

Michigan
Department of
Environmental Quality



Water Resources
Division

CROSS SECTIONS

The computation of water surface profiles requires cross-sections at representative locations throughout the river reach. When a river reach is fairly straight and uniform, cross-sections may be taken at regular intervals not exceeding 500 feet. Cross-sections should fully define transitional elements of a stream such as; the cross-sectional area increasing or decreasing, channel or overbank roughness changes, or marked breaks in bottom slope. When an abrupt change in cross-section occurs, such as at bridges, dams or other manmade or natural restrictions, several cross-sections should be used to describe the change, regardless of the distance.

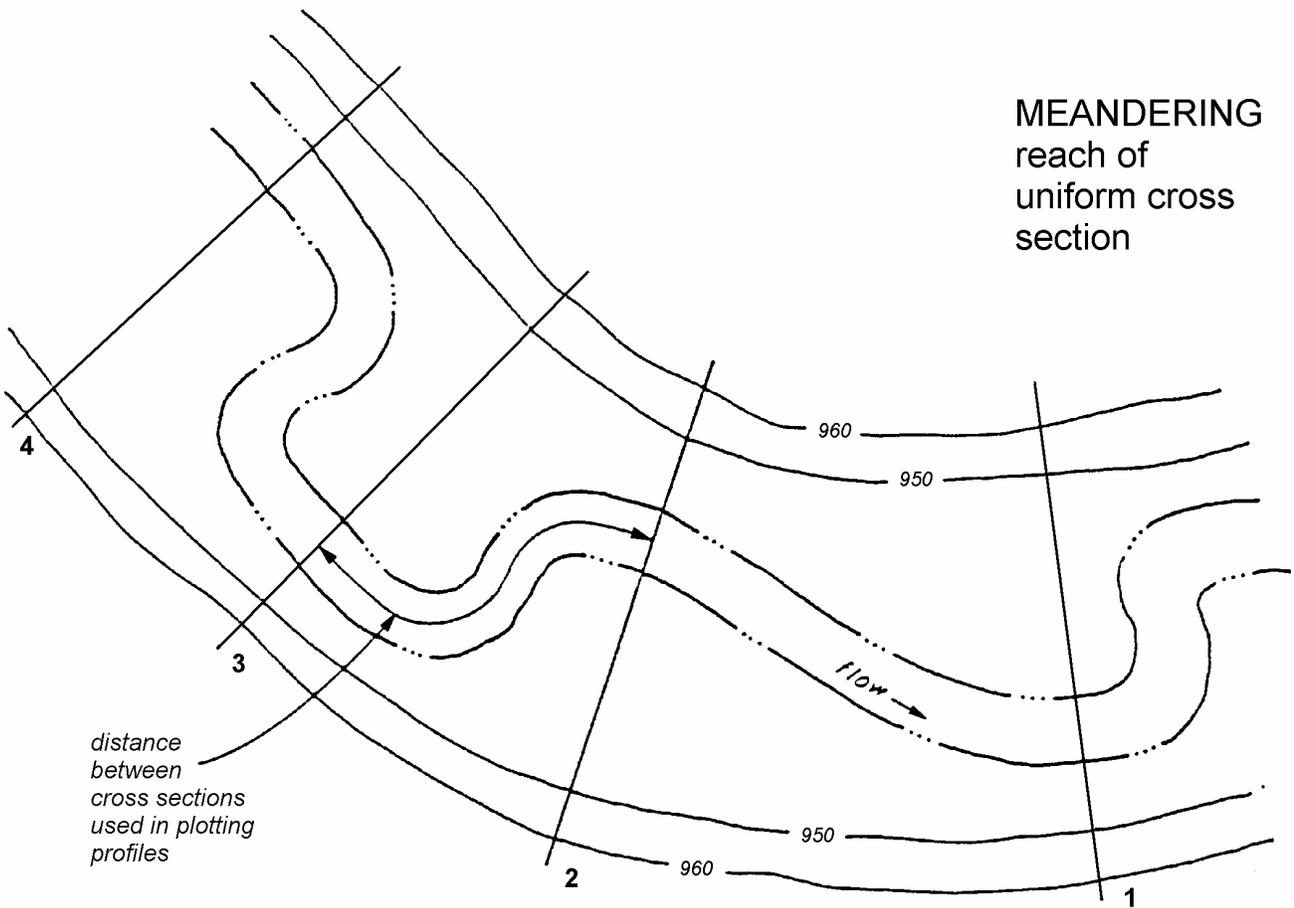
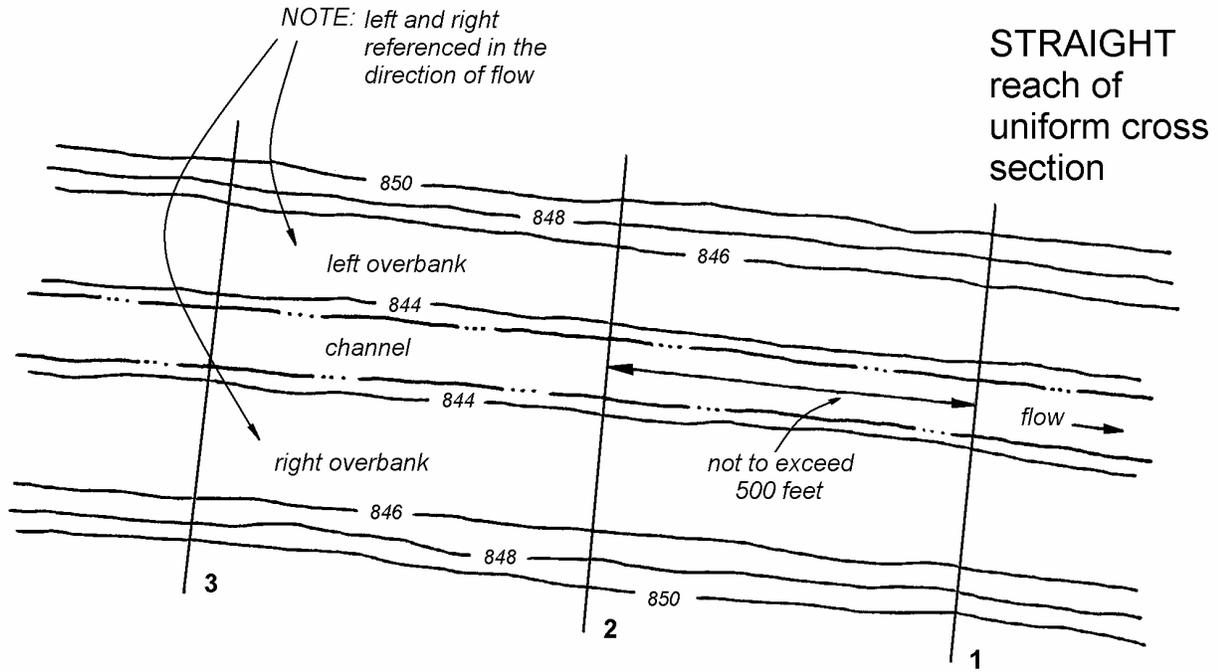
Cross-sections should be taken perpendicular to the direction of the estimated center of mass of the flood flow. This direction, in some instances, may differ materially from that of the normal flow in the channel. Every effort should be made to obtain cross-sections that accurately represent the river geometry at all stages.

