*Calculations are estimates and based on proposed project options. These numbers are subject to change based on final project determination.*

Total Parcel Area: 179,423 ft²

Total Treatable Area: 179,423 ft²

Minimum 25% treatment: 44,856 ft²

Soil Information (see attached soil characterization sheets):
- Soil Test #1 – A Soil Drainage Test was completed for this site. No groundwater was found, and the infiltration rate is moderate.
- Soil Test #2 – A Simple Investigation was completed to check for bedrock or groundwater. No bedrock or groundwater was discovered, and infiltration rate is assumed moderate based on information from Soil Test #1.

Proposed BMPs:
1. Rain Garden treating house roof and lawn
2. Infiltration trench treating driveway, outbuildings & lawn/landscape
3. Media Filter Drain treating lawn
4. Dispersion with native landscaping treating lawn and barn roof
5. Native Landscaping treating lawn and rehab of existing landscape area

Estimated Area to be Treated: 176,000 ft²

Estimated Budget: $228,800
Soil Characterization Sheet – Soil Test #2 (Infiltration)

Step 1. Review available soil data and recommend on-site soil testing
To be completed by HIP Coordinator.

Off-site test pit data. Review map provided by HIP. If one test pit is within 100’ of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
<th>Test Pit Number</th>
<th>Soil Type/ Infiltration Rate</th>
<th>Depth to Groundwater</th>
<th>Depth to Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS_PIT_2</td>
<td>.68</td>
<td>4 ft</td>
<td>Greater than 3’</td>
</tr>
<tr>
<td>E_North EBV5</td>
<td>.68</td>
<td>2 ft</td>
<td>Greater than 3’</td>
</tr>
<tr>
<td>E_North_EBV6</td>
<td>.68</td>
<td>5 ft</td>
<td>Greater than 3’</td>
</tr>
</tbody>
</table>

Based on this information, the recommended soil investigation procedure to follow in Step 2 is (determined by HIP Coordinator):

**SIMPLE INVESTIGATION- based on Soil Test #1 Information**

Step 2. On-site testing procedure to determine soil type
To be completed by HIP Coordinator or the project designer

Follow the soil testing methods and instructions for infiltration BMPs, found in the HIP Design Handbook (Infiltration Trench and Lake Whatcom Rain Garden).

Note: If designing for infiltration facilities in multiple locations, it is suggested that each location be checked for factors that might affect design considerations. Consult with the HIP Coordinator to determine the number of additional investigations recommended for each unique site.

I completed an on-site soil investigation using (check boxes of all completed tests):

- [ ] Soil Drainage Test
  I used the Rain Garden Manual
  After one wet season (or three dry season) tests I have determined that my soil drainage rate is ______ in/hr.
  I’ve characterized my soil as:
    - [ ] Good
    - [ ] Moderate
    - [ ] Marginal
    - [x] Poor

- [x] Simple Investigation
  I dug to a depth of 3’ below ground surface and found:
    - [ ] Groundwater
    - [ ] Bedrock
    - [ ] Other: ________________
    - [x] None of the above

- [ ] Soil Texture Test
  I used this test method to determine soil type (circle one):
    - [ ] Clay
    - [ ] Clayey Silt
    - [ ] Silt/Loam
    - [x] Sandy Loam/Sand
  I’ve characterized my soil as:
    - [ ] Good
    - [ ] Moderate
    - [ ] Marginal
    - [ ] Poor
Soil Characterization Sheet – Soil Test #1 (Rain Garden)

Step 1. Review available soil data and recommend on-site soil testing
To be completed by HIP Coordinator.

Off-site test pit data. Review map provided by HIP. If one test pit is within 100' of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
<th>Test Pit Number</th>
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<td>Greater than 3’</td>
</tr>
<tr>
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<td>.68</td>
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<td>Greater than 3’</td>
</tr>
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<td>E_North_EBV6</td>
<td>.68</td>
<td>5 ft</td>
<td>Greater than 3’</td>
</tr>
</tbody>
</table>

Based on this information, the recommended soil investigation procedure to follow in Step 2 is (determined by HIP Coordinator):

SOIL DRAINAGE TEST

Step 2. On-site testing procedure to determine soil type
To be completed by HIP Coordinator or the project designer

Follow the soil testing methods and instructions for infiltration BMPs, found in the HIP Design Handbook (Infiltration Trench and Lake Whatcom Rain Garden).

Note: If designing for infiltration facilities in multiple locations, it is suggested that each location be checked for factors that might affect design considerations. Consult with the HIP Coordinator to determine the number of additional investigations recommended for each unique site.

I completed an on-site soil investigation using (check boxes of all completed tests):

- [ ] Soil Drainage Test
  I used the Rain Garden Manual
  After one wet season (or three dry season) tests I have determined that my soil drainage rate is 0.68 in/hr.
  I’ve characterized my soil as:
    - [ ] Good
    - [X] Moderate
    - [ ] Marginal
    - [ ] Poor

- [ ] Simple Investigation
  I dug to a depth of 3’ below ground surface and found:
    - [ ] Groundwater
    - [ ] Bedrock
    - [ ] Other: ______________
    - [ ] None of the above

- [ ] Soil Texture Test
  I used this test method to determine soil type (circle one):
    - [ ] Clay
    - [ ] Clayey Silt
    - [ ] Silt/Loam
    - [ ] Sandy Loam/Sand
  I’ve characterized my soil as:
    - [ ] Good
    - [ ] Moderate
    - [ ] Marginal
    - [ ] Poor
Submittal Requirements

Part I: Submittal requirements for all HIP projects

- Project Summary & Project Narrative
- Project Site Plan (to scale)
  - Existing Conditions with Utilities, including approximate location of rights-of-way
  - Proposed Improvements (BMP footprint, dimensions, and conveyance)
  - Erosion and Sediment Control Plan (all BMPs except Landscaping BMP)
- Stormwater Pollution Prevention Plan (SWPPP)
- Material Specifications

Part II: Submittal requirements for each primary BMP

Complete all that apply:

- Native Landscaping
  - Design Submittal (Sections I-III)
  - Plant Density Calculator
  - Planting Areas Shown on Site Map
  - Planting Plan and HIP Plant List

- Infiltration Trench
  - Design Submittal (Sections I-II)
  - Sizing Calculator
  - Alternative Sizing Calculator
  - Facility Cross-Section

- Media Filter Drain
  - Design Submittal (Sections I-II)
  - Sizing Calculator
  - Alternative Sizing Calculator
  - Facility Cross-Section
Part II (continued)

- **Dispersion**
  - Design Submittal (Sections I-II)
  - Sizing Calculator
  - Alternative Sizing Calculator
  - Facility Cross-Section

- **Lake Whatcom Rain Garden**
  - Design Submittal (Sections I-II)
  - Sizing Calculator
  - Alternative Sizing Calculator
  - Facility Cross-Section
  - Planting Plan and HIP Plant List

Part III: Submittal requirements specific to the City or County

**City Only:**
- [ ] City Supplemental Forms

**County Only:**
- [ ] Whatcom County Permit Application

This project will not trip redevelopment thresholds regarding new or replaced impervious or partially-pervious surfaces. Therefore, this work qualifies for permitting exemptions for phosphorus- or flow-limiting projects as provided by applicable local codes and development.

