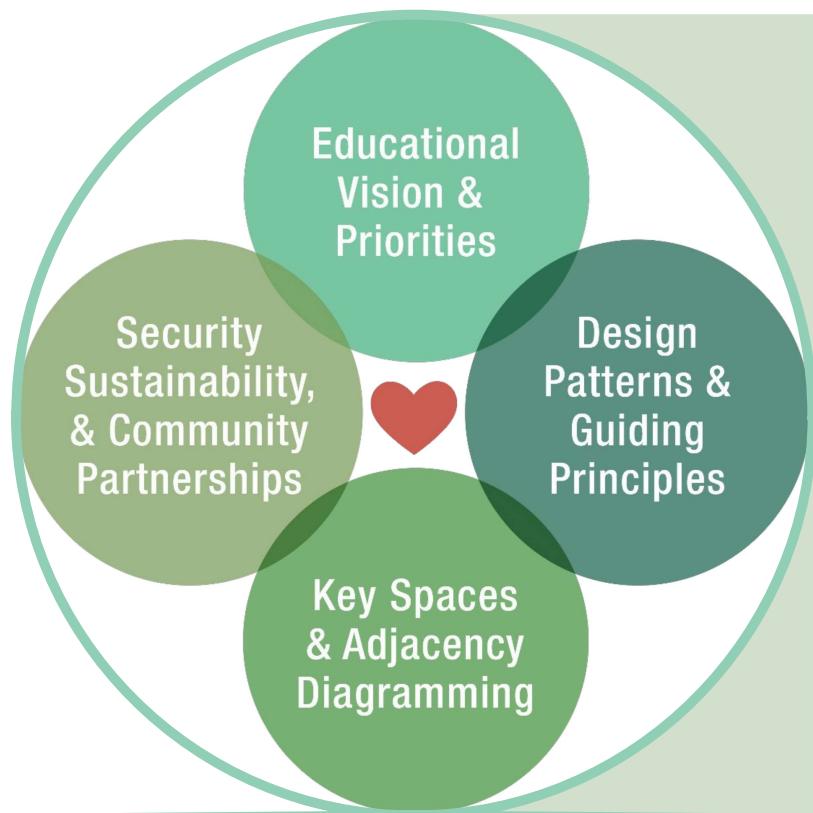


# Lexington High School

*Setting the benchmark for future projects in the Commonwealth, and across the country, for innovative design, efficiency, sustainability, and positive impact for the community.*



## Educational Planning & Sustainability | SMMA



# A Climate Resilient Lexington High School

Environmental  
Literacy

Health and  
Wellness



## Mentimeter Question(s)

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- » Name your top priority relative to Sustainability for the Lexington High School Project
- » What would you highlight on the first day you are giving a tour of the new or reimagined high school?
- » What would the newspaper headline be for the high school on the first day that it opens?

## Heathfulness

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- » Could we create a word cloud for these below?
  - Indoor [and Outdoor] Environmental Quality
  - Ample Daylight
  - Sustainable Materials
  - Healthier Materials Approach & Red List Materials
  - Biophilia & Access to Views
  - Active Site Design & Accessibility
  - Embodied Carbon
- » Mentimeter Question(s):
- » 2-3 minutes discussion from the audience

# HEALTHFULNESS



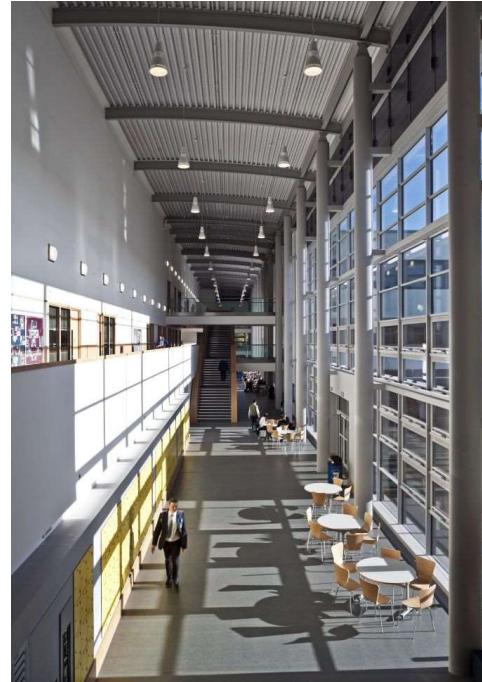
# COMFORT & WELLBEING



Light Quality & Views



Air Quality



Thermal Health



Noise

# SUSTAINABILITY GOALS: HEALTHY MATERIALS

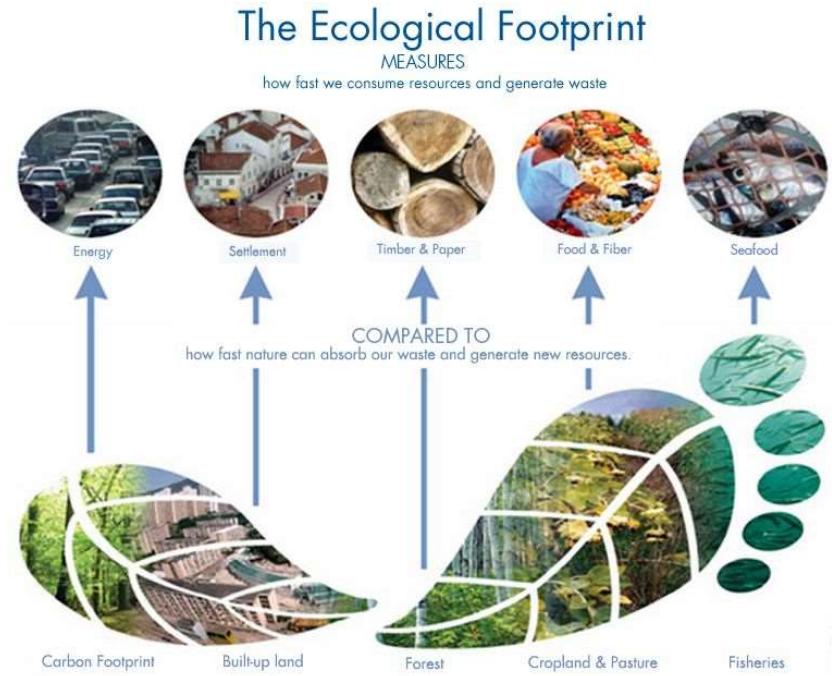
## New Building

- Where are the materials from?
- How are they manufactured?
- What are they made of?
- Will they impact our health?
- How are materials maintained?
- What happens at the end of the materials' life?



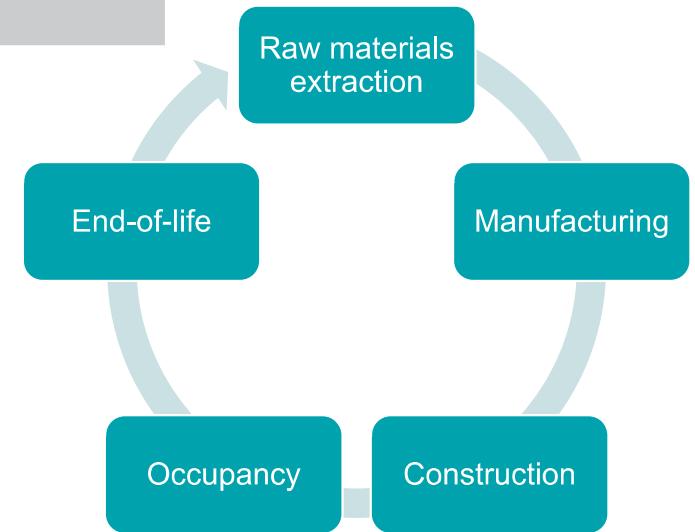
## Existing Building

- What can be salvaged? What needs to be removed?
- Where are our opportunities for positive change?
- Waste diversion



# HEALTHIER MATERIALS TIERED APPROACH

TIER 1: LEED Equivalency	TIER 2: Targeted Products	TIER 3: Division 9 Focus	TIER 4: Division 9 & Beyond
LEEDv4 equivalency for materials credits (HPDs for all identified product categories)	Identify the Top 10-15 products or product categories to vet using the <b>Red List</b> or class-based approach.	Vet all finishes in Division 9 using the Red List or a class-based approach	Vet all finishes in Division 9 & include other targeted categories that have the largest impact on human & environmental health



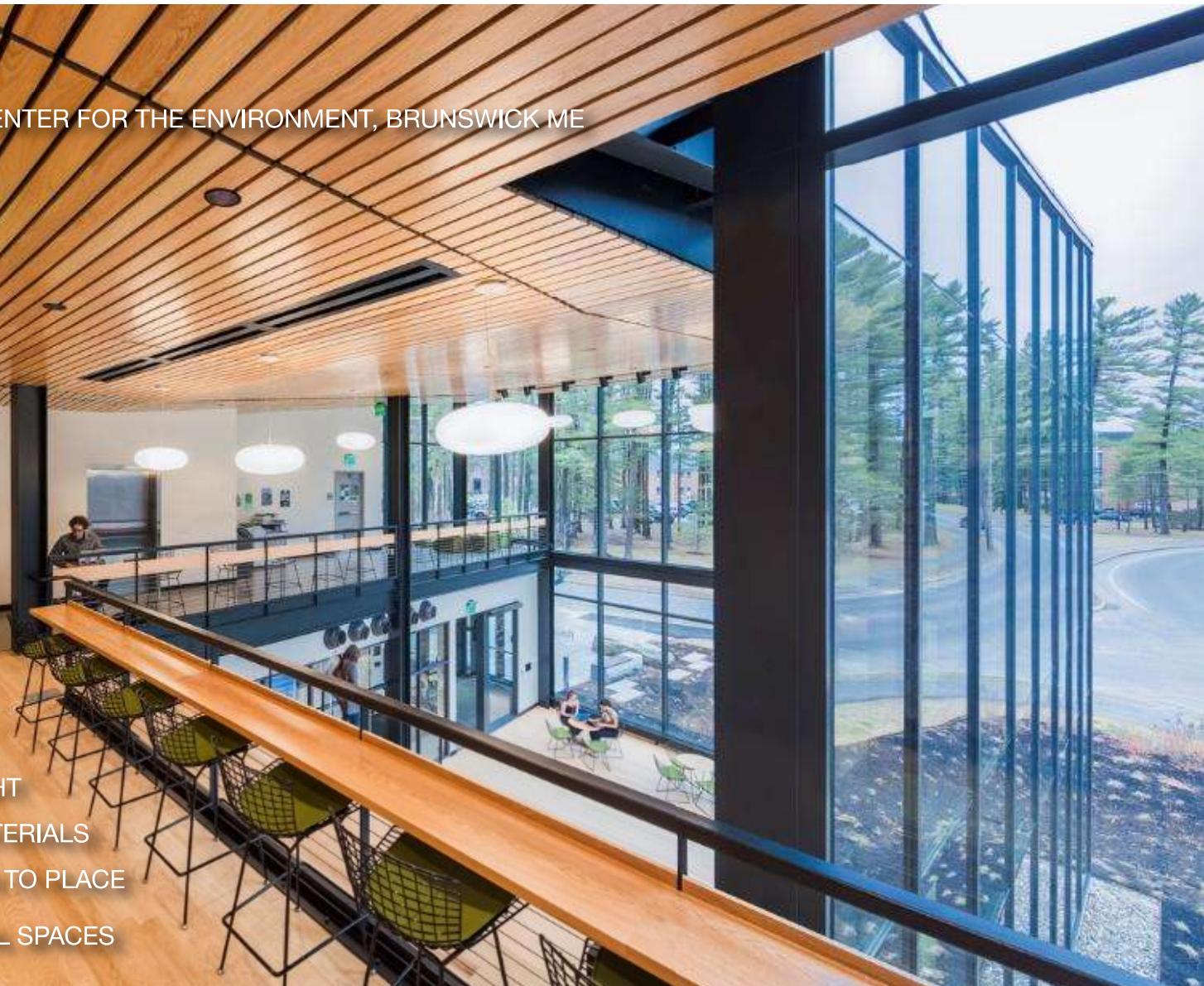
Thornton Tomasetti

# BIOPHILIA

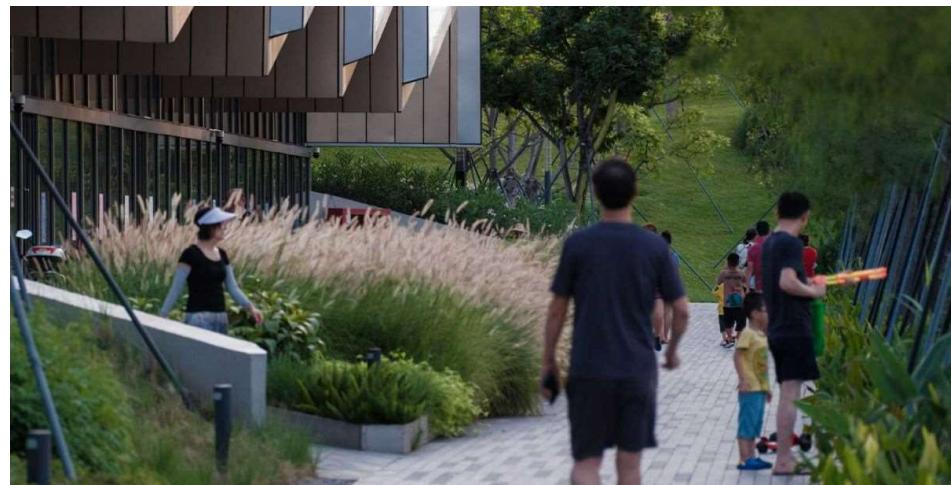
ROUX CENTER FOR THE ENVIRONMENT, BRUNSWICK ME



