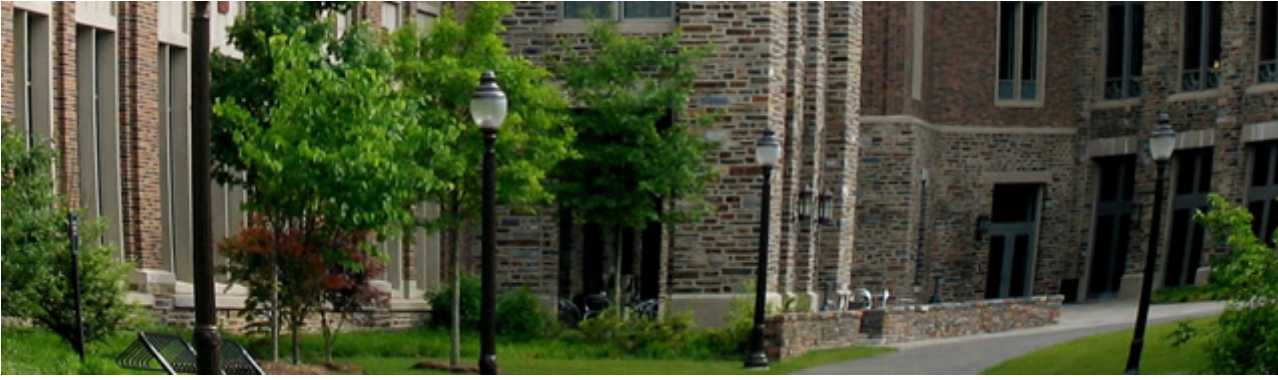


Duke Sustainability



Fitzpatrick (CIEMAS)

Building Information

Tenant: [Pratt School of Engineering](#)

Architect: [Zimmer Gunsul Frasca](#)

Construction: [Skanska](#)

Purpose: Research & Teaching

Footprint: 322,276 sq ft

The Fitzpatrick Center for Interdisciplinary Engineering, Medicine and Applied Sciences (CIEMAS) opened in 2004 and earned LEED™ Silver certification.

[View the CIEMAS LEED™ Scorecard](#)

Sustainable Site Features:

CIEMAS includes features to reduce light pollution and substantially reduce heat island effects. A reflective membrane roof reflects 75% of incoming solar energy, reducing the need for air conditioning. High-albedo (reflective) pavement shaded by trees selected for the site also reduce absorption of solar energy, creating a cooler, more comfortable environment.

Water Efficiency

Xeriscaping, the practice of using local, native plants that do not require additional watering and fertilizing to survive, has eliminated the need for an irrigation system at CIEMAS. A 70,000 gallon rainwater cistern catches rain water, mitigating run-off and providing water for landscaping elsewhere on campus. Low-flow lavatories and waterless urinals reduce building occupants' use of potable water by 53%.

Energy Efficiency

The stonework on the building's exterior slows the transmission of solar heat by about 12 hours, meaning the stones stay cool during hot days and begin releasing heat at night, when temperatures have cooled. Coupled with tinted windows that maximize daylighting without additional heating, these simple, cost-effective smart design features minimize the energy used for climate control, reducing the building's energy use by 15%.

Further energy savings are achieved through custom-built optimally-sized air handling units, variable frequency drives, and heat wheel recovery systems for the auditorium and laboratory exhaust systems. The expected energy cost savings are realized and maintained through building systems commissioning, and measurement and verification of the MEP systems.

Indoor Air Quality

Low-VOC (volatile organic compounds) carpeting, paint, adhesives, and sealants are used throughout the building to guarantee the health of building occupants and reduce environmental impacts. VOC's found in many construction items, in the presence of NOx and light from windows or photocopiers, combine to form ground-level ozone. While this much-lauded chemical is desirable in the "ozone layer" where it shields the earth from ultraviolet radiation, it is toxic and a major source of indoor air pollution.

Resource Management

Approximately 30% of construction materials came from within a 500 mile radius. Over 85% of the wood used in the project is Forest Stewardship Council (FSC) certified, including 70% of materials used for laboratory casework. Construction materials contain 4% post-consumer content and 14.5% post-industrial content.

Integration of Sustainability in Design & Construction Process

Duke used the USGBC LEED™ rating system as a framework in green design charrettes and feasibility studies, to define the sustainability goals of the project and prioritize possible green features. Skanska utilized a web-based LEED™ information management system called *LEEDBuilder*, to facilitate information sharing amongst stakeholders and submit US Green Building Council (USGBC) documentation.



LEED-NC

Center for Interdisciplinary Engineering, Medicine, & Applied Science
 LEED® Project # 0471
 LEED Version 2 Certification Level: SILVER
 April 12, 2005

33 Points Achieved

Certified 26 to 32 points Silver 33 to 38 points Gold 39 to 51 points Platinum 52 or more points

Possible Points: 69

7 Sustainable Sites Possible Points: 14

Y	Prereq	Y	6 Materials & Resources	Possible Points: 13
1	Credit 1	1	Erosion & Sedimentation Control	
	Credit 2	1	Site Selection	
	Credit 3	1	Urban Redevelopment	
1	Credit 4.1	1	Brownfield Redevelopment	
1	Credit 4.2	1	Alternative Transportation, Public Transportation Access	
	Credit 4.3	1	Alternative Transportation, Bicycle Storage & Changing Rooms	
	Credit 4.4	1	Alternative Transportation, Alternative Fuel Refueling Stations	
1	Credit 5.1	1	Alternative Transportation, Parking Capacity	
	Credit 5.2	1	Reduced Site Disturbance, Protect or Restore Open Space	
1	Credit 6.1	1	Reduced Site Disturbance, Development Footprint	
	Credit 6.2	1	Stormwater Management, Rate and Quantity	
1	Credit 7.1	1	Stormwater Management, Treatment	
1	Credit 7.2	1	Stormwater Management, Stormwater Management, 20% Manufactured Locally	
	Credit 8	1	Landscaping & Exterior Design to Reduce Heat Islands, Non-Roof	
		1	Landscaping & Exterior Design to Reduce Heat Islands, Roof	
		1	Light Pollution Reduction	

4 Water Efficiency Possible Points: 5

Y	Prereq	Y	5 Indoor Environmental Quality	Possible Points: 15
1	Credit 1.1	1	Minimum IAQ Performance	
1	Credit 1.2	1	Environmental Tobacco Smoke (ETS) Control	
	Credit 2	1	Carbon Dioxide (CO₂) Monitoring	
1	Credit 3.1	1	Increase Ventilation Effectiveness	
1	Credit 3.2	1	Construction IAQ Management Plan, During Construction	
		1	Construction IAQ Management Plan, Before Occupancy	
		1	Low-Emitting Materials, Adhesives & Sealants	
		1	Low-Emitting Materials, Paints	
		1	Low-Emitting Materials, Carpet	
		1	Low-Emitting Materials, Composite Wood	
		1	Indoor Chemical & Pollutant Source Control	
		1	Controllability of Systems, Perimeter	
		1	Controllability of Systems, Non-Perimeter	
		1	Thermal Comfort, Comply with ASHRAE 55-1992	
		1	Thermal Comfort, Permanent Monitoring System	
		1	Daylight & Views, Daylight 75% of Spaces	
		1	Daylight & Views, Views for 90% of Spaces	

2 Energy & Atmosphere Possible Points: 17

Y	Prereq	Y	5 Innovation & Design Process	Possible Points: 5
Y	Prereq 1	Y	Innovation in Design: Sustainability Education	1
Y	Prereq 2	Y	Innovation in Design: Exemplary Performance WEc3	1
Y	Prereq 3	Y	Innovation in Design: Exemplary Performance EAc6	1
	Credit 1.1	1	Innovation in Design: Fume Hood Commissioning	1
	Credit 1.2	1	LEED® Accredited Professional	1

5 Innovation & Design Process Possible Points: 5

Y	Prereq	Y	2 Energy & Atmosphere	Possible Points: 17
Y	Prereq 1	Y	Fundamental Building Systems Commissioning	
Y	Prereq 2	Y	Minimum Energy Performance	
Y	Prereq 3	Y	CFC Reduction in HVAC&R Equipment	
	Credit 1.1	2	Optimize Energy Performance, 20% New / 10% Existing	
	Credit 1.2	2	Optimize Energy Performance, 30% New / 20% Existing	
	Credit 1.3	2	Optimize Energy Performance, 40% New / 30% Existing	
	Credit 1.4	2	Optimize Energy Performance, 50% New / 40% Existing	
	Credit 1.5	2	Optimize Energy Performance, 60% New / 50% Existing	
	Credit 2.1	1	Renewable Energy, 5%	
	Credit 2.2	1	Renewable Energy, 10%	
	Credit 2.3	1	Renewable Energy, 20%	
1	Credit 3	1	Additional Commissioning	
	Credit 4	1	Ozone Depletion	
	Credit 5	1	Measurement & Verification	
1	Credit 6	1	Green Power	