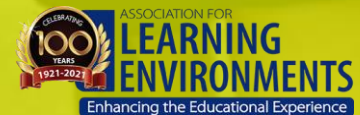


**OPTIMIZING LEARNING ENVIRONMENTS FOR THE LITTLEST LEARNERS:**

# ELEMENTARY SCHOOL DESIGN IN 360°



A4LE ASSOCIATION DAYS



# PRESENTERS

**Richard Higgins, AIA, LEED AP**  
Principal  
BLRB Architects

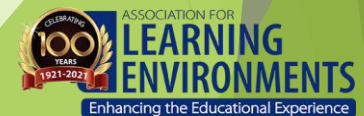
**Elin Shepard, LEED AP BD+C, CEM**  
**Outreach Manager**  
Energy Trust New Buildings Program

**Rick Flacco**  
**Outreach Manager**  
Energy Trust New Buildings Program

**Ruwan Jayaweera, PE, LEED AP**  
Associate Principal  
PAE Engineers



**A4LE ASSOCIATION DAYS**

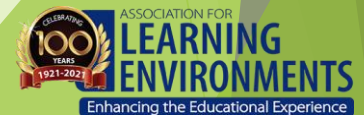


# AGENDA

1. Overview
2. About the District
3. Whole Child Development
4. Integrated Sustainability
5. 360° Review
6. Q & A



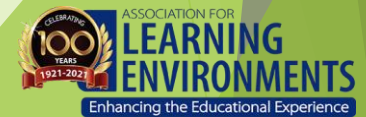
A4LE ASSOCIATION DAYS



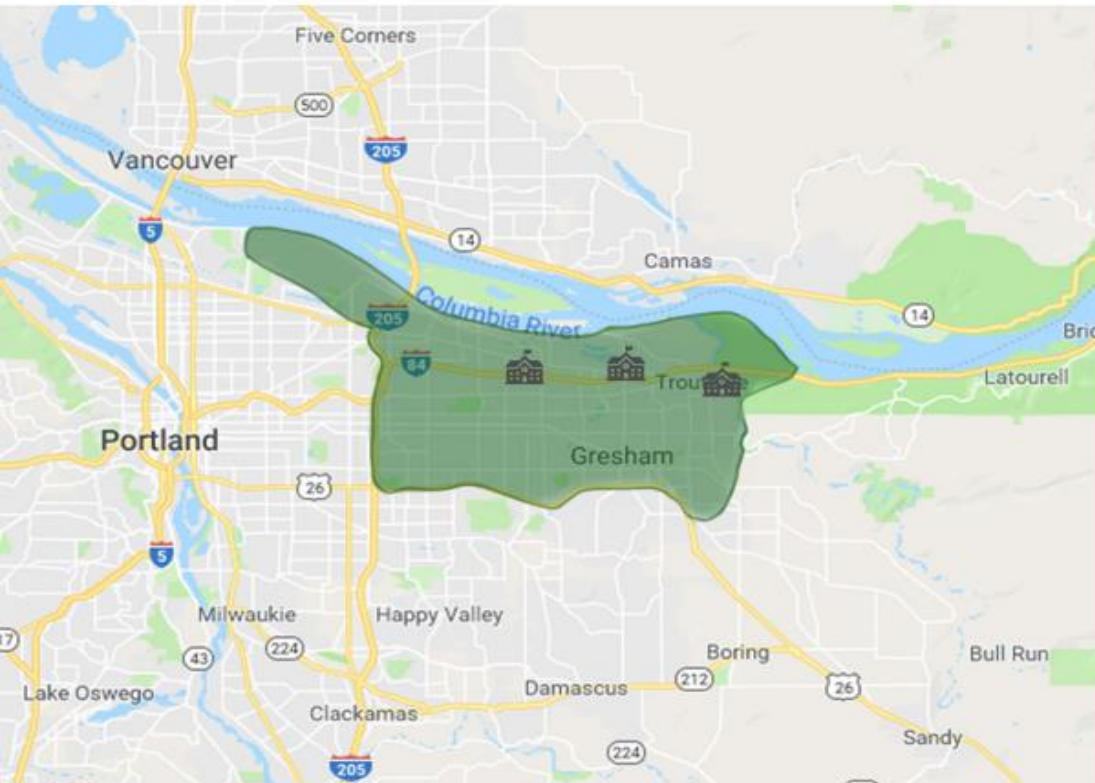
# OVERVIEW



A4LE ASSOCIATION DAYS



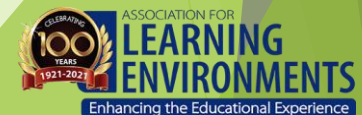
# ABOUT THE DISTRICT



- East Multnomah County  
Portland, Oregon
- Serves 1,200 Students
- Covers Five Municipalities:
  - Portland
  - Gresham
  - Fairview
  - Wood Village
  - Troutdale



A4LE ASSOCIATION DAYS



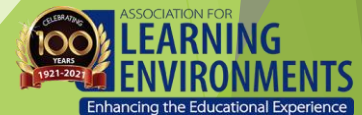
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A4LE ASSOCIATION DAYS



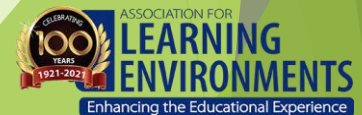
# WILKES ELEMENTARY



- Original Pioneer School House
- Modern Day Pioneers
- Multi-Cultural Identity



A4LE ASSOCIATION DAYS



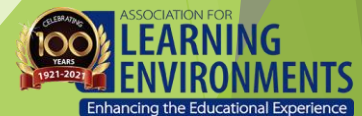
# FAIRVIEW ELEMENTARY



- Established Suburban Community
- Surrounded by Metro-Portland Growth
- Historic Red Brick School



A4LE ASSOCIATION DAYS





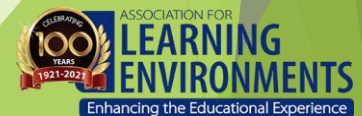
# TROUTDALE ELEMENTARY



- Gateway to Historic Hwy 30 & Columbia Gorge
- Historic Downtown
- Walkable Community School



A4LE ASSOCIATION DAYS



# GUIDING PRINCIPALS



## New Elementary Schools | *guiding principles of design*

### Be a learner-centered environment

- A variety of spaces, both interior and exterior, will be provided to support multiple intelligences and encourage multiple learning modalities.
- The schools will incorporate Small Learning Communities to enhance learning, connectedness, and collaboration.
- Ample, robust, and flexible technology options will be available to support learning.
- The learning environment is to include space for hands-on project-based learning.
- Utilize evidence-based design when selecting interior colors and materials so as to positively impact student behavior, productivity, and achievement.

### Be a safe environment

- The schools will be designed to support security and personal safety.
- The school's main entrance will be adjacent and visible to the administration and incorporate a "secured vestibule" for controlled entry during the school day.
- Access points to the school will be limited, easily supervised, and controlled.
- The schools will be zoned for before- and after-school community use.
- Design the Small Learning Communities as "safe havens" in case of emergency lock downs.
- Provide separate and discreet vehicular drop-off zones for parents and buses.
- Provide adequate exterior site lighting throughout pedestrian and vehicular zones.
- Provide emergency access and exiting throughout the schools.

### Be flexible and adaptable

- Various learning spaces will promote multiple uses to enable high utilization of all spaces.
- Include a variety of spaces such as learning studios, learning commons, and small group rooms in each Small Learning Community to provide diverse and agile places of learning.
- Buildings shall be designed to accommodate change over time; consider building structure, infrastructure, and technology.
- Furniture and equipment will be selected to support flexibility and multi-use.
- Consider providing flexible space that can support and encourage community partnerships.
- Provide adequate covered outdoor space to allow for year-round outdoor play.
- Efficient use of space.

