SINGLE-PLATE CONNECTIONS

A single-plate connection is made with a plate, as illustrated in Figure 10–11. The plate is always welded to the support on both sides of the plate and bolted to the supported member.

Design Checks

The available strength of a single-plate connection is determined from the applicable limit states for the bolts (see Part 7), welds (see Part 8), and connecting elements (see Part 9). In all cases, the available strength, ϕR_n or R_n/Ω, must equal or exceed the required strength, R_u or R_a, respectively.

Single-plate shear connections that satisfy the corresponding dimensional limitations can be designed using the simplified design procedure for the "conventional" configuration. Other single-plate shear connections can be designed using the procedure for the "extended" configuration, which is applicable to any configuration of single-plate shear connections, regardless of connection geometry.

Both the conventional and extended configurations permit the use of ASTM A325, F1852, or A490 bolts. The procedure is valid for bolts that are snug-tightened, pretensioned, or slip-critical. In both the conventional and extended configuration, the design recommendations are equally applicable to plate and beam web material with F_y = 36 ksi or 50 ksi. In both cases, the weld between the single plate and the support should be sized as $^5/_8 t_p$, which will develop the strength of either a 36 ksi or 50 ksi plate.

Conventional Configuration

The following method may be used when the dimensional and other limitations upon which it is based are satisfied.

Dimensional Limitations

1. Only a single vertical row of bolts is permitted. The number of bolts in the connection, n, is limited to 2 to 12.
2. The distance from the bolt line to the weld line, a, must be equal to or less than 3 1/2 in.

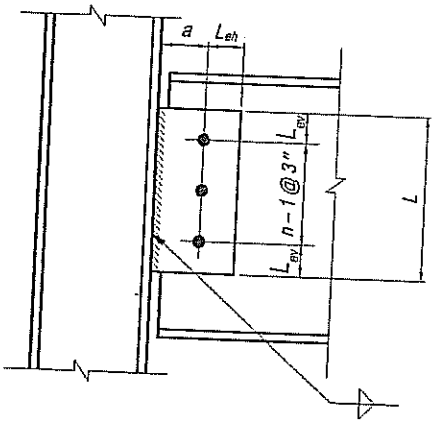

Figure 10–11. Single-plate connection.