STRUCTURE CONTOURS AND MAP PATTERNS

I Main Topics
- A Structure contours
- B Strike of beds on a geologic map with a topographic base
- C Appearance of planar beds on a geologic map
- D Appearance of folded beds on a geologic map with a topographic base

II Structure contours
- A A line or curve (contour) that marks the intersection of a horizontal plane with some geologic surface; this surface need not be planar. Strike lines are tangent to structure contours (see Fig. 5.1).
- B A geologic structure map can be thought of as the collection of points marking the intersections between structure contours and the corresponding topographic contours (see Fig. 5.2).
- C See the “html help desk” for Matlab functions surfc and contour3.

III Strike of beds on a geologic map with a topographic base
- A Lines of strike are horizontal (i.e., a series of points of equal elevation). For a surface (or layer) of constant strike, a line of strike (i.e., a traverse at equal elevation) lies along the surface (or layer) rather than cutting across the surface (or layer); (see Fig. 5.3).
- B Lines of strike can be determined by locating where a contact intersects a given contour line in more than one point; these points of intersection lie along strike. This is easiest where a contact is steep.

IV Appearance of planar beds on a geologic map
- A **Planar beds have a constant strike and a constant dip**
- B Strike lines along structure contours are parallel and straight
- C Strike lines along structure contours are evenly spaced
- D Dip direction is constant

V Appearance of folded beds on a geologic map

A **The strike and/or dip of a folded bed varies with position**

B Strike lines along structure contours might or might not be parallel; the strike of folded layers does not necessarily change.

1 If strike lines are parallel, then the strike is constant and the axis of the fold is horizontal

2 If strike lines are not parallel, then the strike is not constant and the axis of the fold plunges (e.g., fold with a vertical fold axis).

C If a folded layer changes dip, then strike lines along structure contours with a uniform contour interval will not be evenly spaced.

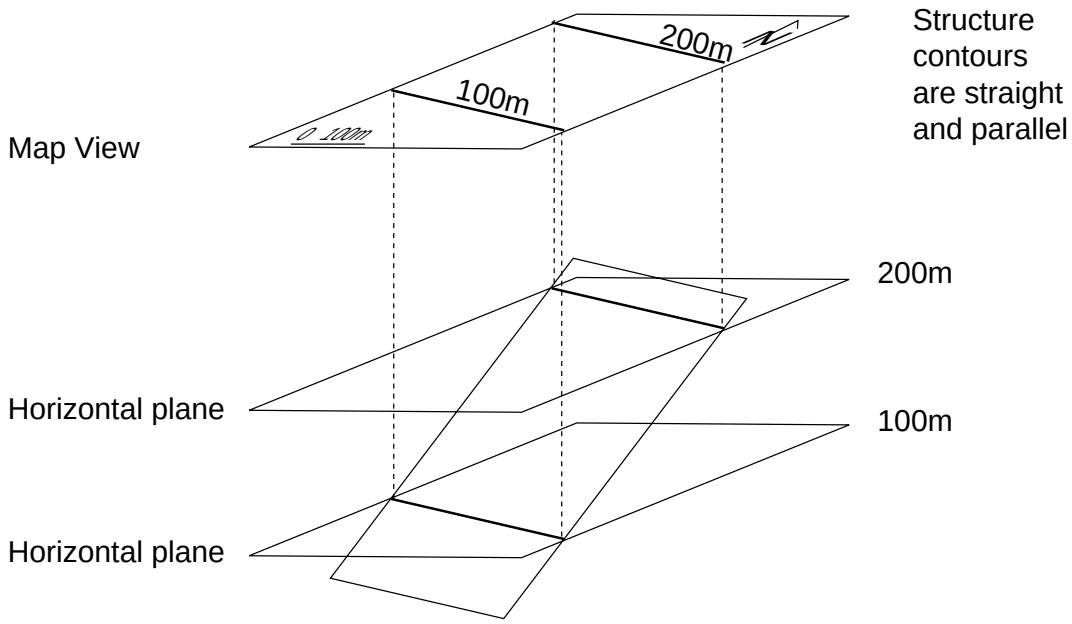
D Dip direction and magnitude may or may not be constant (e.g., fold with a horizontal fold axis).

E Cross sections and maps together are powerful 3-D visualization tools, whether on paper or on a computer.

