

USGBC and LEED Intro

NASA Recycling & Affirmative Procurement/P2 Workshop

March 20, 2007

(statistics are from Oct 2006)

Presented by:

Michael J. Hess PE, LEED AP

Past President of the USGBC Central Florida

Florida & Caribbean USGBC Representative

U.S. Green Building Council - National Board of Directors

GreenTime – Managing Member

GRG Inc. – Sustainable Development Group Leader



What is the USGBC?

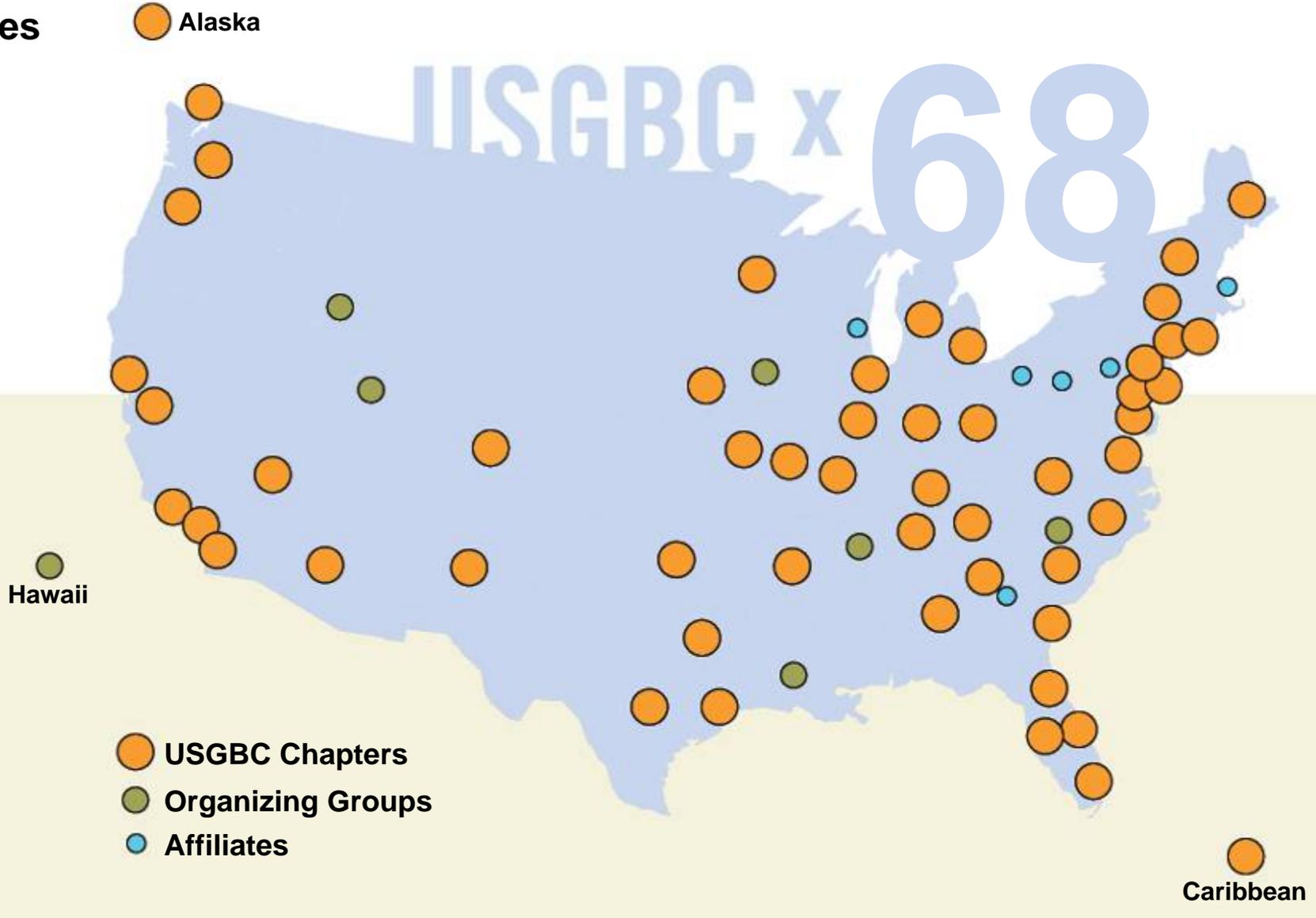
USGBC is a coalition of the country's foremost leaders from across the building industry. We promote buildings that are:

- 1. Environmentally Responsible**
- 2. Economically Profitable**
- 3. Healthy Places to Live and Work**



USGBC Chapters, Organizing Groups, & Affiliates

As of 04/06



What is green building?

Design and construction practices that meet specified standards, resolving much of the negative impact of buildings on their occupants and on the environment.



