

SUSTAINABLE DESIGN OF RECREATION FACILITIES

The West Center at Winthrop University



AAHPERD
Conference

Charlotte, NC

April 26, 2013

MOSELEYARCHITECTS

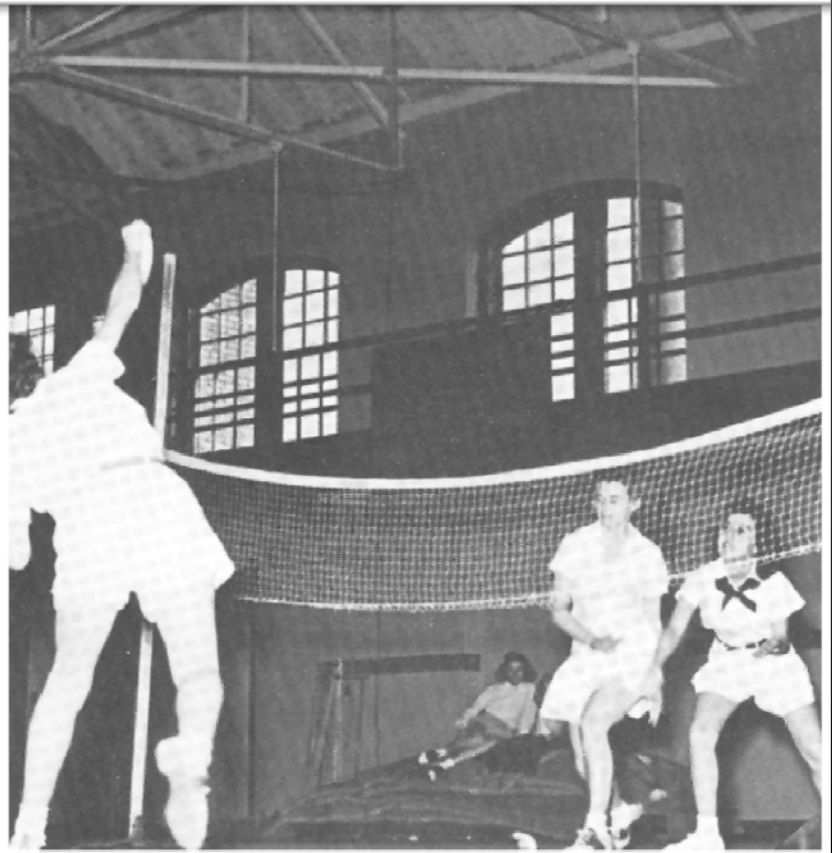
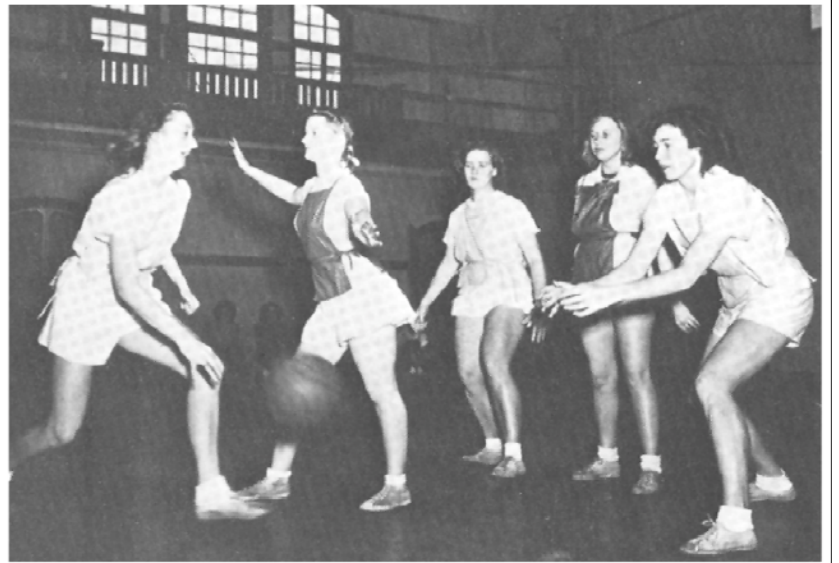


*American Alliance for
Health, Physical Education,
Recreation and Dance*



WINTHROP
UNIVERSITY



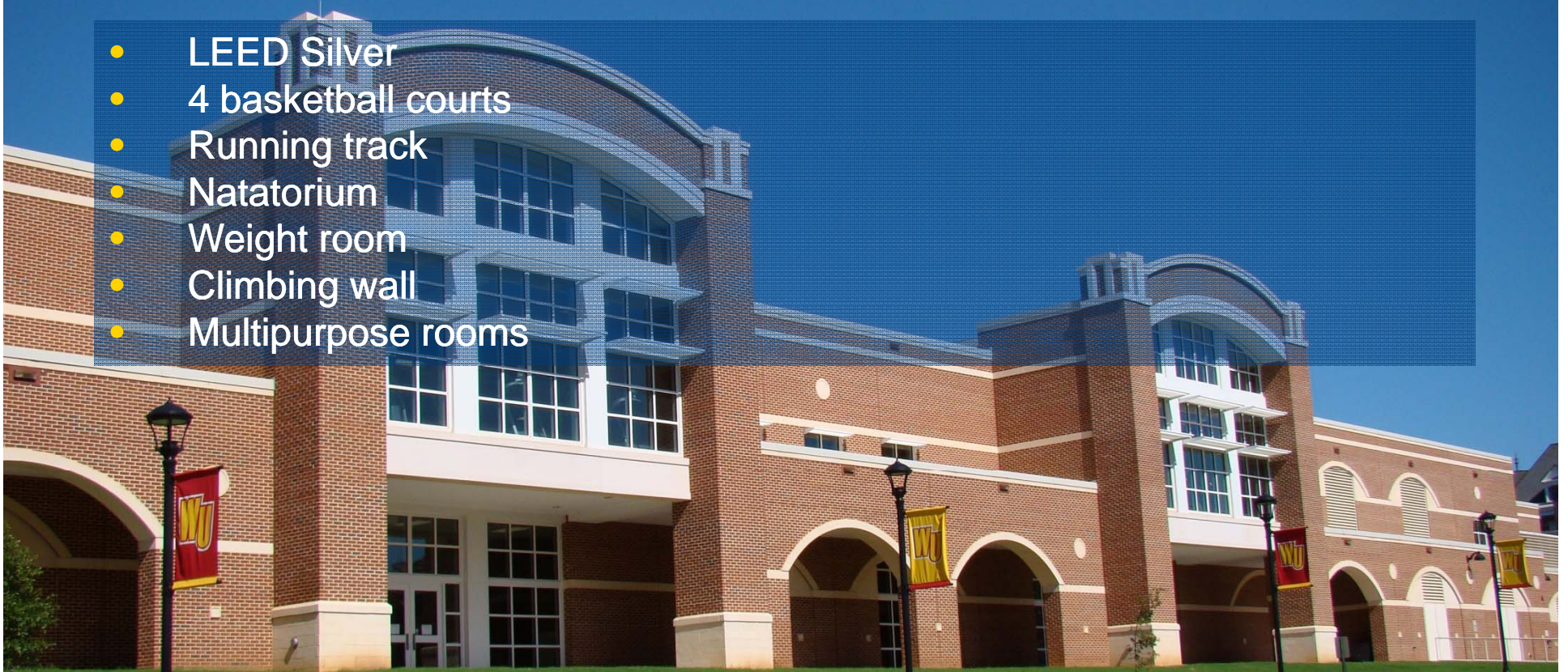


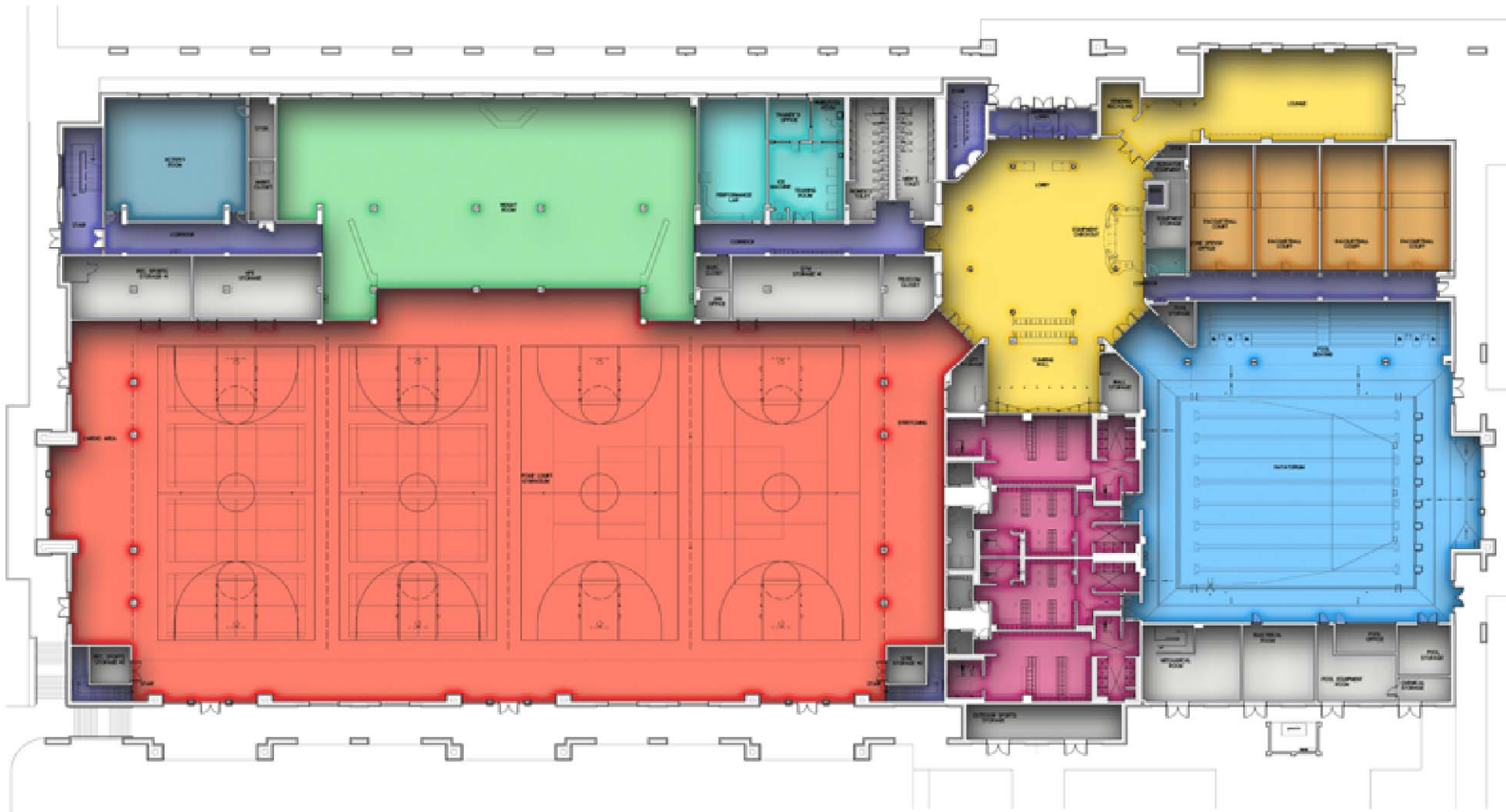


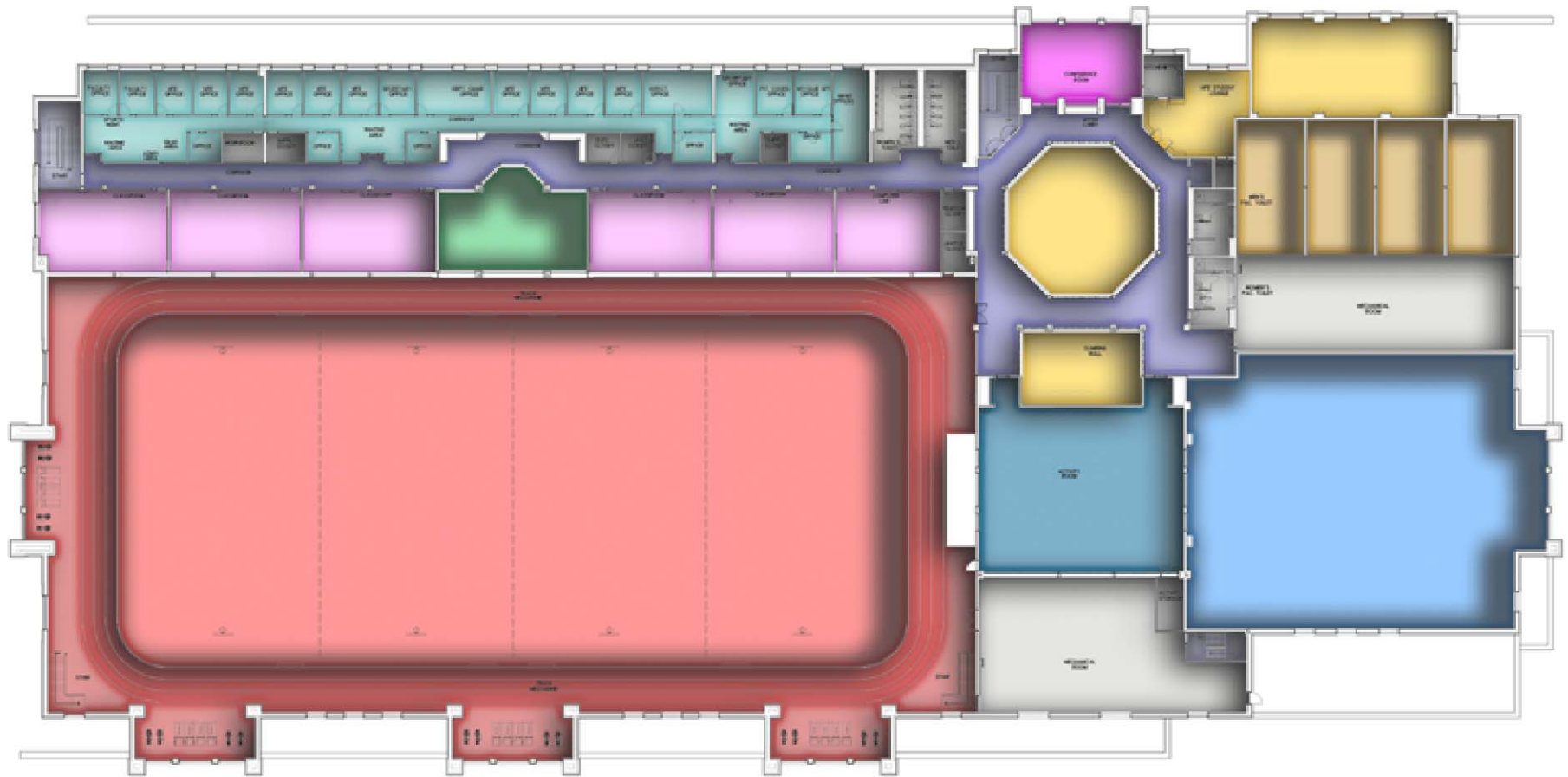
Lois Rhame West

Health, Physical Education and Wellness Center

- LEED Silver
- 4 basketball courts
- Running track
- Natatorium
- Weight room
- Climbing wall
- Multipurpose rooms























