

STAPLES Center

Trane EarthWise System • Los Angeles, California

A rollicking concert by Bruce Springsteen & the E Street Band was the opening event for STAPLES Center in Los Angeles. Groundbreaking for the new facility had been a scant eighteen months earlier. The extremely short construction cycle is just one of many superlatives for the arena that has been called “The Entertainment Center of the World.” Just a month after the opening, the facilities crew had its first “double-header” sports event, with a need to convert from hockey ice in the afternoon to a basketball court in the evening. In a typical season, the facility will have seven to ten days when there are multiple sporting events on a single day. The hockey ice remains in place all season long and receives an insulated cover when basketball or convention floors are placed over the top. The thirty-five-person facilities crew can change from hockey to basketball or the reverse in less than two hours.



Project summary

Trane EarthWise™ HVAC systems for maximum comfort and efficiency.



*"This is the way large buildings will be optimized and designed in the future."
– Blair Boyce, Trane sales engineer*

Home to four pro teams

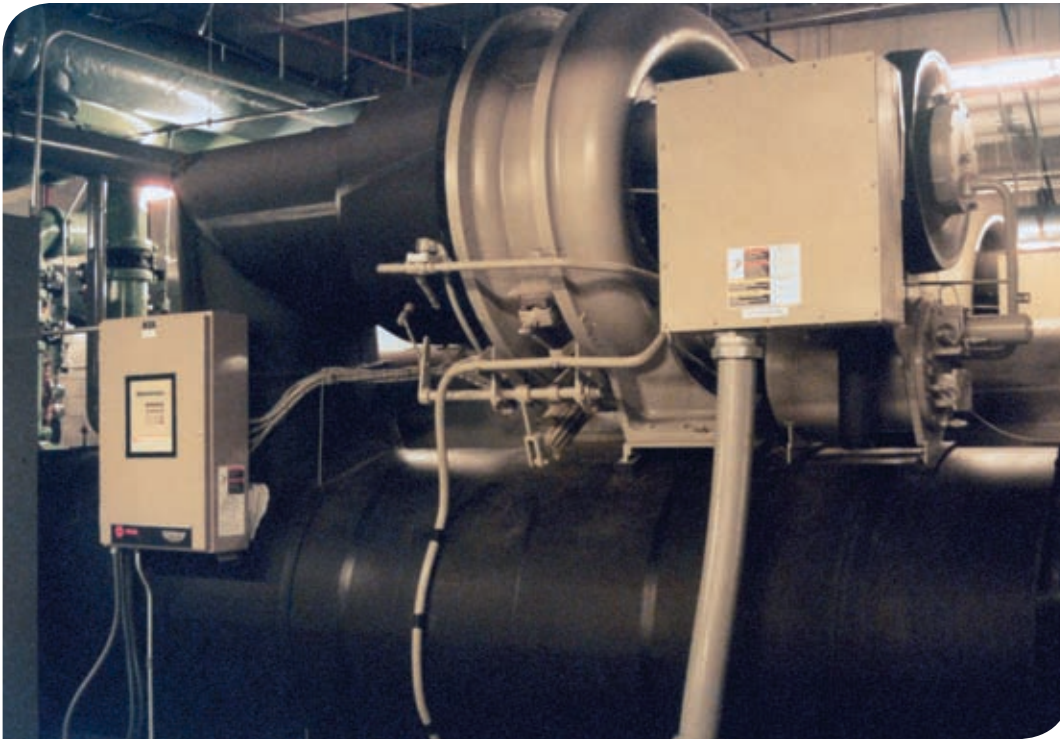
The privately-owned \$375-million facility is adjacent to the Los Angeles Convention Center and is located in the center of downtown Los Angeles. It is the home venue for four professional sports teams – the NBA's Lakers and Clippers, the NHL's Kings and the WNBA Sparks.

The facility encompasses approximately one million square feet and seats 18,500 fans for hockey and 20,000 for basketball. This is a true multipurpose facility, with lighting and acoustics entirely suitable for concerts, conventions and sports events. When the facility was designed, strong emphasis was placed on customer comfort. Seating, sound system and lighting were all designed to make the spectator experience as comfortable as possible. Concession facilities, rest rooms and concourses are spacious and abundant. Another important aspect of the arena is the HVAC system. Again, the emphasis was on assuring a quality entertainment experience for demanding customers.

Trane EarthWise™ design

The consulting mechanical engineer for the facility was M.E. Engineers/Hayakawa Associates of Los Angeles. Its design for the building included a low chilled water temperature, low supply air temperature system featuring high efficiency centrifugal chillers. The units selected were three Trane model CVHF CenTraVac™ chillers rated at 833 tons using HCFC-123 refrigerant.

The cooling towers for the units are based on an 82.5°F/94.6°F range and operate on a 2.3 gpm/ton flow rate. This comparatively low flow rate improves overall system efficiency by reducing pump and fan power requirements over more traditional 3.0 gpm flow rates. The centrifugal chillers deliver chilled water to the air handlers in the range of 40°F to 42°F during non-ice rink events and at 36°F for hockey games and ice rink shows. This lower chilled water temperature during rink events helps assure maximum dehumidification to help maintain the surface quality of the rink ice. With



Chiller plant includes three Trane CentraVac™ chillers. This comparatively low flow rate helps improve overall system efficiency.

this low temperature water, supply air is delivered to the space at 40°F during ice events and at 45°F for other events.

