

AT&T Headquarters: Culmination of a Life's Work

A striking departure from the "glass box" design of many high-rise office buildings is evidenced in the new \$110-million AT&T corporate headquarters now under construction in New York City.

Via use of an innovative structural steel framing system, a host of challenging architectural and engineering requirements have been met for the 36-story, 800,000-sq ft project on Madison Avenue (between 55th and 56th Streets) in midtown Manhattan.

Construction of the new headquarters began in December 1978 and is expected to be completed by the first quarter of 1983.

Architect Philip Johnson has called the AT&T building his "'capolavoro"—the culmination of my life's work." Structural Engineer Leslie E. Robertson speaks just as highly of the building's notable design. His firm prepared the structural design in association with Consulting Engineer LeRoy Callender.

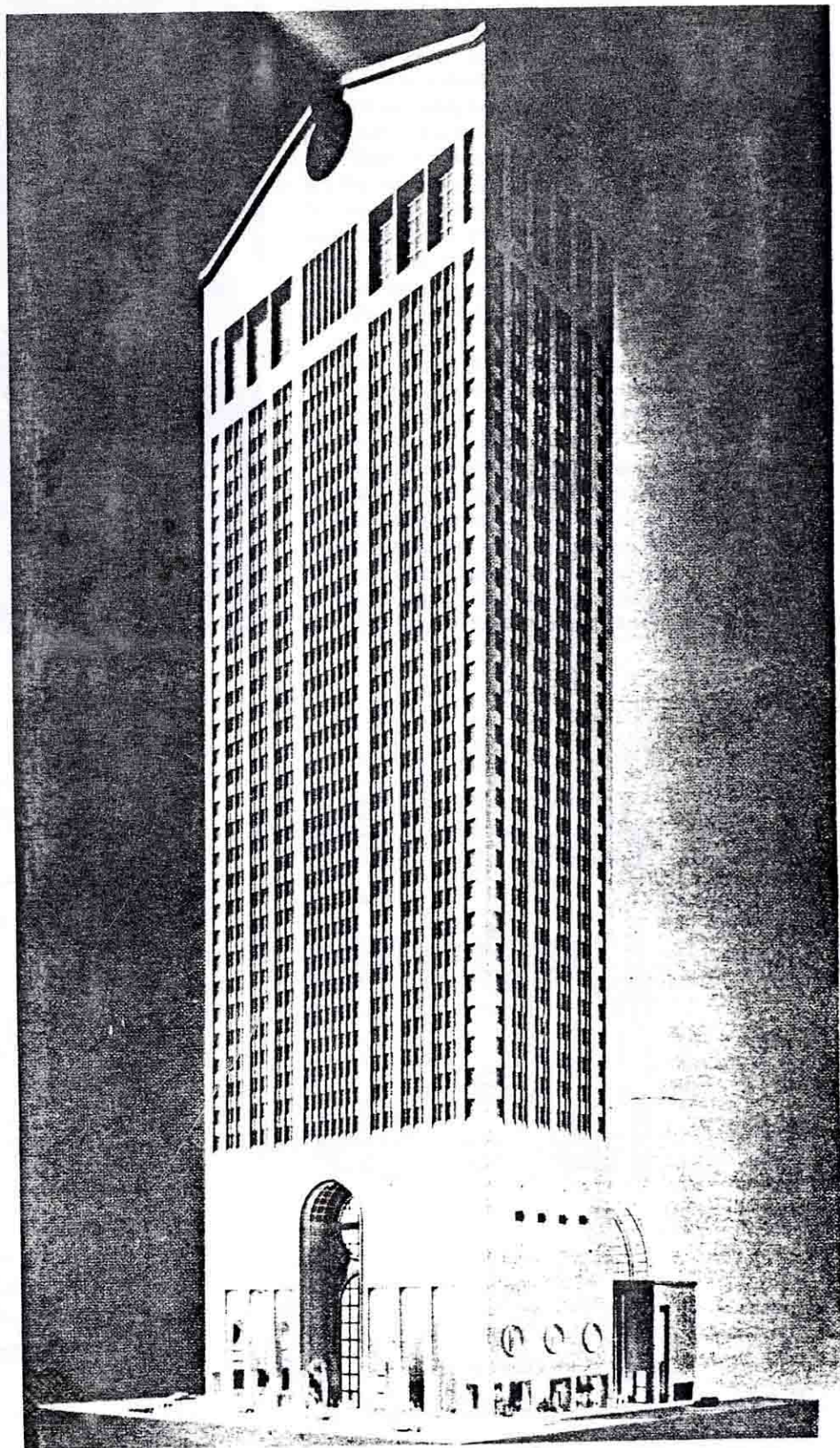
Stanley W. Smith, chairman of the 195 Broadway Corporation, an AT&T subsidiary, said of the new headquarters, "In addressing the kind of building we wanted, we asked the design team to give us a headquarters that reflects a proud tradition and one that typifies a dynamic, progressive organization.

