

US Historical Structure Examples
from Historical Building Construction, Donald Friedman, 1995.

1835 Obadiah Parker House, New York, Parker designer, demolished. House walls were monolithic concrete, probably with natural lime cement.

1841 [Old] Merchants' Exchange, 55 Wall Street at William Street, New York, Isiah Rogers architect, heavily modified 1907, landmarked. Monolithic all-masonry construction.

1853 New York Crystal Palace, George Carstensen and Charles Gildemeister architects, burned 1858. Cast-iron columns, wrought-iron arch ribs and truss girders, arched trusses, and all-glass curtain wall, portal bracing for lateral load.

1854 Harper & Brothers Building, 331 Pearl Street on Franklin Square, New York, John Corlies architect, James Bogardus engineer, James L. Jackson foundry builders, demolished 1925. Brick jack arch floor topped with concrete spanned between wrought-iron floor beams, supported by cast-iron and wrought-iron bowstring truss girders and cast-iron columns. The floor beams were the first lot of wrought-iron beams rolled in the United States, by the Trenton Iron Works. One cast-iron facade, brick side walls and rear.

1860 United States Warehousing Company grain elevator, Brooklyn, George Johnson engineer, Architectural Iron Works builders, demolished. Cast-iron frame supporting brick curtain wall, six stories high, cross-braced in all bays by wrought-iron rods.

1860- Watervliet Arsenal, Watervliet, New York, Daniel Badger designer, Architectural Iron Works building, standing. First all-iron building, 100 feet by 196 feet, cast-iron walls and columns, wrought-iron roof trusses, cast-iron girders with wrought-iron tension rods.

1871 Grand Central Depot, 42nd Street and Park Avenue, New York, John B. Snook architect, Isaac C. Buckhout engineer, Wilhelm Hildenbrand engineer for train shed, Architectural Iron Works builders, altered 1989, demolished 1913. First balloon shed in United States: wrought-iron truss barrel vault for train shed, covered with glass and galvanized iron.

1871 William E. Ward House, Port Chester, Rober Mook architect, Ward designer and builder, standing. First reinforce-concrete building in the United States, entire building monolithic, beams reinforced with wrought-iron I's connected for shear transfer, 3½-inch-thick floors reinforced with rods, 2½-inch-thick partitions reinforced with rods, hollow cylinder columns reinforced with hoops.

1875 Tribune Building, Park Row at Nassau Street, New York, Richard Morris Hunt architect, demolished 1966. Probably highest bearing-wall building in New York at 260 feet high. First tower-type building downtown. Wrought-iron beam floors.

1883 Statue of Liberty, Bedloe's Island, Frederic Auguste Bartholdi architectural designer, Gustave Eiffel engineer, Keystone Bridge Company and D. H. King Contracting builders, landmarked. First full-braced frame in New York, first use of steel columns in the United States, early use of concrete in foundation.

1885 Home Insurance Building¹, Chicago, William LeBaron Jenney, architect and engineer, demolished. Main building 138 feet high, 180 feet with 2 additional floors added later. Construction halted temporarily when building officials were concerned that the building weight was only one-third that of a comparable masonry structure.

1891 Monadnock Building¹ 53 West Jackson Blvd, Chicago, Burnham & Root architects (north), Holabird & Roche architects (south), standing. 197 feet high. The northern half is the last Chicago skyscraper built using load-bearing masonry wall construction with walls of six feet thick at the base.

1892 Manhattan Life Insurance Building, 64-68 Broadway, New York, Kimball & Thompson architects, C. O. Brown engineer, demolished. 67 feet by 119 feet, main building 254 feet high, tower 348 feet high. Tallest building in New York when built, first caisson use on a building anywhere (caissons were used in bridge and tunnel construction as early as 1850s in Europe, 1870s in the United States), fifteen caissons 55 feet below grade, 35 feet below open excavation, cantilevered built-up girders in foundations.

1895 American Surety Building, 96-100 Broadway, New York, Bruce Price architect, standing. First complete skeleton frame in New York, twenty stories and 303 feet high, 85 feet by 85 feet, Z-bar columns, wind braced with rods, caissons to rock 72 feet below curb elevation.

