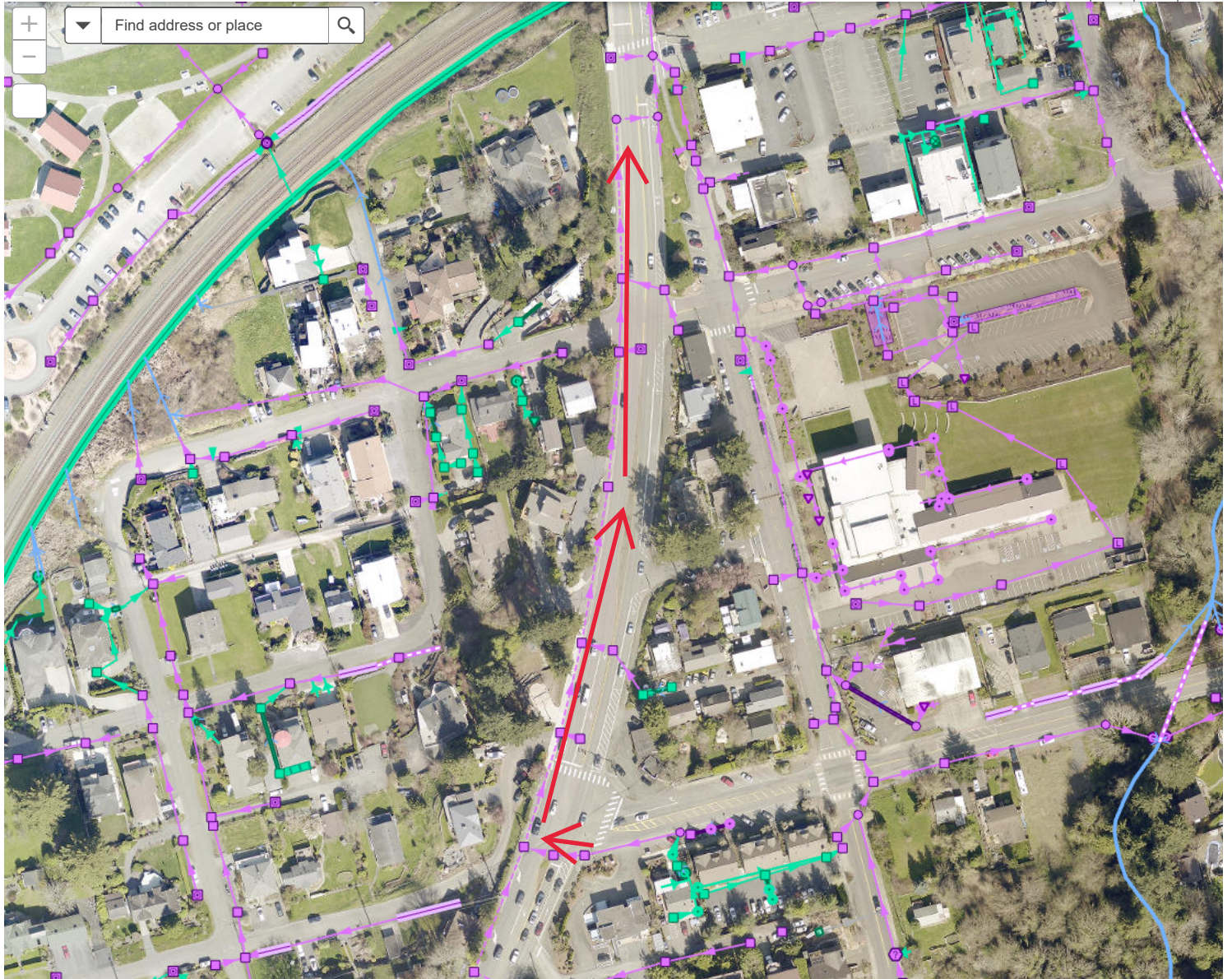
Runoff from the site appears to flow to the northwest into a public conveyance system that flows across the alley to the north of the property which appears to travel approximately 100 feet north through a buried culvert system and then outflows into an open ditch to be collected by an 8" RCP to the north and flows under 5th St. At which point it turns west and flows under Mukilteo Speedway, then into the City's MS4 System to outflow into Puget Sound. According to City of Mukilteo Storm Network Viewer the outfall of this site's drainage is to the east of the Silver Cloud Hotel on the Mukilteo waterfront.