PERCEPTION

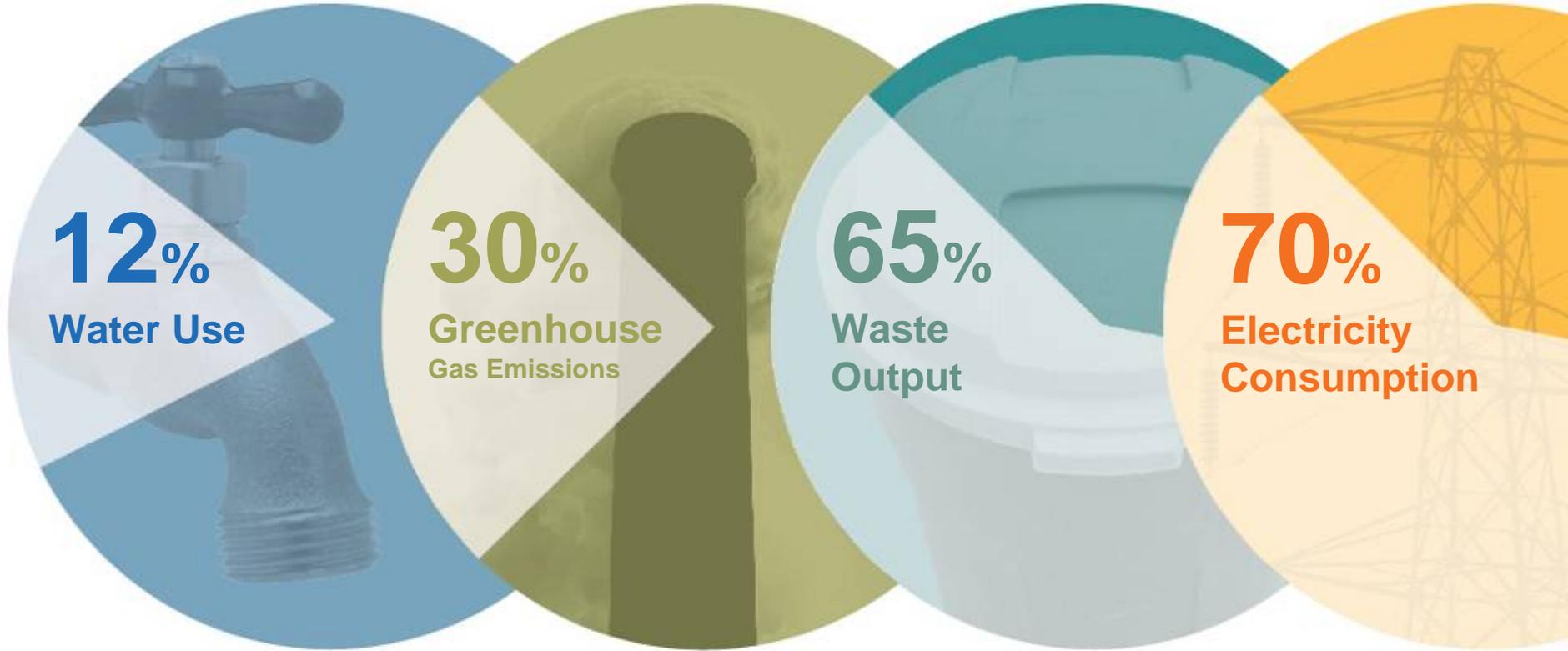


REALITY

Bank of America Tower
at One Bryant Park
The Durst Organization
Cook+Fox Architects
New York NY
LEED-NC Registered:
Platinum Certification go



U.S. Building Impacts:



immediate

&

measurable



What is the LEED System?

LEADERSHIP in ENERGY and ENVIRONMENTAL DESIGN

A leading-edge system for certifying DESIGN, CONSTRUCTION, & OPERATIONS of the greenest buildings in the world

Scores are tallied for different aspects of efficiency and design in appropriate categories.

For instance, LEED assesses in detail:

1. Site Planning
2. Water Management
3. Energy Management
4. Material Use
5. Indoor Environmental Air Quality
6. Innovation & Design Process

Green Facts	
John M. Langston High School Continuation & Langston-Brown Community Center Arlington, Virginia	
LEED-NC rating out of	69
Silver	
Sustainable Site	8
Water Efficiency	3
Energy & Atmosphere	4
Materials & Resources	6
Indoor Environmental Quality	11
Innovation & Design	3
USGBC LEED-NC rated Sept. 3, 2003.	



