Fire Safety Design
&
Sustainable Buildings

LEED CERTIFICATION

November 08, 2012

Co-organized by

National Fire Protection Association

Fire Protection Research Foundation

Co-Sponsored by

Center for Tall Buildings and Urban Habitat

AIA Chicago and Illinois

Society of Fire Protection Engineers

Chicago Highrise Committee

George K. Tuhowski III

LEED AP BD+C

USGBC Illinois BOD | Heartland Sr. Rep

General Superintendent | Director of Sustainability

Leopardo

CONSTRUCTION DESIGN - BUILD DEVELOPMENT

LEED CERTIFICATION

U.S. GREEN BUILDING COUNCIL CHAPTER ILLINOIS CELEBRATING 10 YEARS

NFPA

Leadership in Energy and Environmental Design

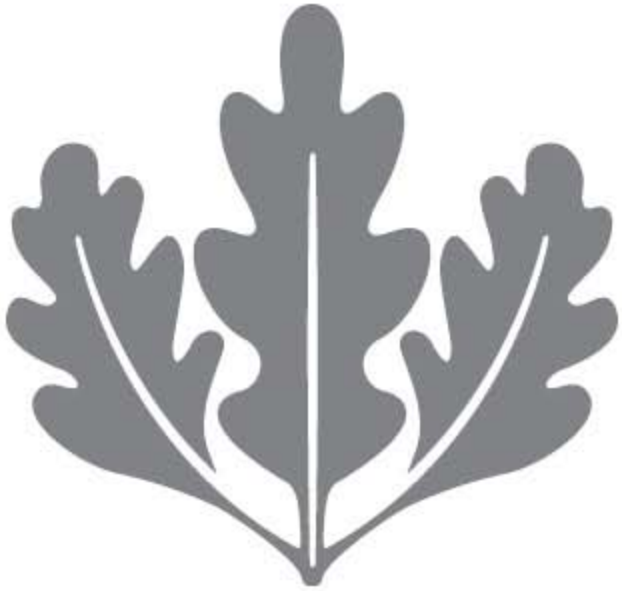
A leading-edge system for certifying the greenest performing buildings in the world

LEED vs. Leeds

U.S. GREEN BUILDING COUNCIL

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

- Environmentally Responsible
- Economically Profitable
- Healthy Places to Construct, Live and Work



MISSION

Buildings and communities will regenerate and sustain the health and vitality of all life within a generation.

VISION

To transform the way buildings and communities are designed, built and operated, enabling an environmentally and socially responsible, healthy and prosperous environment that improves the quality of life.