### Promote meaningful collaboration

- Small personalized learning communities will be provided that promote collaborative activities.
- Provide staff team/planning spaces in each Small Learning Community to promote teacher communication and teaming.
- Provide spaces such as learning commons and small group rooms to support student collaboration and interaction.
- Accommodate staff professional development needs.
- Consider the concept of "the open office" to encourage better communication and collaboration in the school admin area.
- Consider providing common space for parent and community volunteers.
- Provide a "Community Living Room" to welcome and foster communication.

### Be a community resource

- The school will be well lit, visible, inviting, and accessible for community use.
- Zone the facilities in such a way as to promote and support community use.
- Consider the school facility as a potential community FEMA shelter in an emergency.
- Accommodate and allow for community use of playfields, gymnasiums, and other school facilities as deemed appropriate.
- Unity of school community will be supported and promoted through the inclusion of Small Learning Communities, shared spaces, and multi-use of spaces.

### Be a model school for stewardship & sustainability

- The school facilities will incorporate natural light and daylight harvesting features.
- The school building and site will be a teaching tool for environmental stewardship.
- Select bldg. materials/systems that are sustainable, durable, and cost-effective. Select mechanical systems that are both energy efficient and simple/easy to operate and maintain.
- Use renewable energies (i.e. solar, wind) where appropriate and cost effective.
- Provide a healthy indoor school environment; including quality indoor air, quality acoustics, and supporting physical activity.
- Encourage environmentally responsible behavior through the inclusion of recycle stations, energy performance reporting stations and outdoor learning labs.
- Effectively use public funds to deliver a resource and energy-efficient school.
- Foster student health and wellness by encouraging physical activity, active lifestyle, and healthy eating.

### Honor community context

- Design each of the three elementary schools (Wilkes, Fairview, and Troutdale) to reflect and honor the unique community/neighborhood in which it resides while adding to the strength and stability of the neighborhood.
- Ensure that the design of each school is equitable in quality, program, and features.
- Design each school to celebrate and showcase the school's heritage and history.
- Utilize a design aesthetic that is not trendy and will pass the test of time. Consider the use of masonry as a preferred exterior building material.



A4LE ASSOCIATION DAYS



ASSOCIATION FOR  
**LEARNING ENVIRONMENTS**

Enhancing the Educational Experience

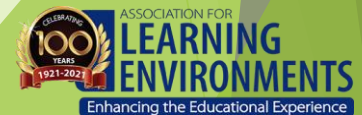
# PLANNING & CONSTRUCTION



- Equity v. Prototype
- Concurrent Construction
- Occupied Sites
- Same Products & Systems
- Same Construction Conditions
- Same but Tailored – Orientation, Access, Parking



A4LE ASSOCIATION DAYS



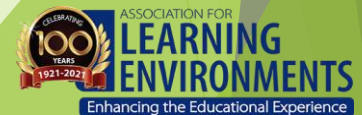
# TROUTDALE ELEMENTARY



FIRST FLOOR



A4LE ASSOCIATION DAYS



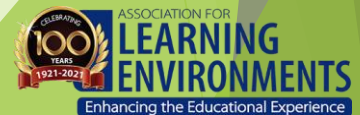
# TROUTDALE ELEMENTARY



SECOND FLOOR



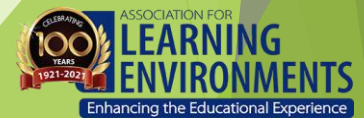
A4LE ASSOCIATION DAYS



# TROUTDALE ELEMENTARY



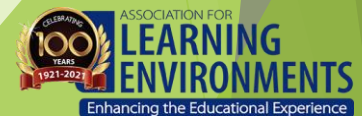
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# TROUTDALE ELEMENTARY



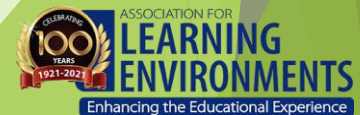
A4LE ASSOCIATION DAYS



# TROUTDALE ELEMENTARY



A4LE ASSOCIATION DAYS

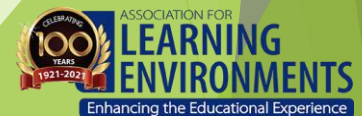




# FAIRVIEW ELEMENTARY



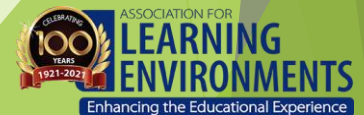
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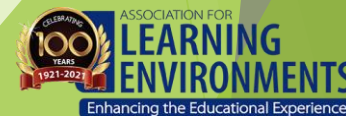
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# FAIRVIEW ELEMENTARY



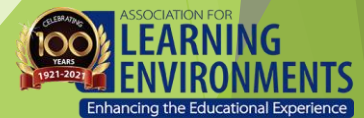
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# WILKES ELEMENTARY



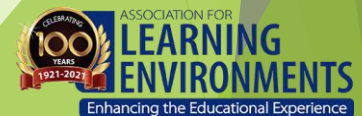
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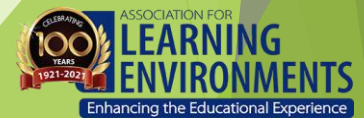
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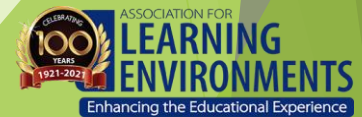
A4LE ASSOCIATION DAYS



# WHOLE CHILD DEVELOPMENT



A4LE ASSOCIATION DAYS



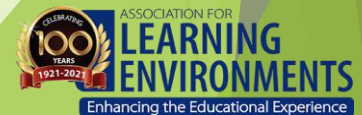
# SAFE ENVIRONMENT



- Monitoring Access & Entry
- Grade Level Learners Organized Around Common Areas
- Belonging to a Smaller Community



A4LE ASSOCIATION DAYS





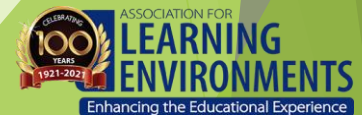
# TEACHING & LEARNING



- “Fat L” Learning Studio
  - Plenary
  - Small Group
  - Independent Learners



A4LE ASSOCIATION DAYS



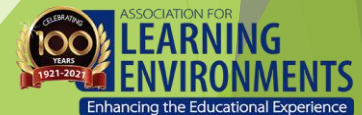
# TEACHING & LEARNING



- Large Group
- Essential Service Within the Community
- Grade-Specific Spaces
  - Grades K-1
  - Grades 2-3
  - Grades 4-5



A4LE ASSOCIATION DAYS



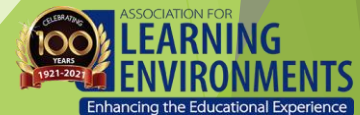
# PHYSICAL NEEDS



- Free & Reduced Meals Program
- Family Support Services



A4LE ASSOCIATION DAYS



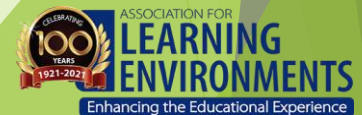
# PHYSICAL NEEDS



- Outdoor & Indoor Play Areas
- Before & After School Programs



A4LE ASSOCIATION DAYS



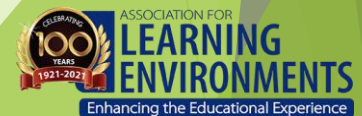
# COMMUNITY



- Wall Mural – History & Heritage of Each School



A4LE ASSOCIATION DAYS



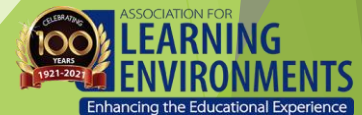
# COMMUNITY



- Oversized & Flexible Commons/Gymnasium
- Maker Space – Hands On Learning + Community Use
- School-Based Facilities for Families



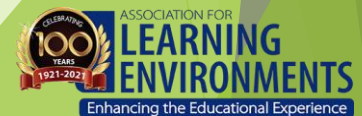
A4LE ASSOCIATION DAYS



# INTEGRATED SUSTAINABILITY



A4LE ASSOCIATION DAYS



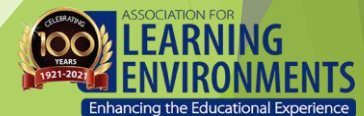
# DISTRICT GOALS



- Resource & Energy Efficient
- Daylight Harvesting



A4LE ASSOCIATION DAYS





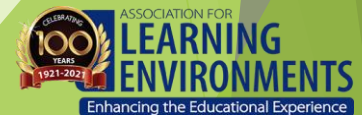
# DISTRICT GOALS



- Cost-Effective Maintenance
- Teaching Environmental Stewardship
- Path to Net Zero
- PV Ready
- Statistics/School
  - Incentive funding: \$150,000
  - Annual Savings: \$61,000
  - Annual KWh Savings: 250,000
  - Annual Therm Savings: 1,600



A4LE ASSOCIATION DAYS



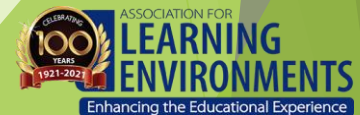
# PROCESS TO NET ZERO



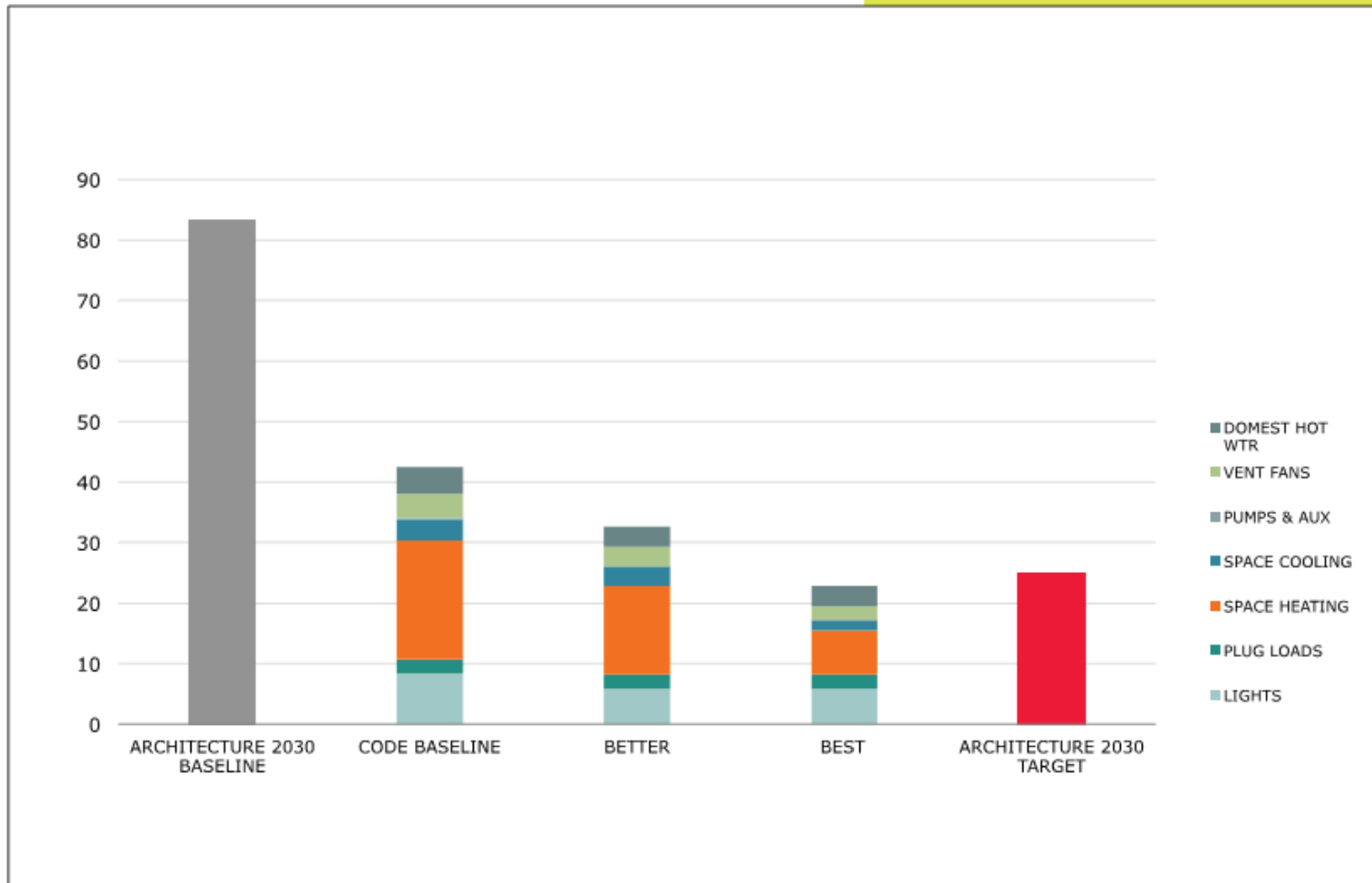
- Guiding Principals
- Multiple HVAC Options
- High Performance Building Envelope
- Natural Ventilation
- Active Supplemental Systems for Heating & Cooling