Part IV: Signatures

<table>
<thead>
<tr>
<th>Printed Name</th>
<th>Signature</th>
<th>Date</th>
</tr>
</thead>
<tbody>
<tr>
<td>[ ] Submittal Completed By:</td>
<td></td>
<td></td>
</tr>
<tr>
<td>[ ] On Behalf Of:</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

These requirements were developed in accordance with the minimum requirements found in the Stormwater Management Manual for Western Washington and local regulations.
# Project Summary

**Address:** 1234 Lake Whatcom Ave.  
**Zip Code:** 98226  
**Parcel #:** 380522000000

**Owner Name:** John & Jane Example  
**Phone:** 360-555-5555  
**Email:** example@gmail.com

**HIP Staff:** Jenny Coe  
**Phone:** 360-306-4701  
**Email:** jcoe@whatcomcd.org

**Designer:**  
**Phone:**  
**Email:**

**Short Description:** Installation of five HIP BMPs to address stormwater runoff from private property

---

Check boxes below to characterize the project:

- [x] Native Landscaping
- [x] Infiltration Trench
- [x] Media Filter Drain
- [x] Dispersion
- [x] Lake Whatcom Rain Garden

- [ ] Permeable Paving
- [ ] Rainwater Harvesting
- [ ] Invasive Species Removal
- [ ] Sand Filter
- [ ] Other:

- [ ] None (Landscaping Only)
- [x] HIP Standard Calculations
- [ ] WWHM Modeling
- [ ] MGS-Flood Modeling
- [ ] Other:

---

<table>
<thead>
<tr>
<th>Measurement</th>
<th>Number</th>
<th>Notes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Total Developed Site Area</td>
<td>189,500 ft²</td>
<td>Existing landscape to be rehabbed</td>
</tr>
<tr>
<td>Area Landscaped by Project</td>
<td>108,000 ft²</td>
<td></td>
</tr>
<tr>
<td>Area Infiltrated by Project</td>
<td>20,250 ft²</td>
<td></td>
</tr>
<tr>
<td>Area Dispersed/Treated by Project</td>
<td>53,000 ft²</td>
<td></td>
</tr>
<tr>
<td>New or Replaced Lawn</td>
<td>0 ft²</td>
<td></td>
</tr>
<tr>
<td>New or Replaced Hard Surface</td>
<td>0 ft²</td>
<td></td>
</tr>
<tr>
<td>Amount of Soil Excavitated</td>
<td>62,270 ft³</td>
<td>(84 cu)</td>
</tr>
</tbody>
</table>

---

### Stormwater Calculations

- [ ] None (Landscaping Only)
- [x] HIP Standard Calculations
- [ ] WWHM Modeling
- [ ] MGS-Flood Modeling
- [ ] Other:
Project Narrative

The following project, located at Lake Whatcom 1234 Waterthud Ave, is proposed as a voluntary stormwater retrofit designed to protect and restore water quality in and around Lake Whatcom. The attached and enclosed information details the proposed phosphorus-reducing best management practices (BMPs) to be installed at the project site.

A summary of these BMPs is as follows:

- **BMP#1: Rain Garden**
  - This component will be 576 ft² in size.
  - This component addresses 7,800 ft² of site area.
  - Location of BMP relative to house: Front yard

- **BMP#2: Infiltration Trench**
  - This component will be 558 ft² in size.
  - This component addresses 12,450 ft² of site area.
  - Location of BMP relative to house: Side yard

- **BMP#3: Media Filter Drain (sheet flow)**
  - This component will be 310 ft² in size.
  - This component addresses 31,000 ft² of site area.
  - Location of BMP relative to house: South yard, west of pasture

If the project contains more than three unique BMPs, additional information must be attached to this project narrative. (Etc...) **Dispersion = 232 ft², improves 22,000 ft²** 

**Native Landscape = 86,000 ft²**
Material Specifications

Refer to the Material Specification section of the BMP Design Manual for more guidance on this requirement. Based on the project site plan and facility cross-section details, the following material specifications shall be followed to ensure proper function of the systems:

Project proposes to follow specifications from HIP Spec book, publication date April, 2017, with no exceptions or alternative specs proposed.
Stormwater Pollution Prevention Plan (SWPPP)

Describe all elements below that apply to your project. Refer to the current edition of the Stormwater Management Manual for Western Washington for drainage project instructions. If you are only completing a landscaping project, describe elements below that you will implement during the winter work season.

**Elements of the SWPPP**

**Element 1 – Mark Clearing Limits:**

I will mark clearing limits with orange fencing

**Element 2 – Establish Stabilized Construction Access:**

Equipment will enter site from North, driving over a gravelly spoil construction entrance, as shown on plan.

**Element 3 – Control Flow Rates:**

HIP Projects are not intended to increase flow rates or stormwater discharge volumes by any amount. Therefore, no flow controls are necessary during construction. If point-discharges are created during construction, they will be mitigated by proper installation of sediment controls and will be disconnected at the completion of the project.

**Element 4 – Install Sediment Controls:**

Silt fencing will be installed as shown on plans

**Element 5 – Stabilize Soils:**

All disturbed, exposed, stockpiled, or uncovered soil materials will be covered using an approved material (durable tarp, mulch, straw, etc.) during all rain events occurring during construction. Unworked soils that will be left exposed for more than 48 hours will be covered at the end of the last working day prior to that 48-hour duration. All disturbed soils will be covered completely between October 1 and May 30.

**Element 6 – Protect Slopes:**

No slopes of concern on site.
Elements of the SWPPP (continued)

Element 7 – Protect Drain Inlets:
No public or private drain inlets will be affected by project scope of work.

Element 8 – Stabilize Channels and Outlets:
No channels or outfalls on site.

Element 9 – Control Pollutants:
No pollution-generating activities in excess of the approved HIP project are allowed. Spills and leaks of fuels, fluids, or chemicals will not be allowed to enter storm systems. Any fuel, fluid, or chemical pollutants entering storm systems, including ditches, must be reported to the City of Bellingham or Whatcom County immediately upon discovery.

Element 10 – Control Dewatering:
Dewatering is not an expected activity related to a HIP project. Trenches, drywells, and other stormwater systems will not be used as sediment traps at any time. If sedimentation occurs, restoration (including dewatering) will not cause the discharge of sediment-laden water from the site by either surface or piped flow.