Each cross-section should be plotted at a reasonable scale with the left and right corresponding to that when viewed in the direction of flow (i.e. looking downstream). For each plotted point, the distance measured from a reference point on the left, and elevation should be shown. The water surface elevation and date taken should be included on each of the plotted cross-sections.

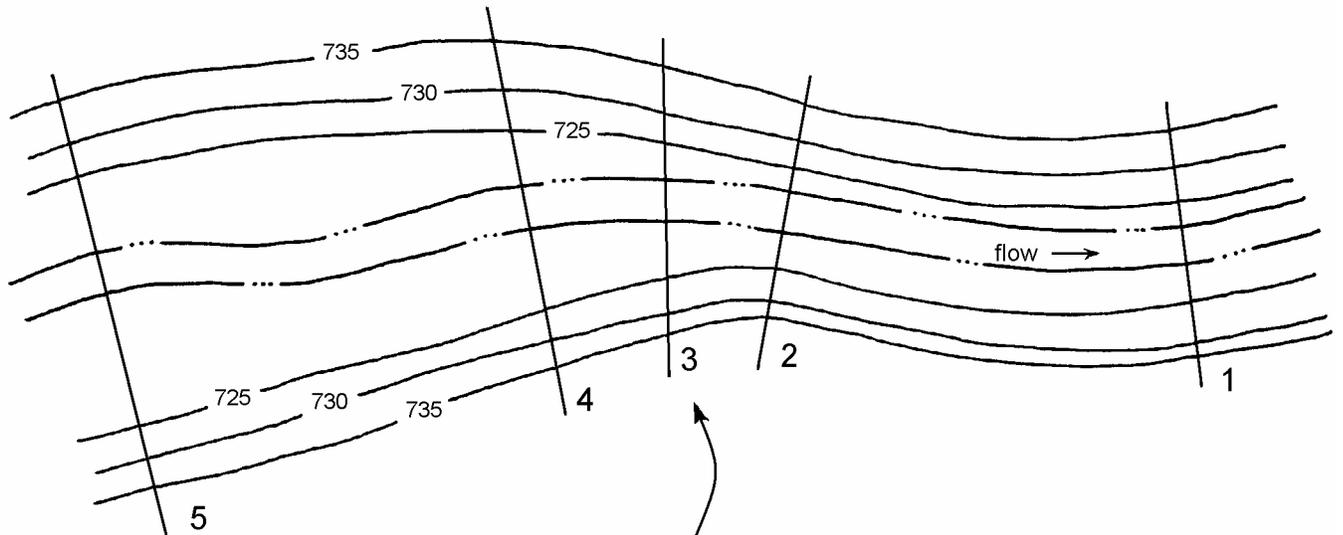
Each cross-section should be located on a topographic map of sufficient detail in order that the channel and overbank distances between sections can be measured accurately.

A profile of the channel bottom and water surface should be plotted from the cross-section data. The plotted distance between cross-sections being that measured along the main channel during normal flow.

The following are some typical examples to serve as an aide in determining the proper location for cross-sections.