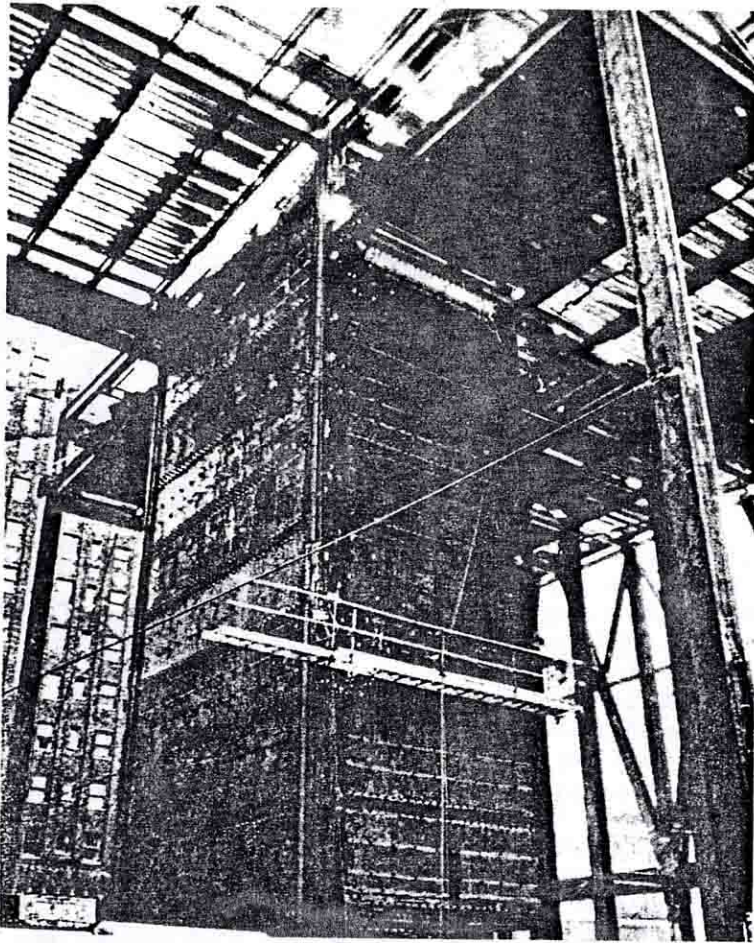
"I think this building will do just that."

Architecture Conveys Dignity

The goal of AT&T was to build a structure that conveys a sense of dignity and identity. One feature of the building, which will make it one of the most distinctive additions to the Manhattan skyline since the World Trade Center, is the top of the AT&T headquarters.

Many designs were prepared and studied before it was decided that a gently pitched triangle, split at its peak by a concave hollow, would convey the individual character of this corporate structure. An impressive 112-ft high arch fronting on Madison Avenue presents a grand entrance to the lobby. Large structural columns along the building face form 60-ft high openings into the structure's open street-level public