Element 11 – Maintain BMPs:
All erosion control BMPs will be maintained per manufacturer’s recommendations and as directed by HIP, City of Bellingham, or Whatcom County Staff.

Element 12 – Manage the Project:
Work will occur as defined in an approved HIP project plan and per HIP rules and requirements. Contractor will exercise adaptive management to correct any unexpected deficiencies in erosion control efforts, as necessary. Adaptive management strategies may be reviewed by HIP, City of Bellingham, or Whatcom County staff to ensure compliance with applicable rules and regulations.

Element 13 - Protect LID Features:
Features will be protected by placing straw wattles on uphill trench edging and by following “Construction Criteria for Infiltration Facilities” as written on HIP Standard Details.
Design Submittal
Lake Whatcom Rain Garden

Section I: System and Sizing Summary

I have provided a site plan and facility cross-section. I have defined the area that will drain into the rain garden, by piping or sheet flow.

The drainage area is **1,800 ft²** of impervious surface and/or **6,000 ft²** of lawn/landscape.

I have sized the system using approved methodology (HIP Sizing Calculator or stormwater hydrological modeling software) and attached that data.

The ponding area of the rain garden will be at least **576 ft²** in size.

I have calculated the number of plants needed for the total rain garden area (square feet of ponding area divided by 16) and completed a plant list.

I will need to install at least **36** native plants in my rain garden.

I have chosen mulch from the HIP-approved mulch list.

Mulch type: **Hog Fuel**  Mulch supplier: **Grow Source**

Section II: Site-Specific Planning

I have determined that the ponding area is at least 5′ from known utilities.

I have determined that the ponding area is at least 10′ from structures or property lines.

I have determined that the rain garden is not on a slope >10% or within 10′ upgradient of a slope >15% or within 50′ upgradient of a slope >35%.

I have developed an erosion control plan for the excavation of the rain garden and completed a site-specific SWPP that is included with this application.
Sizing Calculator
Lake Whatcom Rain Garden

Step 1: Characterize Soils. Use the flow chart in the design handbook to develop a soils characterization.
A. Off-site test pit data. Review map provided by HIP. If one test pit is within 100' of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
<th>Test Pit Number</th>
<th>Soil Type/Infiltration Rate</th>
<th>Depth to Groundwater</th>
<th>Depth to Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loamy Sand / 1.0 in/hr</td>
<td>None found</td>
<td>5 feet</td>
</tr>
<tr>
<td>2</td>
<td>Loam / 0.5 in/hr</td>
<td>8 feet</td>
<td>None found</td>
</tr>
</tbody>
</table>

B. On-site testing results:

I completed an on-site soil investigation using (check box in corner of all completed tests):

- [X] Soil Drainage Test
  I used the Rain Garden Manual
  After one wet season (or three dry season) tests I have determined that my soil drainage rate is _______ in/hr.

- [ ] Simple Investigation
  I dug to a depth of 3' below ground surface and found:
  - [ ] Groundwater
  - [ ] Bedrock
  - [ ] Other: ____________________
  - [ ] None of the above

- [ ] Soil Texture Test
  I used this test method to determine soil type (circle one):
  - [ ] Clay
  - [ ] Clayey Silt
  - [ ] Silt/Loam
  - [ ] Sandy Loam/Sand

I’ve characterized my soil as:
- [ ] Good
- [ ] Moderate
- [ ] Marginal
- [ ] Poor
- [ ] None of the above
**Step 2: Use Sizing Calculator.** Input project-specific data into the table below to calculate the size of the facility. Instructions: Choose soil type based on test results in Step 1. Insert amount of hard surface (roof, pavement, gravel) in square feet and amount of lawn and/or landscape area in square feet. Determine multipliers by using the table below and calculate required ponding area.

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Impervious Surface (square feet)</th>
<th>Hard Surface Multiplier (Varies)*</th>
<th>Lawn/Landscape (square feet)</th>
<th>Lawn/LS Multiplier (Varies)*</th>
<th>Ponding Area Minimum (square feet)**</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td><img src="x" alt="Cross" /> 1,800</td>
<td><img src="+" alt="Plus" /> 0.12</td>
<td><img src="x" alt="Cross" /> 6,000</td>
<td><img src="x" alt="Cross" /> 0.06</td>
<td>576</td>
</tr>
<tr>
<td>Moderate</td>
<td><img src="x" alt="Cross" /> 2,100</td>
<td><img src="+" alt="Plus" /> 0.12</td>
<td><img src="x" alt="Cross" /> 3,600</td>
<td><img src="x" alt="Cross" /> 0.06</td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td><img src="x" alt="Cross" /></td>
<td><img src="+" alt="Plus" /></td>
<td><img src="x" alt="Cross" /></td>
<td><img src="x" alt="Cross" /></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td><img src="x" alt="Cross" /></td>
<td><img src="+" alt="Plus" /></td>
<td><img src="x" alt="Cross" /></td>
<td><img src="x" alt="Cross" /></td>
<td>Infiltration Not Recommended. Use Treatment, Dispersion, or Native Landscaping BMPs</td>
</tr>
</tbody>
</table>

*Use multiplier reference table below.

**The ponding area is defined as the area that will be flooded before the system overflows. All rain gardens will have side slopes extending at least 18” from the top of this ponding area in all directions. See Design Guidance for more details and examples.

---

**MULTIPLIER REFERENCE TABLE**

**RAIN GARDEN SIZING**

<table>
<thead>
<tr>
<th></th>
<th>Multiplier by Soil Type</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Good</td>
</tr>
<tr>
<td><strong>Hard Surface Area</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 5,000 sf</td>
<td>0.09</td>
</tr>
<tr>
<td>More than 5,000 sf</td>
<td>0.07</td>
</tr>
<tr>
<td><strong>Lawn/Landscape Area</strong></td>
<td></td>
</tr>
<tr>
<td>Less than 2,000 sf</td>
<td>0.05</td>
</tr>
<tr>
<td>Between 2,000-10,000 sf</td>
<td>0.04</td>
</tr>
<tr>
<td>Between 10,000 - 40,000 sf</td>
<td>0.03</td>
</tr>
<tr>
<td>More than 40,000 sf</td>
<td>0.02</td>
</tr>
</tbody>
</table>
Soil Characterization Sheet – Soil Test #1(Rain Garden)

Step 1. Review available soil data and recommend on-site soil testing
To be completed by HIP Coordinator.

