Trusses on stilts had to be "stick built." In-use hospital for burned children is nestled below.

Patient, caring work at children's hospital

Sick children and construction workers are not an easy mix. But at the overhead and underfoot replacement of an in-use Boston hospital for young burn victims, hard hats routinely pass patients—in hallways, the cafeteria, the lobby—reminding them to handle construction with extra care.

"Workers have rallied behind this project in a way I have never seen before," says Benjamin T. Rook, chairman, CEO and principal in charge for project architect-mechanical engineer Odell Associates Inc., Charlotte, N.C.

In addition to keeping patients safe during construction, workers at the $60-million Shriners Hospitals for Crippled Children—Burns Institute offer gestures ranging from decorations to financial contributions, says Rook. The institute and 22 other children's hospitals owned and run by the Tampa, Fla.-based Shriners organization rely on charity. All treatment is free.

After exhaustive study, the Shriners determined that constructing a five-story building above the old four-story hospital, then demolishing it and filling the space with the rest of the new building, was indeed the best course—for patients. But "building on the existing site was the last choice the Shrine looked at," says Rook. "It is complicated and expensive."

It would have been simpler to relocate or to shut down for an in-situ replacement. But the selected course allows patient care to continue uninterrupted. Also, it maintains the institute's tunnel link to Massachusetts General Hospital, which offers extensive facilities just a heartbeat away.

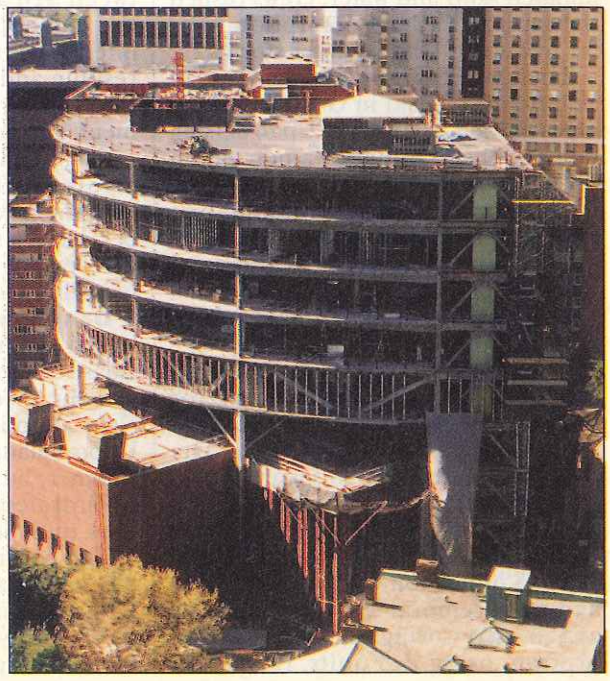
In any case, finding another urban location would have been close to impossible, maintains Rook, who predicts the air rights and new footprint approach "will change completely the way urban hospitals will look at expansion alternatives."

Loaded. The job is loaded emotionally because of the children and technically because of restrictions both for safety and to satisfy abutters concerned about construction noise and views, say those involved.

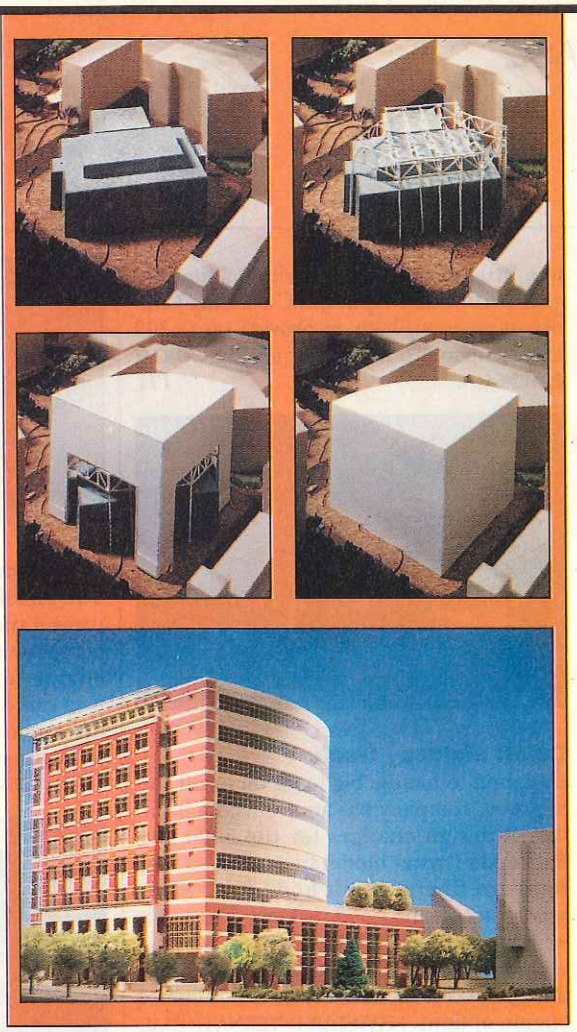
Though only 150 ft tall, the expansion has a high community profile. "There were forty-six meetings with the Boston Redevelopment Authority," says James W. Wright, the Woodstock, Vt., chairman of Shriners' board of governors for the Boston unit. The outcome is a 20,000-sq-ft instead of the proposed 30,000-sq-ft footprint, and a 40-ft height reduction from 190 ft. Consequently, parking is underground, which is more costly to build.

To appease neighbors, work hours are limited: 7 a.m. to 3:30 p.m. weekdays. "We have three cameras to take time-lapse photography to monitor delivery times and weather, so that when we do have complaints from abutters we can defend ourselves," says Gary Kiel, project administrator for construction manager Barton-Malow/Beacon, Boston. The system cost $25,000 but "we have already used it various times to our advantage," he adds. The footage will become a promotional piece for Odell, the Shriners' national architect, and Southfield, Mich.-based Barton-Malow Co., the Shriners' national CM. Beacon Construction Co., a local firm, teamed up with Barton-Malow for the Boston job only.