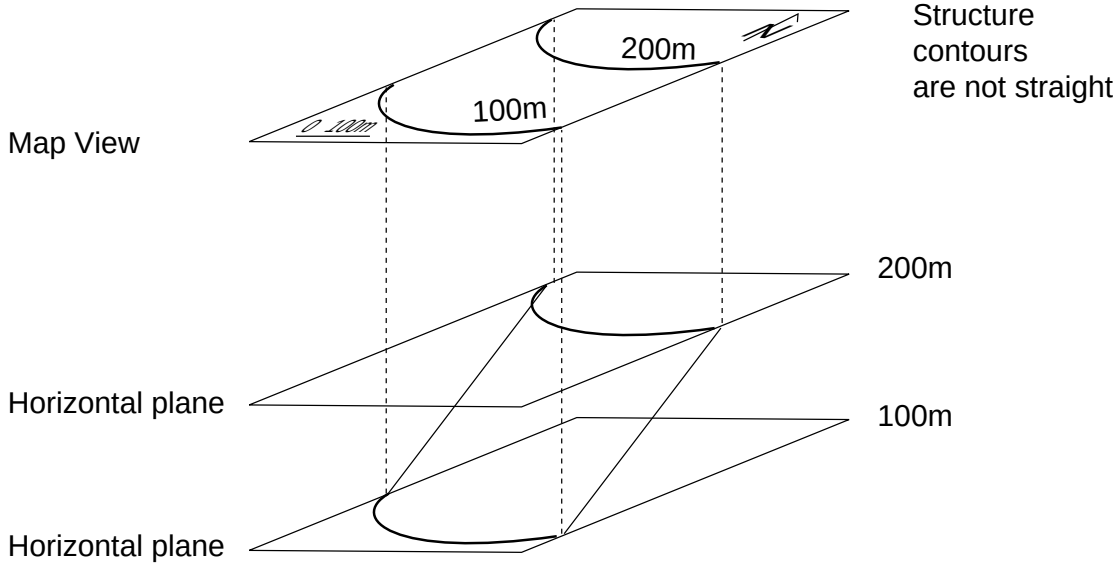
STRUCTURE CONTOURS

Fig. 5.1

Example of structure contours for a planar unit



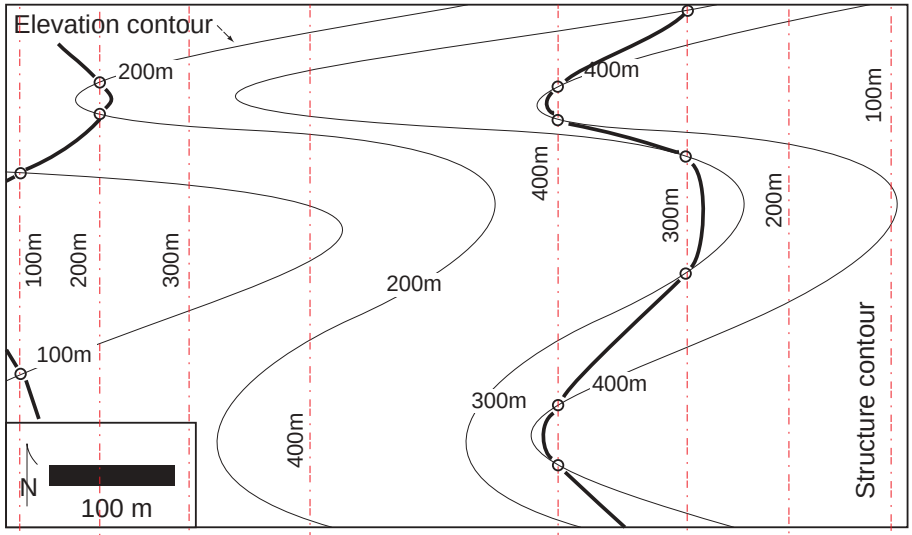
Example of structure contours for a folded unit



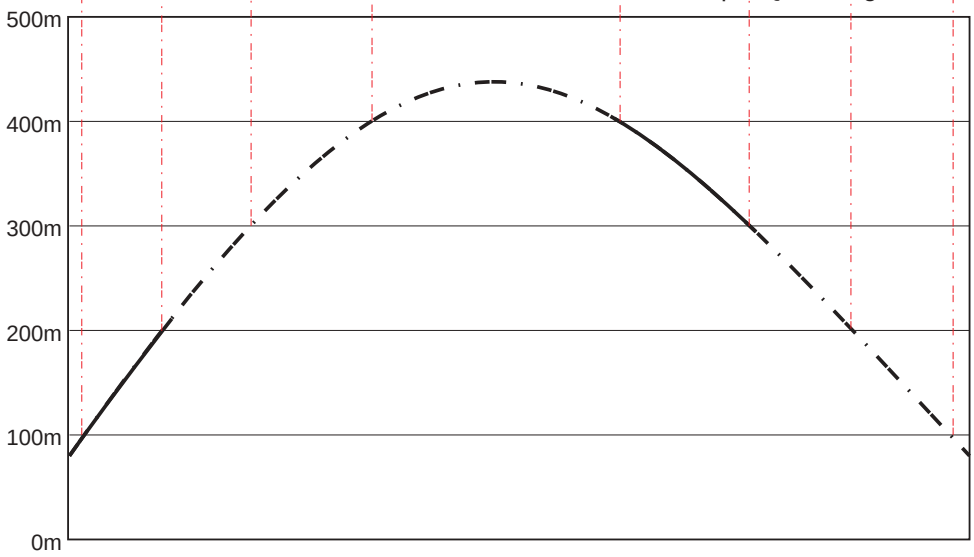
Geologic Structure Map: Intersections of Structure and Topographic Contours