Off-site test pit data. Review map provided by HIP. If one test pit is within 100' of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
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<td>Greater than 3'</td>
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<td>2 ft</td>
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</tr>
<tr>
<td>E_North_EBV6</td>
<td>.68</td>
<td>5 ft</td>
<td>Greater than 3'</td>
</tr>
</tbody>
</table>

Based on this information, the recommended soil investigation procedure to follow in Step 2 is (determined by HIP Coordinator):

**SOIL DRAINAGE TEST**

Step 2. On-site testing procedure to determine soil type
To be completed by HIP Coordinator or the project designer

Follow the soil testing methods and instructions for infiltration BMPs, found in the HIP Design Handbook (Infiltration Trench and Lake Whatcom Rain Garden).

Note: If designing for infiltration facilities in multiple locations, it is suggested that each location be checked for factors that might affect design considerations. Consult with the HIP Coordinator to determine the number of additional investigations recommended for each unique site.

I completed an on-site soil investigation using (check boxes of all completed tests):

- [ ] Soil Drainage Test
  - I used the Rain Garden Manual
  - After one wet season (or three dry season) tests I have determined that my soil drainage rate is **0.68 in/hr**.
  - I've characterized my soil as:
    - [ ] Good
    - [X] Moderate
    - [ ] Marginal
    - [ ] Poor

- [ ] Simple Investigation
  - I dug to a depth of 3' below ground surface and found:
    - [ ] Groundwater
    - [ ] Bedrock
    - [ ] Other: ______________
    - [ ] None of the above

- [ ] Soil Texture Test
  - I used this test method to determine soil type (circle one):
    - [ ] Clay
    - [ ] Clayey Silt
    - [ ] Silt/Loam
    - [ ] Sandy Loam/Sand
  - I've characterized my soil as:
    - [ ] Good
    - [ ] Moderate
    - [ ] Marginal
    - [ ] Poor
SECTION VIEW

LAKE WHATCOM RAIN GARDEN
HIP BMP "E" TYPICAL

Construction Criteria for Infiltration Facilities

Initial basin excavation should be conducted to within 1-foot of the final elevation of the basin floor. Excavate infiltration trenches and basins to final grade only after all disturbed areas in the upgradient project drainage area have been permanently stabilized. The final phase of excavation should remove all accumulation of silt in the infiltration facility before putting it in service. After construction is completed, prevent sediment from entering the infiltration facility by first conveying the runoff water through an appropriate pretreatment system such as a pre-settling basin, wet pond, or sand filter.

Infiltration facilities should generally not be used as temporary sediment traps during construction. If an Infiltration facility is to be used as a sediment trap, it must not be excavated to final grade until after the upgradient drainage area has been stabilized. Any accumulation of silt in the basin must be removed before putting it in service.

Traffic Control Relatively light-tracked equipment is recommended for this operation to avoid compaction of the basin floor. The use of draglines and trackhoes should be considered for constructing infiltration basins. The Infiltration area should be flagged or marked to keep heavy equipment away.
Design Submittal
Infiltration Trench

Section I: System and Sizing Summary

I have defined the area that will drain into the infiltration trench, by piping or sheet flow and have provided a site plan and facility cross-section.

The drainage area is **1,200 ft²** of impervious surface and/or **11,250 ft²** of lawn/landscape.

I have sized the trench using approved methodology (HIP Sizing Calculator or stormwater hydrological modeling software) and attached that data.

The trench will be at least **558 ft²** in size and at least 1.5' (18 inches) deep.

I have calculated the amount of rock needed to fill the trench (cubic feet of trench volume ÷ 27).

I will need to install at least **31 yd³** of drain rock.

Section II: Site-Specific Planning

I have determined that the trench is at least 5' from known public and private utilities.

I have determined that the trench is at least 5' from structures with slab-on-grade foundations and 10' from structures with a basement or crawl space.

I have determined that the trench is not on a slope steeper than 10% and not within 10' upgradient of a slope steeper than 15% and not within 50' upgradient of a slope steeper than 35%.

I have developed an erosion control plan for the excavation of the trench and completed a site-specific SWFPP that is included with this application.
# Sizing Calculator

## Infiltration Trench

**Step 1: Characterize Soils.** Use the flow chart in the design handbook to develop a soils characterization.

A. Off-site test pit data. Review map provided by HIP. If one test pit is within 100' of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
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<th>Soil Type/ Infiltration Rate</th>
<th>Depth to Groundwater</th>
<th>Depth to Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Loam 1.0 in/hr</td>
<td>None found</td>
<td>5 feet</td>
</tr>
<tr>
<td>2</td>
<td>Loam 0.5 in/hr</td>
<td></td>
<td>None found</td>
</tr>
</tbody>
</table>

B. On-site testing results

I completed an on-site soil investigation using (check boxes of all completed tests):

- [ ] Soil Drainage Test
  - I used the Rain Garden Manual
  - After one wet season (or three dry seasons) tests I have determined that my soil drainage rate is ____ in/hr.

I’ve characterized my soil as:
- [ ] Good
- [ ] Moderate
- [ ] Marginal
- [ ] Poor

- [ ] Simple Investigation
  - I dug to a depth of 3' below ground surface and found:
    - [ ] Groundwater
    - [ ] Bedrock
    - [ ] Other: __________
    - [ ] None of the above

- [ ] Soil Texture Test
  - I used this test method to determine soil type (circle one):
    - [ ] Clay
    - [ ] Clayey Silt
    - [ ] Silt/Loam
    - [ ] Sandy Loam/Sand
  - I’ve characterized my soil as:
    - [ ] Good
    - [ ] Moderate
    - [ ] Marginal
    - [ ] Poor

**Step 2: Use Sizing Calculator.** Input project-specific data into the table below to calculate the size of the facility.

Instructions: Choose soil type based on test results in Step 1. Measure the amount of hard surface (roof, pavement, gravel) in square feet and amount of lawn and/or landscape area in square feet and insert values into table below. Use multipliers below to calculate required trench area.

<table>
<thead>
<tr>
<th>Soil Type</th>
<th>Hard Surface (square feet)</th>
<th>Hard Surface Multiplier</th>
<th>Lawn/Landscape (square feet)</th>
<th>Lawn/LS Multiplier</th>
<th>Trench Minimum (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Good</td>
<td>1,200</td>
<td>0.06</td>
<td>11,250</td>
<td>0.04</td>
<td>558</td>
</tr>
<tr>
<td>Moderate</td>
<td></td>
<td>0.09</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Marginal</td>
<td>0.12</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Poor</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td>Infiltration Not Recommended. Use Media Filter Drain or Dispersion BMPs.</td>
</tr>
</tbody>
</table>
Soil Characterization Sheet – Soil Test #2 (Infiltration)

Step 1. Review available soil data and recommend on-site soil testing
To be completed by HIP Coordinator.

Off-site test pit data. Review map provided by HIP. If one test pit is within 100’ of any property line, list only that data. Otherwise, please list three representative test pits, preferably within ¼ mile of the site.