LEED Green Building Rating Systems

NEW CONSTRUCTION AND MAJOR RENOVATIONS

SCHOOLS

COMMERCIAL INTERIORS

NEIGHBORHOOD DEVELOPMENT

RETAIL

HEALTHCARE

HOMES

CORE AND SHELL DEVELOPMENT

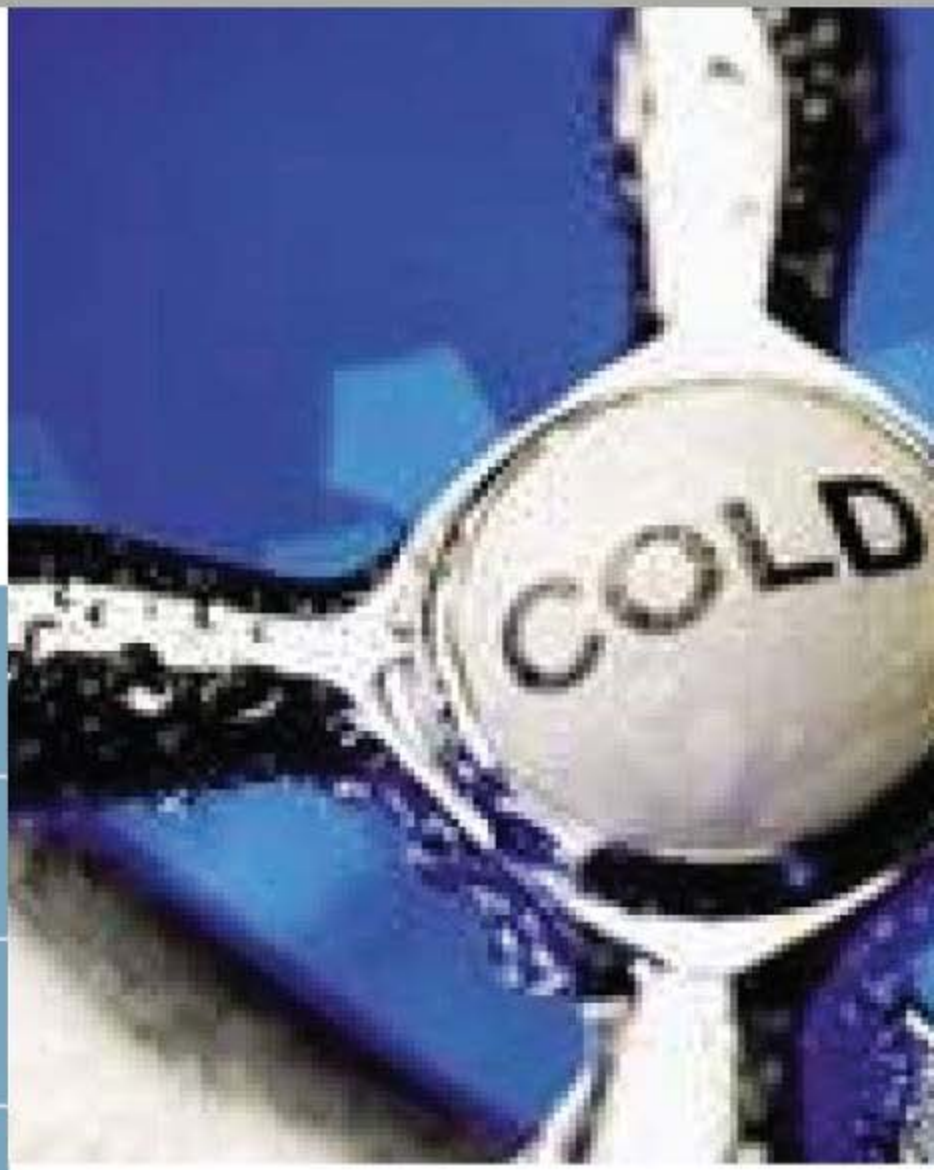
EXISTING BUILDINGS OPERATIONS AND MAINTENANCE

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



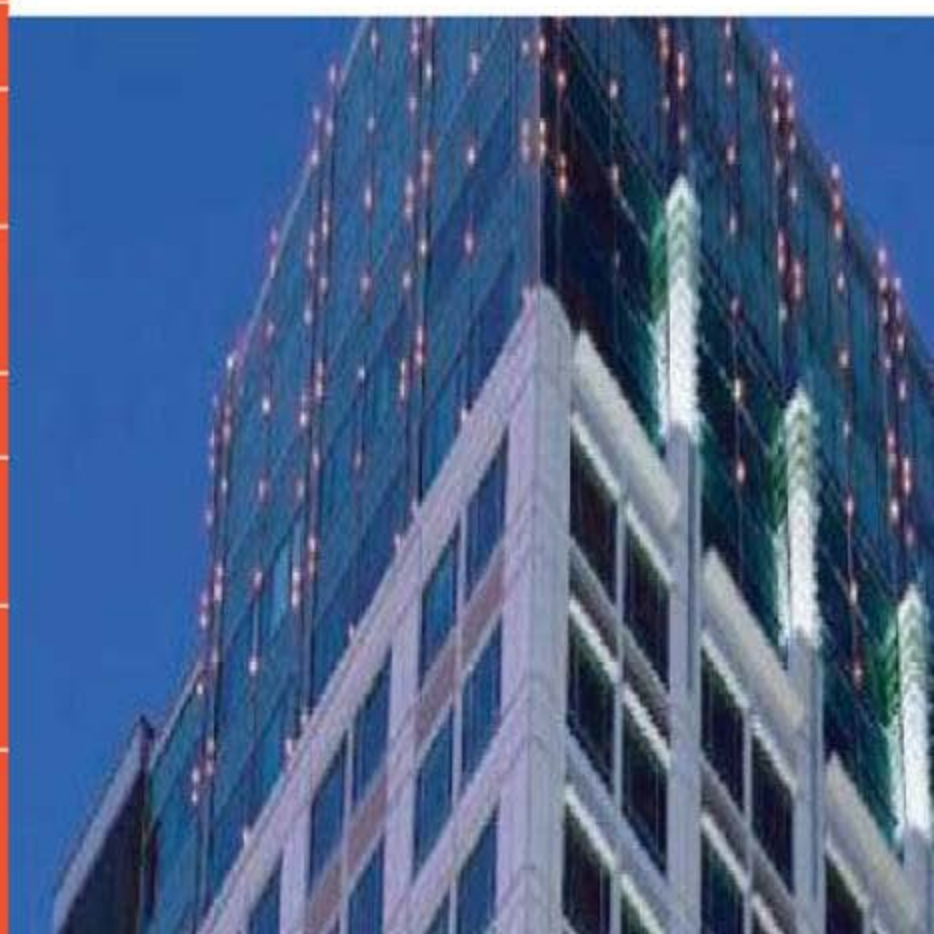
- Minimum Water Efficiency
- Discharge Water Compliance
- Water Efficient Landscaping
- Innovative Wastewater Technologies
- Water Use Reduction

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

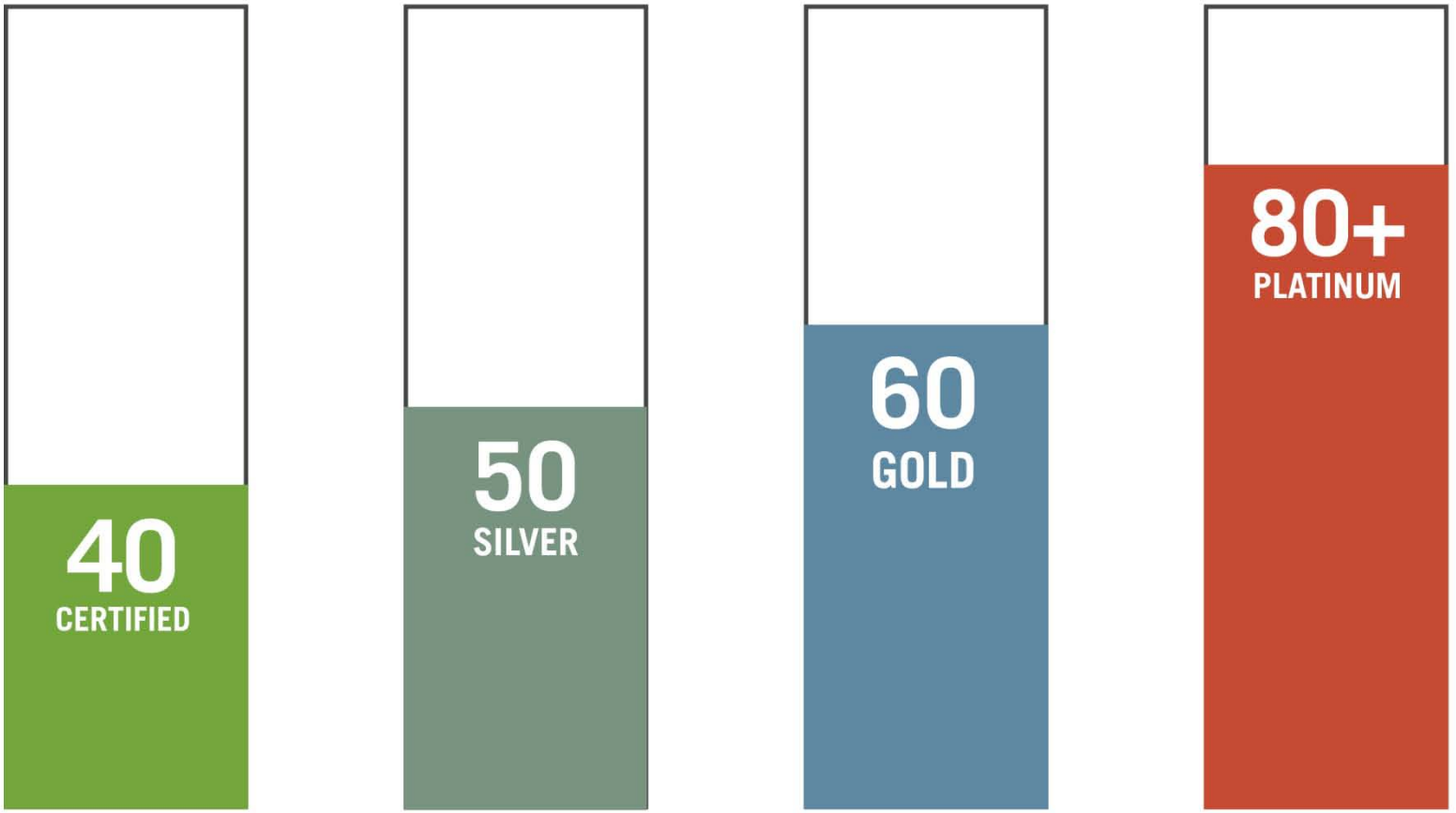
Energy & Atmosphere

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

100-POINT SCALE



LEED 2009 for New Construction and Major Renovations

Project Checklist

Project Name

Date

Sustainable Sites — Possible Points: 26

Y	?	N			
Y			Prereq 1	Construction Activity Pollution Prevention	
			Credit 1	Site Selection	1
			Credit 2	Development Density and Community Connectivity	5
			Credit 3	Brownfield Redevelopment	1
			Credit 4.1	Alternative Transportation—Public Transportation Access	6
			Credit 4.2	Alternative Transportation—Bicycle Storage and Changing Rooms	1
			Credit 4.3	Alternative Transportation—Low-Emitting and Fuel-Efficient Vehicles	3
			Credit 4.4	Alternative Transportation—Parking Capacity	2
			Credit 5.1	Site Development—Protect or Restore Habitat	1
			Credit 5.2	Site Development—Maximize Open Space	1
			Credit 6.1	Stormwater Design—Quantity Control	1
			Credit 6.2	Stormwater Design—Quality Control	1
			Credit 7.1	Heat Island Effect—Non-roof	1
			Credit 7.2	Heat Island Effect—Roof	1
			Credit 8	Light Pollution Reduction	1

Water Efficiency — Possible Points: 10

Y	?	N			
Y			Prereq 1	Water Use Reduction—20% Reduction	
			Credit 1	Water Efficient Landscaping	2 to 4
			Credit 2	Innovative Wastewater Technologies	2
			Credit 3	Water Use Reduction	2 to 4

Energy and Atmosphere — Possible Points: 35

Y	?	N			
Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	
Y			Prereq 2	Minimum Energy Performance	
Y			Prereq 3	Fundamental Refrigerant Management	
			Credit 1	Optimize Energy Performance	1 to 19
			Credit 2	On-Site Renewable Energy	1 to 7
