Rebuild Hawaii Consortium

August 22, 2006
HEI Training Room, 8th Floor
American Savings Bank Building

Update on the Cost/Benefit Analysis of Green vs. Conventional Schools

Analysis of Economic, Environmental and Occupant Benefits of Sustainable Design and LEED Certfication For State of Hawaii and K-12 Public School Facilities

Solicitation No. RFP-05-01-SID

Project Team:

Ferraro Choi
Honolulu, HI

Lincolne Scott, Inc.
Honolulu, HI

RMI/ENSAR
Boulder, CO

O'brien & Co.
Bainbridge, WA

Working Group Review Committtee:

DBEDT
DOE
DAGS
HECO
UH
Private Schools

STUDY TASKING:

Determine E/O/E Benefits Of Sustainable Design For New DOE Schools

- **Establish a Base Case DOE Elemenatary School**
- **Establish a Green Case DOE Elementary School**
- **Compare Base School To Green School to Analyze Costs and Benefits**
- **Survey 12 Existing Sustainable Schools to Corroborate Results**

Standard DOE Elementary School

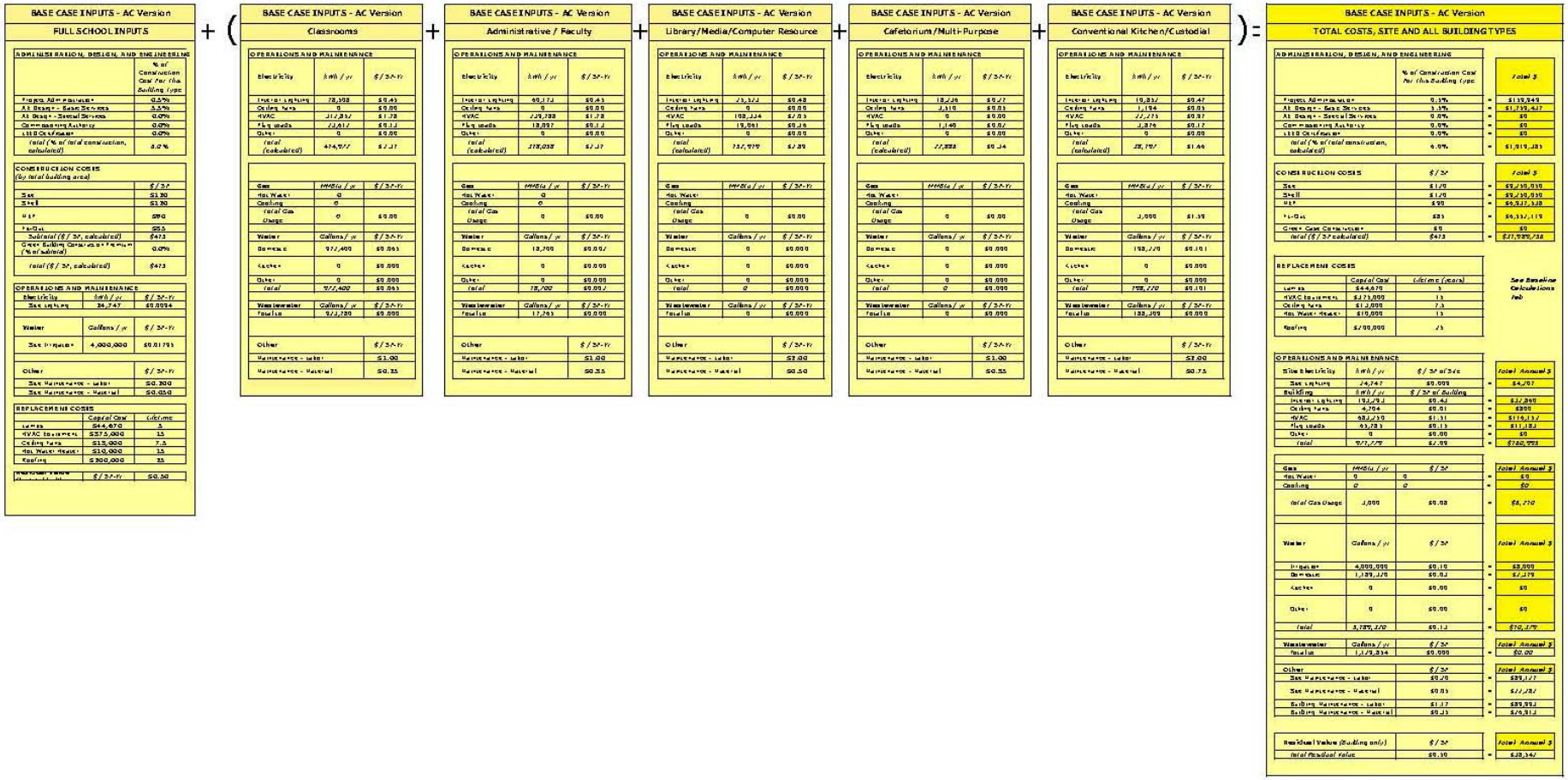
Model Elementary School - DOE Standards

Created: April 6, 2006
Updated: April 18, 2006

Design Enrollment: **550**

Element	Group	Qty	DOE Size(Net)	DOE Size(Net)	Grossing	Size(Gross)
General Classrooms	1	24	980	23,520	1.25	29,400
Self Contained Classrooms	1	4	1,500	6,000	1.25	7,500
Resource Classrooms	1	3	980	2,940	1.25	3,675
Administrative Center	2	1	7,380	7,380	1.25	9,225
Library Media Center	3	1	5,995	5,995	1.25	7,494
Cafetorium/Multi-Purpose	4	1	9,210	9,210	1.25	11,513
Food Service Kitchen - Conventional	5	1	2,632	2,632	1.25	3,290
Custodial Service Center	5	1	500	500	1.25	625
Faculty Center	2	2	980	1,960	1.25	2,450
Computer Resource Center	3	1	1,200	1,200	1.25	1,500
Itinerant	1	1	330	330	1.25	413
Total Building Area				**61,667**		**77,084**
Campus Size (Acres)		12	43,560			**522,720**
Parking Stalls/Area		80	300			**24,000**
Other Hard-Surface Areas (Walkways, Play Surfaces, Roadways)					Say	**26,000**

Establish Base Case LCCA



Using LEED v2.2 To Help Define the Green Case

LEED NC ScoreCard v2-2 — 8/18/2006

33	25	11	Total Project Score - DOE Elementary School	Possible Points 69

Certified 26 to 32 points Silver 33 to 38 points Gold 39 to 51 points Platinum 52 or more points

