Designing a High-Performance Multi-Use Technical Education Space: Chemeketa Community College's Path to Net Zero

Allies for Efficiency

September 15, 2017

Energy Trust of Oregon

Who we are

Energy Trust is an independent nonprofit dedicated to helping 1.5 million utility customers invest in energy efficiency and clean, renewable power.

We provide:

- Information
- Technical services
- Engineering studies
- Cash incentives
- Contractor connections

Energy Trust New Buildings

- New construction
- Major renovation
- Tenant build-out
- Additions or expansions

New Buildings Training & Education

Allies for Efficiency (AFE)

- Case study presentations on high-performance design and construction projects
- Take place 3-5 times per year in Portland + regionally

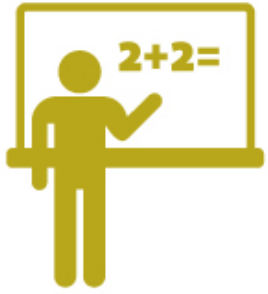
High Performance Design Trainings

- Advanced training events for designers, architects and/or engineers
- Take place 2 – 3 times per year
- Content is focused on specific techniques or technologies

Building Energy Simulation Forum (BESF)

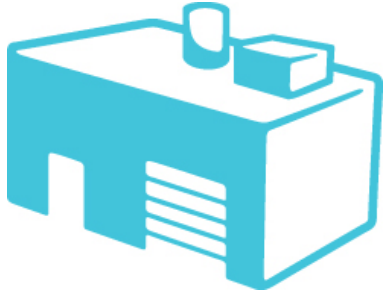
- Advanced energy modeling presentations
- Topics relevant to energy modelers / analysts, and engineers
- Take place every other month

Upcoming Allies for Efficiency Trainings

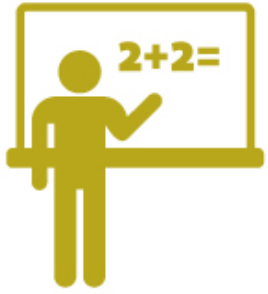


September 29, 2017

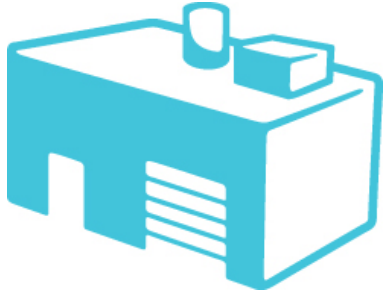
Bellevue Crossing – Bend Energy Week
Bend, Oregon



Upcoming Building Energy Simulation Forum Trainings



BESF usually takes place the third Wednesday of every other month at the Ecotrust Building at noon.



October 18, 2017:

Energy Management Information Systems

Presented by Hannah Kramer, Lawrence Berkeley National Laboratory

December 13, 2017:

Topic TBD

Training & Education Webpage

energytrust.org/commercial/commercial-training-events/

Boost your knowledge with Energy Trust's continuing education opportunities and special training events. Trainings include real-world examples, case studies, and detailed technical information presented by experts from the fields of architecture, engineering, construction and development, as well as specialists in a variety of building types and market sectors. Attendees may be eligible for continuing education units, CEUs.

Find Upcoming Trainings and Events

Questions?

Have questions about upcoming training and education opportunities *or* about becoming an Energy Trust New Buildings Ally?

Contact Kirsten.Vogel@clearesult.com

Thank You

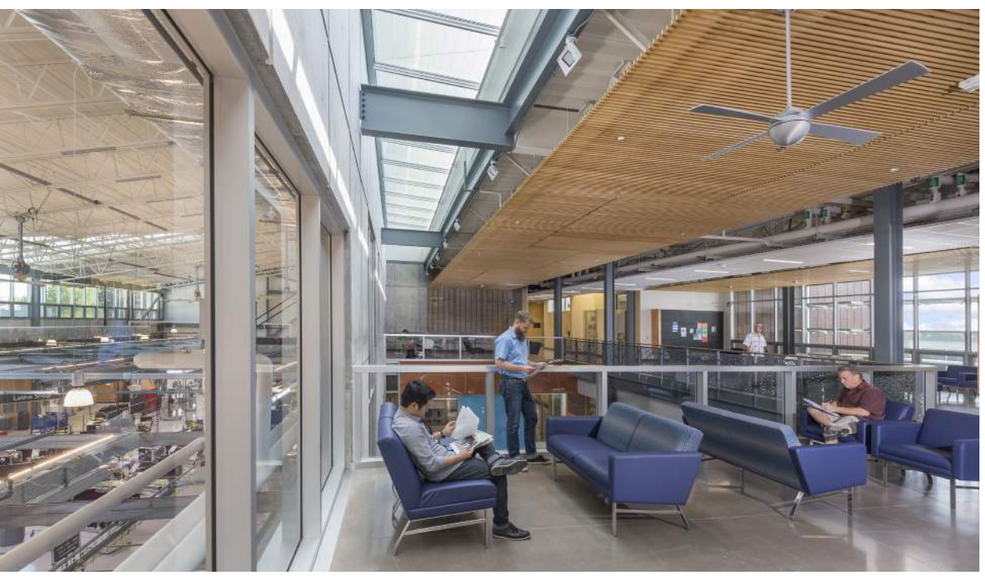
Kirsten Vogel
Market Outreach Specialist
kirsten.vogel@clearesult.com

Energy Trust of Oregon

Chemeketa Community College's

PATH TO NET ZERO

designing a high-use technical education space



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Chemeketa Community College's

PATH TO NET ZERO

designing a high-use technical education space

Allies for Efficiency

Energy Trust of Oregon

Presenters:

Steph Fregosi, Sustainability Coordinator
Chemeketa Community College

Edward Running, AIA LEED AP BD+C
FFA Architecture + Interiors, Inc.
(formally with Yost Grube Hall Architecture)

Nedzib Biberic, PE, LEED AP
PAE Engineers

Zach Suchara, AIA, LEED AP, LC, Design Director
Luma Lighting Design

Rory Alvarez , Interim Director of Facilities & Operations/Capital Projects
Chemeketa Community College

ALLIES FOR EFFICIENCY

CHEMEKETA PROFILE

- Total FTE 2016-2017: 10,046
- Annual Headcount 2016-2017: 29,204
- Applied Associates Oregon Transfer Degree
- Career and Technical Education programs include Fire Protection Technology, Human Services/ Addiction Studies, Horticulture, Nursing, and Visual Communications
- High School Partnerships
- Continuing and Community Ed

Energy Trust of Oregon, Allies for Effciency

ENERGY USE

In FY 2016, Chemeketa consumed the equivalent of 22,436,151 22kWh over 1,349,843 square feet of building space to heat and power our facilities down from 22,999,298 kwH over 1,287,458 square feet.

- Green Buildings
- Energy efficiency & reduction (replacement equipment)
- Retrocommissioning