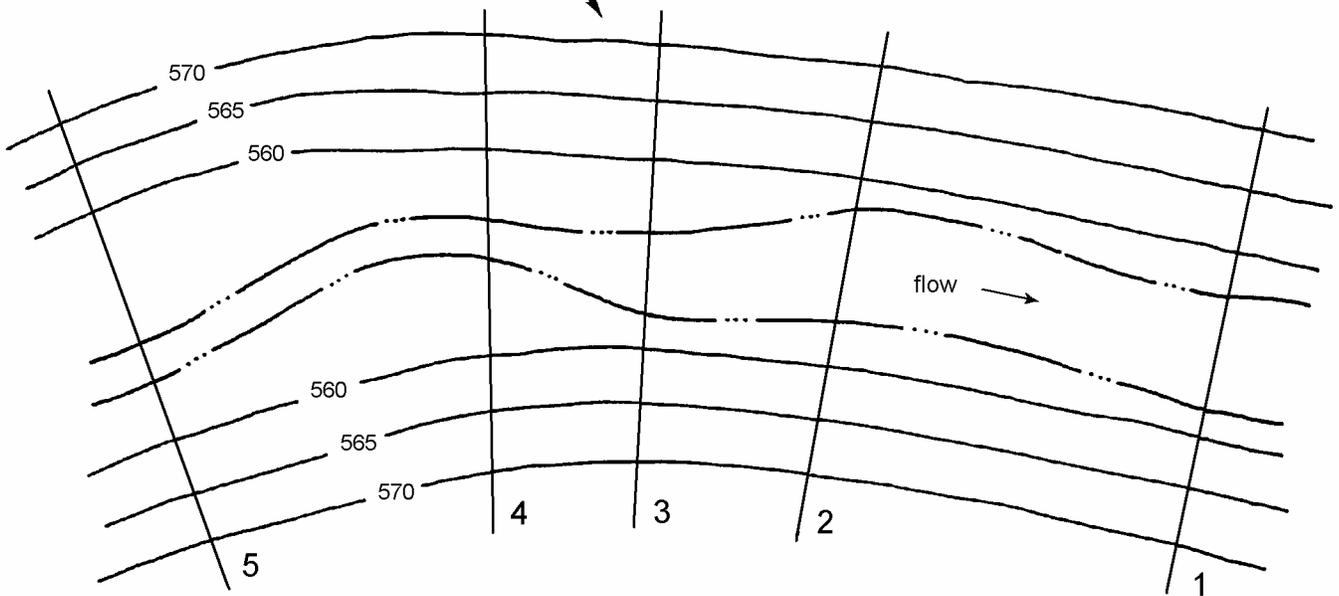


CONTRACTION
of overbank
flow area

