(c) Depth–area–duration values of the selected major storms are maximized in place and transposed to grid points in their areas of transposability or to selected points along their explicit transposition limits. It is rarely necessary to transpose all storms to all grid points since adjustment of a few storms generally indicates which are likely to provide controlling (maximum) values at a particular grid point or set of grid points.

(d) (i) If transposition to grid points is used, data at each point should be checked for durational and areal consistency, and smoothed (sections 5.2.3.1.1 and 5.2.3.1.2);

(ii) If transposition to explicit storm transposition limits is used, draw isohyets to the values on several maps for the various area sizes and durations (Section 5.2.3.2.1).

(e) (i) Draw preliminary isohyets to the values at each grid point. In drawing the isohyets, data at a few points may be undercut or over-enveloped if the data appear inconsistent with adjacent values and cause unwarranted bulges or dips in the otherwise smooth isohyets (section 5.2.3.1.4);

(ii) The data of selected locations should be checked for duration and areal consistency (sections 5.2.3.2.2 and 5.2.3.2.3).

(f) Whatever supplementary aids are available are used for spacing and shaping isohyets between grid points and maintain consistency between maps (section 5.2.4). Final isohyets should be smooth, with no unjustifiable dips, bulges, or gradients.

(g) If maps are prepared for a range of area sizes and durations, the user will have the information necessary to develop smooth depth–area–duration relations so storm PMP values may be calculated for any desired basin. If a generalized chart of PMP for just one specific size of area and duration is prepared, index relations are provided so values for other area sizes and durations can be computed. PMP for other sizes of area and durations are then obtained from these relations, and any necessary depth–area–duration relations calculated for the location of the basin of interest.

5.2.7 Application of generalized or regionalized non-orographic PMP estimates to specific basins

Regionalized, or generalized, estimates of PMP in non-orographic regions provide storm-centred values. It is necessary to develop specific procedures to apply to these storm-centred values to develop a PMP estimate for a specific basin. These procedures are usually provided in an applications manual, which considers the shape and preferred orientations of the isohyetal pattern, the spatial distribution of the isohyetal pattern, and the preferred time distribution of the 6-hour increments of PMP. This is information is usually necessary for the determination of the peak discharge and total volume of the flood hydrograph to permit evaluations of the PMF for a particular location. Procedures described in this section are based on a study for the eastern United States (Hansen and others, 1982). They are based on information derived from major storms in the region and are applicable to non-orographic portions of the region. Variations in these procedures must be developed if they are to be used in orographic regions (section 5.3.6). It should be emphasized that the procedures described may be applicable in other regions, but specific results cannot be applied directly in other regions without detailed examination of data for that region and development of the necessary relations.

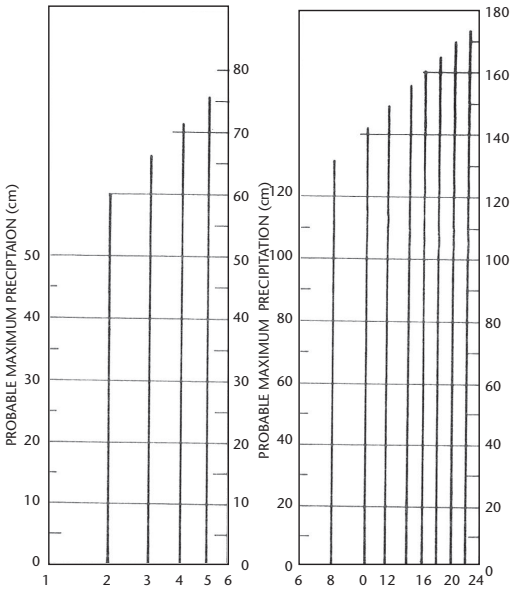

Figure 5.2. Depth-duration interpolation diagrams from study for western United States (United States Weather Bureau, 1960)

5.2.7.1 Temporal distribution

When applying PMP to determine the flood hydrograph, it is necessary to specify how the rain falls with time. Such rainfall sequences are termed the mass curve of rainfall of the storm. They are the accumulated rainfall plotted against the time since the beginning of the storm. Mass curves of rainfall observed in severe storms show a great variety of sequences of 6-hour rain increments. Certain