SCIENCE AND ENGINEERING II BUILDING
University of California Merced

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Presentation Snapshot

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CAMPUS BACKGROUND

- Campus opened in 2005 and sits on 104 acres of land.
- The campus includes three schools:
  1. School of Engineering
  2. School of Natural Sciences
  3. School of Humanities and Arts
- Population:
  1. Students: 6,836
  2. Faculty & Staff: 1,454
LEED CERTIFIED BUILDINGS

- Total of seventeen (17) buildings on the campus, all are certified under Leadership in Energy Environmental Design (LEED NC).
  1. Platinum (8)
  2. Gold (8)
  3. Silver (1)

Kolligian Library

Classroom & Office Building
LEED LAB COURSE

- LEED Lab Course: Multidisciplinary class that spans over two semesters where students work on the certification of buildings under LEED Existing Buildings: Operations & Maintenance (LEED EBOM)
SCIENCE AND ENGINEERING II BUILDING (S&E II)

Completed August of 2014
PROJECT SUMMARY

102,000 sq. ft. $88 Million Project Cost
The S&E I Building was the primary location for teaching and research for engineering and the natural sciences disciplines.

The development of S&E II was critical for research space for existing and emerging academic programs and provides additional teaching laboratories, research laboratories, scholarly activity space, as well as administrative and faculty office space for both the School of Natural Sciences & the School of Engineering.
LEED Platinum 86 Points

Solar-panel shaded promontory perched above the canal that can serve as an event venue.

Produces 52 kilowatts of solar energy/82,000 kwh year
SUSTAINABILITY FEATURES

LEED Platinum 86 Points

Solar hot water heating provides 8% of the domestic hot water and the potential for 25%.
SUSTAINABILITY FEATURES

LEED Platinum 86 Points

Natural daylighting to help reduce the need for artificial light.
SUSTAINABILITY FEATURES

LEED Platinum 86 Points

50% of the material used in the buildings construction are recycled or reclaimed.

CARPET
The carpet has 40% recycled content.
SUSTAINABILITY FEATURES

LEED Platinum 86 Points

412 tons of material diverted from the landfill, 84% diversion.
SUSTAINABILITY FEATURES

LEED Platinum 86 Points

Offices and labs on the upper levels, breakout rooms with adjacent balconies provide collaboration space featuring sweeping vistas of the undeveloped landscape and future campus expansion.
SUSTAINABILITY FEATURES

HVAC System

There are 5 Primary air handling systems:

- **AHU-1, 2**: 100% outside air variable air volume (VAV) air handling systems serving laboratory spaces that are not suitable for any recirculation air.

- **AHU-3**: Economizer VAV air handling system dedicated to the perimeter offices of the West Wing.

- **AHU-4**: Hybrid economizer VAV air handling system serves lab spaces as well as interior and perimeter office areas.

- **AHU-5**: 100% outside air constant volume system serving the chemical storage area of the building.
CA ENERGY CODE TITLE 24

Energy Efficiency Measures are 42% better than Title 24/2010

Envelope Measures

- Exterior overhangs and solar photovoltaic panels which provide shading and reduce solar heat gain.
- Windows are Viracon VNE15-63 glass which is a high-efficiency double-pane low-e glass.
- Exterior wall insulation: R19
- Roof Insulation: R30

Lighting Measures

- High efficiency ST8 (or T5HO where more applicable) lighting, including optimum lamp/ballast combinations, highly reflective surfaces for light fixture housings.
- Occupancy sensor controls throughout that coordinate with the HVAC systems.
- Photosensor controlled dimming of lighting in daylit areas in response to available daylight.
- LED exit lighting
- High efficiency transformers.
- Bi-level control of stairwell lighting.
- Minimize lighting power consumption.
- Photovoltaics and provision for additional future photovoltaics.
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HVAC Measures

- Run-around heat recovery.
- Labs Variable volume terminal heating/cooling lab air handling system with heat-recovery. (No reheat – maximizes use of outside air for cooling, high potential air change rate allows addition of future fume hoods).
- Office areas: Dedicated economizer-based air handlers with intelligent VAV diffusers utilizing switchover heating / cooling operation (No reheat).
- Perimeter offices have their intelligent VAV diffusers interlocked with the windows so that the diffusers stop delivery of space airflow when the windows are opened.
- CO2 demand controlled ventilation in spaces with variable high density occupancy (conference rooms).
- Low duct air velocities – 1,500 feet per minute maximum with a target of 0.06” range pressure drop per 100 feet of duct.
- Variable volume fume hood control in high fume hood density areas.
- Fume hood automatic sash closers utilizing occupant proximity sensors.
- Variable volume lab exhaust (no bypass dampers)
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Building Metering Points
- Whole Building
- Lighting
- Laboratory Power Outlets
- Convenience Outlets
- Mechanical Equipment
- Variable Speed Drives

BTUH Meters
- Chilled Water
- Heating Hot Water serving domestic and laboratory hot water heating

Water Meters
- Building
- Reclaimed Water
- RO Makeup Water
- Irrigation
- Reclaimed Water
- Domestic Hot Water Makeup
- Laboratory Hot Water Makeup
UC BENCHMARKS


- Design Target of 65%  Actual 55%
- Max Power/W/gsf 4.37  Actual 2.93/67%
- Max Chilled Water Tons/kgsf 2.43  Actual 1.72/61%
- Annual Electric kWh/gsf/yr 26.46  Actual 18.61/70%
- Max Thermal Therms/hr/kgsf .28  Actual .16/58%
- Annual Thermal Therms gsf/yr 1.18  Actual .24/20%
Thank you!