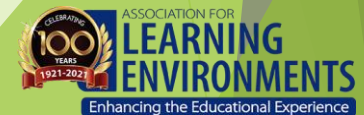
A4LE ASSOCIATION DAYS



# ENERGY USE GOAL SETTING

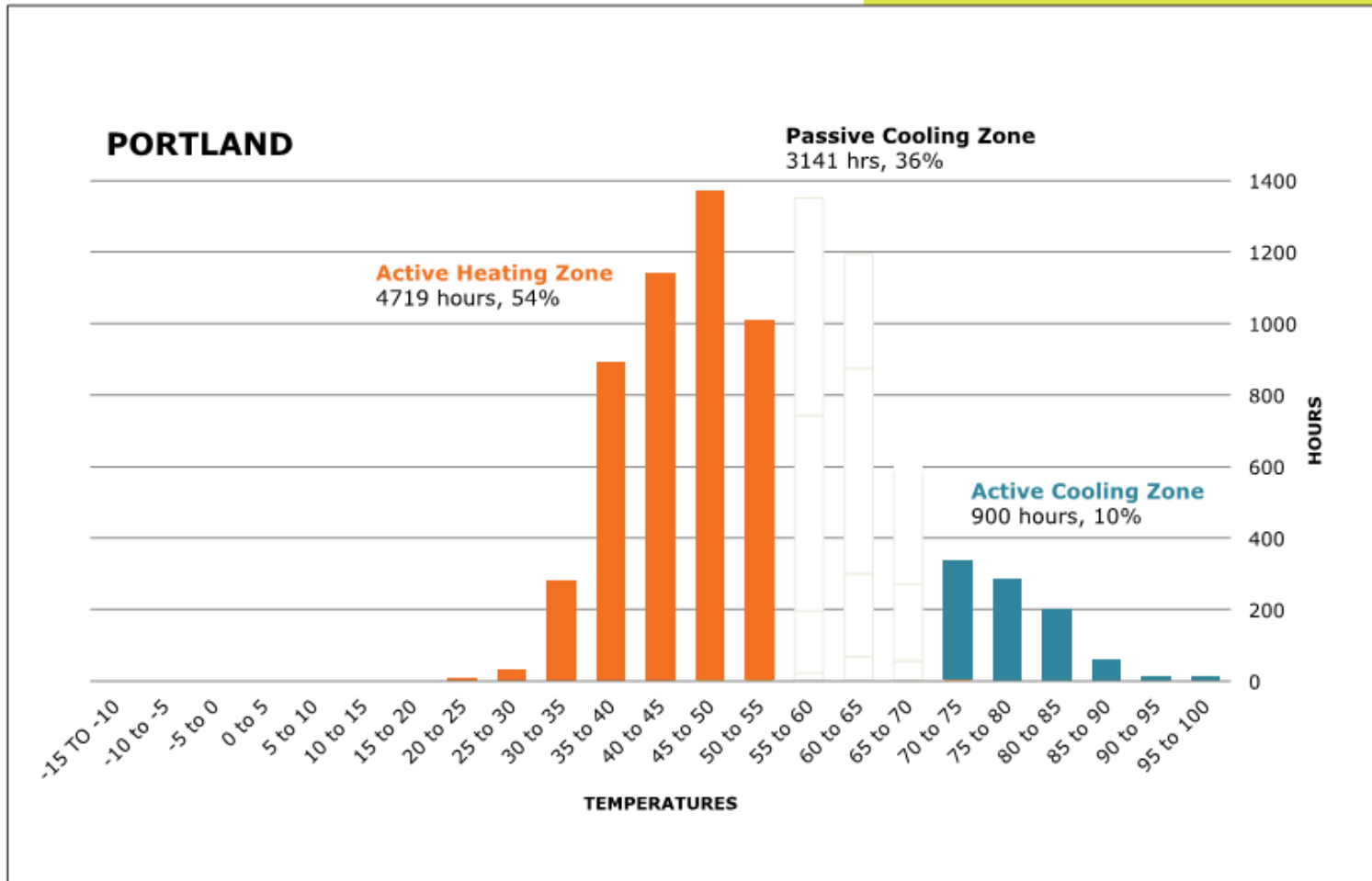


A4LE ASSOCIATION DAYS

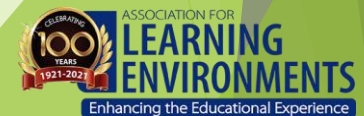


# CLIMATE ANALYSIS

BIN DATA TYPICAL

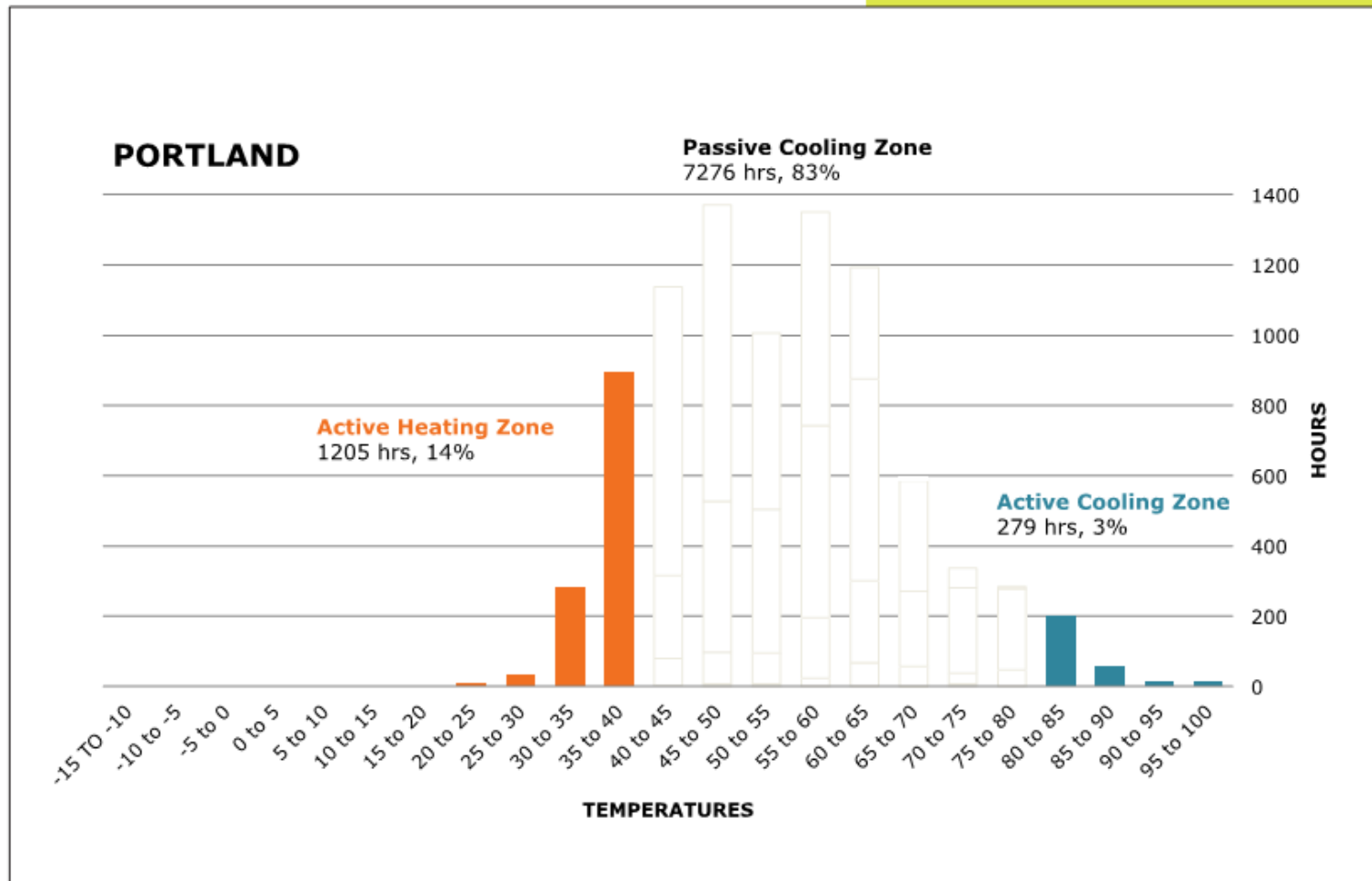


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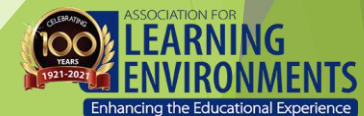


