Box 1-1. Topographic Maps

Topographic maps are a way to depict the three-dimensional physical features of the land’s surface on a two-dimensional sheet of paper, through the use of contour lines. A topographic map is drawn to scale, permitting distances, elevations, directions, and areas to be accurately measured. Specific symbols are used on topographic maps to designate both cultural and natural features. These symbols are explained in the Topographic and Geologic Map Symbols part of Appendix D. Topographic maps are valuable tools for geological studies and for engineers involved in all types of construction, including planning and road building. They are also used by hikers, campers, and others interested in the location of features and the local terrain. Geologic maps, which show the distribution of different types and ages of rocks, are generally plotted on a topographic base map.

Contour Lines

On a topographic map, the third dimension, the dimension of height (or elevation), is shown using contour lines. A contour line is an imaginary line on the surface of the Earth that connects all points on the map having the same elevation above sea level. The contour interval is the vertical distance between each consecutive contour line. For example, a 40-foot contour interval means that the vertical distance from one contour to the next is 40 feet. On most topographic maps, every fifth contour, called an index contour, is shown with a darker line than the other contour lines and is generally labeled with a number indicating the elevation above sea level.

Tips For Reading Topographic Maps

♦ Determine the scale and contour interval of the map.
♦ Every point on a contour line has the same elevation. In other words, contour lines connect points of equal elevation.
♦ Dashed contour lines represent one-half of the contour interval (e.g., 10-foot dashed contours in a map with a 20-foot contour interval). They are added in areas of low relief to increase detail.
♦ Elevations on one side of the line are higher than elevations on the other side of the line.
♦ The direction of slope is perpendicular to any contour. Since rivers and streams flow downhill, they also give the direction that the land slopes and indicate which areas are high versus those that are low.
♦ Widely spaced contour lines represent gentle slopes; closely spaced contour lines indicate steep slopes.
♦ Contour lines do not cross or divide, except at overhanging cliffs. Contour lines that appear to run together, merge, or disappear are actually stacked one on top of the other and represent a cliff or very steep slope.
♦ There will be a matching set of contour lines on each side of a stream. Contour lines that cross stream valleys form a “V” pointing upstream.
♦ Concentric, closed contour lines represent a hill.
♦ Closed depressions (representing basins with no outlet) are shown by closed contours with hachures (short lines) that point inward toward the depression.