Sustainable Sites

Erosion and Sedimentation Control

Age of Building

Green Site and Building Exterior Management

High Development Density Building and Area Alternative Transportation

Reduced Site Disturbance

Stormwater Management

Heat Island Reduction

Light Pollution Reduction



Sustainable Sites

Efficient Water Use

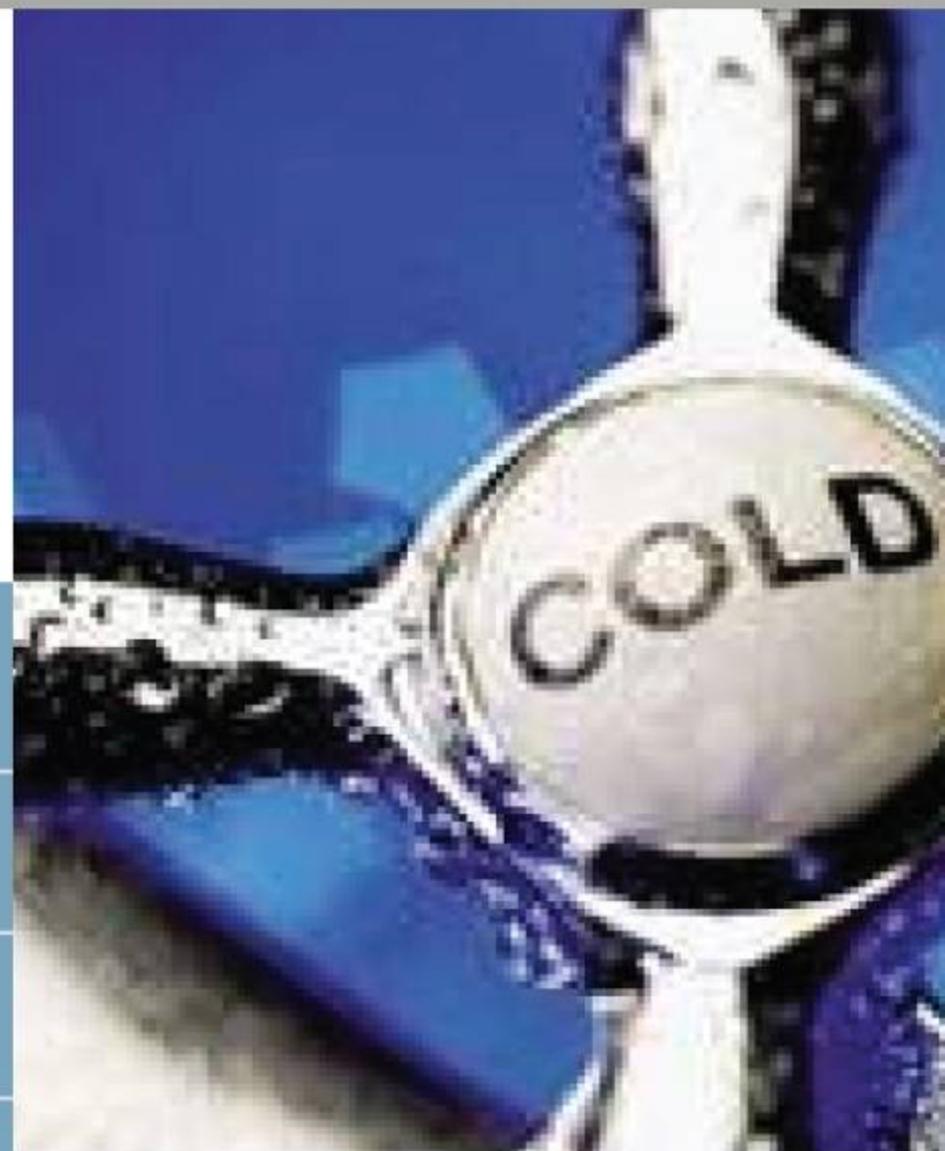
Minimum Water Efficiency

Discharge Water Compliance

Water Efficient Landscaping

Innovative Wastewater Technologies

Water Use Reduction



**Sustainable
Sites**

**Efficient
Water Use**

**Energy &
Atmosphere**

**Existing Building
Commissioning**

**Minimum Energy
Performance**

Ozone Protection

**Optimize Energy
Performance**

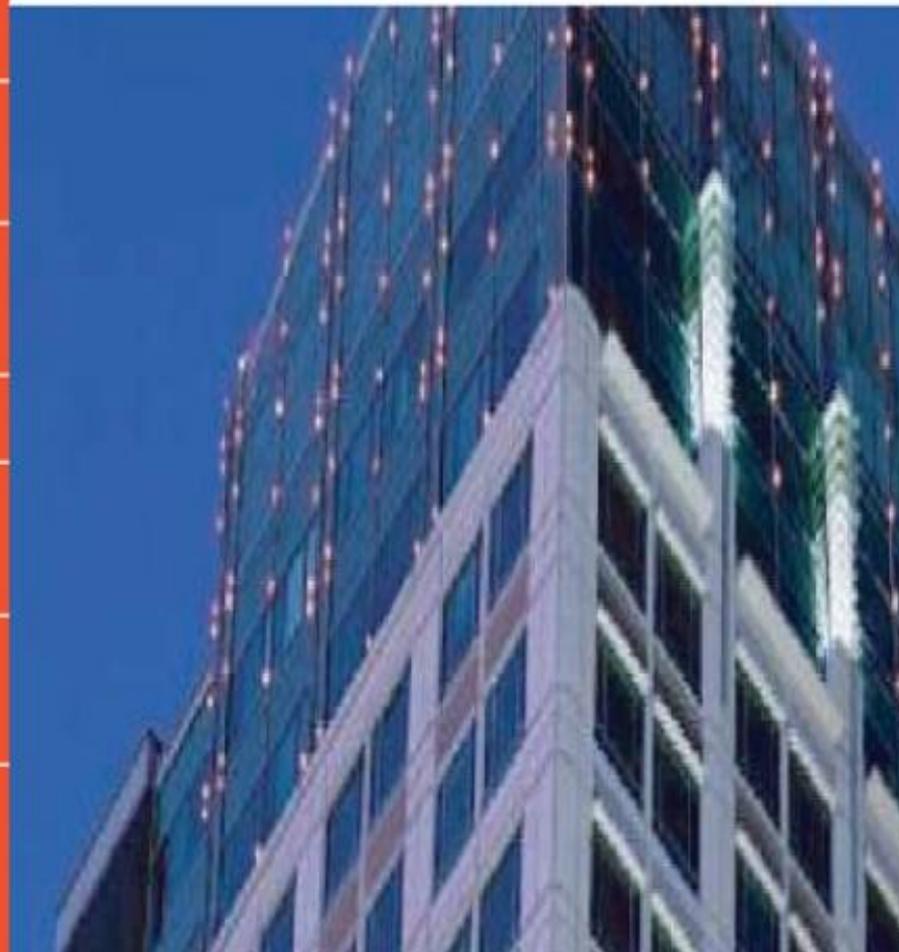
**On/Off Site
Renewable Energy**

Building O&M

**Additional Ozone
Protection**

**Performance
Measurement**

**Documenting
Cost Impacts**



Sustainable Sites
Efficient Water Use
Energy & Atmosphere
Materials & Resources

Source Reduction & Waste Management

Toxic Material Source Reduction

Construction Waste Management

Optimized Use of Alternative Materials

Optimized Use of IAQ Compliant Products

Sustainable Cleaning Products

Occupant Recycling

Additional Toxic Material Source Reduction

Recycled Content



**Sustainable
Sites**

**Efficient
Water Use**

**Energy &
Atmosphere**

**Materials &
Resources**

**Indoor
Environmental
Quality**



Outside Air Exhaust

Tobacco Smoke Control

Asbestos/PCB Removal

**Outdoor Air
Delivery Monitoring**

**Increased Ventilation
Construction**

IAQ Management Plan

**Documenting
Productivity Impacts**

**Indoor Chemical &
Pollutant Source Control**

Controllability of Systems

Thermal Comfort

Daylighting & Views

Contemporary IAQ Practice

Green Cleaning



Categories of LEED Ratings

LEED for New Construction

LEED for Commercial Interiors

LEED for Existing Buildings

LEED for Core & Shell

NEW PROGRAMS

LEED for Homes

LEED for Neighborhood Development

LEED for Schools

Healthcare
Laboratories
Retail
Multi-building Campuses
Multi-family Residential



Levels of LEED Ratings

**Green Buildings
worldwide are certified
with a voluntary,
consensus-based
rating system.
USGBC has four
levels of LEED.**

