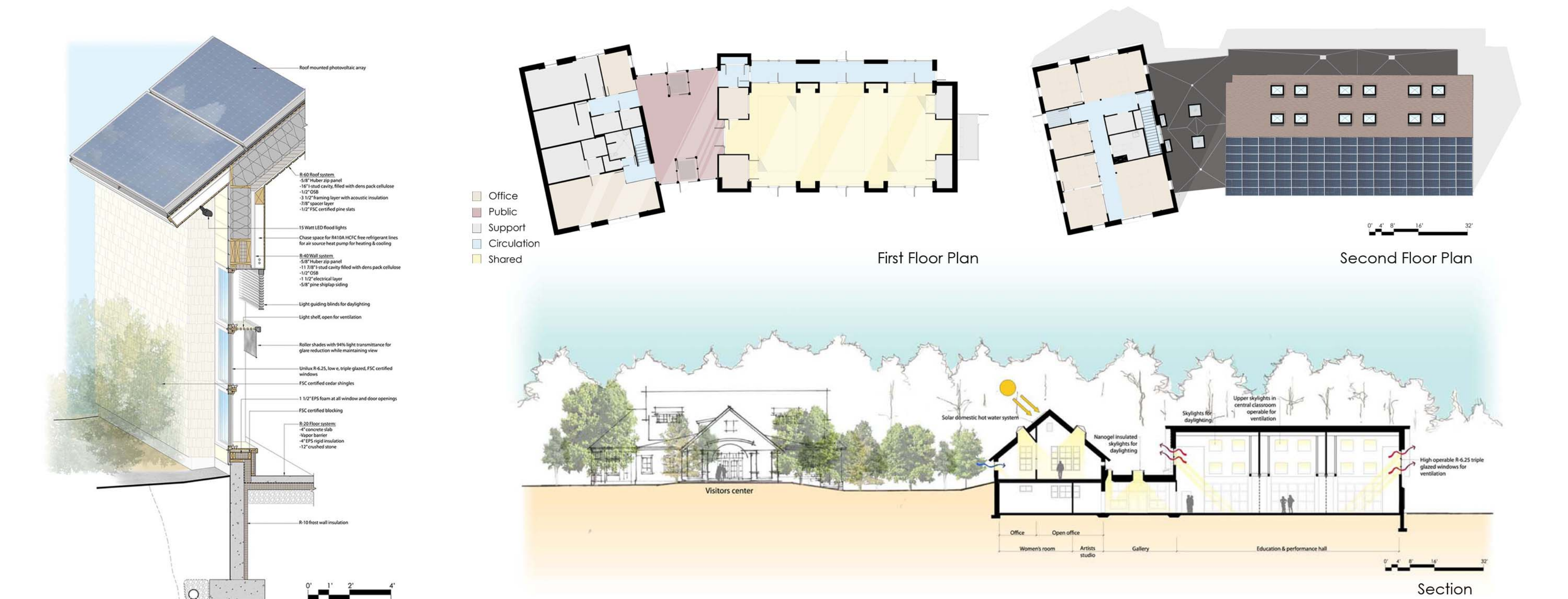




View from children's garden



METRICS			
Total Energy Consumed	38,600 kWh (projected)		
Total Energy Generated	47,278 kWh (projected)		
Square Footage	3,200 sf		
Energy Intensity	12.0 kWh/sf-yr		
Air Leakage Rate	0.115 cfm50/sf exterior surface area		
ENVELOPE			
Component	Description		Value
Wall Construction	R-40, dens pack cellulose in 11 7/8" stud cavity	R-40	
Roof Construction	R-60, dens pack cellulose in 14" stud cavity	R-60	
Slab Perimeter	R-20, 4" EPS rigid insulation	R-20	
Slab Edge Joint	R-20, 4" EPS rigid insulation	R-20	
Subslab	R-20, 4" EPS rigid insulation	R-20	
Windows	Low-e, triple-pane, argon filled, FSC certified	0.14 U	
		0.24, 0.14 SHGC	
Skylights (Type I)	16 mm Nanogel-filled polycarbonate inner layer	0.57 to 0.629	
Skylights (Type II)	Triple-glazed, Low-E2, argon-filled	0.154 U Maximum	
Emergency Egress	Low-E2, triple-pane, argon-filled	0.27 U	
		0.42 U	
MECHANICAL			
Component	Description		
Heating System	Mitsubishi Single Phase Air Source Heat Pump		
Cooling System	Cooling is provided by the ASHP if needed		
Ventilation	Manual and automatically operated clerestory windows and skylights provide venting. ERV with automatic CO2 and airflow sensors provides all ventilation with recovery 70% of heat from exhausted air.		
Hot Water	Solar domestic hot water		
Lighting & Controls	LED, high efficiency and Super 18 throughout. Daylight dimming and cutoff in classrooms and public all public spaces, bi-level (manual on and auto off) in offices and other small spaces	43 kW peak power	
Renewable System	153 rooftop panels, 102 ground mounted panels	47,000 kWh projected annual output	

The Coastal Maine Botanical Gardens wanted to construct a new educational center adjacent to their existing visitor's center to house both administrative office space as well as flexible and adaptable classroom space that could also be used for various events and gatherings. The building needed to establish a strong connection to the outdoors and the neighboring botanical gardens. The client also set out strict environmental guidelines from the beginning of the project, requiring the building to have minimal energy loads and be both LEED Platinum certified and net-zero.

Many high-performance building strategies were incorporated into the design in order to achieve the net-zero goal. The building's super-insulated envelope features R-20 below ground insulation, R-40 above ground walls, an R-60 roof and R-6.25 windows. A panelized wall system constructed off-site reduced waste and minimized site disturbance. On site, 90% of construction waste was recycled. Locally harvested, FSC certified wood was used extensively. The building is sited to take advantage of ample southern light. Additional features include rainwater collection, high-efficiency fixtures and operable windows for natural cooling and ventilation. In addition to these features, the building teaches visitors the importance of resource and energy conservation through the use of signage and real-time energy metering.



South Elevation



View from main entrance



Scupper



Daylit gallery with building dashboard



Education & performance hall