# CLIMATE ANALYSIS

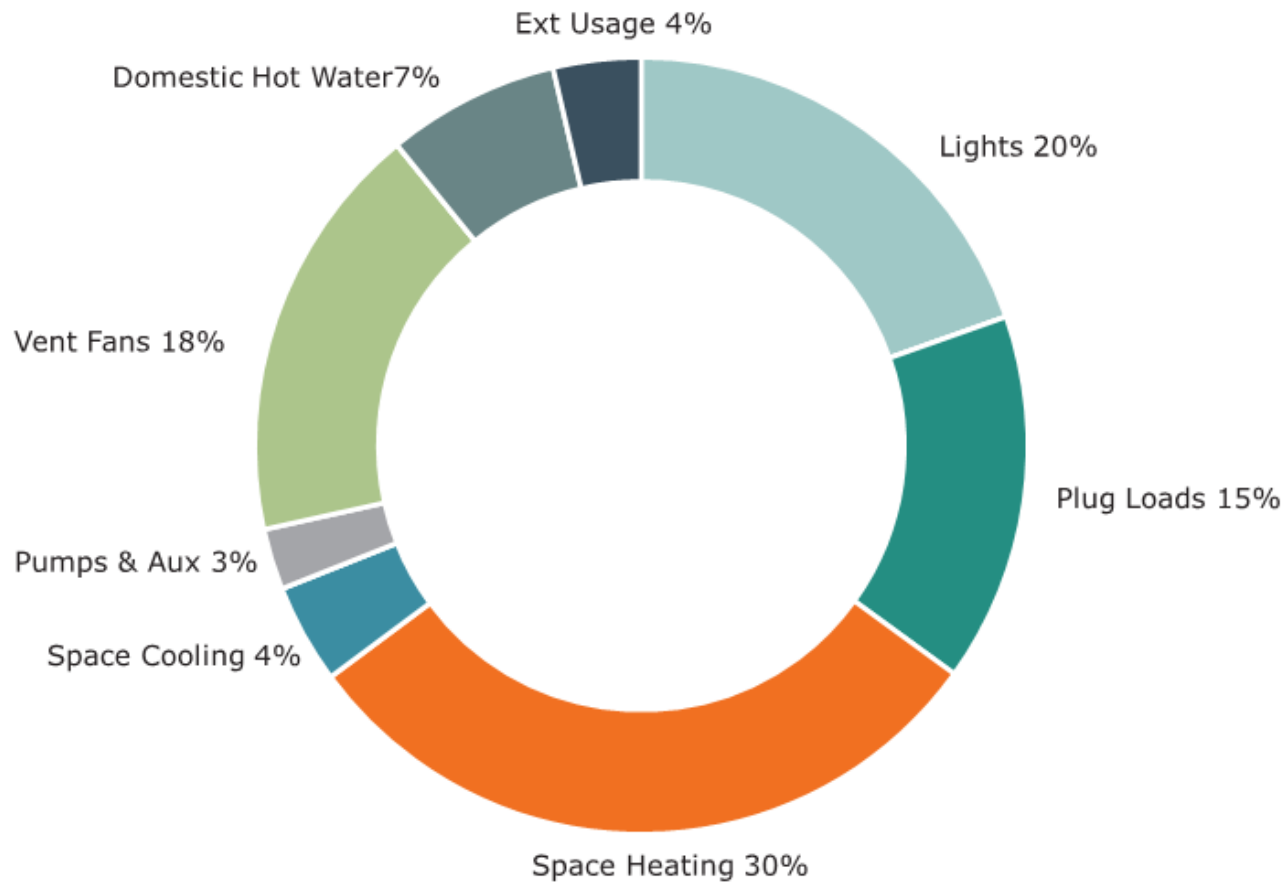
## BIN DATA PASSIVE



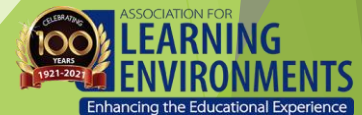
A4LE ASSOCIATION DAYS



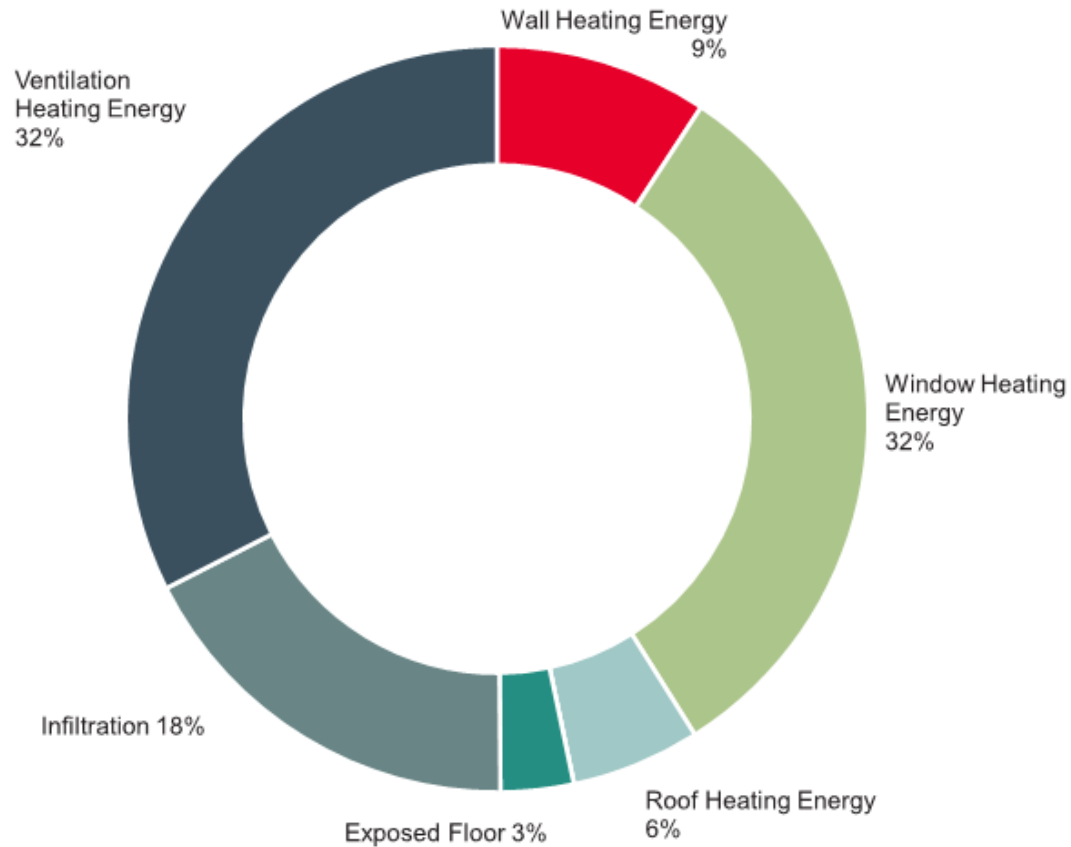
# ENERGY USE BREAKDOWN



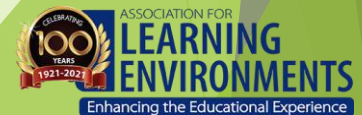
A4LE ASSOCIATION DAYS



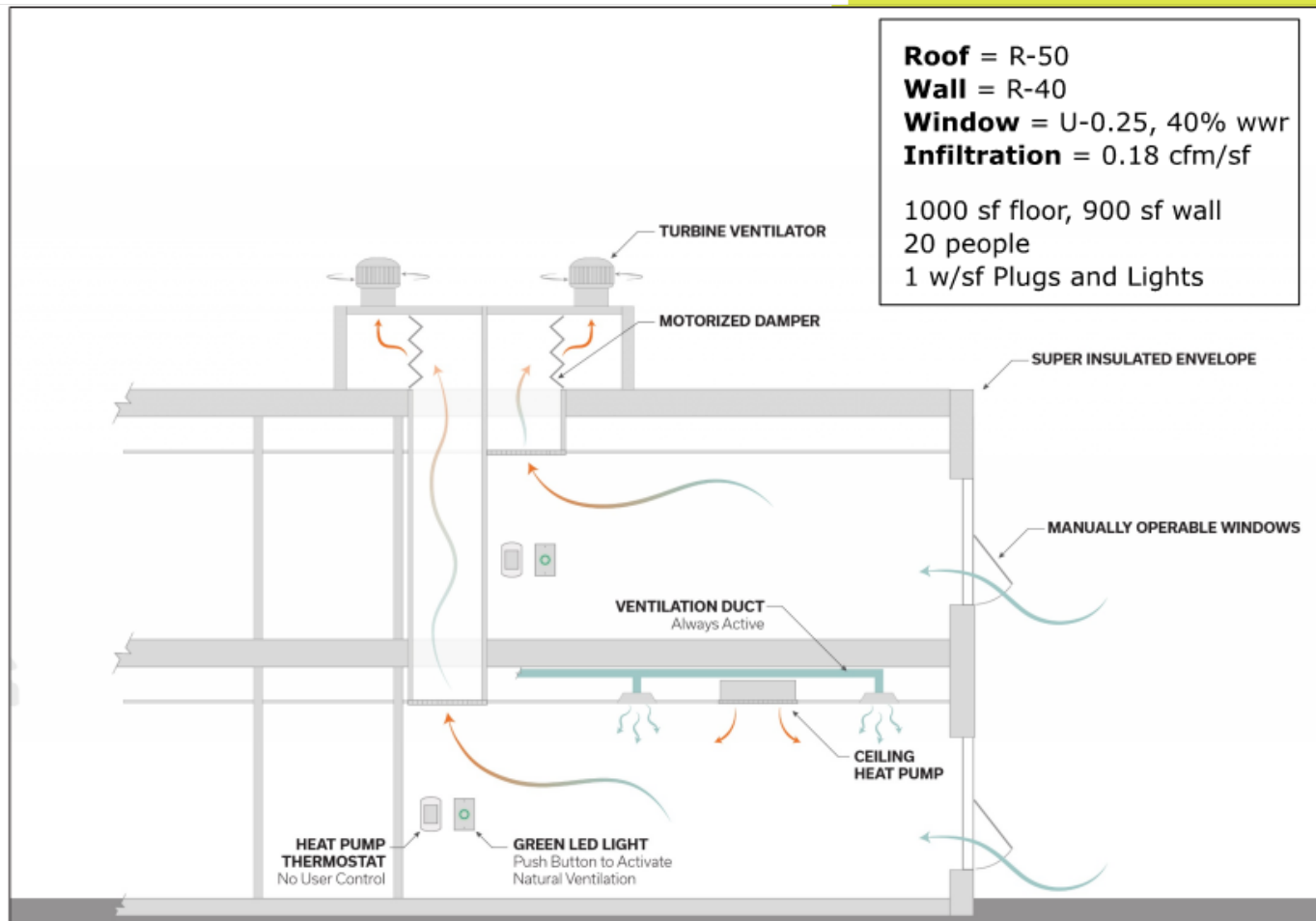
# HEATING ENERGY BREAKDOWN



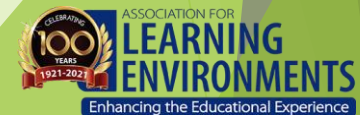
A4LE ASSOCIATION DAYS



# PASSIVE APPROACH

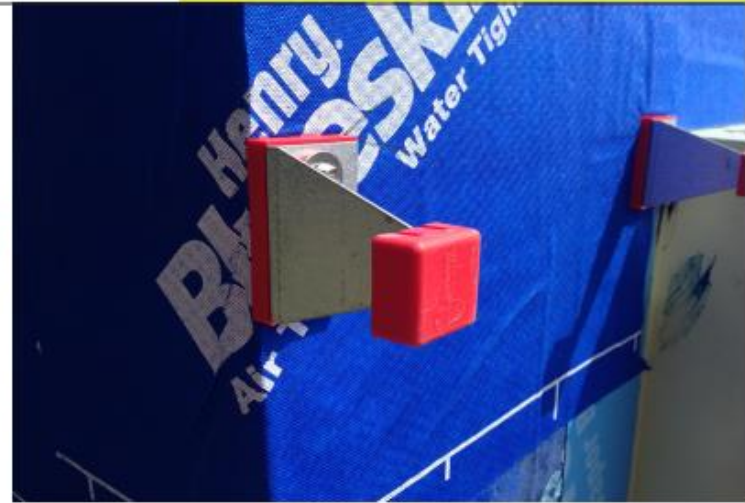


A4LE ASSOCIATION DAYS

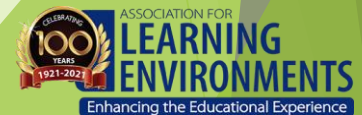




# PASSIVE HEATING WALL DETAILS



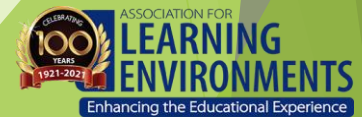
A4LE ASSOCIATION DAYS



# PASSIVE HEATING WALL DETAILS

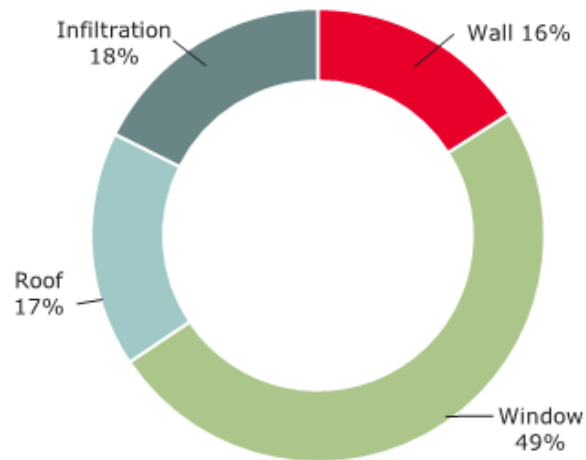