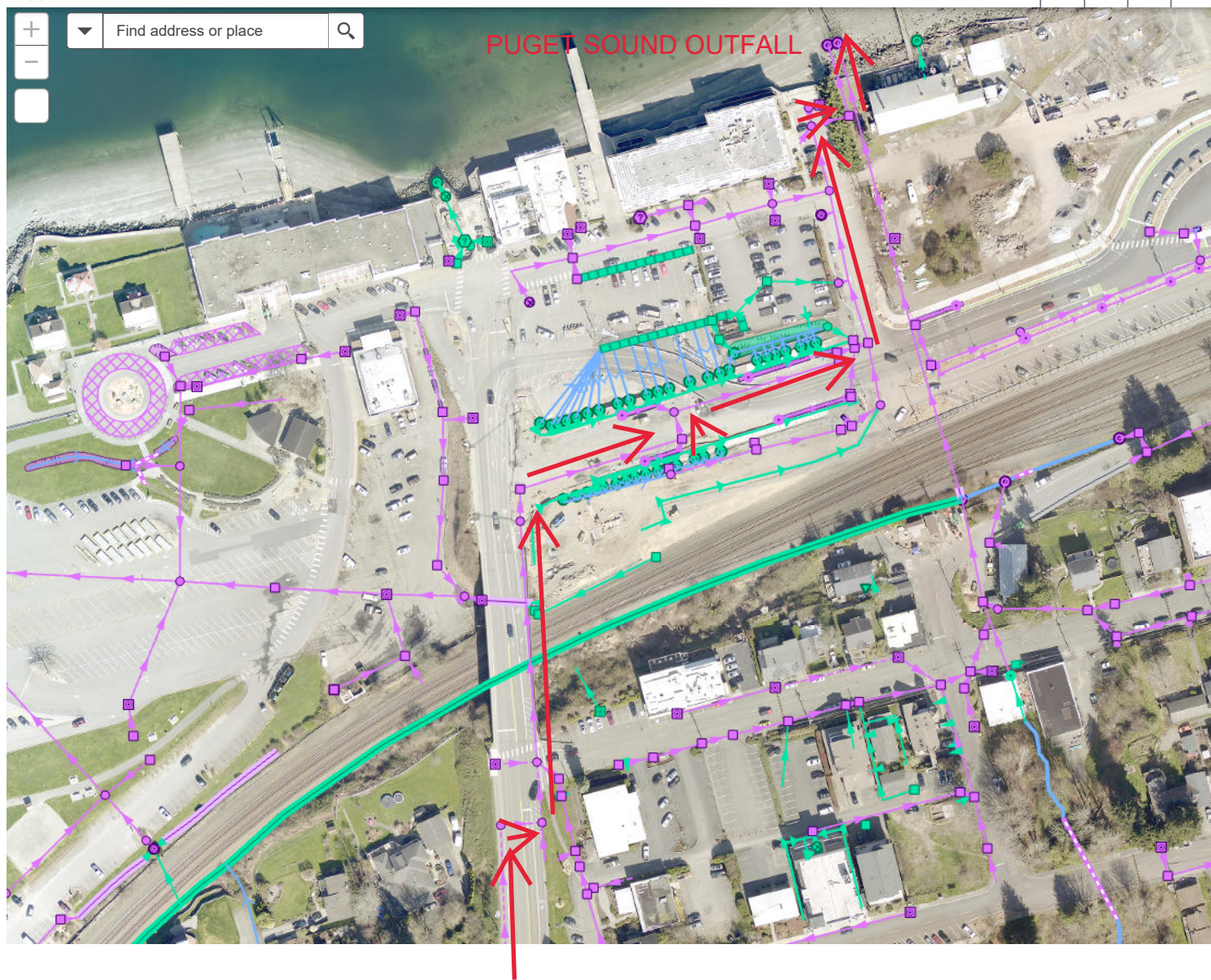
Drainage Complaints

There are no known drainage complaints for this site.

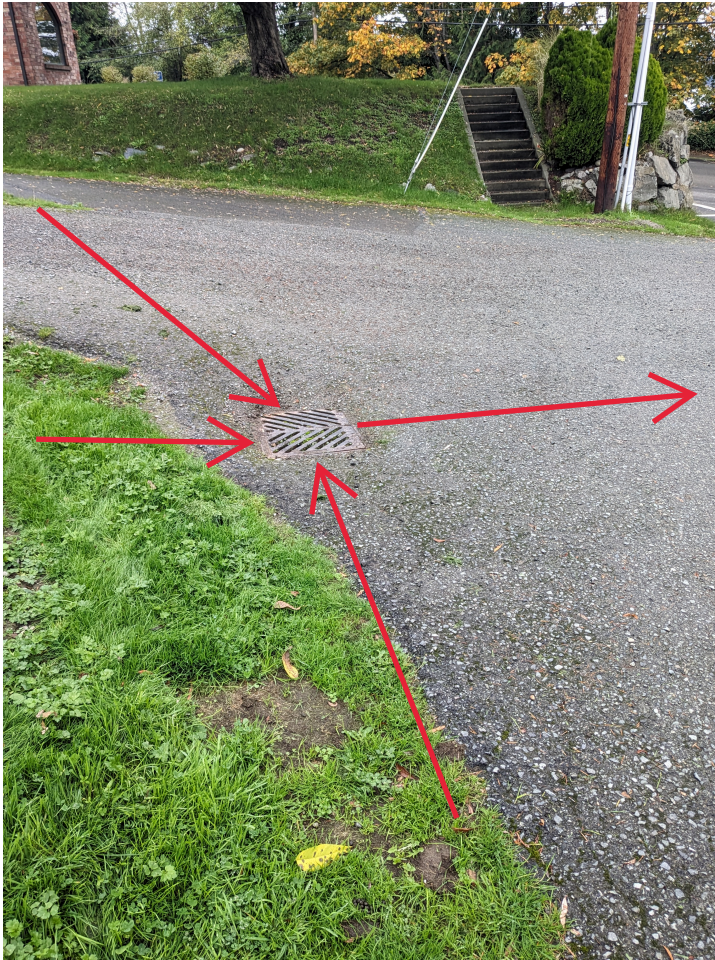
DOWNSTREAM AND AERIAL MAPS



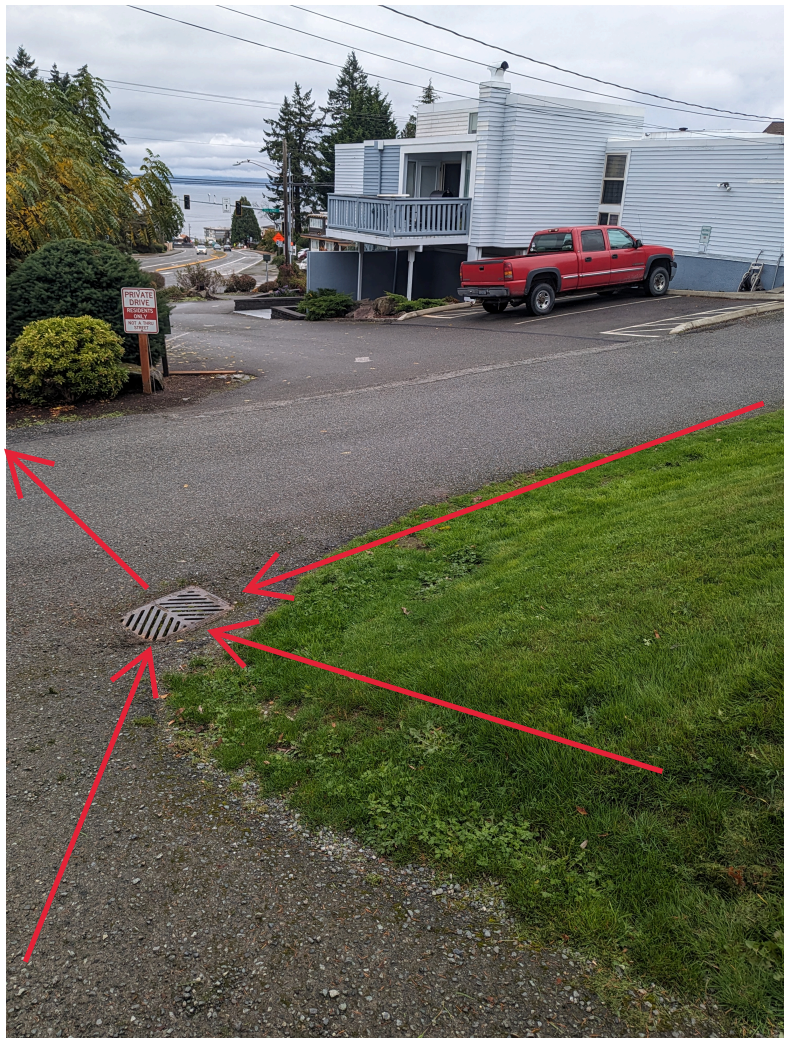




**DOWNSTREAM
PHOTOGRAPHS**



CB Located at northwestern corner of property looking westerly



CB Located at northwestern corner of property looking Northerly



Photos of assumed outfall to subject property
8" RCP located at unidentified Swale/thalweg
at the intersection of 5th & mukilteo speedway.