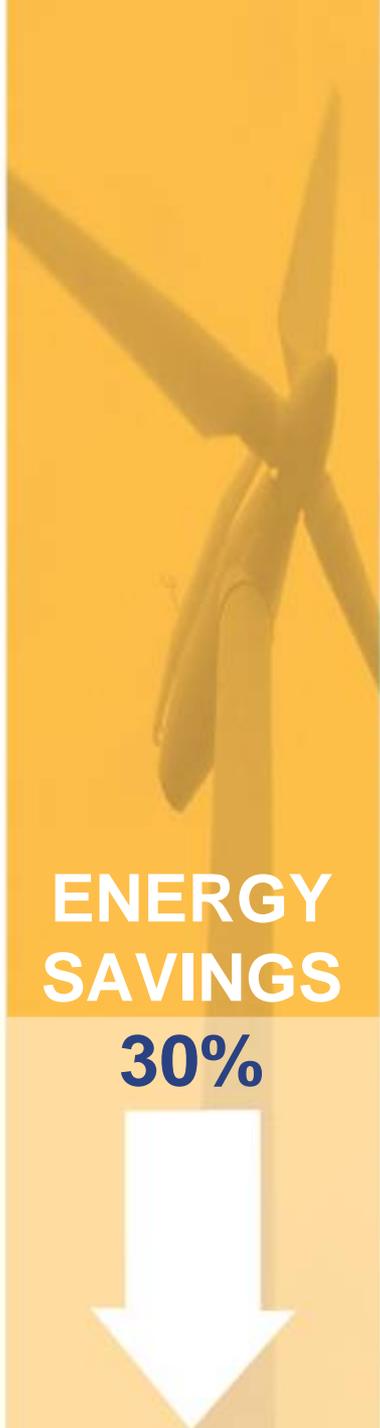


immediate

& measurable



Average Savings of Green Buildings



Source:
Capital E

Increased Productivity.

SCHOOLS

IMPROVED TEST PERFORMANCE

HOSPITALS

EARLIER DISCHARGE

RETAIL

INCREASE IN SALES PER SQUARE FOOT

FACTORIES

INCREASED PRODUCTION

OFFICES

2-16% PRODUCTIVITY INCREASE

 **Increase
in LEED
Projects
in three
years.**

2002:
More than
80 million
square feet.

2003:
More than
141 million
square feet.

2004:
More than
180 million
square feet.

2005:
500 million
square feet.

2006 (thru Oct):
519 million
square feet.



**LEED Projects
total 5,000 in
2006**

610
**LEED Certified
Projects**

4,500+
LEED Registered Projects



LEED ADOPTIONS

8 Countries
16 States
46 Cities
33 Schools
9 Federal Agencies





**“Nobody should ever
build buildings again in
America that don’t meet
LEED standards.”**





THE RATIONALE

Green roof at
Ford Rouge
Ford Motor Comp
Dearborn MI
LEED-NC Gold



33 Diverse Buildings

Built over the last **10** years

Cost construction premiums of **1.8%**



5 = \$0

Five buildings had no cost increase at all.

EPA Science and
Technology Center
Kansas EPA
Kansas City KS
LEED-NC Gold



**Results of the
California
Study:
Average
Bottom Line
Savings**

**GREEN IMPROVEMENTS PAY FOR
THEMSELVES IN 3 YEARS**

(ANNUAL RETURN ON INVESTMENT IS 25-40%)



The William and
Flora Hewlett
Foundation
Menlo Park CA
LEED Gold

Additional constructions costs for LEED-certified buildings

Average for offices and schools, based on 40 buildings

Conventional Building Cost (100%)

Additional Cost

PLATINUM

(2 buildings)

6.8%

GOLD

(9 buildings)

2.2%

SILVER

(21 buildings)

1.9%

CERTIFIED

(8 buildings)

.66%



**Case Study
KSC Visitor's
Complex
Commissary**

**Warehouse/
Office
6,000 sq ft**

**Under review
for LEED
Silver**

**35%
Energy Savings**

Low/minimal cost:

- ✓ Reflective Roof
- ✓ High Efficiency T5HO Lighting
- ✓ High Efficiency DX Condensing Unit
- ✓ External shading

High cost:

- ✓ 6 KW Photovoltaic array



**Case Study
KSC Visitor's
Complex
Commissary**

**Warehouse/
Office
6,000 sq ft**

**Under review
for LEED
Silver**

**40%
Water Savings
Inside Building**

Low/minimal cost:

- ✓ Dual flush toilet
- ✓ Waterless urinal
- ✓ Low flow metered lavatories
- ✓ Low flow shower

**100%
Water Savings
Outside Building
(No Irrigation)**



Case Study KSC Visitor's Complex Commissary

Warehouse/
Office
6,000 sq ft

Under review
for LEED
Silver

Improved Indoor Air Quality (IAQ)

Low/minimal cost:

- ✓ Carbon Dioxide Alarm
- ✓ High Humidity Alarm
- ✓ Protected ductwork during construction
- ✓ Low emitting materials
- ✓ MERV 13 filters
- ✓ Operable windows
- ✓ Daylight & Views