Energy Trust of Oregon: Allies for Effciency

CHEMEKETA & GREEN BUILDING

Chemeketa Center for Business & Industry Building (2009), LEED Silver

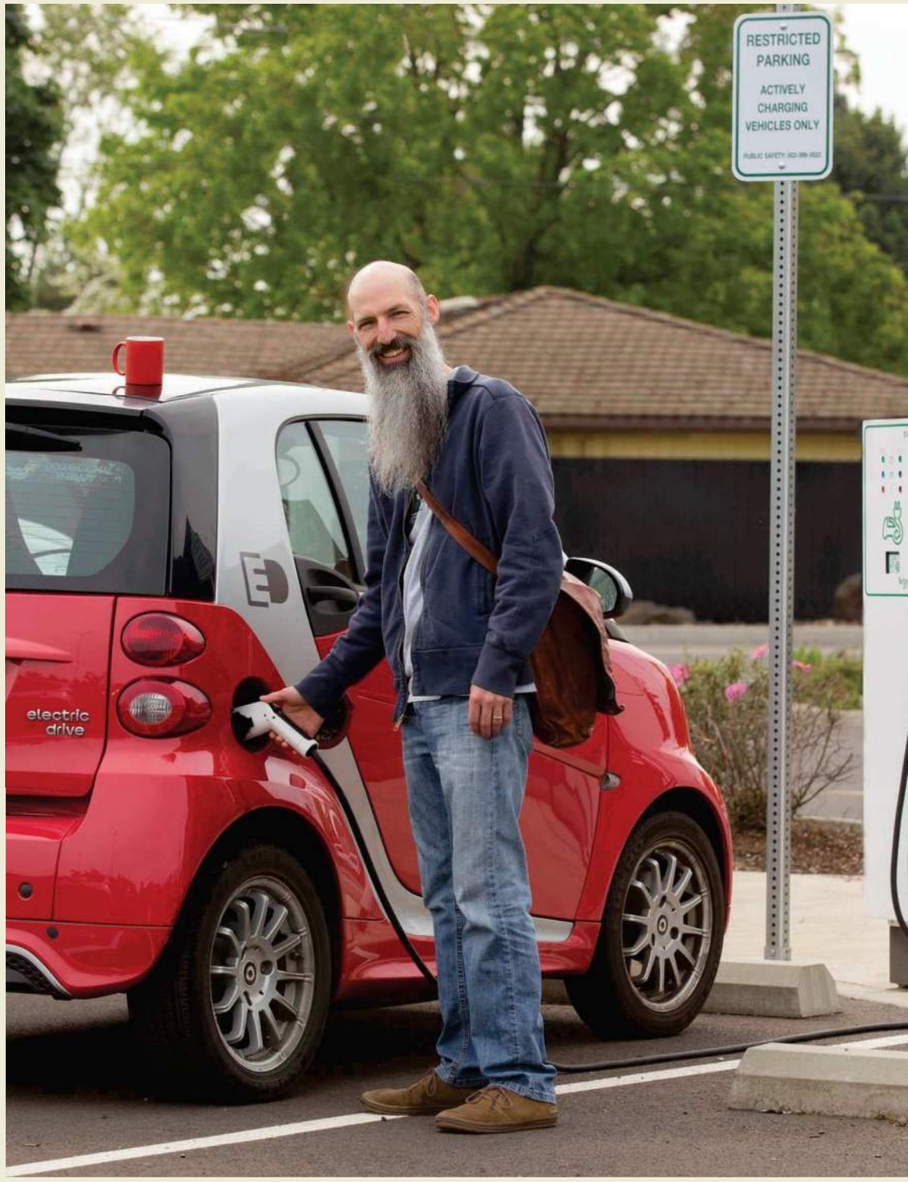
20% of Chemeketa's buildings were built to LEED for New Construction silver equivalent or better standards

Energy Trust of Oregon: Allies for Effciency

CHEMEKETA SUSTAINABILITY PROGRAM

Value: Environmental Stewardship

We act with personal and institutional accountability for the responsible use of environmental, financial, and human resources to meet the needs of current students without compromising the needs of future generations of students.



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CHEMEKETA PROFILE

- Goal: Carbon Neutral by 2050
- Recycling Program
- Engage students through Service Learning, Earth Day and Campus Sustainability Month
- Photovoltaic arrays (205 kW)
- Salmon Safe Winery & Vineyard at NW Wine Studies Center
- Marion Polk Food Share Youth Farm Partnership
- Agricultural Sciences Complex

Energy Trust of Oregon: Allies for Efficiency

BUILDING CONCEPT & ENERGY PROFILE

Building Opened in 2015

•Houses Machining Drafting and Engineering

•Two part building, part machine shop & part classroom

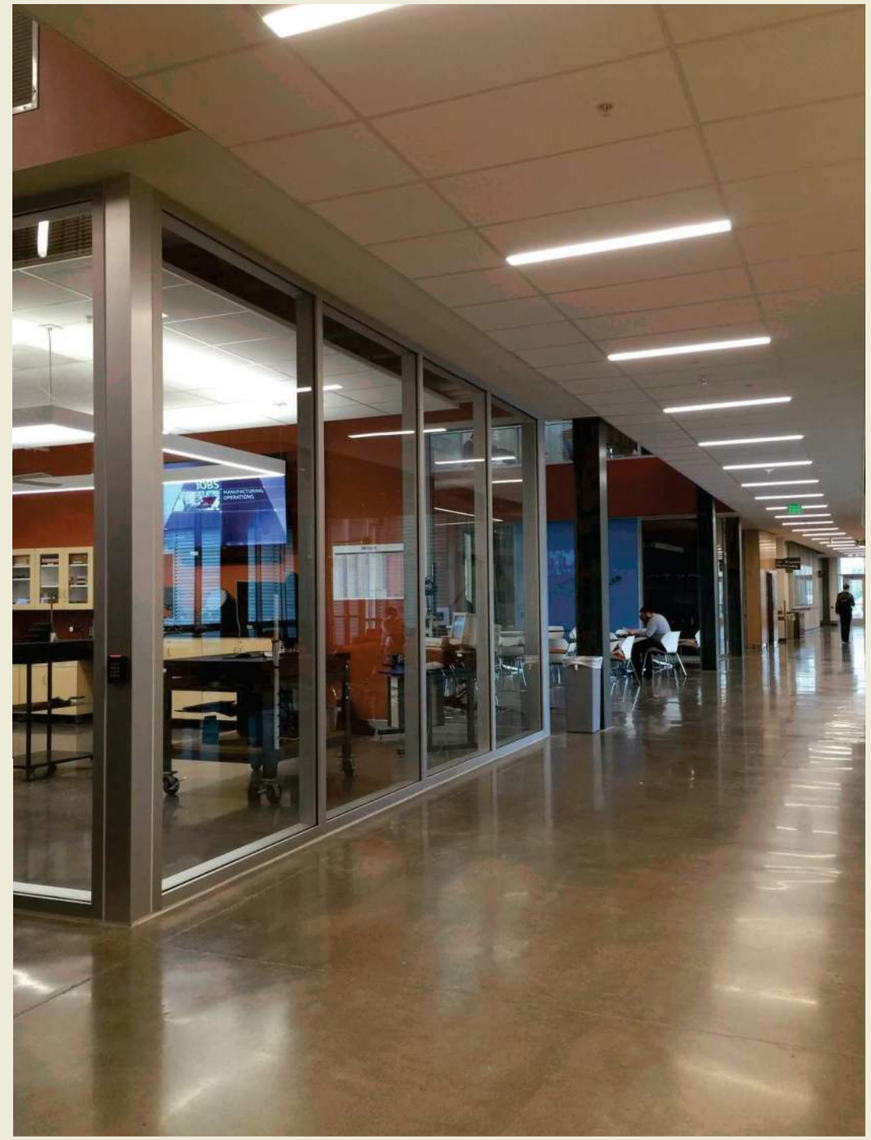
•Classroom on Display

•Energy modeling best practices

*Square Feet: 52,376
*Annual Energy Use

2016 - 361,000 kWh (10.5 months)
2017 - 359,600 kWh

*kwH/square foot - 6.89 - 6.87 kWh/ square foot in electrical consumption



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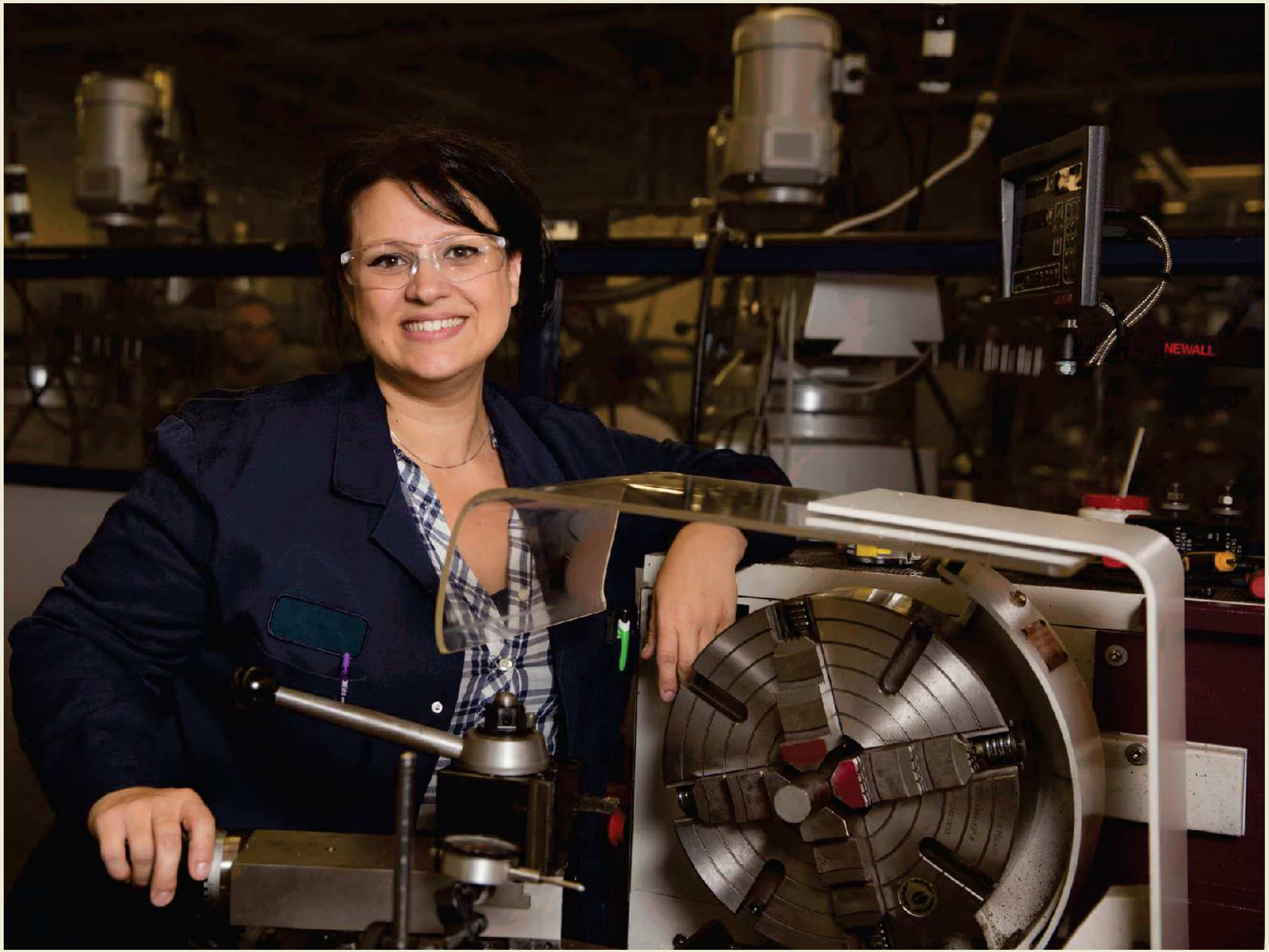

