

# FLOW

The Making of a Living Building

"When the well's dry,  
we know the worth of water."

- BENJAMIN FRANKLIN

FLOW

BNIM



## A Living Building will:

- Harvest all its own water and energy needs on site;
- Be adapted specifically to site and climate and built primarily with local materials;
- Operate pollution-free and generate no wastes that aren't useful for some other process;
- Promote the health and well-being of all inhabitants;
- Comprise integrated systems that maximize efficiency and comfort;
- Be beautiful and inspire us to dream.





# OMEGA

INSTITUTE FOR HOLISTIC STUDIES

## VISION

Omega will be a global center for the development of human potential.

## MISSION

Through innovative educational experiences that awaken the best in the human spirit, Omega provides hope and healing for individuals and society.

## VALUES

Accountability

Holism

Integrity

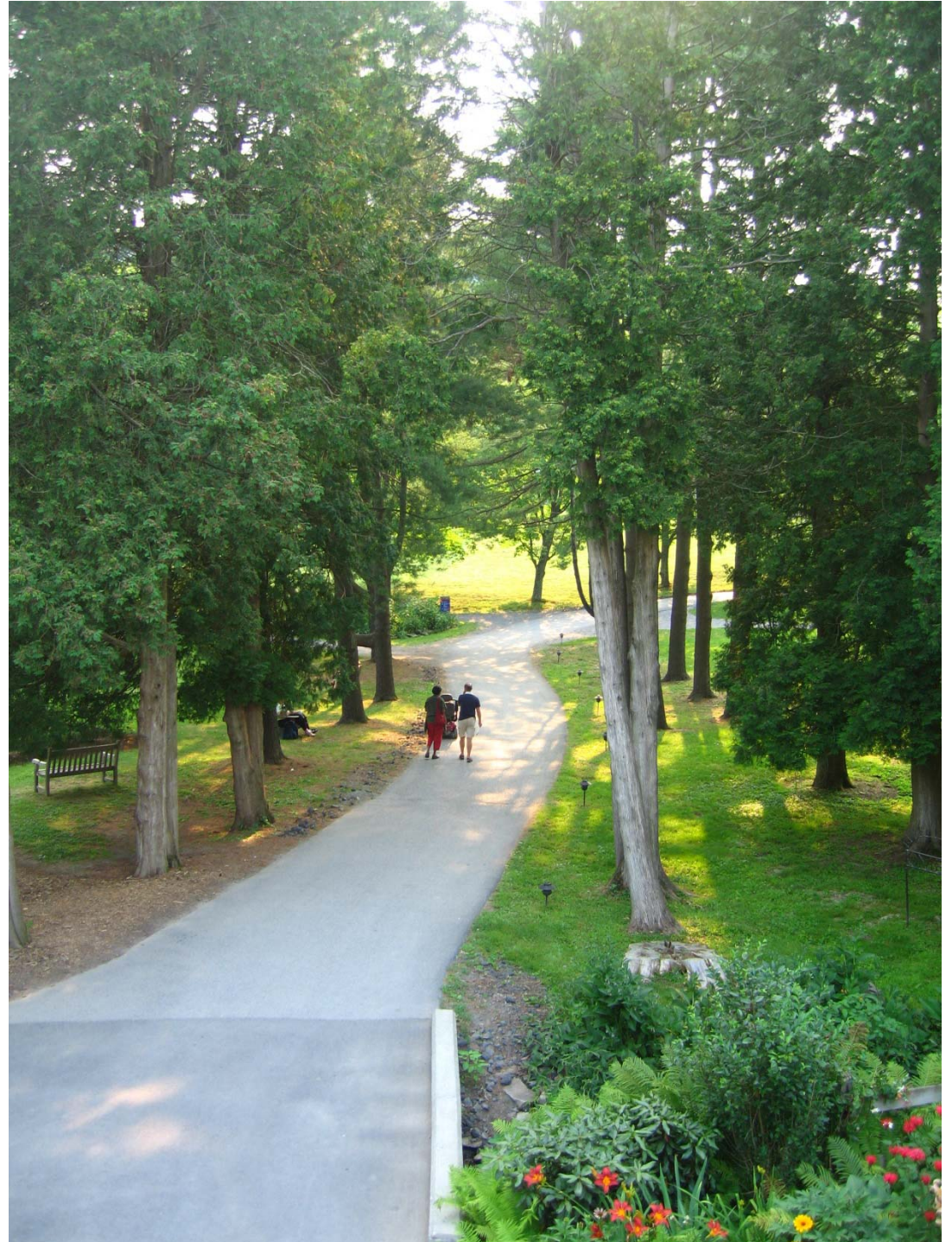
Service

Simplicity

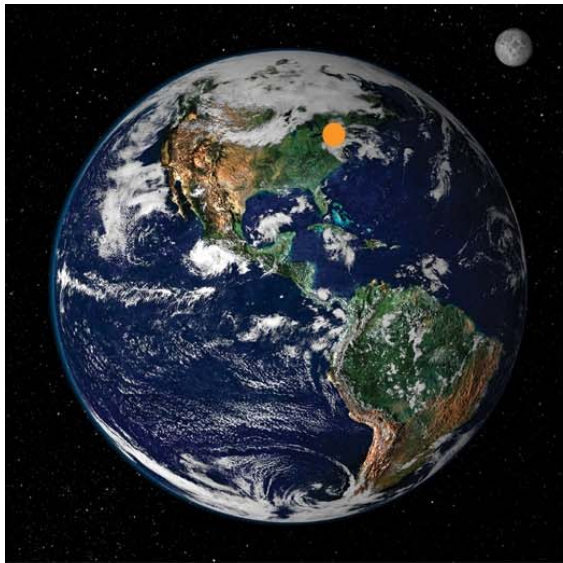
Sustainability

Teamwork

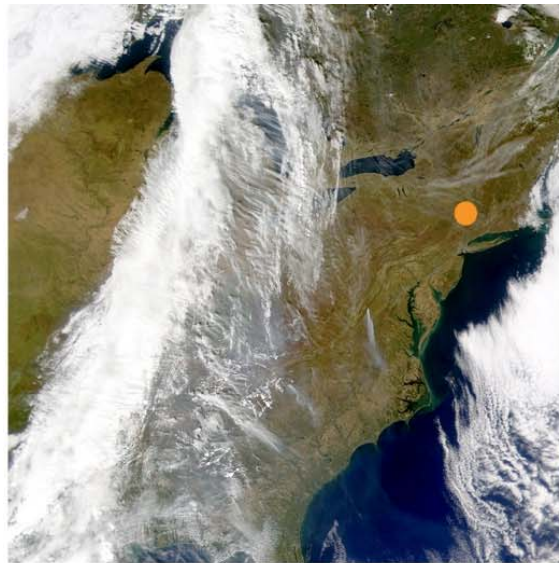
Welcoming



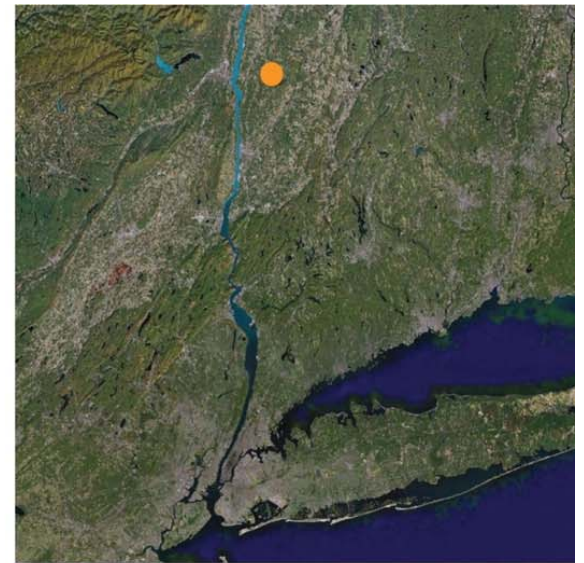




Earth

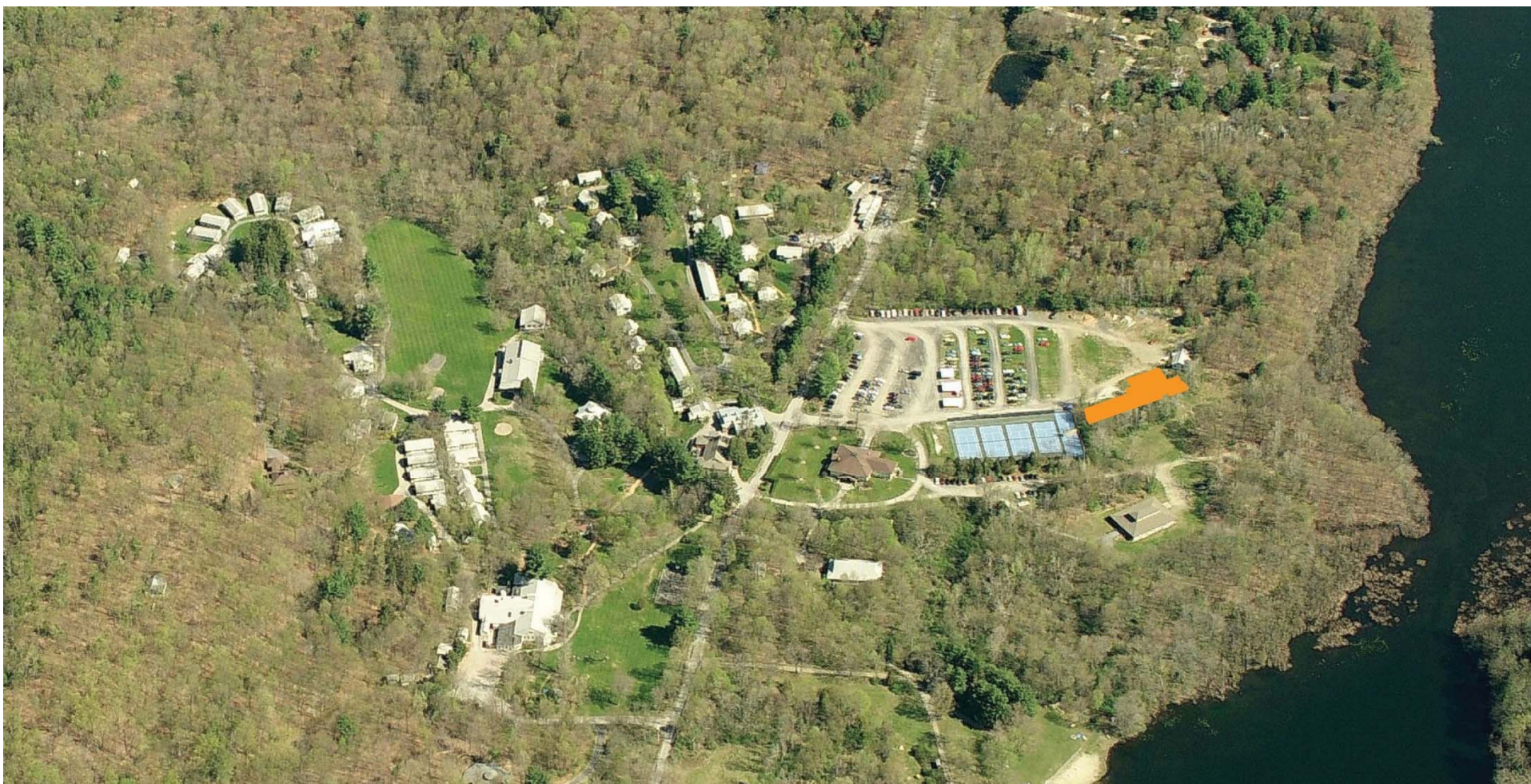


Atlantic Seaboard



Hudson River Valley















# Omega Institute of Sustainable Living

*Rhinebeck New York*



AIR FLOW



ENERGY FLOW



WATER FLOW



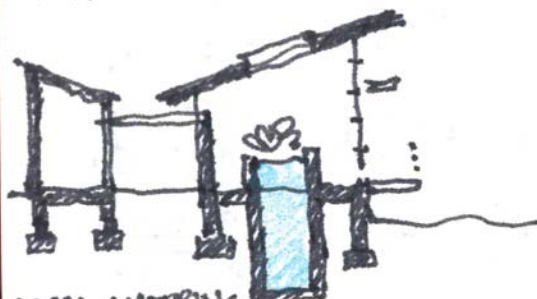




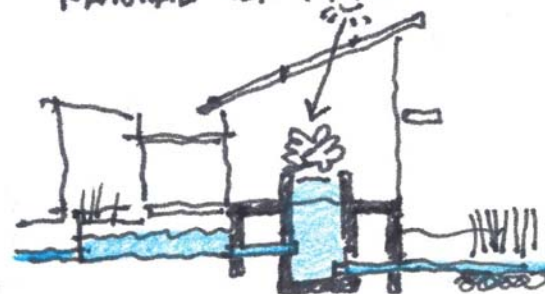
THERMAL MASS OF  $H_2O$



NATURAL VENTILATION



