

Uniform Success:

BOILERS, PIPING & POLICE

The new police training facility in Columbus, OH offered a variety of spaces, which you'd expect, and a slightly odd shape, which you might not. The situation warranted a custom piping and boiler configuration, and engineers produced an arresting design that fulfills its duty to tomorrow's officers.

BY JOHN VASTYAN

Police work, like military duty, is filled with uncertainty. Though there are few things they can take for granted, members of the force and officers in training in Columbus, OH, can rely on comfort systems installed in one of the newest and most contemporary police training facilities. It replaces a much smaller facility, built in 1964 and considered inadequate a decade later.

The new \$27 million, 166,000-sq-ft circular building opened two years ago for its first class of 67 recruits. It's an architectural marvel, with many specialized functions that officials say were needed to prepare officers for an increasingly complex job.

"There's not another like it," stated architect Patrick Allen. "This building is truly an expression of what the Columbus Police Division needed, and what its training is all about."

Police professionals and facility designers quickly recognized the facility as among the finest of its kind worldwide. The facility makes a gleaming forensics classroom plus well-appointed weight training and aerobic-conditioning rooms available to cadets and trainers alike.

So unique is the building that it has already attracted police agencies from across the nation. According to Commander Larry Rod, this will generate revenues to help cover the costs of training the city's officers.

The building's most distinct architectural feature, found immediately within the large, open lobby, is a glass-and-brick tower that permits natural light to stream into a Hall of Honor that memorializes officers killed in the line of duty. The building's circular design has a nearly 1-acre, open-air courtyard within its center that can be used

for class formations, receptions, and graduation ceremonies.

Other amenities include a gymnasium; an indoor pool for exercise, injury rehabilitation, and dive team training; fully-padded defensive tactics rooms; a 300-seat dining hall; a 300-seat auditorium; lecture hall; several classrooms; and a computer lab.



Five-degree angle welds in the pipe were needed to complete the heating loop and accommodate the circular shape of the new police training facility in Columbus, OH.



The training facility is heated hydronically with 11 water-to-air heat exchangers that range in capacity from 3,500 to 18,500 cfm.



One hundred and seventy VAV boxes, one per zone, and 15 fancoil units allow for the fine tuning of zone temperatures.

EXTENSIVE SYSTEMS

The building's complex mechanical systems, though less visible than its many architectural amenities, are no less important to the success of the facility. When the general contractor and planners for the building settled on the mechanical installations firms, they chose two Columbus-based firms. Fox Mechanical, Inc., was tapped to do the substantial heating job, and Aggressive Mechanical was chosen to handle the domestic water system. Both companies are union shops and specialize in commercial and industrial work.

The contract for Fox encompassed an extensive heating system, HVAC, controls, and system insulation, exceeded \$2.5 million, putting them on the jobsite for 11 months. Aggressive stayed on the job a few more months to complete the domestic water system for the new building.

"This was about an 18-month project, overall," said Michael Hann,

project manager for Messer Construction Co., the commercial and industrial general contracting firm chosen by the city of Columbus to build the new facility. Messer Construction Co. is a regional general contractor and commercial construction firm specializing in complex building construction projects throughout the Ohio, Kentucky, Indiana, and Tennessee.

"There definitely were some unique aspects to the mechanical systems at the Police Academy," added Hann. "We chose Fox and Aggressive because of their experience with jobs on this scale, and because they were eager to take on the uniqueness of the project. Fox tapped Martina Metals to handle the airside work, and Stotts Insulation. Both are Columbus-based firms.

"The geometry of the building created the need for a lot of offset piping" said Hann. "To complete the heating loop system, we'd make five-degree angle welds in the black pipe to accommodate the curvature of the building," explained Joe Fox, president of Fox Mechanical. "To say the least, this was very time-consuming. We had three [two person] welding crews working non-stop on the primary loop for four months." According to Fox, the primary loop's large-diameter piping network — in the 2-1/2 to 8-in. sizes — was black pipe. Anything 2-in. or less was run in copper.

"The building is heated hydronically, entirely by hydro-air," added Fox. "We built the heating system around 11 primary water-to-air heat exchangers that ranged in capacity from 3,500 to 18,500 cfm per unit." But there are an additional 170 VAV boxes, one per zone, and 14 fancoil units that serve some of the hallways and stairways where ducting of the hydro-air isn't feasible. "All of these devices permit fine-tuning of zoned temperatures," continued Fox. "Each of the remote units is separately piped with supply and return lines."

The mechanical room is spacious and intelligently designed. At its center, set like crown jewels, are four, 2-million Btuh Pennant boilers by Laars Heating Systems — two sets, two high — that provide 16 stages of firing, all controlled by a Honeywell BAS installed by Columbus-based Commercial Control Services.



In the mechanical room, four 2-million Btuh boilers, controlled by a BAS and stacked one pair on top of another, provide 16 stages of firing.

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A worker performs a combustion air reading of one of the systems, while another employee inspects one of the boiler's pull-out control panels during startup, confirming that the control sequence is working properly.

The boilers are the largest of Laars' Pennant series. The low NO_x, fan-induced units are currently available in seven models, ranging from 500,000 to 2 million Btuh. The Pennant's compact, modular design allows for ease of installation and maintenance. The systems are available in both hydronic and volume water versions, and they may be installed either indoors or outdoors. All models are designed for staged firing to meet required heating loads. Pennant boilers and water heaters offer the building owner six different operating control programs to best match the type of installation in each building.

"Our crews installed 41 showers in one area and tap fixtures throughout the facility. To heat and store the domestic water, we installed two stacked, one-million Btuh Laars Pennant volume water heater systems, controlled in lead-lag fashion to feed hot water to two, 2,020-gal Laars storage tanks," said Jim Buyko, foreman on the job for Aggressive Mechanical. "The storage tanks are the largest we've installed. It was a challenge getting tanks of that size in place, but they piped-up very nicely and definitely add to the facility's energy efficiency."

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As foreman, Buyko led Aggressive Mechanical's installation efforts at the facility. "While installing the domestic water systems, we faced many of the same piping challenges that Fox Mechanical dealt with because of the unique shape of the building," he said.

Between the tanks and the many plumbing fixtures, Aggressive installers connected miles of 1/2-in. to 4-in. copper pipes. "The domestic water system was engineered to go from 'zero to sixty' on short notice," added Buyko. "It was sized to meet the needs of the entire cadet force, hitting the facilities all at once after a rigorous workout."

Now, when winter winds lash at the academy's recruits, out for a run, they'll return to comfortable temperatures inside, and plentiful hot water for showers. Or a swim in the heated pool. Surely, their jobs will be tough enough, too soon. No need to rush it. **ES**

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