Randolph Community College - Continuing Education and Industrial Center

28% **Energy Reduction Compared to Baseline**
$42,332 **Energy Savings in 2014 Compared to Baseline**

PROJECT DETAILS

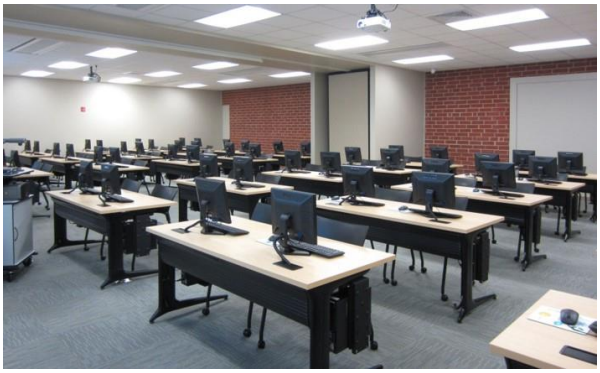
LOCATION	**Asheboro, NC**
CONSTRUCTION TYPE	**Predominantly Renovation**
BUILDING TYPE	**Classroom, Labs, and Office Building**
OWNER	**Randolph Community College**
BUILDING AREA	**42,979 Enclosed SF**
BUILDING CODE OR STANDARD	**ASHRAE 90.1-2004**

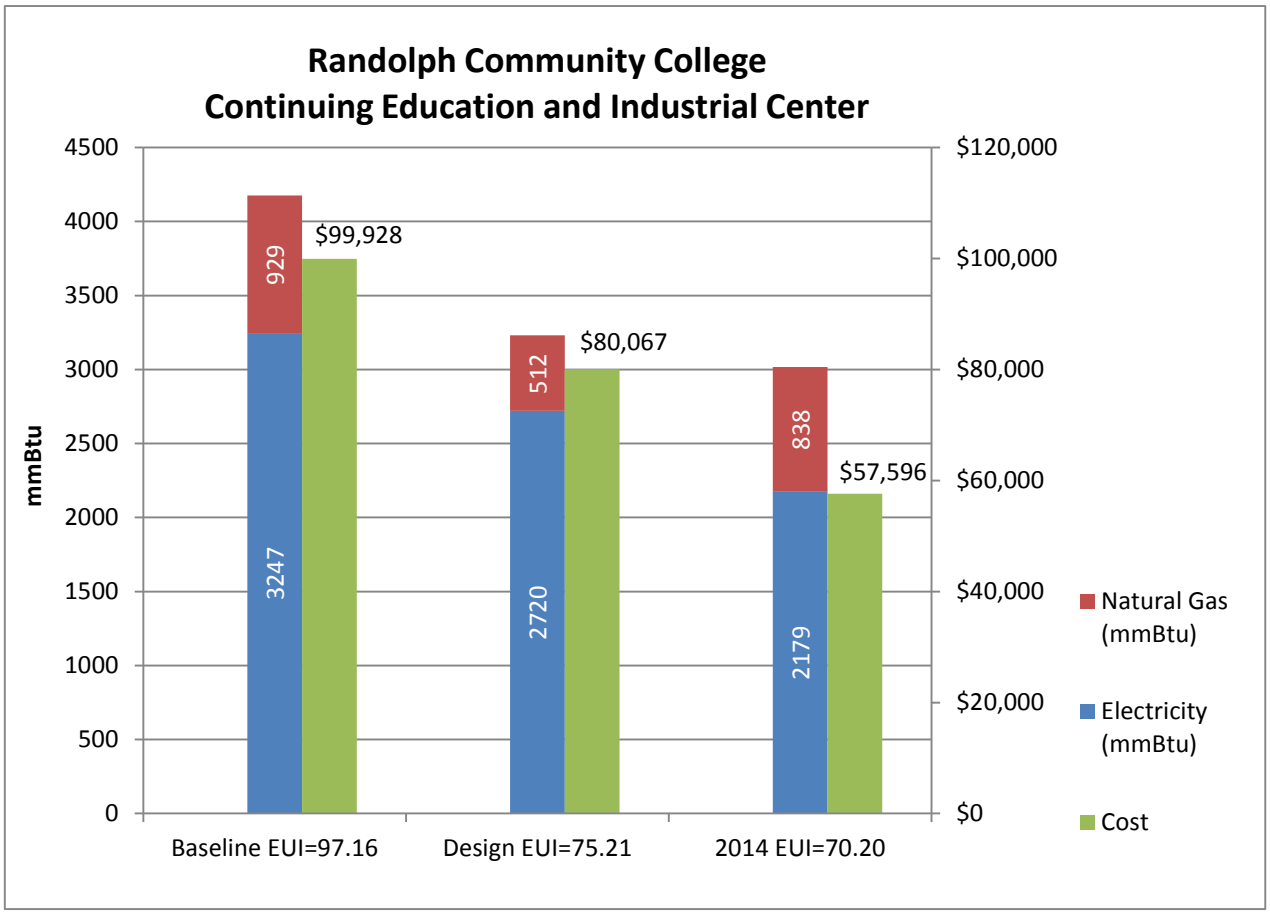
DESIGN TEAM

ARCHITECT	**Smith Sinnett Architecture**
ENGINEER	**Progressive Design Collaborative**
COMMISSIONING AGENT	**Commissioning WorCx**

CONTACT

Cindi Goodwin, Randolph Community College, cjgoodwin@randolph.edu




Randolph Community College
Continuing Education and Industrial Center
mmBtu
4500
4000
3500
3000
2500
2000
1500
1000
500
0
$120,000
$100,000
$80,000
$60,000
$40,000
$20,000
$0
929
3247
$99,928
512
2720
$80,067
838
2179
$57,596
Baseline EUI=97.16
Design EUI=75.21
2014 EUI=70.20
Natural Gas (mmBtu)
Electricity (mmBtu)
Cost

Project Description

A former manufacturing warehouse was converted to this technology driven educational facility at Randolph Community College.

- The entire roof and exterior walls received additional insulation boards to increase the r-value and a white thermoplastic polyolefin roofing membrane was added to improve the roof surface reflectivity.
- Energy efficient lighting with lighting controls was installed to increase the efficiency of the lighting system.
- The heating system includes two high efficiency, modulating, condensing boilers that operate parallel to each other. The cooling is provided by a 128 ton air cooled scroll chiller that is supplemented by four 3000 gallon ice storage units that produces ice slurry during off peak hours.. The pumps are controlled by variable frequency drives. Air ventilation is performed by two dedicated outside air systems that utilize an enthalpy and passive dehumidification energy recovery wheel. The pre-conditioned outside air is circulated to VAV boxes throughout the building.
- The domestic water system was designed to reduce water needs by 40%. The hot water is pre-heated by thermal solar panels on the roof.
- Irrigation for the landscaping is satisfied by a 3200 gallon rain water harvesting tank.

Lessons Learned:

- In order to operate high efficiency and high performance equipment, you must have a person or persons that are highly skilled in operating that equipment. That skill set is not cheap.
- The design of the boiler operation does not allow for the maximum efficiency of the boilers to be reached. You need to have VFD's on the primary pumps with possibly a storage tank to achieve the recommended 20% firing rate with a 30 degree water differential.
- The system is designed to run on 100% outside air during occupied mode. It would be more advantageous to run ventilation on demand as required by CO2 sensors.

By installing a small chiller, the chiller operation is designed to run on chiller first and supplement with ice. We have found that you can utilize more ice and less chiller by increasing the leaving water set point and bringing the chiller on as your demand load increases, only as your ice bank depletes.