Case Study KSC Visitor's Complex Commissary

Warehouse/
Office
6,000 sq ft

Under review
for LEED
Silver

Material & Resource Efficient

Low/minimal cost:

- ✓ XXX% of construction waste diverted from landfill
- ✓ XXX% of materials were recycled content
- ✓ XXX% of materials were from local/regional sources
- ✓ Certified wood doors



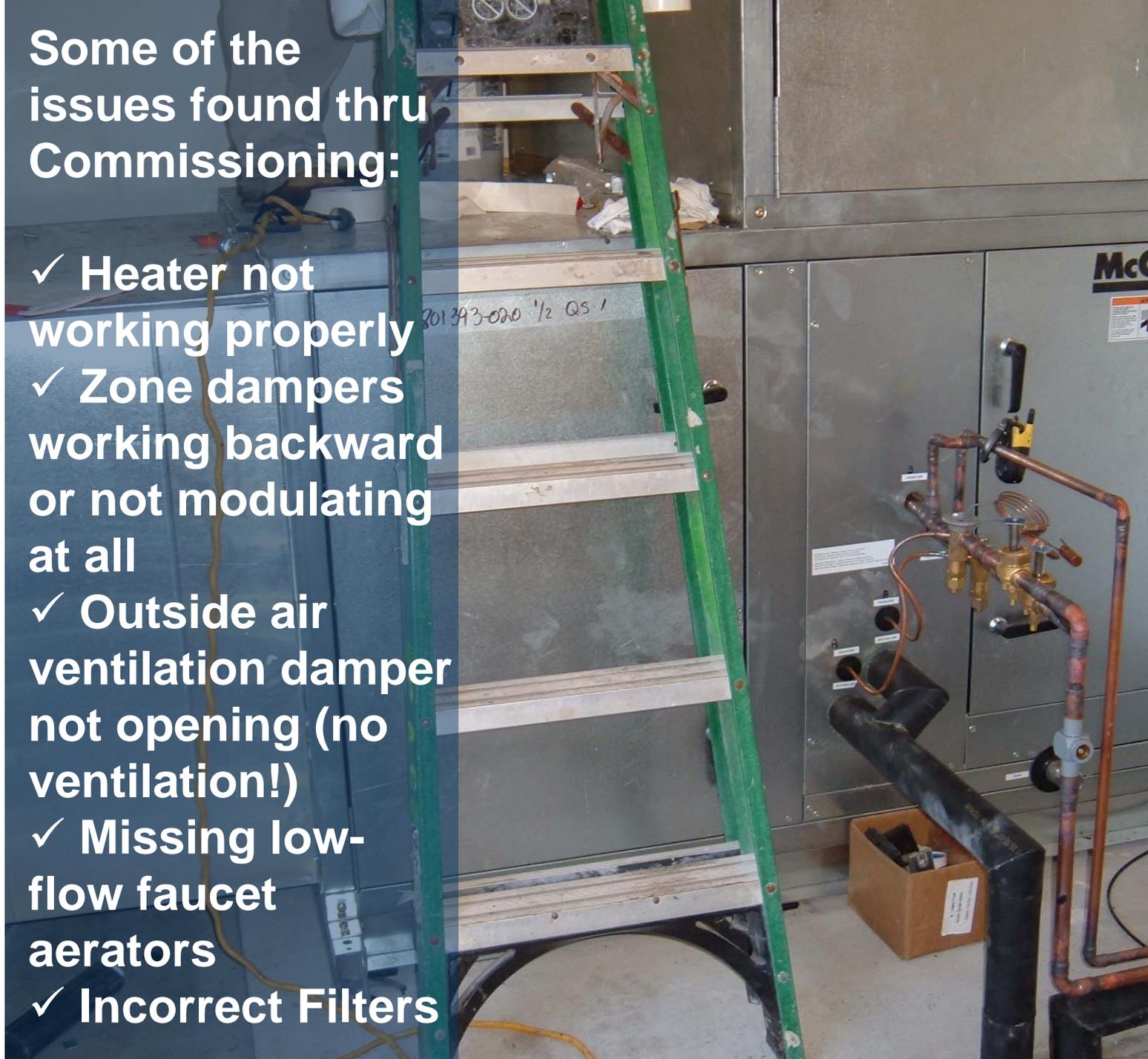
Case Study KSC Visitor's Complex Commissary

Warehouse/
Office
6,000 sq ft

Under review
for LEED
Silver

Some of the
issues found thru
Commissioning:

- ✓ Heater not working properly
- ✓ Zone dampers working backward or not modulating at all
- ✓ Outside air ventilation damper not opening (no ventilation!)
- ✓ Missing low-flow faucet aerators
- ✓ Incorrect Filters



Case Study KSC Life Support Facility

Workshop/
Office
22,000 sq ft

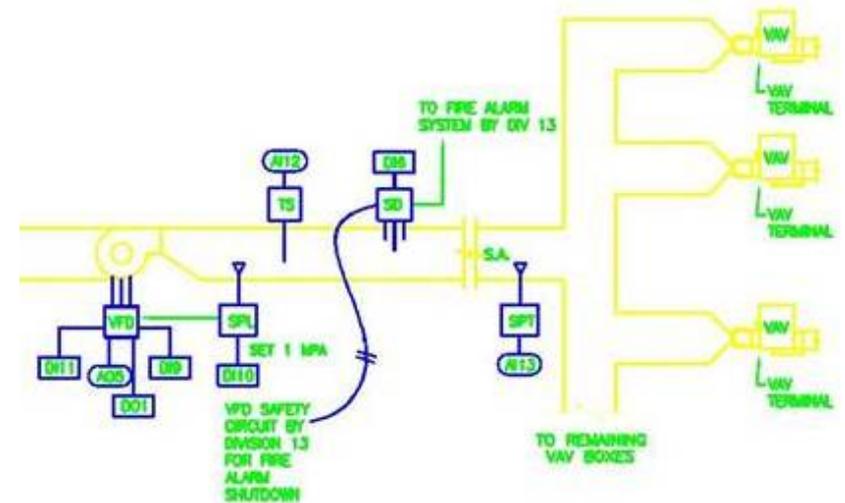
Designed for
LEED
Certification

23%

Energy Savings

Low/minimal cost:

- ✓ High Efficiency T8 Lighting
- ✓ Additional insulation
- ✓ High efficiency glazing
- ✓ Variable Frequency Drives (VFD's) for fans
- ✓ High efficiency gas water heater
- ✓ High efficiency boiler for heating



Case Study KSC Life Support Facility

Workshop/
Office
22,000 sq ft

Designed for
LEED
Certification

Protecting the Atmosphere

Low/minimal cost:

- ✓ Purchasing 100% green power to offset energy usage and carbon emissions (0.5 cents per KWH!)
- ✓ Refrigerants with low ozone depletion and low global warming potential



Case Study
KSC Life
Support
Facility

**Workshop/
Office**
22,000 sq ft

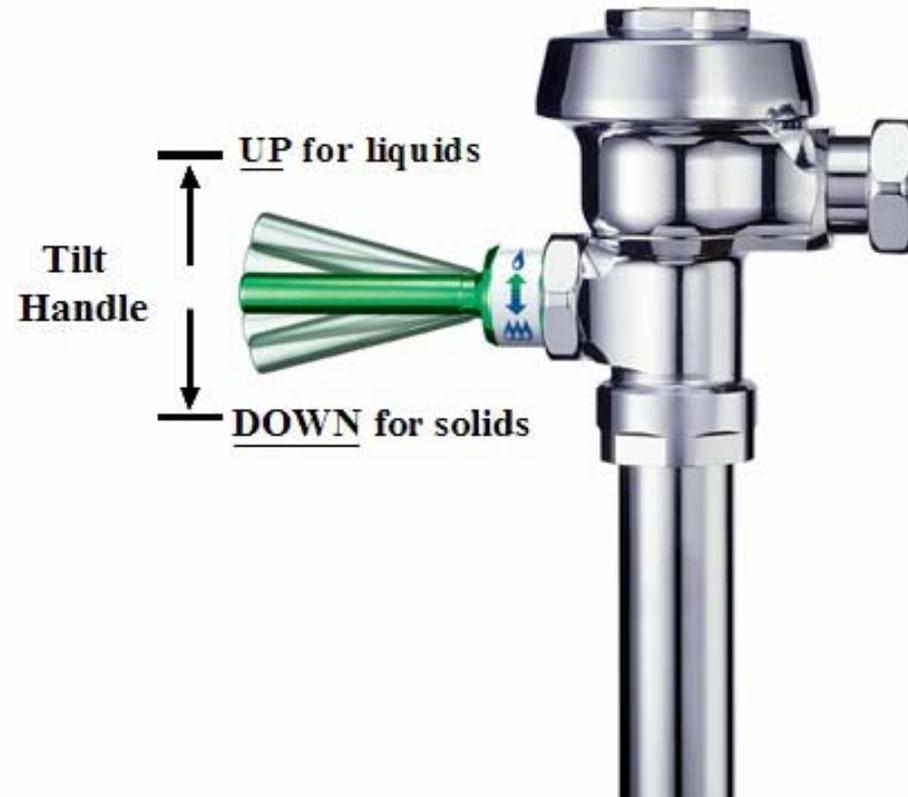
Designed for
LEED
Certification

40%
Water Savings
Inside Building

Low/minimal cost:

- ✓ **Dual flush toilets**
- ✓ **Waterless urinals**
- ✓ **Low flow sensor lavatories**

100%
Water Savings
Outside Building
(No Irrigation)



Case Study
KSC Life
Support
Facility

Workshop/
Office
22,000 sq ft

Designed for
LEED
Certification

**Material &
Resource Efficient**

✓ Specified
materials
w/recycled
content, certified
wood

Sustainable Site

✓ Using existing
wildlife preserve
as a “LEED land
bank”



