Micron Center for Materials Research
Boise State University
Sustainable Design Considerations

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During the initial design efforts, our team researched and compared our building type to various building types in related climate zones and found, according to the Department of Energy Commercial Building Energy Consumption Survey, that on average, lab buildings consume more energy than inpatient hospitals and almost three and a half times as much energy as an office building.

Throughout the design, our team explored a variety of sustainable design features for the project. The summary below captures the sustainability features that have been included in the final design.

Site Improvements

- On-site stormwater retention
- Use of native and adaptive plant material based on the local climate
- High-efficiency irrigation system

Architectural

- A comprehensive energy model was developed to evaluate building energy consumption during design.
- Ceramic Frit on south-facing windows to help reduce peak cooling loads during the summer.
- Sunshade devices at the "Gallery" curtain wall to help reduce peak cooling loads during the summer.
- Exterior walls insulated with both continuous insulation and spray foam within the exterior wall cavities, creating a "tight" building envelope that mitigates thermal bridging and direct air infiltration through the exterior wall assemblies.

Mechanical & Plumbing

- Energy monitoring and utility measuring will be provided at the energy plant for each system. Utility meters will include air, chilled water, heating water, domestic and industrial water, and electrical power. BAS will monitor other system settings and input for use in calculating space utility usage. These outputs can be displayed to occupants on electronic signage for educational and energy-use-reduction purposes.
- The following mechanical and plumbing considerations are included in the design of this project that helps achieve best energy conservation, water conservation and indoor environment:
    - Variable Speed drives for air handling and water handling equipment throughout
    - Premium efficiency motors throughout
    - Variable air volume laboratory systems
    - Outside air economizer for recirculating air handling units
    - CO2 monitoring of high-density occupant spaces
    - Waterside economizer (chilled water)

HA PN: 16018
DPW PN: 16207

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- Direct evaporative cooling
- Ultra-low flow plumbing fixtures
- Process cooling in lieu of domestic water cooling
- Low-pressure drop air handling systems
- Third-party wind tunnel testing of building for optimizing air intakes versus contaminated air sources
- Increased outdoor air quantity for better indoor air quality
- High-efficiency chillers
- Perimeter heating, in conjunction with warmer discharge air temperature in lieu of reheating cold air
- Point of use cooling (Fan coil units), in lieu of exhausting conditioned air
- High performance, low-flow fume hoods
- Occupied/unoccupied controls for offices, general spaces, and laboratories
- Displacement ventilation in classrooms and lecture hall spaces

Electrical

- LED lighting was used throughout to drive energy usage down 50% below energy code levels.
- The lighting control system utilizes scheduling, occupancy sensors, and dimming to respond to the building's occupants and turn down the lights when not required at full brightness.
- An active harmonic filtering system was installed to optimize power system performance.

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