5	7	2	Sustainable Sites	Possible Points 14
Y	?	N		
Y			Prereq 1 — Construction Activity Pollution and Prevention	
		1	Credit 1 — Site Selection	1
	1		Credit 2 — Development Density & Community Connectivity	1
		1	Credit 3 — Brownfield Redevelopment	1
1			Credit 4.1 — Alternative Transportation, Public Transportation Access	1
1			Credit 4.2 — Alternative Transportation, Bicycle Storage & Changing Rooms	1
	1		Credit 4.3 — Alternative Transportation, Low emitting and fuel-efficient vehicles	1
	1		Credit 4.4 — Alternative Transportation, Parking Capacity	1
	1		Credit 5.1 — Reduced Site Disturbance, Protect or Restore Habitat	1
1			Credit 5.2 — Reduced Site Disturbance, Maximize Open Space	1
1			Credit 6.1 — Stormwater Management, Quantity Control	1
	1		Credit 6.2 — Stormwater Management, Quality Control	1
	1		Credit 7.1 — Heat Island Effect, Non-Roof	1
	1		Credit 7.2 — Heat Island Effect, Roof	1
1			Credit 8 — Light Pollution Reduction	1

2	3		Water Efficiency	Possible Points 5
Y	?	N		
1			Credit 1.1 — Water Efficient Landscaping, Reduce by 50%	1
	1		Credit 1.2 — Water Efficient Landscaping, No Potable Use or No Irrigation	1
	1		Credit 2 — Innovative Wastewater Technologies	1
1			Credit 3.1 — Water Use Reduction, 20% Reduction	1
	1		Credit 3.2 — Water Use Reduction, 30% Reduction	1

7	6	4	Energy & Atmosphere	Possible Points 17
Y	?	N		
Y			Prereq 1 — Fundamental Building Systems Commissioning	
Y			Prereq 2 — Minimum Energy Performance	
Y			Prereq 3 — Fundamental Refrigerant Management	
2			Credit 1.1 — Optimize Energy Performance, 14% New /7% Existing	2
2			Credit 1.2 — Optimize Energy Performance, 21% New / 14% Existing	2
	2		Credit 1.3 — Optimize Energy Performance, 28% New / 21% Existing	2
	2		Credit 1.4 — Optimize Energy Performance, 35% New / 28% Existing	2
		2	Credit 1.5 — Optimize Energy Performance, 42% New / 35% Existing	2
	1		Credit 2.1 — Renewable Energy, 2.5%	1
		1	Credit 2.2 — Renewable Energy, 7.5%	1
		1	Credit 2.3 — Renewable Energy, 12.5%	1
1			Credit 3 — Enhanced Commissioning	1
	1		Credit 4 — Enhanced Refrigeration Management	1
1			Credit 5 — Measurement & Verification	1
1			Credit 6 — Green Power	1

