

## FSU Johnston Building



### Project Summary

**Project Size:** 175,735 square feet

**Mechanical Equipment Value:** \$700,000

The Florida State University William Johnston Building renovation involved the retrofitting of a section of the building originally built in 1939. Departments housed in this building include:

- The Division of Undergraduate Studies
- College of Communication and Information
- College of Human Sciences
- College of Visual Arts, Theatre and Dance.

Advanced mechanical systems, a new high-performance building envelope, and higher-efficiency lighting techniques were used in combination with other strategies to deliver a truly sustainable building worthy of the LEED Gold certification. Accordingly, the Johnston Building complies with the 2030 Challenge and reduces energy use by more than 60% anticipated for a similar university building.

### Project Objectives

- Ground floor ceiling height restricted ductwork size requiring unique low-height solution.
- Minimize HVAC operating noise for study group areas.
- Provide high levels of outside air, dehumidified/pre-treated using minimal chilled water capacity.
- Provide energy recovery and other LEED certification points.

## Solutions Delivered

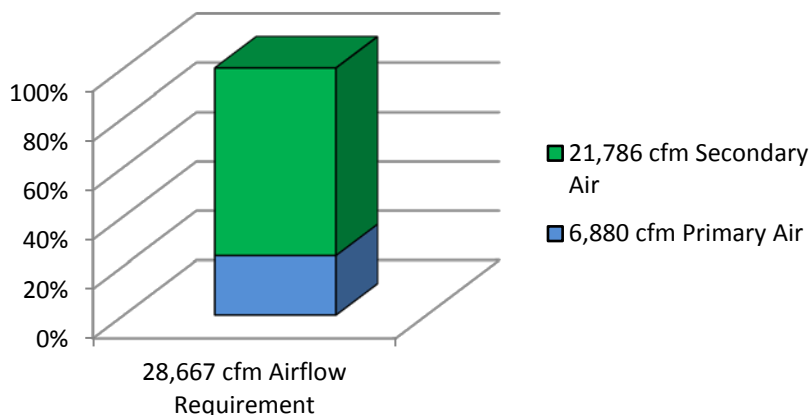
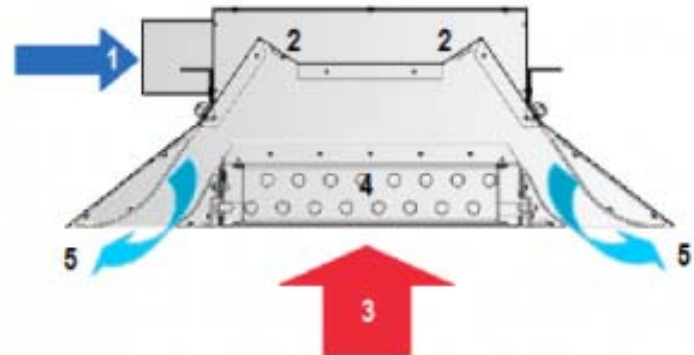
Brooks Air Systems had the privilege of delivering multiple mechanical systems that aided in helping the project hit its efficiency targets. A variety of tailored air-handling strategies were packages together to deliver heating/cooling from the University's central chiller plant. A custom McQuay energy recovery unit using a Cromer Cycle energy wheel was provided to pre-treat and dehumidify the primary air for the active chilled beam system, where an extremely low dew point is required.

System	Total Capacity
(46) Dadanco Active Chilled Beams	
(17) Custom McQuay Vision Air Handling Units	73,530 cfm
(5) McQuay Energy Recovery Units	105.6 tons
(8) Enviro-Tec Fan Coil Units	2,912 cfm
(3) Enviro-Tec Blower Coil Units	3,630 cfm
(117) Enviro-Tec Variable Air Volume Boxes	
(39) ABB VFDs	

## Featured Technology

### Dadanco Active Chilled Beams

The active-chilled-beam system used in the Johnston Building delivers treated air from the McQuay AHUs through chilled-beam terminal (end of ductwork) units. The key to this technology is forcing the supply air through a bank of small nozzles in a relatively-confined space, this creates a low pressure vortex above the horizontal coil as the high pressure air passes by it, inducing room air up through the coil. After passing through the coil, the induced air mixes with the primary air and exits the beam through the linear slot diffusers. To minimize space and air pressure drop, a single two-pipe coil is used in this application rather than two separate heating and cooling coils. The single coil alternates between chilled water and hot water using a mixing block depending on the zone requirements.



For this application, the conditioned space required a total airflow of 28,667 cfm. Due to the chilled-beam technology, only 6,880 cfm of primary air (blue portion of chart) was required to be delivered through the nozzle arrays, while the remaining 21,786 cfm of airflow was induced secondarily. This means that only 24% of the total airflow is required from the supply side, and 76% of the airflow, (green portion of chart) is essentially free air conditioning.