DUCTSOX®
Fabric Air Dispersion Products

SICK COLLEGE POOL GETS Rx WITH SWIM COACH'S IAQ CONCEPTS AND DESIGN.

Fabric ductwork and dehumidifier delivers draftless air, abate swimmers' respiratory problems, & reverse building deterioration.

Carlisle, PA—Dickinson College Aquatics.

Carlisle, PA—There was no doubt in the mind of Dickinson College Aquatics Director, Paul Richards that his pool suffered from Sick Pool Syndrome.

Swim practice was periodically interrupted by team members with breathing problems caused by stagnant chloramines-laden air near the pool surface. Plus, 80-percent humidity levels that created rainforest conditions had taken a toll on many parts of the Kline Athletic Center's 10,000-square-foot natatorium as well as the roof and metal amenities of the connecting 78,000-square-foot field house.

case study

It was ongoing roof problems in the connecting field house that led school officials to appropriate $248,000 to remedy the situation with a complete retrofit for *Dickinson's 8-lane, 25-yard-long pool natatorium.* Richards, who has a Masters degree in sports sciences with a specialization in aquatics maintenance, management and design, then researched the latest state-of-the-art natatorium technology with the help of Durwin Ellerman, supervisor of mechanical and electrical trades at Dickinson. They discovered fabric duct air dispersion, which was becoming popular because the polyester-based ducts don't corrode or attract condensation in aquatic environments, combined with a heat recovery dehumidifier would solve his pool's poor indoor air quality.

Paul Richard

With the drafting and engineering help of *Rich Munkittrick,* vice president of manufacturer's representative, H & H Sales, Mechanicsburg, PA, Richards and Ellerman began designing the new system anchored around fabric duct by DuctSox®, Dubuque, Iowa, and a dehumidifier by Dectron Internationale, Roswell, GA.

Like many natatoriums built in the 1980's, the 23-year-old pool was originally designed with only a commercial air conditioning unit that provided unsatisfactory cooling and no dehumidification relief. The air distribution was equally ineffective and consisted of two 4 x 4-foot wall grill returns in one location and a series of five 3 x 1 foot wall diffuser air supplies located in only one wall. Consequently, air stratification was evident in more than 50 percent of the pool area. Air movement was particularly dead at the pool surface level where swimmers breathe.

Ideally, natatorium environments are most effective with a combination of under deck and overhead air supplies, according to the American Society of Heating, Refrigerating, Air Conditioning Engineers (ASHRAE), Atlanta, GA. Since under deck ductwork was not an economically feasible option, the design team conceived of a main 52-inch-diameter trunk line spanning 120 feet down the center of the natatorium. The trunk line consists of DuctSox's Sedona Comfort-Flow® model, which delivers approximately 15 percent through the natural porosity of the fabric. The remaining air is delivered through a linear mesh diffuser in each of the four 20-inch diameter perpendicular branches that spray the windows and the spectator section with 82ºF air.

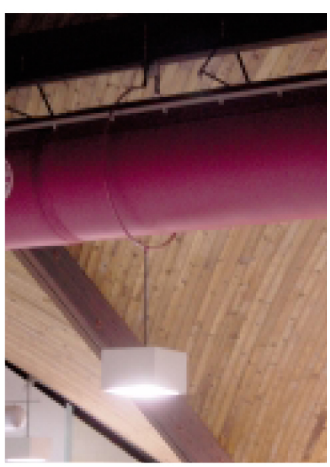
The trunk line and branches were ordered in red and white, respectively, to match Dickinson school colors. The trunk also sports the school logo that DuctSox custom silk-screened onto the fabric.

Air distribution at the pool surface level, which was a major concern of Richards because of swimmers'health issues, now relies on new returns at the shallow end to draw the conditioned air down from the supply duct to mix with evaporating chemicals and then return them to the dehumidifier.

For best air distribution and aesthetics, Richards wanted the trunk line at the center of the roof's peak, however existing lighting fixtures would have been blocked by the duct. Ellerman conceived of a fixture retrofit that would allow both the trunk and the lighting to hang at the center. He lowered the lighting below the trunk line by extending the ceiling mounted conduit pendants into an "O" shape that surrounds the duct and connects to the fixture below the duct.

Another important factor in the retrofit success is the air to water temperature differential, which is 82ºF and 80ºF, respectively. Previously, the previous differential of 75ºF air and 80ºF water caused additional humidity problems. The current relative humidity is maintained at 50 percent.

The 229-year-old liberal arts college wasn't alone in its world of high humidity and poor IAQ. Based on testing and data, Richards claims other local colleges suffer from some degree of Sick Pool Syndrome. Based on his own personal experiences, Richards suspects a significant number of other natatoriums nationwide may need complete retrofits or serious fine tuning adjustments to both their air handling and chemical systems as well as their operating procedures. ■



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