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Iberis St NE
Lancaster Dr NE
Satter Pl NE
Satter Dr NE
Chemeketa Community College
Cooley Dr NE
Embassy Way NE
Campus Loop NE
E Campus Loop
44th Ct NE
45th Ave NE
Milkey Way

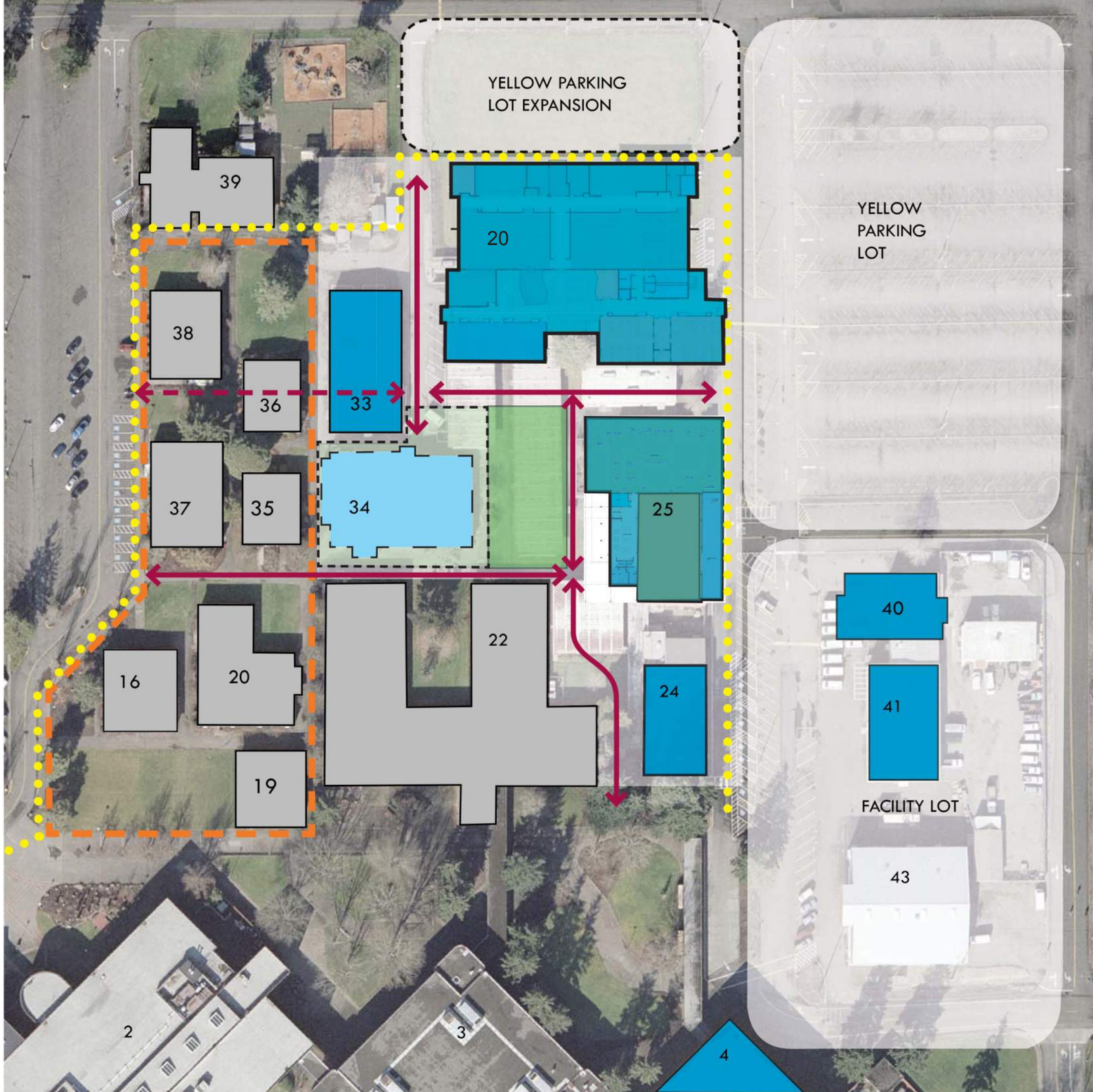
ARCHITECTURAL DESIGN | concept
SITE | master plan diagram

LEGEND

- Existing Building
- New or Renovated Building
- Building to be Removed
- Primary Circulation Path
- Future Circulation Path
- Primary Electrical Extension
- Future Development Zone
- New Landscape Quad
- Future Landscape Expansion

BUILDING KEY

Electronics, Auto. + Visual Communication	4
Future Food Service Building	24
Welding Building	25
Machining, Drafting, + Engineering	20
Apprenticship Program Building	33
Existing Food Service Building	34
Facility Support Building	40 & 41



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CHARACTER
celebration of technology

DUALITY
academia + industry

RELATIONSHIPS
context of influence

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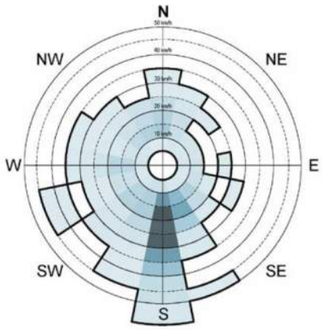
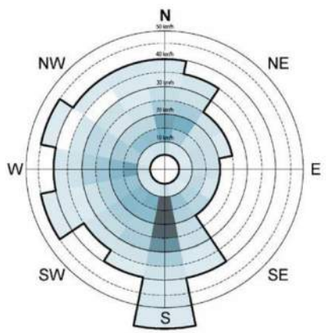
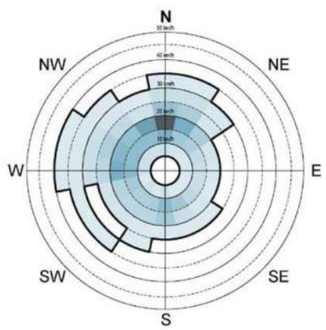
ARCHITECTURAL DESIGN | concept



