LEED for Core & Shell Development: Potential Status

With the incorporation of a green roof and exchanging the current glazing to a more energy efficient low-emissivity glazing, the 77 K Street project would be well on its way to achieving LEED accreditation. The existing building has the potential for achieving four credits in the sustainable sites category and an additional two credits in the indoor environmental quality category. Incorporating the two design changes proposed in this report, the project would likely achieve ten credits, possibly achieve three additional, and help contribute to another four credits at a minimum. Consequently, the green roof and glazing alternative increased the project's point accrual from a possible six points to a possible seventeen. The breakdown of the current LEED status is outlined on the following two pages in the LEED for Core and Shell, Version 2.0 Project Checklist.

Also, of note, the project would be able to receive a number of additional credits by incorporating a number of simple and cost saving changes. These include reducing the size of the parking garage to the District of Columbia code minimum, adding parking spaces for hybrid vehicles, adding bicycle racks, requiring a LEED professional to work on the project, etc.

Equivalent Uniform Annual Cost Analysis

Below is an equivalent uniform annual cost (EUAC) analysis to determine the equivalent annualized cost of the existing 77 K Street conditions in comparison to the proposed design changes. The roofing system analysis includes anticipated annual maintenance costs. The glazing analysis includes only initial costs. Maintenance costs are minimal in comparison to the construction cost and would also be very similar, if not identical, for the two glazing types. An assumption is made that the interest rate the owner receives is 7%.

	ROOFING		GLAZING	
	Existing	Proposed	Existing	Proposed
Type	Ballasted EPDM	Green Roof	VE 1-85	VNE 1-63
Life	20 years	40 years	25 years	25 years
Initial Cost	$313,600	$618,400	$322,924	$359,344
Annual Maintenance	$8,000	$14,000	----	----
Annual Energy Savings	----	-$2,903	----	-$12,712

$EUAC_{Existing}$ = $313,600(A/P,7%,20) + $8,000 + $322,924(A/P,7%,25)
= $313,600(0.0944) + $8,000 + $322,924(0.0858)
= $65,310

$EUAC_{Proposed}$ = $618,400(A/P,7%,40) + $14,000 -$2,903 +$359,344(A/P,7%,25) - $12,712
= $618,400(0.0750) + $10,400 -$2,903 +$359,344(0.0858) - $12,712
= $72,000

The equivalent uniform annual cost analysis indicates that the existing system is just under $7,000 cheaper per year with a fixed interest rate of 7%. Though the glazing systems has a large energy savings with a minimal initial cost increase, the large discrepancy between the existing and proposed green roof is not able to be offset by the roughly $3,000 annual energy savings through the roofing system. Nonetheless, the proposed system is still highly encouraged as it would greatly reduce energy demands, is more environmentally friendly, and would help the building achieve LEED accreditation. The slightly more expensive redesigned building could be offset by in an increase of only $0.01 per square foot per month. Consequently, it can be ruled that the additional annualized cost is relatively inconsequential.

LEED Project Checklist

LEED for Core and Shell v2.0
Registered Project Checklist

Project Address:

Likely	Poss.	Contr.			
6			**Sustainable Sites**		**15** Points
Y			Prereq 1	**Construction Activity Pollution Prevention**	Required
1			Credit 1	**Site Selection**	1
1			Credit 2	**Development Density & Community Connectivity**	1
			Credit 3	**Brownfield Redevelopment**	1
1			Credit 4.1	**Alternative Transportation:** Public Transportation Access	1
			Credit 4.2	**Alternative Transportation:** Bicycle Storage & Changing Rooms	1
			Credit 4.3	**Alternative Transportation:** Low-Emitting and Fuel-Efficient Vehicles	1
			Credit 4.4	**Alternative Transportation:** Parking Capacity	1
			Credit 5.1	**Site Development:** Protect of Restore Habitat	1
			Credit 5.2	**Site Development:** Maximize Open Space	1
1			Credit 6.1	**Stormwater Design:** Quantity Control	1
			Credit 6.2	**Stormwater Design:** Quality Control	1
1			Credit 7.1	**Heat Island Effect,** Non-Roof	1
1			Credit 7.2	**Heat Island Effect,** Roof	1
			Credit 8	**Light Pollution Reduction**	1
			Credit 9	**Tenant Design & Construction Guidelines**	1