Flows enter another 8" rcp to the northern
CB that is part of the MS4 system making
its way to Puget Sound.



Minimum Requirement # 2: SWPPP Narrative

Element #1: Mark Clearing Limits

Clearing limits have been shown on the SWPPP Plan.

Element #2: Establish Construction Entrance

A temporary construction entrance shall be established at the existing driveway entrance. All vehicles shall be free of debris prior to leaving the site.

Element # 3: Control Flow Rates

Flow rates during construction are to be contained through the installation of temporary or permanent seeding, mulching or straw-wattles installed on all disturbed/exposed soils.

Element # 4: Install Sediment Controls

Sediment controls mainly consist of the installation of silt fencing along the perimeter of the site and plastic covering over spoils.

Element # 5: Stabilize Soils

All soil disturbed during site grading will be stabilized by use of the most appropriate BMP method available. These consist of short-term and long-term solutions. Short-term methods consist of compaction of the soils by vibratory roller or bulldozer. Long-term methods consist of straw covering the soil (this is in the case of the project becoming dormant for greater than 1 month). At this time no wintertime grading or construction activities will occur. During construction periods longer than 1 working week (7 days) where the soils are exposed and un-worked will use the proscribed methods in the 2019 Storm Water Management Manual for Western Washington to reduce sedimentation transported offsite. If winter grading is conducted, all exposed soils shall be covered within 2 days.

Element # 6: Protect Slopes

Steep Slopes are present on site. The steepest slopes to the south of the proposed development are to remain undisturbed. All steep slopes disturbed shall be stabilized via straw covering, straw wattles or plastic covering to minimize erosion to the maximum extent feasible.

Element # 7: Protect Drain Inlets

Any culvert inlets affected by the project will be protected with triangular silt dikes or equivalent.

Element # 8: Stabilize Channels and Outlets

Channels are present adjacent to the site and are included as part of this proposal. A re-stabilization detail is provided for the inlet on the proposed channel disturbance. Existing channels or drainage outlets located within 500-feet of the property of the property should be routinely inspected for debris that may dam and/or aid erosion.

Element # 9: Control Pollutants

All pollutants from construction vehicles will be contained and disposed of in the approved manner consistent with state environmental policies. Any vehicle maintenance will be performed by authorized mechanics using drip pans and waste containment vessels. All pollutants will be disposed offsite at approved facilities.

Element # 10: Control De-Watering

De-watering of the site is not expected. If dewatering of the site is needed, all groundwater removed shall be retained and recharged into the ground after de-watering has been finalized.

Element # 11: Maintain BMP's

All Temporary Erosion and Sedimentation Control (TESC) devices and equipment will be inspected and maintained on a weekly basis if not sooner, based on storm events contributing to runoff. When construction is complete and the site is stabilized, any existing sediment will be removed and stabilized onsite.

Element # 12: Manage the Project

A general construction manager will manage the project for or by the owners. The construction manager shall maintain all the above items to minimize sediment transport and turbid water leaving the site. His job will entail continual observation of the grading operations to ensure minimal effects to adjacent properties and offsite waterways.

Element # 13: Protect On-Site Stormwater Management BMPs

Dispersion flow path areas and soil amendment areas will be protected from compaction where feasible. No other stormwater BMP's proposed for development.

Minimal Requirement # 3: Water Pollution Source Control

All proposed development is to consist of small residential type construction. No water pollution source control is needed.

Minimum Requirement # 4: Preservation of Natural Drainage Systems and Outfalls, and provisions of off-site mitigation

No changes to the existing drainage systems and outfalls are proposed with this development. All proposed runoff from the project area is to disperse to maintain natural drainage paths and systems.