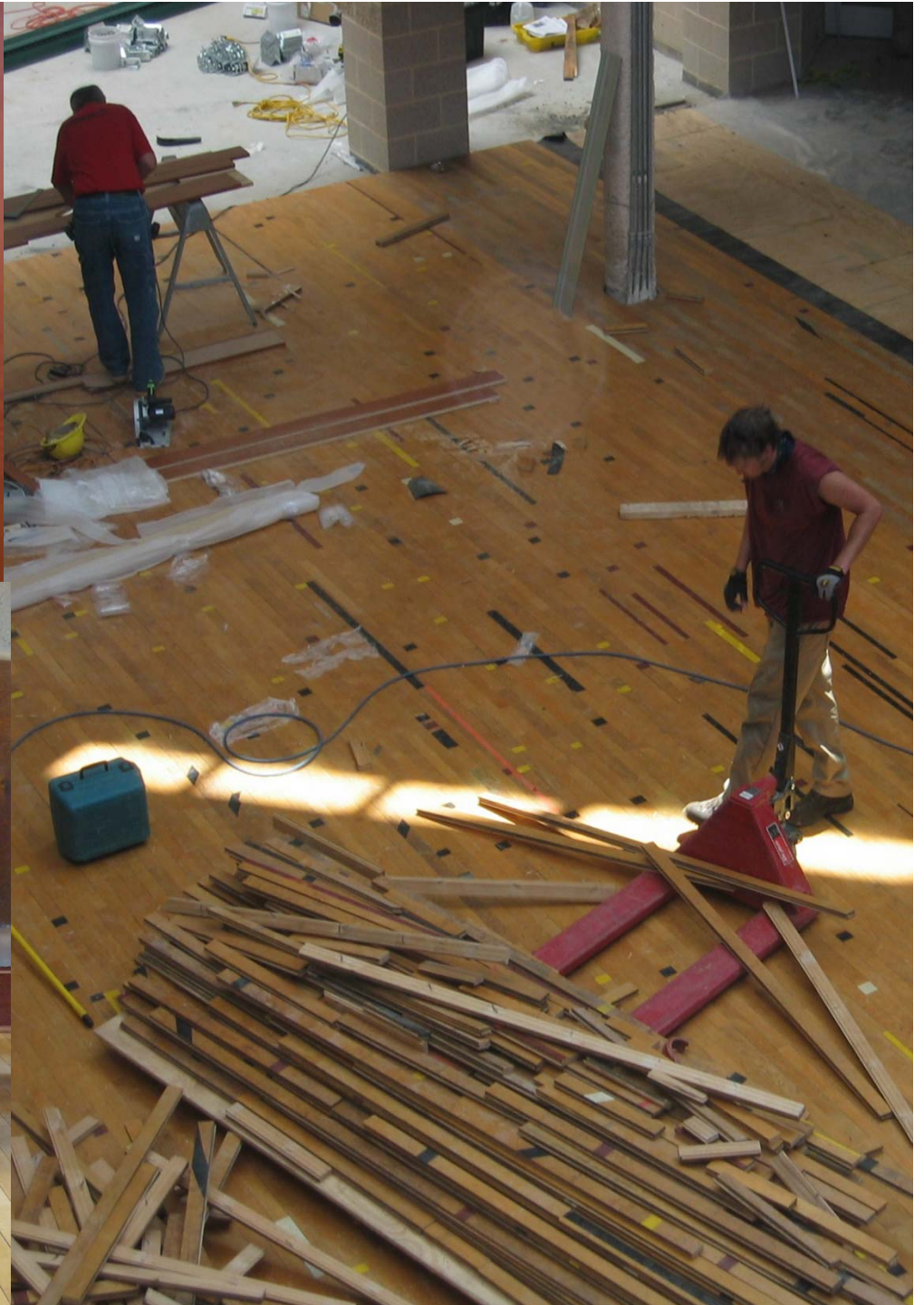






PEABODY GYMNASIUM 1915-2007









GYMNASIUM EXTERIOR



GYMNASIUM INTERIOR



NATATORIUM EXTERIOR



NATATORIUM INTERIOR

Base Case ▶



Adjusted by .613 ▶

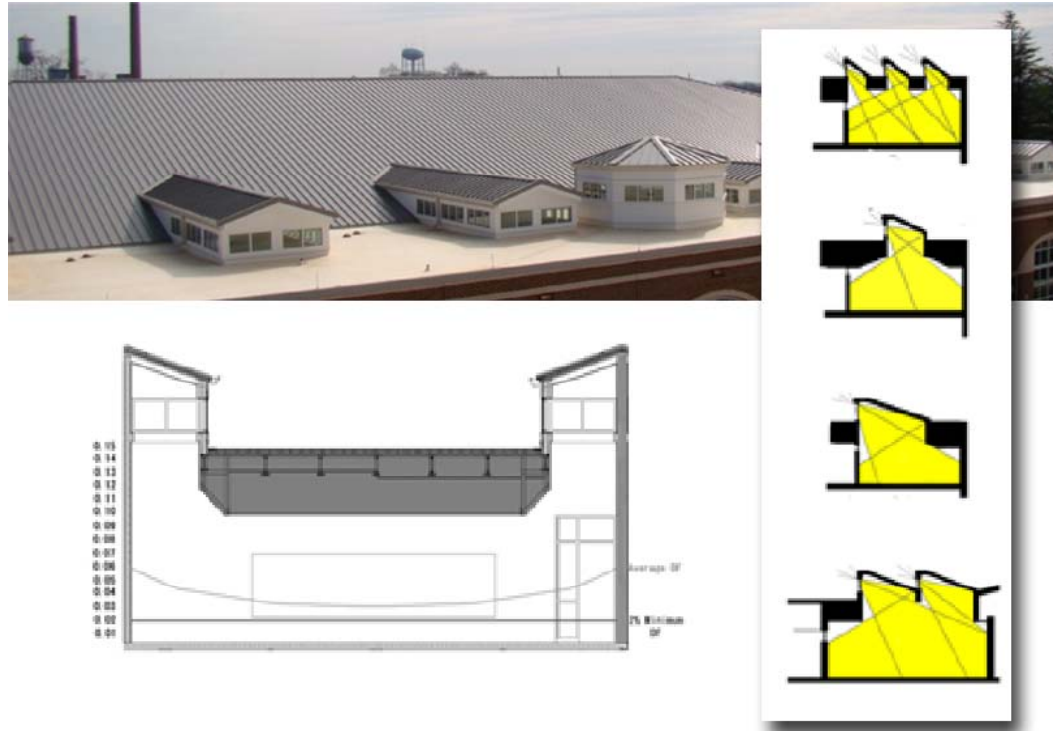


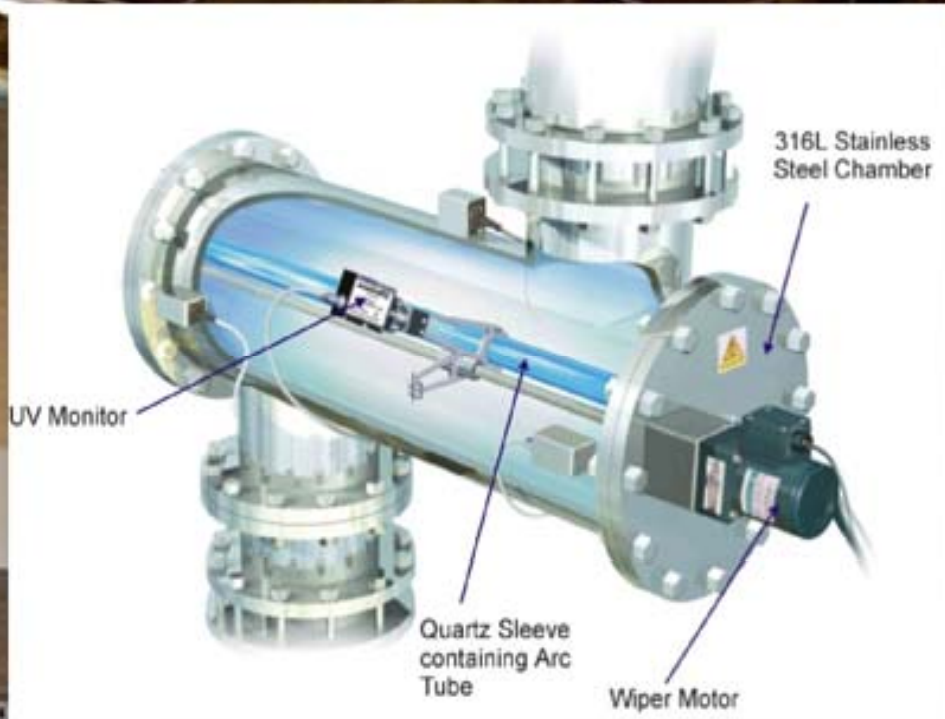
Base Case ▶



Adjusted by .613 ▶







air scour sand filtration
heat recovery for dehumidification
heat recovery for pool reheat