Also, building over the in-use hospital meant providing a structure that not only will function as a self-contained hospital for two years but is structurally independent of the original, says Richard A. Henige, vice president of Cambridge, Mass.-based LeMessurier



Levels above truss floor were simpler to erect because no "flight path" was required.



Metamorphosis: Four steps of change toward finished product (bottom):Old hospital (top, left); truss system; new upper levels, and the new lower levels after demolition of old hospital.

Consultants, structural engineer.

The engineer accomplished that through a 15-ft-deep structural steel truss system, framing the new fifth floor mechanical level. In the shape of the new building's footprint—a quarter circle—the up to 120-ft-long trusses span the old main building and are supported by 70-ft-tall new-building perimeter columns. "We looked at threading columns down through the hospital but there were no convenient locations," says Henige.

Transformer. Like a giant transformer toy, the Burns Institute is metamorphosing from an outdated 85,000-sq-ft hospital into a 200,000-sq-ft state-of-the-art facility. Work began in 1993. Hospital operations are set to move into upper floors next November. By the following March, after asbestos abatement, wreckers will begin demolishing the vacated 26-year-old building. Foundations for two-and-a-half parking levels should be done by May 1996 and the filler section completed by late 1997.

That is, if all goes well. There have already been some snags. "The team was on site for over a year, basically just marking time," says Kiel, doing minor alterations on the old building to allow for construction above, while waiting for a new-building permit.

And then, with little staging room, the foundation contractor took 32 weeks, not the 16 figured. "The delay was a surprise" and the limited work hours made it impossible to catch up, says John C. Dobbins, Barton-Malow/Beacon senior project superintendent.

The job's major difficulty, however, was that truss steel picks had to be scheduled around surgery in two operating rooms and any occupied floating air beds for severely burned patients—all on the top floor. Way in advance, "we had to present a formal erection procedure that dictated every crane movement," says John R. Snow, project manager for Dorel Steel Erection Corp., Quincy, Mass. Dorel has only had to do that twice in 25 years. The other instance happened at the same time, for Boston's replacement arena.

As there was no room to set and lift prefabricated trusses, the system was "stick built." Of three cranes used, only one was on site at a time. "Dorel literally made flight paths for different members on different days," says Dobbins. Without restrictions, the 12-week job would have taken six weeks.

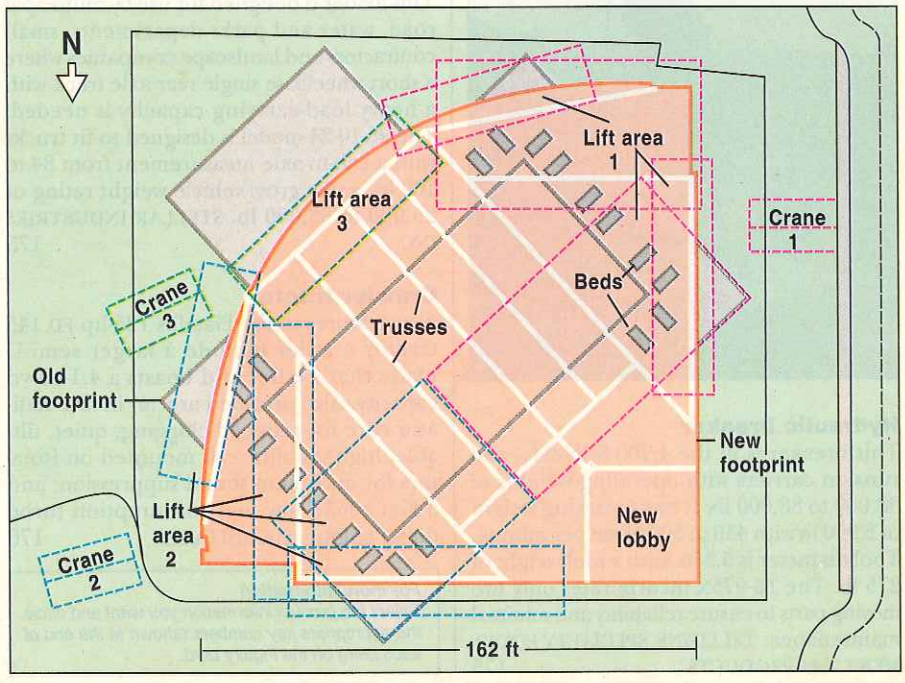
First, Dorel erected and temporarily braced perimeter columns against the old hospital. After the hospital roof and side walls were reinforced for falsework, truss erection began, generally moving clockwise. But "it was all piecemeal and slow-going during the dead of winter," says Snow. Workers were bolting up when the wind chill was 25° F below zero, adds Dobbins, "but there were no mishaps, no cracked walls."

Dorel picked up time when it returned later to erect the upper floor steel. In between, others poured fifth and sixth-floor diaphragm slabs, which also created a safety buffer between the old and the topmost levels, thus eliminating the need for flight paths.

The erector will return yet again for the filler section. This phased nature of the job complicated bidding because most contractors could not afford to tie up bonding capacity for several years. To avoid that, they have separate contracts for each phase. "But they locked in prices for both phases in 1993," says Kiel. Also, the owner waived a requirement for a bid bond. Contractors "have to honor their bids," adds Dobbins.

The level of trust on this job is high. After all, it's all for the children. ▣

By Nadine M. Post in Boston



Lift areas indicate where erector had to alert hospital officials to picks "over" patient beds and operating rooms on old hospital's top floor. Every crane move was planned long in advance.