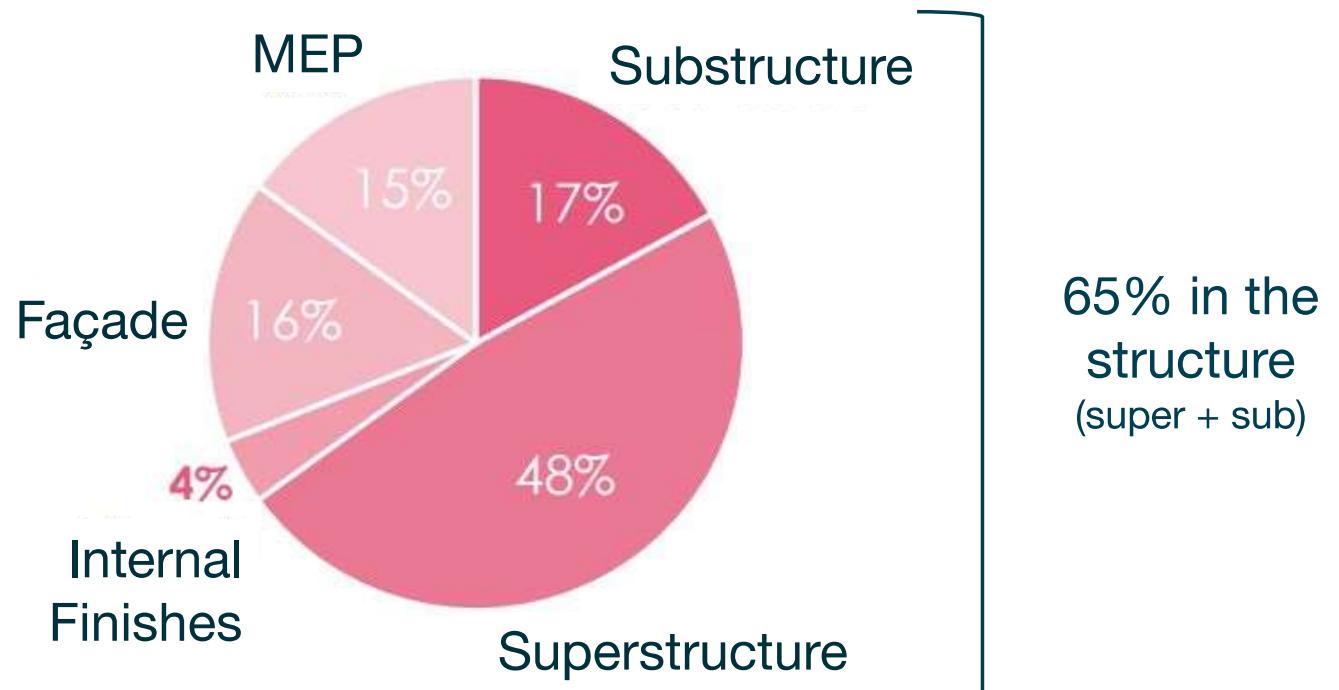
COLOR & LIGHT  
NATURAL MATERIALS  
CONNECTION TO PLACE  
TRANSITIONAL SPACES



# ACTIVE SITE DESIGN & EQUITABLE ACCESS



# WHERE IS THE EMBODIED CARBON?



# SUSTAINABILITY OF MASS TIMBER

## Areas of Impact:



1  
Embodied Carbon

2  
Construction  
Efficiency

3  
Deconstructability &  
Material Circularity

4  
Biophilic  
Design

5  
Occupant  
Wellbeing

## Energy

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» Could we create a word cloud for these below?

