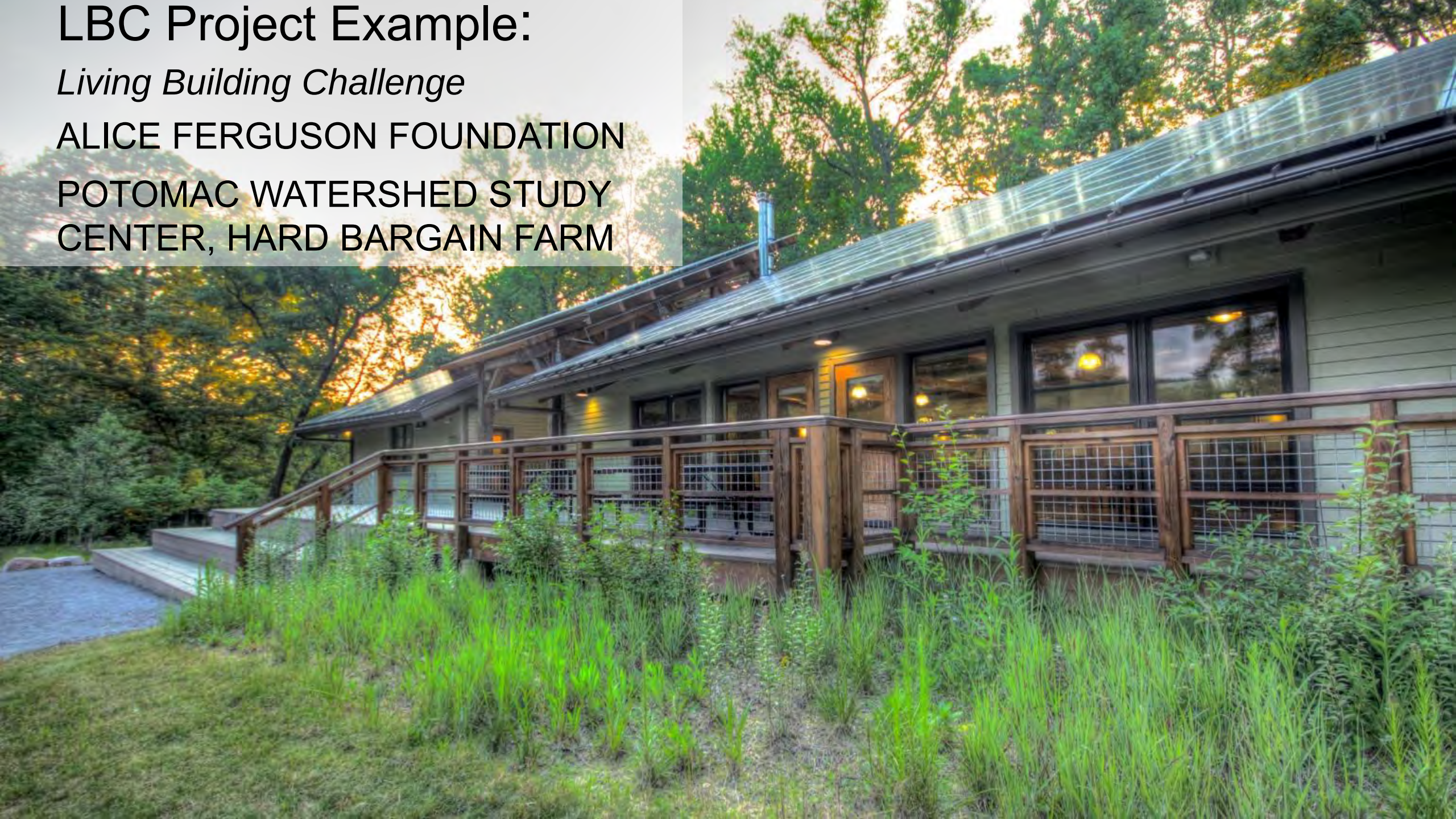
LBC Project Example:

Living Building Challenge

ALICE FERGUSON FOUNDATION

POTOMAC WATERSHED STUDY CENTER, HARD BARGAIN FARM



Alice Ferguson Foundation's Mission

To connect people to the natural world, sustainable agricultural practices and the cultural heritage of their local watershed through education, stewardship and advocacy

