where:

d_{bthole} = diameter of flange plate bolt hole, inches.

L_{TF2} = ratio to transfer moment at bolt hole closest to column to column face given by Equation 3-46:

$$L_{TF2} = \frac{L - d_c}{L - d_c - 2S_1} \tag{3-46}$$

Step 9: Determine M_{fail} the moment at the face of the column for net section fracture of the beam flange in accordance with Equation 3-47 and check for adequacy to meet the criteria of Equation 3-42, Step 6:

$$M_{fail} = F_u - b\left(Z_b - 2\left(d_{bt} + 0.062\right)t_{fb}\left(d_b - t_{fb}\right)\right)L_{TF3} \tag{3-47}$$

where:

d_{bt} = diameter of bolt, inches

L_{TF3} = ratio to transfer moment from the bolt hole furthest from the column face to the column face, given by Equation 3-48:

$$L_{TF3} = \frac{L - d_c}{L - d_c - 2(S_1 + S_3)} \tag{3-48}$$

Step 10: Determine M_{fail} the moment at the face of the column for elongation of bolt holes in accordance with Equation 3-49 and check for adequacy to meet the criteria of Equation 3-42, Step 6:

$$M_{fail} = T_n \left(d_b + \frac{t_{PL-t} + t'_{PL-b}}{2} \right) L_{TF1} \tag{3-49}$$

where:

T_n is the lesser of the values given by Equations 3-50 or 3-51:

$$T_n = 2.4F_{u-b}\left(S_3 + S_1 - c\right)t_{fb} \tag{3-50}$$

$$T_n = 2.4F_{u-pl}\left(S_3 + S_4\right)t_{pl} \tag{3-51}$$

Step 11: Check block shear according to the requirements of *AISC LRFD* to ensure that the moment at the column face due to any of these modes meets the requirements of the relationship in Step 6. The block shear failure modes are shown in Figure 3-19. For the purpose of this calculation, the resistance factor f shall be taken as unity.

Step 12: Design a single-plate, bolted shear-tab connection sufficient to resist the shear given by Equation 3-52: