Massachusetts School Building Authority

MA Schools Embrace a Sustainable Future

Hanlon-Deerfield Elementary School Building Project

“A SCHOOL IN THE WOODS”

Westwood, MA

12.02.2021

DORE + WHITTIER

Collaborated with Community Stakeholders

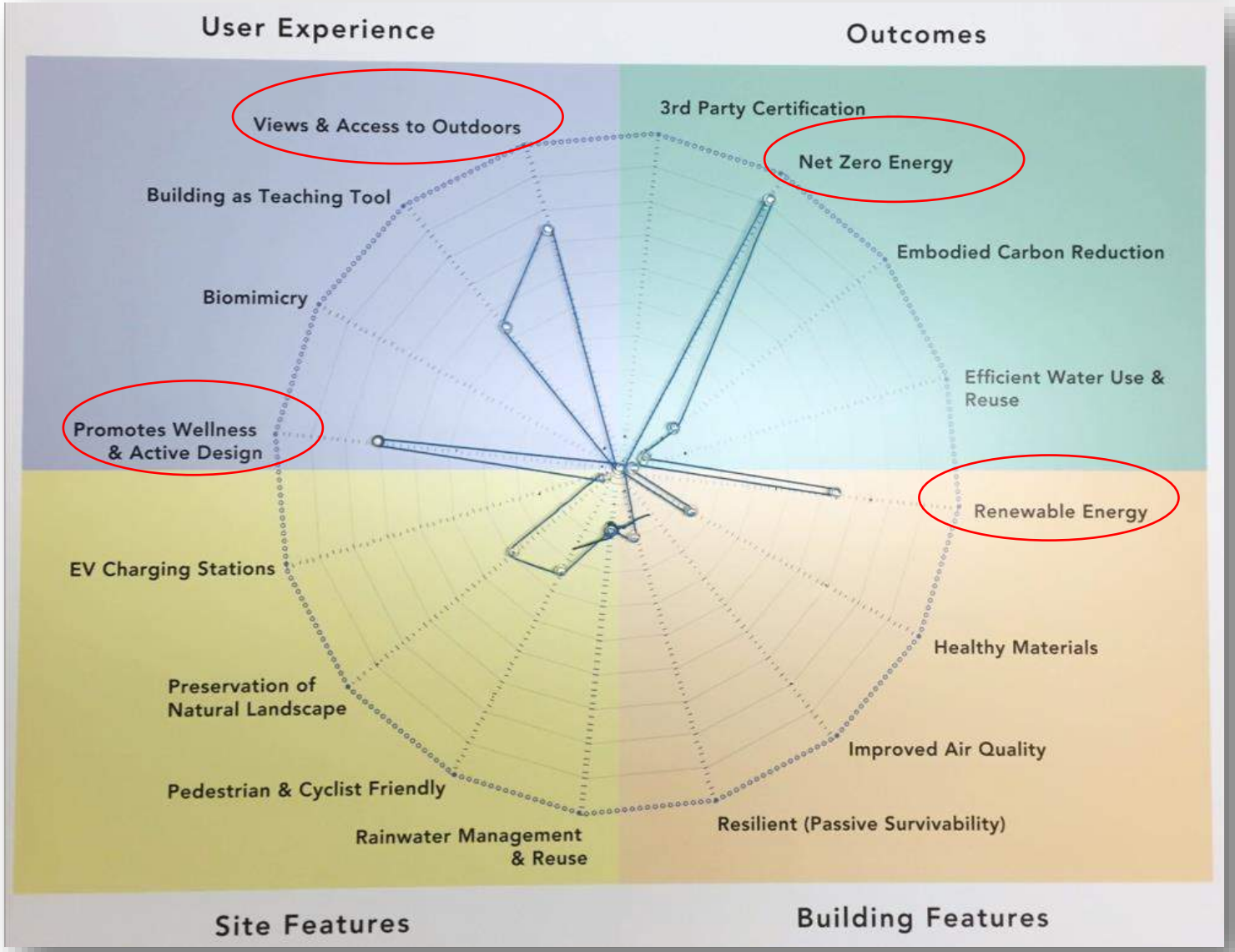
1st Charette: Identified Community Priorities

Westwood Resiliency & Sustainability Draft Comprehensive Plan

- **Importance of this project:**

  Schools are the largest energy consumers/emitters

- **Prioritize Carbon reductions**
- **Net Zero energy standards for new Town buildings**
- **Phase out fossil fuel use**
- **Discourage new natural gas hookups**
- **Install EV chargers**



Courtesy of: The Green Engineer

Iterative Investigation, Modeling and Analysis

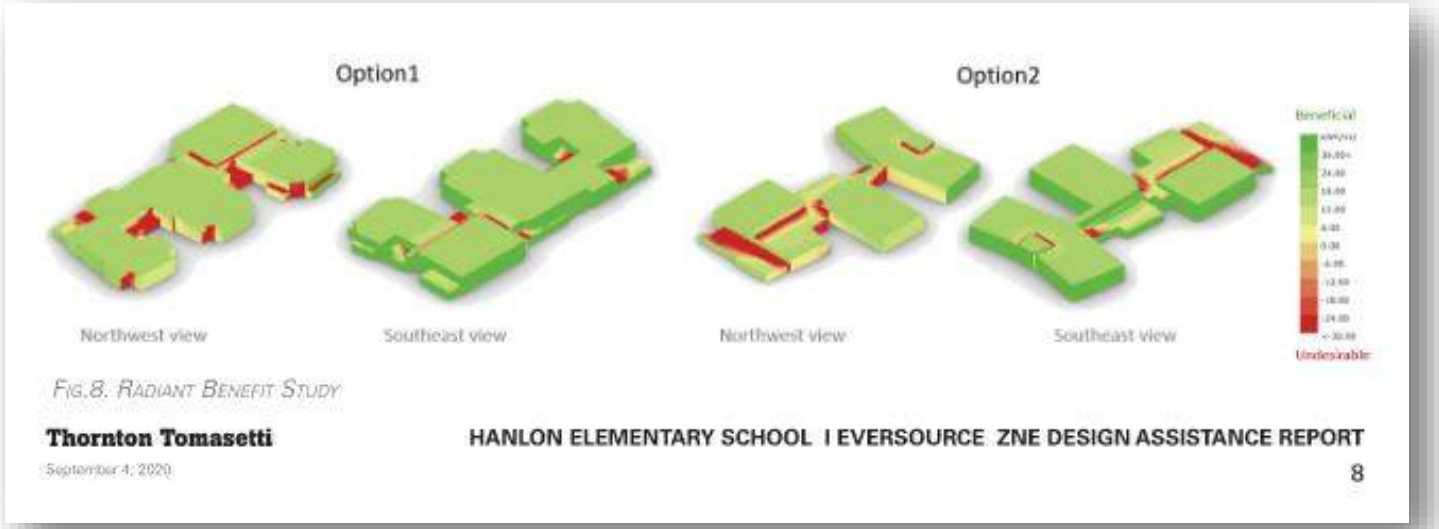


FIG.8. RADIANT BENEFIT STUDY

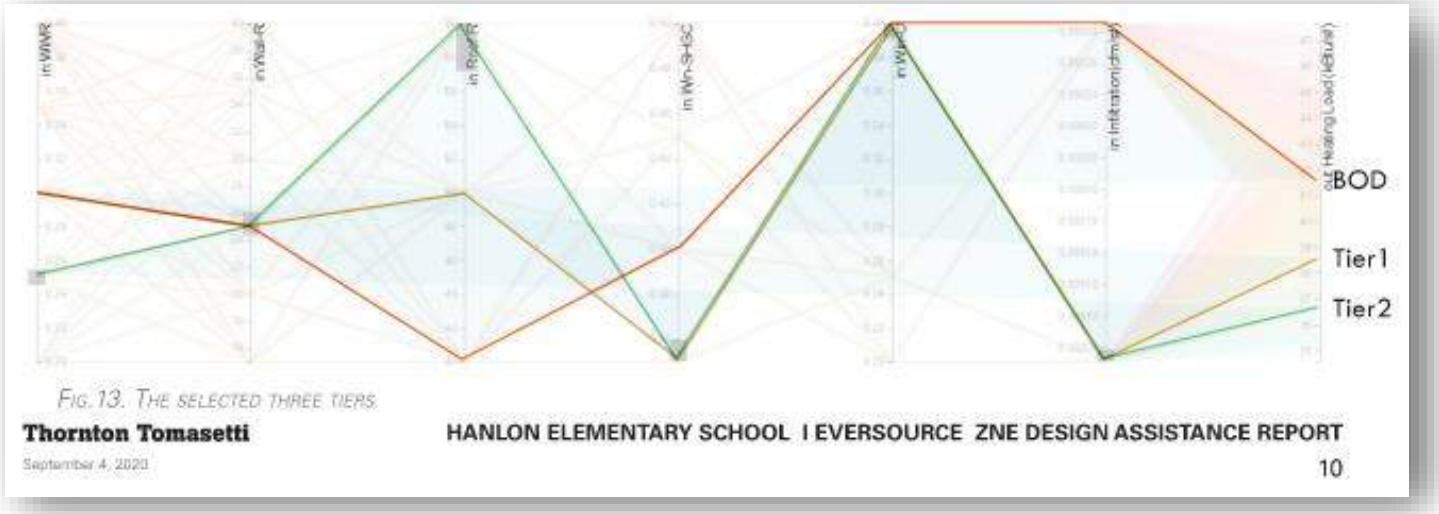
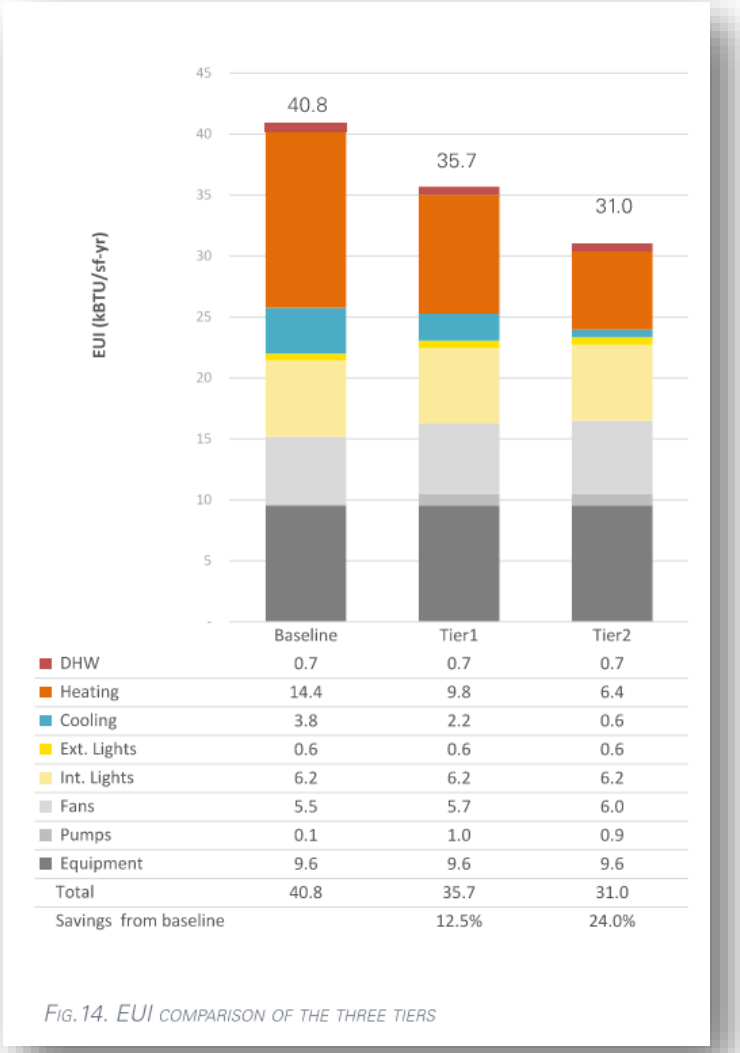


FIG.13. THE SELECTED THREE TIERS



	Baseline	Tier1	Tier2
DHW	0.7	0.7	0.7
Heating	14.4	9.8	6.4
Cooling	3.8	2.2	0.6
Ext. Lights	0.6	0.6	0.6
Int. Lights	6.2	6.2	6.2
Fans	5.5	5.7	6.0
Pumps	0.1	1.0	0.9
Equipment	9.6	9.6	9.6
Total	40.8	35.7	31.0
Savings from baseline		12.5%	24.0%

FIG.14. EUI COMPARISON OF THE THREE TIERS

Courtesy of: Thornton Tomasetti

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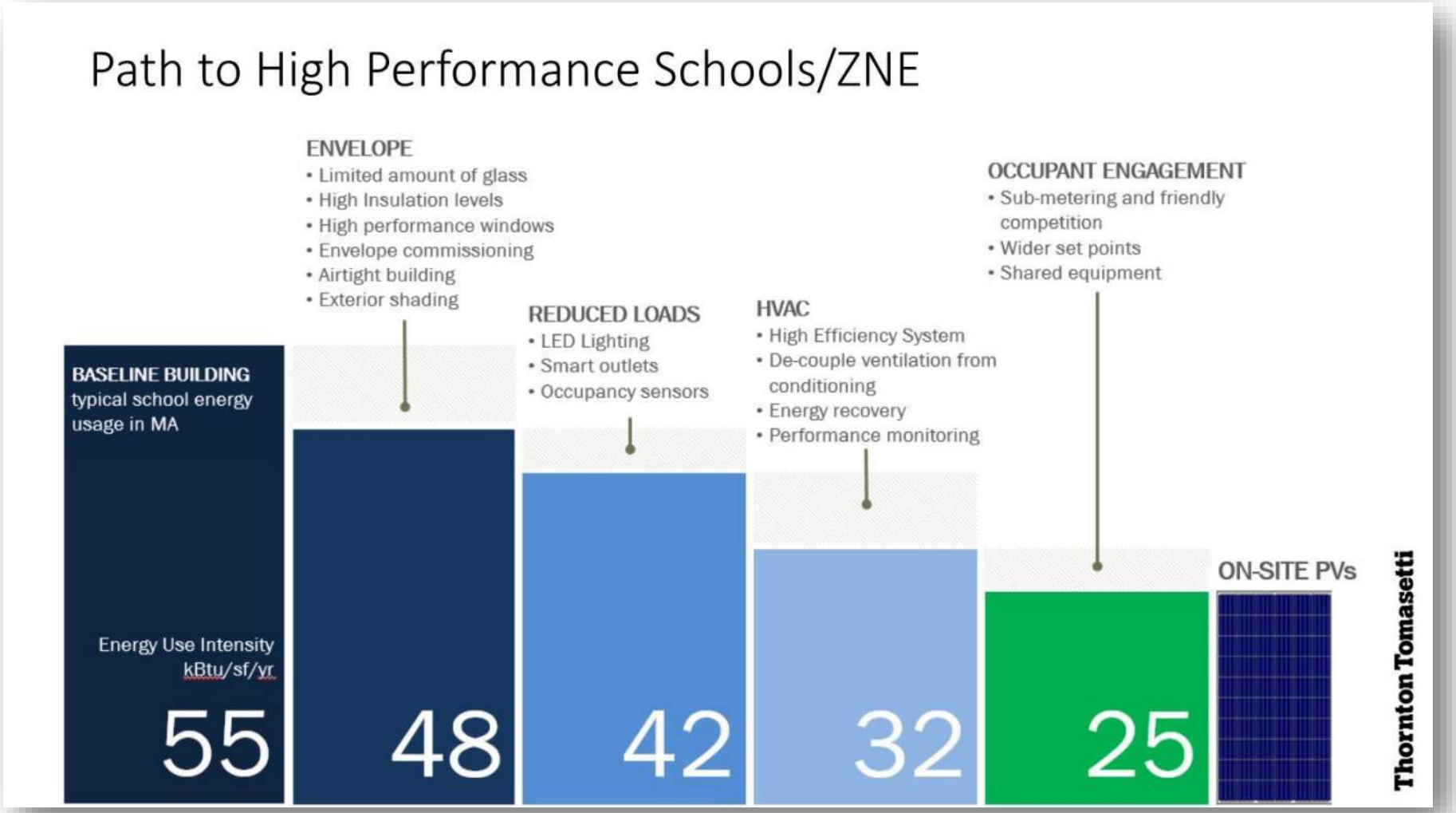
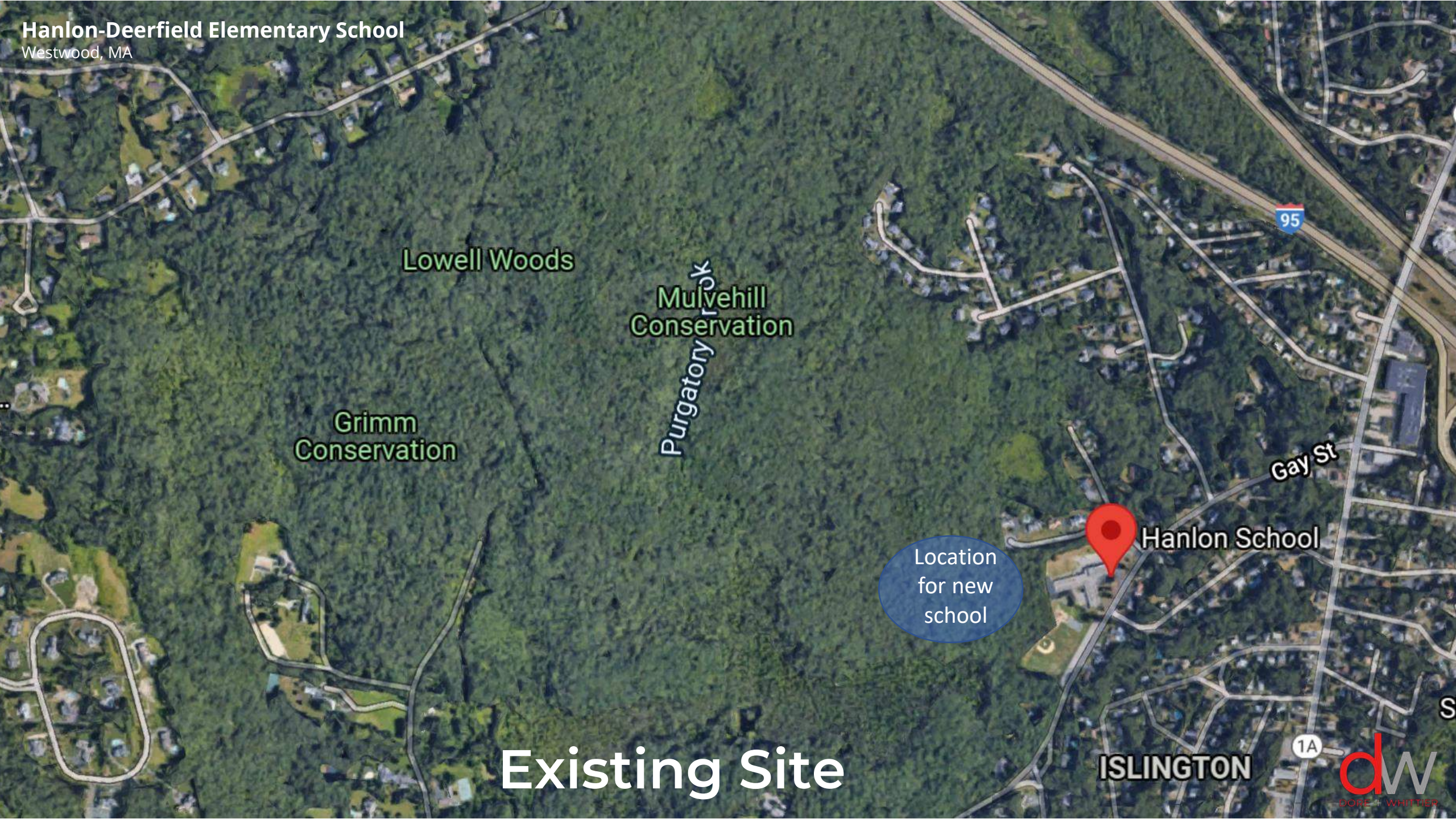
Identified Goals and Direction

Energy Use Intensity (EUI): energy consumed per square ft / year



EUI


Hanlon-Deerfield Elementary School
Westwood, MA
Lowell Woods
Mulvehill Conservation
Purgatory Brook
Grimm Conservation
95
Gay St
Hanlon School
Location for new school
ISLINGTON
1A
Existing Site

Hanlon-Deerfield Elementary School
Westwood, MA

Existing Site Inspiration
“a school in the woods”

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"a school in the woods"

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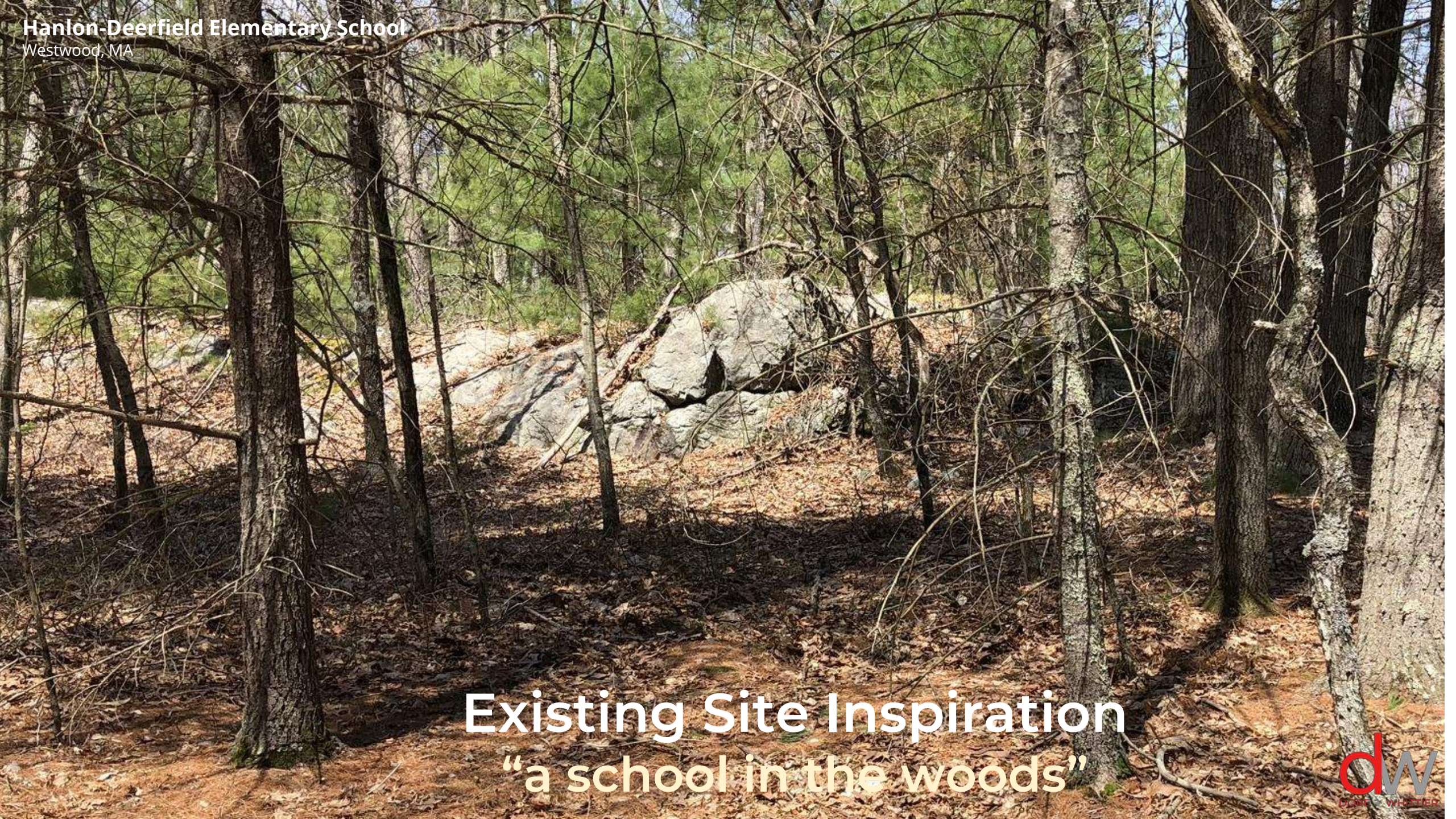

Existing Site Inspiration
“a school in the woods”

Hanlon-Deerfield Elementary School
Westwood, MA

Site Plan

113,141 sf building, 18.5 acres +/-

Hanlon-Deerfield Elementary School
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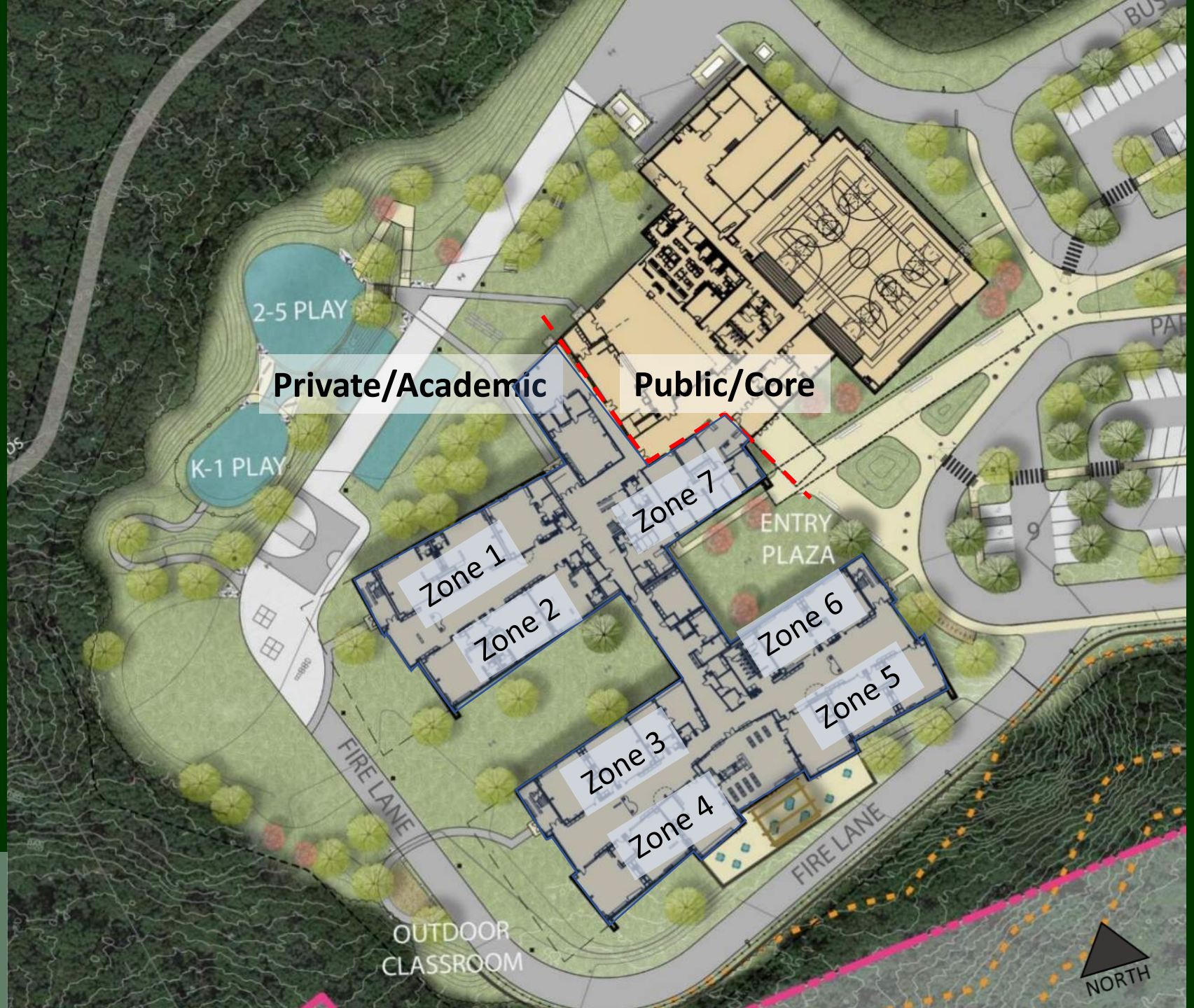

