Campbell Hall
Campus Map
New Campbell Hall
UC Berkeley

Context
Site Plan

Campus
Historical Corridor
Eco-Charrette

- **Quality of Life**
  - Designed to provide daylighting views and open offices

- **Natural Ventilation**
  - Lowered cooling loads from 240 to 120 tons

- **Nighttime Cooling**
  - Open windows at night to provide cooling in the morning

- **Stairways**
  - Designed as thermal chimney to exhaust air to exterior

- **Low Cement Concrete**
  - 70% slag to reduce CO2 footprint

- **Self-Healing Seismic System**
  - Post-tension concrete shear walls with the ability to deform under load and re-center themselves
Integrated Energy Savings

- thermal chimney
- recyclable aluminum
- sunshading
- operable windows / natural ventilation
- water efficient landscaping
Integrated Energy Savings

cool / green roof
sunshading
high performance glazing
high efficiency heating / cooling
daylighting
low cement concrete
permeable landscape
Integrated Energy Savings

- operable lightshelf
- operable windows
- high efficiency lighting
- task lighting
- ceiling fan
- roller sunshades
- water efficient plumbing fixtures
Natural Ventilation
Natural Ventilation

- Operable windows
- Office ceiling fans controlled by occupant
  - Cooling air (summer)
  - Drawing warm air up (winter)
- Operable windows
- West louvers (summer shading)
- 25 ft. naturally ventilated zone
- Louvers for air passage
- Ceiling fan
- Steam radiator
- Natural ventilation

NORTH EAST SECTION

STAIR VENTILATION
Shading Analysis - West

No Louvers

Horizontal louvers

15 degree louvers
No shading

25 degree louvers

Horizontal louvers

15 deg to the horizontal

25 deg to the horizontal
Sun Shading - South

2' projection

3' projection

No shading
East elevation
South facing elevation
NIST Labs
The primary goals for enhanced seismic performance are:

- Limit maximum inelastic inter-story drifts (displacement of one story relative to those above and below) to 1.5% at the code level design seismic event. This value is in line with the more stringent requirements for buildings in Occupancy Category III, outlined in ASCE 7.

- Limit maximum residual seismic drifts to less than 0.15%, CBC does not address this key issue.

- Design mechanical systems, stair wells, and building cladding to remain damage free and without permanent deformation up to 1.5% drift.
Vertical Shear Wall Analysis

Figures:

Figure 1: Force-displacement behavior of concrete elements

Figure 2: Diagram of PT restoring force
• These tendons act as giant rubber bands pulling the structure back to its original configuration after lateral earthquake displacement.

• The primary lateral force resisting system consists of (6) 14'-0” long planar concrete walls - 3 in the north-south direction and 3 in the east-west direction.

• This building is designed with a more sustainable approach in that it will remain substantially damage free and operational after a code level earthquake.

Figure 3: Typical PT wall section for Campbell Hall
Shear wall overview
Shear Wall Reinforcing
Vertical Post Tensioning
High Slag Concrete
• LEED Gold

• Energy Savings 24.3% above T-24

• 42.8% water savings

• 68.9% landscape water savings