5	3	5	Materials & Resources	Possible Points 13
Y	?	N		
Y			Prereq 1 — Storage & Collection of Recyclables	
		1	Credit 1.1 — Building Reuse, Maintain 75% of Existing Walls, Floors and Roof	1
		1	Credit 1.2 — Building Reuse, Maintain 100% of Existing Walls, Floors and Roof	1
		1	Credit 1.3 — Building Reuse, Maintain 50% Interior Non-Structural Elements	1
1			Credit 2.1 — Construction Waste Management, Divert 50% from Landfill	1
1			Credit 2.2 — Construction Waste Management, Divert 75% from Landfill	1
		1	Credit 3.1 — Resource Reuse, 5%	1
		1	Credit 3.2 — Resource Reuse, 10%	1
1			Credit 4.1 — Recycled Content, 10% (post-consumer+ 1/2 post-industrial)	1
	1		Credit 4.2 — Recycled Content, 20% (post-consumer+1/2 post-industrial)	1
1			Credit 5.1 — Regional Materials, 10% Extracted, Processed & Manufactured Regionally	1
	1		Credit 5.2 — Regional Materials, 20% Extracted, Processed & Manufactured Regionally	1
	1		Credit 6 — Rapidly Renewable Materials	1
1			Credit 7 — Certified Wood	1

12	3		Indoor Environmental Quality	Possible Points 15
Y	?	N		
Y			Prereq 1 — Minimum IAQ Performance	
Y			Prereq 2 — Environmental Tobacco Smoke (ETS) Control	
	1		Credit 1 — Outdoor Air Delivery Monitoring	1
1			Credit 2 — Increased Ventilation	1
1			Credit 3.1 — Construction IAQ Management Plan, During Construction	1
1			Credit 3.2 — Construction IAQ Management Plan, Before Occupancy	1
1			Credit 4.1 — Low-Emitting Materials, Adhesives & Sealants	1
1			Credit 4.2 — Low-Emitting Materials, Paints and Coatings	1
1			Credit 4.3 — Low-Emitting Materials, Carpet	1
	1		Credit 4.4 — Low-Emitting Materials, Composite Wood & Agrifiber Products	1
	1		Credit 5 — Indoor Chemical & Pollutant Source Control	1
1			Credit 6.1 — Controllability of Systems, Lighting	1
1			Credit 6.2 — Controllability of Systems, Thermal Comfort	1
1			Credit 7.1 — Thermal Comfort, Design	1
1			Credit 7.2 — Thermal Comfort, Verification	1
1			Credit 8.1 — Daylight & Views, Daylight 75% of Spaces	1
1			Credit 8.2 — Daylight & Views, Views for 90% of Spaces	1

2	3		Innovation & Design Process	Possible Points 5
Y	?	N		
1			Credit 1.1 — Innovation in Design	1
	1		Credit 1.2 — Innovation in Design	1
	1		Credit 1.3 — Innovation in Design	1
	1		Credit 1.4 — Innovation in Design	1
1			Credit 2 — LEED™ Accredited Professional	1

6	Economic Benefit Credits
15	Environmental Benefit Credits
12	Occupant Benefit Credits

LEED v2.2 Scorecard

Establish Green Case LCCA

GREEN CASE INPUTS - AC Version

FULL SCHOOL INPUTS

ADMINISTRATION, DESIGN, AND ENGINEERING	% of Construction Cost for this Building Type
Project Administration	0.5%
A1 Design - Basic Services	3.5%
A2 Design - Special Services	1.0%
Commissioning Authority	0.25%
LEED Certification	0.25%
Total (% of total construction, calculated)	7.5%

CONSTRUCTION COSTS (by total building area)	$/SF
Site	$120
Shell	$120
MEP	$90
FF&E	$35
Subtotal ($/SF, calculated)	$403
Green Building Construction	1.0%
Total ($/SF, calculated)	$407

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Site Lighting	24,747	$0.0094
Water	Gallons / yr	$/SF-Yr
Site Irrigation	3,000,000	$0.01246
Other		$/SF-Yr
Site Maintenance - Labor		$0.200
Site Maintenance - Material		$0.050

REPLACEMENT COSTS	Capital Cost	Lifetime
Lamps	$44,670	3
HVAC Equipment	$257,500	15
Ceiling Tiles	$15,000	5
Hot Water Heater	$11,000	15
Roofing	$200,000	25
Residual Value (building only)	$/SF-Yr	$0.50

+ (

GREEN CASE INPUTS - AC Version

Classrooms

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Interior Lighting	15,702	$0.09
Ceiling Fans	0	$0.00
HVAC	235,997	$1.35
Plug Loads	17,709	$0.10
Other	0	$0.00
Total (calculated)	254,407	$1.44
Gas	MMBtu / yr	$/SF-Yr
Hot Water	0	
Cooking	0	
Total Gas Usage	0	$0.00
Water	Gallons / yr	$/SF-Yr
Domestic	456,200	$0.011
Kitchen	0	$0.000
Other	0	$0.000
Total	456,200	$0.011
Wastewater	Gallons / yr	$/SF-Yr
Total Use	441,990	$0.000
Other		$/SF-Yr
Maintenance - Labor		$1.00
Maintenance - Material		$0.15

+

GREEN CASE INPUTS - AC Version

Administrative / Faculty

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Interior Lighting	56,104	$0.27
Ceiling Fans	0	$0.00
HVAC	167,552	$1.21
Plug Loads	15,575	$0.10
Other	0	$0.00
Total (calculated)	277,178	$1.61
Gas	MMBtu / yr	$/SF-Yr
Hot Water	0	
Cooking	0	
Total Gas Usage	0	$0.00
Water	Gallons / yr	$/SF-Yr
Domestic	9,330	$0.001
Kitchen	0	$0.000
Other	0	$0.000
Total	9,330	$0.001
Wastewater	Gallons / yr	$/SF-Yr
Total Use	8,853	$0.000
Other		$/SF-Yr
Maintenance - Labor		$1.00
Maintenance - Material		$0.35

+

GREEN CASE INPUTS - AC Version

Library/Media/Computer Resource

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Interior Lighting	15,314	$0.09
Ceiling Fans	0	$0.00
HVAC	73,554	$1.42
Plug Loads	14,996	$0.27
Other	0	$0.00
Total (calculated)	103,444	$1.79
Gas	MMBtu / yr	$/SF-Yr
Hot Water	0	
Cooking	0	
Total Gas Usage	0	$0.00
Water	Gallons / yr	$/SF-Yr
Domestic	0	$0.000
Kitchen	0	$0.000
Other	0	$0.000
Total	0	$0.000
Wastewater	Gallons / yr	$/SF-Yr
Total Use	0	$0.000
Other		$/SF-Yr
Maintenance - Labor		$2.00
Maintenance - Material		$0.35

+

GREEN CASE INPUTS - AC Version

Cafetorium/Multi-Purpose

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Interior Lighting	7,294	$0.11
Ceiling Fans	0	$0.00
HVAC	0	$0.00
Plug Loads	555	$0.01
Other	0	$0.00
Total (calculated)	7,749	$0.12
Gas	MMBtu / yr	$/SF-Yr
Hot Water	0	
Cooking	0	
Total Gas Usage	0	$0.00
Water	Gallons / yr	$/SF-Yr
Domestic	0	$0.000
Kitchen	0	$0.000
Other	0	$0.000
Total	0	$0.000
Wastewater	Gallons / yr	$/SF-Yr
Total Use	0	$0.000
Other		$/SF-Yr
Maintenance - Labor		$1.00
Maintenance - Material		$0.30

+

GREEN CASE INPUTS - AC Version

Conventional Kitchen/Custodial

OPERATIONS AND MAINTENANCE		
Electricity	kWh / yr	$/SF-Yr
Interior Lighting	7,597	$0.11
Ceiling Fans	1,194	$0.03
HVAC	22,375	$0.97
Plug Loads	2,907	$0.13
Other	0	$0.00
Total (calculated)	33,073	$1.48
Gas	MMBtu / yr	$/SF-Yr
Hot Water	1,700	
Cooking	1,000	
Total Gas Usage	2,700	$1.43
Water	Gallons / yr	$/SF-Yr
Domestic	99,110	$0.031
Kitchen	0	$0.000
Other	0	$0.000
Total	99,110	$0.031
Wastewater	Gallons / yr	$/SF-Yr
Total Use	94,155	$0.000
Other		$/SF-Yr
Maintenance - Labor		$2.00
Maintenance - Material		$0.65

) =

GREEN CASE INPUTS - AC Version

TOTAL COSTS, SITE AND ALL BUILDING TYPES

ADMINISTRATION, DESIGN, AND ENGINEERING	% of Construction Cost for this Building Type		Total $
Project Administration	0.5%	=	$181,348
A1 Design - Basic Services	3.5%	=	$1,271,431
A2 Design - Special Services	1.0%	=	$363,837
Commissioning Authority	0.25%	=	$90,934
LEED Certification	0.25%	=	$90,934
Total (% of total construction, calculated)	7.5%	=	$2,903,324

CONSTRUCTION COSTS	$/SF		Total $
Site	$120	=	$43,580,850
Shell	$120	=	$43,580,850
MEP	$90	=	$32,685,638
FF&E	$35	=	$12,707,119
Green Construction Premium	$4		$1,451,203
Total ($/SF calculated)	$407	=	$147,806,334

