

Deployment of Integrated Sustainable Roof Technologies in a Singular Project –National Institutes of Health, Case Study (Bethesda, MD)



National Institutes of Health

- ▣ Founded 1887, Staten Island, NY
- ▣ Moved to DC in 1891 – Hygienic Labs
- ▣ Current site from 1938
- ▣ 28 Billion dollars dedicated to medical research
- ▣ 27 Institutes – Cancer, Eyes, Aging, Infectious Diseases, Environmental Health Sciences, Human Genome Project



National Institutes of Health



- ▣ Building 10
Biomedical Research
Library
- ▣ 4,400 sq ft Terrace
- ▣ Conference rooms
underneath
- ▣ Reroofed a few years
earlier, replicating
original design.
Liquid membrane
with pavers

Existing Conditions

- ▣ Rarely used
- ▣ Hot & Humid
- ▣ Glare – patio and library
- ▣ Hardscape promoted storm water runoff
- ▣ Not in line with governmental focus on sustainability



Design Considerations

- ▣ Project conceived in 2006
- ▣ Connect patio to interior renovation
- ▣ Improve storm water retention
- ▣ Improve energy efficiency, add renewable energy if possible
- ▣ Reduce glare
- ▣ Improve usage by researchers
- ▣ Tie-in to medical research
- ▣ Create demonstration model
- ▣ Provide education
- ▣ Political consideration

Team Members

- ▣ Campus General Contractor
- ▣ Campus Specialty GC & Roofing Partners
- ▣ Landscape Architect with vegetative roof experience
- ▣ Environmental Horticulturalist
- ▣ Vegetative Roof Consultant
- ▣ Solar Engineer
- ▣ Mechanical Engineer
- ▣ Structural Engineer

Design Elements

- ▣ Vegetative Roof – extensive and semi-intensive
- ▣ Medicinal plants involved in research
- ▣ Living Walls
- ▣ Storm water retention
- ▣ Photovoltaics
- ▣ Cool roof
- ▣ Shade Structures & Seating
- ▣ Recycling Collection
- ▣ Sensory involvement
- ▣ Walk Bridge
- ▣ Improve visual access
- ▣ Educational signage
- ▣ Reuse materials where possible

Proposed design



Challenges of initial design

- ▣ Cost and delivery of new DNA shade structure
- ▣ Poured in place concrete shade base structures
- ▣ Donated water feature – political issues
- ▣ No on-site storage allowed
- ▣ High security measures
- ▣ Delays due to political considerations, drove substantial completion schedule down to four weeks

Construction photos @
http://nihlibrary.nih.gov/Documents/terrace_photos.pdf



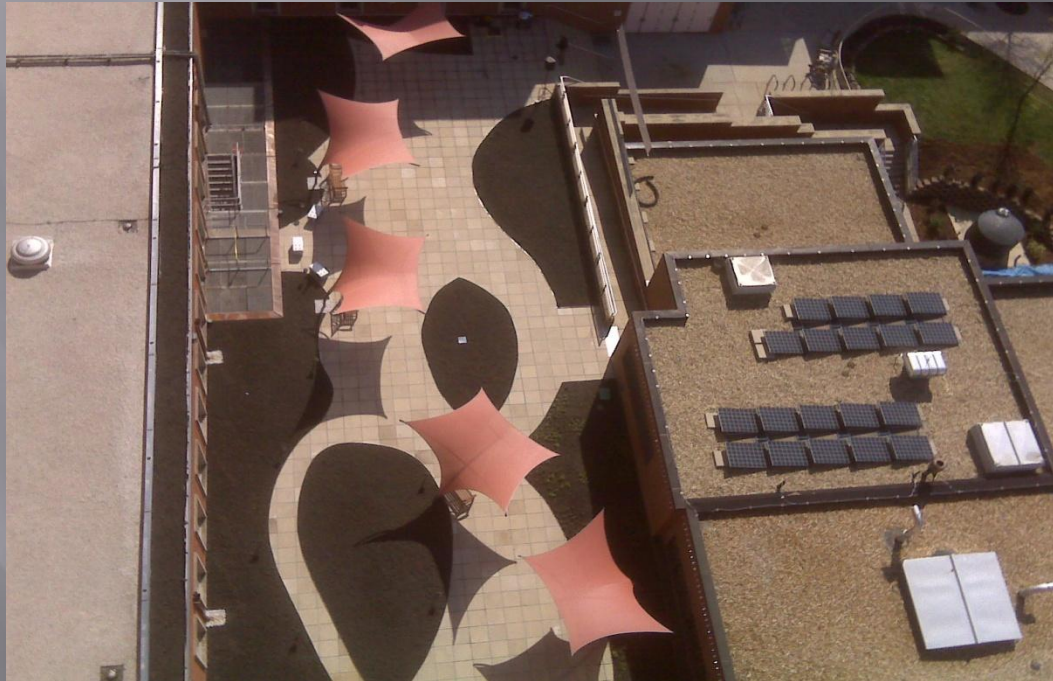
NIH LIBRARY GREEN ROOF TERRACE

Completed in 2009

Interior Remodeled



At Completion



Rooftop view at completion



At Completion



Living wall design



Solar array powers pumps and lightning



Storm Water Collection – 1,200 Gallon Capacity



Recycle bins added



Awarded the Health and Human Services Green Champion Award for Sustainable Building Design for 2009



September 2010



2010 - Scaled down water feature



Sedum areas



Sedum area



Semi-Intensive planting



Semi-Intensive and medicinal plantings



Semi-intensive area



Close-up



First Living Walls started in 2009, one year growth (2010)



Solar panels with new cool roof surface



Overview in 2010



Overview in 2010



2011 – 3 years



2011



2011



2011

