METAL-FAB INC.

Commercial Venting CASE STUDY

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Series 4G Grease Duct Saves Costs and Enhances Look of New Mudhens Stadium

After 65 years of great minor league baseball in Ned Skelton Stadium, the Toledo Ohio Mudhens franchise will move to a brand new, 10,000 seat, $39.2 million stadium in the heart of the downtown Toledo warehouse district. A team often mentioned in fondness by Corporal Max Klinger in the hit TV series “M.A.S.H.”, the Mudhens needed a new stadium and the city needed a better location that would strengthen downtown revitalization plans.

The new stadium, named “Fifth Third Field” (after Fifth Third Bank), is the product of three different architectural firms uniting their talents to present a signature piece of urban architecture that will become a focal point for Toledo’s downtown revitalization project. With architectural features reminiscent of Fenway Park and The Polo Grounds, Fifth Third Field is scheduled to open for play in April 2002.

Architectural design requirements focused on aesthetics and function. H.T. Bernsdorff Inc., the mechanical engineer for the project’s HVAC systems, was faced with the challenge of balancing those requirements while protecting 10,000 avid baseball fans. The upper

Series 4G Grease Duct was chosen for the Mudhens’ new stadium because it offers low space requirements, superior fire protection, cost savings and exceptional performance.

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Fifth Third Field REQUIREMENTS

- Aesthetically pleasing grease duct system
- Ease of installation in congested areas
- Superior fire protection
- Installation and service cost savings
- Convenient delivery of system components

Metal-Fab SOLUTION

- Series 4G Grease Duct
- Round, clean, compact system
- Integral chase – zero clearance to combustibles, easier installation in congested areas
- System protects against damage from thermal expansion
- Components tagged and shipped by system for easy installation

level will feature 28 suites and private boxes and the lower level will have shops, restaurants, offices and more. Both levels enjoy concession stands uniquely designed to allow fans to watch the game while in line for baseball food fare.

MECHANICAL DESIGN – GREASE DUCTS

After considering life safety issues within the stadium, Series 4G grease duct from Metal-Fab Inc. was specified. Series 4G is aesthetically pleasing, offering low space requirements, superior fire protection, cost savings and exceptional performance. “We became familiar with this grease duct on other projects,” said Bud Bernsdorff, specifying engineer on this project with H.T. Bernsdorff, Inc. “We think it is a good product and reduces overall general construction costs.”

Key to the mechanical design are six kitchen exhaust systems used for the concession stands on the first and second levels. Hoods are connected via grease duct to six upblast roof fans. The six individual grease duct systems handle a combined 32,150 cfm of grease-laden air. Six upblast fans exhaust grease-laden air up, into the atmosphere, rather than near the roof where the grease could collect and cause fire risk, along with unsightly stains – an obvious aesthetic problem.

“We worked closely with the parties involved, ensuring that the system that was designed would work. We made sure that the installing sheet metal contractor wouldn’t run into any surprises on the job,” said Butch Amey, Metal-Fab’s application engineer on this project. “Rather than shipping drawings back-and-forth, potentially losing days in the process, we received 3D CAD drawings of the system via e-mail. We checked them, re-labeled system components based on our design criteria, and e-mailed them back. After a couple of revisions and discussions, we were able to provide them with finished ‘as-built’ drawings.”

Series 4G’s unique cylindrical design, with its integral chase, provides “0” clearance to combustibles. This allows the duct to be installed in tighter spaces than a typical duct-and-chase system. Uninsulated single wall grease duct, requiring 18-inch clearances to combustibles could require up to an eight-foot wide chase. Comparable Series 4G with an

Easily accessible inspection/clean-out ports reduce service time and cost.

Ceramic insulation and integral steel chase provides maximum temperature control and protection of the insulation.

integral chase has a nominal outside diameter of 3 feet. Space savings offered by Series 4G from Metal-Fab allows installation in tightly confined areas and often allows additional space for other trades. Series 4G provides a very clean, professional looking system.