- Net Zero Energy
- Operational Carbon
- All-Electric Heating and Cooling
- Ventilation and Air Quality
- Renewable Energy (Solar PV)
- EUI (Energy Use Intensity)
- CEI (Carbon Emissions Intensity)

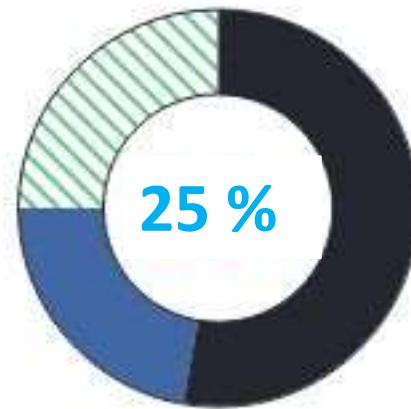
» Mentimeter Question(s):

» 2-3 minutes discussion from the audience

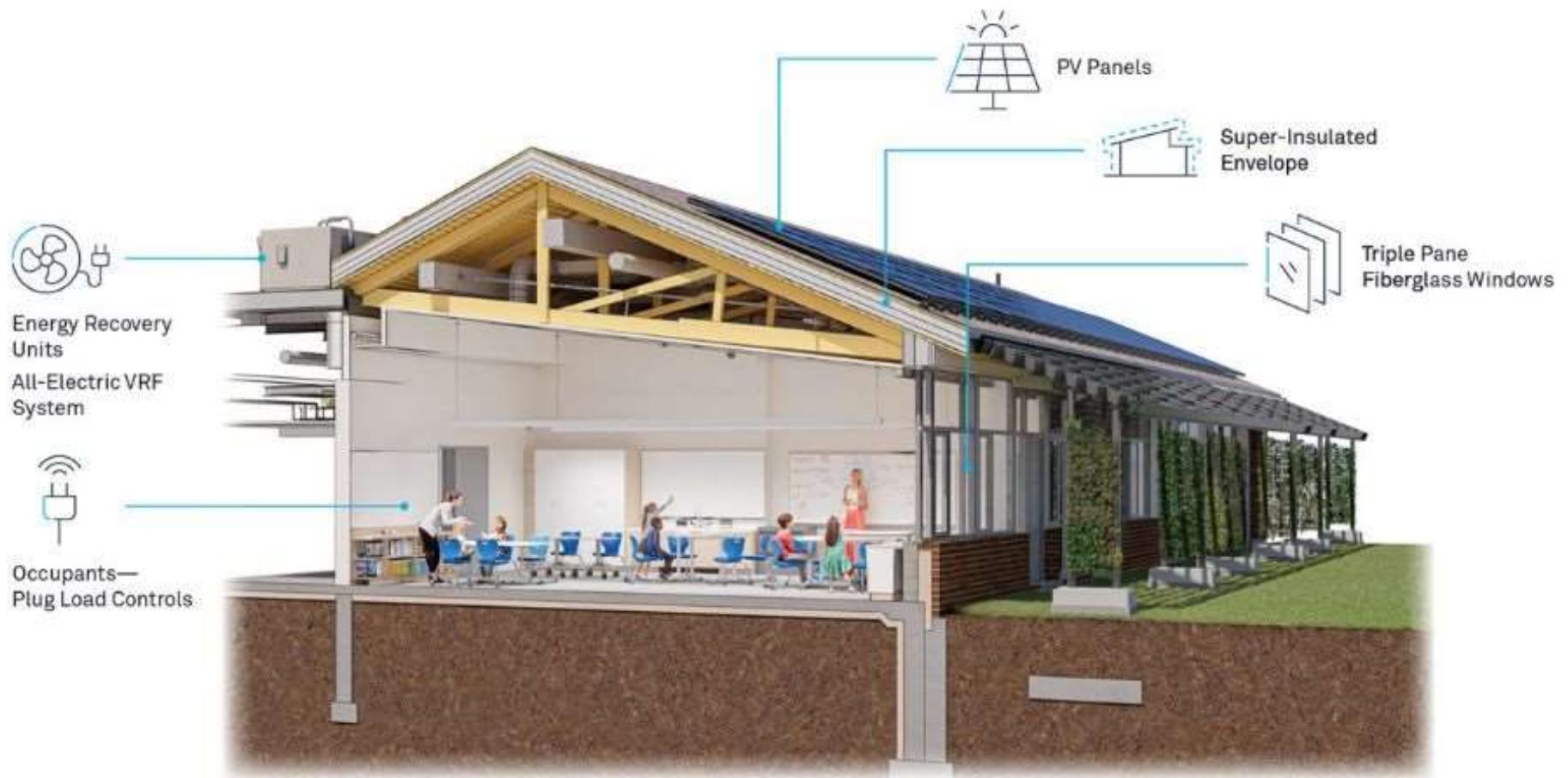
## Operational Carbon | SMMA



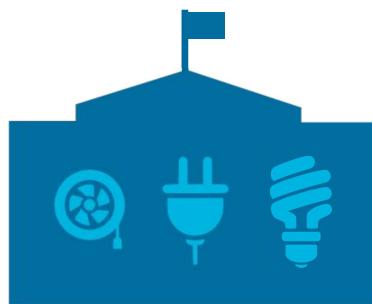
### Total Carbon



## Net Zero Energy | SMMA



Net Zero Energy | SMMA



Energy  
Consumption  
(KBTU/yr)

25 pEUI



People

20% Energy Use  
Contingency



Renewables

PV [Sizing]

= 0

Net Zero  
Energy

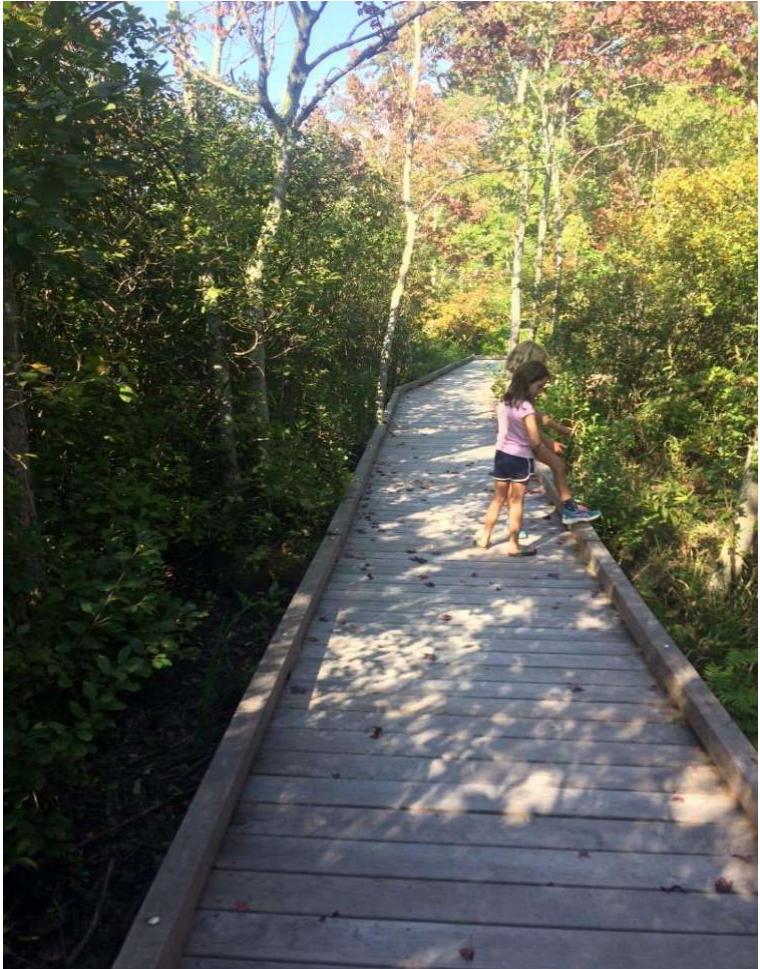
## Environmental Literacy

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- Could we create a word cloud for these below?
  - Building as a Teaching Tool
  - Outdoor Classrooms
  - Occupant Behaviors and Monitoring
  - Ventilation and Air Quality
  - Green Educational Program [Should we show a sample for signage/tour booklet, etc.?]
- Mentimeter Question(s):
- 2-3 minutes discussion from the audience

## Building as a Teaching Tool |SMMA





## Outdoor Classrooms | SMMA

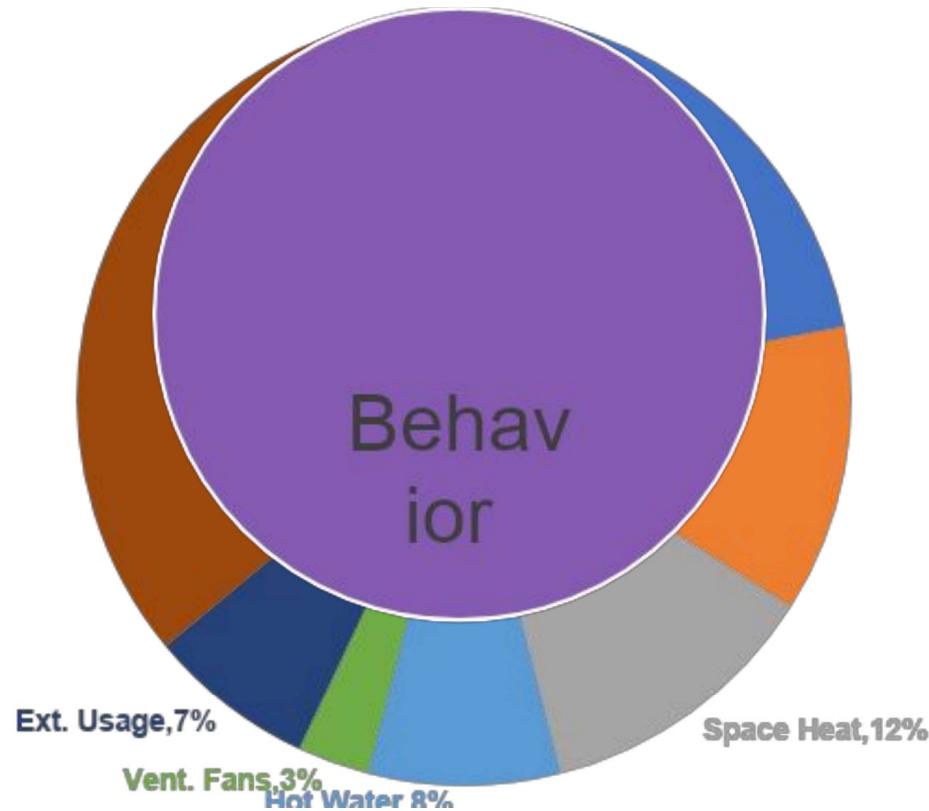
## Occupant Behaviors and Monitoring | SMMA



People

**20% Energy Use  
Contingency**

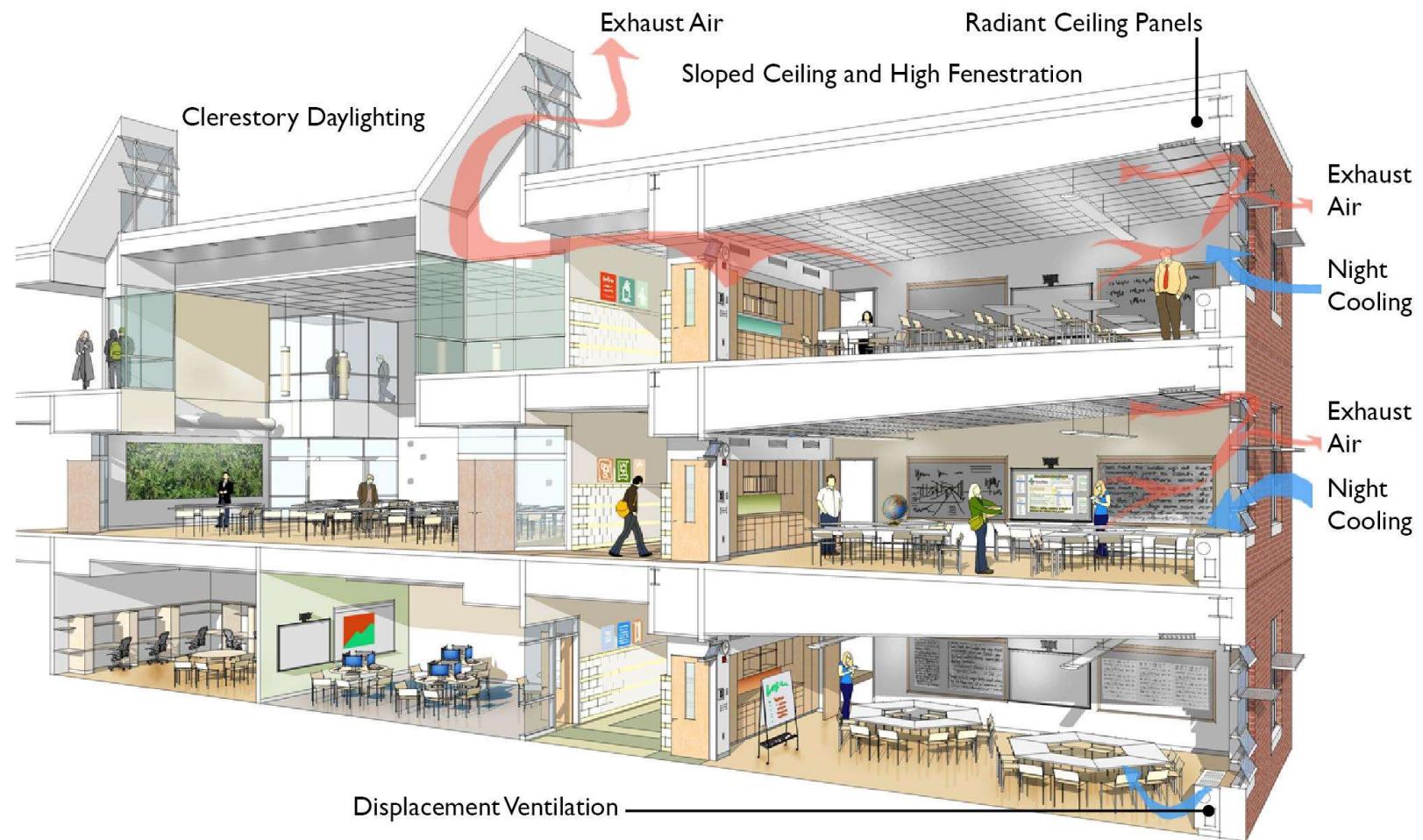
**Operations**



**Environmental Literacy**

**Plug Load Management**

## Ventilation and Air Quality | SMMA



# Green Educational Program | SMMA

## Sustainable Materials Sustainable Materials Attributes

Using materials with recycled content produced in the region and/or with Forest Stewardship Certification wood has proven to reduce the **depletion** of resources and habitat. The Forest Stewardship Certification (FSC) is one of the strictest and trusted sustainable forest management standards. FSC created certification for sustainable forestry. FSC's forest management certification confirms that the forest is being managed to preserve **biological diversity** and to benefit local people and workers' lives while making sure it sustains **economic viability**.

Degrading means to reduce in amount by using up.

**Biological Diversity** refers to the variety and variability of life on Earth.

**Economic Viability** refers to whether or not something is worth more than its costs.

Recycling construction and demolition debris partially contribute to a **circular economy** where the materials find a second life as part of another material or manufacturing process. Phelps Elementary School strived to achieve 25% overall combined materials attributes, with a 75% FSC wood minimum for wood products, veneer, and composites, and up to 95% construction waste recycling by volume.



A **Circular Economy** is an economic system where resources are used continuously through recycling and reuse.

## Water Efficiency Indoor Water Use

High-quality potable water is a critical resource that is becoming increasingly **endangered** through waste and pollution. While it is necessary for uses such as drinking and cooking, potable water use reduction strategies are an important step to conserve water.

### What can you do to help?

Ask your parents to only run the washing machine when there is a full load of laundry available.



Ask your parents to install a low-flow shower head that uses less water.



Phelps Elementary School has installed water efficiency toilet fixtures and kitchen equipment with a goal to reduce water needs by 30%.

Low-flow shower heads and water-efficient faucets and dishwashers will also contribute to energy savings, in reducing the hot water use.

- ① Ask your parents to only run the washing machine when there is a full load of laundry available.
- ② Ask your parents to install a low-flow shower head that uses less water.
- ③ Turn off the water faucet while brushing your teeth. Leaving it running can waste 2 gallons of water.



## Water Efficiency Outdoor Water Use

High-quality water is an important resource that is becoming **endangered** through waste and pollution. To help conserve clean water, the Phelps Elementary School site has been designed as an irrigation-free landscape through the thoughtful selection of native and adaptive trees, **perennials**, and ornamental grass species that are

naturally resistant to drought. Once established, these species require only the water levels provided by local annual rainfall to maintain their function in the landscape. Lawn areas have been minimized to the greatest extent practicable to further eliminate the need for permanent **irrigation**.

### Glossary

**Endangered** refers to something that is in danger of disappearing forever.

**Perennials** are a type of plant that lives longer than two years.

### What can you do to help?

Help your parents water your garden in the early morning while it is still cool. As the day gets hotter, more water will evaporate, leaving less for the plants.



## Sustainability and MEP Systems Focus Group

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- Review goals currently established – Integrated Design Policy
- Review minimum standards included - MSBA; Specialized Stretch Code; LEED; Building Code
- Discuss Lexington Public Schools experience with systems – best practices and lessons learned
- Discuss additional goals
- Discuss all-electric MEP systems to be explored
- Discuss materials to be considered
- Discuss renewable opportunities
- Other