REPLACEMENT COSTS	Capital Cost	Lifetime (years)
Lamps	$44,670	3
HVAC Equipment	$257,500	15
Ceiling Tiles	$15,000	5
Hot Water Heater	$11,000	15
Roofing	$200,000	25

→ See Green Case Calculations Tab

OPERATIONS AND MAINTENANCE					Total Annual $
Site Electricity	kWh / yr	$/SF of Site			
Site Lighting	24,747	$0.009		=	$4,707
Building	kWh / yr	$/SF of Building			
Interior Lighting	82,811	$0.13		=	$11,584
Ceiling Fans	1,194	$0.00		=	$167
HVAC	484,937	$1.07		=	$67,441
Plug Loads	49,119	$0.11		=	$6,870
Other	0	$0.00		=	$0
Total	847,748	$1.16		=	$104,973
Gas	MMBtu / yr	$/SF			Total Annual $
Hot Water				=	
Cooking				=	
Total Gas Usage	2,700	$0.07		=	$2,337
Water	Gallons / yr	$/SF			Total Annual $
Irrigation	3,000,000	$0.03		=	$4,000
Domestic	194,660	$0.07		=	$13,186
Kitchen	0	$0.00		=	$0
Other	0	$0.00		=	$0
Total	3,194,660	$0.09		=	$17,187
Wastewater	Gallons / yr	$/SF			Total Annual $
Total Use	194,017	$0.000		=	$0.00
Other		$/SF			Total Annual $
Site Maintenance - Labor		$0.20		=	$33,127
Site Maintenance - Material		$0.05		=	$8,282
Building Maintenance - Labor		$1.17		=	$193,751
Building Maintenance - Material		$0.26		=	$43,178
Residual Value (building only)		$/SF			Total Annual $
Total Residual Value		$0.50		=	$38,347

