NRCS hydrologic soil group definitions

Group	Meaning	Saturated Hydraulic Conductivity (in/hr)	Saturated Hydraulic Conductivity (mm/hr)
A	Low runoff potential. Soils having high infiltration rates even when thoroughly wetted and consisting chiefly of deep, well to excessively drained sands or gravels.	≥ 0.45	≥ 11.43
B	Soils having moderate infiltration rates when thoroughly wetted and consisting chiefly of moderately deep to deep, moderately well to well-drained soils with moderately fine to moderately coarse textures. E.g., shallow loess, sandy loam.	0.30 - 0.15	7.62-3.81
C	Soils having slow infiltration rates when thoroughly wetted and consisting chiefly of soils with a layer that impedes downward movement of water, or soils with moderately fine to fine textures. E.g., clay loams, shallow sandy loam.	0.15 - 0.05	3.81-1.27
D	High runoff potential. Soils having very slow infiltration rates when thoroughly wetted and consisting chiefly of clay soils with a high swelling potential, soils with a permanent high water table, soils with a clay-pan or clay layer at or near the surface, and shallow soils over nearly impervious material.	0.05 - 0.00	1.27-0.00

Source: Hydrology National Engineering Handbook, Chapter 7, Natural Resources Conservation Service, U.S. Department of Agriculture, January 2009.

Disclaimer

The values listed here were transcribed from the original reference(s) cited; CHI does not guarantee their accuracy, completeness or suitability for any purpose. The reader should read the source document(s) to understand the limitations and appropriateness of the information. The modeler is obligated to verify the applicability of these and all attributes/parameters used in their models. Professional engineering judgement must be used throughout the modeling exercise.

Soil characteristics

The following parameter values can be used for Green-Ampt infiltration in SWMM5. The hydraulic conductivity values on this page may also be used to represent the Min. Infiltration Rate for Horton infiltration in SWMM5.

Note that Initial deficit values given in the table are the maximum potential value for each soil texture class representing the difference between porosity and wilting point (i.e., at 0% saturation). Such values are appropriate for long-term continuous simulation. For design storm events however, it is appropriate to use the drainable porosity as the initial soilwater deficit (i.e., porosity minus field capacity). Alternatively, a specific degree of saturation could be used to reflect typical antecedent soilwater conditions (e.g., 10%, 25%, or 50% saturation).

For more parameter guidance suggestions, please see: Infiltration Editor.

US units

Soil Texture Class	**Hydraulic Conductivity (in/hr)**	**Suction Head (in.)**	**Porosity (fraction)**	**Field Capacity (fraction)**	**Wilting Point (fraction)**	**Initial Deficit (fraction)**
Sand	4.74	1.93	0.437	0.062	0.024	0.413
Loamy Sand	1.18	2.40	0.437	0.105	0.047	0.390
Sandy Loam	0.43	4.33	0.453	0.190	0.085	0.368
Loam	0.13	3.50	0.463	0.232	0.116	0.347
Silt Loam	0.26	6.69	0.501	0.284	0.135	0.366
Sandy Clay Loam	0.06	8.66	0.398	0.244	0.136	0.262
Clay Loam	0.04	8.27	0.464	0.310	0.187	0.277
Silty Clay Loam	0.04	10.63	0.471	0.342	0.210	0.261
Sandy Clay	0.02	9.45	0.430	0.321	0.221	0.209
Silty Clay	0.02	11.42	0.479	0.371	0.251	0.228
Clay	0.01	12.60	0.475	0.378	0.265	0.210

SI units

Soil Texture Class	Hydraulic Conductivity (mm/hr)	Suction Head (mm)	Porosity (fraction)	Field Capacity (fraction)	Wilting Point (fraction)	Initial Deficit (fraction)
Sand	120.34	49.02	0.437	0.062	0.024	0.413
Loamy Sand	29.97	60.96	0.437	0.105	0.047	0.390
Sandy Loam	10.92	109.98	0.453	0.190	0.085	0.368
Loam	3.30	88.90	0.463	0.232	0.116	0.347
Silt Loam	6.60	169.93	0.501	0.284	0.135	0.366
Sandy Clay Loam	1.52	219.96	0.398	0.244	0.136	0.262
Clay Loam	1.02	210.06	0.464	0.310	0.187	0.277
Silty Clay Loam	1.02	270.00	0.471	0.342	0.210	0.261
Sandy Clay	0.51	240.03	0.430	0.321	0.221	0.209
Silty Clay	0.51	290.07	0.479	0.371	0.251	0.228
Clay	0.25	320.04	0.475	0.378	0.265	0.210

Source: Rawls, W.J. et al., (1983). J. Hyd. Engr., 109:1316.

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