

Hospital Operating Room Diffuser (HORD) System Case Study

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► PROJECT

The Stormont-Vail Regional Hospital in Topeka, Kansas

► DESIGNED BY

HMN Architects & Brack and Associates

► PRICE REPRESENTATIVE

Jorban - Riscoe & Associates

The Stormont-Vail Regional Hospital • Topeka, Kansas USA

► THE CHALLENGE

The Stormont-Vail Surgical Suite Addition is a multi-story complex that was completed in July of 2003, and features 18 new operating rooms, two minor surgical facilities, and a 21-bed surgical recovery unit. The hospital and designers wanted a state-of-the-art facility that would provide an excellent working environment and accommodate future technology as well. As a result, these spacious surgical suites range from 550 to 800 square feet.

When The Stormont-Vail Regional Hospital system began the planning for this new 156,000 square foot addition, they had identified a variety of important issues that would need to be addressed.

- A microbiologically clean, pressurized environment was critical.
- It was important that the surgical team was comfortable.
- Above ceiling access for current and future needs had been an issue in the past and would need to be resolved for this expansion.
- The ability to clean and maintain the system was a key consideration.

The hospital enlisted the expertise of Matt Jennings, a project Architect with HMN Architects, and Design engineers Dave Krug and Jeff Romine, with the firm of Brack and Associates in Topeka, Kansas.

► THE SOLUTION

When Brack and Associates began the mechanical design that would ventilate the operating rooms, they already knew which technology they would deploy – central laminar flow diffusers. This approach has been fairly common in the past, but does require a significant number of laminar units in the ceiling to meet the stringent ventilation requirements of operating rooms.

As an alternative, Jeff Romine had requested information on the Price Hospital Operating Room Diffuser system (HORD).

This perimeter curtain with laminar flow design concept, which is supported by the Price Model HORD - Hospital Operating Room Diffuser system, provides an exceptionally clean environment that encompasses the surgical field. Low velocity laminar air washes the patient and surgical team, while an angular projection of higher velocity air creates a perimeter curtain that prevents migration into the sterile field and captures any contaminants that may have entered with the team or equipment.

The HORD system also reduces the number of laminar flow units that are required directly above the surgical team, making additional ceiling space available for other equipment and fixtures. (figure 1.)

The decision was made to utilize the HORD system. (figure 2.)

► IMPLEMENTATION

Early on, Matt Jennings, Jeff Romine, and Brad Hutton, the Project Manager for McElroys, Inc., Mechanical Contractors, recognized the logistical challenge of coordinating the installation of the diffuser system with other equipment and ceiling components.

Of further concern was the execution of the many openings that would be required in the drywall ceiling, and the fact that this approach would not provide the desired flexibility for future modifications or easy access to the plenum above. Working with drywall can be messy, and any changes or modifications would result in closing the room for an extended period of time.

Ceiling access was also an issue for the hospital, since they wanted flexibility for future upgrades in surgical technology. These upgrades could involve emerging technologies such as robotics that might require significant changes above the ceiling to accommodate new fixtures, wiring, and other components.



figure 1. This image illustrates the Linear Diffuser, Unitee CR Cleanroom System and Laminar Flow Diffusers.

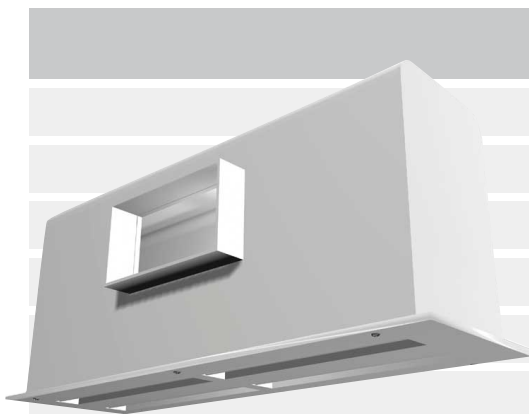


figure 2. Details of the Price HORD system:

- Meets stringent ventilation requirements of today's operating rooms
- Controls air movement from linear slots and discharges a vertical curtain of air
- Clean air curtain separates clean air from contaminated room air
- Exceeds the American College of Surgeons' air cleanliness Class 1 requirements
- Constructed from stainless steel for corrosion resistance
- Designed for ease of cleaning

In fact, the project team visited other medical facilities to determine how they dealt with the flexibility issue. They received various recommendations – some fairly amusing. They were told to install an interstitial space with a catwalk above the ceiling, or hire someone small enough to fit in the space. More radical suggestions included using a crossbow or radio controlled vehicle to relocate or install wiring.