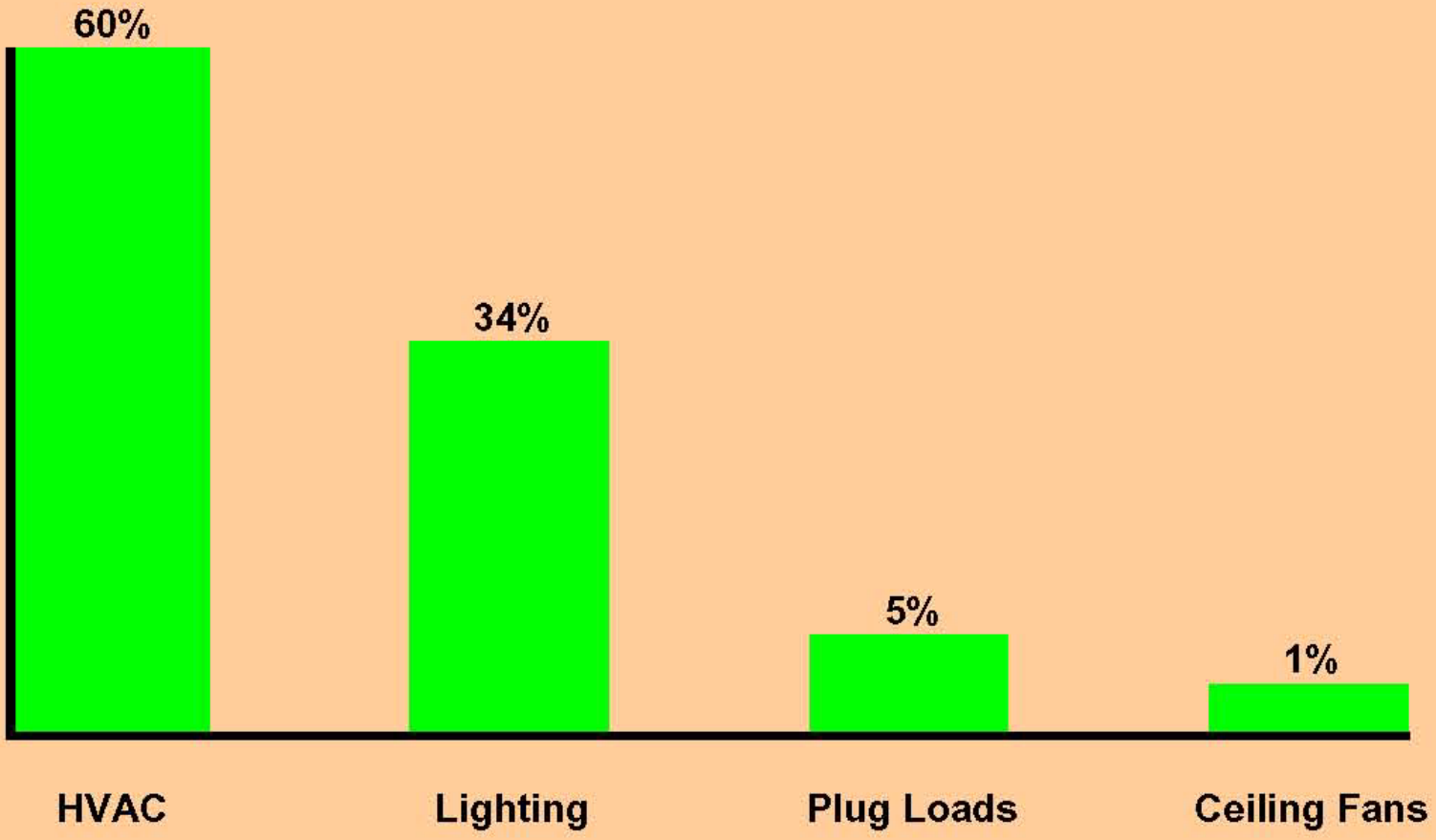
Annual O&M Cost Comparison

Cost Element	Base Case	Green Case	Savings
Site Electrical	4207	4207	None
Interior Lighting	32,860	13,942	18,918
Ceiling Fans	800	203	597
HVAC	116,152.00	82,443	33,709
Plug Loads	11,183.00	8,388	2,795
Total Electrical	165,202.00	109,183	56,019
Gas	6,210	5,589	621
Water - Irrigation	8,000	6,000	2,000
Water - Domestic	2,379	1,189	1,190
Sewer	Population	Population	None
Repairs & Maintenance	219,581	219,581	None
Annual O&M	**$ 401,372.00**	**$ 341,542.00**	**$ 59,830.00**