LOCAL MATERIALS



WATER CLEANING



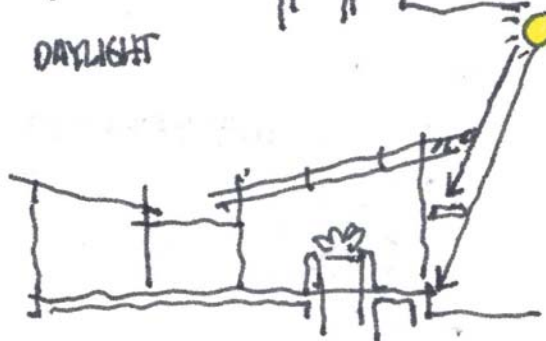
PASSIVE COOLING



DAYLIGHT



PASSIVE HEATING



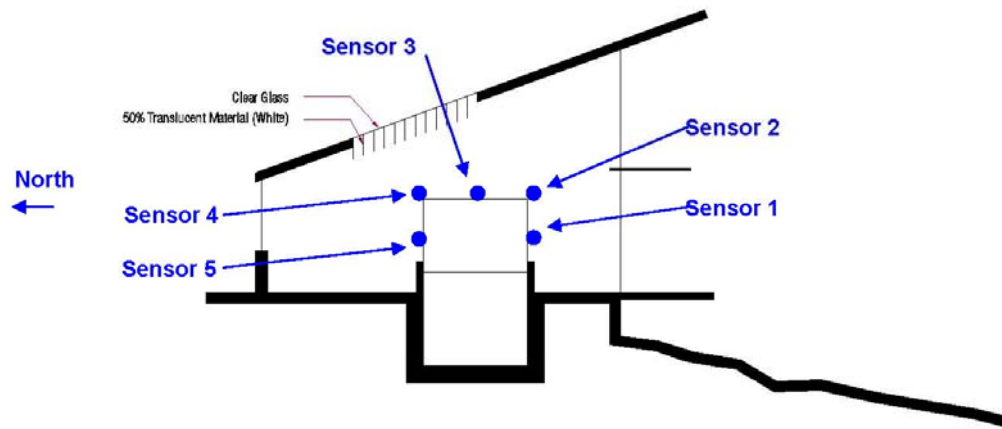
SHADING



### Daylighting Simulation and Optimization

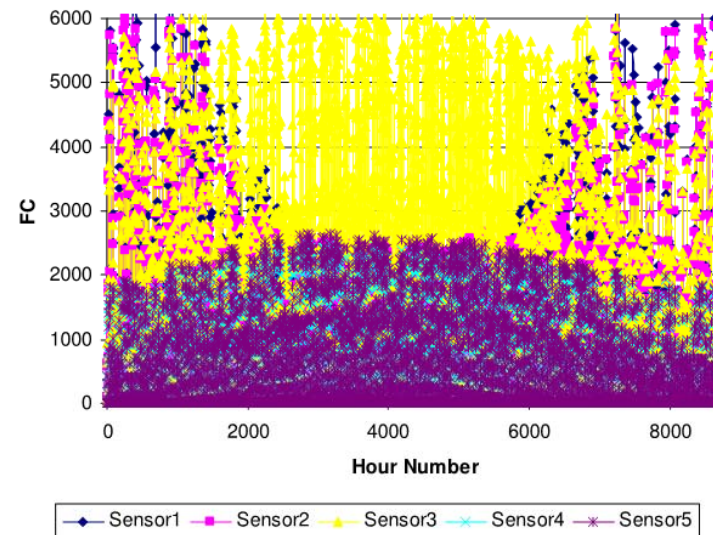
Several Daylighting configurations were tested to optimize the amount of daylight at critical sensor locations for a typical cross section close to 30,000 lux or 3000 fc.

Radiance based simulation tool DAYSIM was used for this purpose.



Lighting levels for each sensor were plotted for all 8760 hours in the year to check for consistency to the 3000 fc goal.

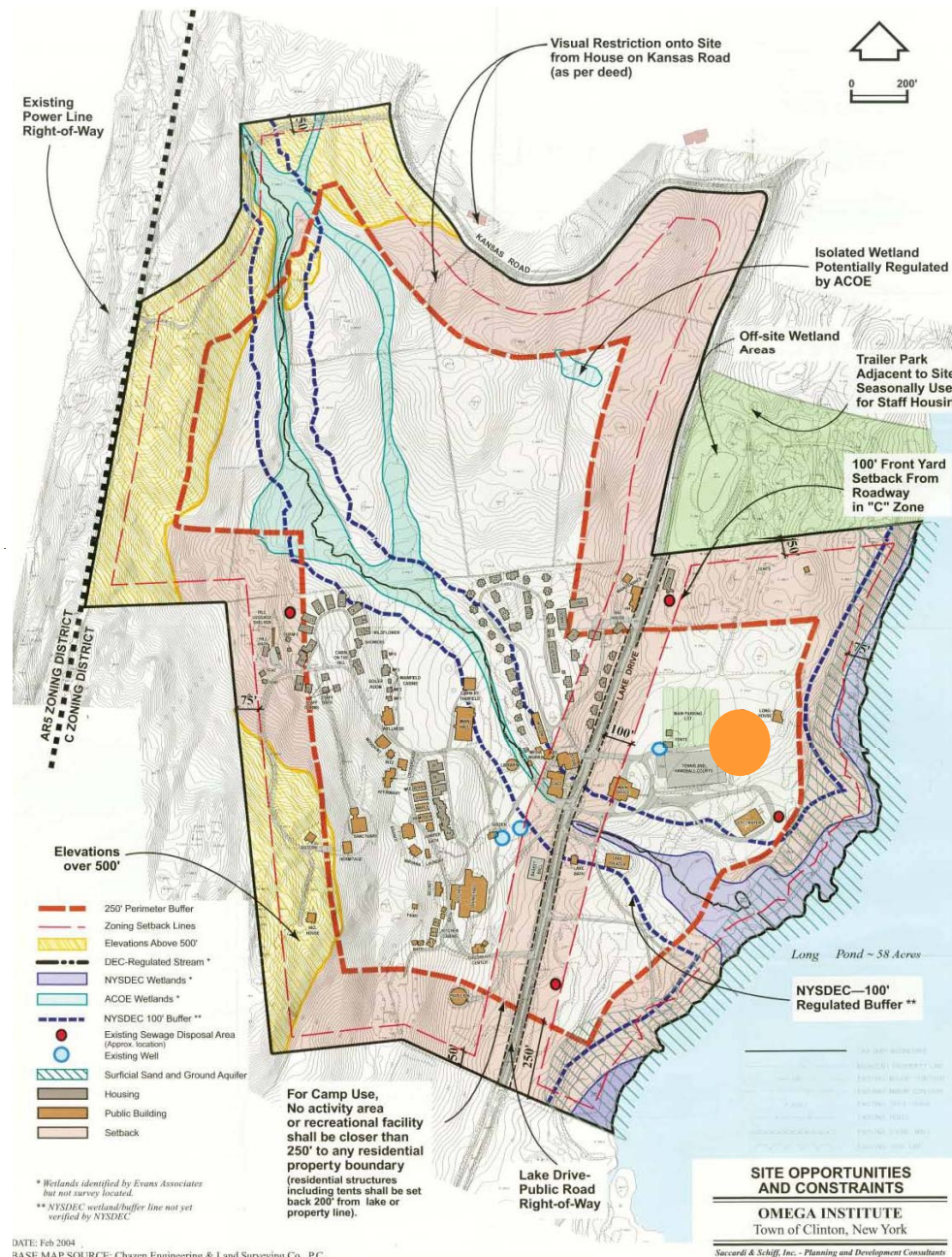
**Annual Daylight Distribution (all roof skylight)**





# Prerequisite SITE Responsible Site Selection

1





# Living Building Challenge

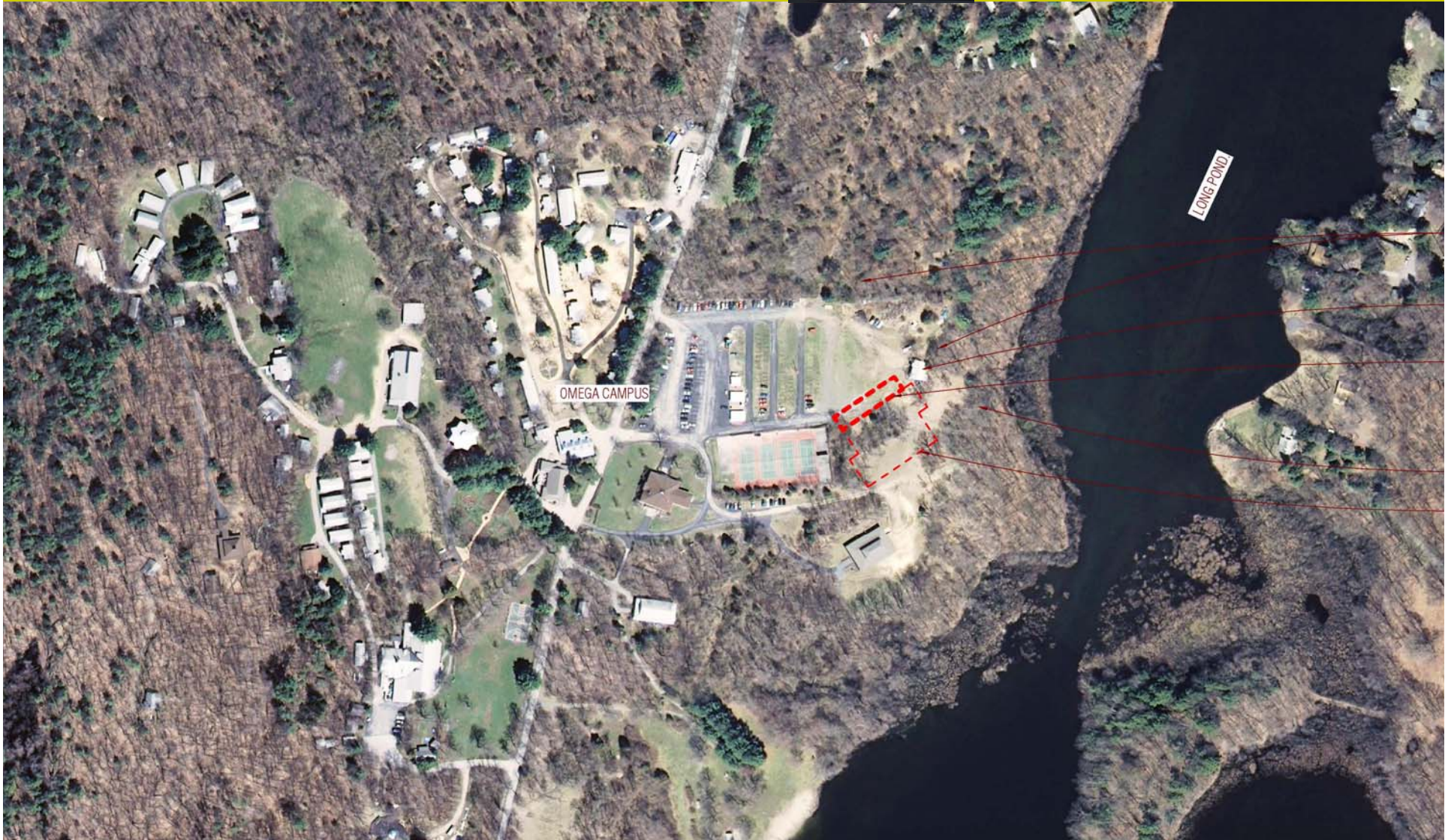


Prerequisite

**SITE**

Limits to Growth

2





# Living Building Challenge



Prerequisite

2

**SITE**

Limits to Growth





# Living Building Challenge



Prerequisite

3

**SITE**

Habitat Exchange



Scenic Hudson



# Living Building Challenge



Energy Module

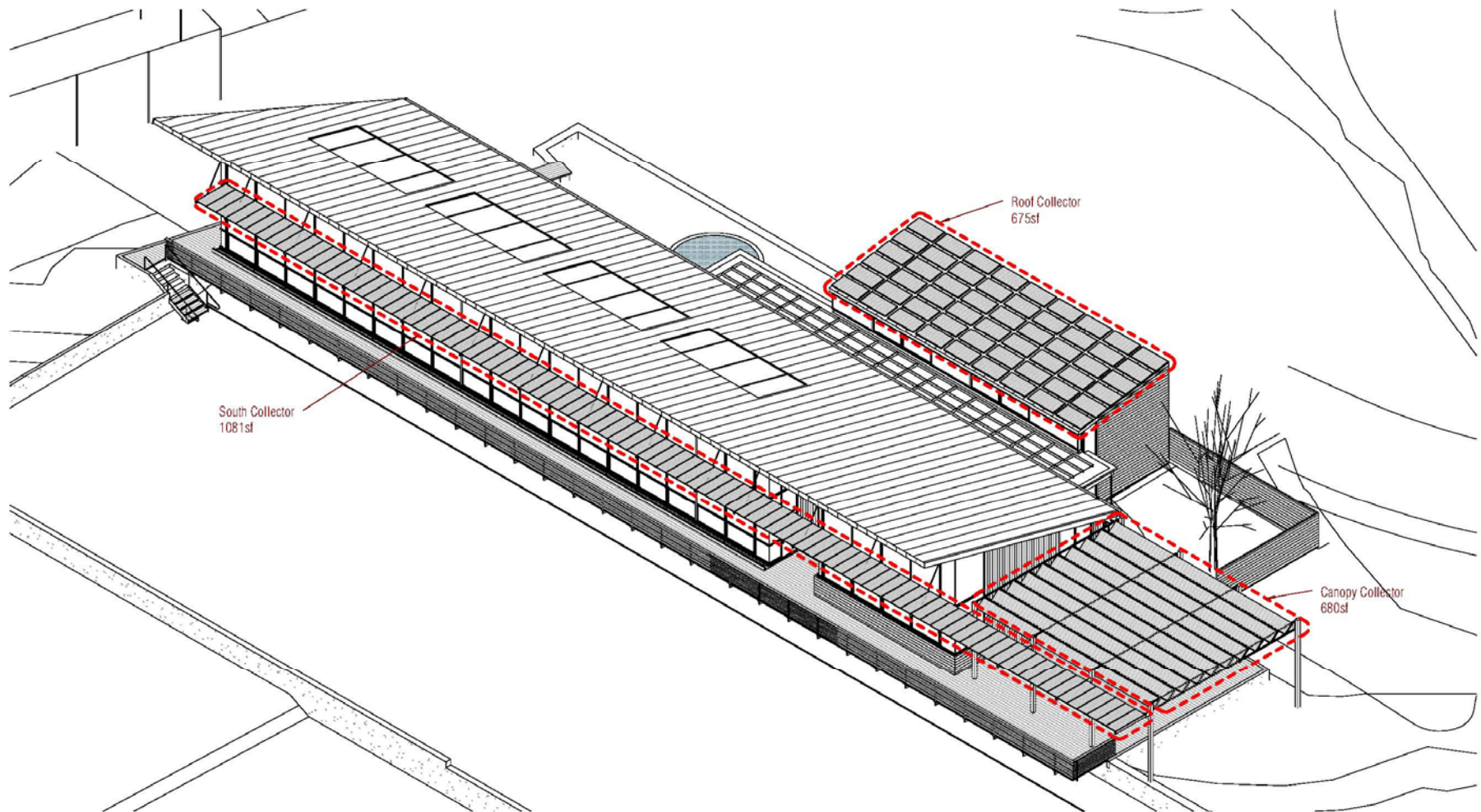


Prerequisite

4

**ENERGY**

Net Zero Energy













## Living Building Challenge



Materials Module

## Prerequisite **MATERIALS** Materials Red List

# 5

Used on the project as substitutes for typical products:

- HDPE, Cast Iron pipe
- Reclaimed lumber and plywood
- Phenol-formaldehyde adhesive in glulam
- Polyisocyanurate insulation
- GreenFiber cellulose insulation
- EPDM roof membrane
- Lutron Vela fabric







Materials Module



Prerequisite

# MATERIALS

Materials Red List

# 5



# Living Building Challenge



Materials Module

## Prerequisite **MATERIALS**

# 6

### Construction Carbon Footprint

[www.BuildCarbonNeutral.com](http://www.BuildCarbonNeutral.com)

## Construction Carbon Calculator Results

Approximate net embodied CO2 for this project is

**-1,387 metric tons.**

### Your Entries

Total Square Feet	6,246
Stories Above Grade	1
Stories Below Grade	0
System Type	mixed
Ecoregion	Eastern Temperate Forests
Existing Vegetation Type	Short Grass or Lawn
Installed Vegetation Type	Wetlands
Landscape Disturbed (SF)	95,036
Landscape Installed (SF)	93,949

Construction Carbon Calculator formula version 0.03.5, last updated 2007.10.11. These results are an approximation. Your actual carbon footprint may vary. See [assumptions](#) for more information.

[reduce & renew](#) | [calculate](#) | [offset](#) | [about the calculator](#) | [assumptions](#) | [faq](#) | [send feedback](#)

