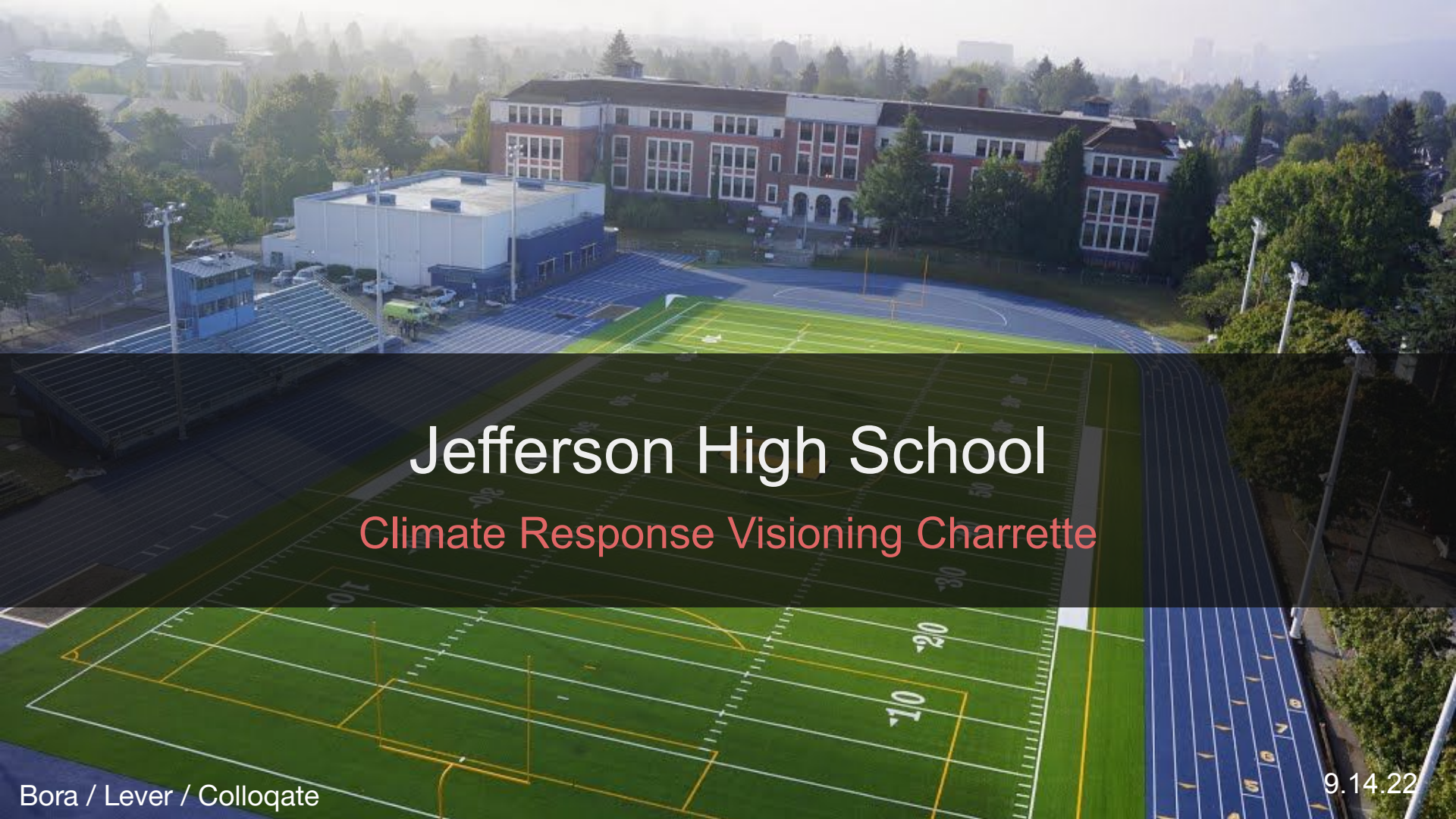


Jefferson High School

Climate Response Visioning Charrette

Bora / Lever / Colloqate

9.14.22

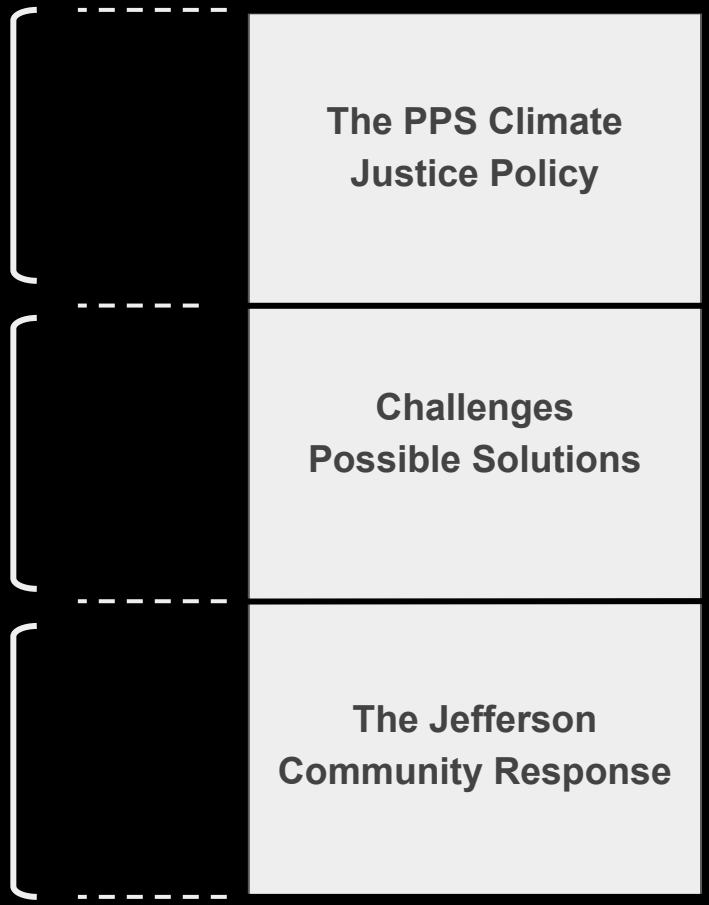
The World is Changing

How does Jefferson HS Respond?

The outcome of today’s session

A Vision for
Jefferson High School as a leader
in Climate Justice, Resilience, Climate Education

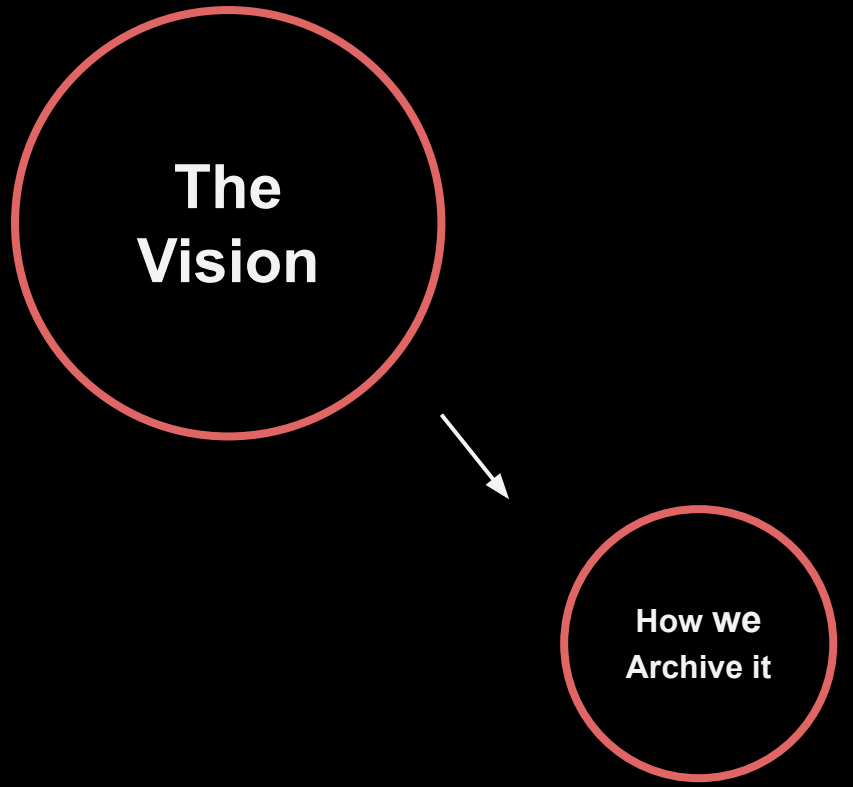
Workshop Agenda



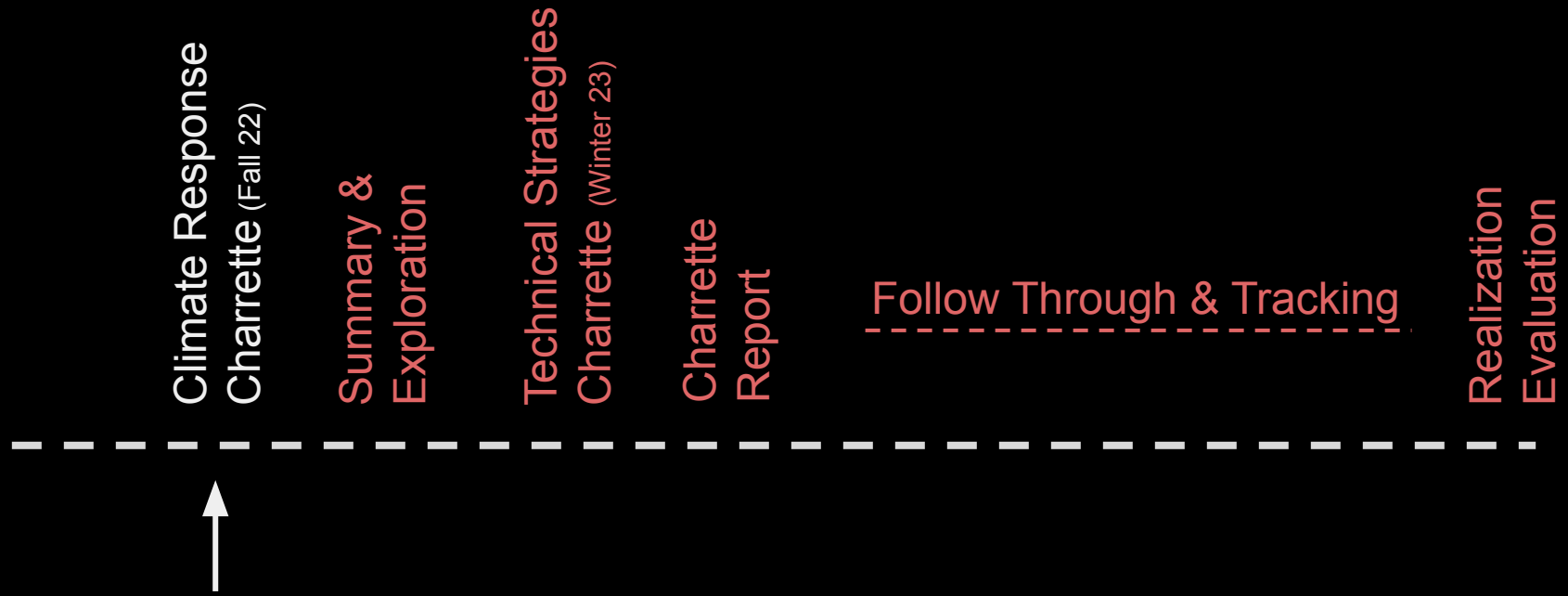
Full Charrette Scope

Climate Response Visioning
Ambitions outcomes
Narrative based

Targeted Strategies
Technical
Metric based



Full Charrette Scope



What do we mean by

Climate Response?