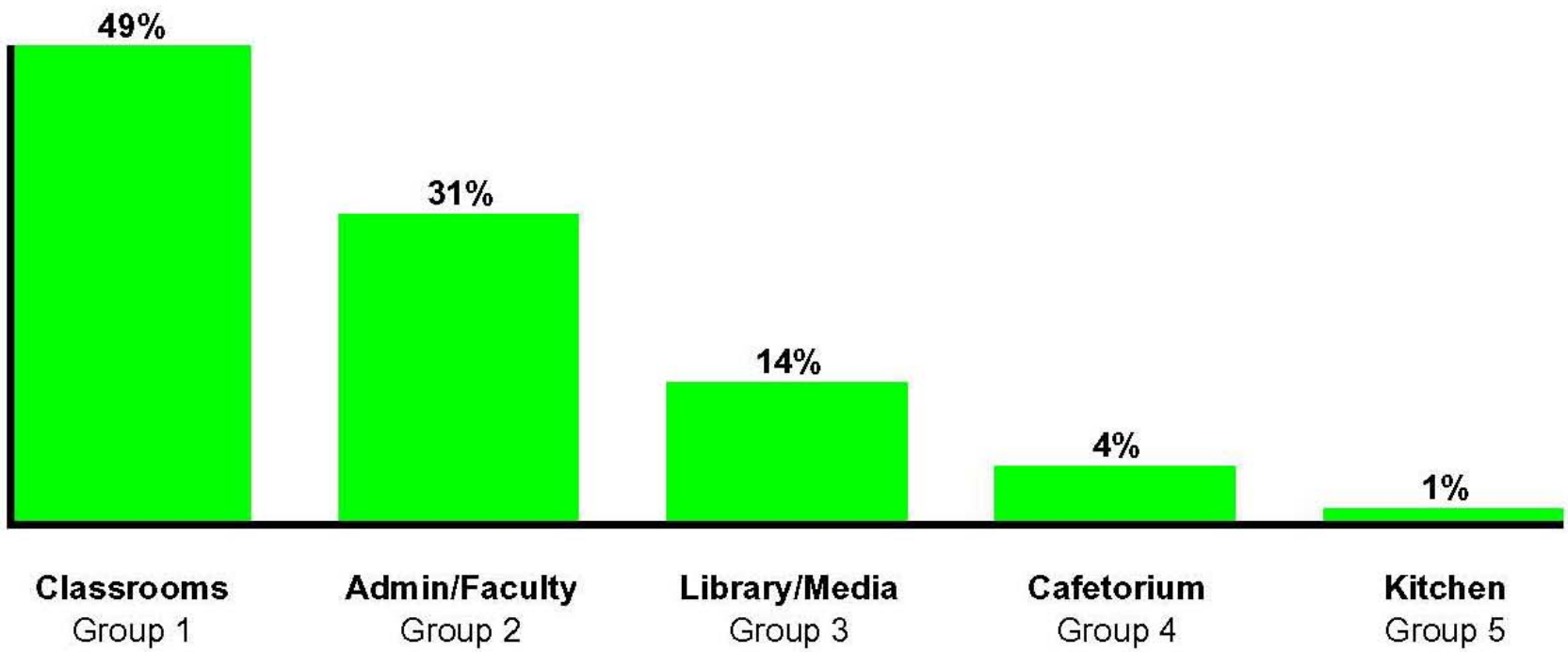
30 Year LCCA - Net Present Value

Life Cycle Cost	Base Case	Green Case
Project Administration	160,000	160,000
AE Basic Servics	1,760,000	1,760,000
AE Special Services	NA	320,000
Commissioning	NA	80,000
LEED Documentation	NA	80,000
Construction	31,990,000	32,310,000
Replacement Costs	680,000	525,000
Operations - Power	3,238,000	2,140,000
Operations - Gas	122,000	110,000
Operations - Water	203,000	141,000
Sewer	Population	Population
Repairs & Maintenance	4,475,000	4,304,000

Net Present Value	**42,628,000**	**41,930,000**
Soft Costs:	1,920,000	2,400,000
Construction Costs:	31,990,000 $415 per SF	32,310,000 $419 per SF



Energy Savings by Type



Percent of Energy Savings by Building Group Type

12 Case Studies of Sustainable Schools

No.	Case Study School	Location	Type	LEED
1	Roy Lee Walker	Texas	Elementary	No
2	Durant Middle School	North Carolina	Middle	No
3	Fossil Ridge High School	Colorado	High	Certified
4	Clackamas High School	Oregon	High	Silver
5	Clearview Elementary	Pennsylvania	Elementary	Gold
6	Willow School	New Jersey	K - 8	Gold
7	Third Creek Elementary	North Carolina	Elementary	Gold
8	Dalles Middle School	Oregon	Middle	Gold
9	Case Middle School (Punahou)	Hawaii	Middle	Gold (Reg)
10	Iolani High School Additions	Hawaii	High	No
11	Benjamin Franklin Elementary	Washington	Elementary	No
12	Cottage Lake Elementary Phase II	Washington	Elementary	No

Mainland Case Studies and Hawaii's Climate

LEED NC ScoreCard v2-2 Hawaii vs Mainland

8/18/2006

33	25	11	Total Project Score - DOE Elementary School	Possible Points 69

Certified 26 to 32 points Silver 33 to 38 points Gold 39 to 51 points Platinum 52 or more points

5	7	2	Sustainable Sites	Possible Points 14
Y	?	N		
Y			Prereq 1 Construction Activity Pollution and Prevention	
		1	Credit 1 Site Selection	1
	1		Credit 2 Development Density & Community Connectivity	1
		1	Credit 3 Brownfield Redevelopment	1
1			Credit 4.1 Alternative Transportation, Public Transportation Access	1
1			Credit 4.2 Alternative Transportation, Bicycle Storage & Changing Rooms	1
	1		Credit 4.3 Alternative Transportation, Low emitting and fuel-efficient vehicles	1
	1		Credit 4.4 Alternative Transportation, Parking Capacity	1
	1		Credit 5.1 Reduced Site Disturbance, Protect or Restore Habitat	1
1			Credit 5.2 Reduced Site Disturbance, Maximize Open Space	1
1			Credit 6.1 Stormwater Management, Quantity Control	1
	1		Credit 6.2 Stormwater Management, Quality Control	1
	1		Credit 7.1 Heat Island Effect, Non-Roof	1
	1		Credit 7.2 Heat Island Effect, Roof	1
1			Credit 8 Light Pollution Reduction	1

2	3		Water Efficiency	Possible Points 5
Y	?	N		
1			Credit 1.1 Water Efficient Landscaping, Reduce by 50%	1
	1		Credit 1.2 Water Efficient Landscaping, No Potable Use or No Irrigation	1
	1		Credit 2 Innovative Wastewater Technologies	1
1			Credit 3.1 Water Use Reduction, 20% Reduction	1
	1		Credit 3.2 Water Use Reduction, 30% Reduction	1

7	6	4	Energy & Atmosphere	Possible Points 17
Y	?	N		
Y			Prereq 1 Fundamental Building Systems Commissioning	
Y			Prereq 2 Minimum Energy Performance	
Y			Prereq 3 Fundamental Refrigerant Management	
2			Credit 1.1 Optimize Energy Performance, 14% New /7% Existing	2
2			Credit 1.2 Optimize Energy Performance, 21% New / 14% Existing	2
	2		Credit 1.3 Optimize Energy Performance, 28% New / 21% Existing	2
	2		Credit 1.4 Optimize Energy Performance, 35% New / 28% Existing	2
		2	Credit 1.5 Optimize Energy Performance, 42% New / 35% Existing	2
	1		Credit 2.1 Renewable Energy, 2.5%	1
		1	Credit 2.2 Renewable Energy, 7.5%	1
		1	Credit 2.3 Renewable Energy, 12.5%	1
1			Credit 3 Enhanced Commissioning	1
	1		Credit 4 Enhanced Refrigeration Management	1
1			Credit 5 Measurement & Verification	1
1			Credit 6 Green Power	1

