

Houston Medical Journal

The Leading Source for Healthcare Business News

March 2011 • Volume 7, Issue 12 • \$3.50

CONSTRUCTION REPORT:

Creating a rare bond: Texas Children's Hospital connects with a miracle feat



BY DANIEL A. GAITAN, Associate AIA FKP Architects

If you drive down the southern end of Fannin Street in the Texas Medical Center, you cannot miss it. Your eye is drawn to the massive steel framework of a two-level 21,400-square-foot elliptical structure looping over the roadway and light rail. This unique sky bridge will soon connect all Texas Children's Hospital patient care buildings including the new Pavilion for Women.

As architects specializing in health care projects, complex challenges come with the territory. And, pedestrian sky bridges in the medical center are certainly not a novel idea. But, an enclosed, climate-controlled pedestrian bridge of this size and complexity is a first in the Texas Medical Center — and one of few like it in the nation. A TMC icon will soon be born.

Conceiving the ideal connection

The initial idea for the bridge of course came

out of necessity. In expanding their main campus, Texas Children's needed a new safe and convenient way to connect all of its

Center. The flow of patients and families, staff and visitors is the lifeblood of the campus and the key factor upon which all



Rendering of Texas Children's Hospital patient care building sky bridge

major buildings — the Pavilion for Women, its West Tower hospital and Clinical Care

major facility decisions are based. As Texas Please see **CONSTRUCTION REPORT** page 22

Page 22

Medical Journal - Houston

March 2011

CONSTRUCTION REPORT continued from page 1

Children's and the Pavilion for Women project team began working together in 2006

height. No diagonal braces enable a clear sight line directly through the oval. This design method was the optimum choice, but construction issues such as complex steel fabrication, building in a heavily trafficked dense urban setting and coordinating the necessary street closures and transit service

in mid-October and continued through mid December. Each section was constructed on site then hoisted into place by a 350-ton capacity crane. Presently, contractor W.S. Bellows is continuing construction on work platforms surrounding the structure. Work on the bridge and Pavilion for Women will



Ground view rendering of sky bridge connecting Texas Children's Hospital patient care facilities

to design the new maternal health facility, it became clear quickly that this campus connector would not be your typical sky bridge. Because the Pavilion for Women's specialty will be high-risk pregnancies and deliveries, the transport of some critically ill babies to West Tower's specialty intensive care units will be frequent. A dedicated patients-only passageway is crucial.

Many options of structural form and placements, such as underground tunnels as well as overhead connections, were weighed. An intensive study of more than 30 urban sky bridges was conducted. To address patient needs, overcome site constraints and create an optimum patient journey experience, Texas Children's and the design team concluded the best option would be a two-level, ellipse-shaped bridge. Two-levels allows complete separation for patient transport and medical staff rushing to emergencies, while giving general pedestrian traffic a comfortable and serene campus link.

A difficult labor

As you can imagine designing and constructing this kind of complex structure presents significant challenges. As is often the case, the elements that make a project unique are the elements that turn up the level of difficulty. In order to achieve the desired open and transparent aesthetic, the bridge is designed with a Vierendeel truss, which uses rectangular panels and rigid joints instead of the diagonal braces typical of most bridge designs. This design features only vertical and horizontal angles with all of the glass the same width and

