

November 6, 2014

Michel Girard
BGH Development, LLC
Michel@BGHdevelopment.com
206.335.1649

Re: Rolling Sunrise Subdivision Soil Infiltration

Dear Michel:

This letter is in response to the request from the City of Bainbridge Island for information regarding the determination of infiltration rates used for sizing of infiltration facilities for mitigation of the Rolling Sunrise Preliminary Plat on Bainbridge Island.

Dave's Septic Services Inc. was hired by you to perform soil logs for the proposed plat. This included seven soil logs across the site including information on the soil depth, soil description, soil type and general slope of the area the samples were taken (attached). We used Table 3.7 (attached) in Volume III of the 2005 Stormwater Management Manual for Western Washington to determine the short term infiltration rate of 1 inch/hour based on Dave's Septic Services soil descriptions. Soil descriptions were visually verified by us in the field. Each stormwater facility was preliminarily sized with an infiltration rate of 0.5-inches/hour after a correction factor of 2 was applied to 1 inch/hour rate.

To evaluate feasibility, we laid out preliminary infiltration trenches and rain garden areas sized to infiltrate 100% of the runoff from impervious areas proposed for the access driveways and areas on each lot considering setbacks from septic drainfields. Preliminary sizing was performed through the use of an approved continuous runoff model, Western Washington Hydrology Model 3 (WWHM3).

Please do not hesitate to contact us if you have any questions.

Very truly yours,

BROWNE WHEELER ENGINEERS, INC.



for homogeneous soils. These rates not consider the effects of site variability and long-term clogging due to siltation and biomass buildup in the infiltration facility.

Table 3.7 -- Recommended Infiltration Rates based on USDA Soil Textural Classification.			
	*Short-Term Infiltration Rate (in./hr)	Correction Factor, CF	Estimated Long-Term (Design) Infiltration Rate (in./hr)
Clean sandy gravels and gravelly sands (i.e., 90% of the total soil sample is retained in the #10 sieve)	20	2	10**
Sand	8	4	2***
Loamy Sand	2	4	0.5
Sandy Loam	1	4	0.25
Loam	0.5	4	0.13

*From WEF/ASCE, 1998.

**Not recommended for treatment

*** Refer to SSC-4 and SSC-6 for treatment acceptability criteria

Based on experience with long-term full-scale infiltration pond performance, Ecology’s Technical Advisory Committee (TAC) recommends that the short-term infiltration rates be reduced as shown in Table 3.7, dividing by a correction factor of 2 to 4, depending on the soil textural classification. The correction factors provided in Table 3.7 represent an average degree of long-term facility maintenance, TSS reduction through pretreatment, and site variability in the subsurface conditions. These conditions might include deposits of ancient landslide debris, buried stream channels, lateral grain size variability, and other factors that affect homogeneity).

These correction factors could be reduced, subject to the approval of the local jurisdiction, under the following conditions:

- For sites with little soil variability,
- Where there will be a high degree of long-term facility maintenance,
- Where specific, reliable pretreatment is employed to reduce TSS entering the infiltration facility

In no case shall a correction factor less than 2.0 be used.

DAVES SEPTIC SERVICES INC.

P.O. BOX 826 SEABECK, WA 98380
PHONE (360) 830-9699
FAX (360) 830-9582
LICENSED ON-SITE SEWAGE DISPOSAL CONSULTANT
PERCOLATION TEST
LICENSED OPERATION & MAINTENANCE SPECIALISTS

7-3-2013

To: Michel Girard
2442 NW Market Street #378
Seattle, WA 98107

Subj: Preliminary soil logs for short plat

Location: Lots off Sunrise Drive Bainbridge Island
Tax # 142502-2-051-2003

I have reviewed the above proposed short plat and have dug preliminary soil logs for each proposed lot. The approximate soil log locations are shown on the attached site plan. Also attached to this report is photo copy of page 93 of the Kitsap Public Health regulations 2008-A-01 which details the minimum lot requirements for lot purposing on-site sewage disposal systems. Table 9 will detail the minimum lot size based on two conditions, water supply type and soil type. Soil type descriptions can be found on page 31 Table #2 of the ordinance and is attached.

Below will describe the soil conditions that were found and my minimum lot size recommendations. All of these lots will be served by a public water supply.

<u>Soil Log #</u>	<u>Soil Depth</u>	<u>Soil Description</u>	<u>Soil Type</u>	<u>General Slope</u>
#1	0-3" 3-36"	Duff material Light brown to gray fine sandy loam, compaction at 36"	4	0-5%/+-
#2	0-3" 3-39"	Duff material Light brown to gray fine loamy sand, compaction at 39"	4	5-10%/+-
#3	0-24" 24-44"	Old fill soils Light brown fine sandy loam compaction at 44"	4	5-10%/+-
#4	0-2" 2-27"	Duff material Light brown to gray fine sandy loam, roots to 20" compaction after 20"	4	0-5%/+-
#5	0-3" 3-29"	Duff material Light brown to gray fine sandy loam, compaction at 29"	4	10-12%/+-
#6	0-4 4-39"	Duff material light brown to gray fine sandy loam	4	5-10%/+-

#7	0-4" 4-48"	Duff material light brown to gray fine loamy sand No compaction to 48"+	4	10-20%+/-
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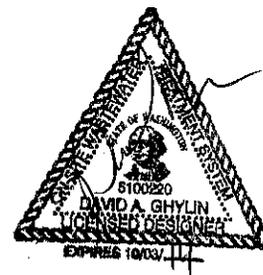
All soil logs are described as a soil type #4 under current codes. The minimum square footage required for this proposal would be 18,000 sq./ft. for each proposed lot. A review of the neighboring lots shows no private wells. A wide range of sewage disposal systems can be designed for these lots from pre-treatment to pressure to gravity flow system possible on lot #7.

If there are any further questions regarding this report please contact me anytime.

Thank you



David A. Ghylin



11" x 17" SHEET = 100% SCALE



Tax Lot #

142502-2-051-2003

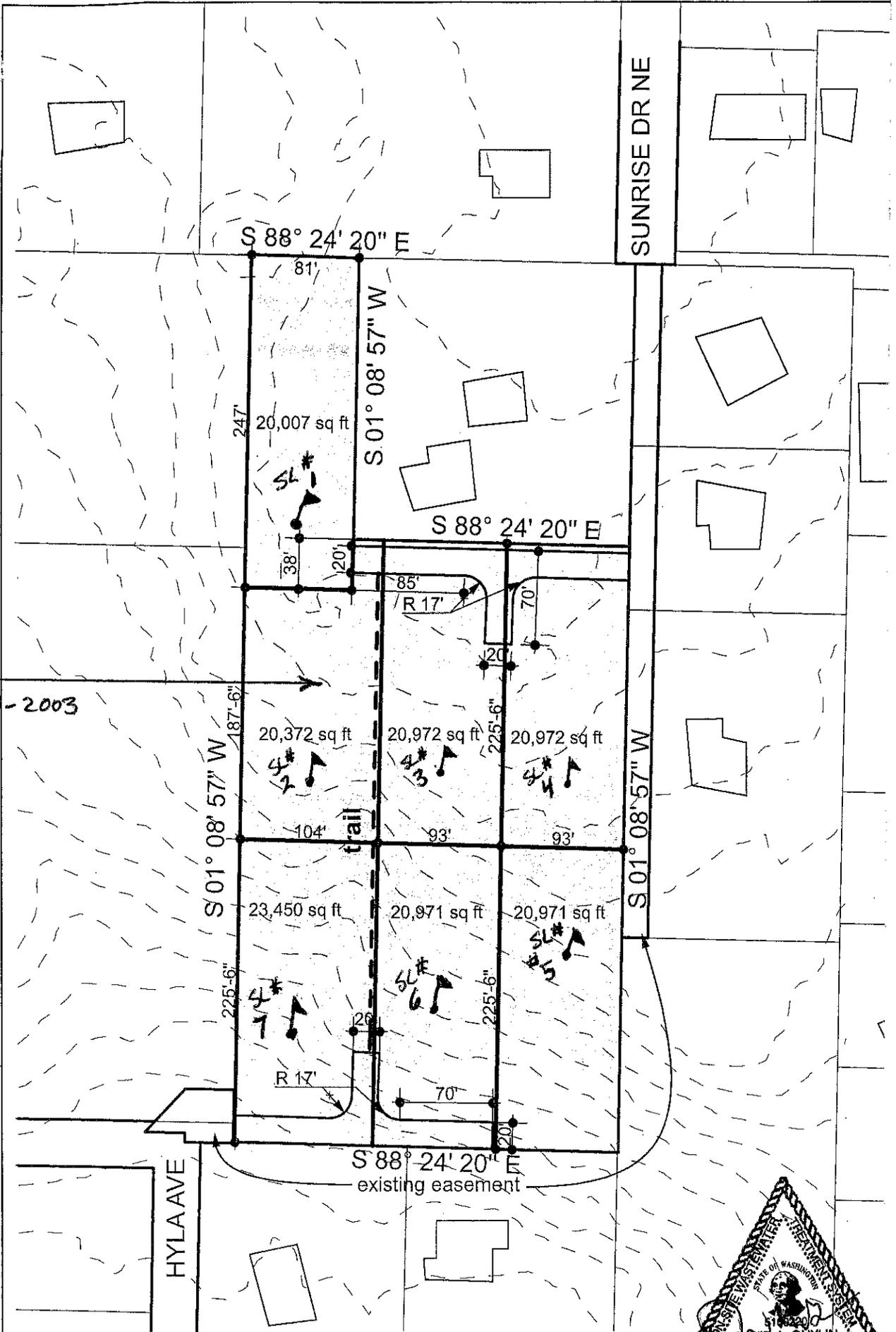
♣ = soil log locations

(Approx Locations)

Dug By
DAVES
SEPTIC
SERVICES
INC.

360-830-9699

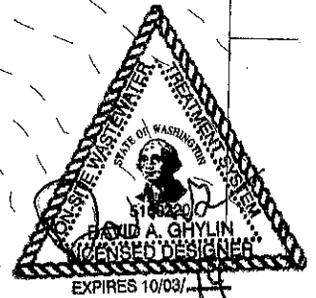
6/28/13 10:01 AM /1309 BGH SUNRISE SITE 6.27.13.pln



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PLAT PLAN

SCALE: 1" = 100'



SECTION 15: MINIMUM LAND AREA REQUIREMENTS FOR DEVELOPMENTS USING ONSITE SEWAGE SYSTEMS

- A. A person proposing a subdivision for property where the use of an onsite sewage system is planned or required shall obtain a recommendation for approval from the Health Officer as required by RCW 58.17.150.

- B. A person proposing a development for property where the use of an onsite sewage system is planned, or required, shall meet the minimum land area requirement for the development for each single-family residence, or each unit volume of sewage, using one of the following methods:
 - 1. Method 1: Based on soil type and type of water supply, the minimum land area required in **Table 9** shall be met for each lot containing a single family residence or a unit volume of sewage.

Table 9

Minimum Land Area Required Based on Water Supply and Soil Type
For Each Single-Family Residence or Unit Volume of Sewage

Type of Water Supply	Minimum Land Area (Acre) Required Per Soil Type (According to Table 2)					
	1	2	3	4	5	6
Public	0.5 acre	12,500 sq. ft.	15,000 sq. ft.	18,000 sq. ft.	20,000 sq. ft.	22,000 sq. ft.
	2.5 acres ¹					
Private/Individual On Each Lot	1.0 acre	1.0 acre			2.0 acres	
	2.5 acres ¹					

¹ See WAC 246-272A-0234(6)

- 2. Method 2: A minimum land area proposal using Method 2 is acceptable only when the applicant:
 - a) Justifies the proposal through a written analysis of the:
 - (1) Soil type and depth;
 - (2) Area drainage, and/or lot drainage;
 - (3) Public health impact on ground and surface water quality;
 - (4) Setbacks from property lines, water supplies, wells, surface waters, etc.;
 - (5) Source of potable water;

Table 2
Soil Type Designations and Descriptions

Soil Type Designation	Soil Type Description
1	Gravelly and very gravelly coarse sands, all extremely gravelly soils excluding Soil Types 5 and 6, all soil types with greater than or equal to 90% rock fragments
2	Coarse Sands
3	Medium sands, loamy coarse sands, loamy medium sands
4	Fine sands, loamy fine sands, sandy loams, loams
5	Very fine sands, loamy very fine sands; OR silt loams, sandy clay loams, clay loams, clay loams and silty clam loams with a moderate or strong structure (excluding platy structure)
6	Other silt loams, sandy clay loams, clay loams, silty clay loams
7	Sandy clay, clay, silty clay, strongly cemented or firm soils, soil with a moderate or strong platy structure, any soil with a massive structure, any soil with appreciable amounts of expanding clays - Unsuitable for effluent dispersal and soil dispersal components

2. The owner or designer shall fill the soil log excavations with the removed soils upon completion of inspection by the Health Officer.
3. In order to determine or ensure compliance with these regulations, the Health Officer may:
 - a) Require a wet season evaluation (See "Wet Season Evaluation Procedure" in Appendix B) and/or additional site inspections of the proposed soil dispersal component area.
 - b) Require additional soil log excavations, evaluations and/or site inspections as needed to determine compliance with these regulations
 - c) Require a stake-out and field marking of the location, size, and configuration of the proposed dispersal component on the proposed site.
 - d) Reduce the required number of soil log excavations for a proposed site development if adequate information already exists, or has previously been developed and is on file with the Health District.
 - e) Require inclusion of a water interceptor as part of the design in order to maintain the minimum vertical separation for the designer-specified treatment level proposed.
- E. Determination of Minimum Sewage Treatment and Effluent Distribution Requirements.
 1. The designer shall use **Table 3, Minimum Treatment Performance Levels and Method of Distribution**, to identify the treatment performance level, and method of effluent distribution for the soil dispersal component,