

# Pennsylvania State University Millennium Science Complex

State College, Pennsylvania

**Owner**

Pennsylvania State University

**Client/Architect**

Rafael Viñoly Architects

**General Contractor**

Whiting Turner Construction Co.

**Completion Date**

2011

**Construction Cost**

\$190 million

**Total Area**

275,600 sf



Creative structural design successfully balanced the competing demands of form, function and efficiency at Penn State's signature science building. The new home of the Life and Materials Sciences programs has two four-story wings that meet over a dramatic entrance plaza. Each wing cantilevers 154 feet over the plaza, supported by two tapered steel trusses on each side. Splitting the load minimized the steel tonnage needed, reducing construction costs. Wind tunnel tests determined possible vibration effects from multi-directional wind loads on the cantilever – a critical factor in a laboratory building with sensitive equipment. A nanotech laboratory required even stricter motion control. The design included a structurally isolated area that “floats” within the building to eliminate vibration from surrounding effects.

The design also incorporates five green roof terraces on the setbacks to meet the LEED certification requirements.

The entire project team effectively collaborated on utilizing Building Information Modeling technology, using Autodesk Revit as a primary tool for information exchange, and coordination during the design and construction phases.

The materials research program requires clean room space and user facilities with several state-of-the-art characterization and fabrication tools housed in a quiet space with low acoustic and electromagnetic noise, suitable for future generations of image analysis instruments. This quiet space is structurally isolated from the rest of the building and situated on 24-inch-thick slabs on grade at the intersection of the two wings. Each wing cantilevers over the quiet room space to avoid transmitting vibrations from building columns. In addition, typical bay sizes were restricted to 22 feet by 22 feet to achieve better vibration performance.