A4LE ASSOCIATION DAYS

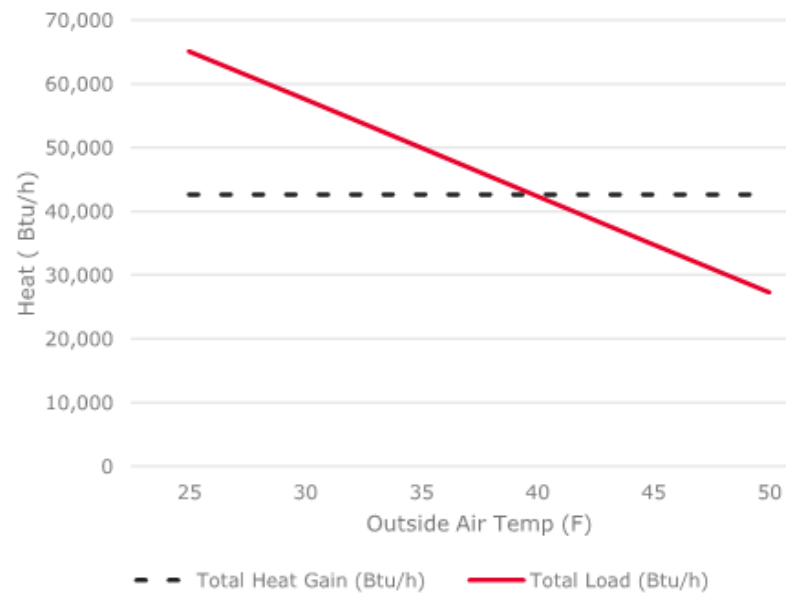


# BALANCE POINT TEMPERATURE

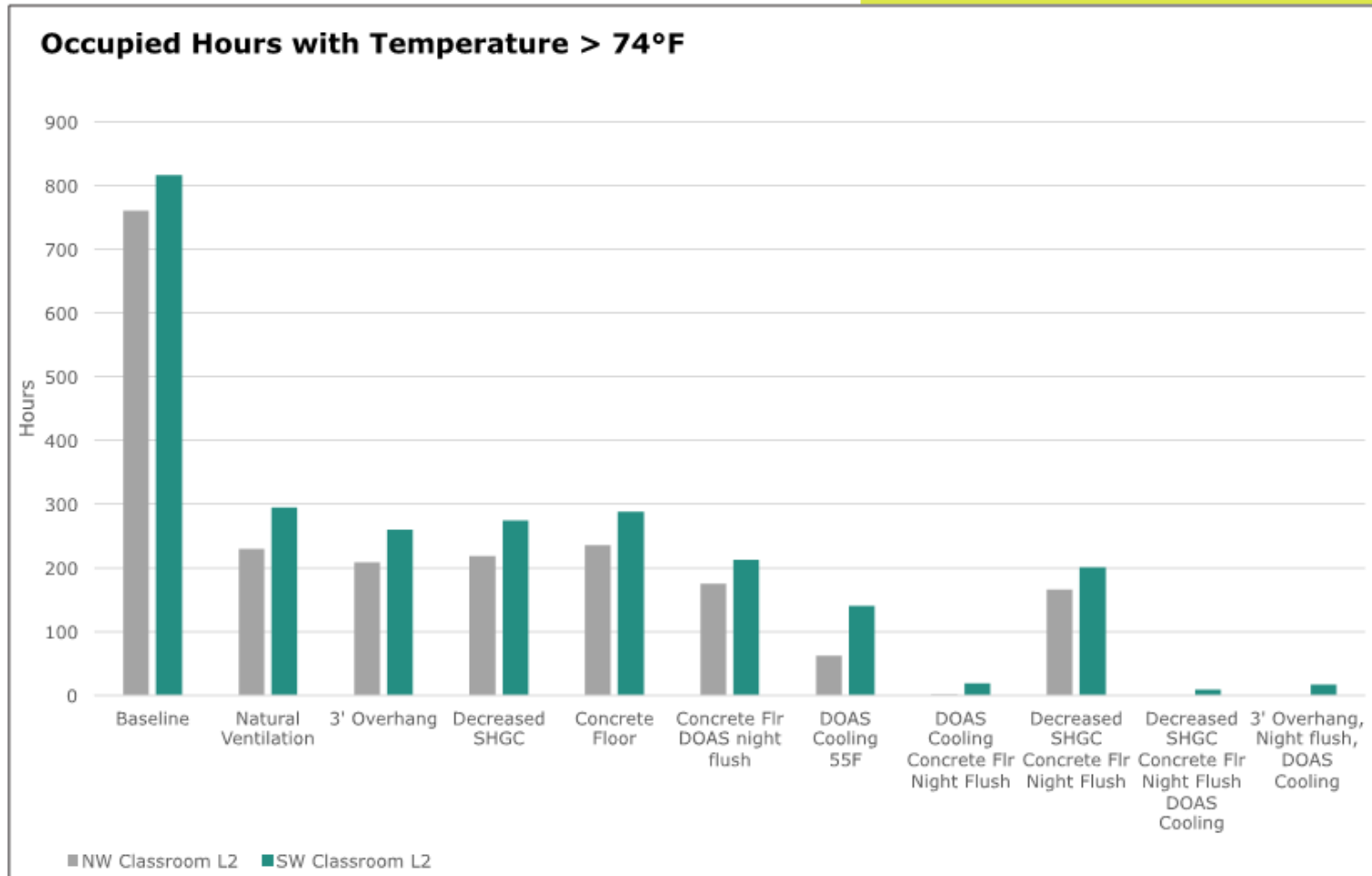
### Heat Load in Passive Buildings



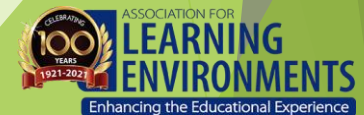
### Balance Point Temperature



# PASSIVE COOLING THERMAL COMFORT



A4LE ASSOCIATION DAYS



# PASSIVE COOLING HEAT MAPS

## August - Option 12

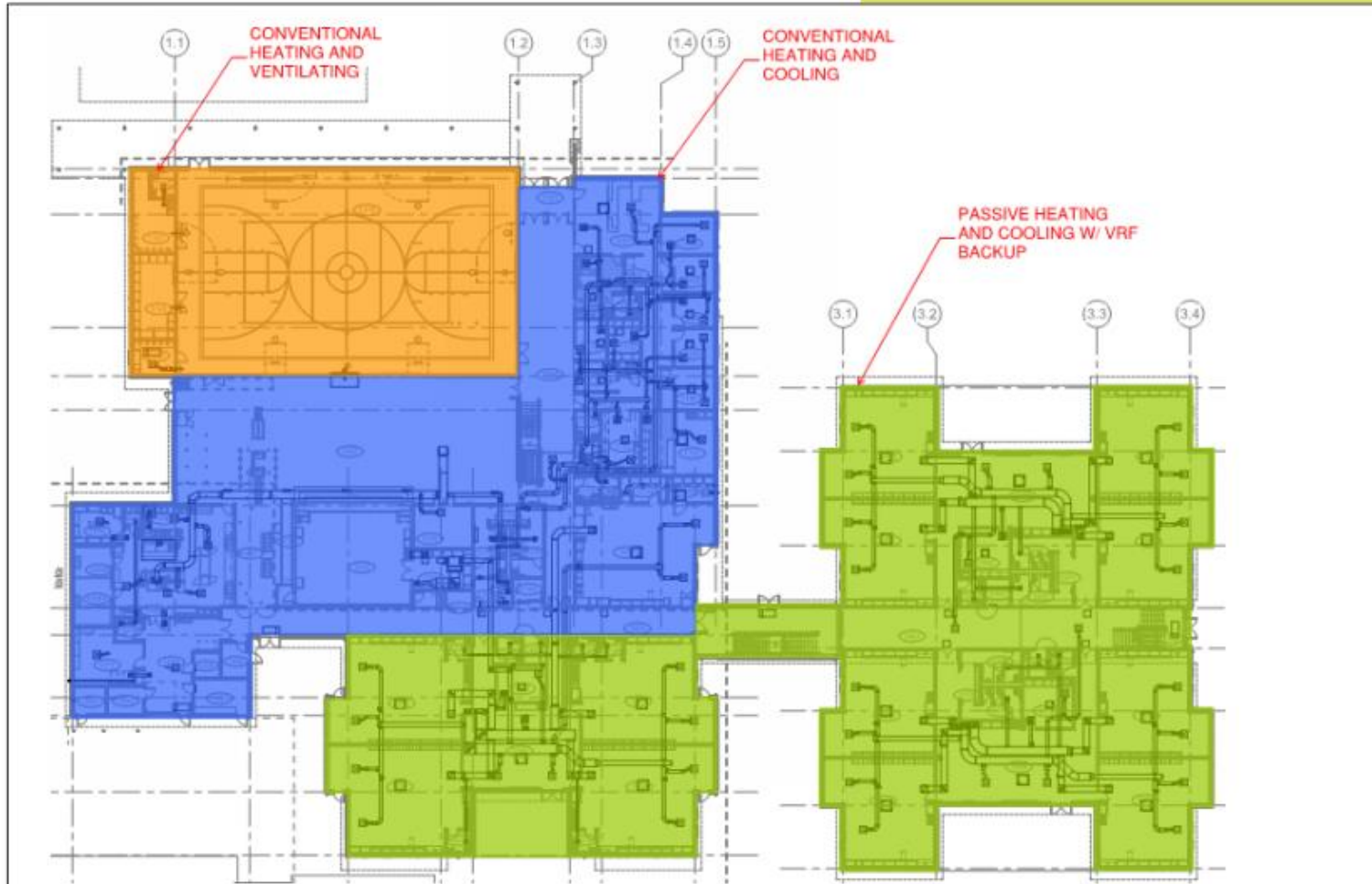
Hour	1-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	
7	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0	68.0
8	69.3	69.5	69.3	69.3	69.3	68.9	68.7	69.2	69.5	69.8	69.7	69.3	69.4	68.7	68.6	68.7	69.5	69.3	69.3	69.1	68.9	
9	70.0	69.8	69.7	69.9	69.8	69.5	69.6	69.7	70.8	71.1	70.1	69.6	69.2	69.7	69.4	69.6	69.9	69.7	69.9	69.5	69.7	