FIRE PROTECTION

Series 4G is unique among grease duct systems for protection against damage due to thermal expansion. During grease fires, duct systems expand, causing potential deformation and fracturing, thus negating the safety of the system. That's a risk that the engineers at H.T. Bernsdorff didn't want to take with 10,000 people. "We had discussed the Series 4G grease duct with a code official, on the (Toledo, Ohio) Juvenile Justice System building. We were comfortable specifying the grease duct on this job too," said Bernsdorff. Metal-Fab's 12-year warranty was also a consideration. Site-welded systems are typically warranted for one year.

Series 4G is uniquely suited for fire protection. It is a "0" clearance, integral chase grease duct system with four inches of high-density ceramic insulation. While most kitchen exhaust systems operate well under 500° F, Series 4G Grease Duct is rated for continuous operation at 500° F and intermittent operation at 2000° F in the event of a grease fire. "High temperatures associated with grease fires cause distortion and potential fracturing of site-welded duct. Rigid duct cannot compensate for thermal expansion. It just doesn't have the room to expand without damaging the duct," said Tim Toffler, Toledo office branch manager of Air Control Products Inc., the Metal-Fab representative in the Toledo area.

Metal-Fab incorporates adjustable lengths when designing Series 4G systems to compensate for thermal expansion. These components allow for expansion without distortion. Series 4G is designed to assure a leak-free system. Metal-Fab tested Series 4G to all applicable portions of UL 103, UL 1978, ASTM E814 and ASTM E119. Utilizing independent testing laboratories, Series 4G test results are recognized by BOCA, ICBO and SBCCI as an alternative grease duct system as provided in NFPA 96. Series 4G is the only factory-built, integral chase, zero clearance system to be recognized by these agencies.

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COST SAVINGS

Factory-built Series 4G saves costs in installation, maintenance and potential future repairs. Systems are assembled on site with minimal welding required. Series 4G's integral chase and "0" clearance capability eliminates the need for a fire rated chase. 2-3 hour fire rated walls and floors are penetrated utilizing simple fire-stops. There is also a significant advantage with long horizontal runs; Series 4G has a minimum slope requirement of 3 inches per 100 feet. Site-built duct requires 25 inches per 100 feet. Headroom requirements are lowered. Changes in slope direction and

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additional grease traps are greatly reduced or eliminated. Additional cost savings are realized by eliminating the cost of a fire rated chase and the insulation costs associated with insulating a site-built system. Series 4G offers a safer, easier and less costly alternative.

MAINTENANCE

Maintenance is easy, fast, and therefore less expensive than most grease duct systems. Its design minimizes temperature loss and grease deposition within the system. Because the duct is cylindrical, Series 4G offers less airflow resistance (lower K factor), and less turbulence thereby keeping more grease in suspension and reducing noise associated with rectangular ducting. Grease that does condense flows easily to inspection/clean-out ports, rather than collecting in corners and on flat surfaces of traditional rectangular duct. Modern duct cleaning equipment can easily clean round duct, greatly reducing the necessity of entering a duct and manually scraping deposits from corners. These features make it easier and less costly to inspect and clean the system.

SYSTEM DELIVERY

Metal-Fab anticipated that the Fifth Third Field grease duct systems would require at least four full truckloads of material. Logistically, this would have been very difficult if all material shipped simultaneously. Metal-Fab, in conjunction with Tim Toffler of Air Control Products, developed a shipping schedule based on individual system requirements and staging restrictions. “We tagged and shipped each component by system number for the installing contractor. The systems shipped in the specified sequence, making it easy for installers to locate and stage the components,” said Tim Farris, eastern regional sales manager for Metal-Fab. “Our goal is to ‘make it easy’ and assist where we can if we are aware of unusual conditions.”

With opening day fast approaching, all were pressed for time. Every day an average of 120-140 construction workers and 13 construction companies worked together to make sure the Mudhens have a nice home every time the ump yells “Play Ball!”

Litho in U.S.A.