The 20th Century

The norms of the last century were baked into architecture of the last century

The 21st Century

The climate is changing

Education is changing

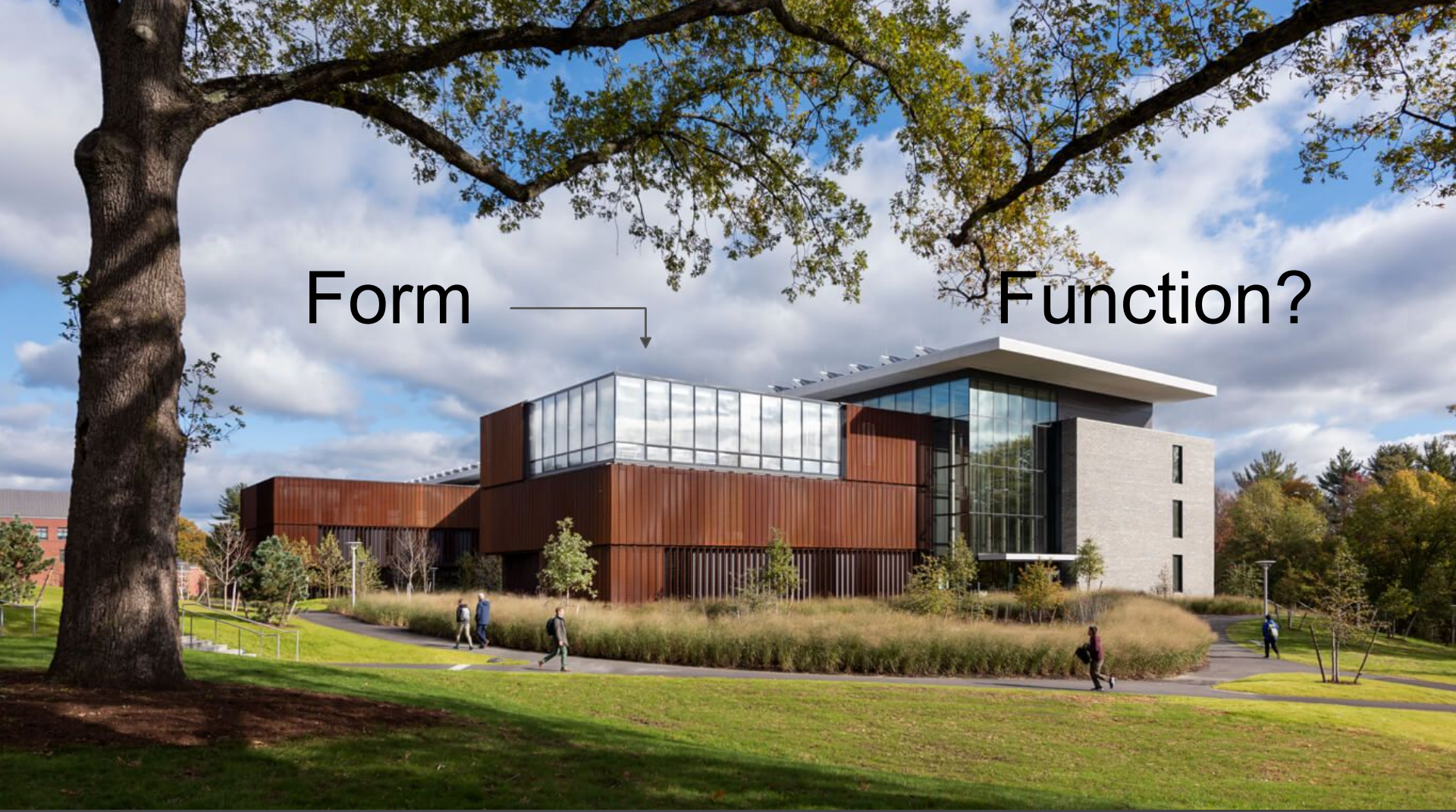
Values are changing

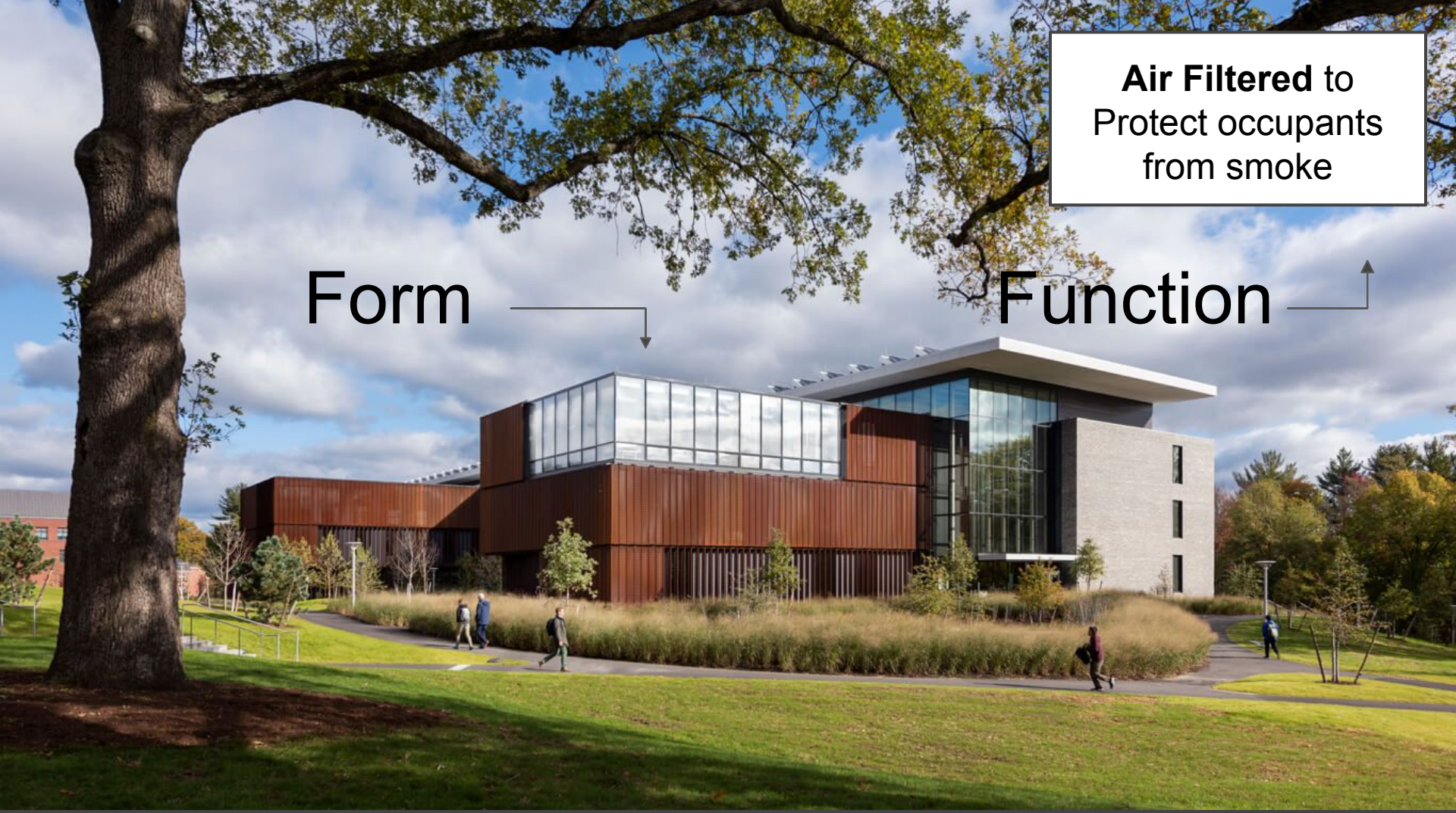
Respond to current challenges

Anticipate future changes

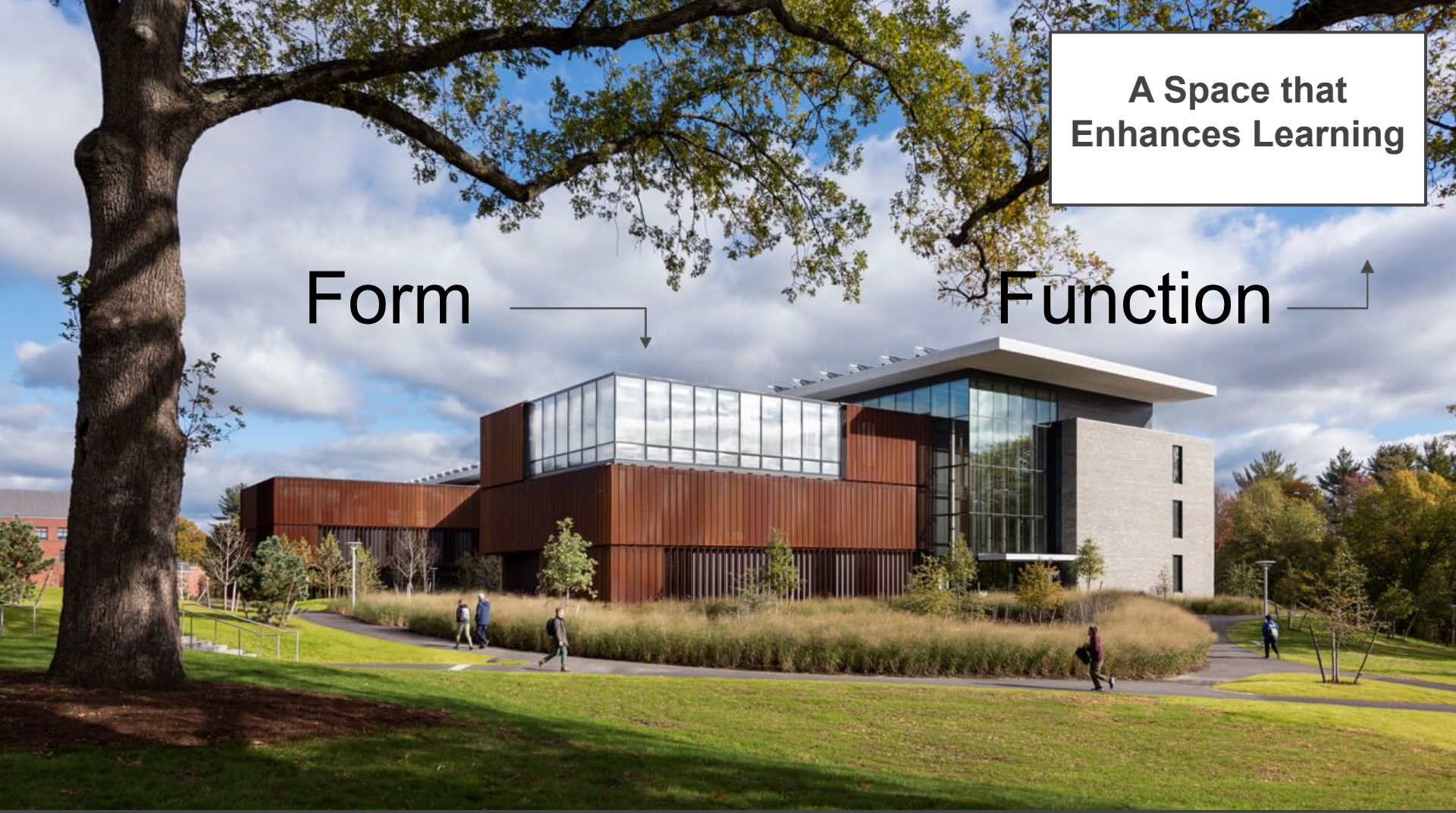
Address the needs of the community

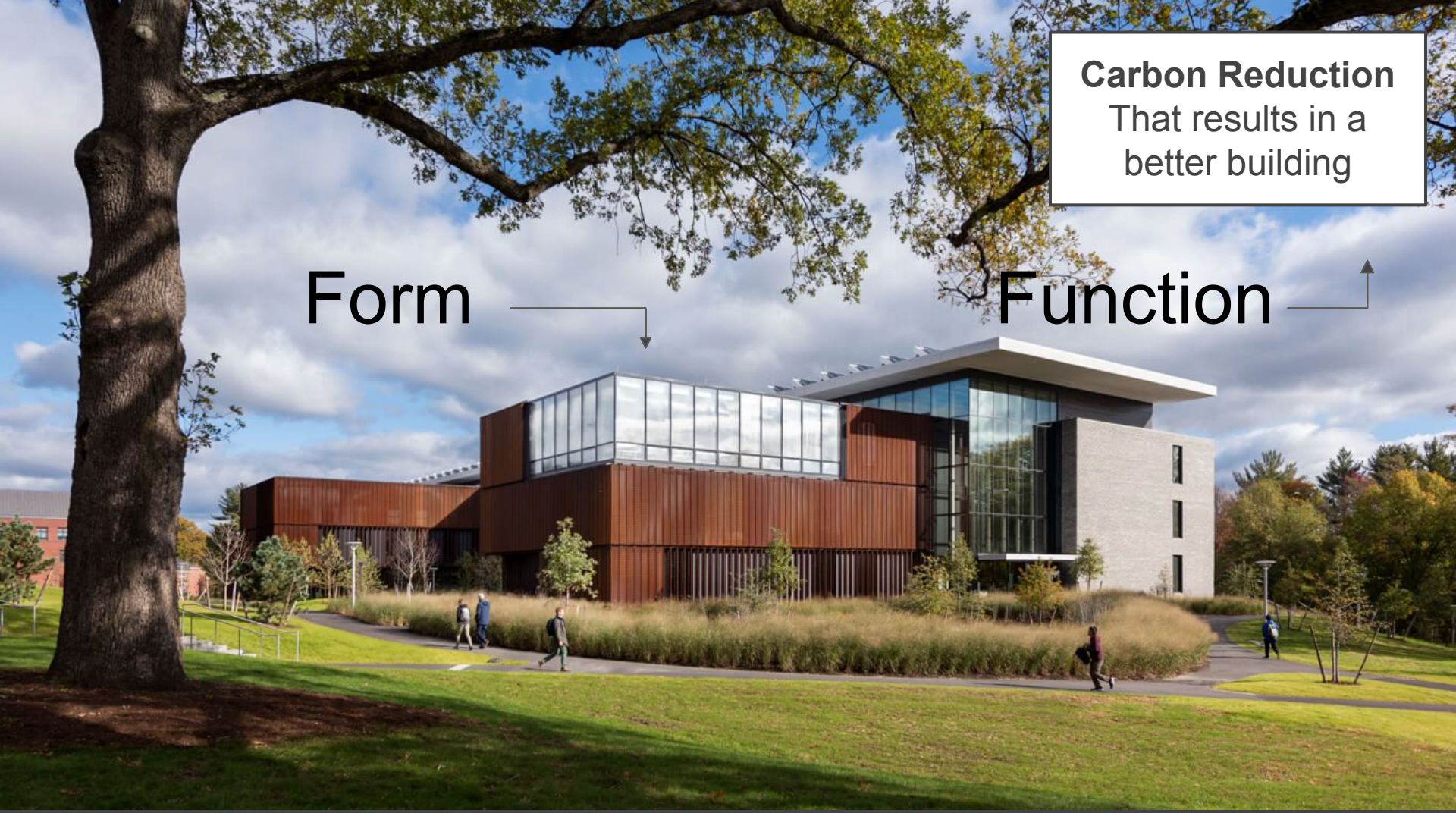
Lead by example


Form
Function?


Air Filtered to
Protect occupants
from smoke
Form
Function


Safety and Comfort
during power outages
Form
Function


A Space that Enhances Learning
Form
Function


Carbon Reduction
That results in a better building
Form
Function

Building a Future of Climate Justice at PPS

Kat Davis
Climate Justice Advisor
Office of the Chief of Staff

Climate Justice

Climate change disproportionately impacts the vulnerable members of our community.

Climate justice centers and prioritizes people with disabilities, communities of color, and other vulnerable populations in developing climate change solutions.

The way we communicate about climate change matters - pushing against systems of oppression that have resulted in climate change through reframing knowledge, solutions, and systems is a form of climate justice.

Climate Crisis Response Policy

- “Climate Crisis Response, Climate Justice, and Sustainable Practices Policy”
- Passed in March, 2022
- A direct result of student, teacher, and community advocacy
- Two Overarching Goals
  - Reduce greenhouse gas emissions by 50 percent by 2030, net zero emissions by 2040
  - Elevate engagement, resilience and wellness
- Three Pillars
