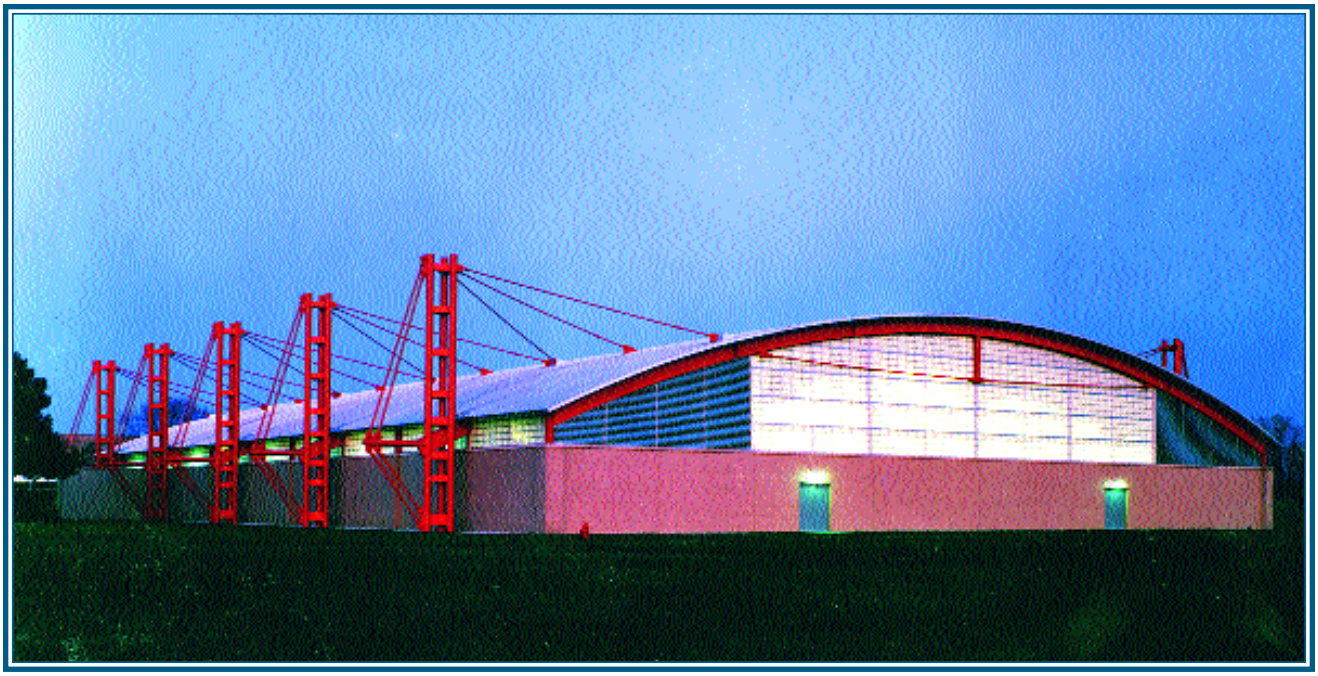
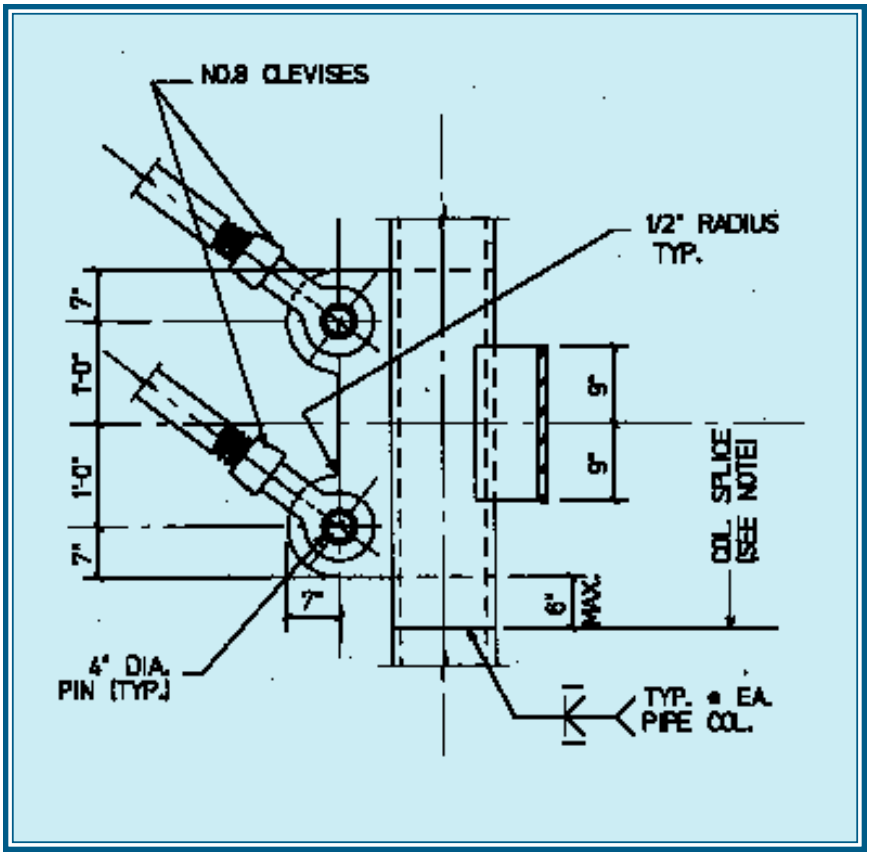
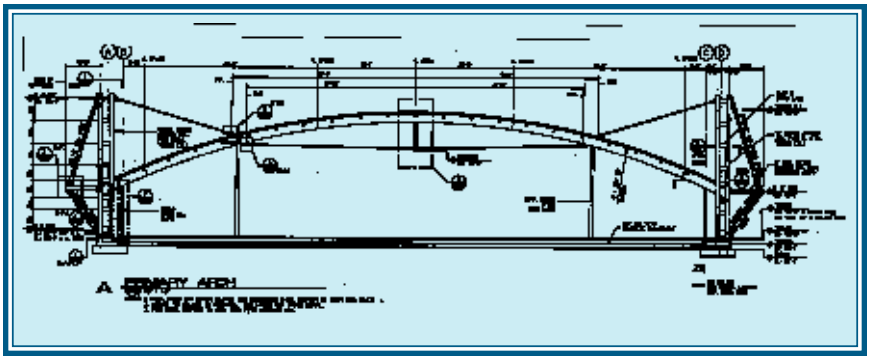