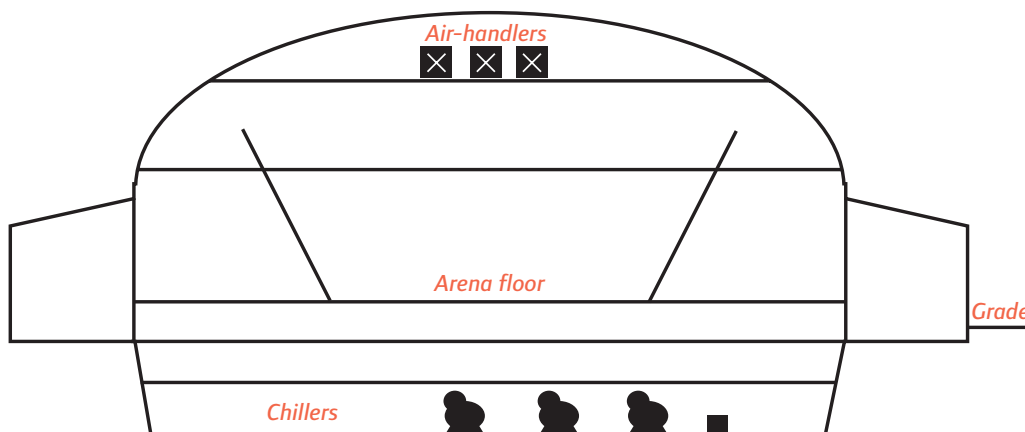
Trane Series R™ chiller for low demand

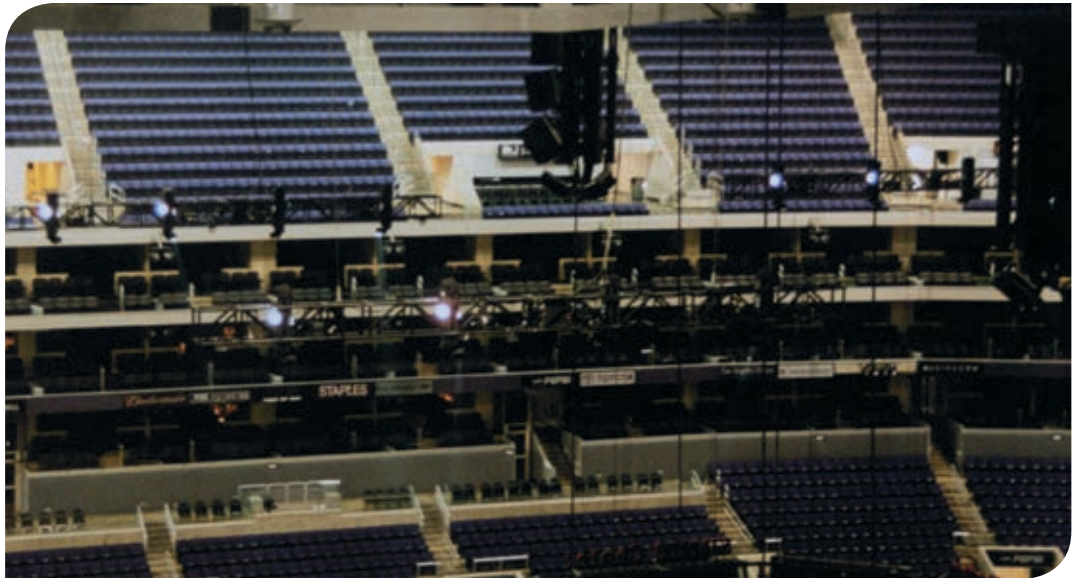
In addition to the centrifugal units, the plant includes one Trane model RTHC Series R™ helical-rotary chiller rated at 300 tons. This chiller is used principally at times of low chilled water demand, typically at times when the arena bowl is not in use. The rink ice plant itself consists of 260 tons of Cimco compressors.

The arena air handlers are manufactured by Trane AireSystems which builds custom air handlers. The custom air handlers for the STAPLES Center feature 12-row chilled water coils. The deep coil design makes these air handlers the principal source for dehumidification of building air, assuring customer comfort and helping maintain high quality ice for NHL level competition. Other building air handlers include Trane Modular Climate Changer™ and outdoor T-Series™ Climate Changer units. These supply restaurants, sports fan retail areas, locker rooms, office areas and other administrative spaces.

Systems installed

- Trane model CVHF CentraVac™ chillers
- Trane model RTHB Series R™ chiller
- Trane Climate Changer™ air handlers
- Trane custom air handling units





Emphasis on comfort and acoustics

In addition to general seating in the arena bowl, STAPLES Center features 160 luxury suites. Here, also, the emphasis is on complete comfort and acoustic performance. The suites have individual variable air volume (VAV) terminals with electric reheat, with ventilation air provided by a dedicated duct system.

The STAPLES Center system is an excellent example of the EarthWise™ building design advanced by Trane. EarthWise projects feature high chiller efficiency, low temperature chilled water and low cooling tower water flow for maximum system efficiency. Trane promotes EarthWise™ systems as the way large buildings will be optimized and designed in the future. Building owners and the engineers look at total system efficiency, not just the efficiency of

individual components. The payoff is both great comfort and lower operating costs.

An important part of customer health and comfort is adequate ventilation. Staple Center's ventilation system includes a CO2 monitoring and control capability that increases ventilation rates as occupancy levels rise. The arena also has a special lightweight (aluminum construction) high-volume fan system for exhausting pyrotechnic smoke. The fans are a low-noise Woods axial design that exhausts pyrotechnic smoke within minutes at 150,000 cfm. Lingering smoke from pyrotechnic displays can be a problem at older indoor facilities. This exhaust fan operates at very low sound levels while quickly clearing away smoke residues. Attention to acoustic levels is a major aspect of the facility's focus on customer comfort.



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