

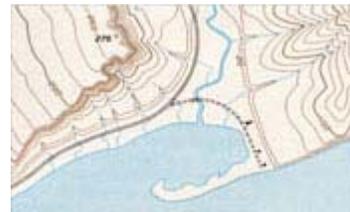
Standard Operating Procedure 6.1.1.1

Reading Topographic Maps

Interpreting the colored lines, areas, and other symbols is the first step in using topographic maps. Features are shown as points, lines, or areas, depending on their size and extent. For example, individual houses may be shown as small black squares. For larger buildings, the actual shapes are mapped. In densely built-up areas, most individual buildings are omitted and an area tint is shown. On some maps, post offices, churches, city halls and other landmark buildings are shown within the tinted area. The first features usually noticed on a topographic map are the area features such as vegetation (green), water (blue), some information added during update (purple), and densely built-up areas (gray or red). Many features are shown by lines that may be straight, curved, solid, dashed, dotted, or in any combination. The colors of the lines usually indicate similar kinds or classes of information: brown for topographic contours; blue for lakes, streams, irrigation ditches, etc.; red for land grids and important roads; black for other roads and trails, railroads, boundaries, etc.; and purple for features that have been updated using aerial photography, but not field verified.

Various point symbols are used to depict features such as buildings, campgrounds, springs, water tanks, mines, survey control points, and wells.

Names of places and features also are shown in a color corresponding to the type of feature. Many features are identified by labels, such as "Substation" or "Golf Course."



Ground Configuration shown by contours

Topographic contours are shown in brown by lines of different widths. Each contour is a line of equal elevation; therefore, contours never cross. They show the general shape of the terrain. To help the user determine elevations, index contours (usually every fourth or fifth contour) are wider. The narrower intermediate and supplementary contours found between

the index contours help to show more details of the land surface shape. Contours that are very close together represent steep slopes. Widely spaced contours, or an absence of contours, means that the ground slope is relatively level. The elevation difference between adjacent contour lines, called the contour interval, is selected to best show the general shape of the terrain. A map of a relatively flat area may have a contour interval of 10 feet or less. Maps in mountainous areas may have contour intervals of 100 feet or more. Elevation values are shown at frequent intervals on the index contour lines to facilitate their identification, as well as to enable the user to interpolate the values of adjacent contours.

Bathymetric contours are generally offshore since they show the shape and slope of the ocean bottom. They are shown in blue or black. Bathymetric contours are shown in meters at intervals appropriate to map scale and coastal profile, and should not be confused with depth curves.

Depth curves are shown along coastlines and on inland bodies of water where the data are available from hydrographic charts or other reliable sources. Depth figures, shown in blue along the curves, are in feet on older USGS maps and in meters on newer maps. Soundings, individual depth values, may also be shown.

Topographic Map Symbols

Elevation

CONTROL DATA AND MONUMENTS	
Aerial photograph roll and frame number*	3-20
Horizontal control	
Third order or better, permanent mark	Neace Neace
With third order or better elevation	BM 45.1 BM 45.1
Checked spot elevation	79.5
Coincident with section corner	Cactus Cactus
Unmonumented*	
Vertical control	
Third order or better, with tablet	BM 16.3
Third order or better, recoverable mark	120.0
Bench mark at found section corner	BM 18.6
Spot elevation	5.3
Boundary monument	
With tablet	BM 21.6 BM 71
Without tablet	171.3
With number and elevation	67 301.1
U.S. mineral or location monument	

CONTOURS

Topographic	
Intermediate	
Index	
Supplementary	
Depression	
Cut, fill	
Bathymetric	
Intermediate	
Index	
Primary	
Index Primary	
Supplementary	

*Provisional Edition maps only
 Provisional Edition maps were established to expedite completion of the remaining large scale topographic quadrangles of the conterminous United States. They contain essentially the same level of information as the standard series maps. This series can be easily recognized by the title "Provisional Edition" in the lower right hand corner.

Boundaries

BOUNDARIES	
National	
State or territorial	
County or equivalent	
Civil township or equivalent	
Incorporated city or equivalent	
Park, reservation, or monument	
Small park	

LAND SURVEY SYSTEMS

U.S. Public Land Survey System

Township or range line	
Location doubtful	
Section line	
Location doubtful	
Found section corner; found closing corner	
Witness corner; meander corner	

Other land surveys

Township or range line	
Section line	
Land grant or mining claim; monument	
Fence line	

Land Surface Features

MINES AND CAVES

Quarry or open pit mine	
Gravel, sand, clay, or borrow pit	
Mine tunnel or cave entrance	
Prospect; mine shaft	
Mine dump	
Tailings	

GLACIERS AND PERMANENT SNOWFIELDS

Contours and limits	
Form lines	

Buildings and Related Features

VEGETATION

Woods	
Scrub	
Orchard	
Vineyard	
Mangrove	

BUILDINGS AND RELATED FEATURES

Building	
School; church	
Built-up Area	
Racetrack	
Airport	
Landing strip	
Well (other than water); windmill	
Tanks	
Covered reservoir	
Gaging station	
Landmark object (feature as labeled)	
Campground; picnic area	
Cemetery: small; large	

Roads, Railroads, and Other Features

ROADS AND RELATED FEATURES

Roads on Provisional edition maps are not classified as primary, secondary, or light duty. They are all symbolized as light duty roads.

Primary highway	
Secondary highway	
Light duty road	
Unimproved road	
Trail	
Dual highway	
Dual highway with median strip	
Road under construction	
Underpass; overpass	
Bridge	
Drawbridge	
Tunnel	

TRANSMISSION LINES AND PIPELINES

Power transmission line: pole; tower	
Telephone line	
Aboveground oil or gas pipeline	
Underground oil or gas pipeline	
Standard gauge single track; station	
Standard gauge multiple track	
Abandoned	
Under construction	
Narrow gauge single track	
Narrow gauge multiple track	
Railroad in street	
Juxtaposition	
Roundhouse and turntable	

TRANSMISSION LINES AND PIPELINES

Power transmission line: pole; tower	
Telephone line	
Aboveground oil or gas pipeline	
Underground oil or gas pipeline	

Source United States Geological Survey Website 2002