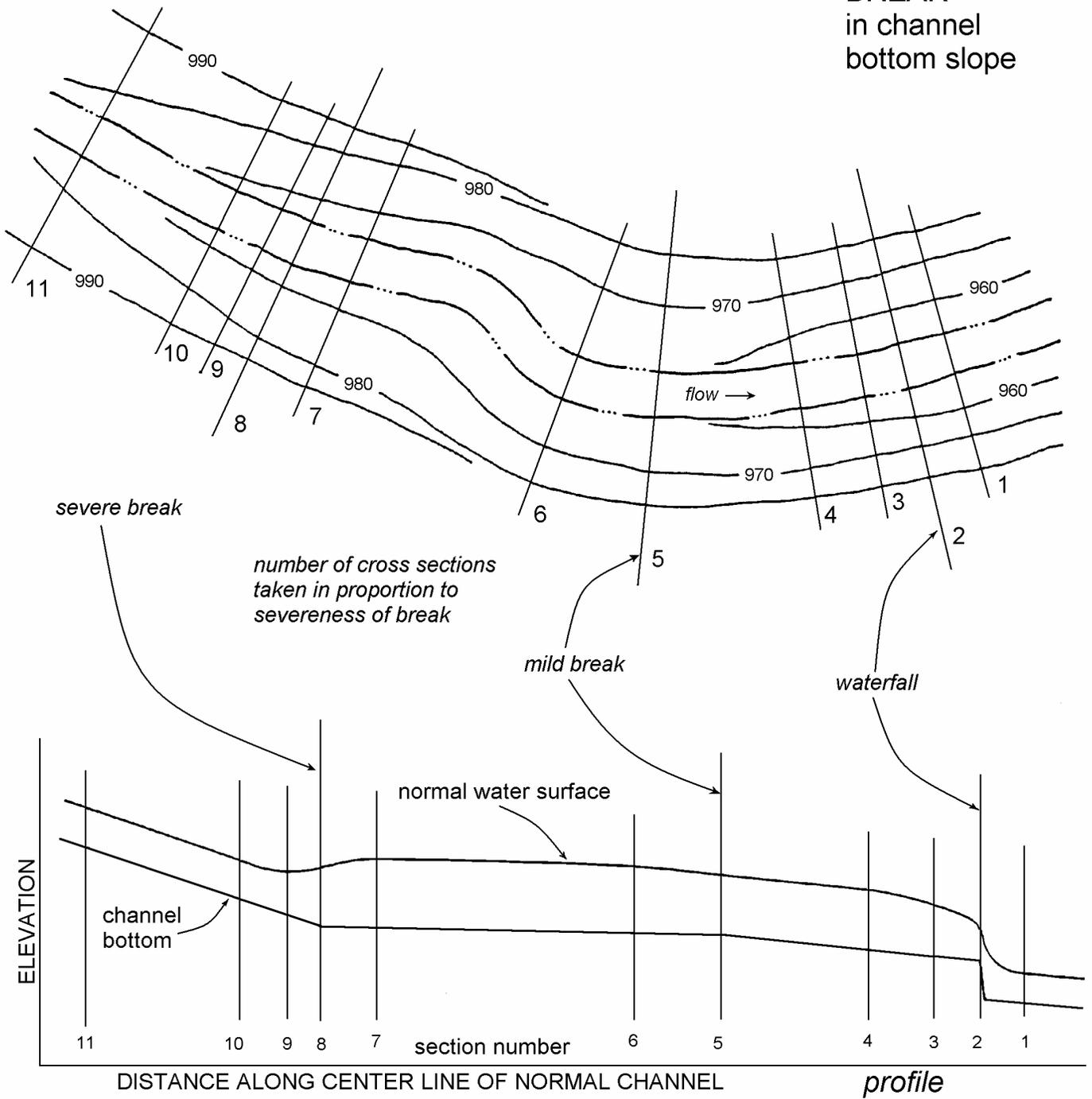


cross sections
spaced in
proportion
to abruptness
of change