Fig. 5.2

Geologic Map of the Example Quadrangle



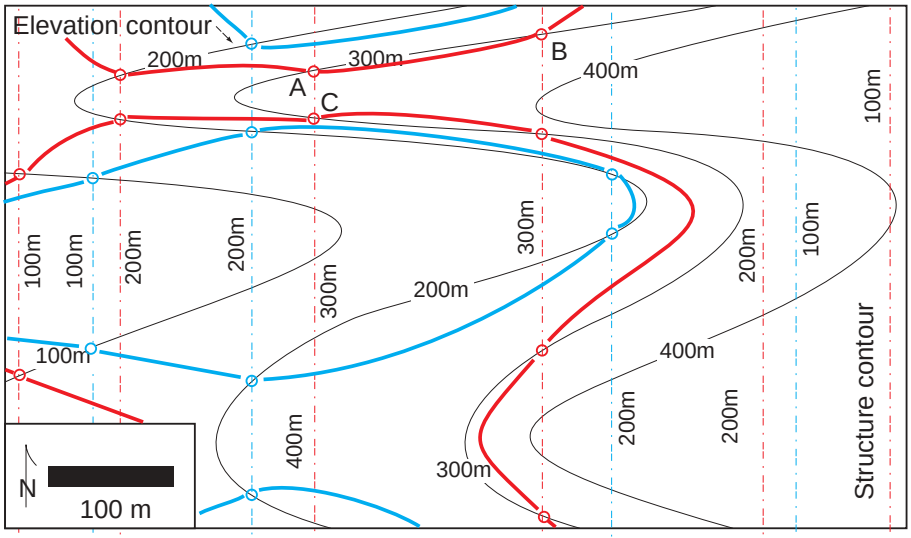
East-West Strike View Cross Section of the Example Quadrangle



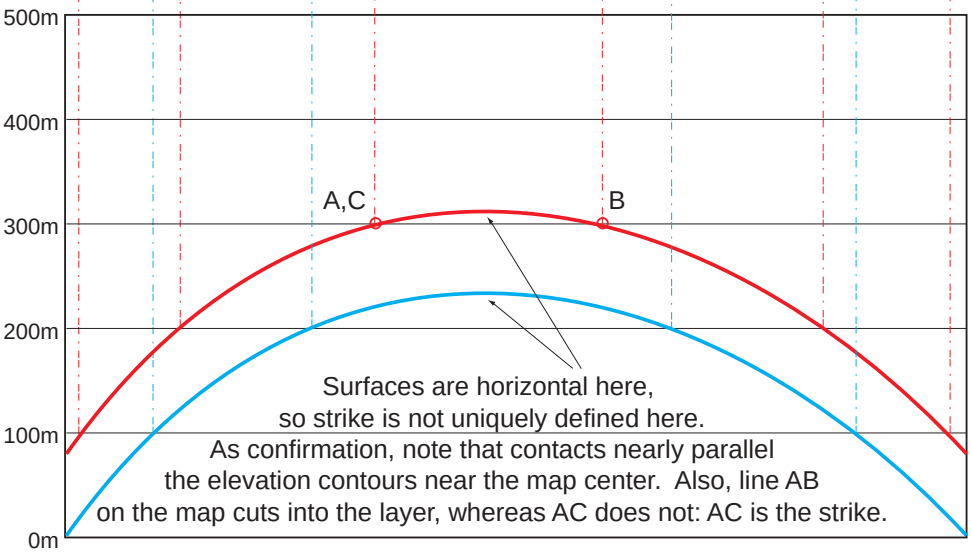
(Elevation lines are shown across the entire cross section only for clarity)

Finding Strike on a Geologic Structure Map Fig. 5.3

Geologic Map of the Second Example Quadrangle



East-West Strike View Cross Section of the Second Example Quadrangle



(Elevation lines are shown across the entire cross section only for clarity)