<table>
<thead>
<tr>
<th>Test Pit Number</th>
<th>Soil Type/Infiltration Rate</th>
<th>Depth to Groundwater</th>
<th>Depth to Bedrock</th>
</tr>
</thead>
<tbody>
<tr>
<td>NS_PIT_2</td>
<td>.68</td>
<td>4 ft</td>
<td>Greater than 3’</td>
</tr>
<tr>
<td>E_North_EBV5</td>
<td>.68</td>
<td>2 ft</td>
<td>Greater than 3’</td>
</tr>
<tr>
<td>E_North_EBV6</td>
<td>.68</td>
<td>5 ft</td>
<td>Greater than 3’</td>
</tr>
</tbody>
</table>

Based on this information, the recommended soil investigation procedure to follow in Step 2 is (determined by HIP Coordinator):

**SIMPLE INVESTIGATION- based on Soil Test #1 Information**

Step 2. On-site testing procedure to determine soil type
To be completed by HIP Coordinator or the project designer

Follow the soil testing methods and instructions for infiltration BMPs, found in the HIP Design Handbook (Infiltration Trench and Lake Whatcom Rain Garden).

Note: If designing for infiltration facilities in multiple locations, it is suggested that each location be checked for factors that might affect design considerations. Consult with the HIP Coordinator to determine the number of additional investigations recommended for each unique site.

I completed an on-site soil investigation using (check boxes of all completed tests):

- Soil Drainage Test
  I used the Rain Garden Manual
  After one wet season (or three dry season) tests I have determined that my soil drainage rate is _______ in/hr.
  I’ve characterized my soil as:
  - Good
  - Moderate
  - Marginal
  - Poor

- **Simple Investigation**
  I dug to a depth of 3’ below ground surface and found:
  - Groundwater
  - Bedrock
  - Other: ______________ ______________
  X None of the above

- Soil Texture Test
  I used this test method to determine soil type (circle one):
  - Clay
  - Clayey Silt
  - Silt/Loam
  - Sandy Loam/Sand
  I’ve characterized my soil as:
  - Good
  - Moderate
  - Marginal
  - Poor
Construction Criteria for Infiltration Facilities

Infiltration facilities should generally not be used as temporary sediment traps during construction. If an infiltration facility is to be used as a sediment trap, it must not be excavated to final grade until after the upgradient drainage area has been stabilized. Any accumulation of silt in the basin must be removed before placing it in service.

Traffic Control Relatively light-weighed equipment is recommended for this operation to avoid compaction of the basin floor. The use of dreglines and trackhoes should be considered for constructing infiltration basins. The infiltration area should be flagged or marked to keep heavy equipment away.
Design Submittal
Media Filter Drain System

Section I: System and Sizing Summary

|☐| I have provided a site plan and facility cross-section. |
|☐| I have defined the area that will drain into the MFD by piping. |

That area is \( \phi \) ft\(^2\) of impervious surface and/or \( \phi \) ft\(^2\) of lawn/landscape

|☐| I have defined the area that will drain into the MFD by sheet flow. |

That area is \( \phi \) ft\(^2\) of impervious surface and/or \( 31,000 \) ft\(^2\) of lawn/landscape

|☐| I have sized the MFD using approved methodology (HIP Sizing Calculator or stormwater hydrological modeling software) and attached that data. |

My trench will need to be at least \( \frac{2}{3} \) feet wide and \( \frac{3}{10} \) ft\(^2\) in filter area

Section II: Site-Specific Planning

|☐| I have determined that the MFD is at least 5' from known public and private utilities. |
|☐| I have determined that the MFD is at least 5' from structures with slab-on-grade foundations and 10' from structures with a basement or crawl space. |
|☐| I have determined that the MFD is not on or next to a slope steeper than 15% and not within 50' upgradient of a slope steeper than 35%. |
|☐| I have developed an erosion control plan for the excavation of the trench and completed a site-specific SWPPP that is included with this application. |
**Sizing Calculator**  
**Media Filter Drain System**

*Instructions:* Measure hard surface area and lawn/landscaping surface area draining to trench. Characterize flow as sheet flow or piped flow. Insert values in the table below and use the following formula to calculate the size of MFD trench that is needed to adequately manage the runoff directed to the system. Sheet flow trenches must be at least 2' wide while piped flow trenches must be at least 3' wide in order for this calculation to be applicable. Runoff from a pipe that crosses at least 25' of lawn or landscape before reaching the trench can be considered sheet flow.

<table>
<thead>
<tr>
<th>Drainage Type</th>
<th>Hard Surface (square feet)</th>
<th>Hard Surface Multiplier</th>
<th>Lawn/Landscape (square feet)</th>
<th>Lawn/LS Multiplier</th>
<th>Minimum Trench Area (square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Flow</td>
<td>φ</td>
<td>0.03</td>
<td>(31,000)</td>
<td>0.01</td>
<td>310</td>
</tr>
<tr>
<td>Piped Flow</td>
<td>φ</td>
<td>0.04</td>
<td>φ</td>
<td>0.01</td>
<td>0</td>
</tr>
</tbody>
</table>

*Total area of trench needed (add trench areas above):*
Design Submittal
Dispersion

Section I: System and Sizing Summary

| ✓  | I have provided a site plan and facility cross-section. |
| ✓  | I have defined the area that will drain into the trench by piping. |

The drainage area is $\varnothing$ ft² of impervious surface and/or $\varnothing$ ft² of lawn/landscape

| ✓  | I have defined the area that will drain into the trench by sheet flow |

That area is $1,500$ ft² of impervious surface and/or $20,500$ ft² of lawn/landscape

| ✓  | I have sized the trench using approved methodology (HIP Sizing Calculator or stormwater hydrological modeling software) and attached that data. |

The trench will be at least $1160$ feet long and the downstream vegetated flow path must be at least that wide and $53$ feet long.

Section II: Site-Specific Planning

| ✓  | I have determined that the trench is at least 5' from known private or public utilities. |
| ✓  | I have determined that the trench is at least 5' from structures with slab-on-grade foundations and 10' from structures with a basement or crawl space. |
| ✓  | I have determined that the trench is not on or next to a slope steeper than 15% and not within 50' upgradient of a slope steeper than 35%. |
| ✓  | I have developed an erosion control plan for the excavation of the trench and completed a site-specific SWPPP that is included with this application. |
# Sizing Calculator

## Dispersion

**Step 1: Determine Trench Length.** Measure the hard surface area draining to the trench. Measure the lawn/landscaping surface area draining to the trench. Use the following formula to calculate the length of dispersion trench that is needed to adequately manage the runoff directed to the system. All dispersion trenches are 2' wide at minimum. Runoff from a pipe that crosses at least 25' of lawn or landscape before reaching the trench can be considered sheet flow.

