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TOWN COUNCIL MEETING UPDATE
RIDE STAGE II SERVICES
BARRINGTON PUBLIC SCHOOLS, RI

APPROACH TO SUSTAINABILITY & RESILIENCY

04.01.24

Sustainability, a comprehensive approach...



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Envelope technology accounts for
30%
Of energy used

Higher levels of outdoor air contributes to higher test scores in math and reading

With proper ventilation rates, students complete schoolwork tasks
8% faster

Sense of belonging improves grades, engagement & advanced course selection

Connections between dampness, leaky envelopes & respiratory health

40 sec.
In nature, or views to nature, leads to fewer mistakes on focused tasks

In daylight classrooms, students progress
20% Faster on math tests
26% Faster on reading tests

Increases happiness and pro-social behavior

Sustainability ~ Where you are today...



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- 1 Many of the overall building systems are either at or past their useful life.
- 2 Most buildings have little to no wall insulation, air and vapor barriers, and failing sealants leading to excessive heat loss/gain.



School Building	Year Built
Barrington High School	1950 (73)
Hampden Meadows Elem. School	1956 (67)
Nayatt Elementary School	1954 (69)
Primrose Hill Elementary School	1954
Sowam	

68+ Years Old!
(Average age of original buildings)

Sustainability ~ Where you are today...



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- 1** *Primrose boiler in need of immediate replacement.*
- 2** *Little to no wall insulation, results in extreme temperature swings and energy waste*
- 3** *Lack of Thermal Comfort ~ extreme overheating in summer, cold in winter*
- 4** *Many buildings have varying vintage replacement components ~ difficult to fix, maintain & operate*
- 5** *Many of the educational spaces do not meet current codes for air exchange and filtration.*



Sustainability ~ Where you are today...



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- Many schools rely on original inefficient/converted boilers & original piping distribution (vintage circa 1960)
- Antiquated electrical distribution system & service yields wasted energy
- Reliance on portable AC units is inefficient, and is compounded by an inefficient building envelope
- Current utility bills at H.S. approx. \$1M per year !!!



Systems well past
their useful life!

CONTAINS ASBESTOS FIBERS
AVOID CREATING DUST
CANCER AND LUNG
DISEASE HAZARD

What is EUI?

Similar to a golf score, the lower the EUI the more efficient the building. EUI, or “Energy Use Intensity” measures the amount of energy used by the building per square foot annually.

	Existing: Unit Ventilators/ RTUs	Baseline: Code Minimum VAV
<i>Barrington High School</i>	83 EUI	70-80 EUI
<i>Nayatt Elementary</i>	136 EUI	
<i>Primrose Hill Elementary</i>	106 EUI	
<i>Sowams Elementary</i>	140 EUI	

What is EUI?

Similar to a golf score, the lower the EUI the more efficient the building. EUI, or “Energy Use Intensity” measures the amount of energy used by the building per square foot annually.

NOTE: Proposed EUI can likely reduce further as the exterior envelope is refined in subsequent phases of project development.

	Existing: Unit Ventilators/ RTUs	Baseline: Code Minimum VAV	Targeted/Proposed: High Efficiency VRF
Barrington High School	83 EUI	70-80 EUI	35-55 EUI
Nayatt Elementary	136 EUI		
Primrose Hill Elementary	106 EUI		
Sowams Elementary	140 EUI		

When completed, the buildings will be on average between **2.5-3X** more energy efficient than they are today.

Sustainability & Resiliency – Approach...



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Passive Solar Analysis

1



Roof repairs & insulation

2



All brand new systems

3



1. Building Placement
2. Tight Envelope
3. Efficient Systems
4. Healthy Interiors
5. Adaptability

Address leaks & humidity

4



De-clutter the roof for PV

5





1 Site Enhancements

- *Native plantings to reduce heat island affect; reduce potable water for irrigation; bioswales to control/naturally filter stormwater*

2 Exterior Envelope Improvements

- *New and/or modified roofing systems with proper insulation*
- *New insulation interior of exterior wall (entire perimeter)*
- *Modifications to fenestration to maximize natural daylighting inside the building*
- *Solar tubes to reduce/eliminate artificial light*
- *New doors, weatherstripping, and sealants*



3 Building Systems

- All new HVAC System: Variable Refrigerant Flow (VRF) heat pumps; dehumidification; dedicated ventilation/fresh air (DOAS)
- Lighting controls; occupancy sensors; daylighting sensors

4 Interior Environment

- Advanced filtration using MERV-13 filters
- Indoor thermal comfort and air quality (IAQ)

5 Design for Flexibility

- De-clutter the roof for future PV; plan for interior building systems equipment
- Build infrastructure/building structure to support future goals (site and building)
- Easy access to above-ceiling or in-wall wiring as technology/devices adapt

Summer due diligence work

- *Roof and exterior wall construction*
- *Analysis of passive solar, building orientation, natural daylight*
- *Immediate building/systems repairs*

Prioritize additional enhancements

- *Layering of multiple strategies for improved energy performance*
- *Develop plan for now & future (PV ready, geothermal wells)*
- *Commit to continuous improvement plan...*

Design flexible systems meant to adapt to future technologies)...constantly optimizing energy performance



In process of hiring consultants!





Investigate grant opportunities and funding

- **Federal** ~ Inflation Reduction Act (IRC Section 48)
- **Rhode Island Energy** ~ Path 1 through 4, Deep Energy Savings (Rebates for HVAC/Mechanical systems, Lighting, EV charging, Refrigeration Equipment)
- **FEMA** ~ “dry floodproofing”
- **RI** ~ **Efficient Building Fund (EBF)**



In process of hiring consultants!

ELIGIBILITY	FEDERAL TAX CREDIT
Property Owners/Developers	Transferable, One Time
Government Buildings Owners	Paid Directly by the IRS
Tax Exempt Building Owners	

ENERGY %	QUALIFICATION
6%	Base Credit
+24%	Bonus - for projects started before 01/29/23, or meeting prevailing wage req's
+10%	Domestic Content Bonus - 100% US steel/iron & 40% US manufactured products
+10%	Energy Community Bonus - located in brownfield, coal, oil, or natural gas sites
+10 or 20%	Low-Income Bonus - located in low-income or tribal lands, low-income housing

Federal tax credit for:

- Solar / PV
- Geothermal, Heat Pumps
- Combined heat & power system
- Waste Energy Recovery Properties

- Dynamic glass
- Fiber-optic Solar
- Fuel cells
- Small wind energy
- Standalone energy storage
- Qualified biogas property
- Microgrid controllers



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