			Credit 3	Enhanced Commissioning	2
			Credit 4	Enhanced Refrigerant Management	2
			Credit 5	Measurement and Verification	3
			Credit 6	Green Power	2

Materials and Resources — Possible Points: 14

Y	?	N			
Y			Prereq 1	Storage and Collection of Recyclables	
			Credit 1.1	Building Reuse—Maintain Existing Walls, Floors, and Roof	1 to 3
			Credit 1.2	Building Reuse—Maintain 50% of Interior Non-Structural Elements	1
			Credit 2	Construction Waste Management	1 to 2
			Credit 3	Materials Reuse	1 to 2

Materials and Resources, Continued

Y	?	N			
			Credit 4	Recycled Content	1 to 2
			Credit 5	Regional Materials	1 to 2
			Credit 6	Rapidly Renewable Materials	1
			Credit 7	Certified Wood	1

Indoor Environmental Quality — Possible Points: 15

Y	?	N			
Y			Prereq 1	Minimum Indoor Air Quality Performance	
Y			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
			Credit 1	Outdoor Air Delivery Monitoring	1
			Credit 2	Increased Ventilation	1
			Credit 3.1	Construction IAQ Management Plan—During Construction	1
			Credit 3.2	Construction IAQ Management Plan—Before Occupancy	1
			Credit 4.1	Low-Emitting Materials—Adhesives and Sealants	1
			Credit 4.2	Low-Emitting Materials—Paints and Coatings	1
			Credit 4.3	Low-Emitting Materials—Flooring Systems	1
			Credit 4.4	Low-Emitting Materials—Composite Wood and Agrifiber Products	1
			Credit 5	Indoor Chemical and Pollutant Source Control	1
			Credit 6.1	Controllability of Systems—Lighting	1
			Credit 6.2	Controllability of Systems—Thermal Comfort	1
			Credit 7.1	Thermal Comfort—Design	1
			Credit 7.2	Thermal Comfort—Verification	1
			Credit 8.1	Daylight and Views—Daylight	1
			Credit 8.2	Daylight and Views—Views	1