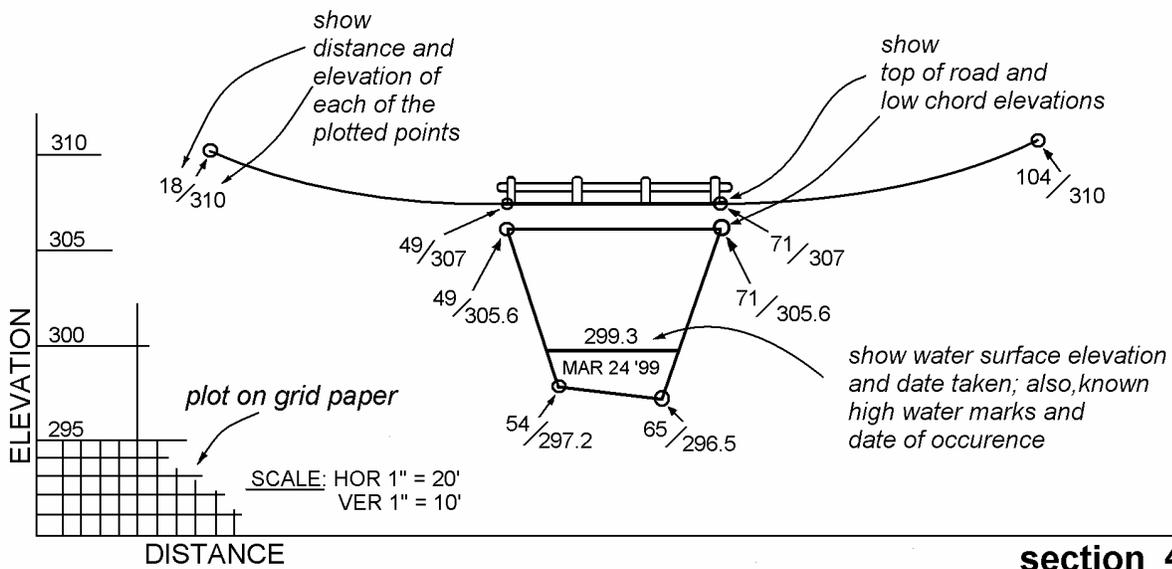
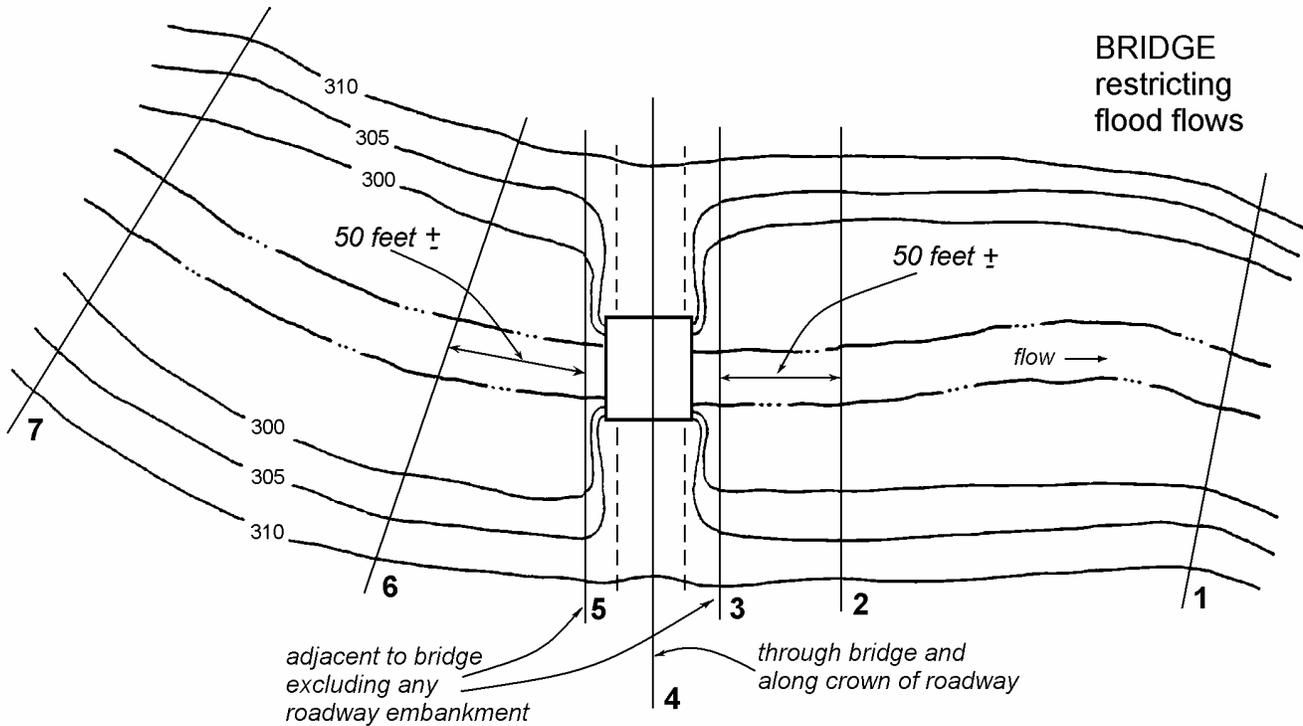
EXPANSION
of channel