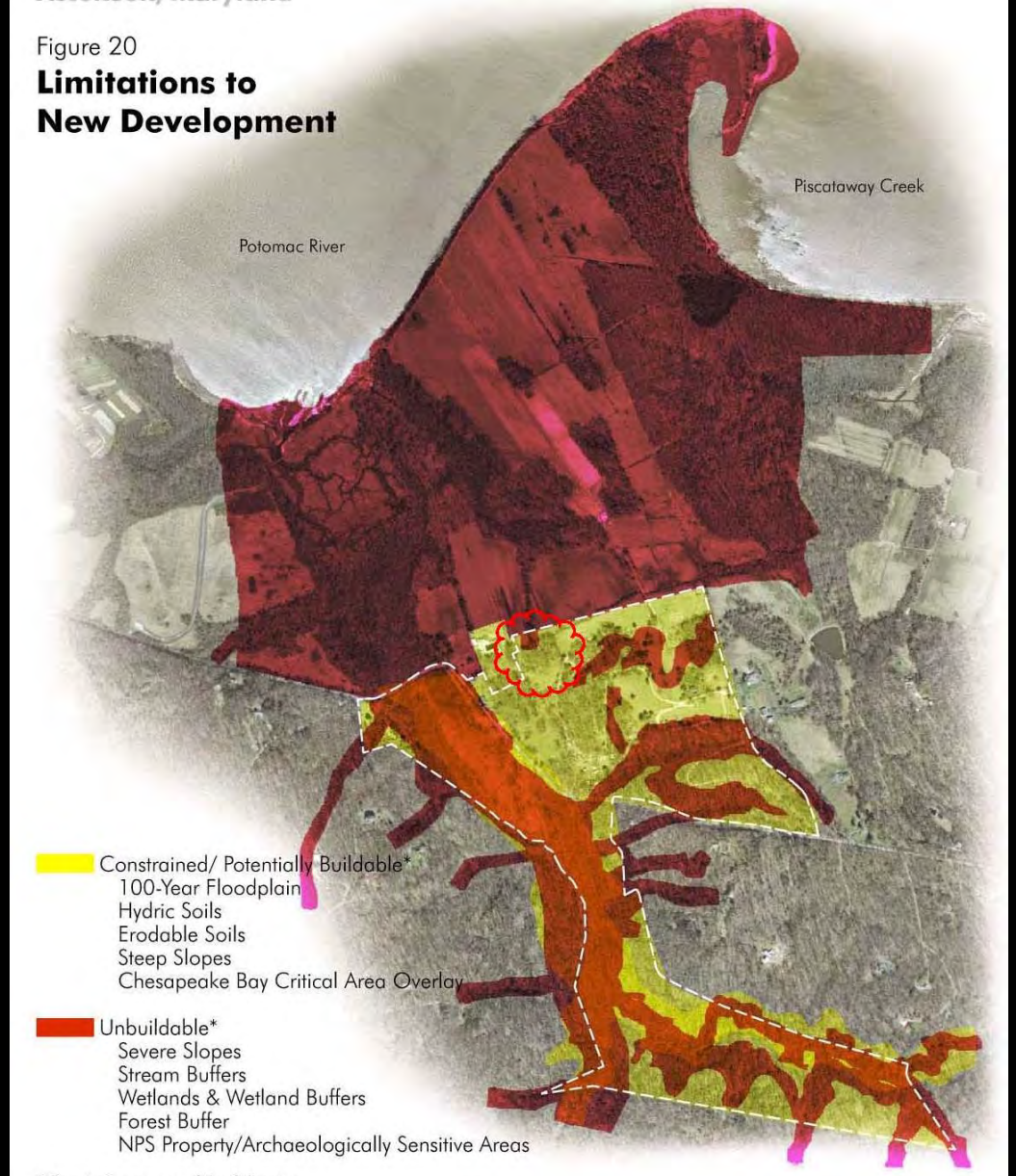
SITE CONTEXT

HARD BARGAIN FARM — Land Use Plan

Accokeek, Maryland

Figure 20

Limitations to New Development

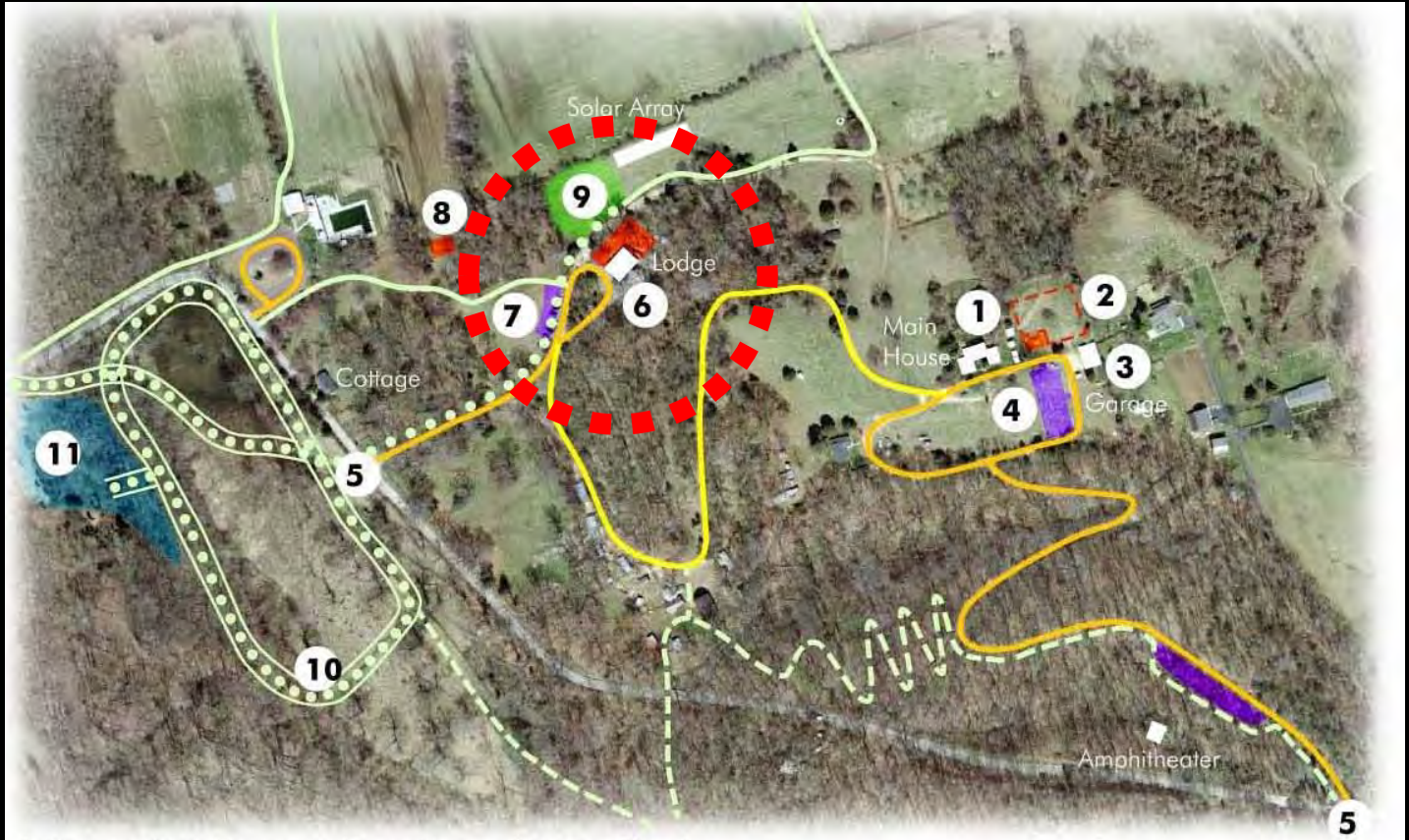


* Due to 1 or more of the following

Prepared for: The Alice Ferguson Foundation
Prepared by: Rhodeside & Harwell, Incorporated
Sources: RHI field reconnaissance

0' 450' 900' 1800'
Scale 1"=900'