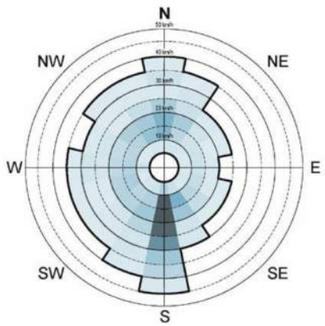
WIND ROSE
WINTER



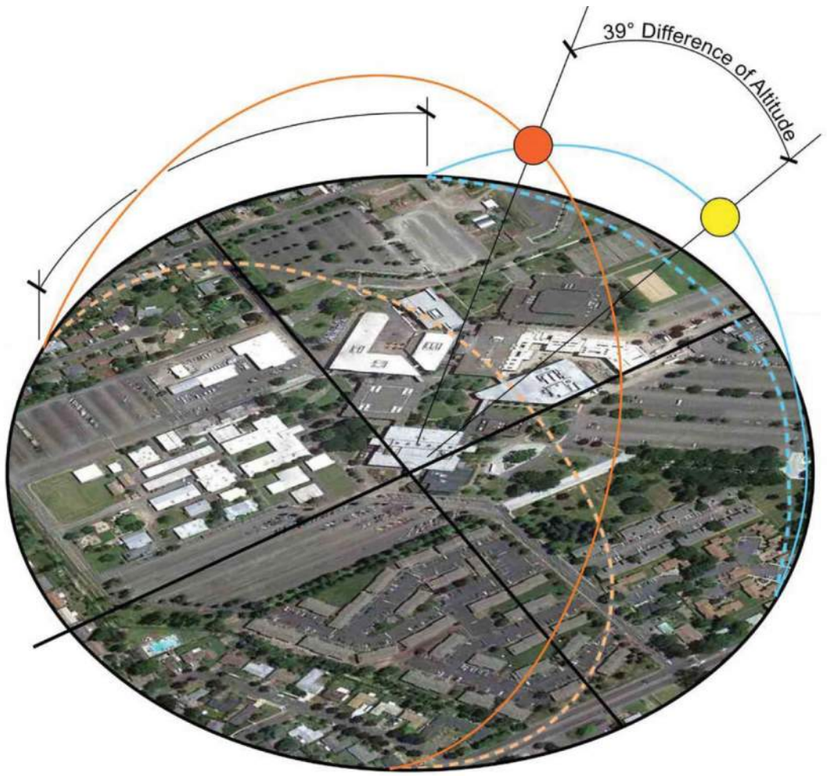
WIND ROSE
SPRING

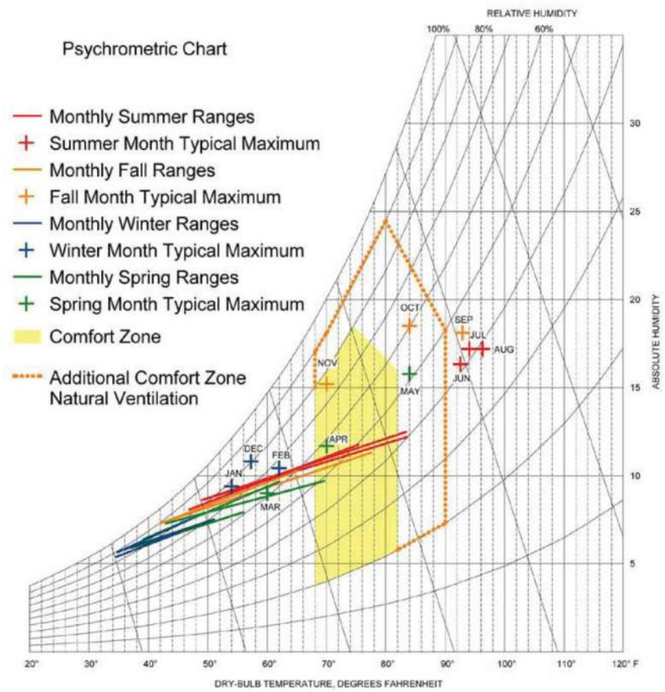


WIND ROSE
SUMMER



WIND ROSE
AUTUMN





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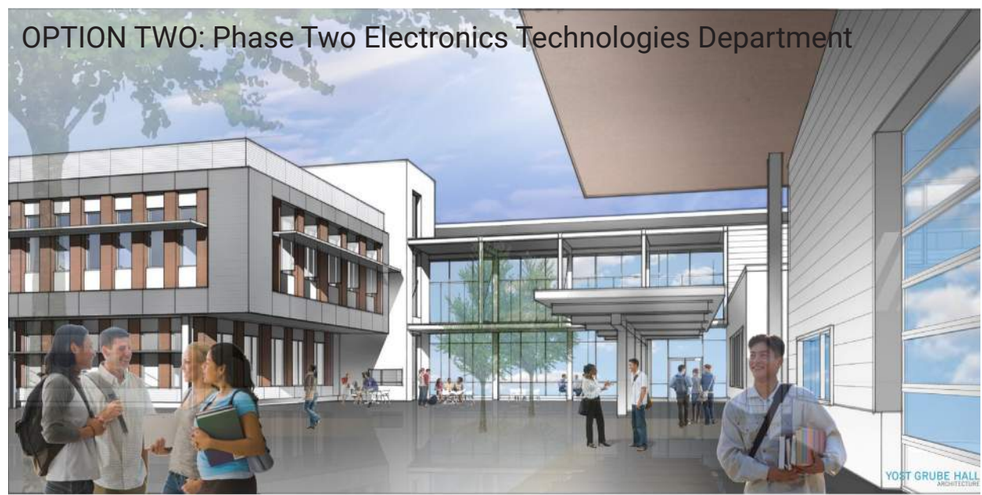

ARCHITECTURAL DESIGN | concept

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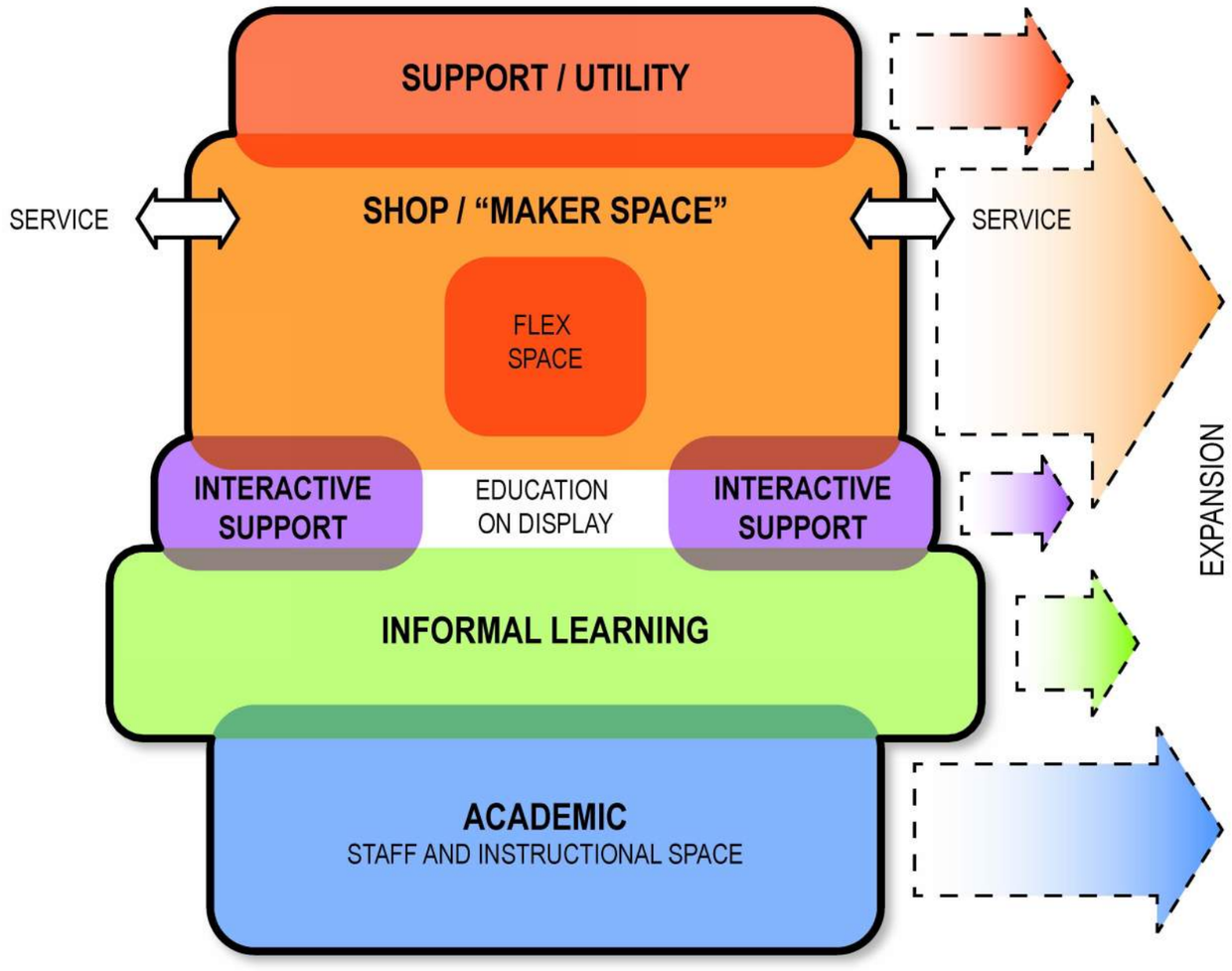
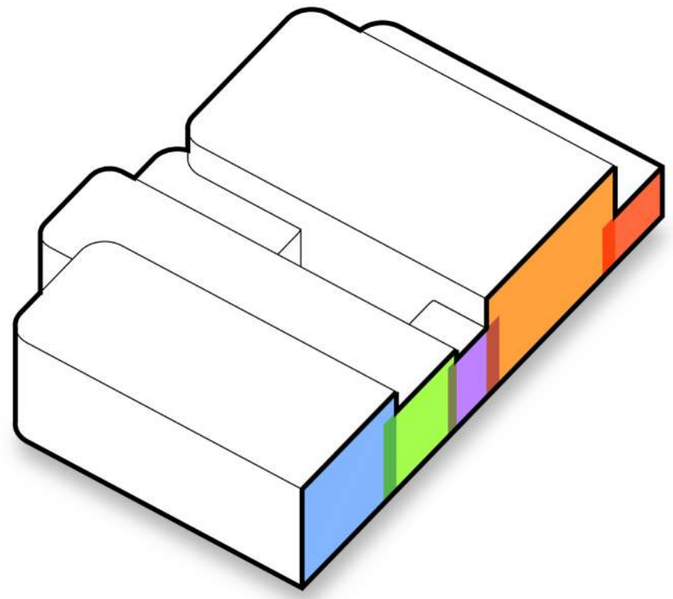
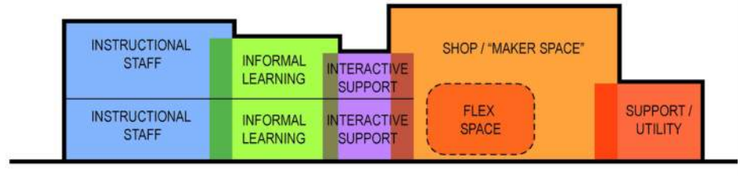
FINAL OPTION: Machining, Drafting and Engineering Technologies







