

built-up shapes. Built-up columns had a W14x730 section² with side cover plates welded to the flanges (to form a box), or web plates welded between the flanges, as shown in Figure 2–23. The plate welds were specified to be continuous fillet welds at the side cover plates and the web plates. Plate thickness ranged from 1.5 in to 8 in. Plate thickness t (in.) and steel grade were specified as follows:

$2 < t < 4$	ASTM A588 Grade 50
$4 < t < 6$	ASTM A572 Grade 42
$t > 6$	ASTM A588 Grade 42

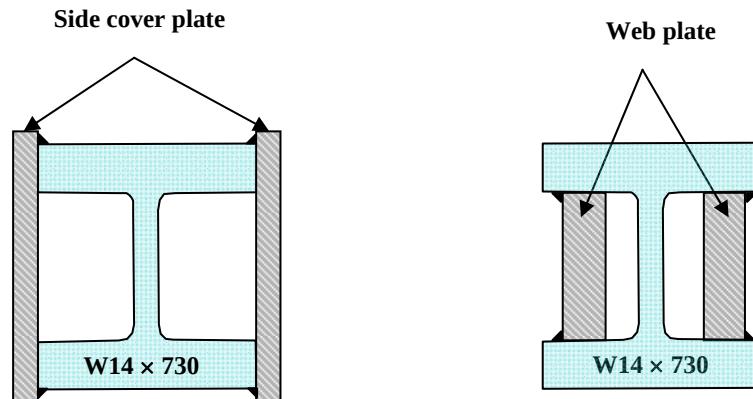


Figure 2–23.
Typical built-up
column details.

Based on structural drawings (Cantor 1985)

Each interior column was spliced every two stories. Typical interior column splices had milled ends and splice plates were welded or bolted to the outside of the column web and flanges. Built-up columns were also milled at their bearing ends but the splice plates were fillet welded to the cover plate or web plate.

Exterior columns were nominally 14 in. W shapes (W14) of ASTM A36 steel. Exterior column splices were similar to the interior column splices.

2.4.5 Column Transfer Trusses and Girders

The layout of the foundation substructure and Con Edison columns did not align with the column layout in the upper portion of WTC 7. Therefore, a series of column transfers were constructed. These transfers occurred primarily between Floors 5 and 7. See Figure 2–24 for a schematic rendering of the transfers.

Columns 47 through 54, at the north facade, were transferred at Floor 7 by cantilever girders to bring them in line with the substation columns, which were offset 6 ft 9 in. to the south. The cantilever girders spanned an additional 46 ft, where they were supported by the north side core columns. The easternmost cantilever girder was connected to Truss 1, and the westernmost cantilever girder was connected to Truss 3 (Figure 2–24).

² W14x730 refers to wide flange section that is nominally 14 in. deep and weighs 730 lb/ft.