

Infiltration in Puget Sound

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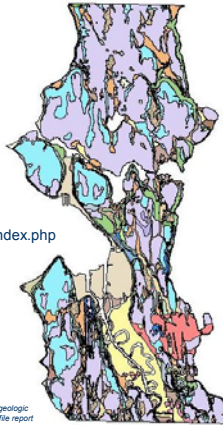
Infiltration in Puget Sound

- Geology of the Puget Sound Region
- Keys to infiltration
- Infiltration Testing

Geologic Map of Seattle

Available at:
<http://geomapnw.ess.washington.edu/index.php>

Light Blue and Orange are Outwash
Purple is Till

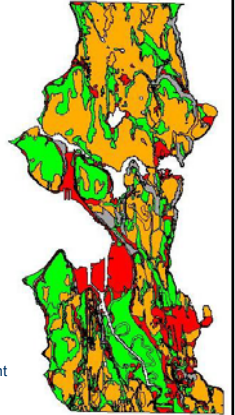


Tross, K. G., Booth, D. B., Wisler, A. P., and Stimmel, S. A., 2005. The geologic map of Seattle - A progress report, 2005. U. S. Geological Survey Openfile report 2005-1252, scale 1:24,000.

Geology Map converted to Infiltration Potential

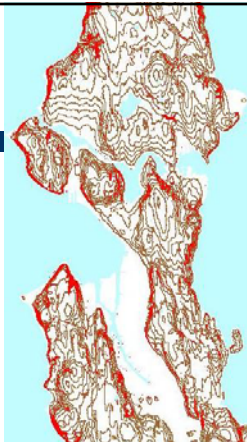
- High Infiltration Potential
- Mixed Infiltration Potential
- Low Infiltration Potential

The relative infiltration is based on type of surface soil only. It does not take into account the location of the groundwater table or the underlying soils.



Steep Slopes in Seattle

Under existing conditions, steep slopes are most likely in a just stable condition. Adding water to the subsurface could cause instability.



Keys to infiltration

- Grain Size of the Soil
 - Soil containing small particles have less space for water to pass through the soil.
 - Soil containing particles of all different sizes will have a lower infiltration rate.



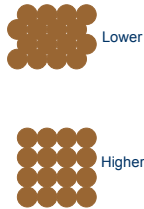
Lower



Higher

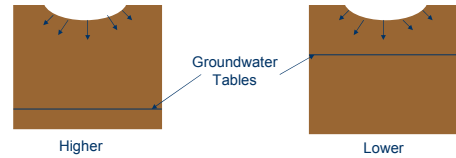
Keys to Infiltration

- Density of the Soil
 - More compacted soil has less space for water to pass through



Keys to Infiltration

- Depth to the Groundwater
 - A groundwater table closer to the surface will decrease the infiltration rate.



Keys to Infiltration

- Soil Layering
 - The infiltration rate is only as fast as the slowest layer.



Over the long-term the infiltration rate will be that of the clay.

Infiltration Testing

- Basically 2 Options
 - Full-scale infiltration tests (recommended but not always practical)
 - Grain size correlation (Easier and cheaper but less reliable)

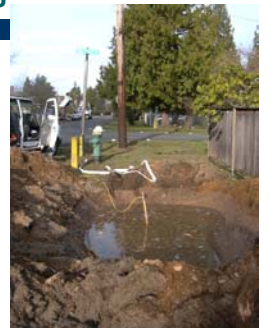
Infiltration Testing

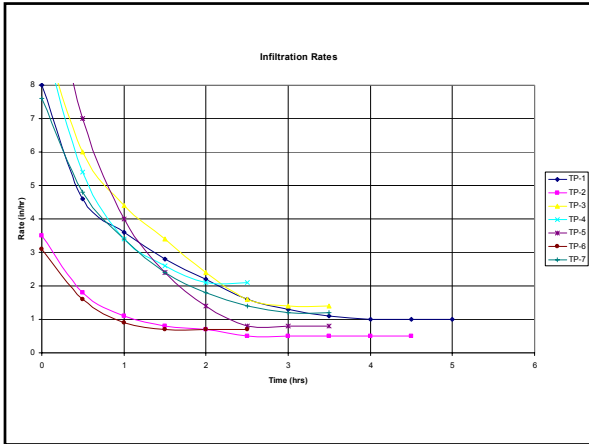
- Full scale Infiltration Testing



Infiltration Testing

- Full scale Testing





Infiltration Testing

- Grain Size Correlation
 - Pros: Relatively inexpensive and minimal disturbance.
 - Cons: Does not take into account the density of the soil or the stratigraphy of the soil.

Infiltration Testing

- Grain Size Correlations
 - Compare the size of the soil particle in which 10 percent of the entire sample is smaller with tabulated data.

Table 3.8 - Alternative Recommended Infiltration Rates based on ASTM Gradation Testing	
D10 Size from ASTM D422 Soil Gradation Test (mm)	Estimated Long-Term (Design) Infiltration Rate (in/hr)
≥ 0.4	9.0
0.3	6.5
0.2	3.5
0.1	2.0
0.05	0.8

QUESTIONS