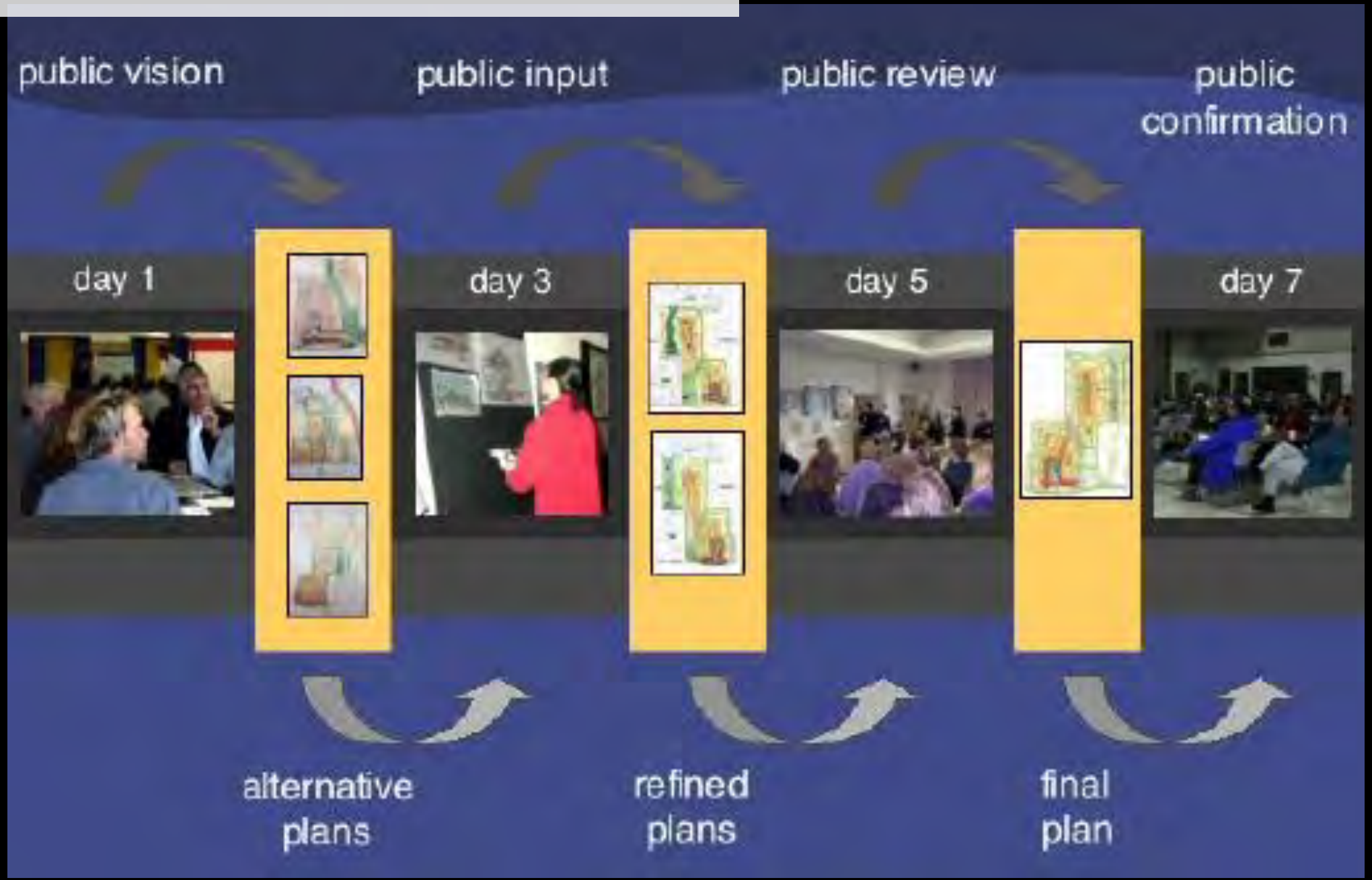
NORTH



1. Renovate Main House as a House Museum/ Meeting Place/ Conference Facility (small).
2. Develop new state-of-the-art administrative facility.
3. Rehabilitate Garage for storage functions.
4. New parking lot (approximately 30 vehicles) with overflow parking areas.
5. Current circulation/entrance configuration.
6. Renovate and expand Lodge.
7. Create new parking lot (approximately 18 vehicles)
8. Develop Day Use Pavilion on HBF Property. Discuss with Moyane Association use of their parking lot for Day Use Program drop-off.
9. Develop site for camping.
10. Develop ADA-compliant loop trail around emergent wetland.
11. Expand area for Problem-Solving Course.

- Structures
- Parking
- Camping
- Problem-Solving Course
- External Circulation
- Internal Circulation
- Existing Trail
- Proposed Trail
- ADA Trail
- Boardwalk

CHARRETTE APPROACH




Moyaone
Community
Center & Pool
P
solar array
Existing
Lodge
P
N


Nature builds to its
available resources

grass

moss

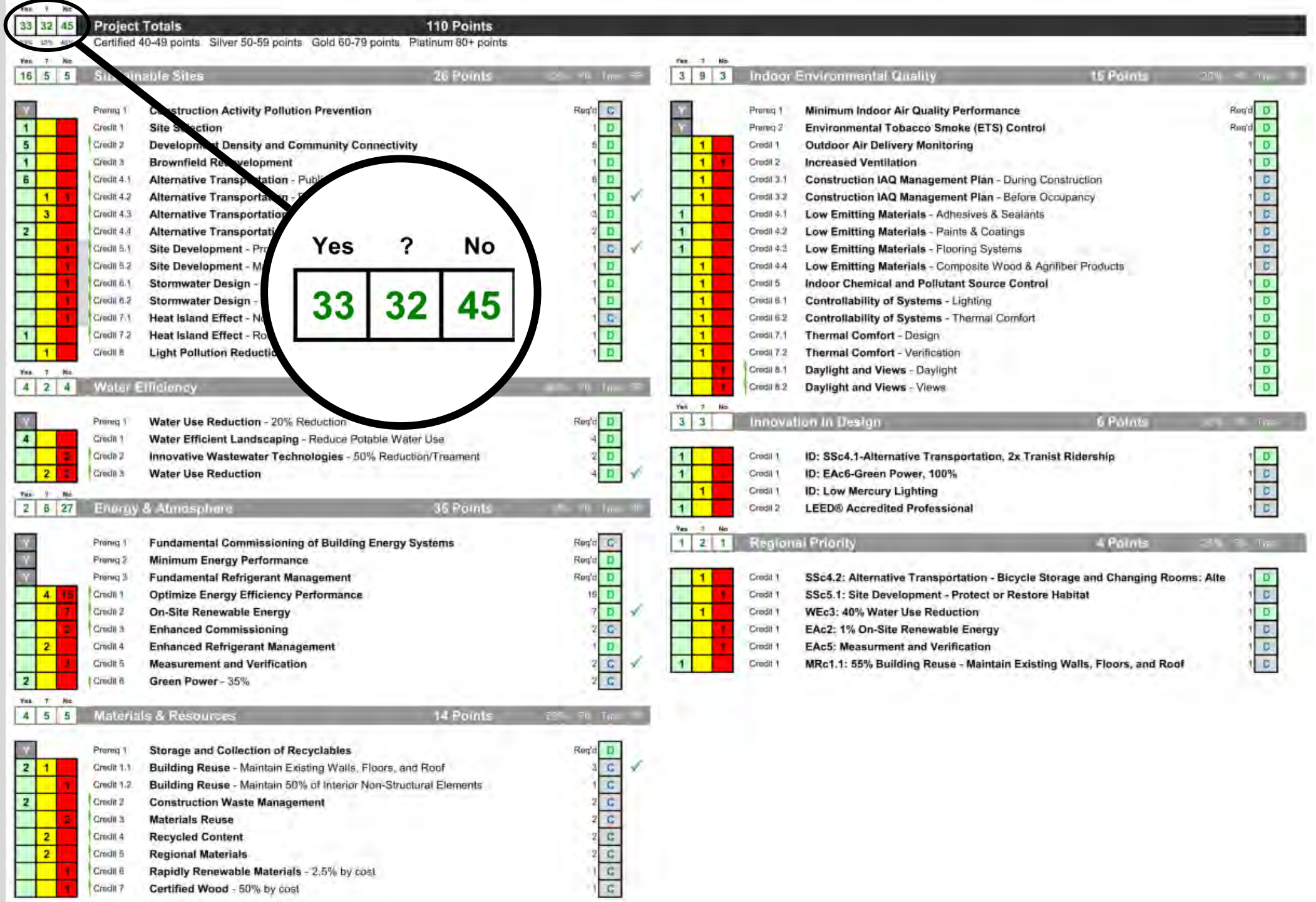
Symbiotic Approach Rather than working independently, the sunny "Grass" and shady "Moss" buildings were designed to work together to achieve **net-zero energy** and **water** targets.