Minimum Requirement #5 On-Site Storm Water Management

Due to the project proposing less than 5,000 sf of new hard surfaces, Minimum Requirements 1 through 5 must be evaluated. Per the 2019 Stormwater Management Manual for Western Washington either the LID performance standard or list #1 must be implemented. This proposal chooses to utilize the options in list #1.

Lawn and landscaped areas:

- Post-Construction Soil Quality and Depth in accordance with BMP T5.13 (To be used in disturbed vegetated areas)

Roofs feasibility description:

1. Full Dispersion per BMP T5.30 or Downspout Full Infiltration per BMP T5.10A.
 - i. Full Dispersion is infeasible due to insufficient flow path length and lack of native forest vegetation. Full Infiltration is infeasible due to inadequate infiltration conditions as noted by the Geotech report attached in the appendix of this report.
2. Bioretention per Volume V, Chapter 7.
 - i. Since the entire site consists of inadequate soil depth for roof drain infiltration, bioretention facilities are infeasible.
3. Downspout Dispersion Systems in accordance with BMP T5.10B.
 - i. Downspout Dispersion System is feasible with the amount of vegetation downstream. Only one half of the roof/deck of the proposal is feasible with this option, therefore downspout dispersion will be used to the maximum extent feasible and the next option will be utilized to mitigate the remainder. Roof drain dispersion consists of 1 dispersion trench.
 - ii.

Dispersion Trench Sizing Calculation:

- 10 Lineal feet of trench required per 700 sf. of roof area.
- Proposed roof area to trench = 662.5 sf.
- Total length required => $662.5 \text{ sf.} \times 10 \text{ lf} / 700 \text{ sf.} = 9.46 \text{ lf}$
=> Designed length = 10 lf

4. Perforated Stub-out Per BMP T5.10C
 - i. Perforated stub-out is feasible for the remaining 662.5 sf of rooftop and will be utilized at this point.

Other Hard Surfaces feasibility description:

1. Full Dispersion per BMP T5.30
 - i. As noted above, Full Dispersion is infeasible due to insufficient flow path length and lack of native forest vegetation.
2. Permeable Pavement per BMP T5.15
 - i. Due to the fact that the site is deemed infeasible for infiltration, permeable pavement is infeasible.
3. Bioretention per Volume V, Chapter 7.
 - i. Since the entire site consists of inadequate soil depth for infiltration, bioretention facilities are infeasible.
4. Sheet Flow Dispersion in accordance with BMP T5.12 or BMP T5.11.
 - i. Sheet Flow Dispersion BMP T5.12 has been selected for new driveway areas.

For the proposed driveway area, BMP T5.12 Sheet Flow Dispersion has been selected and a gravel transition zone has been specified along the downslope side. If the proposed driveway is to be composed of gravel and concentrated flows are not expected, then a gravel flow spreader is not required, but the required dispersion flow path length must be maintained. Additionally, all disturbed pervious areas are to be amended per BMP T5.13.

BMP T5.13 Post-Construction Soil Quality and Depth

Maintenance

- Soil quality and depth should be established toward the end of construction and once established, should be protected from compaction, such as from large machinery use, and from erosion.
- Soil should be planted and mulched after installation.
- Plant debris or its equivalent should be left on the soil surface to replenish organic matter.

APPENDIX I

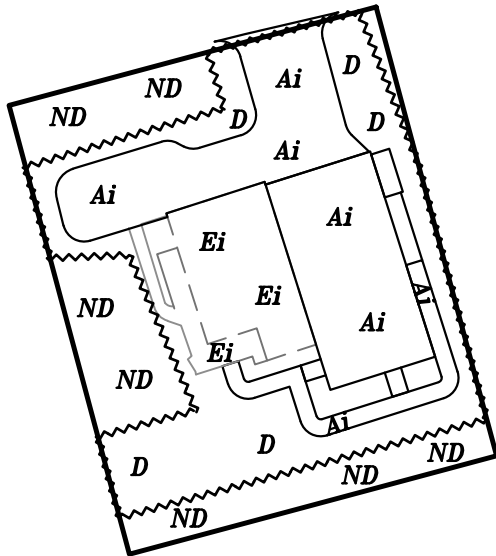
Drainage Plan

APPENDIX II

SOIL INFORMATION

APPENDIX III

SOIL AMENDMENT



D = DISTURBED AREA (2,922 SF) - INSTALL 8" MINIMUM DEPTH STOCKPILED SOIL PER BMP T5.13

Ai = PROPOSED IMPERVIOUS AREA (3,322 SF)