10	70.2	70.4	70.1	70.5	69.4	69.7	69.8	70.1	72.0	72.3	71.0	69.7	69.3	69.3	69.6	69.7	71.1	70.3	69.8	69.3	69.9	
11	69.9	70.7	70.5	71.5	70.0	70.0	70.0	69.9	72.6	72.9	71.8	69.8	69.4	69.7	69.5	70.3	72.0	71.6	70.0	69.6	70.2	
12	70.7	71.9	71.8	72.6	70.3	70.7	71.1	70.7	73.2	73.6	73.1	70.2	69.6	69.5	69.7	71.4	72.9	72.8	70.6	70.2	71.3	
13	72.0	72.8	72.8	73.4	70.2	71.7	72.0	71.6	74.1	74.5	74.0	71.3	70.2	70.3	70.1	72.3	73.9	73.8	72.1	71.0	72.5	
14	72.5	73.4	73.3	74.0	70.2	72.4	72.6	72.5	74.6	75.0	74.7	71.8	70.2	71.1	70.5	73.0	74.5	74.5	73.3	72.2	73.1	
15	70.6	71.4	71.3	72.0	69.5	70.4	70.7	70.7	72.6	73.1	72.7	70.6	68.8	69.8	69.5	71.2	72.7	72.7	71.5	70.7	71.3	