Nestled The building nestles on the woodland edge and opens to the sun.

Rating systems help keep you on the right track

Case Study: Shared-Use Commercial Kitchen + Incubator Restaurant Space

Case Study: Shared-Use Commercial Kitchen + Incubator Restaurant Space



Yes	?	No
33	32	45

Project Totals — 110 Points

Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80+ points

Sustainable Sites — 26 Points (16 / 5 / 5)

Y					
	1			Credit 1	Site Selection
	5			Credit 2	Development Density and Community Connectivity
	1			Credit 3	Brownfield Redevelopment
	6			Credit 4.1	Alternative Transportation - Public Transportation Access
		1	1	Credit 4.2	Alternative Transportation - Bicycle Storage and Changing Rooms
		3		Credit 4.3	Alternative Transportation - Low-Emitting and Fuel-Efficient Vehicles
	2			Credit 4.4	Alternative Transportation - Parking Capacity
			1	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

Water Efficiency — 4 Points (4 / 2 / 4)

Y					
	4			Credit 1	Water Efficient Landscaping - Reduce Potable Water Use
			2	Credit 2	Innovative Wastewater Technologies - 50% Reduction/Treament
		2	2	Credit 3	Water Use Reduction

Energy & Atmosphere — 35 Points (2 / 6 / 27)

Y					
		4	15	Credit 1	Optimize Energy Efficiency Performance
			7	Credit 2	On-Site Renewable Energy
			2	Credit 3	Enhanced Commissioning
	2			Credit 4	Enhanced Refrigerant Management
			3	Credit 5	Measurement and Verification
	2			Credit 6	Green Power - 35%

Materials & Resources — 14 Points (4 / 5 / 5)

Y					
	2	1		Credit 1.1	Building Reuse - Maintain Existing Walls, Floors, and Roof
			1	Credit 1.2	Building Reuse - Maintain 50% of Interior Non-Structural Elements
	2			Credit 2	Construction Waste Management
			2	Credit 3	Materials Reuse
		2		Credit 4	Recycled Content
		2		Credit 5	Regional Materials
			1	Credit 6	Rapidly Renewable Materials - 2.5% by cost
			1	Credit 7	Certified Wood - 50% by cost

Indoor Environmental Quality — 15 Points (3 / 9 / 3)

Y					
Y				Prereq 1	Minimum Indoor Air Quality Performance
Y				Prereq 2	Environmental Tobacco Smoke (ETS) Control
		1		Credit 1	Outdoor Air Delivery Monitoring
		1	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 & Sealants
	1			Credit 4.2	Low Emitting Materials - Paints & Coatings
	1			Credit 4.3	Low Emitting Materials - Flooring Systems
		1		Credit 4.4	Low Emitting Materials - Composite Wood & 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

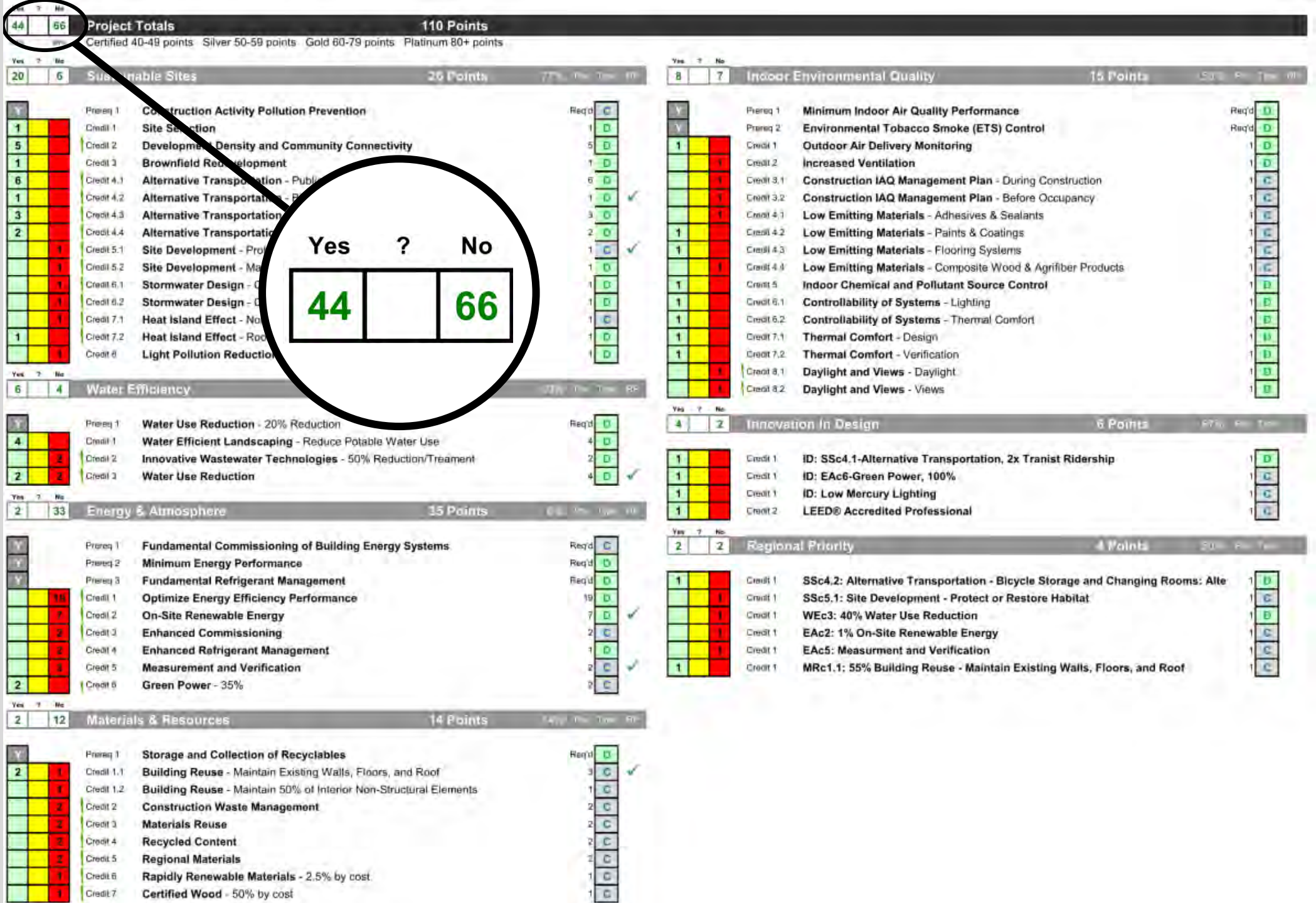
Innovation in Design — 6 Points (3 / 3)

1				Credit 1	ID: SSc4.1-Alternative Transportation, 2x Tranist Ridership
1				Credit 1	ID: EAc6-Green Power, 100%
	1			Credit 1	ID: Low Mercury Lighting
1				Credit 2	LEED® Accredited Professional

Regional Priority — 4 Points (1 / 2 / 1)

	1			Credit 1	SSc4.2: Alternative Transportation - Bicycle Storage and Changing Rooms: Alte
			1	Credit 1	SSc5.1: Site Development - Protect or Restore Habitat
	1			Credit 1	WEc3: 40% Water Use Reduction
			1	Credit 1	EAc2: 1% On-Site Renewable Energy
			1	Credit 1	EAc5: Measurment and Verification
1				Credit 1	MRc1.1: 55% Building Reuse - Maintain Existing Walls, Floors, and Roof

Case Study: Shared-Use Commercial Kitchen + Incubator Restaurant Space



Yes	?	No	Project Totals	110 Points
44		66	Certified 40-49 points Silver 50-59 points Gold 60-79 points Platinum 80+ points	

Yes	?	No	Sustainable Sites	26 Points
20		6		

Y			Prereq 1	Construction Activity Pollution Prevention	Req'd	C
1			Credit 1	Site Selection	1	D
5			Credit 2	Development Density and Community Connectivity	5	D
1			Credit 3	Brownfield Redevelopment	1	D
6			Credit 4.1	Alternative Transportation - Public	6	D
1			Credit 4.2	Alternative Transportation -	1	D
3			Credit 4.3	Alternative Transportation	3	D
2			Credit 4.4	Alternative Transportation	2	D
		1	Credit 5.1	Site Development - Pro	1	C
		1	Credit 5.2	Site Development - Ma	1	D
		1	Credit 6.1	Stormwater Design -	1	D
		1	Credit 6.2	Stormwater Design -	1	D
		1	Credit 7.1	Heat Island Effect - No	1	C
1			Credit 7.2	Heat Island Effect - Roo	1	D
		1	Credit 8	Light Pollution Reduction	1	D

Yes	?	No	Water Efficiency	10 Points
6		4		

Y			Prereq 1	Water Use Reduction - 20% Reduction	Req'd	D
4			Credit 1	Water Efficient Landscaping - Reduce Potable Water Use	4	D
		2	Credit 2	Innovative Wastewater Technologies - 50% Reduction/Treament	2	D
2		2	Credit 3	Water Use Reduction	4	D

Yes	?	No	Energy & Atmosphere	35 Points
2		33		

Y			Prereq 1	Fundamental Commissioning of Building Energy Systems	Req'd	C
Y			Prereq 2	Minimum Energy Performance	Req'd	D
Y			Prereq 3	Fundamental Refrigerant Management	Req'd	D
		15	Credit 1	Optimize Energy Efficiency Performance	19	D
		7	Credit 2	On-Site Renewable Energy	7	D
		2	Credit 3	Enhanced Commissioning	2	C
		2	Credit 4	Enhanced Refrigerant Management	1	D
		3	Credit 5	Measurement and Verification	2	C
2			Credit 6	Green Power - 35%	2	C

Yes	?	No	Materials & Resources	14 Points
2		12		

Y			Prereq 1	Storage and Collection of Recyclables	Req'd	D
2		1	Credit 1.1	Building Reuse - Maintain Existing Walls, Floors, and Roof	3	C
		1	Credit 1.2	Building Reuse - Maintain 50% of Interior Non-Structural Elements	1	C
		2	Credit 2	Construction Waste Management	2	C
		2	Credit 3	Materials Reuse	2	C
		2	Credit 4	Recycled Content	2	C
		2	Credit 5	Regional Materials	2	C
		1	Credit 6	Rapidly Renewable Materials - 2.5% by cost	1	C
		1	Credit 7	Certified Wood - 50% by cost	1	C

Yes	?	No	Indoor Environmental Quality	15 Points
8		7		

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

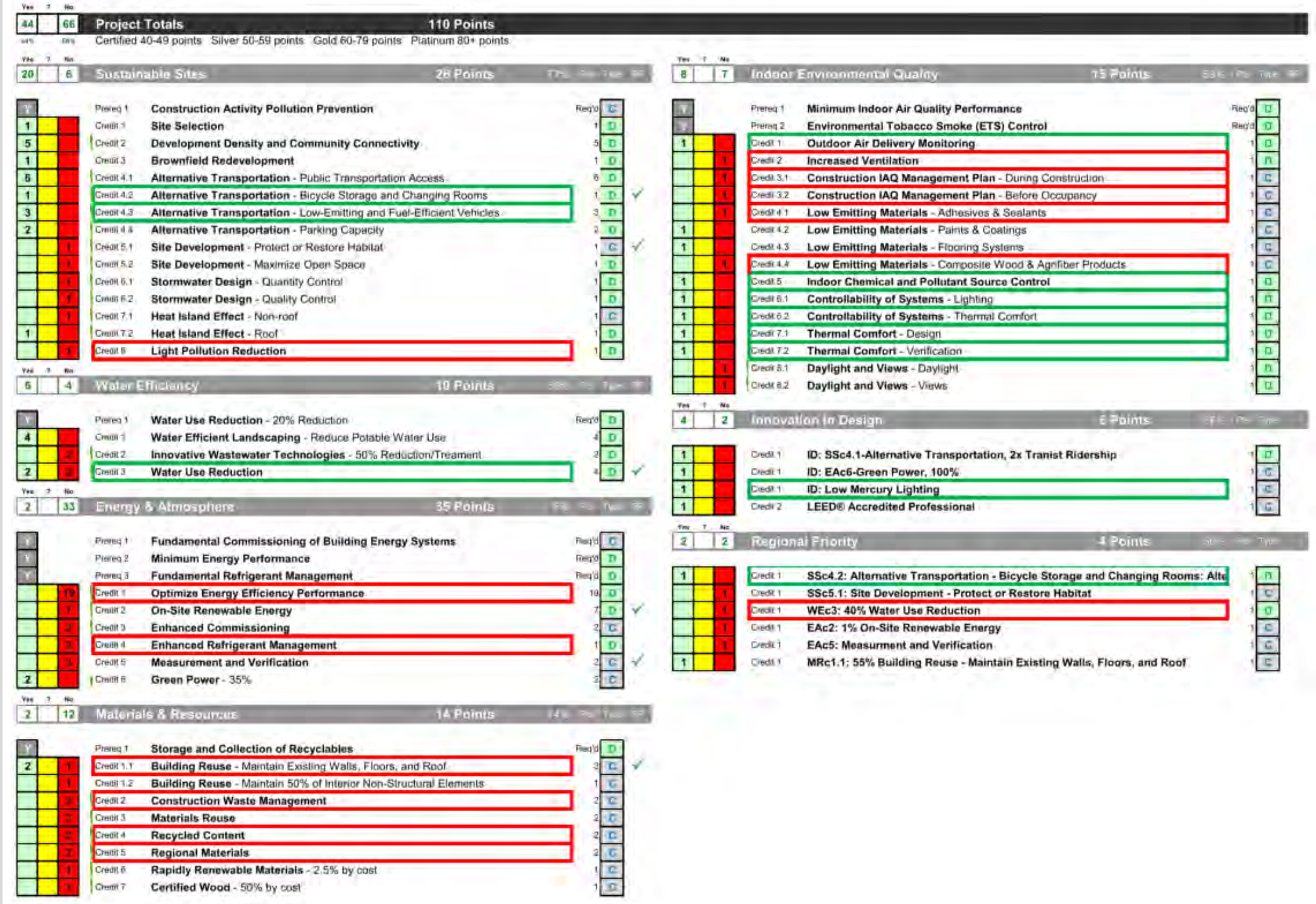
Yes	?	No	Innovation in Design	6 Points
4		2		

1			Credit 1	ID: SSc4.1-Alternative Transportation, 2x Tranist Ridership	D
1			Credit 1	ID: EAc6-Green Power, 100%	C
1			Credit 1	ID: Low Mercury Lighting	C
1			Credit 2	LEED® Accredited Professional	C

Yes	?	No	Regional Priority	4 Points
2		2		

1			Credit 1	SSc4.2: Alternative Transportation - Bicycle Storage and Changing Rooms: Alte	D
		1	Credit 1	SSc5.1: Site Development - Protect or Restore Habitat	C
		1	Credit 1	WEc3: 40% Water Use Reduction	D
		1	Credit 1	EAc2: 1% On-Site Renewable Energy	C
		1	Credit 1	EAc5: Measurment and Verification	C
1			Credit 1	MRc1.1: 55% Building Reuse - Maintain Existing Walls, Floors, and Roof	C

Case Study: Shared-Use Commercial Kitchen + Incubator Restaurant Space



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Yes	?	No	Sustainable Sites	26 Points
20		6		

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

Yes	?	No	Water Efficiency	10 Points
5		4		

Y						
	Prereq 1	Water Use Reduction - 20% Reduction	Req'd	D	
4	Credit 1	Water Efficient Landscaping - Reduce Potable Water Use	4	D	
	Credit 2	Innovative Wastewater Technologies - 50% Reduction/Treament	2	D	
2	Credit 3	Water Use Reduction	4	D	✓

Yes	?	No	Energy & Atmosphere	35 Points
2		33		

Y						
	Prereq 1	Fundamental Commissioning of Building Energy Systems	Req'd	C	
	Prereq 2	Minimum Energy Performance	Req'd	D	
	Prereq 3	Fundamental Refrigerant Management	Req'd	D	
	Credit 1	Optimize Energy Efficiency Performance	19	D	
	Credit 2	On-Site Renewable Energy	7	D	✓
	Credit 3	Enhanced Commissioning	2	C	
	Credit 4	Enhanced Refrigerant Management	1	D	
	Credit 5	Measurement and Verification	2	C	✓
2	Credit 6	Green Power - 35%	2	C	

Yes	?	No	Materials & Resources	14 Points
2		12		

Y						
	Prereq 1	Storage and Collection of Recyclables	Req'd	D	
2	Credit 1.1	Building Reuse - Maintain Existing Walls, Floors, and Roof	3	C	✓
	Credit 1.2	Building Reuse - Maintain 50% of Interior Non-Structural Elements	1	C	
	Credit 2	Construction Waste Management	2	C	
	Credit 3	Materials Reuse	2	C	
	Credit 4	Recycled Content	2	C	
	Credit 5	Regional Materials	2	C	
1	Credit 6	Rapidly Renewable Materials - 2.5% by cost	1	C	
	Credit 7	Certified Wood - 50% by cost	1	C	

Yes	?	No	Indoor Environmental Quality	15 Points
8		7		

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

Yes	?	No	Innovation in Design	6 Points
4		2		

1	Credit 1	ID: SSc4.1-Alternative Transportation, 2x Tranist Ridership	1	D	
1	Credit 1	ID: EAc6-Green Power, 100%	1	C	
	Credit 1	ID: Low Mercury Lighting	1	C	
1	Credit 2	LEED® Accredited Professional	1	C	

Yes	?	No	Regional Priority	4 Points
2		2		

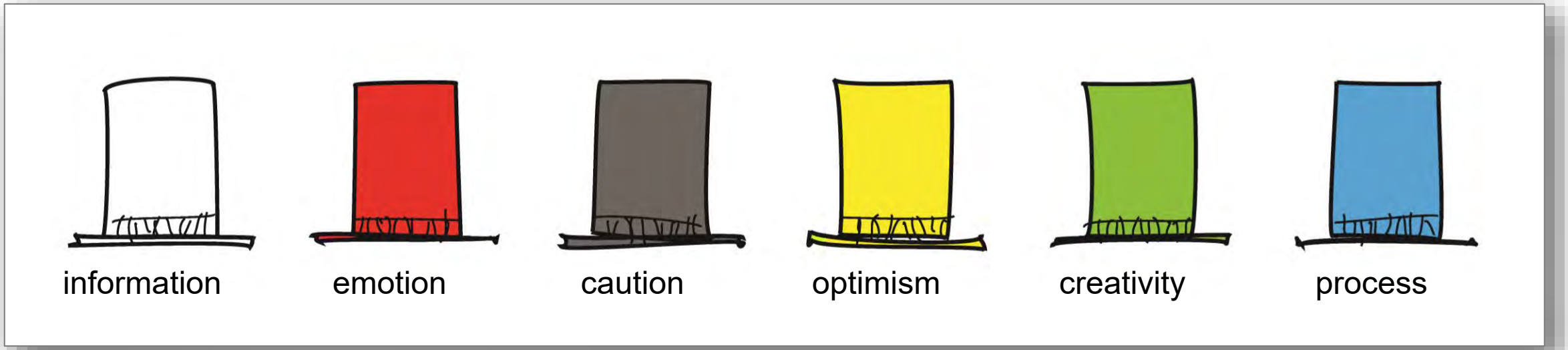
1	Credit 1	SSc4.2: Alternative Transportation - Bicycle Storage and Changing Rooms: Alte	1	D	
	Credit 1	SSc5.1: Site Development - Protect or Restore Habitat	1	C	
	Credit 1	WEc3: 40% Water Use Reduction	1	D	
	Credit 1	EAc2: 1% On-Site Renewable Energy	1	C	
	Credit 1	EAc5: Measurment and Verification	1	C	
1	Credit 1	MRc1.1: 55% Building Reuse - Maintain Existing Walls, Floors, and Roof	1	C	

Case Study:
Shared-Use Commercial Kitchen + Incubator Restaurant Space

Lessons Learned:

DO RATING SYSTEMS REALLY WORK?

Draw conclusions concentrating on how rating systems work, what they can do for operations, their limitations, and why they are important or irrelevant.



PARALLEL THINKING

Each thinker puts forward his or her thoughts in parallel with the thoughts of others.

WHAT ARE SOME OF THE GREATEST “OPTIMISMS” you have about rating systems?

(Please come to the microphone to share for as little as
15 seconds and up to 90 seconds. This can be a point or a story.)

DREW, HOW DO WE MAKE THIS SO WE CAN EDIT IT?

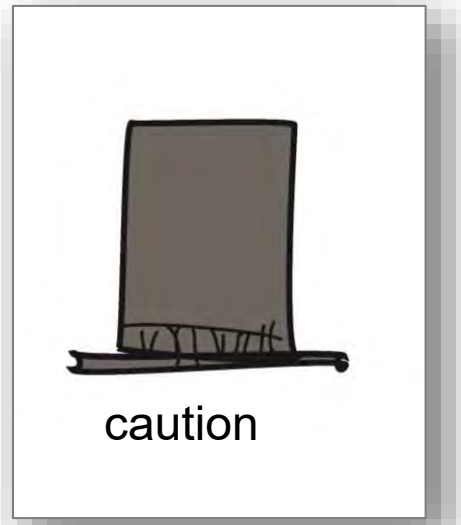
PARALLEL THINKING

Each thinker puts forward his or her thoughts in parallel with the thoughts of others.

WHAT ARE SOME OF THE GREATEST “CAUTIONS” you have about rating systems?

(Please come to the microphone to share for as little as 15 seconds and up to 90 seconds. This can be a point or a story.)

DREW, HOW DO WE MAKE THIS SO WE CAN EDIT IT?



PARALLEL THINKING

Each thinker puts forward his or her thoughts in parallel with the thoughts of others.

NOW LET'S GET CREATIVE! How can you address the cautions in the rating systems with creativity?

(Please come to the microphone to share for as little as
15 seconds and up to 90 seconds. This can be a point or a story.)

DREW, HOW DO WE MAKE THIS SO WE CAN EDIT IT?

PARALLEL THINKING

Each thinker puts forward his or her thoughts in parallel with the thoughts of others.

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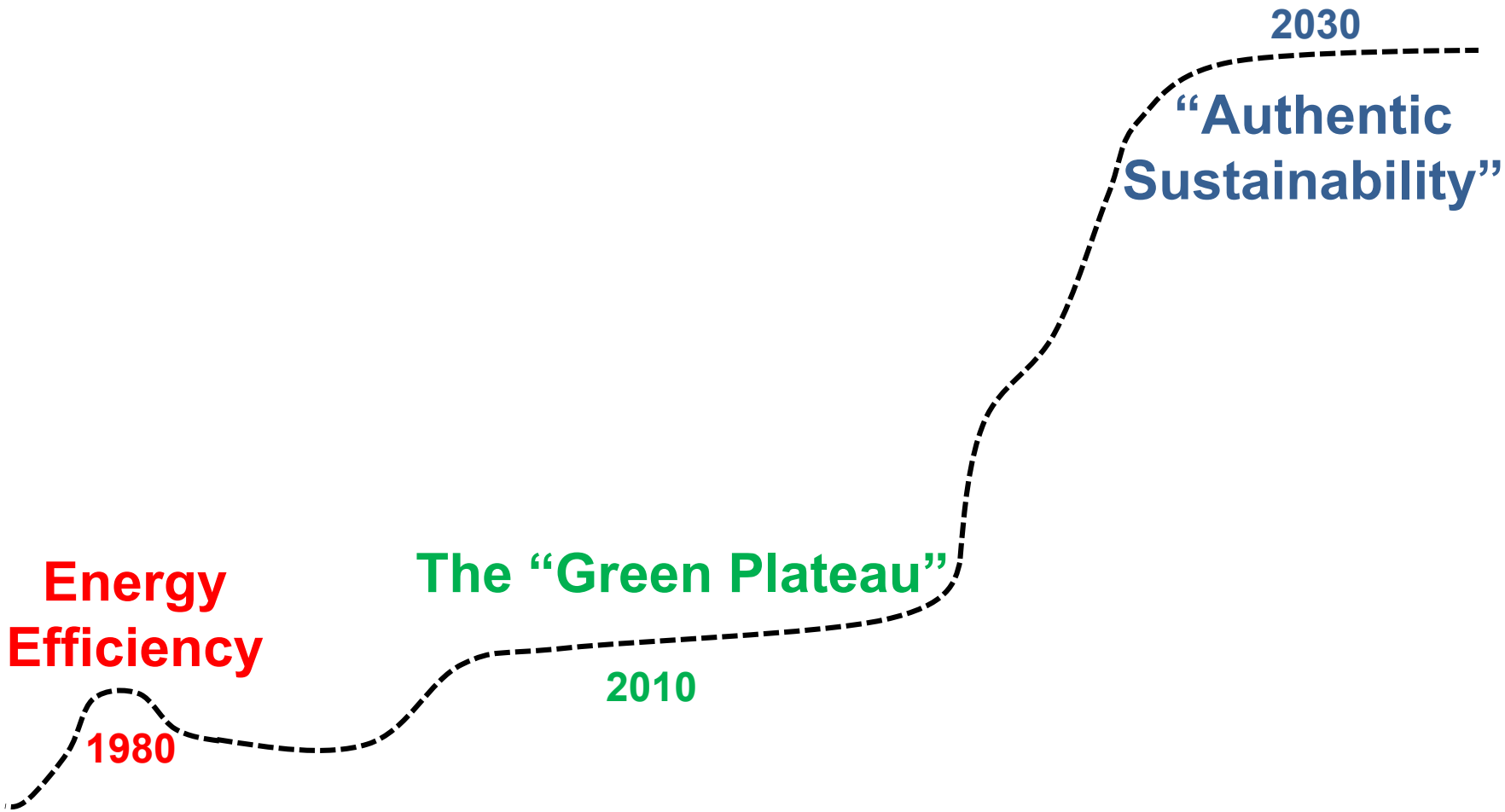
How do these rating systems get us above the green plateau?