  - Reduce Environmental Impact & Costs
  - Improve Health and Wellness
  - Provide Effective Environmental & Sustainability Education

Moving Forward

- Launching the Climate Crisis Response Committee - Community Board Oversight committee
- Clarity and strategic alignment across the district with the CCRP goals
- District-wide implementation plan
- Pathways for involvement - Climate Justice Youth Advisory

Jefferson Modernization

- First major construction project to begin design since the policy passed
- Policy considerations:
  - Goal 1.1: PPS will design and construct new low-carbon schools and renovations that are energy-efficient, resilient, and adaptable
  - Goal 1.2: Maximize reductions in Greenhouse gas emissions from district operations, maintenance, and facilities
  - Goal 1.3: Maximize carbon sequestration potential and other environmental benefits of green school yards and increase the ability of school grounds to adapt to climate extremes
- This building is the opportunity to lead by example and show what a future of climate solutions looks like for our community

Quick Discussion

What resonated from the PPS Policy?

What does this look like at Jefferson?

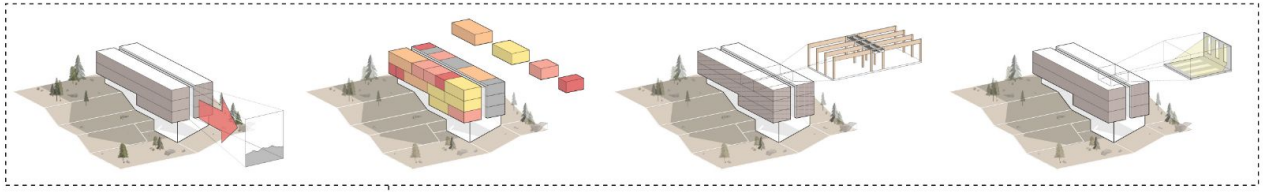
10 minutes to discuss,
But first introduce yourselves

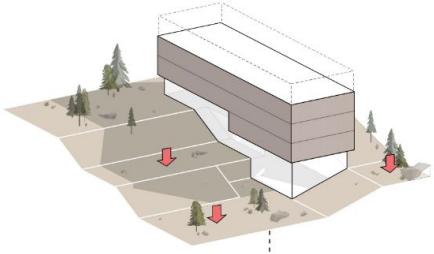

High Performance
Precedents

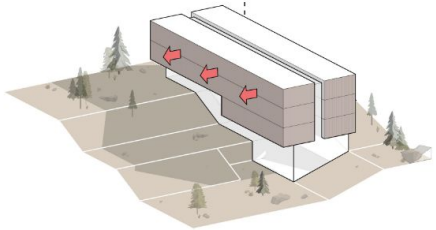
Meyer Memorial Trust
Portland, OR

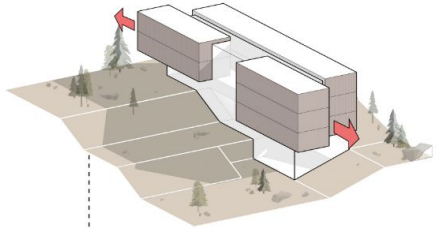
Oregon State University Ray Hall

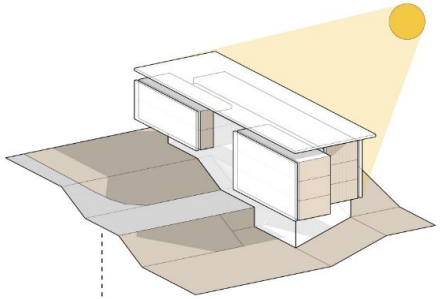
- 50,000 sf new construction
- Academic + Sciences Building for OSU Cascades
- NZE Energy + Water Ready