Likely	Poss.	Contr.			
	1		**Water Efficiency**		**5** Points
	1		Credit 1.1	**Water Efficient Landscaping:** Reduce by 50%	1
			Credit 1.2	**Water Efficient Landscaping:** No Potable Use or No Irrigation	1
			Credit 2	**Innovative Wastewater Technologies**	1
			Credit 3.1	**Water Use Reduction:** 20% Reduction	1
			Credit 3.2	**Water Use Reduction:** 30% Reduction	1

Likely	Poss.	Contr.			
2	1		**Energy & Atmosphere**		**14** Points
Y			Prereq 1	**Fundamental Commissioning of the Building Energy Systems**	Required
Y			Prereq 2	**Minimum Energy Performance**	Required
Y			Prereq 3	**Fundamental Refrigerant Management**	Required

***Note for EAc1:** All LEED for Core and Shell projects registered after June 26th, 2007 are required to achieve at least two (2) points under EAc1.

2	1		Credit 1	**Optimize Energy Performance**	1 to 8
				10.5% New Buildings or 3.5% Existing Building Renovations	1
			2	14% New Buildings or 7% Existing Building Renovations	2
				17.5% New Buildings or 10.5% Existing Building Renovations	3
				21% New Buildings or 14% Existing Building Renovations	4
				24.5% New Buildings or 17.5% Existing Building Renovations	5
				28% New Buildings or 21% Existing Building Renovations	6
				31.5% New Buildings or 24.5% Existing Building Renovations	7
				35% New Buildings or 28% Existing Building Renovations	8
			Credit 2	**On-Site Renewable Energy**	1
			Credit 3	**Enhanced Commissioning**	1
			Credit 4	**Enhanced Refrigerant Management**	1
			Credit 5.1	**Measurement & Verification** - Base Building	1
			Credit 5.2	**Measurement & Verification** - Tenant Sub-metering	1
			Credit 6	**Green Power**	1

Likely	Poss.	Contr.			
		4	**Materials & Resources**		**11** Points
Y			Prereq 1	**Storage & Collection of Recyclables**	Required
			Credit 1.1	**Building Reuse:** Maintain 25% of Existing Walls, Floors & Roof	1
			Credit 1.2	**Building Reuse:** Maintain 50% of Existing Walls, Floors & Roof	1
			Credit 1.3	**Building Reuse:** Maintain 75% of Interior Non-Structural Elements	1
			Credit 2.1	**Construction Waste Management:** Divert 50% from Disposal	1
			Credit 2.2	**Construction Waste Management:** Divert 75% from Disposal	1
			Credit 3	**Materials Reuse:** 1%	1
		1	Credit 4.1	**Recycled Content:** 10% (post-consumer + ½ pre-consumer)	1
		1	Credit 4.2	**Recycled Content:** 20% (post-consumer + ½ pre-consumer)	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
			Credit 6	**Certified Wood**	1
Likely	Poss.	Contr.			
2			**Indoor Environmental Quality**		**11** Points
Y			Prereq 1	**Minimum IAQ Performance**	Required
Y			Prereq 2	**Environmental Tobacco Smoke** (ETS) **Control**	Required
			Credit 1	**Outdoor Air Delivery Monitoring**	1
			Credit 2	**Increased Ventilation**	1
			Credit 3	**Construction IAQ Management Plan:** During Construction	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:** Carpet Systems	1
			Credit 4.4	**Low-Emitting Materials:** Composite Wood & Agrifiber Products	1
			Credit 5	**Indoor Chemical & Pollutant Source Control**	1
			Credit 6	**Controllability of Systems:** Thermal Comfort	1
			Credit 7	**Thermal Comfort:** Design	1
1			Credit 8.1	**Daylight & Views:** Daylight 75% of Spaces	1
1			Credit 8.2	**Daylight & Views:** Views for 90% of Spaces	1
Likely	Poss.	Contr.			
	1		**Innovation & Design Process**		**5** Points
	1		Credit 1.1	**Innovation in Design**: Provide Specific Title	1
			Credit 1.2	**Innovation in Design**: Provide Specific Title	1
			Credit 1.3	**Innovation in Design**: Provide Specific Title	1
			Credit 1.4	**Innovation in Design**: Provide Specific Title	1
			Credit 2	**LEED® Accredited Professional**	1
Likely	Poss.	Contr.			
10	3	4	**Totals (pre-certification estimates)**		61

Certified: 23 to 27 points, **Silver:** 28 to 33 points, **Gold:** 34 to 44 points, **Platinum:** 45 to 61 points