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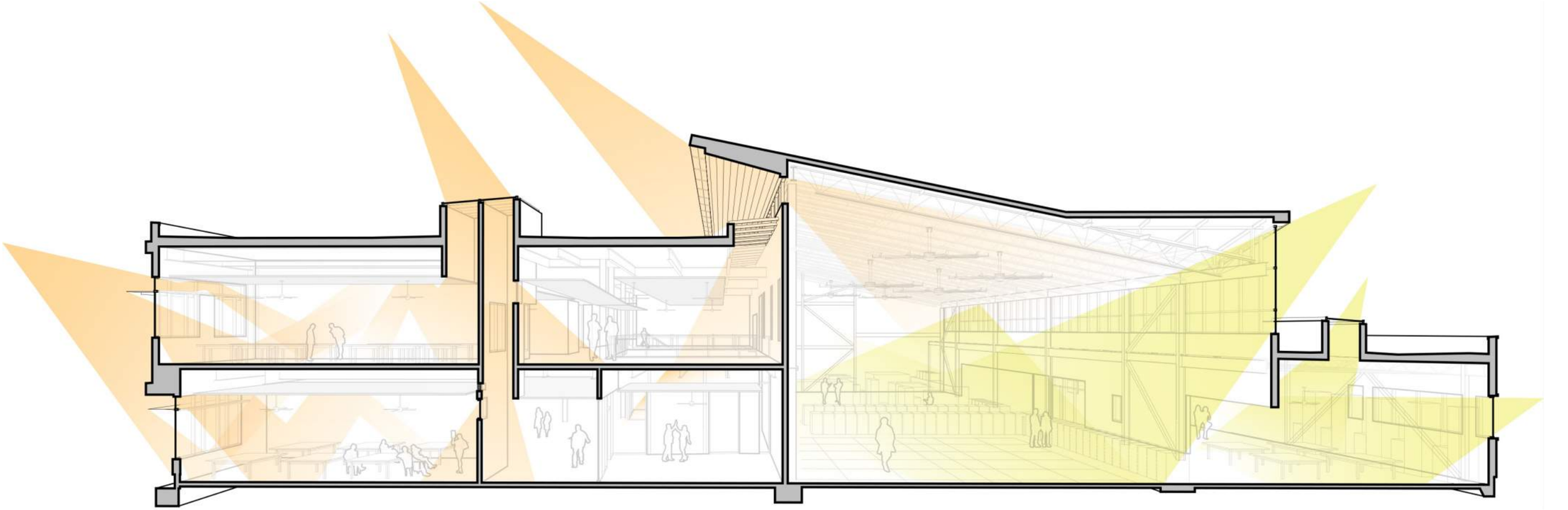

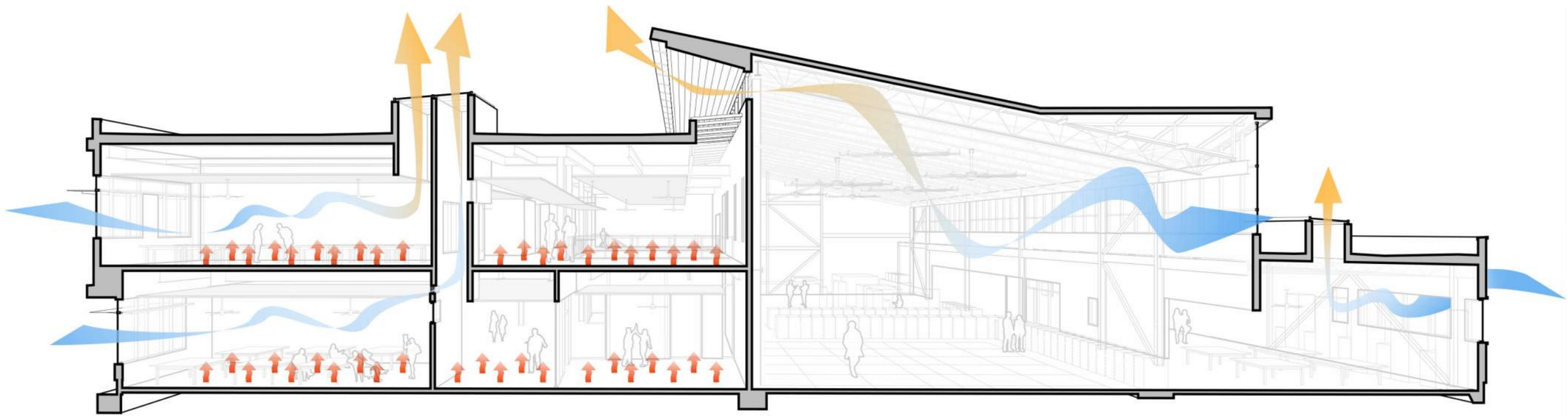

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PAE'S 6 STEP APPROACH

Set Aggressive Goals

Choose Efficient Systems

Analyze the Climate

Opt for Renewables

Reduce the Loads

Verify Performance

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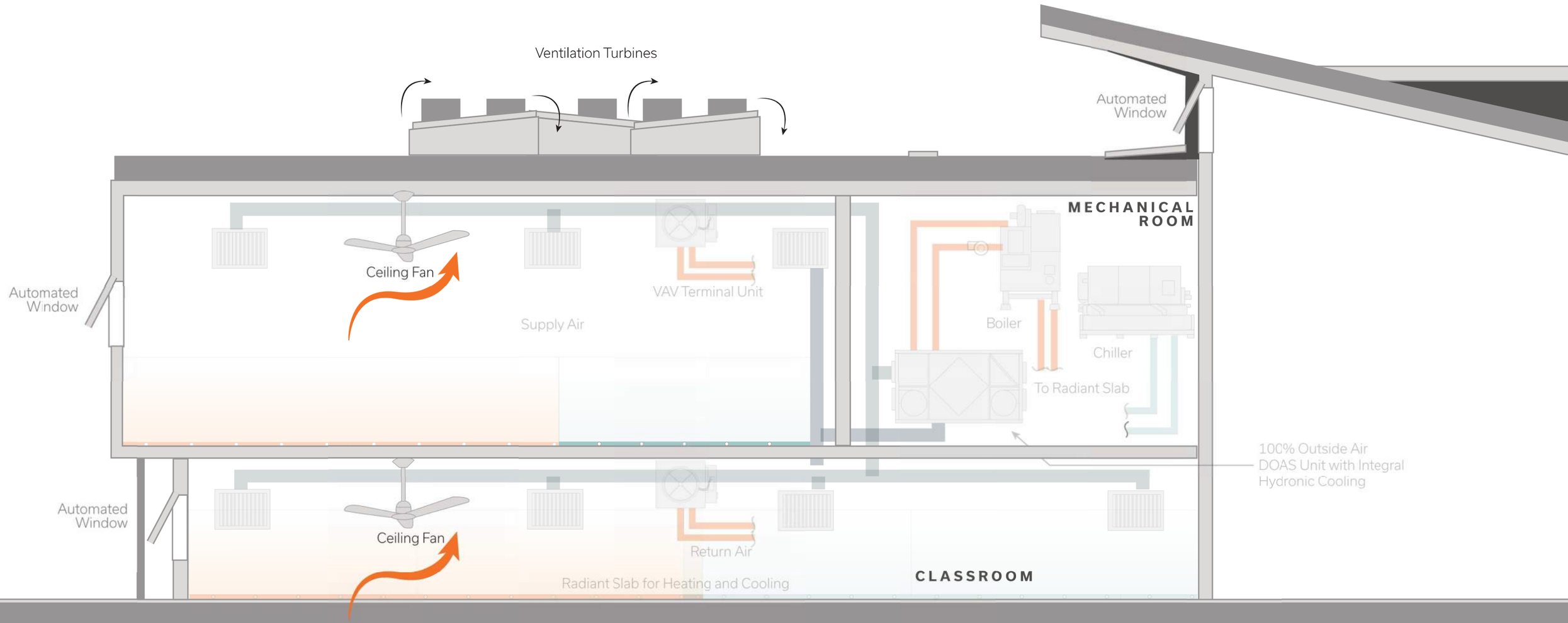
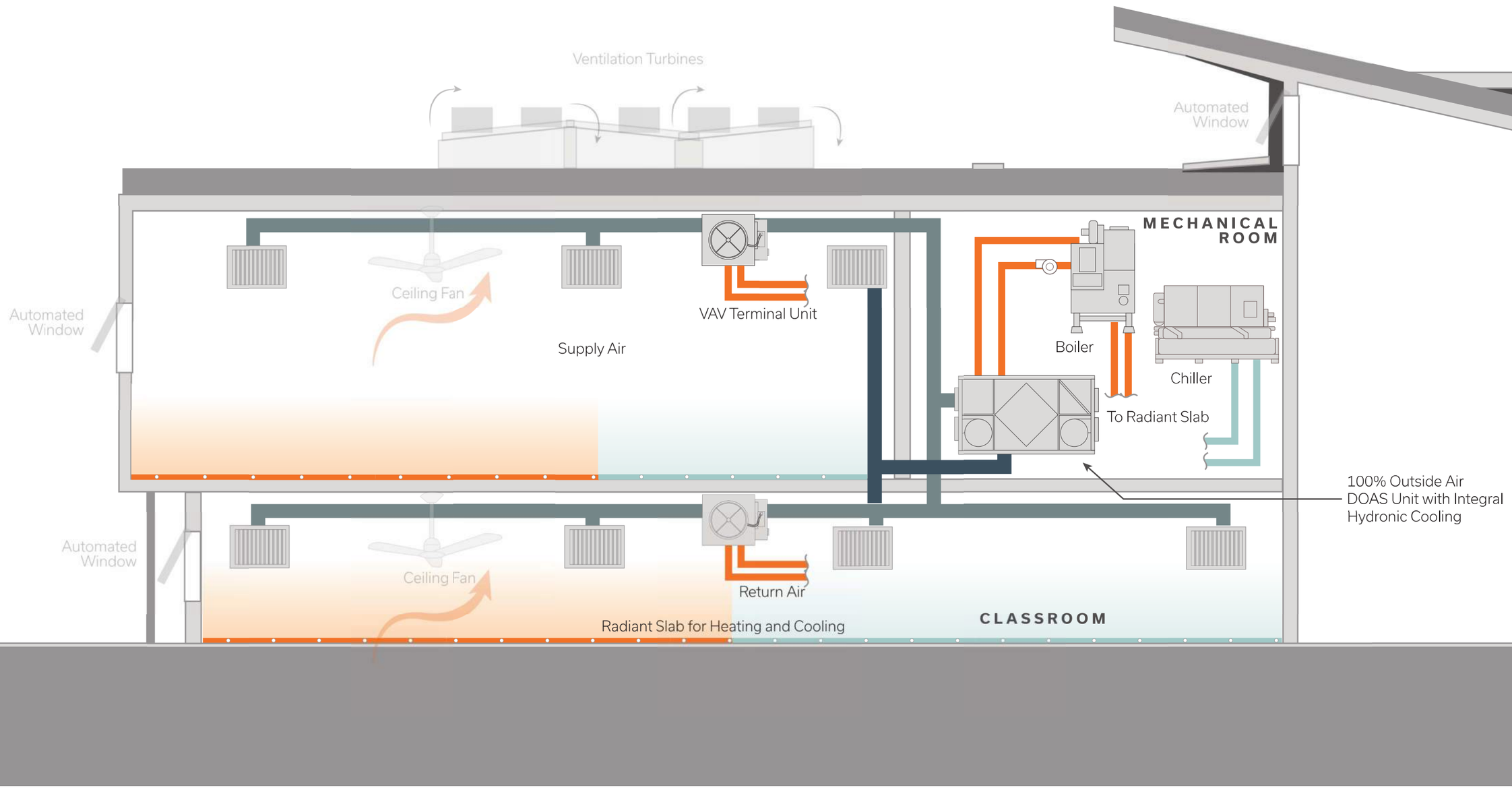


Classroom: Natural Ventilation

Energy Trust of Oregon: Allies for Effciency



Classroom: DOAS (DX Cooling) Unit w/ Radiant Slab Manifold

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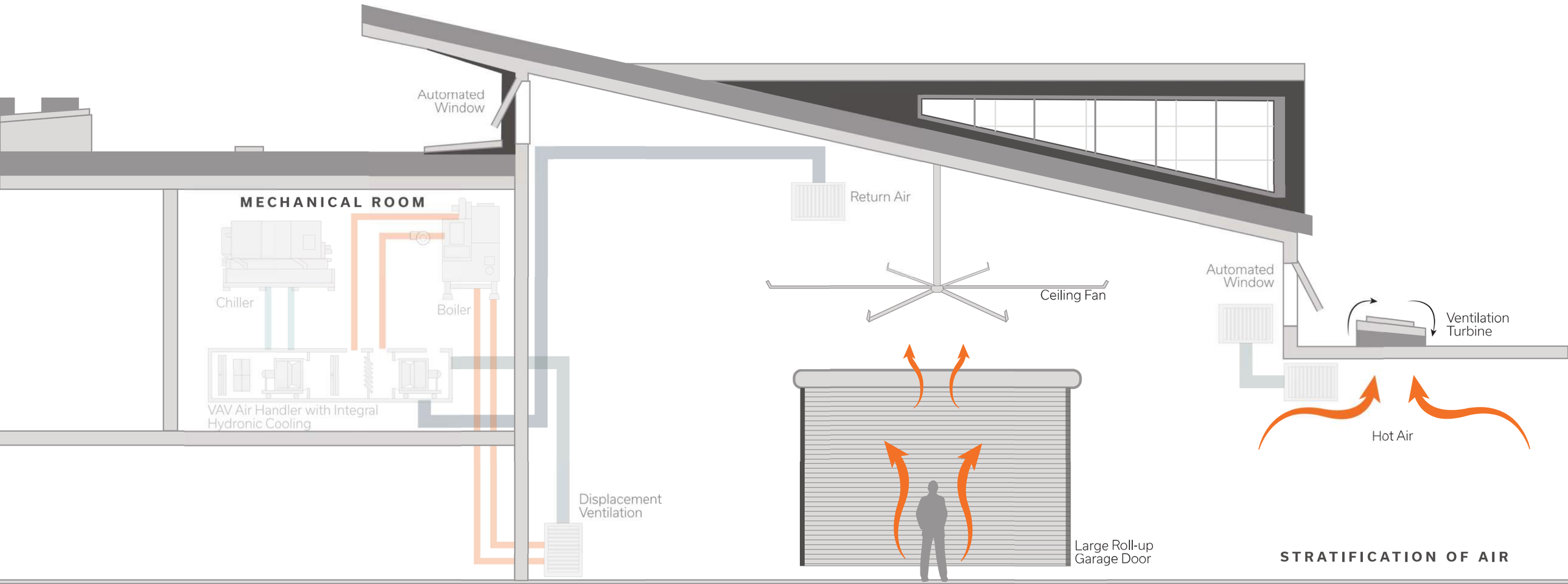