Moseley Architects

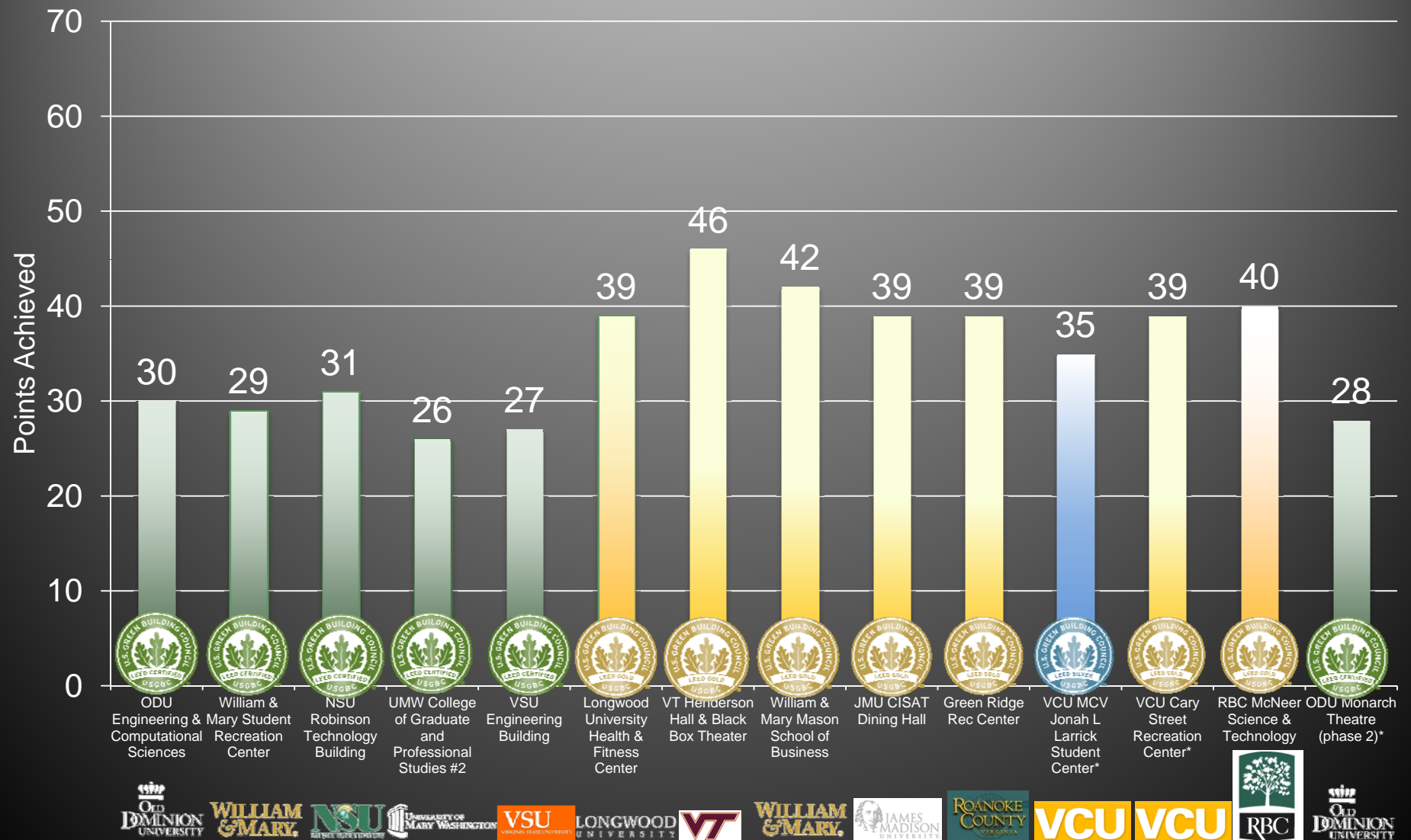
LEED Platinum Richmond Office



89 LEED Projects

Higher Ed LEED Certified Projects

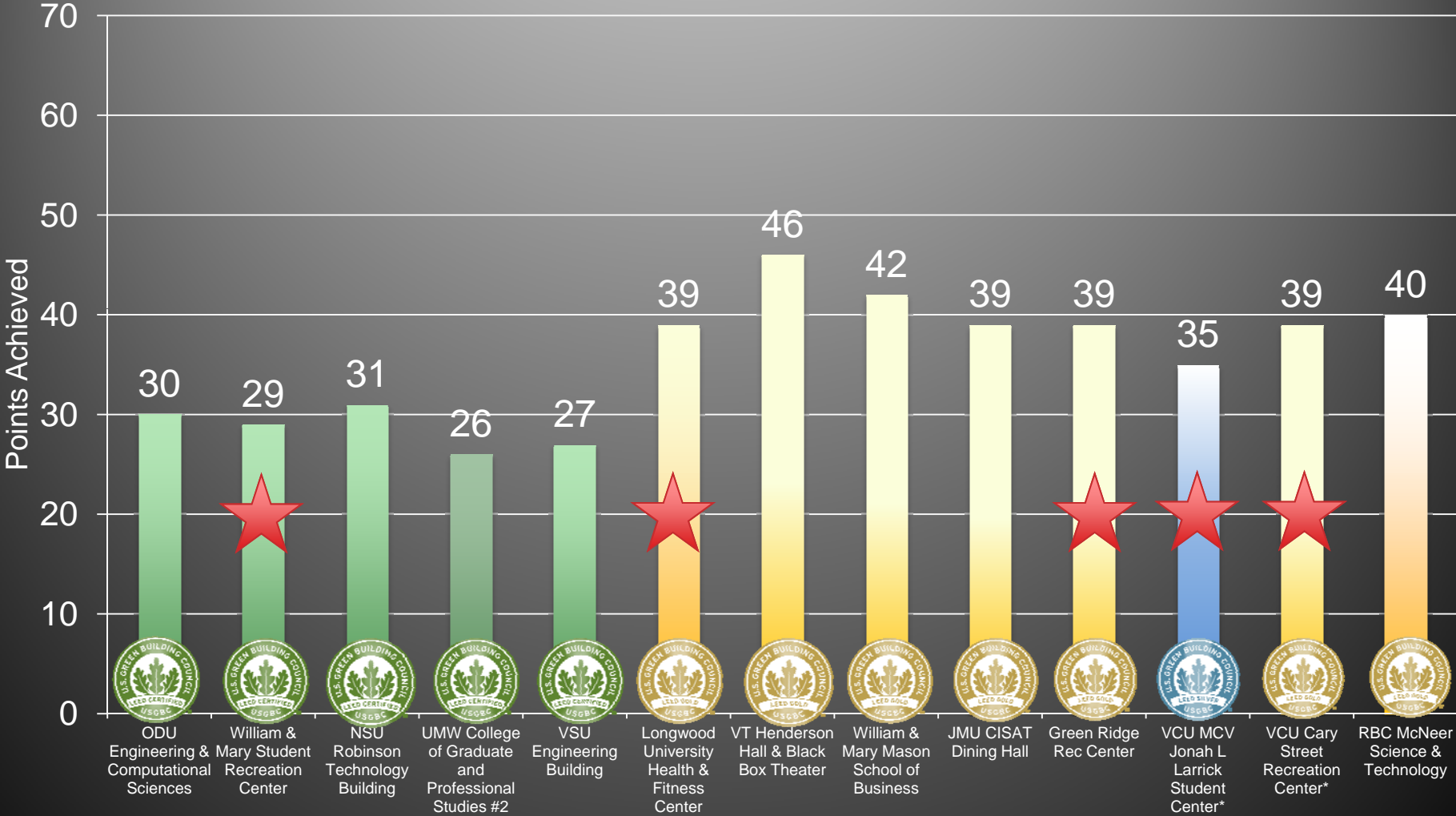
1st LEED Certified Building on Each Campus



*not first LEED certification on campus

LEED Experience

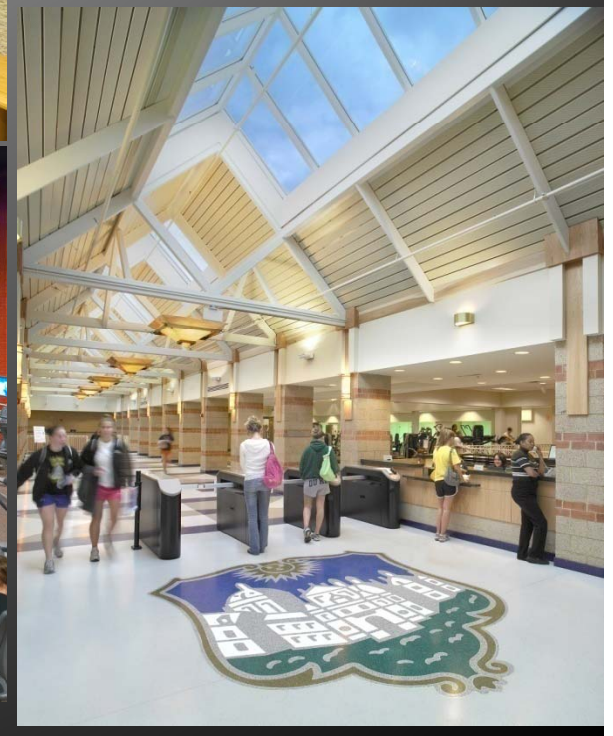
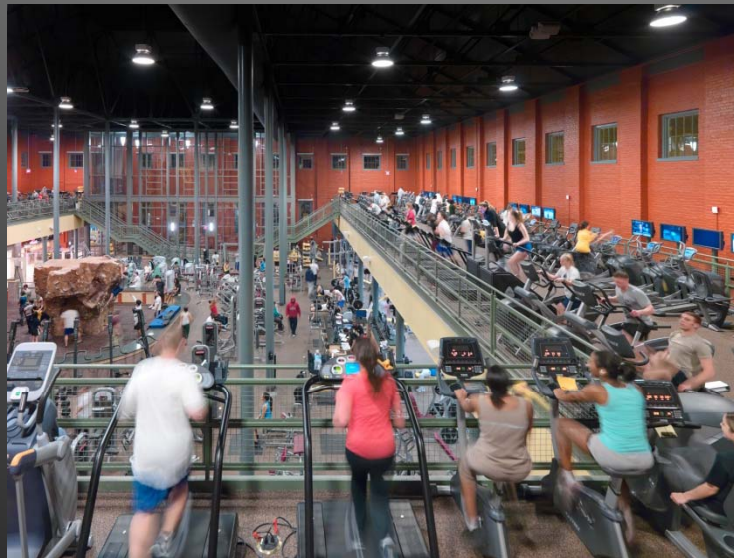
Collegiate Projects



Recreation Center Projects

Moseley Architects – 12 recreation projects

- Student Recreation Center, James Madison University
- Funkhouser Recreation Center, Bridgewater College
- Student Recreation Center, Old Dominion University
- Student Sports Recreation Center, College of William and Mary
- Fitness Center Marketplace, Virginia Commonwealth University
- Cary Street Recreation Center, Virginia Commonwealth University
- Student Recreation Center, Longwood University
- Student Recreation Center, Blue Ridge Community College
- Green Ridge Recreation Center, Roanoke County
- Base Recreation Center, Fort Monroe
- Bow Creek Recreation Center, Virginia Beach
- William Anderson Convocation & Recreation Center



Award Winning Architecture

Moseley Architects and Hastings+Chivetta



Longwood University Health & Fitness Center

Moseley Architects, with design consultant Hastings + Chivetta, recently completed the first LEED gold collegiate facility in Virginia, the Health & Fitness Center at Longwood University. The 73,000-square-foot center offers two basketball courts, a Multi-Athletic Court, an exercise area with the latest equipment, a climbing wall, two racquetball courts, three multipurpose rooms for aerobic activities, an elevated running track, a student recreation office suite, and a wellness/counseling office suite. The building is designed to serve as an inspiration for future green projects; educate the facility's users and campus

community; and provide a "healthier" recreation facility. The new facility creates a dramatic terminus at the end of a major pedestrian thoroughfare on campus, and utilizes an architectural style that recalls the historic tradition of the campus. The strategic use of glass exploits the advantages of natural daylighting, while providing spectacular views into the building from the campus and community. To ensure gold certification, the design team included water efficient technologies in the facility; an energy-efficient HVAC system; a carbon dioxide monitoring system to help provide adequate ventilation; and renewable energy provided by the campus central plant. Additionally,

the center was manufactured in a factory setting. "We are excited in such an important university," says principal of the firm of Moseley Architects, Richard B. Moseley. "It is only the beginning of responsible and accessible of the large

April 2008 /



Campus LEEDers

San Francisco operates a cogeneration plant, which converts natural gas into electricity. Cal State-Fullerton went a similar route by investing \$3.5 million in the construction of a stand-alone plant to serve the rec center and the neighboring student union. Supporting the union and the rec center through the cooling towers that serve the rest of the campus facilities would have overwhelmed cold water distribution systems designed to recharge during periods of non-peak visitors demand, says Kurt Boring, director of the Titan Student Union.