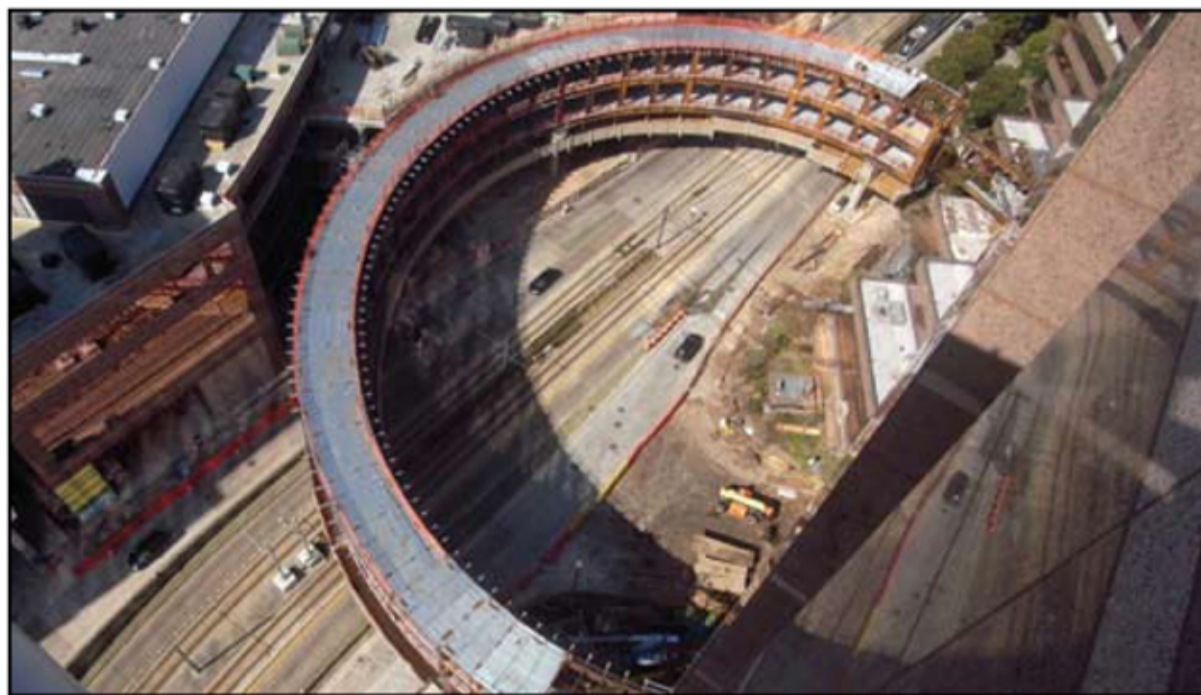
disruptions with the City of Houston and METRO had to be overcome.

The design team innovated by creating 3D physical models literally printed from computer rendered models and applying advanced project coordination methods such as Building Information Modeling (BIM) and integrated project delivery (IPD) methodology (all state-of-the-art

continue through fall 2011, when the facility begins offering outpatient services. The first babies will be delivered at the Pavilion in early 2012, when labor and delivery and other hospital services commence.

An iconic result

Linking to the existing auxiliary bridge, the new Texas Children's bridge makes a complete loop, encompassing a walkable area of more than one-fifth of a mile. With the Vierendeel truss design, the bridge will appear to float and emit a glow inside and out, created by 124 illuminated interior columns and a lit exterior outer rim. Exceeding hurricane building codes and built to withstand 130 mph winds, the bridge maximizes use of natural light with soaring ceilings that conceal, beyond mechanical



Aerial perspective view of construction sky bridge structure

practices in 2006). BIM was invaluable in pre-troubleshooting bridge connections at the two existing buildings, which required uniting six different floor elevations. Meetings at structural engineer Walter P Moore's Visionarium (a collaboration room in a massive IMAX-like theatre setting), visualized structural construction in the fourth-dimension (time), enabling leaders of the construction team and within the Texas Medical Center to plan street closures and traffic reroutes for the 11-month bridge construction.

The construction process began October 1, 2010, with the first street closings to start site preparation. Installation of the nine bridge sections occurred on weekends beginning

and electrical infrastructure, a pneumatic tube system for quick transport of materials between the Pavilion for Women, the West Tower and Clinical Care Center.

Though its practical function and the orientation of the buildings largely dictated its form, the stunning geometry of the bridge's elliptical shape brings additional value to Texas Children's. The bridge serves as a symbol of Texas Children's continuum of care from preconception through childhood. This symbolism, its majestic presence and its location at the Texas Medical Center southern gateway converge to make it an icon and way finding landmark for Texas Children's and the Texas Medical Center. ▼