<table>
<thead>
<tr>
<th>Drainage Type</th>
<th>Impervious Surface (square feet)</th>
<th>Hard Surface Multiplier</th>
<th>Lawn/Landscape (square feet)</th>
<th>Lawn/LS Multiplier</th>
<th>Minimum Trench Length (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Flow</td>
<td>1500</td>
<td>0.009</td>
<td>(20,500)</td>
<td>0.005</td>
<td>110</td>
</tr>
<tr>
<td>Piped Flow</td>
<td>0</td>
<td>0.014</td>
<td>13.5</td>
<td>0.005</td>
<td>0</td>
</tr>
</tbody>
</table>

Total length of trench needed (add trench lengths above): 116'

**Step 2: Determine Flow Path Length.** Use the following formula to calculate how far the dispersed water must travel, through vegetation, before it leaves your property or enters a water body. Runoff from a pipe that crosses at least 25' of lawn or landscape before reaching the trench can be considered sheet flow.

<table>
<thead>
<tr>
<th>Drainage Type</th>
<th>Hard Surface (square feet) &quot;A&quot;</th>
<th>Lawn/Landscape (square feet) &quot;B&quot;</th>
<th>Lawn Width &quot;C&quot;</th>
<th>Formula</th>
<th>Minimum Flow Path Length (linear feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sheet Flow</td>
<td>Not part of formula</td>
<td>Not part of formula</td>
<td>110'</td>
<td>(IC-25)/3+25</td>
<td>53'</td>
</tr>
<tr>
<td>Piped Flow</td>
<td>0</td>
<td>0</td>
<td>Not part of formula</td>
<td>(A/B)*100+25</td>
<td>0'</td>
</tr>
</tbody>
</table>

Total length of flow path needed (add flow path lengths above): 53'
Design Submittal
Native Landscaping

Section I: System and Sizing Summary

I have defined the area that will be converted into native landscaping and have provided a site map showing the planting area.

The area is currently \( \emptyset \) ft\(^2\) of impervious surface and/or \( 86,000 \) ft\(^2\) of lawn/existing landscape

If any of my planting is in the public right-of-way, I have received written approval from the jurisdiction that manages the public area (City or County).

The size of the area of the Right-of-Way I plan to landscape is \( \emptyset \) ft\(^2\)

I have calculated the amount of lake-friendly mulch (area divided by 80) and number of native plants (varies) I will need to install to complete the project.

My landscaping plan requires \( 1.075 \) cubic yards of approved mulch, and my plant list includes 300 native trees, 1024 native shrubs, and 2440 native groundcovers.

Section II: Site-Specific Planning

I have determined that I will not be planting trees or shrubs within 5' of a known utility, including septic systems (on private property) or 10' from a utility (in public ROW).

I have determined that I will not need additional approvals for planting trees in the public right-of-way (if proposed, tree planting in ROW is not required).

I have determined that the planting area is not on or next to a slope steeper than 35%.

I have developed a plan to prevent erosion or runoff during my planting activities, including work during the wet season that complies with winter work provisions.
Plant Density Calculator
Native Landscaping

Instructions: Choose and circle at least two of the following plant layers that will be included in this project. Use the corresponding planting option in the plant density calculator below to determine the number of plants needed for each plant layer.

<table>
<thead>
<tr>
<th>Option</th>
<th>Canopy Layers Included</th>
<th>Plant Layer</th>
<th>Project area (sq ft)</th>
<th>Density Divider</th>
<th>Number of Plants</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>Canopy, Understory, and Groundcover</td>
<td>Trees</td>
<td>86,000</td>
<td>225 (15' o.c.* )</td>
<td>300</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shrubs</td>
<td>86,000</td>
<td>64 (8' o.c.)</td>
<td>1,094</td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groundcovers</td>
<td>86,000</td>
<td>25 (5' o.c.)</td>
<td>2,440</td>
</tr>
<tr>
<td>B</td>
<td>Canopy and Understory Only (No Groundcovers)</td>
<td>Trees</td>
<td></td>
<td>144 (12' o.c.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Shrubs</td>
<td></td>
<td>36 (6' o.c.)</td>
<td></td>
</tr>
<tr>
<td>C</td>
<td>Canopy and Groundcovers Only (No Understory)</td>
<td>Trees</td>
<td></td>
<td>144 (12' o.c.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groundcovers</td>
<td></td>
<td>16 (4' o.c.)</td>
<td></td>
</tr>
<tr>
<td>D</td>
<td>Understory and Groundcovers Only (No Canopy)</td>
<td>Shrubs</td>
<td></td>
<td>49 (7' o.c.)</td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td>Groundcovers</td>
<td></td>
<td>25 (5' o.c.)</td>
<td></td>
</tr>
</tbody>
</table>

*The abbreviation "o.c." stands for "on center", a convention used to describe the average distance between plants. For example, a tree that is planted 15' o.c. would be, on average, 15' from its nearest neighbor.*
The City of Bellingham has accepted this information for its own use and has no responsibility for any use of this information by others. The information and data provided are intended only as a reference to the public and should not be used as the sole basis for any development or construction plans. The City of Bellingham reserves the right to make changes to this information at any time without notice. Any questions related to this information should be directed to the City of Bellingham at 360-671-8161. The full version of this information can be found at http://www.cityofbellinghamwa.gov. This map is not to be used for navigation. Use with caution.
GENERAL CONSTRUCTION STORMWATER POLLUTION PREVENTION PLAN

PURPOSE
TO PREVENT THE DISCHARGE OF SEDIMENT AND OTHER POLLUTANTS TO
THE MAXIMUM EXTENT PRACTICABLE FROM SMALL CONSTRUCTION PROJECTS.

DESIGN AND INSTALLATION

PLAN AND IMPLEMENT PROPER CLEARING AND GRADING OF THE SITE, IT IS
MOST IMPORTANT ONLY TO CLEAR THE AREAS NEEDED KEEPING EXPOSED
AREAS TO A MINIMUM. PHASE CLEARING SO THAT ONLY THOSE AREAS
THAT ARE ACTIVELY BEING WORKED ARE UNCOVERED.

NOTE: CLEARING LIMITS SHALL BE FLAGGED ON THE LOT OR PROJECT AREA
PRIOR TO INITIATING CLEARING.

• FROM OCTOBER 1 THROUGH APRIL 30, NO SOILS SHALL REMAIN EXPOSED
AND UNWORKED FOR MORE THAN TWO DAYS FROM MAY 1 TO SEPTEMBER 30,
NO SOILS SHALL REMAIN EXPOSED AND UNWORKED FOR MORE THAN SEVEN
DAYS.

