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.


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 Corliss 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- **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.


1885  **Home Insurance Building**¹, Chicago, William LeBarron Jenny, 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 Building**¹, 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 Building**¹, 1 South State Street, Chicago, Louis Sullivan, architect, standing. Steel structure allowed for increased window area.

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.


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-terracotta 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 Building**, 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.


1951  **Lake Shore Drive Apartments**, 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 11/8 inches diameter x 7-inch grip in size; 200,000 shop rivets. Early use of two-man bolt crews.


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.

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2 Wikiupedia: 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 Towers**\(^4\), 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 52\(^{nd}\) Street, New York, Eero Saarinen architect, standing. Early concrete tube and core structure, thirty-nine stories and 491 feet high.


1969  **John Hancock Building**\(^4\), 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 Pyramid**\(^4\), 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) Tower**\(^4\), 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 Building**\(^5\), 9 W. 57\(^{th}\) 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**\(^6\), 845 North Michigan Avenue, Chicago, Loebl, 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.


1977  **Citigroup (Citicorp) Center**\(^4\), 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.


\(^5\) Skidmore, Owings and Merrill: [SOM.com](http://www.som.com)

\(^6\) Emporis Buildings: [http://www.emporis.com](http://www.emporis.com)