

5.3.2 WTC 7 Characteristics

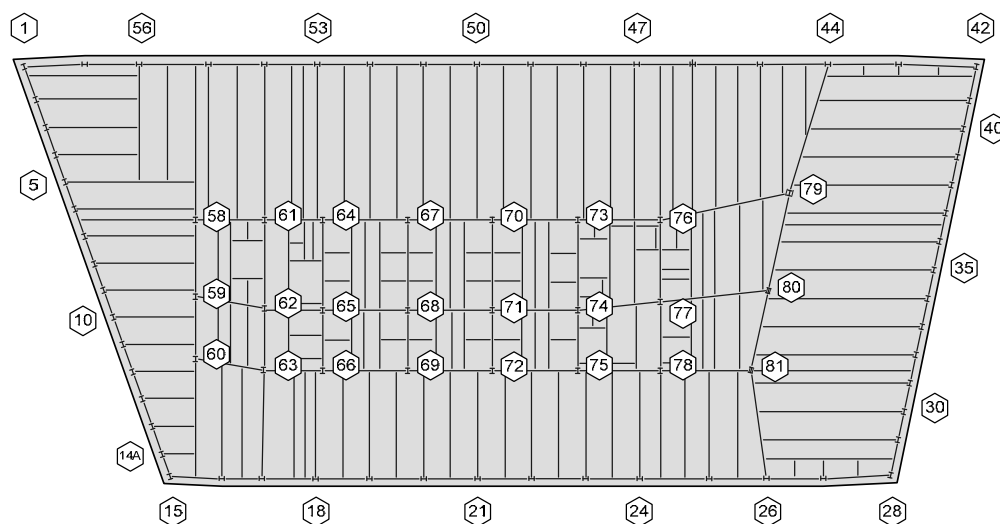
This section repeats some features of WTC 7 (more fully described in Chapter 2) that are needed to understand the visual observations. This section also introduces some of the nomenclature that will be used in later sections.

General Structure

WTC 7 was a 47 story office building whose height from the ground floor to its roofline was approximately 186 m (610 ft). The structure was built over an existing Consolidated Edison electrical substation. A series of transfer trusses and girders on the 5th and 6th floors transferred loads from higher stories to columns that extended to the ground. The upper part of the building had a trapezoidal shape. The south side was 75.2 m (247 ft), the east side was 45.0 m (149 ft), the north side was 100.3 m (329 ft), and the west side was 46.7 m (153 ft). On the north face, an approximately 278 ft wide, two story section of the substation extended outward an additional 42 ft along the base of the west wall.

Figure 5–7 shows the locations and numbers of the structural columns for Floor 8 and above. See Chapter 2 for similar drawings for the lower floors. Column numbers 58 to 78 formed a 15.7 m × 48.2 m (51.5 ft × 158 ft) rectangular core, consisting of a standard steel skeleton constructed from columns and beams. The long side of the core was oriented along the east-west direction. Note that the core was offset toward the west side of the building. Various building services, including mechanical and electrical systems, stairways, elevators, and restrooms, were located in the core. Columns 79, 80, and 81 provided additional support for the long floor spans between the east side of the core and the east face of the building.

The remaining 58 columns were located around the periphery of the building. These columns were numbered starting at the northwest corner and progressing counterclockwise around the building. There was a Column 14A between Column 14 and 15 on the west face. All of these columns were connected by steel wide-flange beams having nominal heights (which varied slightly with location) of 0.9 m (36 in.).



Source: McAllister 2002

Figure 5–7. Locations of columns and beams for a typical floor of WTC 7.