than building new ones, universities can own a piece in the materials and resources category. William and Mary reused 75 percent of the existing building, and by not tearing down the facility, it saved energy and contributed to the stabilization of the structure, Knight says. Moseley Architects, Virginia Beach, VA, designed the rec center for William and Mary. Jeff Hyle, project manager and architect for the company, says that the project involved the challenge of balancing energy efficiency with the energy required for air quality. In a rec center, it

provide services, universities, about energy our students different ways say. "They can sustainability run and the best." mg. Efficient at university, on the site design four levels of

Despite the additional time and initial cost of sustainable design, university administrators, partially inspired by their students, have made sustainability a priority. University presidents have signed the Climate Commitment, which had 152 signatories in June 2007 and 400 as of press time. By signing this commitment, the university presidents pledge to complete an emissions inventory within two years, set a target date and interim guidelines for becoming climate neutral, take immediate steps to reduce greenhouse gases, integrate

frictions and

AB Show Back to Orlando PAGE 38
In Transition Redefining Yoga PAGE 44
Shaky Ground Vibration Training PAGE 52

Club Industry's FITNESS business-pro

Management tools for health fitness facility owners

OCTOBER 2007

Green is the new school color at many universities. Education construction, which is valued at \$53 billion for 2007, is the fastest growing sector for green building, according to McGraw-Hill Construction. In the past seven years, more than 3,000 new buildings have registered for Leadership in Energy Efficient Design (LEED) certification, and the U.S. Green Building Council (USGBC), which awards LEED certification to 1,059 of those buildings. About 7 percent of those projects are for colleges and universities, according to the USGBC, a non-profit organization with 11,500 member organizations. The green campus trend, which includes sustainable design for student recre-

Campus LEEDers

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WWW.SCHOOLDESIGNS.COM

AMERICAN SCHOOL & UNIVERSITY

SHAPING FACILITIES & BUSINESS DECISIONS

COMMUNICATIONS/OFFICE SYSTEMS | 35TH ANNUAL CONSTRUCTION REPORT | ENERGY-EFFICIENT LIGHTING

MAY 2009

BUILT to LAST

Early sustainable-design strategies have fulfilled and exceeded proponents' expectations.

A PENTON MEDIA PUBLICATION

Energy Efficiency and Conservation judges' choice

Student Health & Wellness Center
Longwood University
Fayetteville, VA

Moseley Architects/Hastings + Chivetta Architects, Inc.

Project Information
Capacity (chairs): 2,271
Site (sq ft): 4,400
Value (\$): \$1,200 sq. ft.
FF/IE (sq ft): 82,78
Cost per sq ft: \$12 per sq ft
Total Project Cost: \$14,300 per sq ft (approx. 2007)

green design

LEED Gold certified Health & Fitness Center at Longwood University, Fayetteville, VA, now in its second year of operation, provides a green recreational experience for the University's faculty, staff, and students. The facility consolidates recreational spaces that were once dispersed across the campus and expands the University's health and wellness programs by offering new recreational opportunities.

Presenting a contemporary take on the campus' traditional architecture, the 73,000-sq-ft building features a combination of brick and stone with a glass curtain wall and simple windows that reduce the building's thermal mass with daylight. Efforts to improve the building's indoor air quality create healthier surroundings where students can breathe easy as they use the facility's multi-purpose and two-court gymnasiums, fitness center with climbing wall, exercise rooms, racquetball courts, and indoor track.

In a building with large, open interior spaces, energy efficiency can be a challenge. Energy recovery, more efficient roof and wall insulation, high-efficiency glazing, and demand-controlled ventilation are some of the strategies the design team employed to improve the building's energy efficiency. The energy model completed for the project showed that the facility is expected to use 43 percent less energy (by cost) than a standard facility of the same type and size.

VCU Cary Street Gymnasium




Award Winning Architecture

Cary Street Gymnasium Addition/Renovation, VCU

10 Awards since 2009

Mid-Atlantic Construction



Best Of 2010 - Projects of the Year

The VCU Cary Street Gymnasium in Richmond, Va., won the "Project of the Year" award in the Architectural Design category.

Photo courtesy Kjellstrom and Lee Construction

[View Related Story »](#)

[Image 1 of 17] NEXT >

Historic Building Works Out

This historic building gets an addition and learns to work out as a campus recreation and student fitness center

GRAND PRIZE
Monroe Park Recreation Center

CATEGORY: MODERNIZATION



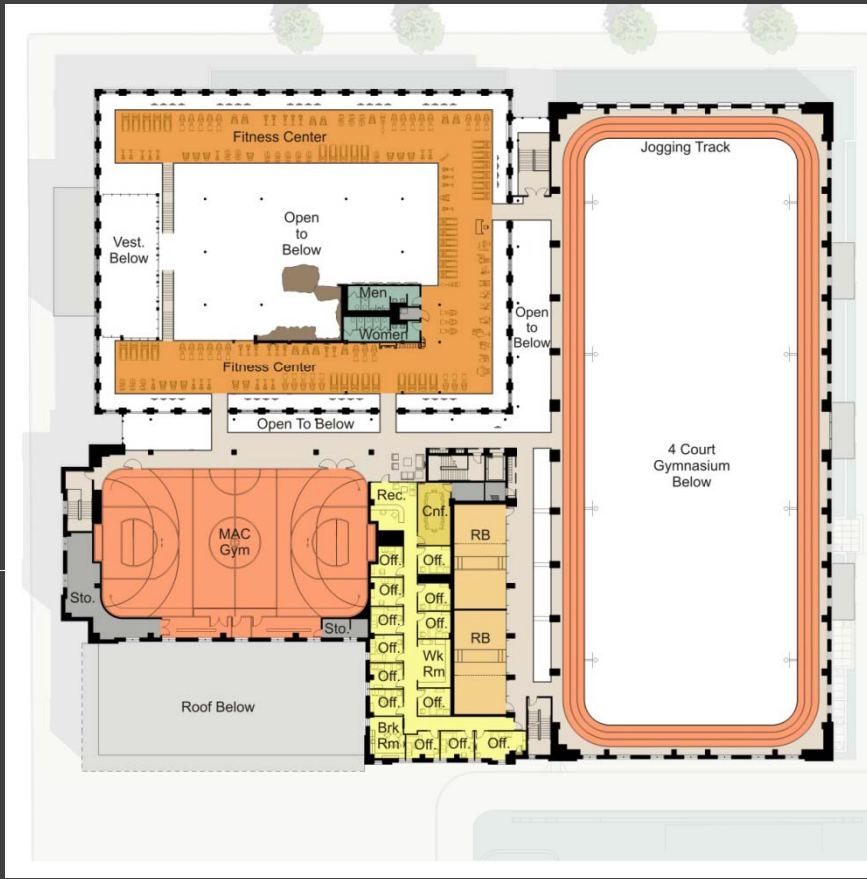

PROJECT TEAM

DESIGN: [unreadable]
CONSTRUCTION MANAGER: [unreadable]
ARCHITECTURAL RENDERING: [unreadable]
ARCHITECTURAL PHOTOGRAPHY: [unreadable]
LANDSCAPE ARCHITECTURE: [unreadable]
INTERIOR ARCHITECTURE: [unreadable]
MECHANICAL, ELECTRICAL AND PLUMBING ENGINEERING: [unreadable]


GRAND PRIZE

MONROE PARK

- Project of the Year, Architectural Category, *Mid-Atlantic Construction*, Best of 2010
- Featured in *Style Weekly*, "Miracle on Cary Street", March 31, 2010
- Innovation Grand Prize Modernization Winner, *Buildings* magazine, 2010
- Virginia Green Innovation Award, Virginia Sustainable Building Network, 2011
- **Innovative Architecture & Design Award, *Recreation Management* magazine, 2011**
- Green Building Leadership Award, James River Green Building Council, 2011
- GRACRE award, Best Institutional Building, 2011
- **Architectural Showcase, *Athletic Business*, 2011**
- Specialized Facility Citation, *American School & University Architectural Portfolio*, 2011
- **Outstanding Sports Facilities Award, NIRSA, 2012**