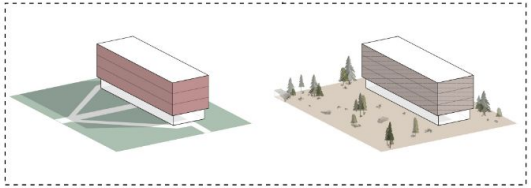


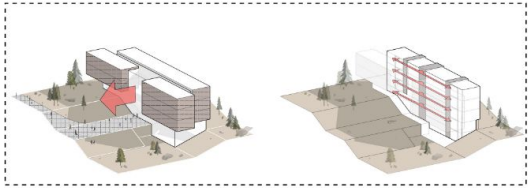


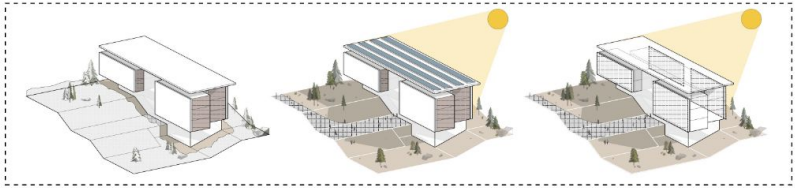












Mass Timber / CLT

Benefits:

Renewable Resource and Potential for Carbon Sequestration / Reduction

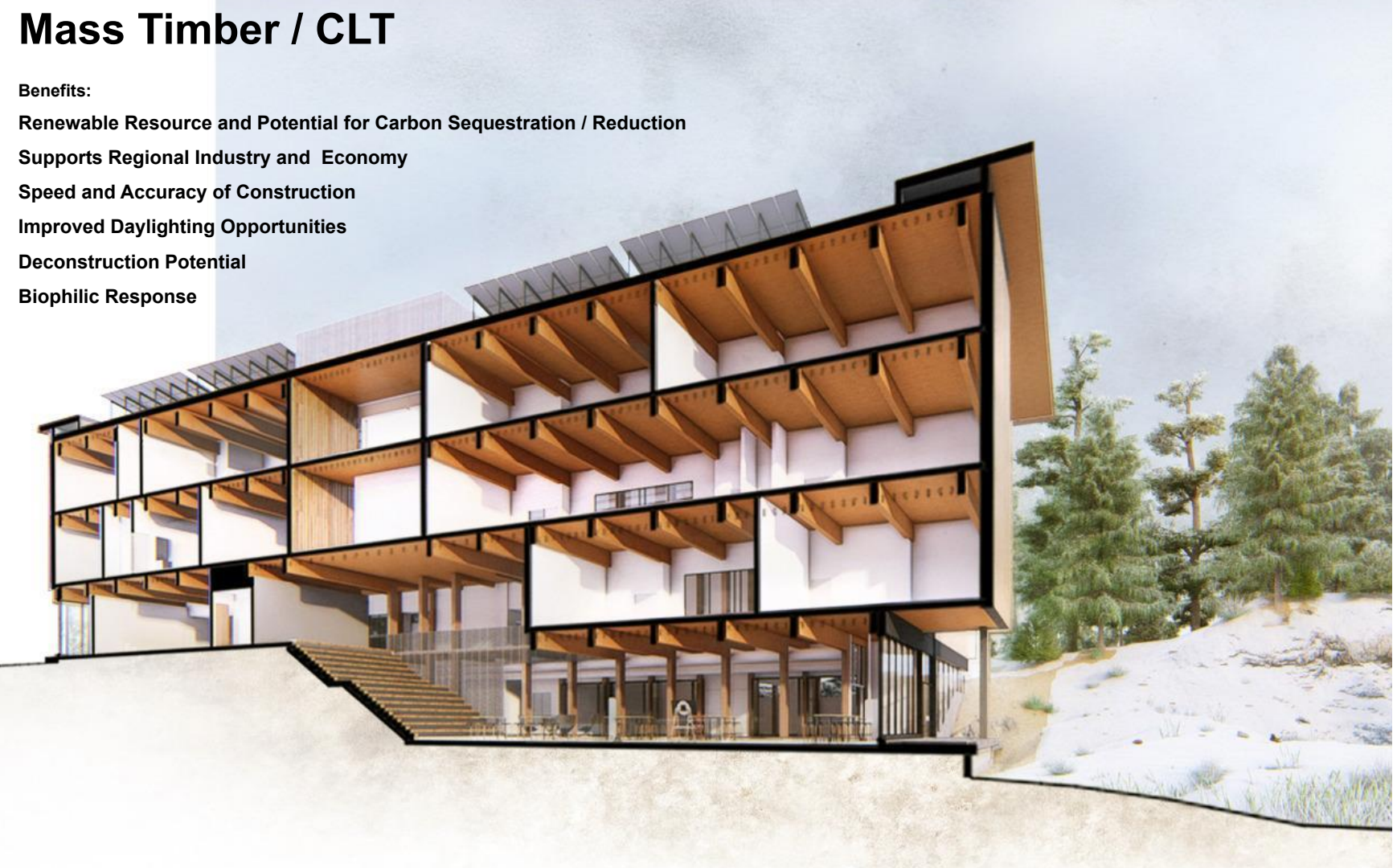
Supports Regional Industry and Economy

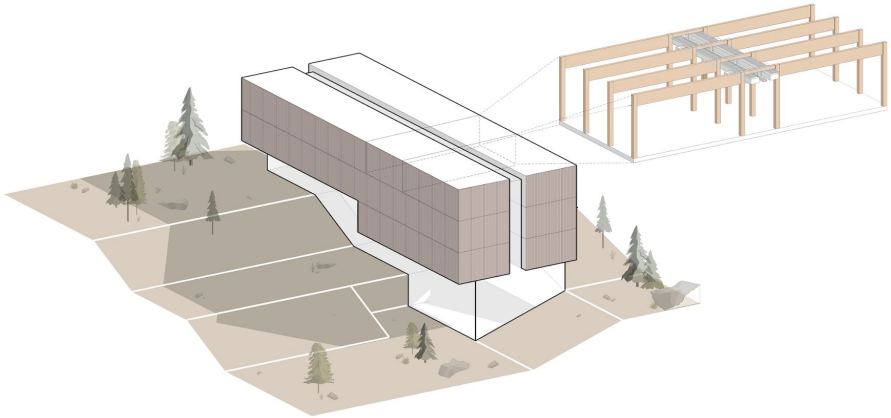
Speed and Accuracy of Construction

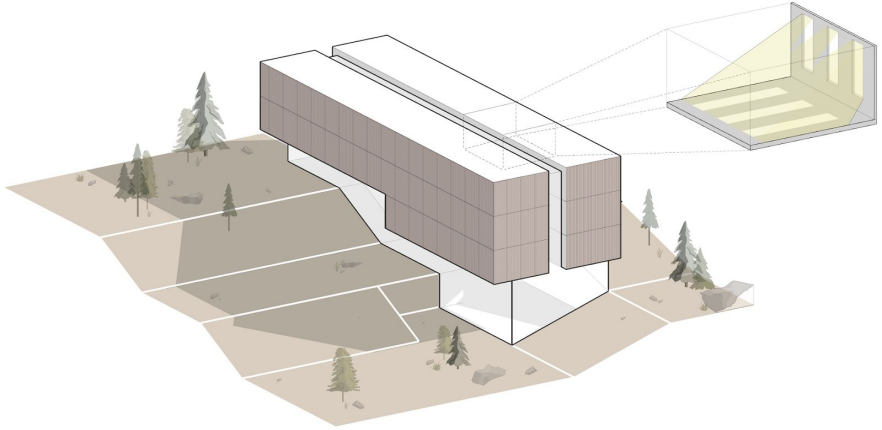
Improved Daylighting Opportunities

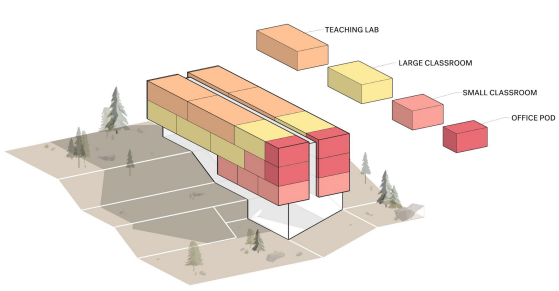
Deconstruction Potential

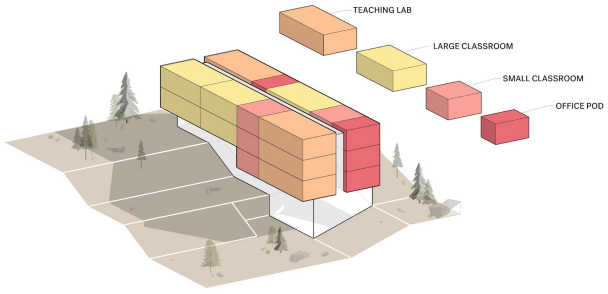
Biophilic Response

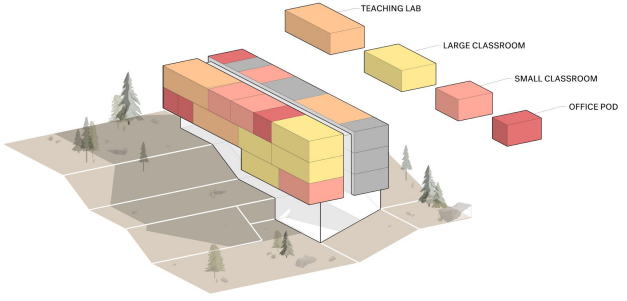






