

# Duke Sustainability

## French Family Science Center



### Building Information

Architect: [RMJM](#)

Construction: [Skanska](#)

Purpose: Teaching Facilities and Labs

Footprint: 293,495 sq ft

The French Family Science Center, named for the family of Duke alumnae and trustee Melinda French Gates, houses laboratories and classrooms for numerous departments and disciplines. The building opened in August of 2006.

[View the French Family Science Center's LEED™ Scorecard](#)

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### Sustainable Site Features

This large research and teaching complex was designed to fit into a tight space in the center of campus, increasing density rather than building on a peripheral greenfield site. 15,000-square-feet of green roofs mitigate the building's physical footprint and reduce stormwater run-off. Bicycle racks are conveniently located around the building for up to 120 bicycles.

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### Water Efficiency

Use of waterless urinals, and low-flow sinks reduces water usage by 51%. The building's 15,000 square feet of green roofs help to absorb rainwater, reducing run-off and improving watershed quality.

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### Energy Efficiency

Occupancy sensors control energy efficient lighting throughout the building. 275 windows were treated with an energy efficiency glaze to limit solar heat and [reflective louvers](#) (passive solar features that reflect or deflect direct glare) are employed to bounce natural daylight into the building. Use of a white coating on the building's roof reduces the energy needed for indoor cooling by 41%.

The most innovative features of the French Family Science Center involve the complex mechanical systems common in research-intensive lab buildings. 249 low-flow fume hoods operate at 80 fpm and are arranged throughout the building to permit heat recovery systems that capture energy from the exhaust air stream and use it to pre-heat (or pre-cool) the incoming air.

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### Resource Management

94% of all the new wood in the building is Forest Stewardship Council certified. More than 50% of construction debris was recycled.

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### **Integration of Sustainability in Design & Construction Process**

Town hall meetings were held during design and construction to foster communication between the multiple departments occupying the building. The adoption of sustainability objectives into the campus master plan and building standards helped to steer design. Flexibility was a central theme in the buildings design and construction that has important connections to sustainability.

Laboratory spaces were intermixed and designed to accommodate two or more research groups, with faculty offices grouped together, to encourage interaction between disciplines. Shared laboratory space was located so as to allow flexible use of the building as the nature and demands of research changes.



## LEED for New Construction v2.0/2.1

**35 Points Achieved**

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

### 8 Sustainable Sites Possible Points: 14

Y	Prereq	Credit	Description	Points
Y	Prereq 1		<b>Erosion &amp; Sedimentation Control</b>	
1	Credit 1		Site Selection	1
1	Credit 2		Development Density	1
1	Credit 3		Brownfield Redevelopment	1
1	Credit 4.1		Alternative Transportation, Public Transportation Access	1
1	Credit 4.2		Alternative Transportation, Bicycle Storage & Changing Rooms	1
1	Credit 4.3		Alternative Transportation, Alternative Fuel Vehicles	1
1	Credit 4.4		Alternative Transportation, Parking Capacity & Carpooling	1
1	Credit 5.1		Reduced Site Disturbance, Protect or Restore Open Space	1
1	Credit 5.2		Reduced Site Disturbance, Development Footprint	1
1	Credit 6.1		Stormwater Management, Rate & Quantity	1
1	Credit 6.2		Stormwater Management, Treatment	1
1	Credit 7.1		Landscape & Exterior Design to Reduce Heat Islands, Non-Roof	1
1	Credit 7.2		Landscape & Exterior Design to Reduce Heat Islands, Roof	1
1	Credit 8		Light Pollution Reduction	1

### 3 Water Efficiency Possible Points: 5

Y	Prereq	Credit	Description	Points
1	Credit 1.1		Water Efficient Landscaping, Reduce by 50%	1
1	Credit 1.2		Water Efficient Landscaping, No Potable Use or No Irrigation	1
1	Credit 2		Innovative Wastewater Technologies	1
1	Credit 3.1		Water Use Reduction, 20% Reduction	1
1	Credit 3.2		Water Use Reduction, 30% Reduction	1

### 7 Energy & Atmosphere Possible Points: 17

Y	Prereq	Credit	Description	Points
Y	Prereq 1		<b>Fundamental Building Systems Commissioning</b>	
Y	Prereq 2		<b>Minimum Energy Performance</b>	
Y	Prereq 3		<b>CFC Reduction in HVAC&amp;R Equipment</b>	
1	Credit 1.1		Optimize Energy Performance, 15% New / 5% Existing	1
1	Credit 1.2		Optimize Energy Performance, 20% New / 10% Existing	1
1	Credit 1.3		Optimize Energy Performance, 25% New / 15% Existing	1
1	Credit 1.4		Optimize Energy Performance, 30% New / 20% Existing	1
1	Credit 1.5		Optimize Energy Performance, 35% New / 25% Existing	1
1	Credit 1.6		Optimize Energy Performance, 40% New / 30% Existing	1
1	Credit 1.7		Optimize Energy Performance, 45% New / 35% Existing	1
1	Credit 1.8		Optimize Energy Performance, 50% New / 40% Existing	1
1	Credit 1.9		Optimize Energy Performance, 55% New / 45% Existing	1
1	Credit 1.10		Optimize Energy Performance, 60% New / 50% Existing	1
1	Credit 2.2		Renewable Energy, 5%	1
1	Credit 2.3		Renewable Energy, 10%	1
1	Credit 2.3		Renewable Energy, 15%	1
1	Credit 3		Additional Commissioning	1
1	Credit 4		Ozone Depletion	1
1	Credit 5		Measurement & Verification	1
1	Credit 6		Green Power	1

## Duke University French Family Science Center Project # 10001767 Certification Level: Silver 10/9/2007

**Possible Points: 69**

### 5 Materials & Resources Possible Points: 13

Y	Prereq	Credit	Description	Points
Y	Prereq 1		<b>Storage &amp; Collection of Recyclables</b>	
1	Credit 1.1		Building Reuse, Maintain 75% of Existing Shell	1
1	Credit 1.2		Building Reuse, Maintain 100% of Shell	1
1	Credit 1.3		Building Reuse, Maintain 100% Shell & 50% Non-Shell	1
1	Credit 2.1		Construction Waste Management, Divert 50%	1
1	Credit 2.2		Construction Waste Management, Divert 75%	1
1	Credit 3.1		Resource Reuse, Specify 5%	1
1	Credit 3.2		Resource Reuse, Specify 10%	1
1	Credit 4.1		Recycled Content, Specify 5%	1
1	Credit 4.2		Recycled Content, Specify 10%	1
1	Credit 5.1		Local/Regional Materials, 20% Manufactured Locally	1
1	Credit 5.2		Local/Regional Materials, of 20% Above, 50% Harvested Locally	1
1	Credit 6		Rapidly Renewable Materials	1
1	Credit 7		Certified Wood	1

### 7 Indoor Environmental Quality Possible Points: 15

Y	Prereq	Credit	Description	Points
Y	Prereq 1		<b>Minimum IAQ Performance</b>	
Y	Prereq 2		<b>Environmental Tobacco Smoke (ETS) Control</b>	
1	Credit 1		Carbon Dioxide Monitoring	1
1	Credit 2		Ventilation Effectiveness	1
1	Credit 3.1		Construction IAQ Management Plan, During Construction	1
1	Credit 3.2		Construction IAQ Management Plan, Before Occupancy	1
1	Credit 4.1		Low-Emitting Materials, Adhesives & Sealants	1
1	Credit 4.2		Low-Emitting Materials, Paints	1
1	Credit 4.3		Low-Emitting Materials, Carpet	1
1	Credit 4.4		Low-Emitting Materials, Composite Wood & Agrifiber Products	1
1	Credit 5		Indoor Chemical & Pollutant Source Control	1
1	Credit 6.1		Controllability of Systems, Perimeter	1
1	Credit 6.2		Controllability of Systems, Non-Perimeter	1
1	Credit 7.1		Thermal Comfort, Comply with ASHRAE 55-1992	1
1	Credit 7.2		Thermal Comfort, Permanent Monitoring System	1
1	Credit 8.1		Daylight & Views, Daylight 75% of Spaces	1
1	Credit 8.2		Daylight & Views, Views for 90% of Spaces	1

### 5 Innovation & Design Process Possible Points: 5

Y	Prereq	Credit	Description	Points
Y	Prereq 1		<b>Innovation in Design: ISO Certified Contractor</b>	
1	Credit 1.1		Innovation in Design: Exemplary Performance, WEC3	1
1	Credit 1.2		Innovation in Design: Exemplary Performance, WEC4	1
1	Credit 1.3		Innovation in Design: Exemplary Performance, WEC3	1
1	Credit 1.4		Innovation in Design: Fume Hood Commissioning	1
1	Credit 2		LEED® Accredited Professional	1