VCU Cary Street Gymnasium





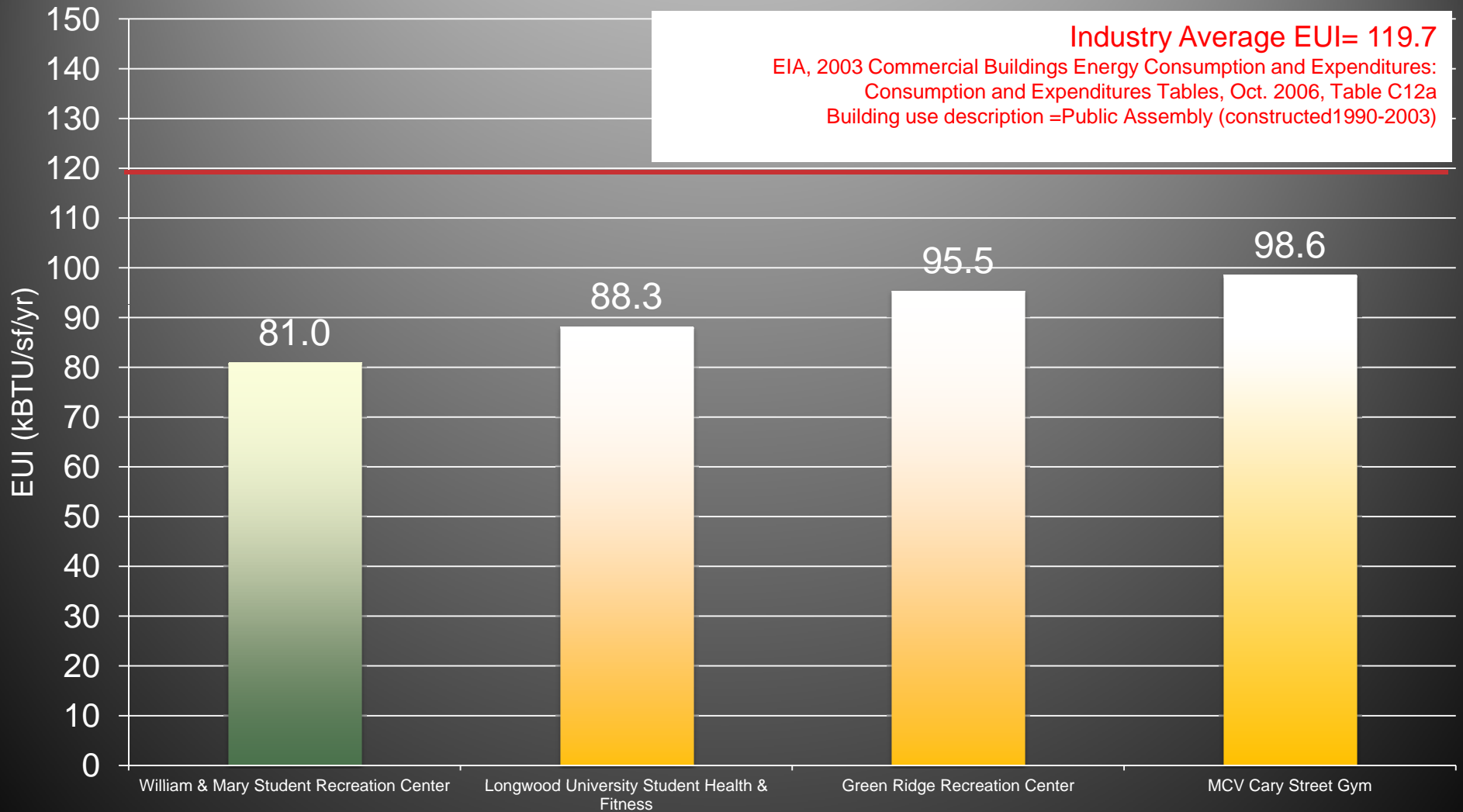

VCU Cary Street Gymnasium



VCU Cary Street
Gymnasium

Moseley Architects' LEED Recreation Projects

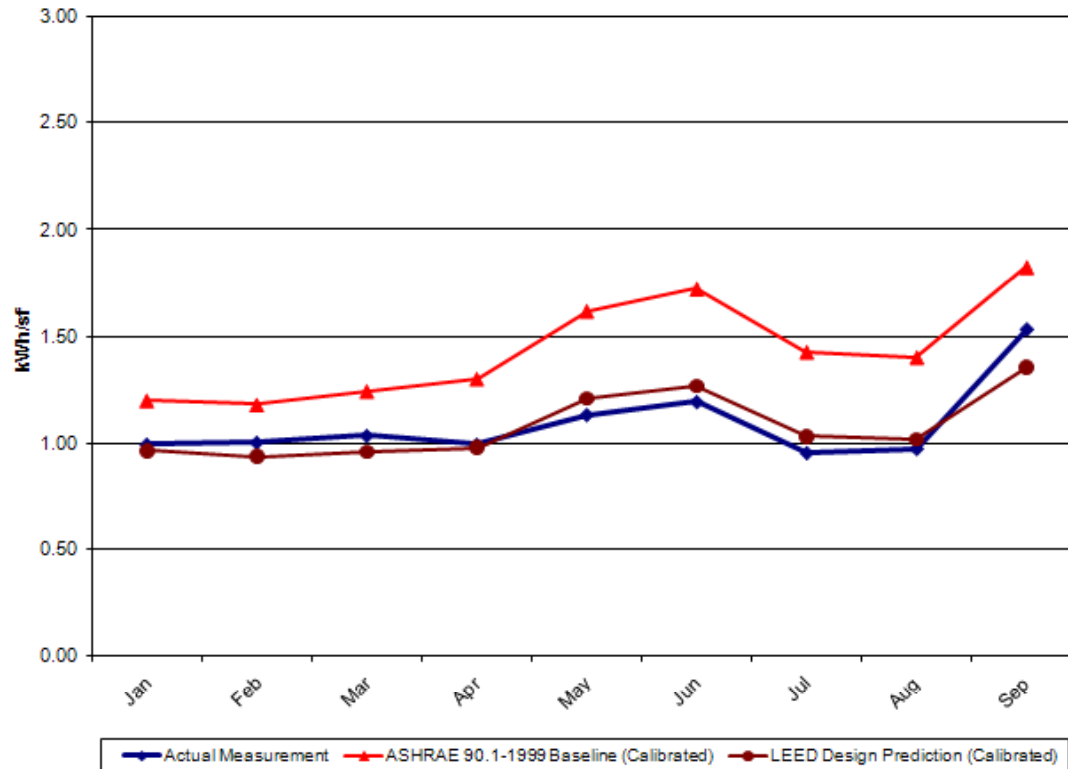
Actual Site Energy Usage Intensity (Site EUI)



Longwood Recreation Center

1st LEED Certified Gold Recreation Center in the Southeast

LONGWOOD HEALTH AND FITNESS
ENERGY PERFORMANCE (kWh per sf)



Electricity savings from upgrades to:

- Ventilation
- Cooling
- Lights
- Plug Loads

Savings are also accruing for:

- Heating
- Hot water

LEED Points

39

Energy Points

10

D+C Cost

\$14.3M

LEED Premium

\$120k

Annual Savings

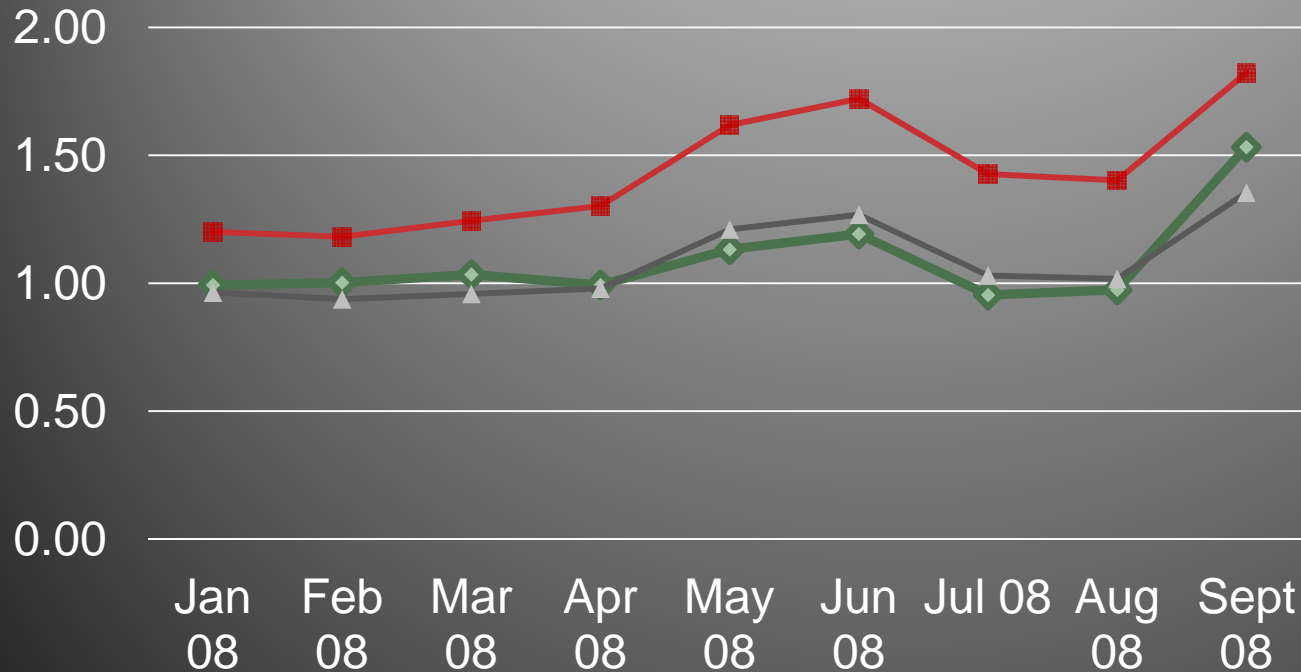
\$42.5k

Payback

2.8 yrs

Student Health & Fitness Center

Energy Performance (kWh/sf)



Savings calculated for electricity only:

- Ventilation
- Cooling
- Lights
- Plug Loads

Savings are also accruing for:

- Heating
- Hot water

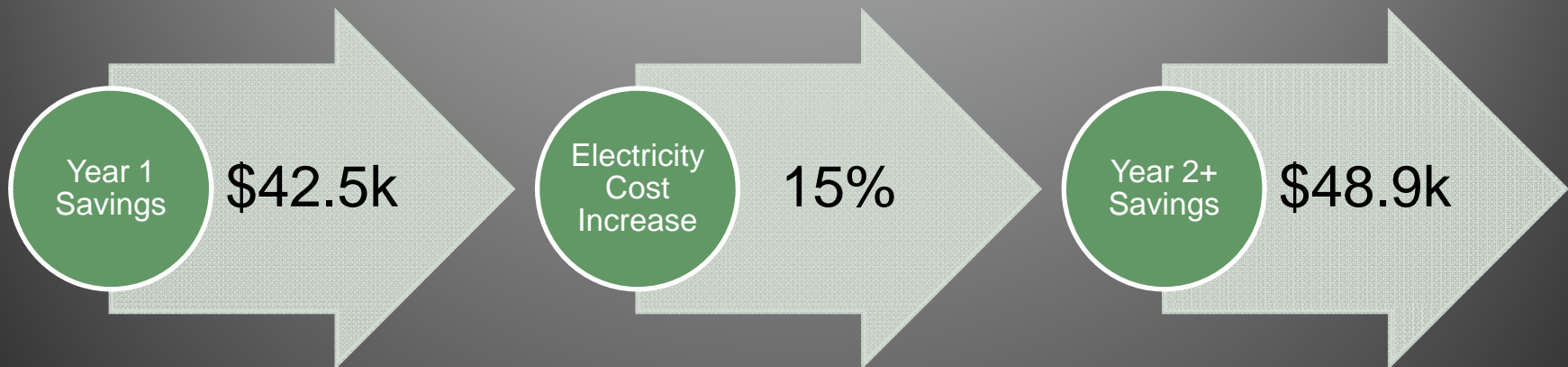
◆ Actual Performance ■ ASHRAE 90.1-1999 Base (calibrated) ▲ LEED Design (calibrated)

LEED Points	Energy Points	D+C Cost	LEED Premium	Annual Savings	Payback
39	10	\$14.3M	\$65.7k	\$42.5k	1.5 yrs

Longwood Health & Wellness Center

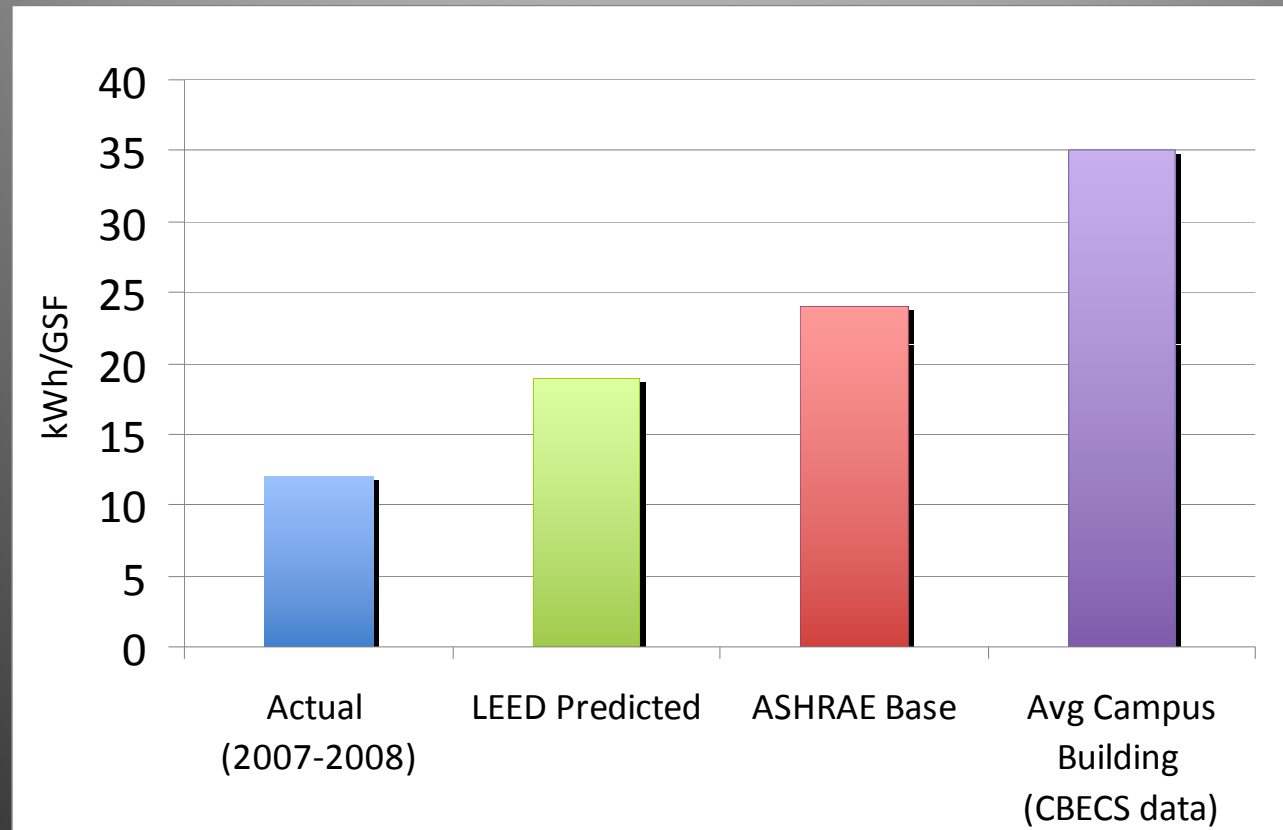
Tracking Energy Performance

Electricity Savings



LEED Points	Energy Points	D+C Cost	LEED Premium	Annual Savings	Payback
39	10	\$14.3M	\$158k	\$42.5k	3.7 yrs

Student Health & Fitness Center



LEED Points

39

Energy Points

10

D+C Cost

\$14.3M

LEED Premium

\$65.7k

Annual Savings

\$42.5k

Payback

1.5 yrs

Integrated Design

Process

Kickoff

- Include LEED workshop
- Identify high performance features that are important

Preliminary Design

- Regular LEED checks with design team
- Preliminary energy model

Construction Documents

- Finalize LEED design-phase documentation
- Finalize energy model

Construction

- Submit design-phase LEED application
- Regular LEED checks with contractor

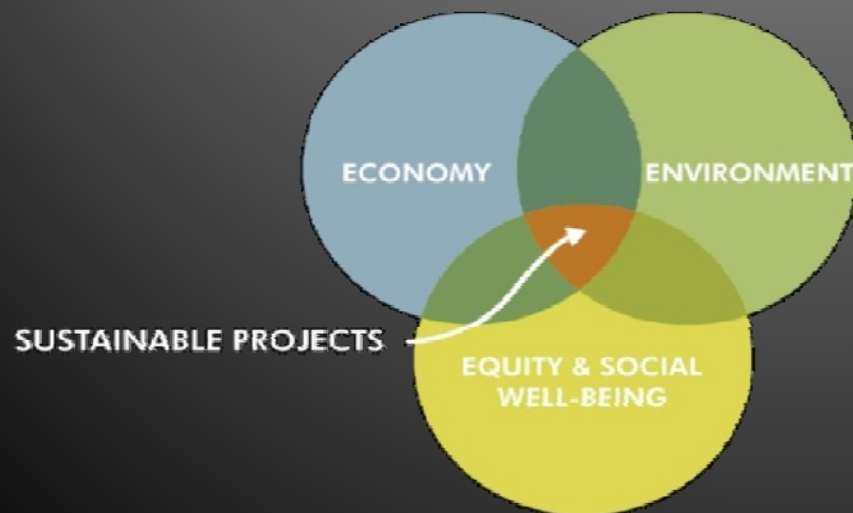
Occupancy

- Submit construction phase LEED application
- Obtain certification

Sustainability

Forward Thinking

- ✓ Architecture that teaches
 - Measurement & verification
 - Dashboard
- ✓ Sustainable design
 - Reduce waste
 - Conservation
 - Carbon neutrality



On-site Renewable Energy

Wind: Site or Building Integrated



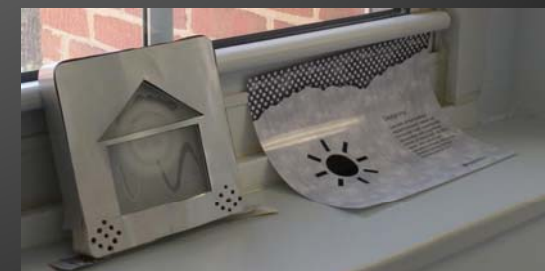
Daylighting

Tubular Devices or Fiber Optics



Monitoring Energy Performance

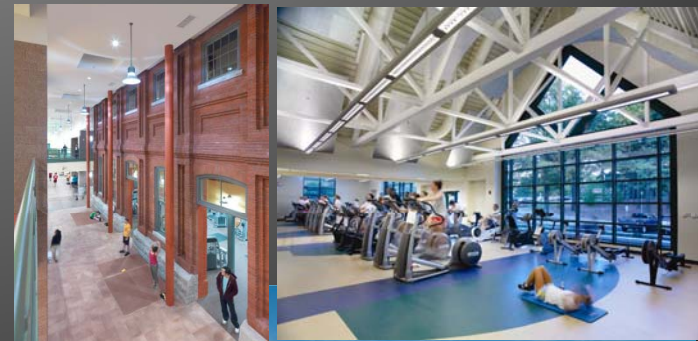
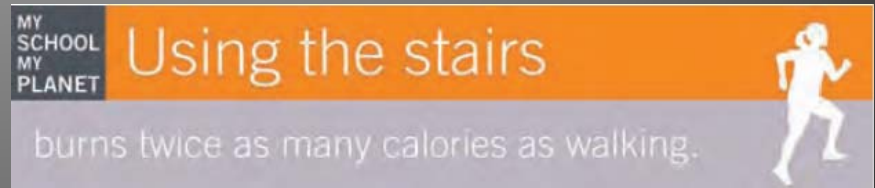
UREC as a Teaching Tool



Technology by Lucid Design Group

ACTIVE DESIGN

1. Facilitate bicycling for recreation and transportation.
2. Increase stair use.
3. Support exercise.
4. Promote pedestrian-friendly urban environment.