**BREAK
in channel
bottom slope**

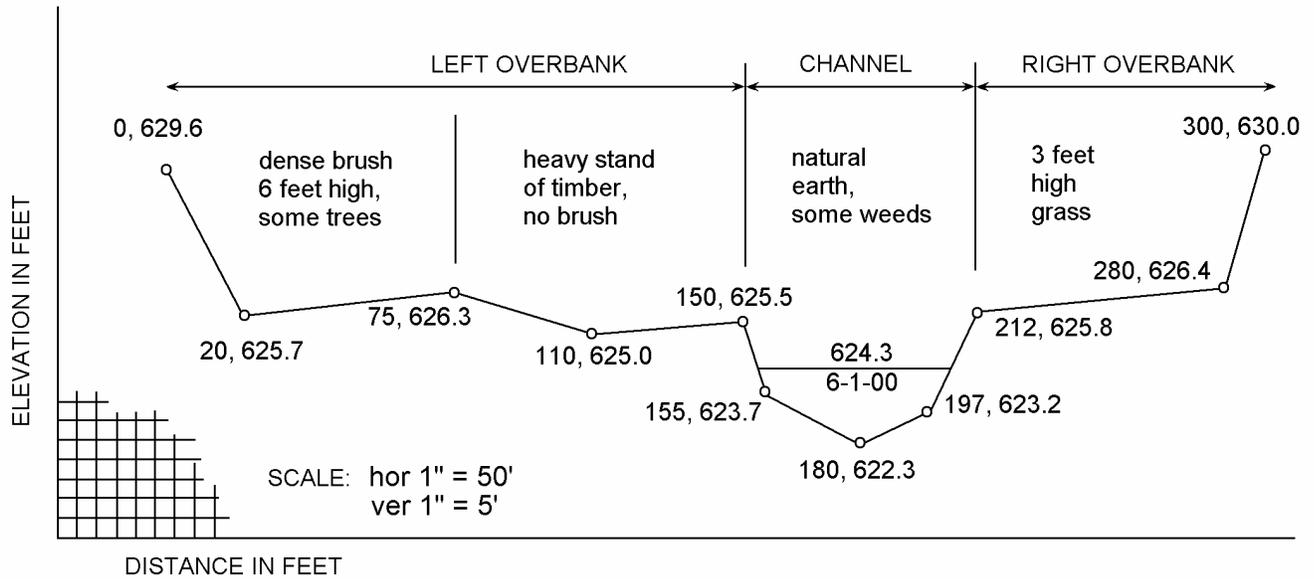


NOTE: profiles should be plotted on grid paper; indicate horizontal and vertical scales



NOTE: cross sections taken at same locations for culverts; include up and downstream invert elevations

TYPICAL
PLOTTED
VALLEY
CROSS
SECTION



NOTE: Valley cross-sections are located as previously described.

Each valley cross-section is plotted on grid paper at a reasonable scale and oriented so that the left and right overbanks are those viewed when looking downstream.

The distance and elevation are shown for each of the plotted points to facilitate the computation of flow areas.

A brief description of the channel material and overbank vegetation is given to aid in the selection of roughness coefficients.

The water surface elevation and date taken is shown. Any high water marks and date of occurrence should be included.