

Optimizing Points for LEED

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LEED Rating Systems

- New Construction
- Core and Shell
- Schools
- Existing Buildings: Operations and Maintenance
- Commercial Interiors
- Retail (Pilot)
- Healthcare (In Development)
- Homes
- Neighborhood Development

LEED Rating Systems

- LEED v3 took effect April 27, 2009
- Can't register under an older rating system after June 26, 2009

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- 10% Reduction as compared to the “baseline” building (for new construction)
- 5% Reduction as compared to the “baseline” building (for major renovations to existing buildings)
- Baseline building is defined by ASHRAE 90.1-2007, Appendix G with errata but without addenda.
- Computer Modeling is “REQUIRED”

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- Proposed Building “MUST” comply with the following:
 - Comply with Mandatory provisions (section 5.4, 6.4, 7.4, 8.4, 9.4 and 10.4)
 - Must include all energy costs
 - Process Energy “MUST” represent 25% of total energy costs (if it doesn’t then the LEED Submittal must include documentation substantiating process energy within the building).

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- Building Envelope, Section 5.4: Mandatory Provisions:
 - Insulation
 - Fenestration and Doors
 - Air Leakage
 - Building Envelope Sealing
 - Fenestration and Doors – comply with NFRC400
 - 1 CFM/SF for glazed swinging doors and revolving entrance doors
 - 0.4 CFM/SF for all products
 - Loading Dock Weatherseals
 - Vestibules

Energy & Atmosphere Prerequisite 2 – Minimum Energy Performance

- Heating, Ventilating and Air Conditioning Section 6.4: Mandatory Provisions:
 - Equipment Efficiencies, Verification and Labeling requirements.
 - Load Calculations
 - Controls
 - HVAC System Construction and Insulation
 - Completion Requirements
 - Drawings
 - Manuals
 - System(s) Balancing

Energy & Atmosphere Prerequisite 2 – Minimum Energy Performance

- Service Water Heating Section 7.4: Mandatory Provisions:
 - Load Calculations
 - Equipment Efficiencies
 - Service Hot Water Piping Insulation
 - Service Water Heating Controls
 - Pools
 - Heat Traps

Energy & Atmosphere Prerequisite 2 – Minimum Energy Performance

- Power Section 8.4: Mandatory Provisions:
 - Voltage Drop
- Lighting Section 9.4:
 - Lighting Control
 - Tandem Wiring
 - Exit Signs
 - Exterior Building Grounds Lighting
 - Exterior Building Lighting Power

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- Other Equipment 10.4: Mandatory Provisions:
 - Electric Motors

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- Process Loads include:
 - Office and General Miscellaneous Equipment
 - Computers
 - Elevators
 - Escalators
 - Kitchen cooking and refrigeration
 - Laundry washing and drying
 - Lighting exempt from lighting power allowance

Energy & Atmosphere Prerequisite 2 –
Minimum Energy Performance

- Prescriptive Paths:
 - ASHRAE Advanced Energy Design Guides
 - Small Office Buildings-2004
 - 20,000 SF or less
 - Small Retail Buildings-2006
 - 20,000 SF or less
 - Small Warehouses and Self Storage Buildings-2008
 - 50,000 SF or less

Energy & Atmosphere Prerequisite 2 – Minimum Energy Performance

- Prescriptive Paths:
 - Advance Buildings Core Performance Guide
 - 100,000 SF or less
 - Comply with Section 1 – Design Process Strategies
 - Comply with Section 2 –Core Performance Requirements
 - Healthcare, warehouse and laboratory spaces are ineligible to follow this path.

Energy & Atmosphere Credit 1– Optimized Energy Performance

Option 2: ASHRAE Advanced Design Guides: 1 pt

Option 3: Advanced Buildings Core Performance Guide: 1-3 pts

- 100,000 SF or less
- 1 pt for complying with sections 1 and 2
- Up to 2 more points for complying with Section 3
 - 1 pt for every three strategies implemented from Section 3, Enhanced Performance.
- The following strategies are not eligible because they are addressed in other LEED categories:
 - 3.1 Cool Roofs
 - 3.8 Night Venting
 - 3.13 Additional Commissioning

Energy & Atmosphere Credit 1– Optimized Energy Performance, Option 1

New Buildings	Existing Building Renovations	Points
12%	8%	1
14%	10%	2
16%	12%	3
18%	14%	4
20%	16%	5
22%	18%	6
24%	20%	7
26%	22%	8
28%	24%	9
30%	26%	10
32%	28%	11
34%	30%	12
36%	32%	13
38%	34%	14
40%	36%	15
42%	38%	16
44%	40%	17
46%	42%	18
48%	44%	19

Energy & Atmosphere Credit 1– Optimized Energy Performance, Option 1

Its all about "simple" math:

Process Energy is 25% if we want to achieve a 30% reduction for a new building and we "AREN'T" doing anything different with Process Energy then we must reduce the remainder of the energy costs by 40%.

25% Process Energy Costs + 75% All Other Energy Costs X 0.60 = 70% Total Energy Costs Reduction

If we don't control process loads or clearly identify them then to maximize points (ie achieve 19) then we must reduce all other energy costs by 64%!!!

Energy & Atmosphere Credit 1– Optimized Energy Performance, Option 1

Strategies for lowering energy costs

- Establish a "precise" list of process loads
 - "Don't GUESS!!"
- Establish a method for "controlling" process loads
- Better Envelope
- Daylighting
- Low Flow Service (hot) Water Fixtures
- High Efficiency Service Water Heating
- High Efficiency HVAC Systems
- High Efficiency Lighting Systems
- Heat Recovery Ventilation (in some cases)

Energy & Atmosphere Credit 1– Optimized Energy Performance, Option 1

Sample Projects and Strategies:

Hope Lake Lodge:

- Attic Insulation (R-60 vs R-38)
- Daikin Variable Refrigerant Volume System(s)
- Lighting (Compact Fluorescent)
- Heat Recovery Ventilation
- Ozone Treatment - Laundry

Rome Air Force Research Laboratories

- Variable Air Volume
- Lighting

SUMMARY

To obtain the greatest bang for the BUCK it has to be a TEAM effort, involving the:

Architect,
Electrical Designer/Contractor,
HVAC Designer/Contractor,
Plumbing Designer/Contractor ,
Elevator Design/Contractor ,
and Commissioning Agent.
