# Map Showing Thickness of Overburden, District of Columbia

by

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Overburden, as used with this map, designates all the surficial earth materials that overlie fresh bedrock. Overburden includes: soil, disturbed ground and artificial fill, alluvial and terrace deposits, colluvium, upland gravel, Coastal Plain strata, and saprolite on crystalline bedrock. Overburden can generally be moved directly with power shovels, whereas bedrock generally requires ripping or blasting before removal.

Saprolite is the thickest, most extensive unit of overburden in the western part of the District of Columbia. It is soft, earthy, clay-rich, decomposed material formed in place by chemical weathering of crystalline bedrock. Saprolite ranges from zero to more than 50 metres (160 ft) in thickness. The thickness varies with topographic position, lithology, and structure of the underlying bedrock (see Preliminary Geologic Map). Little or no saprolite overlies ultramafic rock or quartz veins and dikes. Thin to moderately thick, poorly drained saprolite overlies mafic rocks of the Georgetown Complex. In general, saprolite is thickest and fairly well-drained beneath upland areas underlain by Wissahickon schist, but belts of locally thick saprolite, which are well to excessively drained, overlie both Wissahickon gneiss and Kensington gneiss. Each major crystalline rock type yields a characteristic saprolite and each saprolite underlies a characteristic residual soil type.

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Coastal Plain strata and upland gravel comprise other areas of thick overburden with physical properties radically different from those of saprolite. Cretaceous Potomac Group strata form the thickest and most extensive unit of overburden in the Coastal Plain of the eastern part of the District. They are overlain by marine beds of upper Cretaceous and Tertiary age southeast of the Anacostia River. The Coastal Plain strata are poorly consolidated sediments which thicken from a feather edge along the Fall Line to more than 300 metres (1000 ft) along the southeastern margin of the city; they dip to the southeast about 19 metres per kilometre (100 ft per mi) or less. Characteristic residual soils are developed on weathered clay-rich layers or on sandy and gravelly parent materials.

The Coastal Plain strata and some of the Piedmont rocks are overlain in places by a unit of upland gravel and sand about 10 metres (30 ft) thick. The gravels commonly form nearly flat-topped upland surfaces sloping gently to the southeast. Colluvium on Piedmont upland surfaces rarely exceeds 6 metres (20 ft) in thickness. Overburden is thin along most Piedmont stream valleys and lowlands, except locally where alluvial and terrace deposits exceed 6 metres (20 ft) in thickness. Soils developed on the alluvial and upland gravel deposits are diverse: Some profiles on upland gravels have a clay-rich hardpan which may impede surface drainage; alluvial soils are subject to recurrent flooding. Data upon which the contours are drawn is based on the ground surface elevation in relation to:

1. The approximate surface elevation of the contact between overburden and bedrock.

2. The distribution and elevation of fresh rock outcrops.

3. Estimates of thickness of overburden from driller's logs of holes (mainly water well logs) and foundation, utility, metro and highway borings and excavations.

Areas of thin overburden are commonly favorable sites for heavy construction requiring strong bedrock for maximum structural support. The same areas, on the other hand, would generally require extensive design modifications for utility lines and highway construction. Areas of thick overburden may provide favorable routes or excavation corridors for deep burial of utility lines and pipelines. Thick clay or saprolite which underlies relatively steep natural slopes, or slopes that are cut and artificially steepened by construction, are likely to be less stable and more readily eroded than steep slopes where fresh bedrock occurs at the surface.

Published and unpublished sources of data used to compile this map, as well as a selected bibliography, are listed in the References. In addition, a limited amount of new field work was carried out, particularly to help position the interface between rock and overburden; however, field checks were rapid and not intensive. Thus the final result embodies interpretations synthesized from a variety of sources. Although overburden thickness can be generalized, striking local variations are common, and as much as 25 percent variance from indicated thickness is possible, especially in areas where overburden is less than 200 feet (60 m) thick. The map cannot be used reliably for site investigations, which require detailed surface geologic examination in conjunction with engineering and other studies, such as core drilling and seismic surveys.

## Selected References


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EXPLANATION

Thickness of Overburden, in feet below land surface

| Interval | Class | Thickness (feet) |
|---|---|---|
| 100 ft interval | 14 | More than 1000 |
| | 13 | 900-1000 |
| | 12 | 800-900 |
| | 11 | 700-800 |
| | 10 | 600-700 |
| | 9 | 500-600 |
| | 8 | 400-500 |
| | 7 | 300-400 |
| | 6 | 200-300 |
| 50 ft interval | 5 | 150-200 |
| | 4 | 100-150 |
| | 3 | 50-100 |
| < 50 ft interval | 2 | 10-50 |
| | 1 | Less than 10 (Fresh bedrock outcrops common) |