

Greenheck Project Profile

McKnight Cullinaire Catering Company

Houston, TX

- **Engineering Firm:**

Syska Hennessy Group, Inc.
Houston, TX

- **General Contractor:**

CAM Construction
Houston, TX

- **Mechanical Contractor:**

New Balance
Houston, TX

- **Greenheck Representative:**

HD Grant
Houston, TX



This historic 1912 house is home for the McKnight Cullinaire Catering Company which opened in February, 2007.



The Challenge

- **Ensure lower heating and cooling costs in a new commercial kitchen installed in an historic home.**
- **Effectively exhaust contaminated air and contain grease while minimizing maintenance required for the ventilation system.**
- **Maintain appropriate humidity levels and room temperatures in a professional food preparation environment.**

McKnight Cullinaire Catering Company opened for business in February, 2007 in an historic 1912-constructed home that's listed on Houston's Historic Home Registry. Prior to opening,

Owner Lance McKnight added 1,000 new square feet to the existing 500 square-foot kitchen for new cooking equipment and ventilation. Due to the cyclical nature of the catering business, use of the kitchen cooking equipment and ventilation system demands vary significantly throughout the day and into the evening. Charbroiling is often necessary and the smoke needs to be exhausted and grease produced must be efficiently captured. McKnight, who is also an electrical engineer, was very interested in maximizing energy savings in the newly expanded kitchen and maintaining a comfortable indoor temperature with appropriate humidity

control that would not only protect the food his company prepares but also would keep his skilled and creative employees working productively. The warm, humid climate in Houston eight months of the year (with average highs in the mid-80s) provided opportunities to recover and transfer heat from cooking operations and rooftop cooling and heating equipment to help heat water and warm the building outside temperatures were cooler. McKnight also wanted to minimize maintenance of exhaust equipment and protect his investment in the historic building with appropriate fire suppression protection.

Greenheck's Solution

- **One Greenheck Variable Volume Kitchen Hood Model GHEW**
- **One Zone Defense Fire Suppression System**
- **One KSF with CUBE**
- **Two IGX Make-up Air Units**

Whenever McKnight Cullinaire employees activate cooking equipment, Greenheck's kitchen hood with variable volume controls and a centrifugal upblast exhaust fan (Model CUBE) automatically respond to the resulting heat load detected by built-in duct temperature sensors. As cooking temperatures increase, fan speeds automatically rise to exhaust more smoke and capture grease-laden vapors. When cooking activity slows down or stops and temperatures drop, the ventilation system (fan and make-up air) slows down

to a pre-set minimum speed dramatically reducing energy consumption and costs. The kitchen hood also includes a self-contained Amerex Zone Defense fire suppression system with discharge nozzles equally spaced over the length of the hood. This allows the owner to reposition cooking equipment anywhere under the hood without having to move and reinstall the fire suppression system. The Greenheck CUBE exhaust fan discharges contaminated grease laden air directly upward away from the roof surface. The CUBE offers an easy access clean-out port and a grease-resistant Teflon coating for quick easy cleaning. In addition, the motor in the CUBE is mounted outside the air stream where it cannot be contaminated by grease and can be easily maintained when necessary.



Greenheck's KSF supply fan, gas-fired make-up air unit, Model IGX, and CUBE exhaust fan.

Greenheck's Model KSF supply fan supplies untempered make-up air where needed to balance negative pressures caused by the discharge of exhaust air. Finally, the two Greenheck gas-fired make-up air unit (Model IGX) provide 100% outdoor air into the kitchen and can heat and cool the air as needed. A custom-designed heat transfer system allows the building owner to recover heat off the condensing unit to help pre-heat hot water for use in the kitchen and to help reheat room air for comfortable indoor humidity levels.

The Results

- Lance McKnight, owner of the building, says the variable volume ventilation system "has been fantastic" and he believes its ability to function on demand has definitely helped him reduce energy costs compared to a non-variable system. He is also very pleased with the custom-designed heating, cooling and ventilation system that maintains

a comfortable uniform room temperature and humidity level. The system also yields significant amounts of hot water for use in the kitchen. "We're able to recapture approximately 105 degrees of heat from the air conditioning condenser unit for our hot water heating system and for reheating the kitchen space to maintain the

humidity levels we want. The system works great and our gas bills have been relatively low," he says. McKnight is also impressed with Greenheck's easy maintenance CUBE. "It's easy to clean and maintenance is non-existent," he explains. "I checked it two months ago, (about eight months after installation) and it was spotless."

