



**TCC South Campus  
Center of Excellence for  
Energy Technology**

# History

- ▶ Formerly housed in a number of buildings dating back to original campus construction (1967) totaling 13,000 GSF
- ▶ 15+ year planning, funding cycle

# Building Facts

- ▶ 87KSF two building complex
  - ▶ South Building - one story, high-bay labs, classrooms and offices
  - ▶ North Building - two story, low-bay labs, classrooms and offices
  - ▶ Multipurpose spaces/auditorium between the two buildings
- ▶ Supplied with utilities (power, CHW, HW, DHW, Telecomm) via existing campus infrastructure)

# Building Features

- ▶ Exposed, color-keyed MEP/FP Distribution Systems
- ▶ Exposed Mechanical and Electrical Rooms
- ▶ Storefront Partitions on Laboratory Spaces
- ▶ Extensive Collaborative Learning Spaces
- ▶ Building Envelope Mock-ups Displayed
- ▶ Low e Double Pane Ar Glazing used through out
- ▶ High Efficiency Reflective Roofing and Insulation
- ▶ Tunnel connects to Campus Distribution Areas
- ▶ Loading Dock
- ▶ Bridge over Bio-Swale
- ▶ Fire access Roads/sidewalks to all buildings

# Mechanical Systems

- ▶ VAV re-heat air distribution systems
- ▶ Energy Recovering units supply outside air to fan coil units
- ▶ Variable volume refrigerant DX systems in some areas
- ▶ Geothermal in select areas
- ▶ Pressure Independent Characterized Control Valves for all cooling and heating coils to precisely control flow

# Electrical Systems

- ▶ Very Low loss “Amorphous core” Medium Voltage 1500 kVA 2x Transformers supply complex with 480 vac electrical power
- ▶ Very Low Loss Low Voltage Distribution Transformers used through out
- ▶ High Efficiency LED lighting used through out
- ▶ Computerized control systems used for Lighting
- ▶ Exterior High Efficiency LED lighting through out
- ▶ Premium Efficiency Motors used through out
- ▶ ECM motors used in VAV boxes

# Plumbing Systems

- ▶ Lavatory Fixtures use 0.5 GPM with sensor control
- ▶ Urinals use 0.125 GPF with sensor control
- ▶ Toilets use 1.28 GPF with sensor control
- ▶ Utilize Trap Guards instead of Trap Primers
- ▶ Natural Gas Lab shut off systems
- ▶ Irrigation systems utilize 95+% drip distribution
- ▶ Irrigation systems controlled by computerized District wide system using local high end weather station for (ET) Evapo-Transpiration localized calculated data
- ▶ Various Planting Areas have tailored irrigation routines utilized
- ▶ Irrigation software detects leaks then isolates zone

# Building Automation Systems

- ▶ Full DDC BACNet system
- ▶ Latest energy saving sequences of operations utilized
- ▶ Latest occupancy sensor technology utilized



# Measurement and Verification Systems

- ▶ Extensive Electrical Metering
  - ▶ Overall Usage
    - ▶ Lighting Usage Sub Group
    - ▶ Mechanical Usage Sub Group
    - ▶ Process Usage Sub Group
    - ▶ Every Switchboard/Panel and specific loads as needed
  - ▶ Overall Renewable Generation
    - ▶ PV Generation Sub Group
    - ▶ PV Grid Tie Individual Inverters
    - ▶ Wind Turbine Inverter
  - ▶ Natural Gas Emergency Generator

# Measurement and Verification Systems

- ▶ Extensive Thermal Energy Metering
  - ▶ Chilled Water BTU's
  - ▶ Heating Water BTU's
  - ▶ Domestic Hot Water BTU's
- ▶ Natural Gas MCF and equivalent BTU's
  - ▶ Sub metering can be easily added if needed
- ▶ Water Consumption
  - ▶ Water Usage by building subsections
  - ▶ Domestic Hot Water Usage by building subsections
  - ▶ Irrigation Water Usage
- ▶ Data collection systems on UPS/Generator Power
- ▶ Full Trending every 15 minute to server in data center

# Site Features

- ▶ Bio-Swale treats storm water runoff
- ▶ Natural grasses and flowers in turf areas
- ▶ Plants chosen for drought hardiness

# Renewable Energy Features

- ▶ Approximately 106 kW peak DC PV generation
- ▶ 12.5 kW Wind Turbine to be installed soon
- ▶ Reflective light tubes with diffusers and dampers supplements lighting with daylight harvesting system
- ▶ Extensive fenestration to supplement lighting in large labs with daylight harvesting system

# LEED Certification Goals

- ▶ Platinum

# Academic Programs

- ▶ (DRAFT-Placeholder by DLH)
- ▶ HVAC
- ▶ Building Automation Systems
- ▶ Refrigeration
- ▶ Building Construction Management
- ▶ Certification Programs ...
- ▶ ...