Niles West High School
Field House

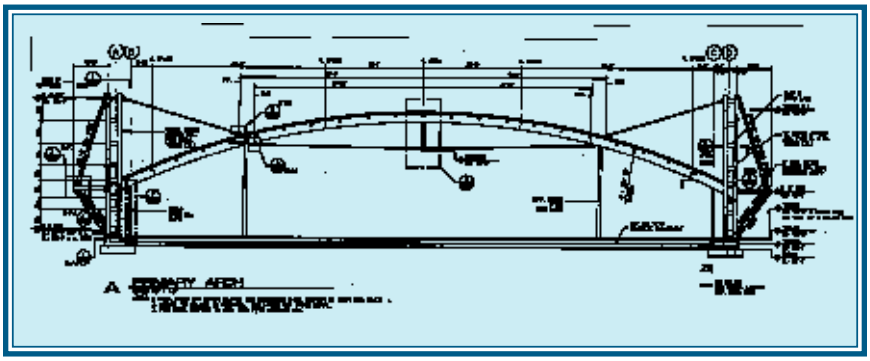


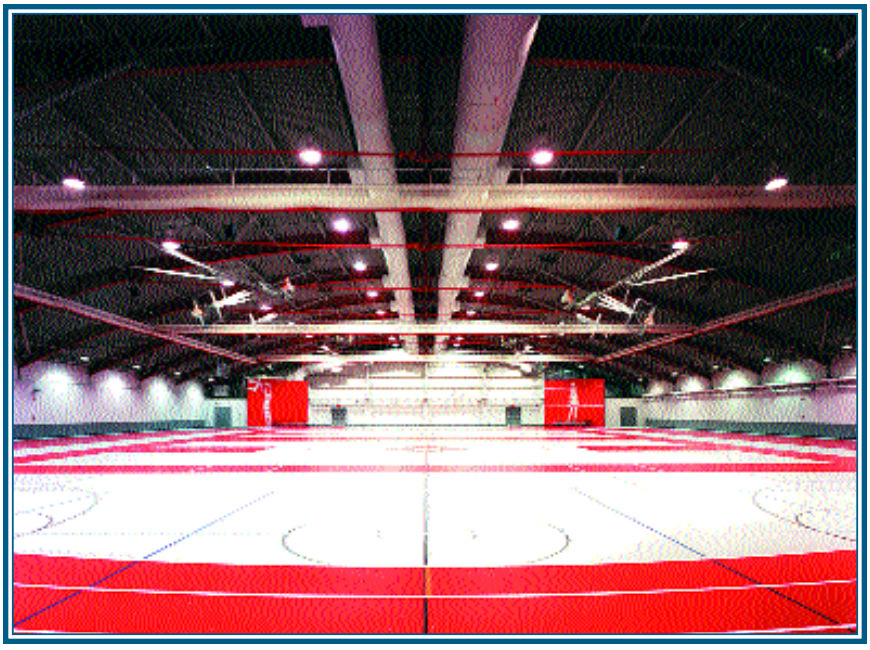


Designed to accommodate the physical education and athletic needs of a burgeoning student population, the 40,000-sq.-ft. Niles West High School Field House includes four teaching stations, a competitive 160-meter track and four full-size basketball courts, which allows several sporting events to take place simultaneously.

The design of the building was driven by programmatic and structural requirements. Perhaps the greatest challenge was to sat-







isfy the School Board's desire to minimize the volume and the new building and thereby reduce heating costs. The solution was a curved roof supported by exterior structural steel elements and clear-spanning 170' over the field

Judges Comments

The combination of a steel arch, an unusual thrust tie system and the exterior columns yields a very elegant solution. A highly aesthetic yet cost effective response to the need for column free space.