1899 Carson, Pirie, Scott and Company Building¹, 1 South State Street, Chicago, Louis Sullivan, architect, standing. Steel structure allowed for increased window area.

¹ Wikipedia: <http://en.wikipedia.org/>

1903 Flatiron Building, 175 Fifth Avenue, New York, D. H. Burnham & Company architects, Corydon Purdy engineer, landmarked. Steel frame with portal bracing and knees at all wind girders, tallest building in the city when completed.

1907 Monolith Building, 45 West 34th Street, New York, Howells and Stokes architects, standing. The first tall, reinforce-concrete building in the city, had limestone veneer for three floors at base, but exposed concrete above to full twelve-story height, stone veneer later replaced by stucco.

1909 [Old] New York Times Building, 42nd Street and Broadway, Eidlitz & McKenzie architects, standing altered. First tall building in the country to be designed using live-load reduction on its columns.

1913 Woolworth Building, 233 Broadway, New York, Case Gilbert architect, Gunvald Aus Company structural engineers, landmarked. Fifty-five stories, 760 feet, 6 inches high, tallest in the city when completed, caissons to rock, with moment-resisting portal frame, all-terra-cotta facade, facade rigidly connected to steel structure, no expansion joints provided, facade restoration required in mid-1980s, designed by Ehrnkrantz Group, over 20,000 panels had to be replaced with fiberglass-reinforced polymer concrete, approximately 100,000 reanchored.

1920 Electric Welding Company of America factory, Brooklyn, T. Leonard McBean engineer. Early use of structural welding, Brooklyn Department of Buildings required a full-scale load test before allowing construction.

1930 Chrysler Building², 42nd Street and Lexington Avenue, New York, William Van Allen, architect, standing. Briefly, the world's tallest building at 1047 feet to spire prior to the Empire State Building. Steel construction (riveted) with central core and steel-clad roof.

1931 Starrett-Lehigh Building, Eleventh Avenue and 26th Street, New York, R. G. Cory, W. M. Cory, and Yasuo Matsui architects, Purdy and Henderson engineers, landmarked. Flat slab concrete floors, on concrete columns with mushroom capitals at 21 feet on center above third floor, steel columns below; slabs are cantilevered to support curtain wall, nineteen stories high.

1931 Empire State Building, 350 Fifth Avenue, New York, Shreve, Lamb and Harmon architects, H. G. Balcom and Associates engineers, landmarked. Eighty-

five stories and 1239 feet high, tallest building in the city when completed, full moment connection wind bracing, early use of aluminum cladding for top tower (dirigible mooring mast), ornament, and spandrel panels, early use of stainless-steel cladding in window edging.

1935 Hayden Planetarium, New York, Trowbridge and Livingston architects, Weiskopf & Pickworth engineers, standing. Early concrete shell dome, 3 inches thick, supporting projection screen.

1950 Secretariat Building of United Nations, near 42nd Street and First Avenue, New York, International Committee and Wallace Harrison architects, standing. First tall, glass curtain wall in New York.

1951 Lake Shore Drive Apartments³, 860-880 Lake Shore Drive, Chicago, Ludwig Mies van der Rohe, architect, standing. Steel frame with lateral resistance in the exterior (non-curtain) walls from steel plate welded to the frame.

1956 425 Park Avenue, New York, Kahn & Jacobs architects, Charles Meyer engineer, standing. Height 375 feet, "one of the tallest to be built to date with bolted connections," 150,000 field bolts up to 1 1/8 inches diameter x 7-inch grip in size; 200,000 shop rivets. Early use of two-man bolt crews.

1957 Seagram Building, 375 Park Avenue, New York, Ludwig Mies van der Rohe, Philip Johnson, and Kahn & Jacobs architects, Severud-Elstad-Kreuger engineers, landmarked. At thirty-eight stories and 520 feet high, tallest building using high-strength bolts when built. Shop connections riveted; unfinished bolts used for beam-to-girder connections.

1958 [Former] Union Carbide Building, 270 Park Avenue, New York, standing. At fifty-two stories and more than 700 feet high, tallest bolted frame when built.

