Over 100 years ago, in 1886, the milestone nine-story Home Insurance Building in Chicago was completed. Generally accepted as the world’s first skyscraper, the now-demolished structure symbolizes the beginning of a century of progress in tall building construction.

Well over 6,000 skyscrapers—as defined by the Council on Tall Buildings and Urban Habitat—have been constructed during the past century.

This phenomenal growth in high-rise technology can be attributed, for the most part, to two factors. First is the introduction of lightweight, high-strength materials such as space-age plastics and new metal alloys. The second factor is the re-application of existing products to solve new problems, such as development of the I-Stud Cavity Shaftwall System.

Designed to replace heavier, more expensive masonry walls, the I-Stud Cavity Shaftwall System by Gold Bond Building Products utilizes gypsum wallboard framed by metal studs and channels to enclose elevator shafts, stairwells and vertical services shafts. The shaftwalls incorporate built-in flex characteristics designed to withstand the positive and negative air pressure forces exerted by high-speed elevators.

The I-Stud Cavity Shaftwall System and similar systems are major contributors to the technology of high-rise buildings because they are four to five times lighter, considerably less expensive than masonry enclosures, and weighs approximately 10 pounds per square foot of wall compared to 40-50 pounds per square foot for a masonry wall.
and weigh approximately 10 pounds per square foot of wall as compared to 40 or 50 pounds per square foot for a masonry wall.

A weight savings of this magnitude rapidly translates into major dollar savings because buildings which utilize the I-Stud Cavity Shaftwall System will require less structural steel and less extensive underground support pilings.

And interestingly, none of the fire-resistive qualities of masonry are lost because the core of the gypsum panels in the Cavity Shaftwall System contains approximately 21% water by weight, creating a fire barrier with a two-hour rating from either side. When the shaftwall panel is exposed to fire, the water is slowly released as steam to effectively retard heat transmission.

An I-Stud Cavity Shaftwall System also goes up much faster than masonry during any season of the year. And the system is built from one side, one floor at a time, which eliminates the need for scaffolding.

This speed and ease of installation was demonstrated in construction of the award-winning NCNB’s Tampa Headquarters, designed by Harry Wolf, FAIA. Over six miles of I-Stud System Shaftwall were installed in the 33-story, stone-faced tower as the project moved from groundbreaking to completion in just two years.

The I-Stud Cavity Wall System is typically installed utilizing inch-thick gypsum shaftliner panels inside a 2-1/2" metal I-stud with integral tabs to hold the panels in place on the shaft side. Metal J-track runners are used horizontally on the top and bottom and vertically at partition ends, and also to frame openings. Two layers of half-inch gypsum wall board are then fastened to the outside of the stud, creating the wall side of the enclosure.

Development of the first gypsum shaftwall system came about just prior to construction of the twin World Trade Center Towers in New York, which in 1972 were the world’s two tallest buildings.

The architects and engineers who were designing the Trade Center asked the major gypsum wallboard manufacturers to develop a gypsum-based alternative to the conventional masonry elevator enclosures.

Since that time, gypsum shaftwall systems have become “standard equipment” in nearly every medium- and high-rise building project to come off the drawing boards.

In another noteworthy application, the equivalent of 15 miles of Cavity Shaftwall was used to enclose the 32 elevators and numerous stairwells in the Standard Oil Company (Sohio) world headquarters building in Cleveland, Ohio. The 45-story structure, the city’s tallest, is located in the heart of downtown and served as the focal point for the city’s redevelopment plan.

In Dallas, the Cavity Shaftwall System was specified for use in the 60-story Allied Bank Tower. Designed by the renowned architectural firms of I.M. Pei and Harry Weese, the 10-sided structure, enclosed with emerald green glass panels, looks like a modern art sculpture. With sloping side and a pointed top, no two floors in the building are exactly alike.
Selection of the Gold Bond I-Stud System by Otis Elevator for use in the company’s Bristol, Connecticut, research facility ranked as a high point in the evolution of the Gold Bond enclosure system. Accommodating a wide range of elevator experiments in 11 hoistways, the 29-story Otis tower utilized more than 300,000 square feet of Gold Bond gypsum shaftliner/face panels in blending the best of elevating art with high-rise construction.

In addition to the more obvious construction benefits, 2-1/2” thick I-Stud Cavity Shaftwalls provide more leasable building space than masonry shaftwalls constructed with 8” block. And, because the I-Stud System may be installed by the interior finishing contractor, there is no need for specialized tradesmen.

As a contributor to high-rise building technology, the Gold Bond I-Stud Cavity Shaftwall System’s benefits add up rapidly--superior fire resistance, tremendous weight savings, faster installation, increased leasable space--all factors that translate into major savings for building owners and developers faced with spiraling construction costs.