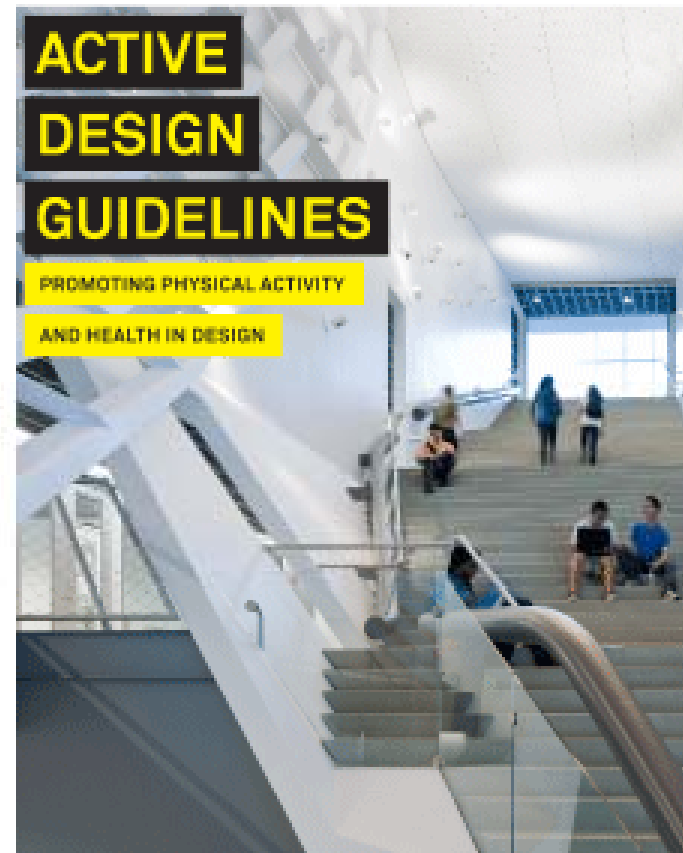
NEW YORK CITY DEPARTMENT OF
DESIGN + CONSTRUCTION

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Design
Active Design Guidelines



CENTER
FOR **ACTIVE**
DESIGN

PROMOTING HEALTH THROUGH DESIGN

Active design is critical to addressing obesity and its related diseases—the fastest growing epidemics of our time, while also supporting the goal of sustainability.

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The Center for Active Design



LEED



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LEED™ is an internationally recognized green building program.

It provides building owners and operators with a framework for identifying and implementing practical and measurable green building design, construction, operations and maintenance solutions.

www.USGBC.org



DIRECTORY

Organizations People **Projects**



New Construction v2.1

Lois Rhame West PE Center



Alumni Drive
Rock Hill, SC 29733
United States
[Map](#)

803-323-2281

Overview Scorecard Stories

LEED Scorecard

Silver 33/69

▶ SUSTAINABLE SITES	2 OF 14	
▶ WATER EFFICIENCY	3 OF 5	
▶ ENERGY & ATMOSPHERE	9 OF 17	
▶ MATERIAL & RESOURCES	3 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	11 OF 15	
▶ INNOVATION	5 OF 5	

DOWNLOAD SCORECARD

LEED Facts

for New Construction (v2.1)

Certification awarded Apr 2009

Silver	33
Sustainable sites	2/14
Water efficiency	3/5
Energy & atmosphere	9/17
Material & resources	3/13
Indoor environmental quality	11/15
Innovation	5/5

ENERGY & ATMOSPHERE

9 OF 17




EAc1	Optimize energy performance	8 / 10
EAc2.1	Renewable energy - 5%	0 / 1
EAc2.2	Renewable energy - 10%	0 / 1
EAc2.3	Renewable energy - 20%	0 / 1
EAc3	Additional commissioning	0 / 1

INDOOR ENVIRONMENTAL QUALITY

11 OF 15




EQc1	Carbon dioxide (CO2) monitoring	1 / 1
EQc2	Ventilation effectiveness	0 / 1
EQc3.1	Construction IAQ management plan - during construction	1 / 1
EQc3.2	Construction IAQ management plan - after construction	1 / 1
EQc4.1	Low-emitting materials - adhesives and sealants	1 / 1
EQc4.2	Low-emitting materials - paints and coatings	0 / 1
EQc4.3	Low-emitting materials - carpet	1 / 1
EQc4.4	Low-emitting materials - composite wood	1 / 1
EQc5	Indoor chemical and pollutant source control	1 / 1
EQc6.1	Controllability of systems - perimeter spaces	0 / 1
EQc6.2	Controllability of systems - non-perimeter spaces	0 / 1
EQc7.1	Thermal comfort - compliance with ASHRAE 55-1992	1 / 1
EQc7.2	Thermal comfort - permanent monitoring system	1 / 1
EQc8.1	Daylight and views - daylight 75% of spaces	1 / 1
EQc8.2	Daylight and views - daylight 90% of spaces	1 / 1




New Construction v2.2
Green Ridge Recreation Center

LEED GOLD 2010



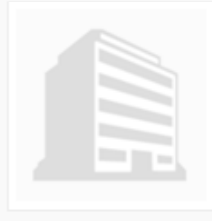
New Construction v2.1
Longwood University Health & Fitness Ctr

LEED GOLD 2008



New Construction v2.2
James Madison University Athletic Fields

LEED SILVER 2013



New Construction v2.2
VCU Cary Street Gym

911 West Cary St.
Richmond, VA 23220
United States
[Map](#)







804-828-0391

LEED GOLD 2011

Overview
Overview
Overview
Overview

LEED Scorecard
Overview
Scorecard
Stories

- ▶ SUSTAINABLE SITES
- ▶ WATER EFFICIENCY
- ▶ ENERGY & ATMOSPHERE
- ▶ MATERIAL & RESOURCES
- ▶ INDOOR ENVIRONMENTAL QUALITY
- ▶ INNOVATION

LEED Scorecard		Gold 39/69
▶ SUSTAINABLE SITES	7 OF 14	
▶ WATER EFFICIENCY	4 OF 5	
▶ ENERGY & ATMOSPHERE	6 OF 17	
▶ MATERIAL & RESOURCES	7 OF 13	
▶ INDOOR ENVIRONMENTAL QUALITY	10 OF 15	
▶ INNOVATION	5 OF 5	

DOWNLOAD SCORECARD

LEED Facts
for New Construction (v2.2)

Certification awarded Jan 2011

Gold	39
Sustainable sites	7/14
Water efficiency	4/5
Energy & atmosphere	6/17
Material & resources	7/13
Indoor environmental quality	10/15
Innovation	5/5



MOSELEYARCHITECTS

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- NEWS/EVENTS
- SELECTED PROJECTS
- SUSTAINABLE DESIGN**
- ON THE BOARDS
- CAREERS
- CLIENT ACCESS

With a long history of proven LEED success, our portfolio consists of:

Registered: 53

Certified: 47

LEED Certified

LEED Platinum Certification

Moseley Architects' Headquarters
Richmond, VA
[Click here for additional information](#)

LEED Gold Certification



Cary Street Recreation Center Addition and Renovations
Virginia Commonwealth University
[Click here for additional information](#)



Student Health & Wellness Center
Longwood University
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Green Ridge Recreation Center
Roanoke County, VA
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LEED Silver Certification

James Madison University Athletic Field
James Madison University
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VCU-MCV Recreation Addition and Renovation
Virginia Commonwealth University
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Student Sports Recreation Center
College Of William And Mary
[Click here for additional information](#)

LEED Registered

Higher Education

BRCC - Construct Student Recreation Center
Blue Ridge Community College, VA
[Click here for additional information](#)

JMU - University Recreation? UREC Addition?
James Madison University/
[Click here for additional information](#)

Richmond Downtown YMCA
Metro Richmond YMCA
[Click here for additional information](#)

Longwood University

Health and Wellness Center



“For the past two years, the Longwood University Sustainable Committee has focused on “meeting the needs of the present without compromising the ability of future generations to meet their own needs”. The newly LEED gold certified Health & Fitness Center is proof that achieving this goal is possible”.

**Dr. Patricia Cormier,
President**

questions?





FINAL CONSTRUCTION COST

Final Estimate		\$18,291,145	
Awarded Bid		\$18,592,000	+1.6%

Final Cost(+COs)		\$19,513,920	+3%
Site Package		\$ 3,396,387	
<u>Total</u>		<u>\$22,910,307</u>	

FINAL COST PER SQUARE FOOT

137500 gsf

Building Only		\$142
Building + Site		\$166

TOTAL PROJECT COST

*includes FFE, testing, design fees

\$28,000,000

**85% student fees*