1959 Kips Bay Plaza, 30th Street to 33rd Street, First Avenue to Second Avenue, New York, I. M. Pei & Partners and S. J. Kessler architects, August Komendant engineer, standing. Early exposed-concrete apartment houses, using load-bearing exterior walls of Vierendeel truss type.

1960 Western Electric Building, Fulton Street and Broadway, New York, Purdy & Henderson engineers, standing. At thirty-one stories, tallest steel frame with welded connections in the eastern half of the country when built.

² Wikipedia: <http://en.wikipedia.org/>

³ Emporis Buildings: <http://www.emporis.com/>

1961 Chase Manhattan Building, Cedar Street and Nassau Street, New York, Skidmore, Owings & Merrill architects, Weiskopf & Pickworth engineers, standing. First glass curtain wall building over 800 feet high, sixty stories, largest building using solely interior bracing, steel rails and mullions mounted to structural frame.

1964 New York State Pavilion, Flushing Meadows Park, Queens, Philip Johnson and Richard Foster architects, Lev Zetlin engineer, standing empty. Early use of slip-forming to create freestanding concrete columns; roof is a bicycle-wheel cable truss.

1964 Marina City Towers⁴, 300 North State Street, Chicago, Bertrand Goldberg, architect. Tallest reinforced concrete structures built at the time with 61 floors. Central load-bearing core with column and beam construction.

1965 CBS Building, 51 West 52nd Street, New York, Eero Saarinen architect, standing. Early concrete tube and core structure, thirty-nine stories and 491 feet high.

1968 Madison Square Garden, Seventh Avenue and 33rd Street, New York, Charles Luckman Associates architects, Severud Associates engineers, standing. 425-foot-diameter bicycle-wheel cable truss roof.

1969 John Hancock Building⁴, 875 N. Michigan Avenue, Chicago, Fazlur Khah (Skidmore, Owings & Merrill) designer and engineer, standing. 1500 feet tall with external cross bracing to resist lateral loads as the predominant architectural feature for the tubular design.

1972 Transamerica Pyramid⁴, 600 Montgomery Street, San Francisco, William Pereira architect, standing. 853 feet tall and was the tallest skyscraper west of the Mississippi River from 1972-1974. Constructed of reinforced concrete, it has a tapering shape from base to tip with two vertical “wings” at the upper stories.

1973 Willis (Sears) Tower⁴, 233 South Wacker Drive, Chicago, Bruce Graham architect, Skidmore Owings and Merrill, engineers, standing. 1721 feet high to spire, and the world’s tallest building from 1973-2004. The design incorporates nine steel-unit square tubes in a 3 tube by 3 tube arrangement, with each tube having the footprint of 75 feet by 75 feet. This building was the first with this design.

1974 Avon Building⁵, 9 W. 57th Street, New York, Skidmore, Owens and Merrill architects, standing. Lateral forces are resisted by a sloping base in the street direction (setback requirements), and by exposed, inset cross bracing in the narrow direction.

1975 Water Tower Place^{4,6}, 845 North Michigan Avenue, Chicago, Loeb, Schlossman, Dart & Hackl and C.F. Murphy Associates architects, standing. Framed tube constructed of high-performance concrete. It was the world’s tallest concrete structure from 1975-1990.

1976 World Trade Center, near Church and Fulton streets, New York, Minoru Yamasaki and Emery Roth architects, Worthington, Skilling, Helle and Jackson engineers, tragically demolished. Early structural tube wind frame, of Vierendeel truss type, early pressure-equalized curtain wall.

1977 Citigroup (Citicorp) Center⁴, 601 Lexington Avenue, New York, Stubbins Associates, Emery Roth & Sons architects, William LeMessurier engineer, standing. 72 feet long cantilever spans achieved with 114 feet high stilt-like columns that accommodated an existing church at the corner of the site. The system was not adequately designed for lateral loads when the connections were changed from welds to bolts, and was reinforced in 1978.

⁴ Wikipedia: <http://en.wikipedia.org/>

⁵ Skidmore, Owings and Merrill: SOM.com

⁶ Emporis Buildings: <http://www.emporis.com>