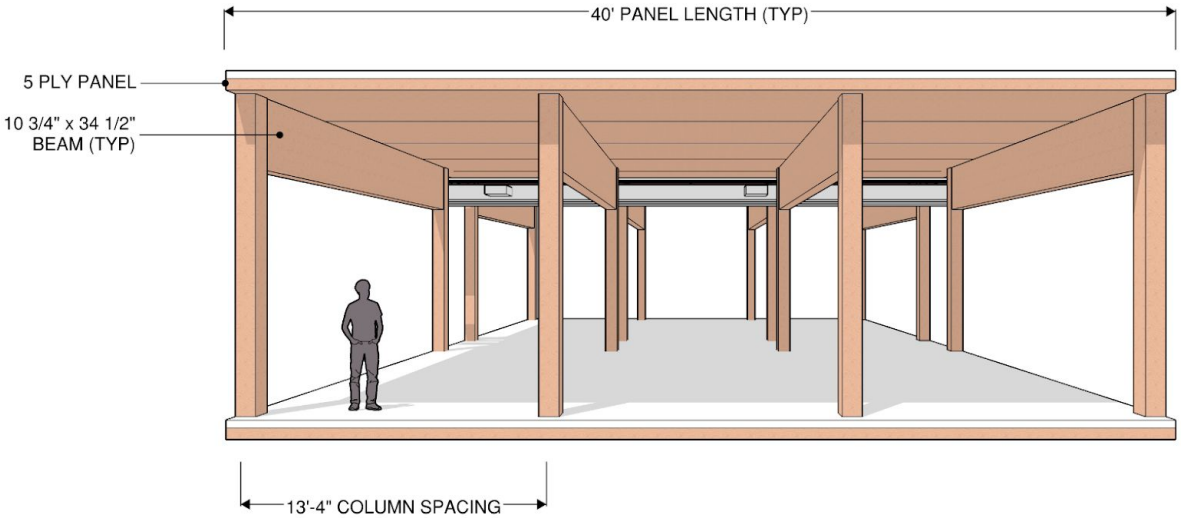

TEACHING LAB
LARGE CLASSROOM
SMALL CLASSROOM
OFFICE POD


TEACHING LAB
LARGE CLASSROOM
SMALL CLASSROOM
OFFICE POD

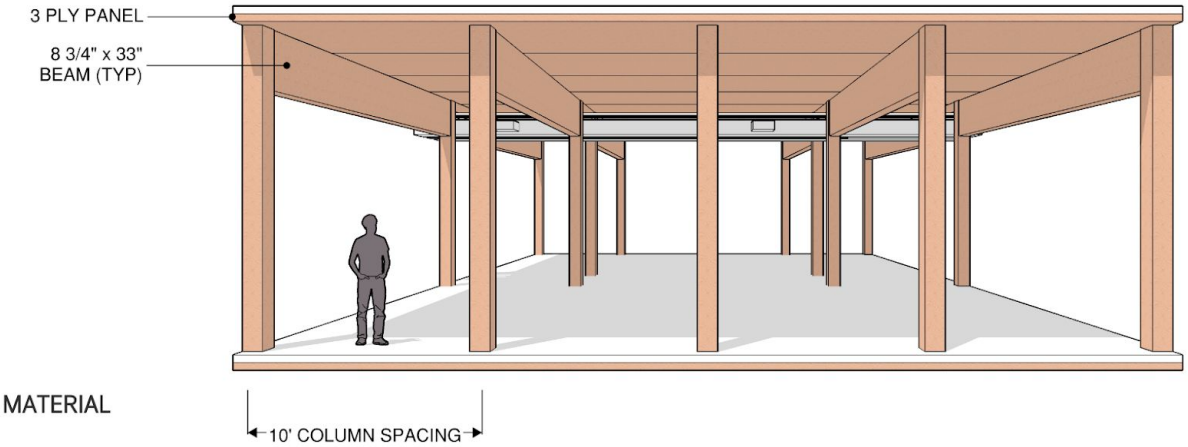

TEACHING LAB
LARGE CLASSROOM
SMALL CLASSROOM
OFFICE POD

SYSTEMS OPTIONS

5 PLY PANEL WITH 13'-4" O.C. COLUMN SPACING
CLT BY VOLUME (APPROX):
30,070 CUBIC FT
FRAMING BY VOLUME (APPROX):
10,670 CUBIC FT
TOTAL WOOD VOLUME (APPROX):
40,740 CUBIC FT

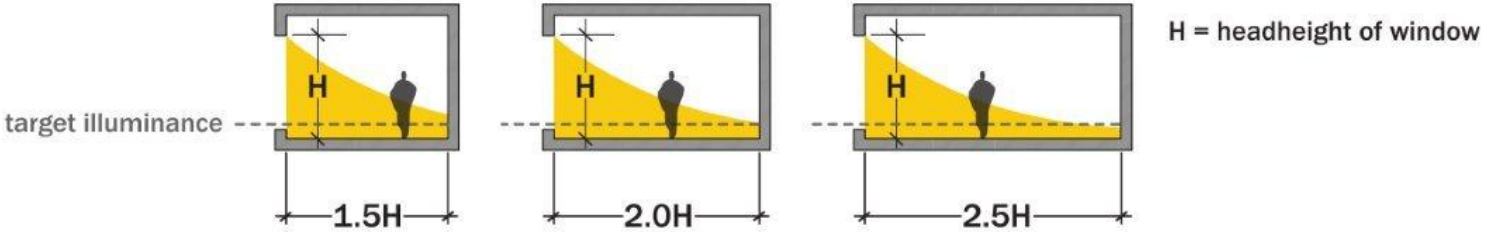


3 PLY PANEL WITH 10'-0" O.C. COLUMN SPACING
CLT BY VOLUME (APPROX):
18,700 CUBIC FT
FRAMING BY VOLUME (APPROX):
11,750 CUBIC FT
TOTAL WOOD VOLUME (APPROX):
30,450 CUBIC FT