Shop Area: Natural Ventilation

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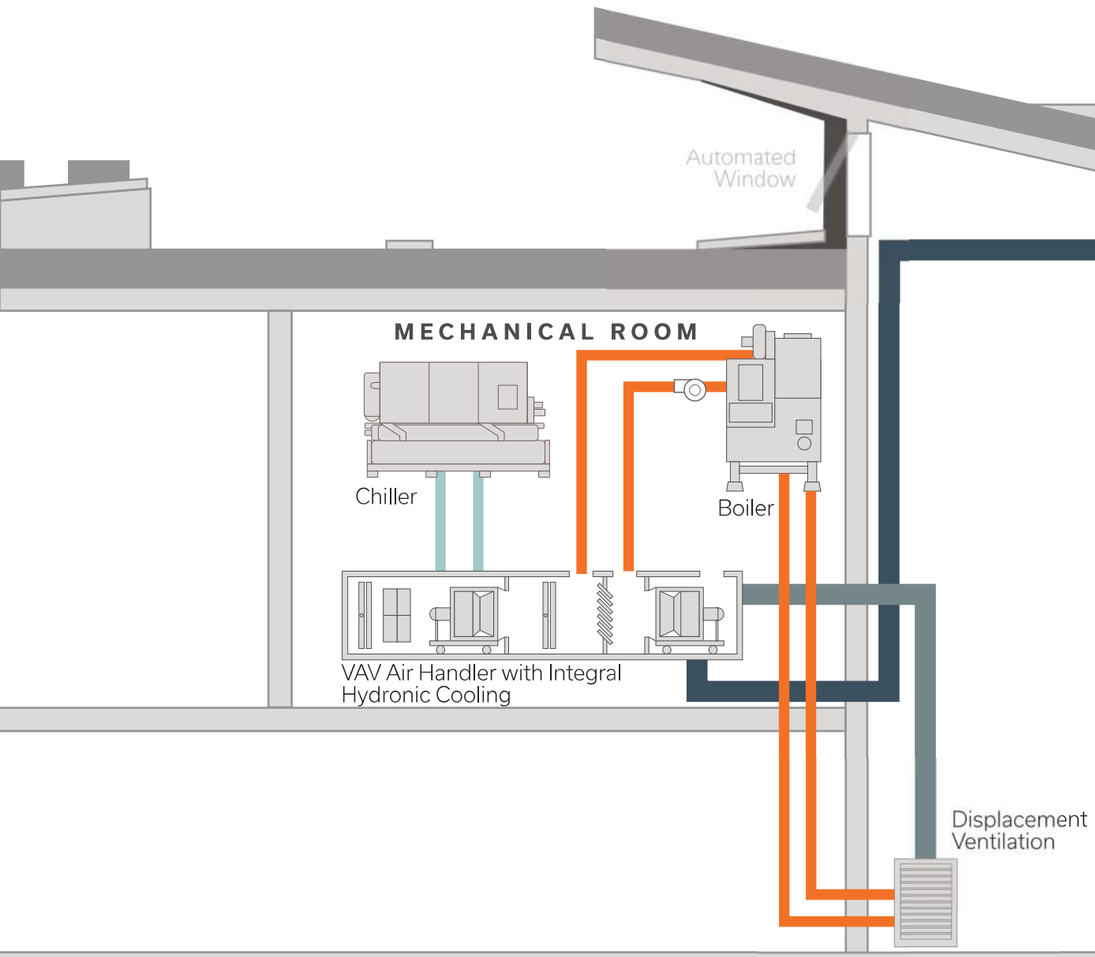
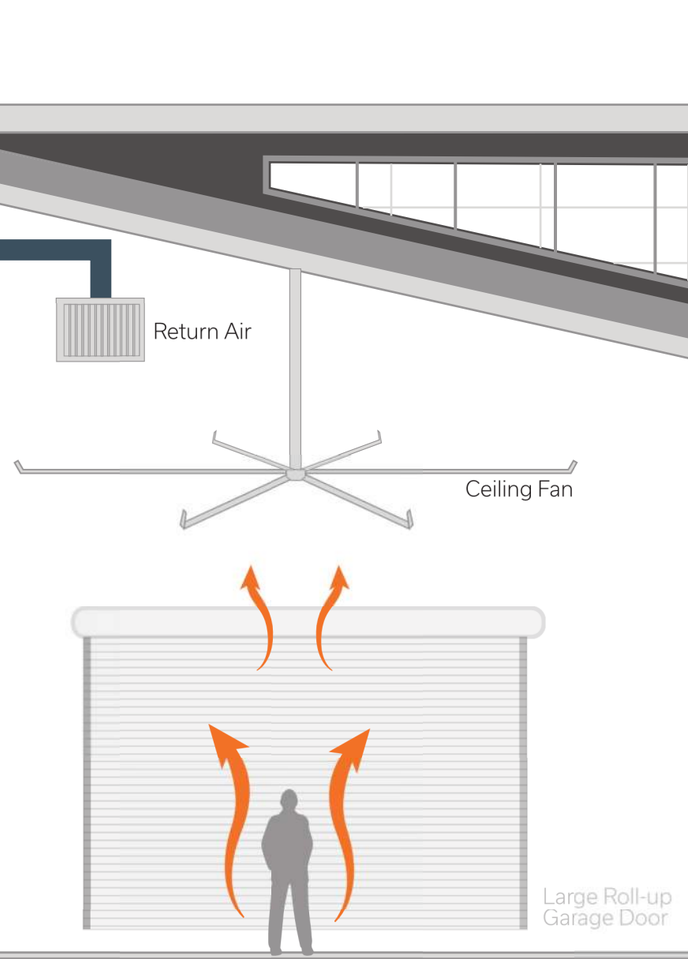
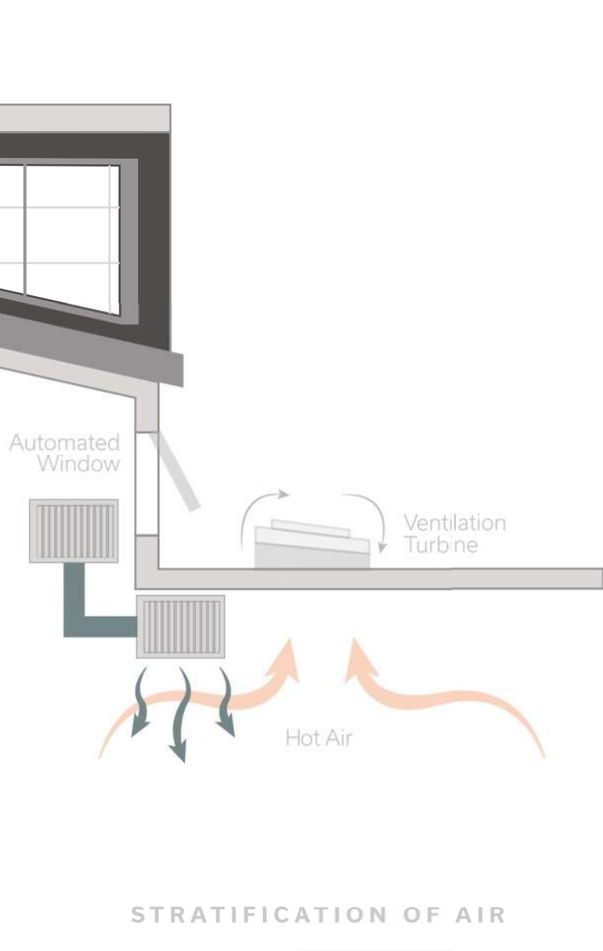
PAE







Shop Area: AHU & VAV Reheat Terminal Unit

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Integrating Light

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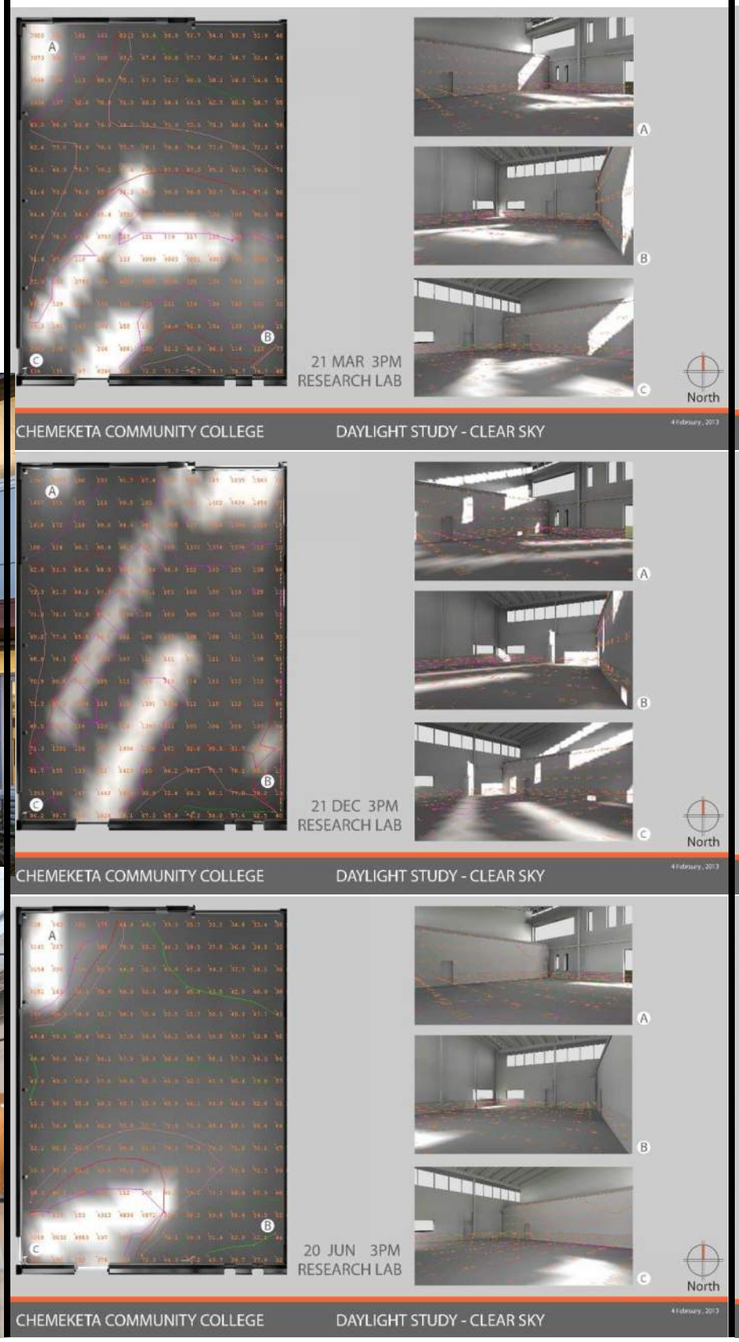
Daylight