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# Living Building Challenge



Materials Module



Prerequisite  
**MATERIALS**  
Responsible  
Industry

# 7









# Living Building Challenge



Materials Module

Prerequisite

8

## **MATERIALS**

Appropriate Materials  
/ Service Radius

### **Renewable Energy Technologies**

Germany v. Philippines v. Mexico

### **Building performance assemblies**

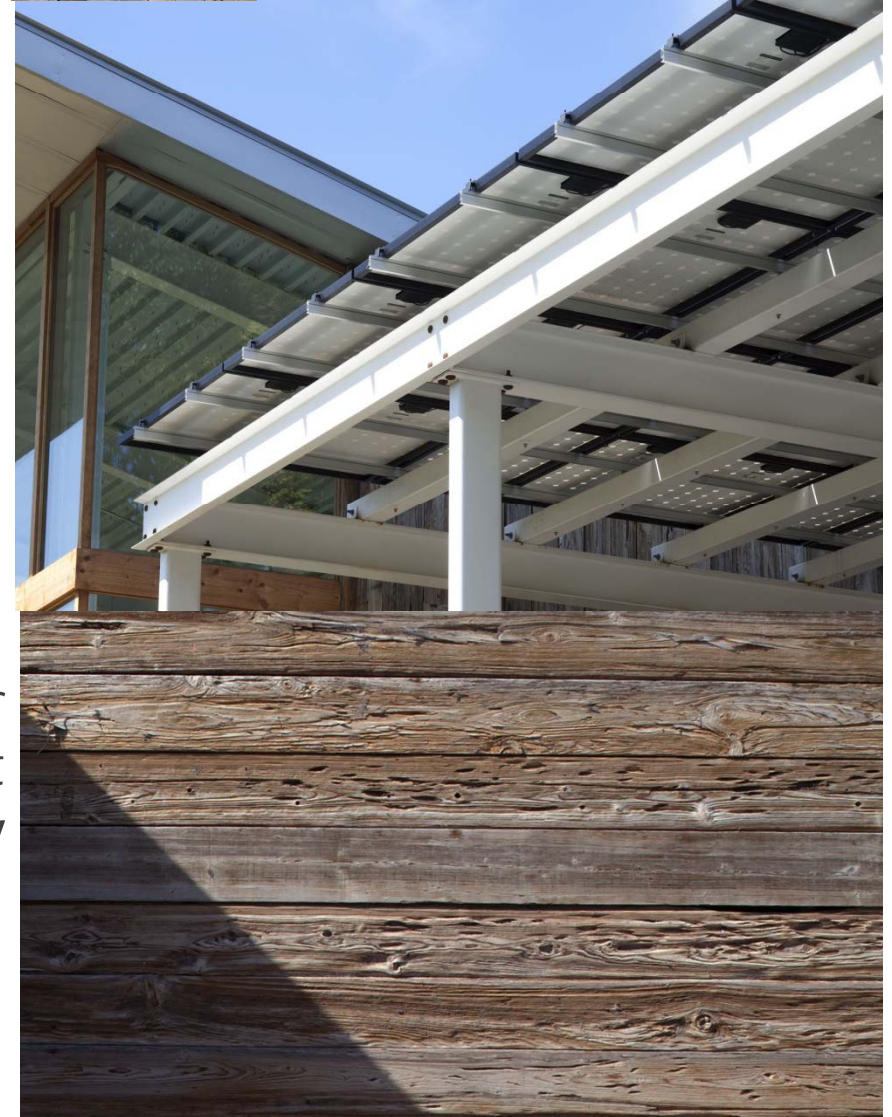
Rainscreen wall assembly

### **Consultant travel**

Tipping Mar, Berkeley, CA      too far

BNIM / BGR      just made it

Everyone else      okay





# Living Building Challenge



Materials Module

Prerequisite

8

## **MATERIALS**

Appropriate Materials  
/ Service Radius

### **Low-weight/density materials**

Insulation

### **Medium-weight/density materials**

Wood (all)

Windows (exception for glass)

### **Heavy-weight/density materials**

Concrete

Steel







- 99% of metals scraps recycled.
- 99% of cardboard scraps and waste recycled.
- 99% of rigid foam waste was reused elsewhere or recycled.
- 99% of wood waste was shredded for mulch or stored for future use.
- 100% of food waste was composted.
- 100% of glass waste, paper, and plastic packaging waste was recycled.





# Living Building Challenge

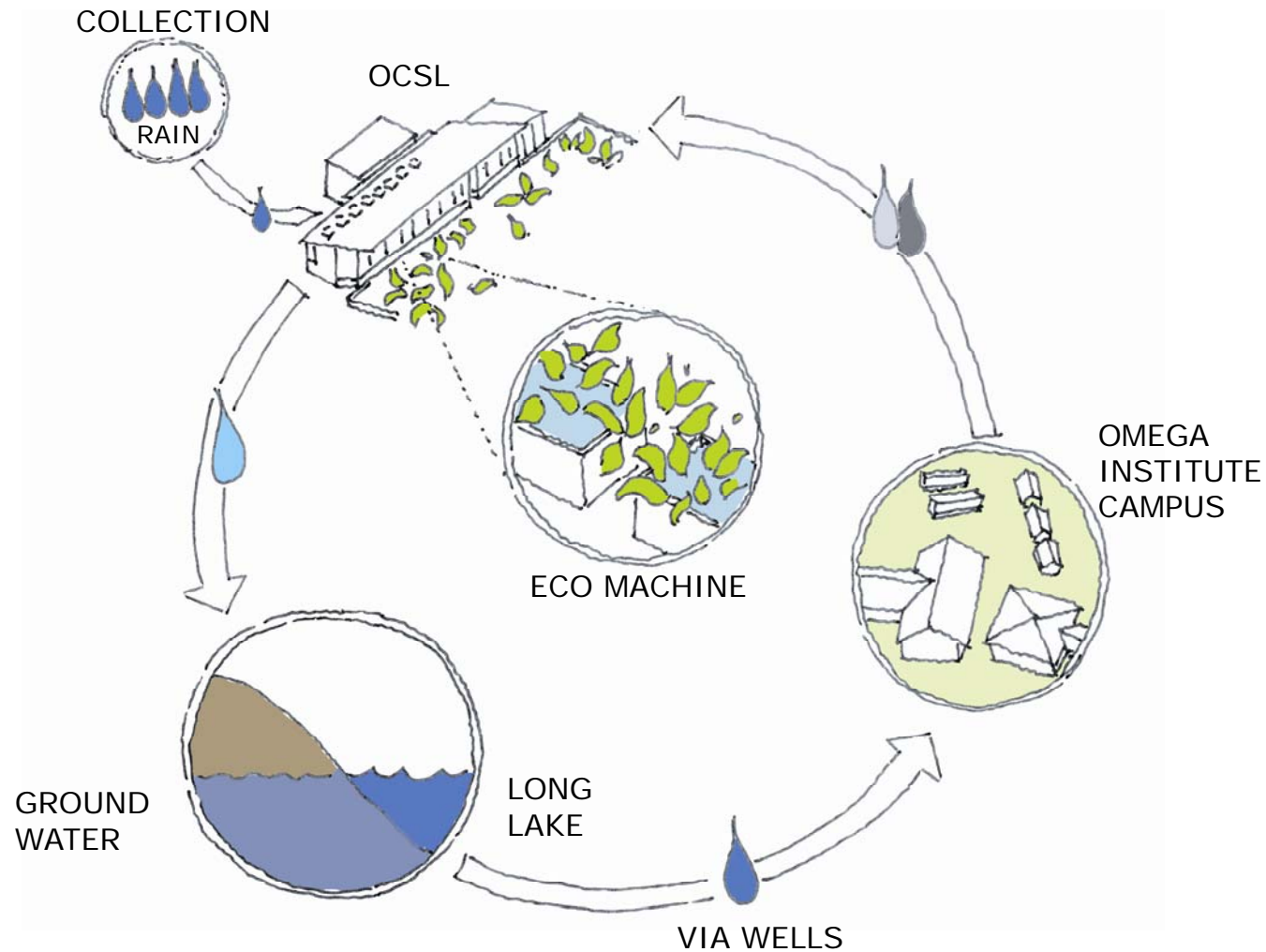
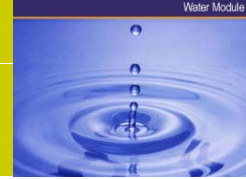


Prerequisite

# 10

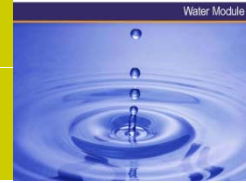
## WATER

### Net Zero Water





# Living Building Challenge



## Prerequisite **11** **WATER** Sustainable Water Discharge







### Did you know...

Turning off the faucet while  
brushing your teeth can save up to 8 gallons  
of water per day or 240 gallons a month.

Switching to a low flow  
showerhead can save up to 20 gallons  
of water in a 5-minute shower.