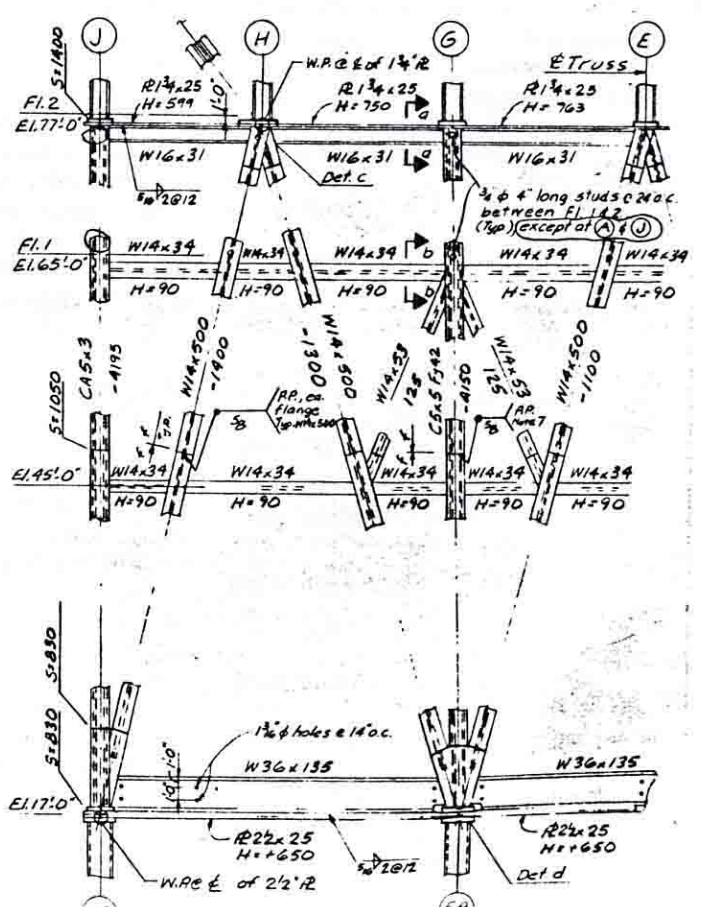
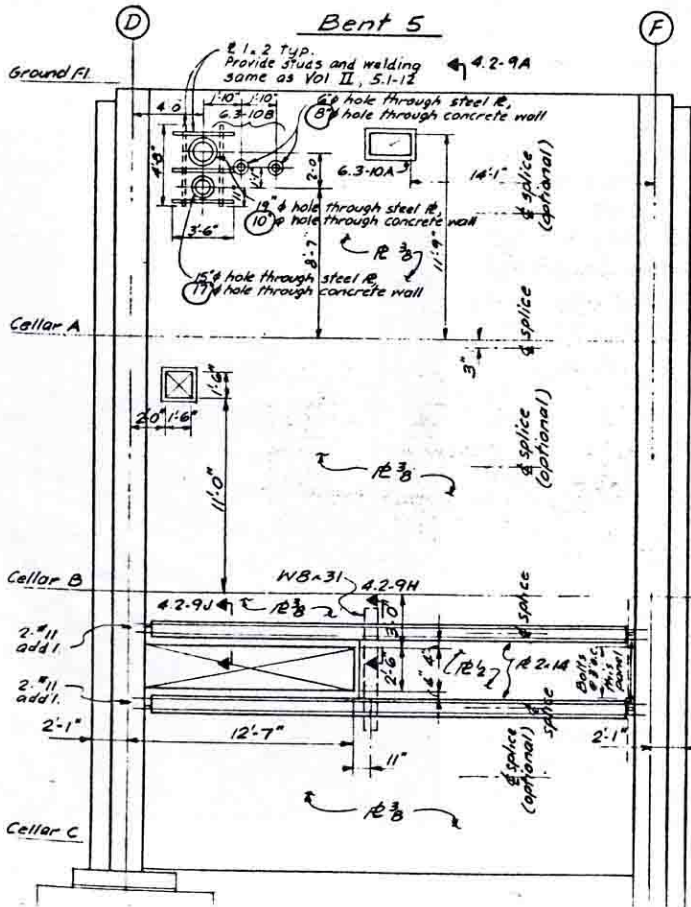


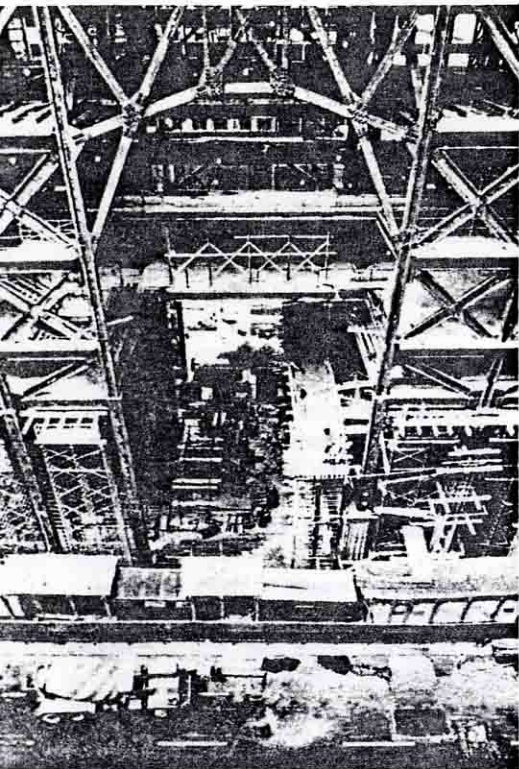


AT&T Headquarters building (1.) now under construction. Above, shear box on lower level, details below.