ND = NON DISTURBED AREA TO REMAIN COVERED WITH EXISTING SECOND GROWTH TREE AND UNDERSTORY

Ei = EXISTING IMPERVIOUS AREA

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SOIL PLACEMENT EXHIBIT FOR HANK SAFFOLD

SE 1/4, NW 1/4, SEC.04, T.28N, R.04E, W.M.
MUKILTEO, WASHINGTON

DRAWN BY NBB	DATE 10/24/23	REV. BY	DATE	PROJECT MANAGER R. SLEIGHT	SCALE 1"=50'
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Model SOIL MANAGEMENT PLAN for BMP T5.13(available as MS Word file at www.SoilsforSalmon.org)**PROJECT INFORMATION**

Page # ____ of ____ pages

Complete all information on page 1; only site address and permit number on additional pages.

Site Address / Lot No.: 514 Washington Ave

Permit Type: _____ Permit Number: _____

Permit Holder: _____ Phone: _____

Mailing Address: _____

Contact Person: _____ Phone: _____

Plan Prepared By: _____

ATTACHMENTS REQUIRED (Check off required items that are attached to this plan)

____ Site Plan showing, to scale: _____ Areas of undisturbed native vegetation (no amendment required)
 _____ New planting beds and turf areas (amendment required)
 _____ Type of soil improvement proposed for each area

Soil test results (required if proposing custom amendment rates)

Product test results for proposed amendments

AREA # D (should match Area # on Site Plan)

PLANTING TYPE ☒ Turf _____ Undisturbed native vegetation
 _____ Planting Beds _____ Other: _____

SQUARE FOOTAGE OF THIS AREA: 2,922 square feet

SCARIFICATION 8 inches (depth) of scarification needed to achieve finished total 12" loosened depth.
☒ Subsoil will be scarified

PRE-APPROVED AMENDMENT METHOD:
☒ Topsoil import
 Amend with compost
 _____ Stockpile and amend
 (_____ cu. yds. stockpiled)

4 inches of compost or imported topsoil applied
 X 3.1 (conversion factor, inches to cubic yards)
12.4 = cu. yards per 1,000 sq. ft.
 X 3 ,000s sq.ft. in this area
37.2 = cubic yards of amendment → → → → →
 (needed to cover this area to designated depth)

PRODUCT: Contractor TopsoilQUANTITY: 37.2 CU. YDS.

CUSTOM AMENDMENT
 _____ Topsoil import
 _____ Topsoil & compost lift
 Amend
 _____ Stockpile and amend
 (_____ cu. yds. stockpiled)

Attach test results and calculations.
 _____ inches organic matter or topsoil import
 X 3.1
 _____ = cu. yards / 1,000 sq. ft.
 X _____ ,000s sq.ft. in this area
 _____ = cubic yards of amendment → → → → →

PRODUCT: _____

QUANTITY: _____ CU. YDS.

MULCH

____ ,000 sq.ft.
 X 6.2 (conversion, to give 2 inch mulch depth)
 _____ = cubic yards of mulch → → → → →

PRODUCT: _____

QUANTITY: _____ CU. YDS.

TOTAL AMENDMENT/TOPSOIL/MULCH FOR ALL AREAS (complete on page 1 only, totaling all areas/pages in this Plan)

<input type="checkbox"/> Product #1: _____	<input type="checkbox"/> Quantity: _____ cu. yds.
<input type="checkbox"/> Test Results: _____ % organic matter _____ C:N ratio <25:1 (except mulch, or <35:1 for native plants)	_____ "stable" (yes/no)
<input type="checkbox"/> Product #2: _____	<input type="checkbox"/> Quantity: _____ cu. yds.
<input type="checkbox"/> Test Results: _____ % organic matter _____ C:N ratio <25:1 (except mulch, or <35:1 for native plants)	_____ "stable" (yes/no)
<input type="checkbox"/> Product #3: _____	<input type="checkbox"/> Quantity: _____ cu. yds.
<input type="checkbox"/> Test Results: _____ % organic matter _____ C:N ratio <25:1 (except mulch, or <35:1 for native plants)	_____ "stable" (yes/no)

Date: _____

Inspector: _____

Approved: _____

Revisions Required: _____

Date: _____

Inspector: _____

Approved: _____

Revisions Required: _____

COMMENTS: _____