25-30% REDUCTION IN STRUCTURAL MATERIAL

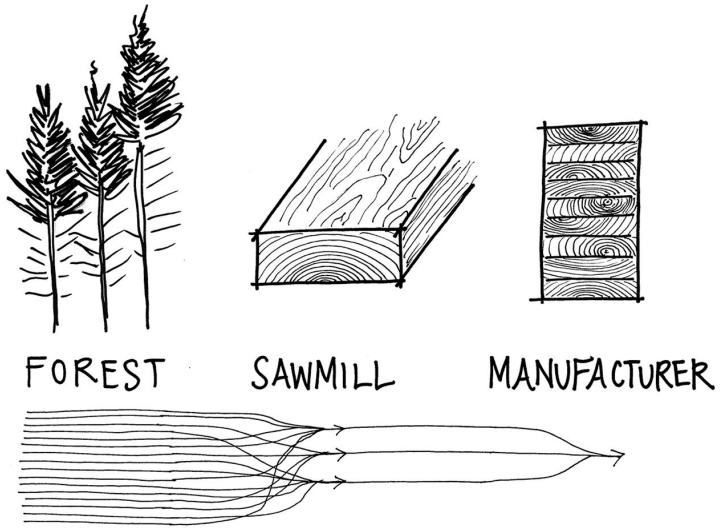

VERMEER
Genie


target illuminance
H
H
H
1.5H
2.0H
2.5H
H = headheight of window

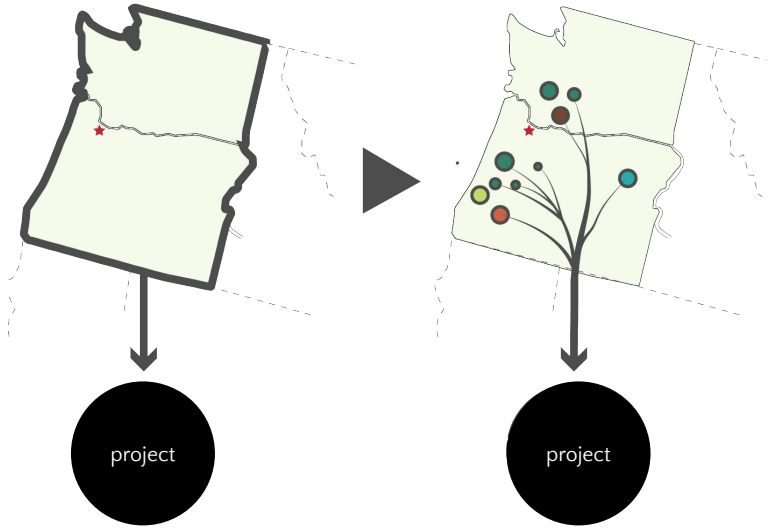
WOOD SUPPLY CHAIN TRANSPARENCY

What is it?

- Supply chain transparency asks where wood comes from and who helped produce it.



- Reaches back all the way to landowners
- Knowing where the wood comes from and who made it

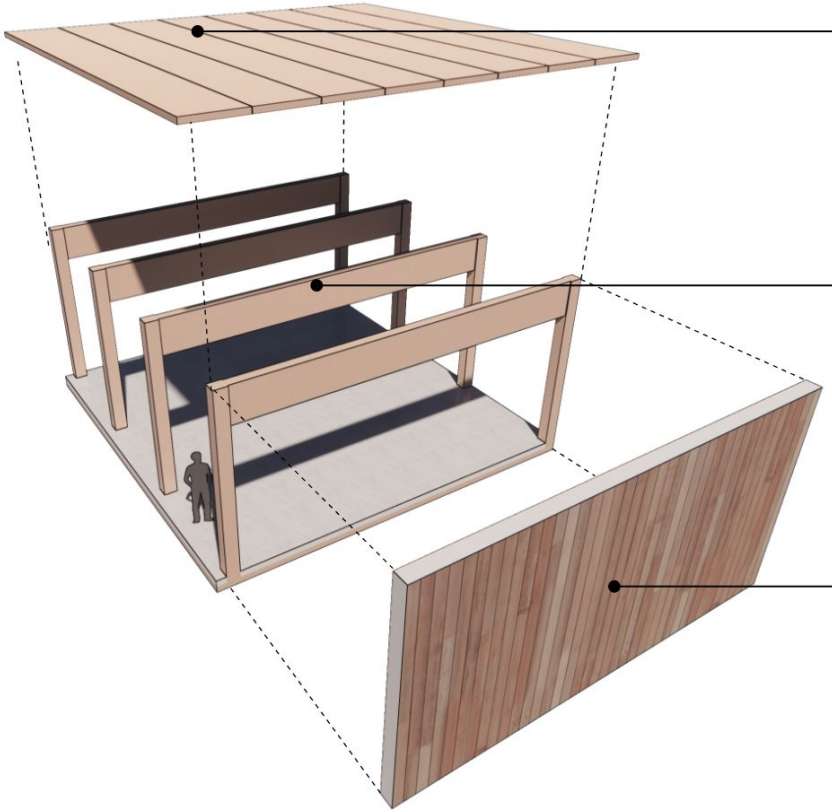


WOOD SUPPLY CHAIN TRANSPARENCY

Why It's Important

- It enables a deeper connection to the people and forests that produce the wood products in our buildings.
- It builds understanding and potential to elevate the community, conservation, and equity opportunities that align with PPS values (wildfire resilience, tribal sourcing, etc.)
- Certifications can be a tool but they don't provide forest-of-origin info. This approach goes beyond what certification is designed to do (while building relationship and transparency that can be complementary)
- It can differentiate mass timber products from the PNW and US at large from international markets that can typically produce cheaper products due to the maturity of their mass timber industry.

FSC ADJACENT SUSTAINABLE WOOD SOURCING BY BUILDING COMPONENT



LOG PURCHASE TRANSPARENCY

FOREST RESTORATION WOOD

VAAGEN TIMBERS CLT:
202,632 BF

RESTORATION TIMBER LOGS:
135,088 BF

FOREST HEALTH:
40 ACRES OF FOREST RESTORATION

JOBS CREATED IN:
STEVENS COUNTY

VERTICALLY INTEGRATED MILL

TRIBAL FOREST RESTORATION WOOD

ZIP-O LAMINATORS GLULAM BEAMS:
67,162 BF of lumber from Yakama Forest Products (50% of 134,324 TOTAL BF)

YAKAMA NATION LOGS:
47,972 BF

FOREST HEALTH:
14 ACRES OF FOREST RESTORATION

JOBS SUPPORTED IN:
YAKAMA AND LANE COUNTY

SMALL MILL DIRECT SOURCING

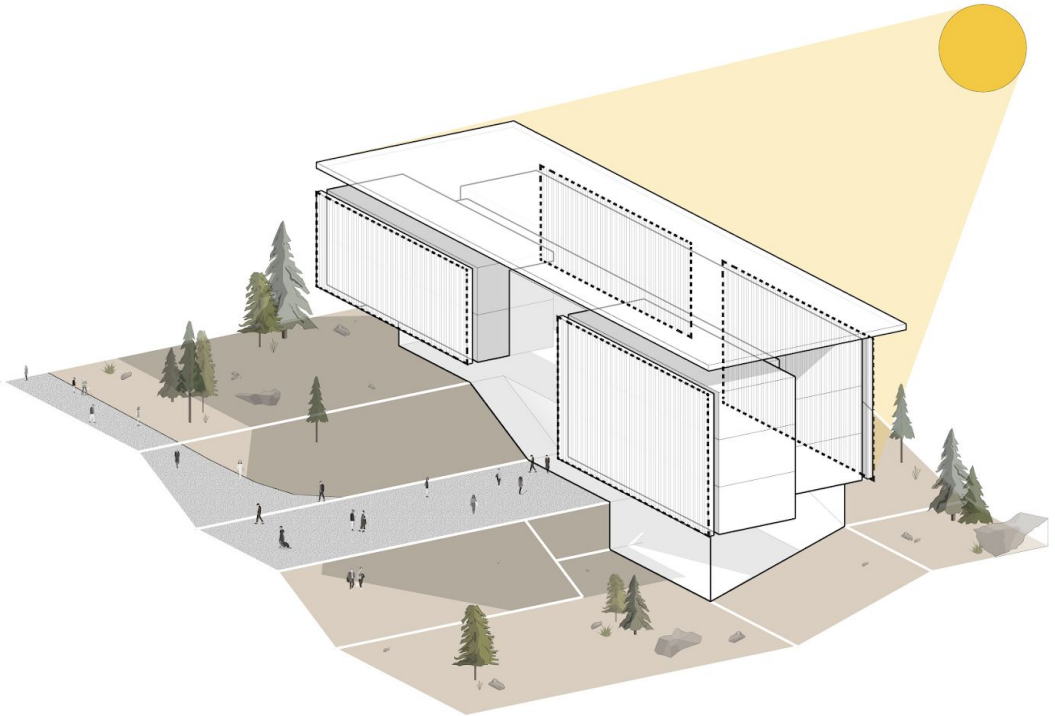
FAMILY FOREST WOOD

SUSTAINABLE NORTHWEST WOOD CEDAR SIDING:
10,900 BF

FAMILY FOREST LOGS:
11,000 BF

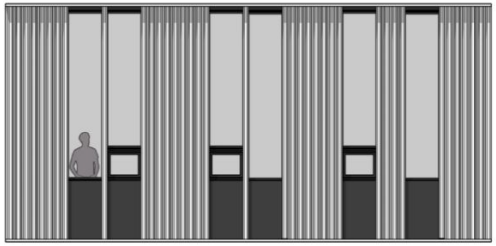
FOREST HEALTH:
10 ACRES (single tree selection)

