Mathias Laboratory: Facts & Figures

The Charles McC. Mathias Laboratory is designed to be the Smithsonian’s most environmentally sustainable building to date, and the first Smithsonian building to achieve LEED Platinum status (Leadership in Energy and Environmental Design). Housed at the Smithsonian Environmental Research Center, the 92,000-square-foot lab consists of a newly constructed section for laboratories and offices (69,000 sq. ft.) and a renovated section for additional office space (23,000 sq. ft.). Besides leaving a lighter footprint on the Earth, more open and flexible laboratories will allow scientists to make new discoveries in biogenomics, conservation and other cutting-edge fields of environmental science.

By the Numbers

- 37% less CO₂ emitted than a non-LEED-certified lab
- 42% more energy-efficient than a non-LEED-certified lab
- 70% materials regionally sourced
- 96% construction waste recycled
- 100% water reclamation system

What’s in a Name?

Charles McC. “Mac” Mathias Jr. served as a Republican Congressman in the House and Senate from 1961 to 1987. An early environmental defender, he helped create the Chesapeake Bay Program in 1983 and advocated for legislation that would protect the Bay from pollution and overdevelopment. His Democratic colleague Mike Mansfield once called him “the conscience of the Senate.”

Scaling Up to Platinum

The U.S. Green Building Council determines which buildings make LEED certification, ranking them as Bronze, Silver, Gold or Platinum, the highest level. To reach LEED Platinum, the Mathias Lab needs 52 credits. Here is how the points are expected to break down before the USGBC evaluation in 2015:

- Sustainable Sites—Target: 11 out of 14 credits
- Water Efficiency—Target: 5 out of 5 credits
- Energy & Atmosphere—Target: 17 out of 17 credits
- Materials & Resources—Target: 7 out of 13 credits
- Indoor Environmental Quality—Target: 12 out of 15 credits
- Innovation & Design Process—Target: 4 out of 4 credits

Total Target: 56 credits

Project Budget: $56.6 Million

- Design $5.67M
- Water Reclamation System, $3.4M
- Geothermal $3.9M
- Renewable & Photovoltaic System, $2.5M
- Other Construction $41.13 M

Photos by Chuck Gallegos, Kristen Minogue and Monaca Noble of SERC (left to right).
Key Green Features

- Passive Solar Design
- Geothermal Heating & Cooling
  - 250 wells, 430 feet deep
  - (12) 35-ton, two-stage heat pumps
  - Stable 55°F ambient heating and cooling medium
- Automated Lighting & Building Automation System
- Heat Recovery through Enthalpy Wheels
- On-site Solar Energy Production
  - 352-kilowatt array of solar panels
  - 312 kilowatts for electrical photovoltaic energy
  - 40 kilowatts for closed-loop domestic hot water production
- 100% Water Reclamation System
  - On-site wastewater treatment plant for all domestic “gray water”
  - Water returned to lab for fire protection, irrigation and water-closet supply
- Rainwater Capture (three cisterns, 16,000 gallons total)
- 4.56-acre Constructed Wetland for Stormwater Management

The Six Guilds

A total of 15 laboratories conduct environmental research in the Mathias Lab, on topics ranging from mercury and nutrient pollution to genomics and global change. To encourage sharing of ideas, the new building groups labs together instead of housing each in a separate room. Each lab has its own space, but labs in the same guild are not completely separated by walls, so ecologists can freely pass between them.

Thanks and Acknowledgements:

Smithsonian Teams:
Office of Facilities Engineering & Operations
Office of Finance & Administration
Office of Government Relations
Smithsonian Environmental Research Center

EwingCole, Architects
Poole Design, LLC, Landscape Architect
Cornerstone Commissioning
Atelier Ten, Energy Modeling
LaSalle Engineering

Hensel Phelps, General Contractors
Chaney Construction, Concrete
NORESCO/Standard Solar, Solar Power
Joshua Construction, Mechanical/Plumbing
Singleton Construction, Electrical

Allied Well Drilling, Geothermal
A.C. Dellovade, Exterior
Northeast, Roofing
Glass & Metals, Doors & Windows