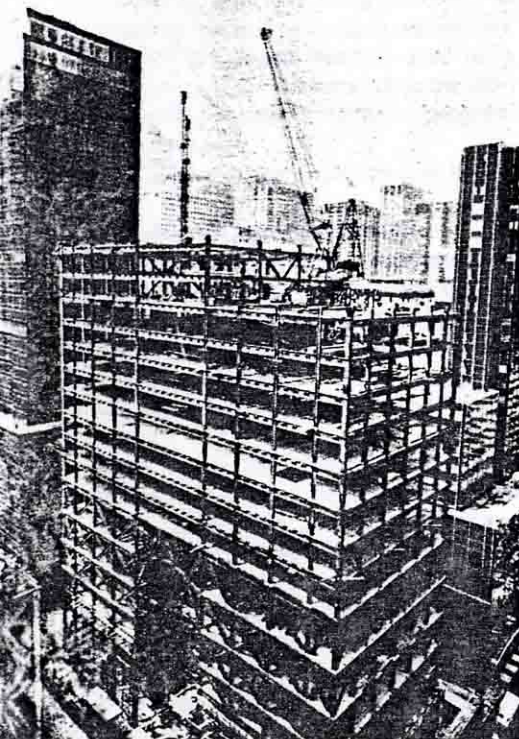
Shear tube wall details

Truss detail





Early progress photos of steel framing of 112-ft high arch that fronts on Madison Avenue.



joints and to insure safety. Only one third of the AT&T building's exterior will be covered by windows as an energy conservation measure.

Rigid Frame Steel Tube Employed

Architects called for wide-span areas in the building, an important consideration in the design of the structural system. The rigid steel tube comprises the structural frame of the headquarters and represents the most innovative application of steel in the project. A total of 15,800 tons of A36, A572 and A588 F_y 50 grade structural steel was used.

Steel was selected for the framing system both for its economy and flexibility. Use of steel enabled the owner to make changes in the design as construction proceeded—changes which would have been costly and difficult to implement if a concrete structural system had been employed. However, reinforced concrete—3,000-4,000 psi—was used in the structural system to provide additional support to steel columns from basement level to ground floor. Concrete was also used for foundation walls, perimeter of the building up to the second floor and for the "cellular" floor system, steel decks topped with concrete.

Essentially, the office part of the AT&T headquarters is "hoisted" some 134 ft off the ground on stilt columns to create an expansive public space. Occupants and visitors to the building take shuttle elevators from the ground level to the building's sky lobby five stories above the public plaza, where they change to elevators that serve the low-rise and high-rise floors.

The frame is actually two series of tubes, the first a lower cross-braced part of the four exterior walls supported by the stilt columns. A second short tube is a cross-braced part at the top. The next series involves two tall vertical tubes that comprise the inner cores of the building, the vertical tubes separated by a 50-ft clear-span space.

At the lower level (fourth floor and below), inner cores are contained within two large shear boxes. Four plates of 3/8-in. thick steel surrounding these boxes house elevator shafts, stairs, ductwork and other mechanical services. The boxes then become architecturally functional elements which conceal the mechanical services,

house the 12 columns in the inner cores (six in each core) and act to resist the horizontal shear at the ground level.

Unique Transfer System for Wind Forces

The AT&T building rises on a 36,800-sq ft site. The fact its width is extremely slender—98 ft—presented potential wind problems. The structural engineer's solution involved a network of trusses which transfer lateral wind forces on the building to its exterior columns.

Running the height of the building from the second level up is a series of steel trusses located within the inner cores. Every eight floors, steel-plated wind braces with holes (doors) cut out for pedestrian circulation extend out from the cores to the perimeter columns. There will be eight of these assemblies which will form four one-story high trusses at three levels in the tower (floors 12, 20 and 28).

Wind shear forces that accumulate from the top down are transferred to the two shear tubes forming the inner cores. The shear tubes, in turn, dissipate shear forces through the grade slab and basement slabs to the rock at the site perimeter.

According to the structural engineers, it was not necessary to have wind braces on every level—a fact welcomed by AT&T, which wanted as much clear, usable space as possible in the interior. □

Architects

Johnson/Burgee Architects
Harry Simmons, Architect (associate)
New York, New York

Structural Engineers

Skilling, Helle, Christiansen, Robertson, P.C.
LeRoy Callender, Consulting Engineer (associate)
New York, New York

Construction Manager

Crow-Briscoe (joint venture)
New York, New York

Steel Fabricator

Bethlehem Fabricators, Inc.
Bethlehem, Pennsylvania

Steel Erector

American Steel Erectors, Inc.
South Plainfield, New Jersey

Owner

American Telephone & Telegraph
New York, New York