OMEGA













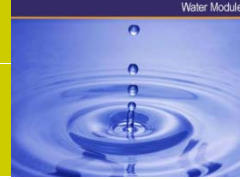




# Living Building Challenge



Water Module



Prerequisite

11

**WATER**

Sustainable  
Water Discharge





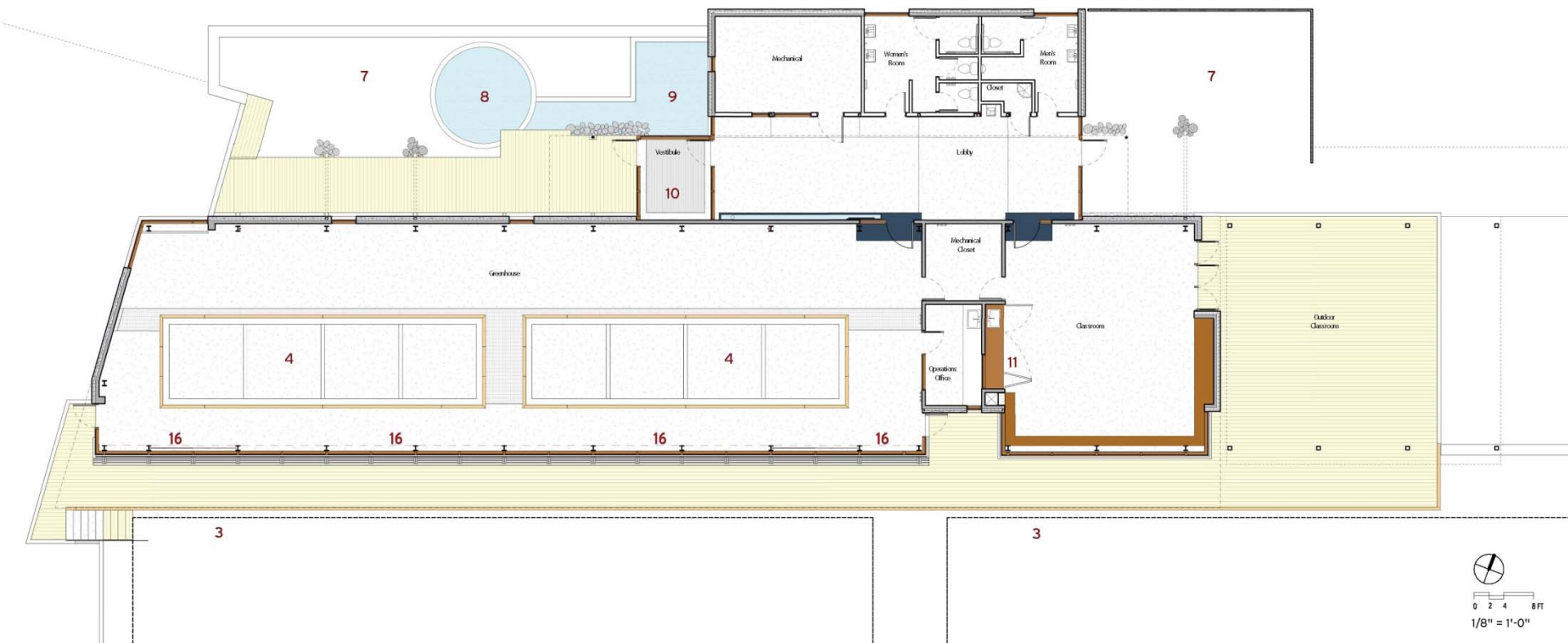




# Living Building Challenge



Prerequisite **12**  
**INDOOR QUALITY**  
A Civilized  
Work Environment









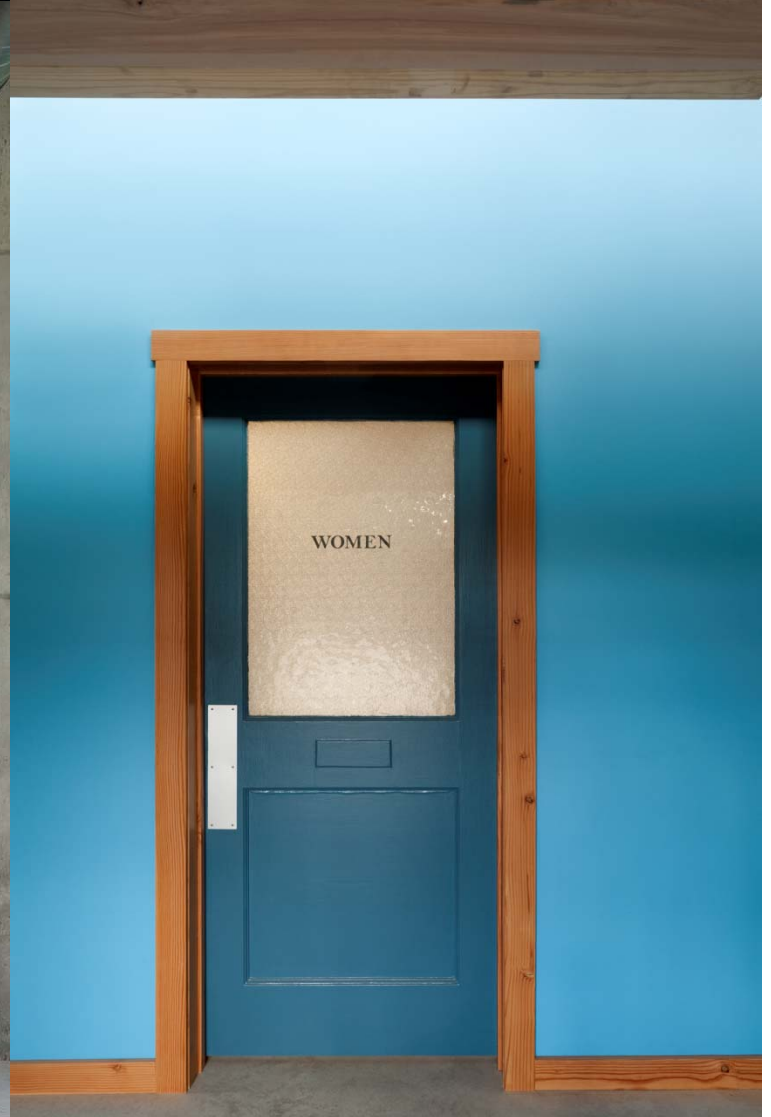
# Living Building Challenge



Indoor Quality Module



## Prerequisite **13** **INDOOR QUALITY** Healthy Air / Source Control





# Living Building Challenge



Indoor Quality Module



Prerequisite **14**  
**INDOOR QUALITY**  
Healthy Air /  
Ventilation





# Living Building Challenge

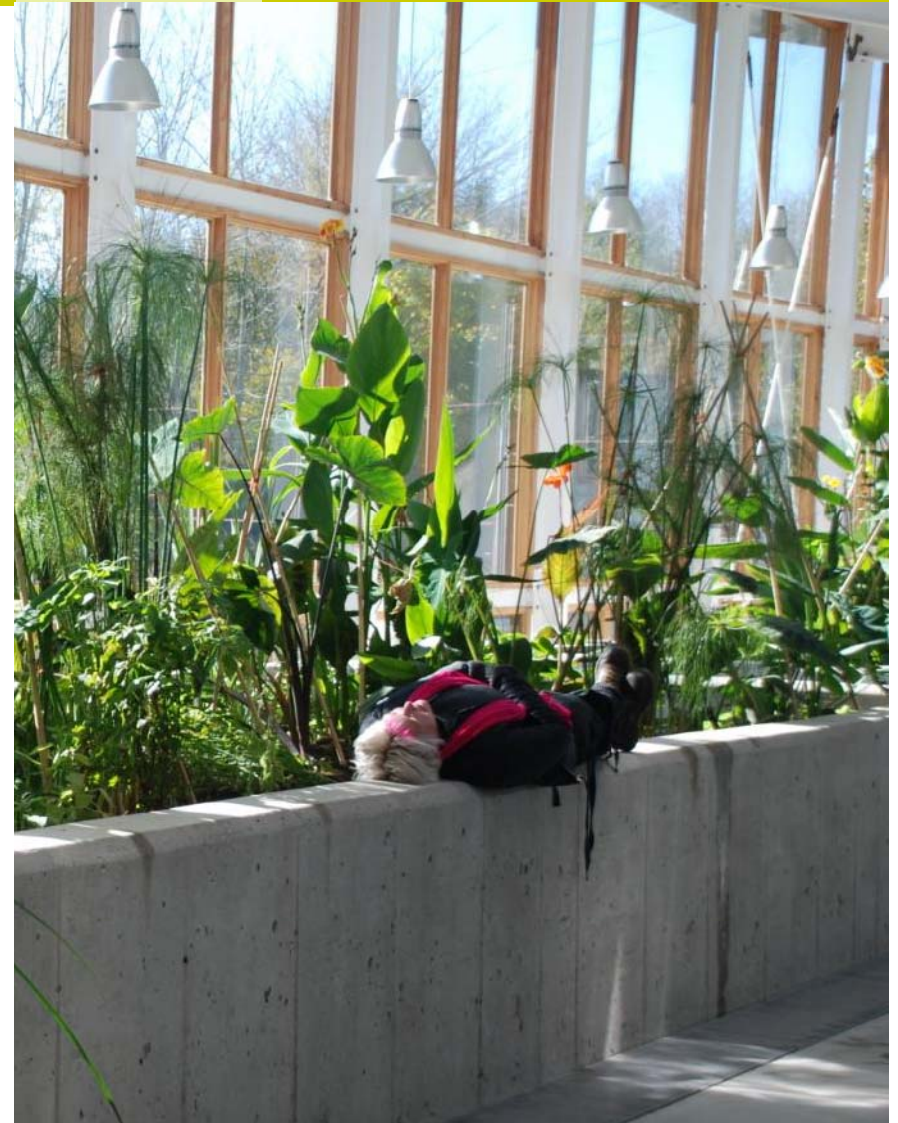


The Living Building Challenge  
In Pursuit of True Sustainability in the Built Environment  
Version 1.2  
March 2019

Prerequisite **15**  
**BEAUTY +  
INSPIRATION**  
Beauty + Spirit

This is a healing place.

- Dr. John Todd

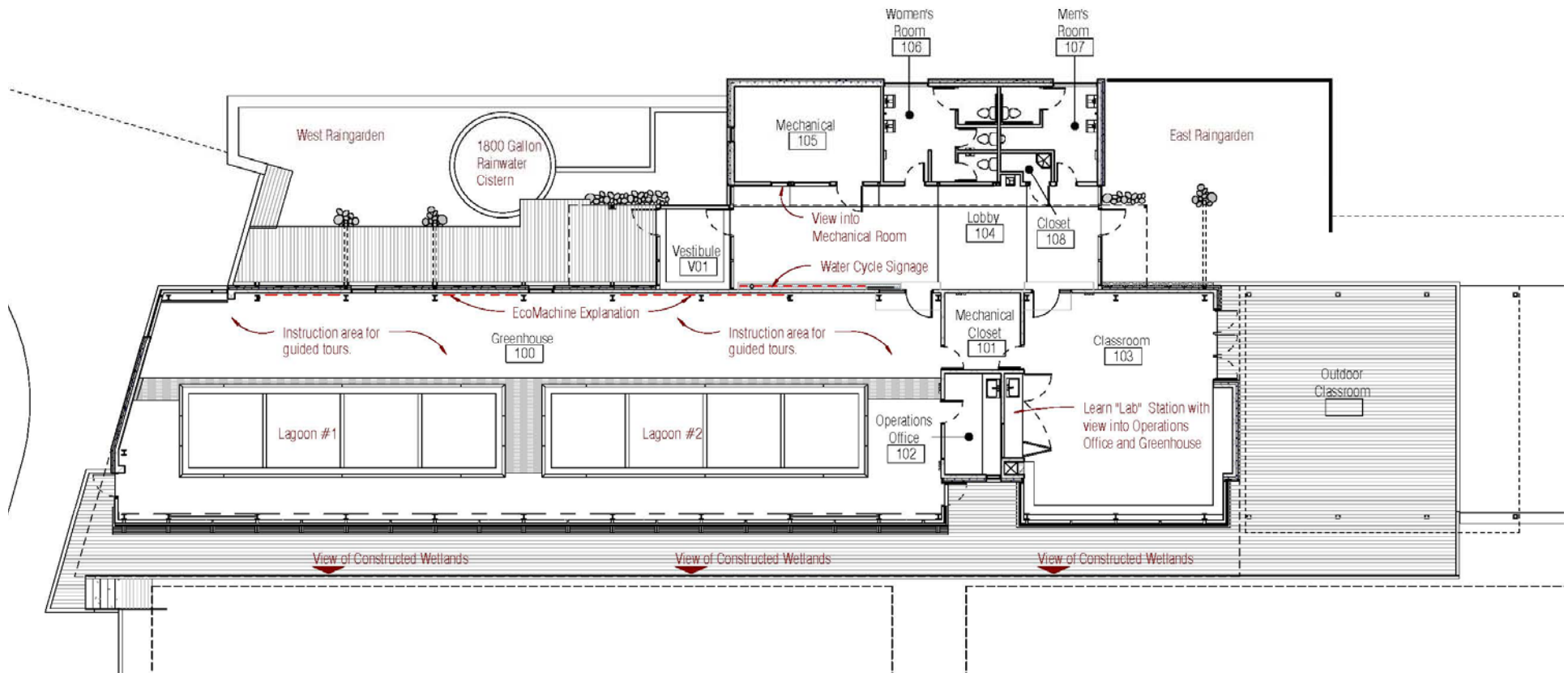




# Living Building Challenge



Prerequisite **16**  
**BEAUTY +  
INSPIRATION**  
Inspiration + Education





















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*Rhinebeck New York*



**BNIM**