3.6.2.1 Design Procedure

The connection shall be designed so that yielding occurs either as a combination of beam flexure and panel zone yielding or as beam flexure alone. The design should be performed using the steps below. The various parameters used in the equations are defined in Figure 3-16 and in *AISC-LRFD*.

Step 1: Calculate M_f and M_c according to the methods of Section 3.2.7.

Step 2: Select end plate bolt size by solving Equation 3-31 for T_{ub} and selecting bolt type and A_{bolt} as required:

$$M_f < 3.4 T_{ub} \left(d_o + d_i \right) \tag{3-31}$$

where:

T_{ub} = $90 A_{bolt}$ for A325 bolts
= $113 A_{bolt}$ for A490 bolts
and d_o and d_i are as defined in Fig. 3-16

Confirm that T_{ub} satisfies the Equation:

$$T_{ub} \geq \frac{0.00002305\, p_f^{\,0.591} \left(F_{fu} \right)^{2.583}}{t_p^{\,0.895} d_{bt}^{\,1.909} t_s^{\,0.327} b_p^{\,0.965}} + T_b \tag{3-32}$$

Where T_b is the minimum bolt pretension per Table J3.1 of *AISC-LRFD* and F_{fu} is as defined in Equation 3-36.

Adjust bolt size as required.

Step 3: Check the adequacy of the selected bolt size to preclude shear failure by ensuring that the area A_b of the bolts, satisfies the formula:

$$A_b \geq \frac{\dfrac{2M_f}{L - d_c} + V_g}{6F_v} \tag{3-33}$$

Step 4: Determine the minimum end plate thickness t_p required to preclude end plate flexural yielding as the larger of the values given by equations 3-34 or 3-35:

$$t_p \geq \frac{0.00609\, p_f^{\,0.9}\, g^{0.6}\, F_{fu}^{\,0.9}}{d_{bt}^{\,0.9}\, t_s^{\,0.1}\, b_p^{\,0.7}} \tag{3-34}$$

$$t_p \geq \frac{0.00413\, p_f^{\,0.25}\, g^{0.15}\, F_{fu}}{d_{bt}^{\,0.7}\, t_s^{\,0.15}\, b_p^{\,0.3}} \tag{3-35}$$

where: