



**Rutgers University Business School**  
*Piscataway, NJ*  
**Geothermal Plant Engineering Design**

**ABOUT THE CLIENT**

Rutgers, The State University of New Jersey, is a leading national research university and the state of New Jersey's preeminent, comprehensive public institution of higher education. Established in 1766, the university is the eighth oldest higher education institution in the United States. More than 69,000 students and 22,500 full- and part-time faculty and staff learn, work, and serve the public at Rutgers locations across New Jersey and around the world.

**REFERENCE**

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**CONSTRUCTION COST:**

\$85 Million

**YEAR COMPLETED:**

2013

**143,000 SQ. FT.**

**NEW BUSINESS SCHOOL**

The Livingston Campus building, which opened with the start of the 2013 fall semester, contains nearly \$4 million worth of technology. The majority of the technology is wired into more than two dozen teaching rooms, including a 440-seat, theater-styled auditorium. The seating in the classrooms and lecture halls can collectively accommodate more than 2,000 students. Within its 143,000 square feet, the building also contains three student technology centers, student lounges and 21 break-out meeting rooms. It also represents one of the latest examples of Rutgers University's commitment to renewable energy. Two solar fields on campus supply the building with electricity and a nearby geothermal field provides its heating and cooling features that helped the building achieve LEED Silver certification.

**GEOHERMAL CENTRAL PLANT DESIGN**

After Concord performed a Life Cycle Cost Analysis (LCCA) on varying system alternatives, it was decided that a chiller/heater plant located within the 143,000 square foot Business School fed by a geothermal vertical closed loop bore field was the best solution for several reasons. This system provided the best net present value while still meeting the sustainable, energy efficient design objects (LEED Silver) of the project without compromising the University's facilities staff desire to have centralized equipment with conventional 4-Pipe distribution system throughout the building. Additionally, this geothermal plant design is able to simultaneously provide chilled water and hot water taking advantage of the energy sharing of coincidental heating and cooling loads with the business school and the future build out of the Performing Arts center adjacent to the Business School that this plant will also serve. Concord is the design Engineer of Record for the geothermal HVAC chiller/heater plant within the Business School and the bore field which is located in a common courtyard area across the street.

**Central Geothermal Utilities Plant/Ground Source Heat Pump System**

- ◆ CO2 Emissions reduction of 642,311 lbs or 291 Metric Tons
- ◆ Equivalent of removing 53 cars from the road each year

**PJM Grid at Carbon Neutral**

- ◆ CO2 Emissions reduction of 1,104,246 lbs or 444 Metric Tons
- ◆ Equivalent of removing 91 cars from the road each year