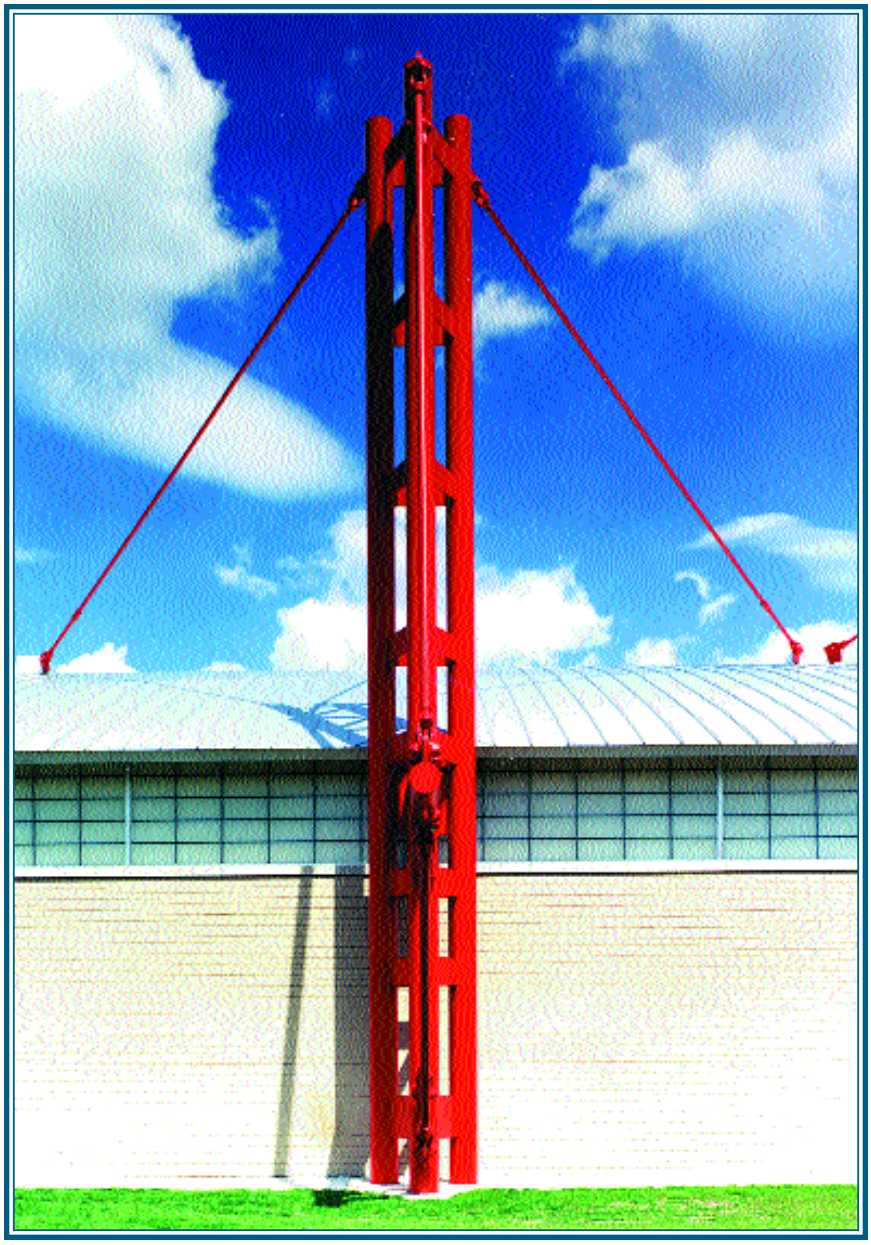
house's open floor. Supporting the structure from above minimized interior obstructions while a curved long-span arch provided the required vertical clearance of a peak of 35' above the basketball and volleyball activities while providing a minimum height of 12' over the track. The curved structure eliminated approximately a quarter million cubic feet of unnecessary volume, which translates into an annual energy savings of about $27,800.

The structure includes five primary arches and six secondary arches. All of the arches consist of curved W30x99 wide flange members.

The primary arches tie into columns consisting of three 12" diameter hollow structural sec-

tions in a triangular arrangement. The column design was chosen both for aesthetics and because the design provided the necessary stiffness. Heavy W12 members encased in concrete run under the building and tie the tower bases together, closing the forces full circle and eliminating the need to accommodate the large horizontal forces in the foundation system. The alternative, according to a soil consultant, would have been to use batter piles, but they would have been much more expensive.

The thrust in the secondary arches is transferred to the tower columns through a truss, consisting of W12x40 members, in the "plane" of the roof. Transferring forces through the truss allowed the designer to cut the number of column towers in half and instead of having columns at each arch they could be at every other arch. Not only did this reduce costs, but it created a more open and attractive design, both light and dynamic in appearance.



Project Team

Architect/Engineer:
OWP&P Architects, Inc., Deerfield, IL

Contractor:
Boller Construction Co., Inc., Waukegan, IL