Following a number of discussions with sales engineers Tom Wilkerson and RD Arnold with Jorban - Riscoe & Associates, the local Price representative, the group was delighted to learn that Price could also provide a ceiling system that would easily integrate with the HORD diffuser system.

The Price Unitee CR Cleanroom gasketed ceiling was appealing because the system provides a high integrity ceiling membrane with extruded aluminum structural members and aluminum lay-in panels that are held in compression against a non-degrading vinyl seal. Engineered for ease of installation, ceiling members assemble with a patented fastening technology that eliminates the need for welding and bolts. In addition, clip in panels provide flexibility, and easy access to the ceiling plenum. The Unitee system was proposed to Matt Jennings, the project architect.

Matt Jennings was understandably concerned about the shift to an alternate ceiling system. Drywall, although more difficult to work with, is a proven membrane that is stable and prevents infiltration. After a thorough evaluation the Unitee CR Cleanroom gasketed ceiling system was selected as the ceiling system that would accompany the HORD systems in these operating theatres.

To ensure proper fit up, Price provided a team of experts to take on-site measurements, generate drawings and installation guidelines, and assist in determining system requirements. As the time neared for installation, the involved parties determined that good coordination between the mechanical contractor and the ceiling installer would be extremely important.

► THE RESULTS

The installation went very well, with the expertise of McElroy's and Bob Florence Contractors, overcoming the few challenges that were encountered. In retrospect, all acknowledged that the ease of installation helped them to meet an otherwise aggressive completion schedule. Nick Reilly, Project Manager, and Jim Webb, Installer for Bob Florence Contractors, found the Unitee CR Ceiling to be amazingly strong and robust. Even large 48" x 48" ceiling panels that had openings cut into them maintained structural integrity.

The new addition has been occupied since July, and according to Dean Smith, Facility Manager for Stormont-Vail, all are satisfied with the performance of the system. The Unitee CR Ceiling gasketed system has proven to be effective in maintaining room pressurization and preventing infiltration. The HORD is functioning well as it provides a clean and comfortable environment for the patient and surgical staff. Both elements of the system are easy to clean and maintain. *(figure 3.)*


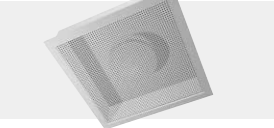


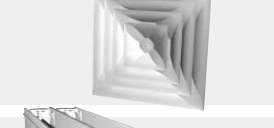



The decision makers at Stormont Vail told us that they would again consider the Unitee CR system for cleanrooms, cath labs, procedure rooms, and other environments where a clean area and easy access are required.

Stormont-Vail and this project design team have taken a progressive approach and are setting the standard for integrated ventilation solutions in critical environments. Price is proud to have been a part of the Stormont-Vail Suite Surgical addition.



figure 3. This image illustrates the finished Operating Room.

STORMONT-VAIL PRODUCT LIST

Product	Description	Image
HORD - Hospital Operating Room Diffusers	<ul style="list-style-type: none"> An air integration system designed to meet the ventilation requirements of today's operating theatres 	
LFD - Laminar Flow Diffuser	<ul style="list-style-type: none"> Engineered to provide a uniform vertical projection of supply air at controlled low velocity 	
700H - Stainless Steel Return	<ul style="list-style-type: none"> Designed for cleanrooms, laboratories and hospital applications Easy to access and maintain 	
UNITEE CR - Cleanroom Ceiling System	<ul style="list-style-type: none"> Engineered to provide a uniform vertical projection of supply air at controlled low velocity 	
SCD - Square Cone Diffuser	<ul style="list-style-type: none"> Provides a 360° radial horizontal air pattern onto the ceiling Most efficient for any ceiling application 	
SDS - Linear Slot Supply	<ul style="list-style-type: none"> High performance in a VAV outlet with 180° air pattern control Complete blank-off for true design flexibility 	
530 - Steel Louvered Return Grille	<ul style="list-style-type: none"> Precise, high quality roll-formed construction Attention of detail uncommon to an economical air outlet 	
SMD - Steel Louvered Directional Diffuser	<ul style="list-style-type: none"> Supplies large volumes of air at relatively low sound levels and pressure drops 	

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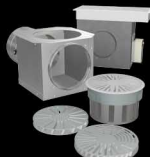
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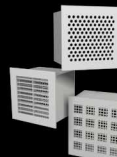
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