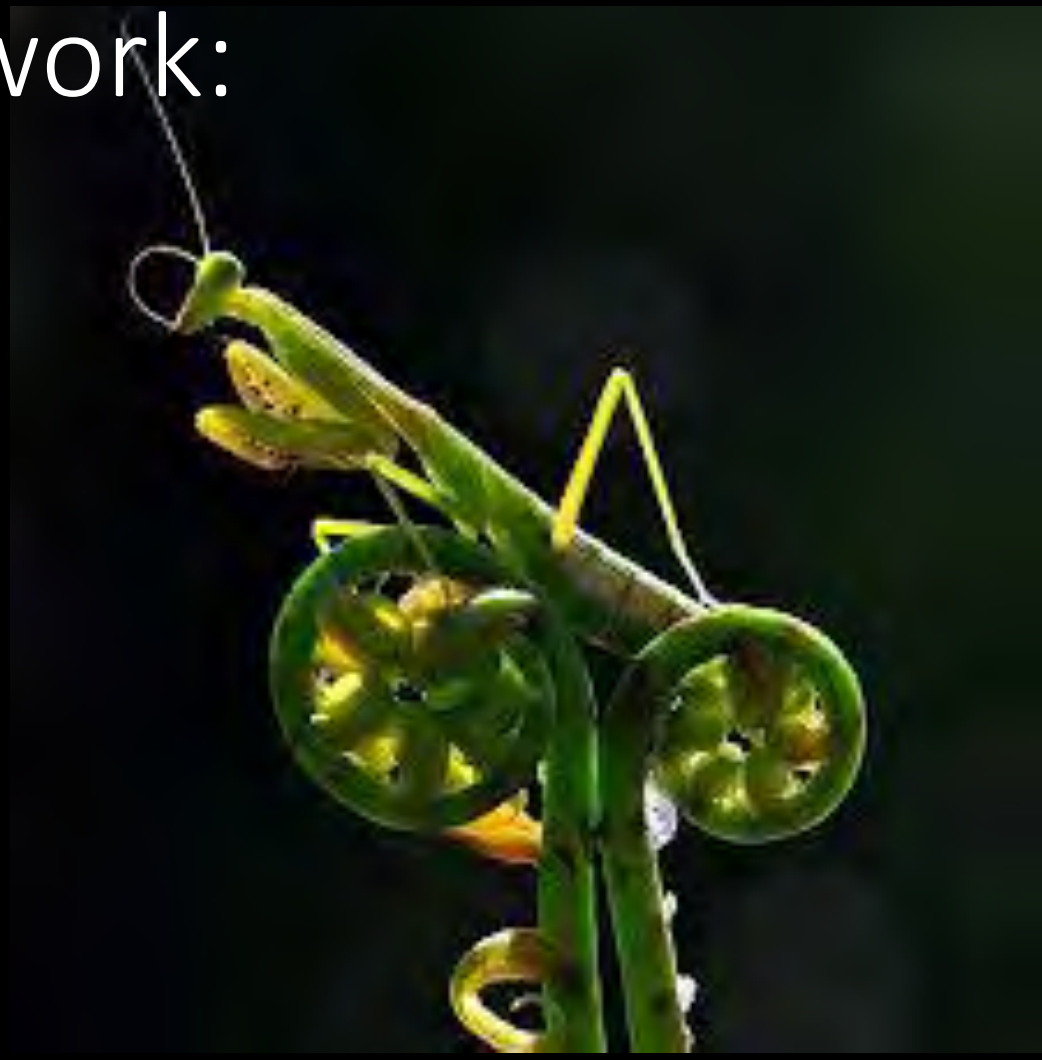
Credited to Rob Fleming, Philadelphia University

Closing thoughts:

~~Do rating systems really work?~~

How to get rating systems to work:

- Pick the right rating system to match your goals
- Manage the process
- Play a role in shaping the rating system



Why stop there?

- Use BMPs from other rating systems
- Why wait for the client to tell you?
- It is bigger than CO_2

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CPHC, LEED AP, WELL AP
Broussard@ReVisionArch.com

?

A comparison of the 2018 IECC to other standards

MEASURE	2018 IECC / 90.1-2016	ENERGY STAR	LEED BD+C	LEED LOWRISE	LEED MIDRISE	EGC 5.1B	PHIUS	NGBS	GREEN GLOBES
ENERGY MODEL ASHRAE 90.1-2013 as base	8%	15%	3%	15%	3%	15%	WUFI ~25%	=	- 3%
ENVELOPE INSPECTION	✓	✓	No	✓	✓	✓	✓	✓	No
BLOWER DOOR TESTING	No	✓	No	✓	✓	No	✓	No	No
MANUAL J	No	✓	No	✓	✓	✓	✓	✓	No
KITCHEN EXHAUST	No	✓	✓	✓	✓	✓	✓	No	No
IN-UNIT VENTILATION	✓	✓	✓	✓	✓	✓	✓	No	No
IN-UNIT DUCT TESTING	No	✓	No	✓	✓	✓	✓	No	No
COMMISSIONING	✓	No	✓	?	✓	✓	?	No	No

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