• SOIL SHOULD BE MANAGED IN A MANNER THAT DOES NOT PERMANENTLY
COMPACT OR DETERIORATE THE FINAL SOIL AND LANDSCAPE SYSTEM. IF
DISTURBANCE AND/OR COMPACTION OCCUR THE IMPACT MUST BE
CORRECTED AT THE END OF THE CONSTRUCTION ACTIVITY. THIS SHALL
INCLUDE RESTORATION OF SOIL DEPTH, SOIL QUALITY, PERMEABILITY, AND
PERCENT ORGANIC MATTER. CONSTRUCTION PRACTICES MUST NOT CAUSE
DAMAGE TO OR COMPROMISE THE DEPTH OF PERMANENT LANDSCAPE OR
INFILTRATION AREAS.

• LOCATE ANY SOIL PILES AWAY FROM DRAINAGE SYSTEMS. SOIL PILES SHOULD
BE TAPED OR MOLDED UNTIL THE SOIL IS EITHER USED OR REMOVED.
PILES SHOULD BE SITUATED SO THAT RUNOFF DOES NOT RUN INTO THE
STREET OR ADJACENT YARDS.

• BACKFILL WALLS AS SOON AS POSSIBLE AFTER BACKFILLING. THIS WILL
ELIMINATE ANY SEDIMENT LOSS FROM SURPLUS FILL.

• THE CONSTRUCTION ENTRANCE SHALL BE STABILIZED WHERE TRAFFIC WILL
BE LEAVING THE CONSTRUCTION SITE AND TRAVELING ON PAVED ROADS OR
OTHER PAVED SURFACES.

• PROVIDE FOR PERIODIC STREET CLEANSING TO REMOVE ANY SEDIMENT THAT
MAY HAVE BEEN Tracker OUT. SEDIMENT SHOULD BE REMOVED BY
SHOVELING OR SWEETYING AND CAREFULLY REMOVED TO A SUITABLE
DISPOSAL AREA WHERE IT WILL NOT BE RE-ERODED, STREET WASHING IS
PROHIBITED.

CASE STUDY/EXAMPLE

ADJACENT WATTEIS
SHALL TIGHTLY ABUT
OR OVERLAP

WATTEIS MUST BE PLACED
ALONG SLOPE CONTOURS

SPACING DEPENDS ON
SOL TYPE AND SLOPE
STEEPNESS

SEDEMNT, ORGANIC
MATTER, AND NASTE
SEEDS ARE CAPTURED
BEGINE THE ROLL.

LIVE STAKE

1"X1" STAKE

NOTE:
1. WATTE INSTALLATION REQUIRES THE PLACEMENT AND SECURE STAKING OF THE WATTE IN
A TRENCH, 3'-5' DEEP. DUG ON CONTOUR, RUNOFF MUST NOT BE ALLOWED TO RUN
UNDER OR AROUND WATTE.

2. WATER INSTALLATION MUST BE COMPLETE PRIOR TO CLEARING AND GRADING ACTIVITY.
3. SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND
RE-INSERTING IT INTO THE CATCH BASIN.

WATTEIS (SEDIMENT BARRIER)

QUARRY SPALLS
GEOTEXTILE FOR
SEPARATION
GEOTEXTILE FOR
SEPARATION
GEOTEXTILE FOR
SEPARATION
HOG FUEL
HOG FUEL
HOG FUEL
CROSS SECTION
CROSS SECTION
CROSS SECTION

NOTE:
1. INSERT SHALL BE INSTALLED PRIOR TO CLEARING AND GRADING ACTIVITY, OR UPON
PLACEMENT OF A NEW CATCH BASIN.
2. SEDIMENT SHALL BE REMOVED FROM THE UNIT WHEN IT BECOMES HALF FULL.
3. SEDIMENT REMOVAL SHALL BE ACCOMPLISHED BY REMOVING THE INSERT, EMPTYING, AND
RE-INSERTING IT INTO THE CATCH BASIN.

CATCH BASIN INSERT (INLET PROTECTION) DETAIL

NTS

NTS

NTS

NTS
Case Study / Example

My HIP Project will meet the required density for the following layers (Choose AND CIRCLE at least two)

- Canopy (Native Trees)
- Understory (Native Shrubs)
- Groundcover (Small Native Plants)

**If you chose:**

**Then your minimum density will be...**

<table>
<thead>
<tr>
<th>Total Project Area (in square feet)</th>
</tr>
</thead>
<tbody>
<tr>
<td>22000</td>
</tr>
</tbody>
</table>

**Plant List, Please complete with species name (common or scientific) and desired number**

<table>
<thead>
<tr>
<th>Native Trees</th>
<th>Native Shrubs</th>
<th>Native Groundcovers</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Species Name</strong></td>
<td><strong>#</strong></td>
<td><strong>Species Name</strong></td>
</tr>
<tr>
<td>Alaska Yellow Cedar</td>
<td>10</td>
<td>Bald Hip Rose</td>
</tr>
<tr>
<td>Beaked Hazelnut</td>
<td>10</td>
<td>Salal</td>
</tr>
<tr>
<td>Big Leaf Maple</td>
<td>10</td>
<td>Tall Oregon Grape</td>
</tr>
<tr>
<td>Cascara</td>
<td>10</td>
<td>Osoberry</td>
</tr>
<tr>
<td>Western Redcedar</td>
<td>10</td>
<td>Pacific Rhododendron</td>
</tr>
<tr>
<td>Western Hemlock</td>
<td>10</td>
<td>Red-flowering Currant</td>
</tr>
<tr>
<td>Oregon Ash</td>
<td>10</td>
<td>Shiny Leaf Spirea</td>
</tr>
<tr>
<td>Blue Elderberry</td>
<td>10</td>
<td>Salmonberry</td>
</tr>
<tr>
<td>Vine Maple</td>
<td>10</td>
<td>Thimble berry</td>
</tr>
<tr>
<td>Douglas' Maple</td>
<td>8</td>
<td>Black Cap Raspberry</td>
</tr>
</tbody>
</table>

**Total** 98
**My HIP Project will meet the required density for the following layers (Choose AND CIRCLE at least two)**

<table>
<thead>
<tr>
<th>Canopy (Native Trees)</th>
<th>Understory (Native Shrubs)</th>
<th>Groundcover (Small Native Plants)</th>
</tr>
</thead>
</table>

**If you chose:**

A. Canopy, Understory, and Groundcover

<table>
<thead>
<tr>
<th>Then your minimum density will be...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divide project area by 225 (15' o.c.)</td>
</tr>
<tr>
<td>Divide project area by 64 (8' o.c.)</td>
</tr>
<tr>
<td>Divide project area by 25 (5' o.c.)</td>
</tr>
</tbody>
</table>