Innovation and Design Process — Possible Points: 6

			Credit 1.1	Innovation in Design: Specific Title	1
			Credit 1.2	Innovation in Design: Specific Title	1
			Credit 1.3	Innovation in Design: Specific Title	1
			Credit 1.4	Innovation in Design: Specific Title	1
			Credit 1.5	Innovation in Design: Specific Title	1
			Credit 2	LEED Accredited Professional	1

Regional Priority Credits — Possible Points: 4

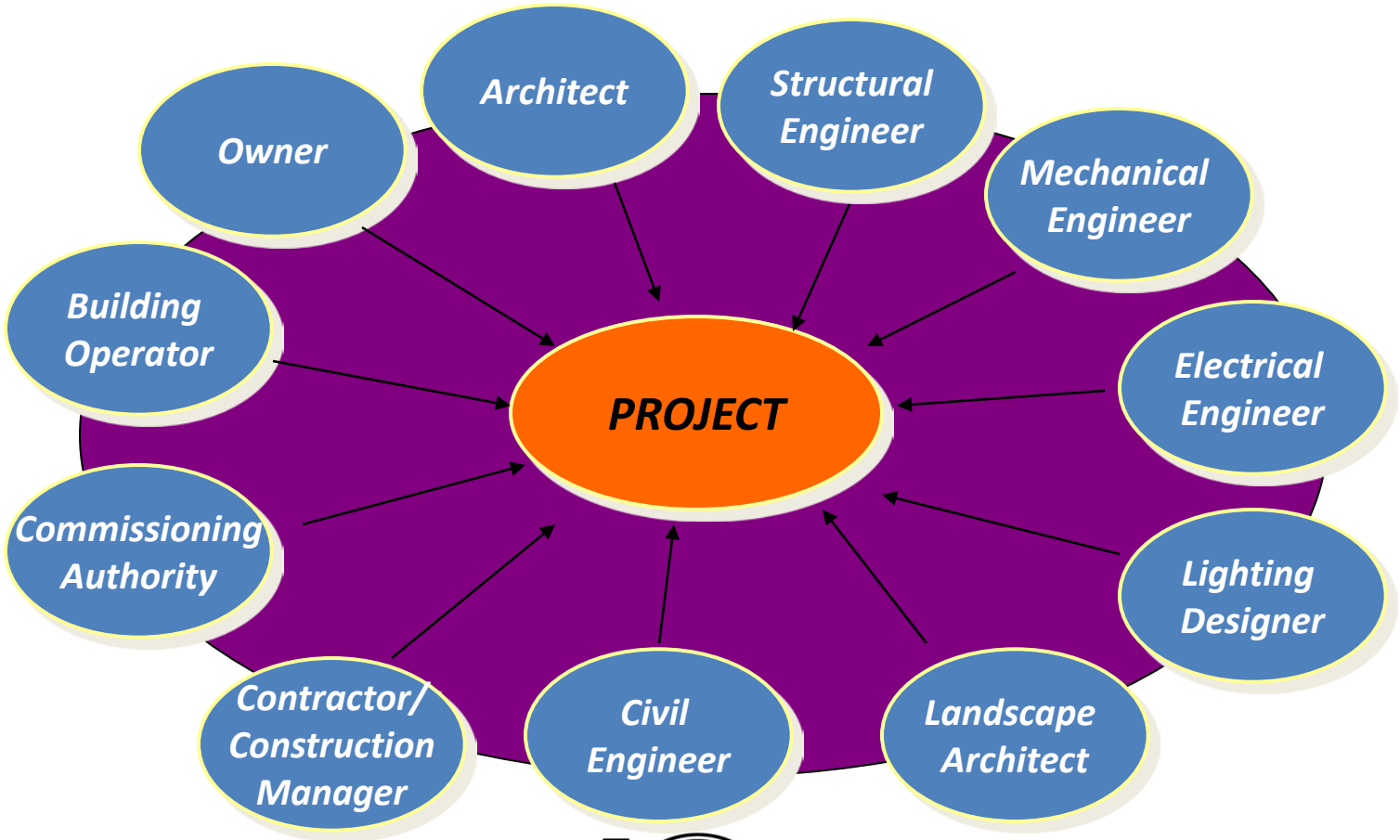
			Credit 1.1	Regional Priority: Specific Credit	1
			Credit 1.2	Regional Priority: Specific Credit	1
			Credit 1.3	Regional Priority: Specific Credit	1
			Credit 1.4	Regional Priority: Specific Credit	1

Total — Possible Points: 110

Certified 40 to 49 points Silver 50 to 59 points Gold 60 to 79 points Platinum 80 to 110

USGBC has four levels of LEED:

Integrated Project Delivery



Contractor Role During Design

Eco-charrette/design workshop

Materials availability – sourcing

- Local/regional
- Green attributes

Materials and systems performance

- Products that worked well on past projects

Ensure buildability

Provide pre-construction cost estimates

Value engineering input

USGBC & GBCI

USGBC develops and updates the LEED rating systems, reference guides, and provides education & advocacy

GBCI is responsible for:

Registering and certifying projects

Administering LEED professional examinations for individuals (LEED Green Associate, LEED AP, etc.)

Credits for Contractors

Sustainable Sites Credits

Prerequisite – Construction Activity Pollution Prevention (CAPP) / SWPPP

Water Efficiency

WEc1.1&1.2 – Water Efficient Landscaping

WEc2 – Innovative Wastewater Technologies

WEc3.1&3.2 – Water Reduction

Credits for Contractors

Materials & Resources

CR 2 Construction Waste Management

CR 3 Material Reuse

CR 4 Recycled Content

CR 5 Regional Materials

Credits for Contractors

Energy and Atmosphere Credits

- **EAp1** and **EAc3** - Commissioning
- **EAp2** and **EAc1** - Energy Efficiency
- **EAc2** - On-Site Renewable Energy
- **EAc5** - Measurement & Verification

Indoor Environmental Quality Credits

- **EQc1** - Outdoor Air Delivery Monitoring
- **EQc3.1** – Indoor Environmental Quality Plan
- **EQc6.1** - Controllability of Systems, Lighting

Credits for Contractors

Innovation and Design Process

Develop a proactive approach to sustainability

Embrace the challenge to create your own criteria for environmental responsibility

How – What – Where???

Credits for Contractors

Innovation and Design Process

How – What – Where???

The UPS Story – Right Turn Only

Credits for Contractors

Innovation and Design Process

How – What – Where???

Knowledge of sustainable products\materials

VOC's	Recycled Content	Glycol
Cutting Oils	Lubricants	Rubber Gasket

Sustainable methods in design, fabrication & installation

- BIM & Lean Construction
- Water preservation – flushing, testing, drain-down
- Disposal - Recaptures - Pollutants in discharge water

Credits for Contractors

Innovation and Design Process

How – What – Where???

Energy Efficient Equipment for Operation & Installation

- Pumps (Main & Jockey)
- Cutting & Threading Equipment

Integrate Design & Install with other Sustainable Systems

- Use of greywater for system filling, testing, flushing
- Recapture of flushing and testing water

Credits for Contractors

Innovation and Design Process

How – What – Where???

Greening the Supply Chain – The Walmart Story

U.S. GREEN BUILDING COUNCIL CHAPTER
ILLINOIS
CELEBRATING 10 YEARS

NFPA

Credits for Contractors

Innovation and Design Process

How – What – Where???

ILLINOIS
CELEBRATING 10 YEARS

USGBC – Illinois Chapter

The mission of USGBC – Illinois is to transform our region's built environment to become ecologically sustainable, profitable, and healthy. We accomplish our mission through education, advocacy, and collaboration.

- 1,600+ Members in the Illinois area
- 8 Volunteer committees developing programs and events
- 7 Regional branches
- Over 150 programs and events per year, including:
  - Green building education on a variety of topics
  - LEED Workshops
  - Research studies
  - Networking events
  - Green building training for contractors
  - LEED credentialing study sessions
  - Advocacy initiatives
  - Green building tours

U.S. GREEN BUILDING COUNCIL CHAPTER
ILLINOIS
CELEBRATING 10 YEARS

NFPA

How do I learn more?

Green Building Certification Institute

- Understand the Building Certification process
- Download a LEED Candidate Handbook
- Review the Credential Maintenance Program (CMP) Guide
- Available at www.gbci.org

USGBC & USGBC Chapters

- Take an online or in-person LEED course
- Purchase a LEED Exam Study Guide
- Available at www.usgbc.org

LEED CERTIFICATION

Thank You!!!

George K. Tuhowski III

Leopardo

CONSTRUCTION DESIGN - BUILD DEVELOPMENT

U.S. GREEN BUILDING COUNCIL CHAPTER

ILLINOIS

CELEBRATING 10 YEARS

NFPA