Condition 2: Find gutter flow, given spread.

a. Determine input parameters, including longitudinal slope (S), cross slope (S_x), spread (T), and Manning's "n."

b. Draw a line between the S and S_x scales and note where it intersects the turning line.

c. Draw a line between the intersection point from Step b and the appropriate value on the T scale. Read the value of Q or Qn from the intersection of that line on the capacity scale.

d. For Manning's "n" values of 0.016, the gutter capacity (Q) from Step c is selected. For other Manning's "n" values, the gutter capacity times n (Qn) is selected from Step c and divided by the appropriate n value to give the gutter capacity.

Figure A3-3 can be used to find the flow in a gutter of width (W) less than the total spread (T). Such calculations are generally used for evaluating composite gutter sections or frontal flow for grate inlets. The following steps are used to evaluate *composite gutter sections*:

Condition 1: Find spread, given gutter flow.

a. Determine input parameters, including longitudinal slope (S), cross slope (Sx), depressed section slope (Sw), depressed section width (W), Manning's "n," gutter flow (Q), and a trial value of the gutter capacity above the depressed section (QS).

b. Calculate the gutter flow in W (Qw), using the equation:

$$\mathbf{Q_w = Q - Q_s} \qquad \textbf{(Eq. A3-5)}$$

c. Calculate the ratios Q_w/Q and S_w/S_x and use Figure A3-4 to find an appropriate value of W/T.

d. Calculate the spread (T) by dividing the depressed section width (W) by the value of W/T from Step c.

e. Find the spread above the depressed section (T_s) by subtracting W from the value of T obtained in Step d.

f. Use the value of T_s from Step e along with Manning's "n," S, and S_x to find the actual value of Q_s from Figure A3-3.

g. Compare the value of Q_s from Step f to the trial value from Step a. If values are not comparable, select a new value of Q_s and return to Step a.

Condition 2: Find gutter flow, given spread.

a. Determine input parameters, including spread (T), spread above the depressed section (T_s), cross slope (S_x), longitudinal slope (S), depressed section slope (S_w), depressed section width (W), Manning's "n," and depth of gutter flow (d).