## August - Option 7

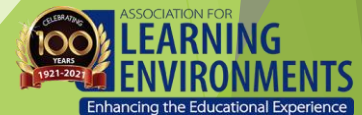
Hour	1-Aug	4-Aug	5-Aug	6-Aug	7-Aug	8-Aug	11-Aug	12-Aug	13-Aug	14-Aug	15-Aug	18-Aug	19-Aug	20-Aug	21-Aug	22-Aug	25-Aug	26-Aug	27-Aug	28-Aug	29-Aug	
7	69.6	69.8	69.1	69.9	70.6	68.0	68.0	69.8	70.0	72.3	71.8	71.5	69.4	68.0	68.0	68.0	69.7	70.3	70.0	68.6	68.0	
8	70.2	69.7	70.0	70.4	70.7	69.4	69.3	70.4	70.8	73.5	71.5	70.6	69.6	69.4	69.0	69.4	70.5	70.1	70.3	69.5	69.2	
9	71.4	71.6	70.6	71.3	70.7	69.6	70.0	70.4	73.7	74.8	73.4	70.8	69.3	69.2	69.5	69.6	71.5	70.9	70.6	69.6	69.8	
10	72.3	73.2	72.0	73.4	70.9	70.1	70.5	71.1	77.9	77.5	75.2	70.8	69.7	70.0	69.8	70.5	74.1	72.5	70.9	69.4	70.8	
11	71.0	73.0	73.2	74.6	71.4	71.4	72.0	71.7	80.5	80.0	76.6	70.7	69.2	69.8	70.2	72.1	76.1	74.2	71.6	70.7	72.5	
12	72.6	74.5	74.5	77.3	72.0	72.3	74.2	72.9	82.5	82.7	78.7	72.2	70.0	70.1	70.5	74.4	78.7	77.9	73.4	71.7	73.9	
13	75.3	76.7	76.1	79.3	71.0	73.3	75.8	74.6	84.1	84.8	80.8	74.1	71.6	71.7	70.7	77.3	81.3	81.3	75.2	73.2	75.7	
14	75.5	78.7	77.7	80.9	71.3	74.4	77.8	75.0	85.6	86.5	82.8	74.6	71.9	73.3	71.9	79.7	83.5	83.4	76.6	74.6	77.7	
15	74.1	78.4	77.9	80.7	71.0	74.4	77.9	75.8	84.8	85.9	82.8	73.8	70.4	73.4	71.6	79.5	83.1	83.2	76.1	74.5	77.8	



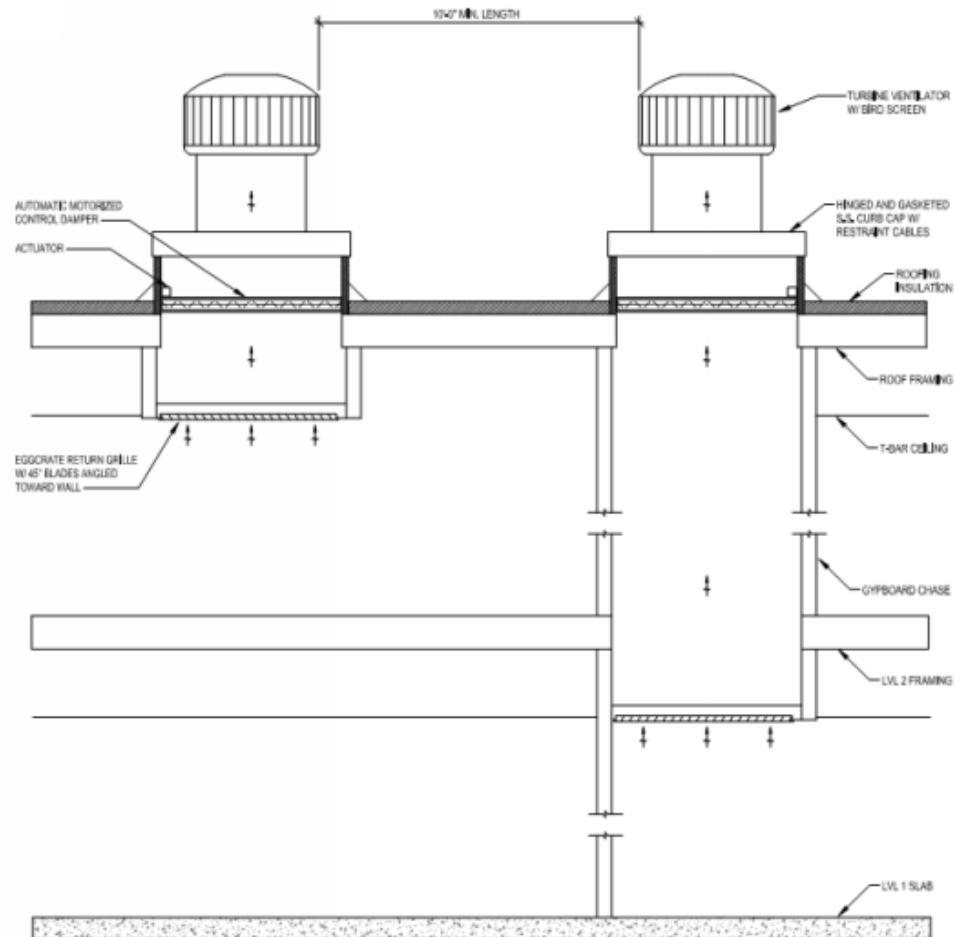
# HVAC SYSTEMS



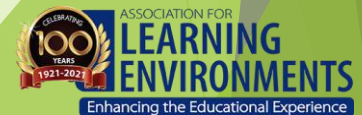
A4LE ASSOCIATION DAYS



# NATURAL VENTILATION STACK



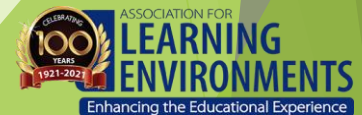
A4LE ASSOCIATION DAYS



# NATURAL VENTILATION STACK



A4LE ASSOCIATION DAYS





# SYSTEM CONTROLS



Thermostat



LED Sensor



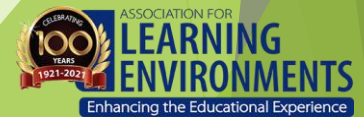
Ceiling Heat Pump



# 360° REVIEW



A4LE ASSOCIATION DAYS



# REYNOLDS IN 360°

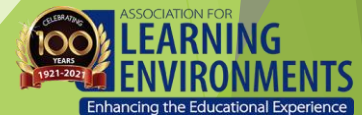
## WHOLE CHILD DEVELOPMENT

*RSD Board & Administration are committed to helping the whole child succeed:*

- Mind, body & a sense of belonging
- Safety & security
- Age-specific environments
- Integration of contemporary learning environments
- Student & family services beyond the classroom
- Supporting the community through families



A4LE ASSOCIATION DAYS



# REYNOLDS IN 360°

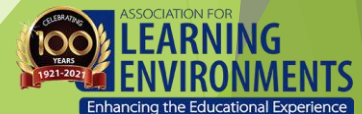
## INTEGRATED SUSTAINABLE DESIGN

*RSD Board & Administration are committed to a sustainable future:*

- Durability & maintainability are priorities
- Energy conservation is a priority
- High performance building design
- Integrated student learning in controlling the learning environment via system controls



A4LE ASSOCIATION DAYS



# QUESTIONS?



A4LE ASSOCIATION DAYS

