

A tale of two buildings

State energy efficiency, LEED initiatives



Carvel – Wilmington



Richardson & Robbins – Dover



Carvel

- 302,250 square feet
- Built in 1977
- Multiple agencies housed there
- Facilities Management is the driver
- Urban location, minimal greenspace
- Underground parking, transit line

R&R

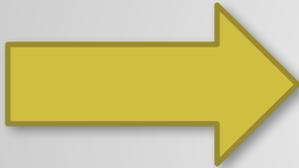
- 166,400 square feet
- Former cannery (1881)
- DNREC headquarters, green commitment
- DNREC employees are the drivers
- Dover location, abuts Silver Lake, more greenspace
- Surface parking lot, street parking



WOODHAVEN-HISTORIC

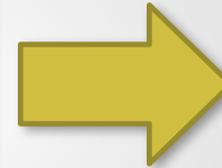
Project evolution

Governor Markell's
Executive Order 18



Creation of
Sustainable Energy
Utility (SEU)

Proposals from
Energy Services
Companies
(ESCOs)



SEU floated bonds
for energy
improvements

\$7.6 million
performance contract
with Ameresco to
achieve 24-34%
energy savings
(\$528,000 annually) at
these two buildings



Local Delaware Vendors/Suppliers

GESA Contractors and Suppliers List

ECM	ECM Description	Carvel Building	R&R Complex
01	Lighting System Improvements	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE) DEDC (DE)	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE) DEDC (DE)
02	Lighting Controls	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE) DEDC (DE)	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE) DEDC (DE)
03	Building Automation System	Modern Controls (DE)	Modern Controls (DE)
04	Furne Hood Controls	N/A	Flow Safe, Inc. (NJ) Battaglia (DE)
05	Cooling Tower Measures	Fluidics (DE)	Fluidics (DE)
06	Premium Efficiency Motors	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE)	N/A
07	Insulate Piping	Completed (By DFM)	N/A
08	Variable Volume Pumping	ID Griffith (DE)	N/A
09	Energy Efficient Transformers	Preferred Electric, Inc. (DE) PowerSmith (GA)	Preferred Electric, Inc. (DE) United Electric Supply Co. (DE)
10	Water Conservation	Battaglia (DE)	Battaglia (DE)
11	Replace Heat Pumps	ID Griffith (DE)	N/A
12	Photovoltaic Power Generation	KW Solar (DE) Motech Solar Panels (DE) Solar Dock (DE)	N/A
13	Energy Star Appliances	N/A	Ameresco (MA)
14	Envelop Measures	N/A	Wilkinson Roofing (DE)
15	Boiler Plant Upgrade	N/A	Battaglia (DE)
16	HVAC Unit Upgrades	N/A	Battaglia (DE)
17	LEED Certification Costs	Ameresco (MA)	Ameresco (MA)

For both buildings, the Project used 100% Delaware labor; and, 90% of equipment was supplied by DE suppliers, including:

- Solar panels
- Solar docking stations
- Lighting
- Lighting controls

Energy Conservation Measures

ECM #	ECM Description
01	Lighting System Improvements
02	Lighting Controls
03	Building Automation System
04	Fume Hood Controls
05	Cooling Tower Measures
06	Premium Efficiency Motors
07	Insulate Piping (complete by DFM)
08	Variable Volume Pumping
09	Energy Efficient Transformers
10	Water Conservation
11	Replace Heat Pumps
12	Photovoltaic Power Generation
13	Energy Star Appliances
14	Envelop Measures
15	Boiler Plant Upgrade
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17	Customer Managed Contingency
18	LEED Certification Costs



Retrofitting existing fixtures with high-efficiency lamps and some LEDs; installation of automated controls

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Optimize operation of cooling towers with new Variable Frequency Drives on the fans.

Above, new Pulse Power conditioning system at R&R

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Installed new premium efficiency units that will reduce the electric losses and lower the cooling load of the equipment rooms

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613 heat pumps replaced in Carvel Building

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Ameresco's projects account for about half of the credits needed to achieve LEED certification for both buildings.

They are providing documentation and supporting non-ESCO LEED credits.

Both buildings seeking certification under the LEED for Existing Buildings: Operations & Maintenance (EBOM) rating system.



LEED 2009 for Existing Buildings: Operations & Maintenance

Project Checklist

Project Name

Date

Sustainable Sites Possible Points: 26

Y	?	N			
			Credit 1	LEED Certified Design and Construction	4
			Credit 2	Building Exterior and Hardscape Management Plan	1
			Credit 3	Integrated Pest Mgmt, Erosion Control, and Landscape Mgmt Pt 1	1
			Credit 4	Alternative Commuting Transportation	3 to 15
			Credit 5	Site Development—Protect or Restore Open Habitat	1
			Credit 6	Stormwater Quantity Control	1
			Credit 7.1	Heat Island Reduction—Non-Roof	1
			Credit 7.2	Heat Island Reduction—Roof	1
			Credit 8	Light Pollution Reduction	1

Water Efficiency Possible Points: 14

Y	?	N			
			Prereq 1	Minimum Indoor Plumbing Fixture and Fitting Efficiency	
			Credit 1	Water Performance Measurement	1 to 2
			Credit 2	Additional Indoor Plumbing Fixture and Fitting Efficiency	1 to 5
			Credit 3	Water Efficient Landscaping	1 to 5
			Credit 4	Cooling Tower Water Management	1 to 2

Energy and Atmosphere Possible Points: 35

Y	?	N			
			Prereq 1	Energy Efficiency Best Management Practices	
			Prereq 2	Minimum Energy Efficiency Performance	
			Prereq 3	Fundamental Refrigerant Management	
			Credit 1	Optimize Energy Efficiency Performance	1 to 18
			Credit 2.1	Existing Building Commissioning—Investigation and Analysis	2
			Credit 2.2	Existing Building Commissioning—Implementation	2
			Credit 2.3	Existing Building Commissioning—Ongoing Commissioning	2
			Credit 3.1	Performance Measurement—Building Automation System	1
			Credit 3.2	Performance Measurement—System-Level Metering	1 to 2
			Credit 4	On-site and Off-site Renewable Energy	1 to 6
			Credit 5	Enhanced Refrigerant Management	1
			Credit 6	Emissions Reduction Reporting	1

Materials and Resources Possible Points: 10

Y	?	N			
			Prereq 1	Sustainable Purchasing Policy	
			Prereq 2	Solid Waste Management Policy	
			Credit 1	Sustainable Purchasing—Ongoing Consumables	1
			Credit 2.1	Sustainable Purchasing—Electric-Powered Equipment	1
			Credit 2.2	Sustainable Purchasing—Furniture	1
			Credit 3	Sustainable Purchasing—Facility Alterations and Additions	1
			Credit 4	Sustainable Purchasing—Reduced Mercury in Lamps	1
			Credit 5	Sustainable Purchasing—Food	1

Materials and Resources, Continued

Y	?	N			
			Credit 6	Solid Waste Management—Waste Stream Audit	1
			Credit 7	Solid Waste Management—Ongoing Consumables	1
			Credit 8	Solid Waste Management—Durable Goods	1
			Credit 9	Solid Waste Management—Facility Alterations and Additions	1

Indoor Environmental Quality Possible Points: 15

Y	?	N			
			Prereq 1	Minimum IAQ Performance	
			Prereq 2	Environmental Tobacco Smoke (ETS) Control	
			Prereq 3	Green Cleaning Policy	
			Credit 1.1	IAQ Best Mgmt Practices—IAQ Management Program	1
			Credit 1.2	IAQ Best Mgmt Practices—Outdoor	1
			Credit 1.3	IAQ Best Mgmt Practices—Increased Ventilation	1
			Credit 1.4	IAQ Best Mgmt Practices—Reduce Particulates in Air Distribution	1
			Credit 1.5	IAQ Mgmt Plan—IAQ Mgmt for Facility Alterations and Additions	1
			Credit 2.1	Occupant Comfort—Occupant Survey	1
			Credit 2.2	Controllability of Systems—Lighting	1
			Credit 2.3	Occupant Comfort—Thermal Comfort Monitoring	1
			Credit 2.4	Daylight and Views	1
			Credit 3.1	Green Cleaning—High Performance Cleaning Program	1
			Credit 3.2	Green Cleaning—Custodial Effectiveness Assessment	1
			Credit 3.3	Green Cleaning—Sustainable Cleaning Products, Materials Purch	1
			Credit 3.4	Green Cleaning—Sustainable Cleaning Equipment	1
			Credit 3.5	Green Cleaning—Indoor Chemical and Pollutant Source Control	1
			Credit 3.6	Green Cleaning—Indoor Integrated Pest Management	1

Innovation in Operations Possible Points: 6

Y	?	N			
			Credit 1.1	Innovation in Operations: Specific Title	1
			Credit 1.2	Innovation in Operations: Specific Title	1
			Credit 1.3	Innovation in Operations: Specific Title	1
			Credit 1.4	Innovation in Operations: Specific Title	1
			Credit 2	LEED Accredited Professional	1
			Credit 3	Documenting Sustainable Building Cost Impacts	1

Regional Priority Credits Possible Points: 4

Y	?	N			
			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

Sustainable Sites

Credits include:

- Stormwater management
- Habitat protection
- Alternative commuting
- Heat island reduction
- Light pollution reduction



Left, Rain garden built by DNREC employees. Above, preferred parking signs.

Water Efficiency



Installed 55 bathroom aerators at Carvel.

Credits include:

- Reducing water used for irrigation
- Plumbing fixture and fitting efficiency
- Cooling tower water management
- Metering water use

Energy and Atmosphere

Credits include:

- Optimizing energy performance
- Building Automation Systems
- Commissioning building systems
- Refrigerant management
- Renewable energy

Building automation system upgrades establish control sequences of: demand ventilation, night setback for unoccupied spaces, morning warm-up/cool-down and chilled/hot water temperature optimization.

Also consists of testing and balancing HVAC equipment.

Savings: \$39,368 at Carvel

Materials and Resources

Credits include:

- Sustainable purchasing of paper products, computers, appliances, furniture, even food
- Waste stream audit
- Recycling of consumables, durable goods
- Alterations and additions covered



Indoor Environmental Quality

Credits include:

- Green cleaning practices, purchases and equipment
- Occupant comfort
- Air quality management
- Integrated pest management



*New smoking ban
on state
property meets
LEED prerequisite*



Innovation, Regional Priority



*DNREC pursuing new
LEED pilot credit for bird
collision deterrence*

Other state LEED buildings

Killens Pond Nature Center,
Felton



Blue Ball Barn,
Concord Pike



Kent County
Courthouse,
Dover



Dover High School
(under construction) and
several other schools
throughout the state are in
progress



More than one-third of worldwide energy is consumed in buildings, accounting for about 17 percent of global carbon emissions.

In large cities, building energy use can account for up to 80 percent of carbon emissions.

The built environment is therefore a critical part of the climate change problem – and solution.

-- Clinton Foundation, Building Retrofit Program

Thank you.

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DNREC