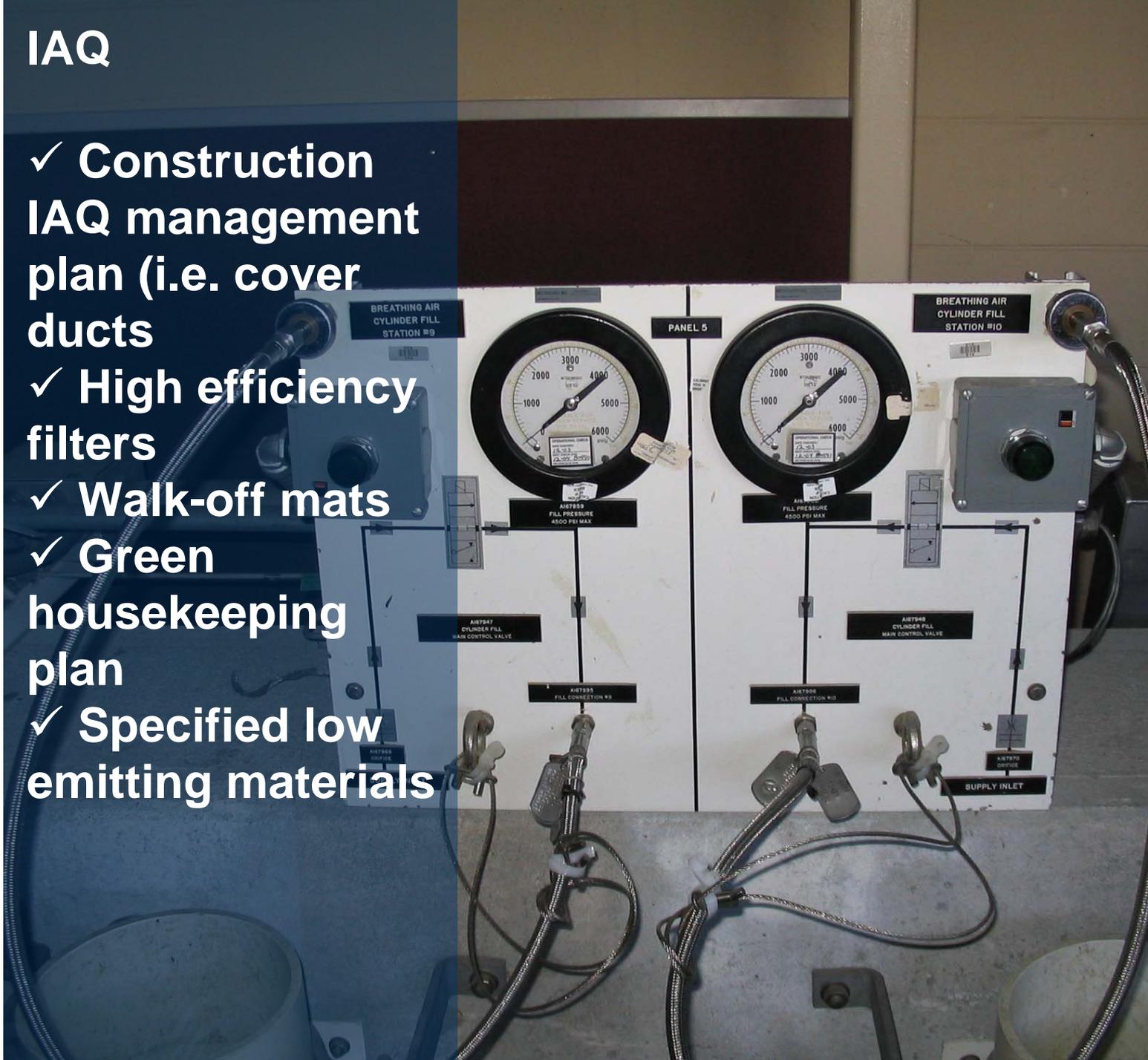
Case Study
KSC Life
Support
Facility

**Workshop/
Office**
22,000 sq ft

Designed for
LEED
Certification

IAQ

- ✓ **Construction IAQ management plan (i.e. cover ducts)**
- ✓ **High efficiency filters**
- ✓ **Walk-off mats**
- ✓ **Green housekeeping plan**
- ✓ **Specified low emitting materials**



Tips for a Successful LEED Process

- Find a knowledgeable LEED Administrator
 - “LEED Accredited Professional” designation does not always equal LEED knowledge!
 - Experience on a Certified project or a go getter (has read the Reference Guide, CIR’s, etc.)
 - Tracks LEED points
 - Sets up project on LEED Online
 - Helps with LEED specifications, calculations, etc.



LEED®-NC Checklist Worksheet

NASA Life Support Facility
February 7, 2007

		Pts Avail	Yes	Probable	Maybe	Not prbl'e	No	Documentation Responsibility	Remarks/ Tasks
Credit 5.1	Reduced Site Disturbance, Protect or Restore Open Space						1		
	On greenfield sites, limit site disturbance including earthwork and clearing of vegetation to 40 feet beyond the building perimeter, 5 feet beyond primary roadway curbs, walkways, and main utility branch trenches, and 25 feet beyond constructed areas with permeable surfaces (such as pervious paving areas, stormwater detention facilities and playing fields) that require additional staging areas in order to limit compaction in the paved area OR, on previously developed sites, restore a minimum of 50% of the site area (excluding the building footprint) by replacing impervious surfaces with native or adapted vegetation.	1					1		
Credit 5.2	Reduced Site Disturbance, Development Footprint		1					Krista Schaffer	Krista is working to set this up. NASA needs to change master documents to show LEED land bank. Is in progress.
	Reduce the development footprint (defined as entire building footprint, access roads and parking) to exceed the local zoning's open space requirement for the site by 25%. For areas with no local zoning requirements (e.g., some university campuses and military bases), designate open space area adjacent to the building that is equal to the building footprint.	1	1						
Credit 6.1	Stormwater Management, Rate and Quantity		1					Krista Schaffer	Stormwater off site. The LEED boundary will include a portion of master stormwater pond. Calcs have been done for LEED boundary.
	If existing imperviousness is less than or equal to 50%, implement a stormwater management plan that prevents the post-development 1.5 year, 24 hour peak discharge rate from exceeding the pre-development 1.5 year, 24 hour peak discharge rate OR, if existing imperviousness is greater than 50%, implement a stormwater management plan that results in a 25% decrease in the rate and quantity of stormwater runoff.	1	1						
Credit 6.2	Stormwater Management, Treatment		1					Krista Schaffer	Stormwater off site. The LEED boundary will include a portion of master stormwater pond. Calcs have been done for LEED boundary.
	Construct site water stormwater treatment systems designed to remove 80% of the average annual post-development total suspended solids (TSS) and 40% of the average annual post-development total phosphorous (TP) based on the average annual loadings from all storms less than or equal to the 2-year/24-hour storm.	1	1						

Tips for a Successful LEED Process

- Use a design & construction team with LEED knowledge and the right attitude
- Take advantage of “LEED Design Review”
- Perform LEED calculations early in design instead of guessing
- Take advantage of streamlined LEED Online

INDOOR ENVIRONMENTAL OCCUPANCY (CREDIT 3.2)

CLAIM OF CREDIT STATUS

Displays status information and

Attempted On:
Credit Status:
Assigned Team Role:

CREDIT TEMPLATE

Displays information on credit

Template Status:
Manage Template:

Required Documents:

Documentation Status:

OPTION 1

(HVAC Engineer, Contractor or Responsible Party)

I, [REDACTED], declare to USGBC that a minimum two-week building flush-out was conducted with new Minimum Efficiency Reporting Value (MERV) 13 filtration media at 100% outside air. The filtration media after flush-out has been replaced with new MERV 13 filtration media, except the filters solely processing outside air.

