3.3.4 PREFERRED SOLUTION

C. Sustainable Design

1. LEED-S V.4 Sustainability Scorecard
2. Designer Statement
3. Sustainability Narrative

LEED v4.1 BD+C: Schools

Project Checklist

Project Name: Doherty Memorial High School
Date: Dec-19

Y	?	N			
		1	Credit	Integrative Process	1

3	10	2	Location and Transportation		15
		N	Credit	LEED for Neighborhood Development Location	15
	1		Credit	Sensitive Land Protection	1
		2	Credit	High Priority Site	2
2	3		Credit	Surrounding Density and Diverse Uses	5
	4		Credit	Access to Quality Transit	4
	1		Credit	Bicycle Facilities	1
	1		Credit	Reduced Parking Footprint	1
1			Credit	Electric Vehicles	1

3	5	4	Sustainable Sites		12
Y			Prereq	Construction Activity Pollution Prevention	Required
Y			Prereq	Environmental Site Assessment	Required
1			Credit	Site Assessment	1
		2	Credit	Protect or Restore Habitat	2
		1	Credit	Open Space	1
	3		Credit	Rainwater Management	3
	2		Credit	Heat Island Reduction	2
1			Credit	Light Pollution Reduction	1
		1	Credit	Site Master Plan	1
1			Credit	Joint Use of Facilities	1

7	0	5	Water Efficiency		12
Y			Prereq	Outdoor Water Use Reduction	Required
Y			Prereq	Indoor Water Use Reduction	Required
Y			Prereq	Building-Level Water Metering	Required
1		1	Credit	Outdoor Water Use Reduction	2
3		4	Credit	Indoor Water Use Reduction	7
2			Credit	Cooling Tower Water Use	2
1			Credit	Water Metering	1

24	4	3	Energy and Atmosphere		31
Y			Prereq	Fundamental Commissioning and Verification	Required
Y			Prereq	Minimum Energy Performance	Required
Y			Prereq	Building-Level Energy Metering	Required
Y			Prereq	Fundamental Refrigerant Management	Required
5		1	Credit	Enhanced Commissioning	6
16			Credit	Optimize Energy Performance	16
	1		Credit	Advanced Energy Metering	1
		2	Credit	Grid Harmonization	2
3	2		Credit	Renewable Energy	5
	1		Credit	Enhanced Refrigerant Management	1

4	3	6	Materials and Resources		13
Y			Prereq	Storage and Collection of Recyclables	Required
Y			Prereq	Construction and Demolition Waste Management Planning	Required
		5	Credit	Building Life-Cycle Impact Reduction	5
1	1		Credit	Building Product Disclosure and Optimization - Environmental Product Declarations	2
	1	1	Credit	Building Product Disclosure and Optimization - Sourcing of Ra	2
1	1		Credit	Building Product Disclosure and Optimization - Material Ingre	2
2			Credit	Construction and Demolition Waste Management	2

6	2	7	Indoor Environmental Quality		16
Y			Prereq	Minimum Indoor Air Quality Performance	Required
Y			Prereq	Environmental Tobacco Smoke Control	Required
Y			Prereq	Minimum Acoustic Performance	Required
2			Credit	Enhanced Indoor Air Quality Strategies	2
1	1	1	Credit	Low-Emitting Materials	3
1			Credit	Construction Indoor Air Quality Management Plan	1
	1	1	Credit	Indoor Air Quality Assessment	2
1			Credit	Thermal Comfort	1
1			Credit	Interior Lighting	2
		3	Credit	Daylight	3
		1	Credit	Quality Views	1
		1	Credit	Acoustic Performance	1

6	0	0	Innovation		6
5			Credit	Innovation	5
1			Credit	LEED Accredited Professional	1

2	2	0	Regional Priority		4
1			Credit	Regional Priority: EAc2 Optimize Energy Performance	1
	1		Credit	Regional Priority: EAc5 Renewable Energy Production	1
1			Credit	Regional Priority: Wec Cooling Tower and Process Water	1
	1		Credit	Regional Priority: Indoor Water Use Reduction	1

55	26	28	TOTALS	Possible Points:	110

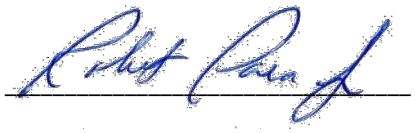
Certified: 40 to 49 points, **Silver:** 50 to 59 points, **Gold:** 60 to 79 points, **Platinum:** 80 to 110

During the PDP phase, the understanding was that the City's recent Nelson Place Elementary School and South High Community goals of LEED silver certification would be the benchmark for sustainable design. After further review and discussion, the decision was made to achieve LEED "Certified" as a minimum level.