Site Plan

113,141 sf building, 18.5 acres +/-

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Daylighting Studies

Southern Classroom wing- integrated solar shading

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Southern Classroom wing- Outdoor Classroom

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View from Bus Loop

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Birdseye overall view of building, looking northwest

Hanlon-Deerfield Elementary School Westwood, MA

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View from Gay Street at northern entrance

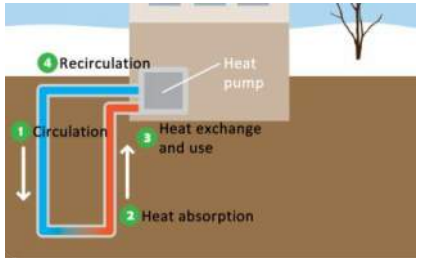
Hanlon-Deerfield Elementary School
Westwood, MA

Sustainable Design Benefits
Hanlon - Deerfield School Project

The proposed project plans to:

1. Minimize impact on the environment
2. Improve human health and well-being
3. Reduce economic impact over the life of the building

1. Minimize Impact on the Environment



- Low Energy and Zero Carbon use:
  - Super insulated and tight thermal envelope
  - Uses the ground for heating/cooling - without burning fossil fuels
  - Use controls for efficient use of HVAC, electricity (lights and outlets)

- Materials and Resources
  - Uses materials with low carbon footprint
  - Uses wood from sustainably harvested forests
  - Uses materials made from recycled materials and/or can be recycled

- Waste
  - Separates and recycles construction waste (96% avoid landfill)

- Water
  - Uses low-flow plumbing fixtures

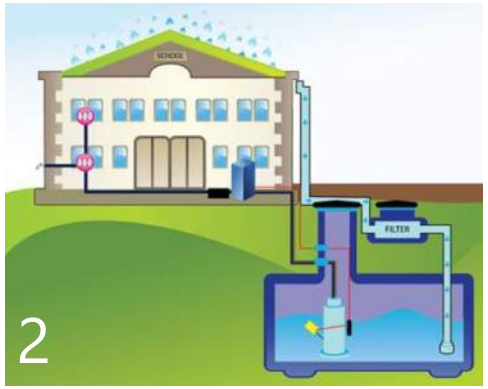
- Ecology
  - Uses native, drought tolerant, low maintenance plants, trees and shrubs
  - Limits construction footprint to preserve existing trees

2. Improve Human Health and Well Being

- Indoor Air Quality and monitoring
- Materials made of non-toxic substances
- Daylighting and views
- Using the building and site as teaching tools: help children (and teachers) understand the impact of their decisions

3. Reduce Economic Impact - $$


1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5

1. Increased thermal envelope = less energy to heat/cool
2. Fossil fuel free, highly efficient HVAC, electrical systems and controls
3. Well-planned daylight use = reduced need for artificial lights/electricity
4. Use Renewable Energy = Photovoltaic (Solar) Panels
5. Careful management by End User so **actual** energy savings achieve **designed** energy savings

Summary of Sustainable Features

1. **LEED v.4 Silver**

2. **Net Zero Energy Ready**

   - **Super insulated thermal envelope:** Passive House standards for air infiltration
   - **Geothermal wells** for heating and cooling
   - **Fossil fuel free** (all electric)
   - **Tracking predicted EUI of 22.6**
   - **Roof designed to support Photovoltaic Panels**
   - **Mass Save/Eversource Path 1 NZE schools**
   - **Solar shading integrated design**

3. **Highly efficient Electrical, HVAC, and Building Management System**

4. **Thoughtful management of water, sustainable materials and native landscaping**

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