I have provided the following supplementary documentation to support the documentation:

a description of the building flush out procedures.

Flush-out start date: [REDACTED]

Flush-out end date: [REDACTED]

OPTION 2

(HVAC Engineer or Responsible Party)

I, [REDACTED], declare to USGBC that the referenced standard's IAQ testing protocol has been followed and I have attached a copy of the testing results.

Project Name: COLONIAL 9TH GRADE CTR BUILDIN

Credit: EQ Credit 3.2 (1 Point): Construction IAQ Management Plan, Before Occupancy Points Documented: 0

READY TO SAVE THIS TEMPLATE TO LEED-ONLINE? Please enter your first name, last name and today's date below, followed by your LEED-Online Username and Password Associated with the Project listed above to confirm submission of this template.

Michael Hess [REDACTED] MIKE@GREENTIMELLC.COM [REDACTED]
First Name Last Name Date Username (Email Address) Password

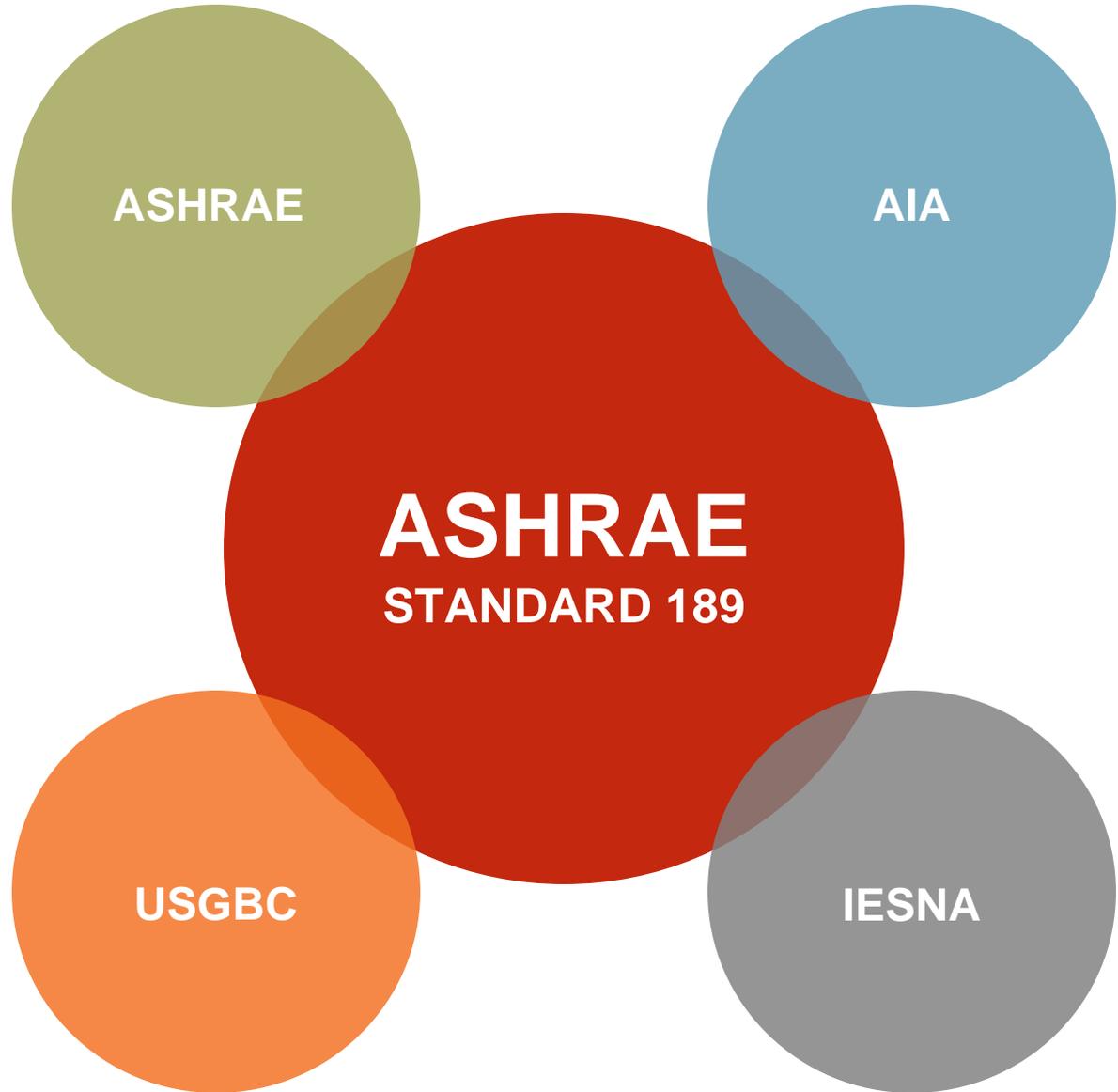
SIGN APPLICATION

Occupancy [REDACTED]

tion.

Standard 189

A new minimum green building standard that will serve as a baseline for sustainable building and potentially be incorporated into building code.



Taking LEED to the Next Level

Bio-regionally Weighted Credits

LCA as Basis for LEED Credits

Smart Credits

Improved Accounting for:

Energy

Ecological Sites

Transport Implications

IEQ

Health



The Market