Total Project Area (in square feet) = 46000

B. Canopy and Understory Only (No Groundcovers)

<table>
<thead>
<tr>
<th>Then your minimum density will be...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divide project area by 144, (12' o.c.)</td>
</tr>
<tr>
<td>Divide project area by 36 (6' o.c.)</td>
</tr>
</tbody>
</table>

C. Canopy and Groundcovers Only (No Understory)

<table>
<thead>
<tr>
<th>Then your minimum density will be...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divide project area by 144 (12' o.c.)</td>
</tr>
<tr>
<td>Divide project area by 16 (4' o.c.)</td>
</tr>
</tbody>
</table>

D. Understory and Groundcover Only (No Canopy)

<table>
<thead>
<tr>
<th>Then your minimum density will be...</th>
</tr>
</thead>
<tbody>
<tr>
<td>Divide project area by 49 (7' o.c.)</td>
</tr>
<tr>
<td>Divide project area by 25 (5' o.c.)</td>
</tr>
</tbody>
</table>

**Plant List, Please complete with species name (common or scientific) and desired number**

**Native Trees**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alaska Yellow Cedar</td>
<td>10</td>
</tr>
<tr>
<td>Beaked Hazelnut</td>
<td>50</td>
</tr>
<tr>
<td>Big-Leaf Maple</td>
<td>40</td>
</tr>
<tr>
<td>Cascara</td>
<td>25</td>
</tr>
<tr>
<td>Western Red Cedar</td>
<td>10</td>
</tr>
<tr>
<td>Western Hemlock</td>
<td>10</td>
</tr>
<tr>
<td>Oregon Ash</td>
<td>10</td>
</tr>
<tr>
<td>Blue Elderberry</td>
<td>25</td>
</tr>
<tr>
<td>Vine Maple</td>
<td>25</td>
</tr>
<tr>
<td>Douglas Maple</td>
<td>17</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>204</td>
</tr>
</tbody>
</table>

**Native Shrubs**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bald Hic Resc</td>
<td>50</td>
</tr>
<tr>
<td>Salal</td>
<td>150</td>
</tr>
<tr>
<td>Tall Oregon Grape</td>
<td>50</td>
</tr>
<tr>
<td>Osoberry</td>
<td>40</td>
</tr>
<tr>
<td>Pacific Rhododendron</td>
<td>40</td>
</tr>
<tr>
<td>Red-blooming Girant</td>
<td>100</td>
</tr>
<tr>
<td>Shiny leaf Spirea</td>
<td>50</td>
</tr>
<tr>
<td>Salmon berry</td>
<td>100</td>
</tr>
<tr>
<td>Thimbleberry</td>
<td>39</td>
</tr>
<tr>
<td>Red Black Currant</td>
<td>100</td>
</tr>
</tbody>
</table>

**Native Groundcovers**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Kinickinack</td>
<td>250</td>
</tr>
<tr>
<td>Beach Strawberry</td>
<td>250</td>
</tr>
<tr>
<td>Forest Strawberry</td>
<td>250</td>
</tr>
<tr>
<td>Okalis</td>
<td>100</td>
</tr>
<tr>
<td>Douglas Asker</td>
<td>50</td>
</tr>
<tr>
<td>Deer Fern</td>
<td>250</td>
</tr>
<tr>
<td>Sword Fern</td>
<td>250</td>
</tr>
<tr>
<td>Licorice Fern</td>
<td>50</td>
</tr>
<tr>
<td>Inside Out Flower</td>
<td>195</td>
</tr>
<tr>
<td>Nodding Onion</td>
<td>195</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td>1840</td>
</tr>
</tbody>
</table>
**My HIP Project will meet the required density for the following layers (Choose AND CIRCLE at least two)**

- **Canopy (Native Trees)**
- **Understory (Native Shrubs)**
- **Groundcover (Small Native Plants)**

**If you chose:**

<table>
<thead>
<tr>
<th>Selection</th>
<th>Rest Area (in square feet)</th>
<th>Minimum Density</th>
</tr>
</thead>
<tbody>
<tr>
<td>A (All)</td>
<td>40000</td>
<td>178 Trees</td>
</tr>
<tr>
<td>B (Canopy and Understory Only)</td>
<td>1111 Shrubs</td>
<td></td>
</tr>
<tr>
<td>C (Canopy and Groundcover Only)</td>
<td>2500 Groundcovers</td>
<td></td>
</tr>
<tr>
<td>D (Understory and Groundcover Only)</td>
<td>1600 Groundcovers</td>
<td></td>
</tr>
</tbody>
</table>

**Then your minimum density will be...**

- Divide project area by 225 (15' o.c.)
- Divide project area by 64 (8' o.c.)
- Divide project area by 25 (5' o.c.)

**Total Project Area (in square feet)**

**Plant List, Please complete with species name (common or scientific) and desired number**

**Native Trees**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Trees</td>
<td>82</td>
</tr>
<tr>
<td>Escada</td>
<td>16</td>
</tr>
<tr>
<td>Beaked Halewax</td>
<td>14</td>
</tr>
<tr>
<td>Vine Maple</td>
<td>16</td>
</tr>
<tr>
<td>Blue Elderberry</td>
<td>16</td>
</tr>
<tr>
<td>Red Elderberry</td>
<td>16</td>
</tr>
<tr>
<td>Big-Leaf Maple</td>
<td>16</td>
</tr>
</tbody>
</table>

**Native Shrubs**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Shrubs</td>
<td>250</td>
</tr>
<tr>
<td>Red-flowering currant</td>
<td>65</td>
</tr>
<tr>
<td>Pacific Photodonther</td>
<td>65</td>
</tr>
<tr>
<td>Shiny Leaf Spirea</td>
<td>65</td>
</tr>
<tr>
<td>Sunflower</td>
<td>65</td>
</tr>
<tr>
<td>Black Cap Raspberry</td>
<td>50</td>
</tr>
</tbody>
</table>

**Native Groundcovers**

<table>
<thead>
<tr>
<th>Species Name</th>
<th>#</th>
</tr>
</thead>
<tbody>
<tr>
<td>Existing Groundcovers</td>
<td>1000</td>
</tr>
<tr>
<td>Kinnikinnick</td>
<td>150</td>
</tr>
<tr>
<td>Beach Strawbery</td>
<td>150</td>
</tr>
<tr>
<td>Forest Strawbery</td>
<td>150</td>
</tr>
<tr>
<td>Sword Fern</td>
<td>150</td>
</tr>
<tr>
<td>Daphne</td>
<td>150</td>
</tr>
<tr>
<td>Blackberry</td>
<td>150</td>
</tr>
</tbody>
</table>

---

**Address:**

**HIP Project Planting Plan - Landscape Rehab**

**Owner Name:** Example Project for Certification