JOBS SUPPORTED IN:
CLACKAMAS, WHATCOM, MARION, MULTNOMAH COUNTIES



BUILDING ENVELOPE DESIGN VS. HEATING AND COOLING SYSTEM OPTIONS COMPARISON

SOUTH ORIENTATION
31% GLAZING



HEATING AND COOLING SYSTEM OPTIONS

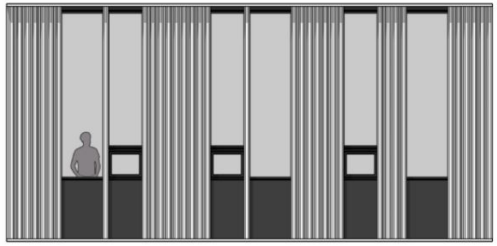
RADIANT PANELS

HYDRONIC FAN POWERED BOXES

VARIABLE REFRIGERANT FLOW

VARIABLE AIR VOLUME

SOUTH ORIENTATION
35% GLAZING



HEATING AND COOLING SYSTEM OPTIONS

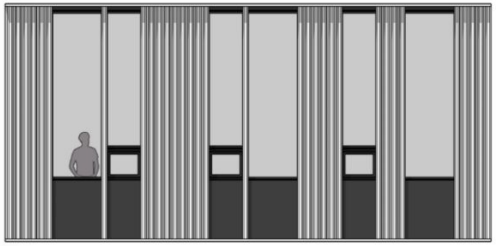
~~RADIANT PANELS~~

HYDRONIC FAN POWERED BOXES

VARIABLE REFRIGERANT FLOW

VARIABLE AIR VOLUME

SOUTH ORIENTATION
39% GLAZING



HEATING AND COOLING SYSTEM OPTIONS

~~RADIANT PANELS~~

~~HYDRONIC FAN POWERED BOXES~~

VARIABLE REFRIGERANT FLOW

VARIABLE AIR VOLUME

POSITIVE OPERATIONAL ENERGY IMPACT

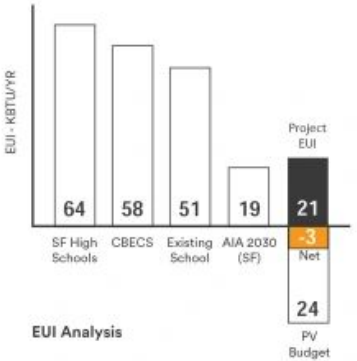
NEGATIVE GLOBAL WARMING POTENTIAL IMPACT

BASELINE ASSUMPTIONS: 30' x30' BAY, 16' FLOOR TO FLOOR WITH 10'-10" TALL APERTURES LOCATED 3'-0" ABOVE FLOOR FOR OPTIMIZED DAYLIGHTING. FIBERGLASS WINDOWS WITH 0.24 U-VALUE, GLAZING WITH 0.27 SHGC AND .65 VLT. R-21 WALL ASSEMBLY WITH R-8 CONTINUOUS EXTERIOR INSULATION.

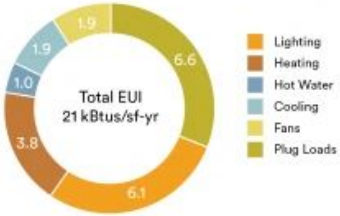

EDWARD J. RAY HALL


CHARLES M. McGRATH FAMILY ATRIUM

Lick Wilmerding HS Expansion & Renovation
San Francisco, California
EHDD

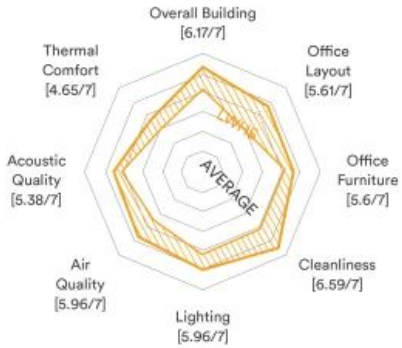


EUI Analysis



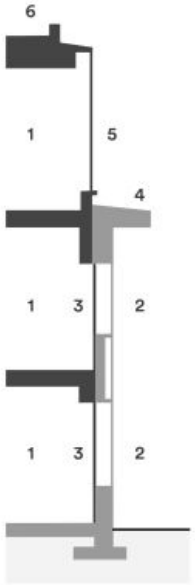
Plug Load Analysis

Plug loads and lighting accounted for nearly two-thirds of predicted energy use. An onsite assessment of plug loads was performed during design, followed by commissioning of lighting and day-lighting controls.



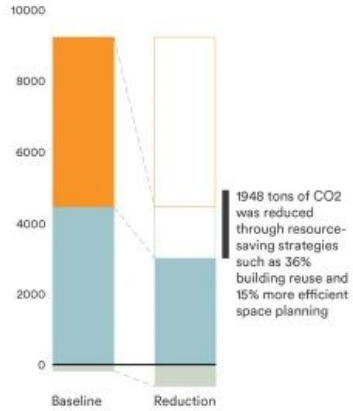
Center for the Built Environment - Livable Building Metrics

2020 Livable Building Award Winner



Wall Section

1 Classroom
2 Restored Historic Wood Curtainwall
3 New Interior Glazing
4 Historic Eave
5 New Curtainwall
6 New Roof



Carbon Emissions Reductions

Operational Emissions
100% Reduction

Embodied Emissions
34% Reduction

Sequestration
612 Additional Tons Sequestered

Mundo Verde at Cook Campus
Washington DC
Studio Twenty Seven Architecture

The multipurpose Zocalo gleams from midday sun

Zocalo terrace and porous parking

View of Zocalo from teacher work room

Percentage of floor area or percentage of occupant work stations with direct views of the outdoors:

95%

Percentage of floor area or percentage of occupant work stations within 30 feet of operable windows:

92%

Percentage of power needs supportable by onsite power generation:

15%

Anticipated number of days the project can maintain function without utility power:

260 Days

Arlington Elementary School
Tacoma, WA
Mahlum Architects


COASTAL RIPPLE

Carbon / Resilience

Health / Environment

Student Empowerment

Carbon / Resilience

Strategies and Opportunities

- How does the Jefferson HS prioritize
- energy conservation?

- What happens when the lights go out?

- What happens when the temp hits 115 or 0?

- How can the project educate and prepare the community for a different future?

Health / Environment

Strategies and Opportunities

- How do we address indoor and outdoor air quality?
- Describe the materials that we want or don't want inside the school
- Describe desirable experiential quality (daylight, views, interior finishes, acoustics, etc.)
- How are occupants connected with the outdoors and local community?

Student Empowerment

Strategies and Opportunities

- How can the school building teach the students about sustainability and climate justice.
- How does the school building teach students about buildings and systems?
- How does the school building empower students to act for positive change?
- How does the Jefferson Community talk about climate justice?

Visioning

What resonates?
What do we want to achieve?

Discussion

A Climate Responsive Jefferson High School

Choose a topic to dig into

40 minutes to discuss,
but first a five minute break

and then then take 2 minutes to think to yourself