5	3	5	Materials & Resources	Possible Points 13
Y	?	N		
Y			Prereq 1 Storage & Collection of Recyclables	
		1	Credit 1.1 Building Reuse, Maintain 75% of Existing Walls, Floors and Roof	1
		1	Credit 1.2 Building Reuse, Maintain 100% of Existing Walls, Floors and Roof	1
		1	Credit 1.3 Building Reuse, Maintain 50% Interior Non-Structural Elements	1
1			Credit 2.1 Construction Waste Management, Divert 50% from Landfill	1
1			Credit 2.2 Construction Waste Management, Divert 75% from Landfill	1
		1	Credit 3.1 Resource Reuse, 5%	1
		1	Credit 3.2 Resource Reuse, 10%	1
1			Credit 4.1 Recycled Content, 10% (post-consumer+ 1/2 post-industrial)	1
	1		Credit 4.2 Recycled Content, 20% (post-consumer+1/2 post-industrial)	1
1			Credit 5.1 Regional Materials, 10% Extracted, Processed & Manufactured Regionally	1
	1		Credit 5.2 Regional Materials, 20% Extracted, Processed & Manufactured Regionally	1
	1		Credit 6 Rapidly Renewable Materials	1
1			Credit 7 Certified Wood	1

12	3		Indoor Environmental Quality	Possible Points 15
Y	?	N		
Y			Prereq 1 Minimum IAQ Performance	
Y			Prereq 2 Environmental Tobacco Smoke (ETS) Control	
	1		Credit 1 Outdoor Air Delivery Monitoring	1
1			Credit 2 Increased Ventilation	1
1			Credit 3.1 Construction IAQ Management Plan During Construction	1
1			Credit 3.2 Construction IAQ Management Plan Before Occupancy	1
1			Credit 4.1 Low-Emitting Materials, Adhesives & Sealants	1
1			Credit 4.2 Low-Emitting Materials, Paints and Coatings	1
1			Credit 4.3 Low-Emitting Materials, Carpet	1
	1		Credit 4.4 Low-Emitting Materials, Composite Wood & Agrifiber Products	1
	1		Credit 5 Indoor Chemical & Pollutant Source Control	1
1			Credit 6.1 Controllability of Systems Lighting	1
1			Credit 6.2 Controllability of Systems Thermal Comfort	1
1			Credit 7.1 Thermal Comfort, Design	1
1			Credit 7.2 Thermal Comfort, Verification	1
1			Credit 8.1 Daylight & Views, Daylight 75% of Spaces	1
1			Credit 8.2 Daylight & Views, Views for 90% of Spaces	1

2	3		Innovation & Design Process	Possible Points 5
Y	?	N		
1			Credit 1.1 Innovation in Design	1
	1		Credit 1.2 Innovation in Design	1
	1		Credit 1.3 Innovation in Design	1
	1		Credit 1.4 Innovation in Design	1
1			Credit 2 LEED™ Accredited Professional	1

Achievable Climate Related Credits

Achievable General Credits

LEED v2.2 Scorecard

Survey of 12 Existing Sustainable Schools

Summary of Significant Emerging Trends

1. Daylighting is a primary strategy to reduce operational costs and improve performance of students, faculty, and staff. Over 75% of spaces are daylit.

2. Primary water conservation strategies include low-flow plumbing fixtures, and drought tolerant native landscaping.

3. Commissioning and M&V is a common characteristic of schools surveyed.

4. Increased up-front costs are perceived to be exceeded by operational savings.

5. Environmental goals were considered important, including water conservation, avoiding. pollution of water sources, and promoting water conservation awareness

6. Construction waste management is a common characteristic of surveyed schools.

7. Daylighting and good indoor air quality have produced noticeable improvements in productivity, occupant comfort, occupant health, student performance, and reduced absenteeism.

8. No significant evidence that construction budgets have increased. Perception is that achieving sustainable schools is more a product of best practice than more money.

9. Pursuing LEED certification was typically an independent decision of the school, and not a mandate by the local jurisdiction.

Rebuild Hawaii Consortium

August 22, 2006
HEI Training Room, 8th Floor
American Savings Bank Building

Update on the Cost/Benefit Analysis of Green vs. Conventional Schools

QUESTIONS?