This is an acknowledgement that the Worcester Public Schools District has identified a minimum goal of "Certified" using LEED for Schools V.4.1 for this project, and will exceed the level of energy efficiency required in the current MA (base) energy code by 10%, using the LEED for Schools Energy and Atmosphere "Optimize Energy Performance" credit submittal to demonstrate that performance. As their Designer, I have submitted a completed LEED scorecard showing a minimum of forty (40) attempted points, which will meet that goal.

The scope of work for this project will include the construction elements and performance tasks to achieve that goal, and all subsequent documents, including but not limited to, specifications, drawings and cost estimates will match the scope of work indicated in the submitted scorecard.

Robert Para, Jr., AIA
Lamoureux Pagano Associates | Architects



Sustainable Design is an important component of the Doherty High School program. The City of Worcester has established a program requirement "*for the development and evaluation of creative energy efficiency solutions and innovative alternative sustainable design solutions, including but not limited to active/passive solar, geothermal, etc. and identifying alternative funding sources, first costs and paybacks, investigate feasibility for 'net zero energy' facility design".*

The Doherty High School project provides an excellent opportunity to showcase sustainable design targets as outlined in local, state, and federal action plans.

The City of Worcester developed a Climate Action Plan in December 2006 (currently under revision).

The City speaks of their ongoing plans:

> *Worcester is strongly committed to sustainability. The City and many community partners have already been investing in environmental protection, renewable energy and many other green activities.*
> *During 2019-2020 we will develop a comprehensive and holistic Green Worcester Plan to bring sustainability values to all aspects of city life, including social and economic development. The Plan will draw on our city's unique strengths and challenges, identify environmental and sustainability priorities, and include short and longer-term actions.*
> *Our goal is to finalize and unveil the plan for the 50th anniversary of Earth Day on April 22, 2020!*

In the body of the Climate Action Plan, it is noted that the City Council, in March 2005, adopted a goal to attain 20% renewable electricity and the role of municipal buildings as a vanguard for the program to set an example for other private and public ventures is emphasized.

To address the strategies and opportunities for achieving Net Zero for the project, a Sustainable Design workshop/charrette will be organized in the Schematic Design Phase

A preliminary LEED scorecard was drafted as part of the PSR phase, (a copy is included in the following section) and the scorecard will be further refined as part of the Sustainable Design Charrette.

In regards to Net Zero feasibility, it was pointed out that important design parameters for the project include:

- Doherty High School is planned to be a year-round facility with 100% air conditioning
- A full-service kitchen with onsite food preparation is included in the program
- National Grid rebate program incentives toward energy usage will be reviewed and implemented
- The systems to be designed as maintainable for the current school facilities department

As a general strategy, it was recommended to first determine methods to reduce energy consumption, then evaluate renewable options to produce the required annual energy on site.

The following is a summary of potential strategies, and grant opportunities:

Potential On-Site Strategies:

- Optimal Orientation
- Passive Strategies; shading, thermal mass, and daylighting/skylights & natural ventilation
- Maximum Efficiency of Building Envelope, Lighting and Ventilation System
- Power Purchase Agreement
- Solar Photovoltaic / Solar Hot Water
- Green Roof
- Chiller Systems
- Sale of Renewable Energy Credits (RECs)

Potential Owner/User Strategies:

- Building as a tool for Education
- Behavioral Change programs
- Measurement and Verification
- Environmental Collaboration with adjacent parks

The City of Worcester may want to consider the following off-site strategies:

Potential Off-Site Strategies:

- Offsite Solar, Wind or Hydro-Electric generation
- BioMass/ Digestion System
- Co-generation of power
- Purchase of Renewable Energy Credits

References:

- City of Worcester: MA-Climate Action Plan, dated December 2006
- Green Worcester Plan http://www.worcesterma.gov/finance/energy-asset-management/green-worcester

Agencies sponsoring Incentives & Grants:

1. Massachusetts Department of Energy Resources (DOER)
2. MA Clean Energy Center
3. Utility Incentives: NGRID/NSTAR