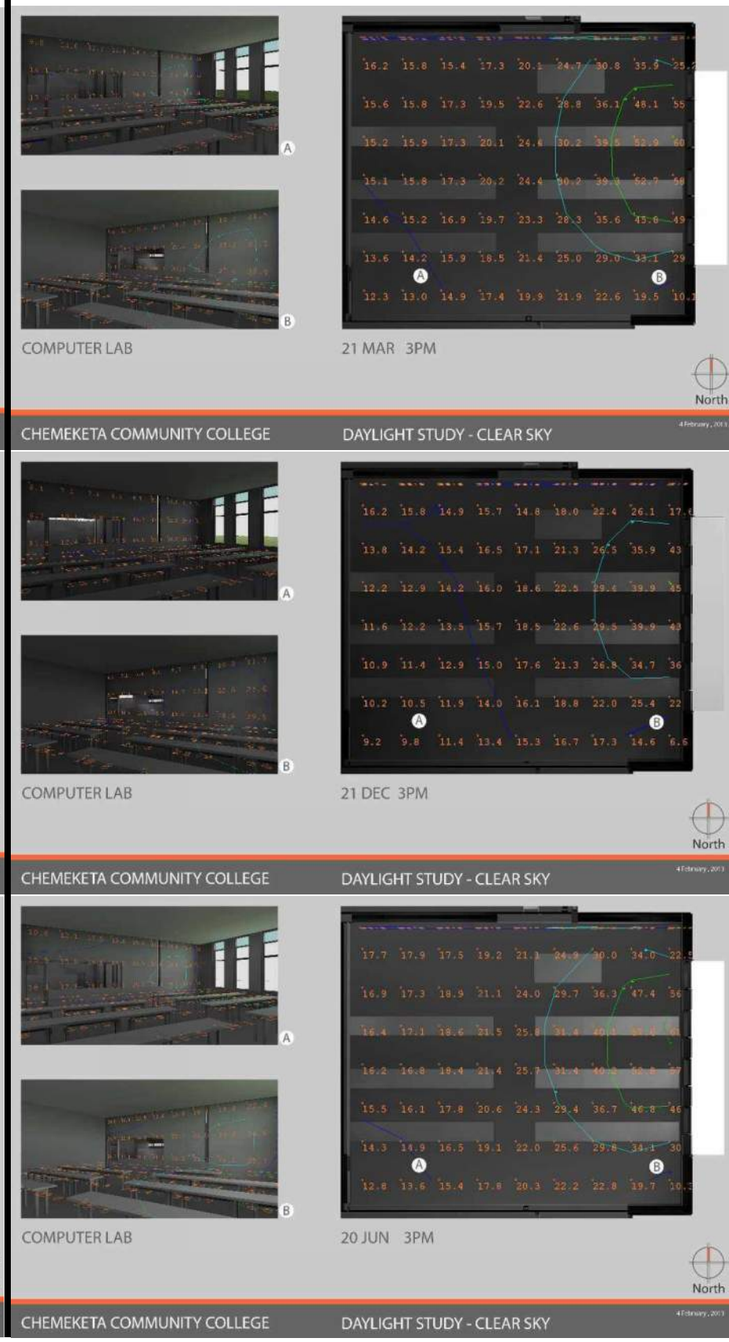
Glazing Selection

Exterior Shading Options

Interior Glare control

Orientation





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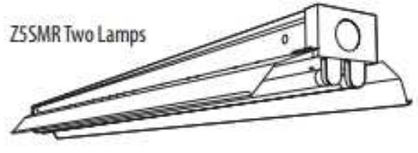
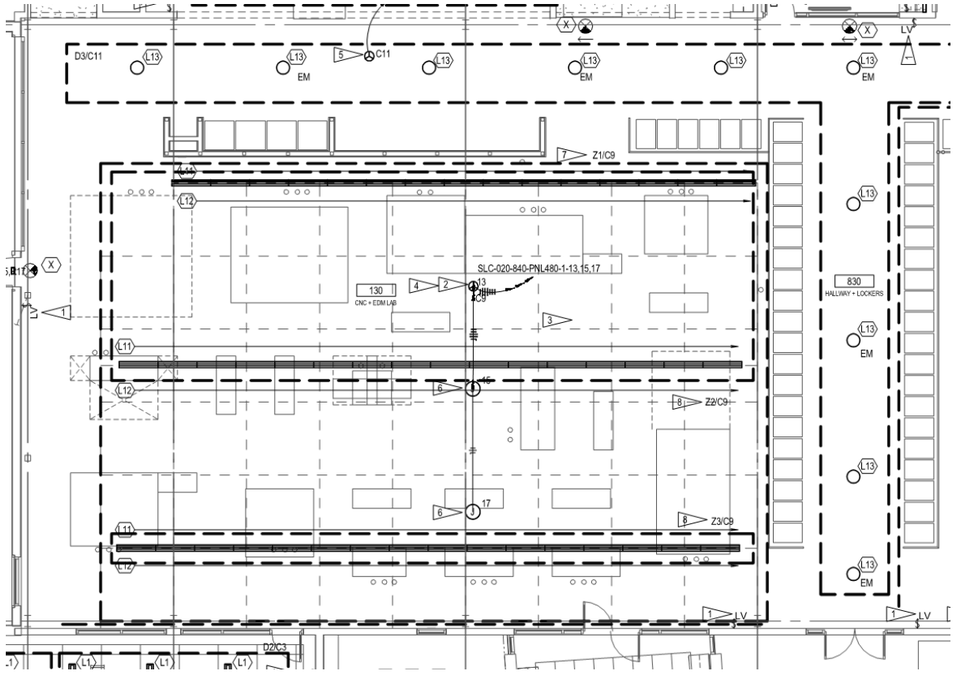
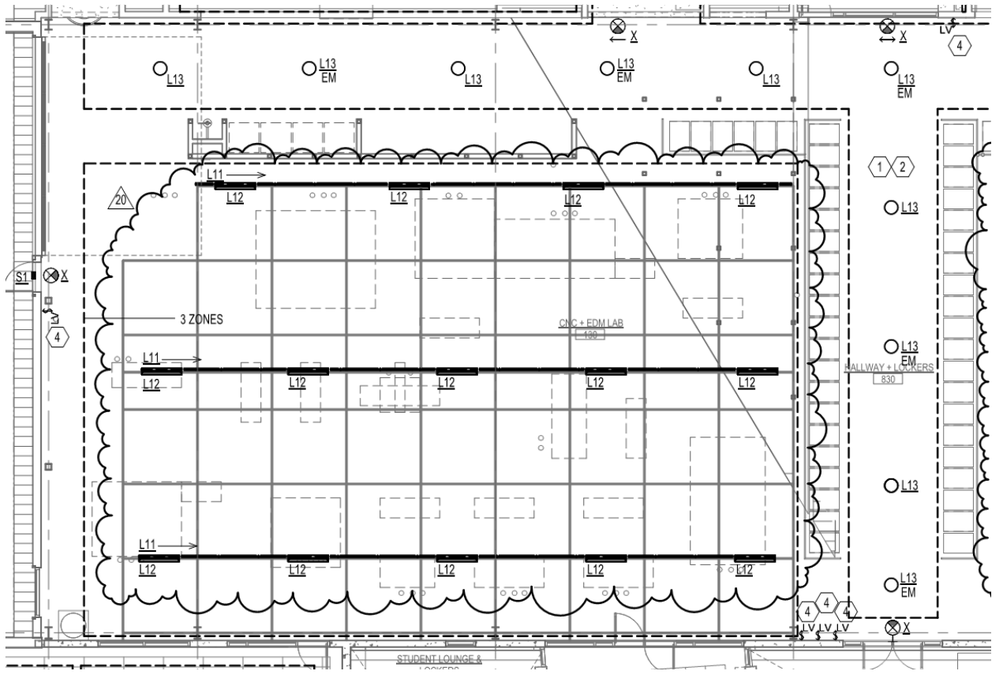
Electric Lighting and Control



42 Fluorescent Fixtures – 4,914 W

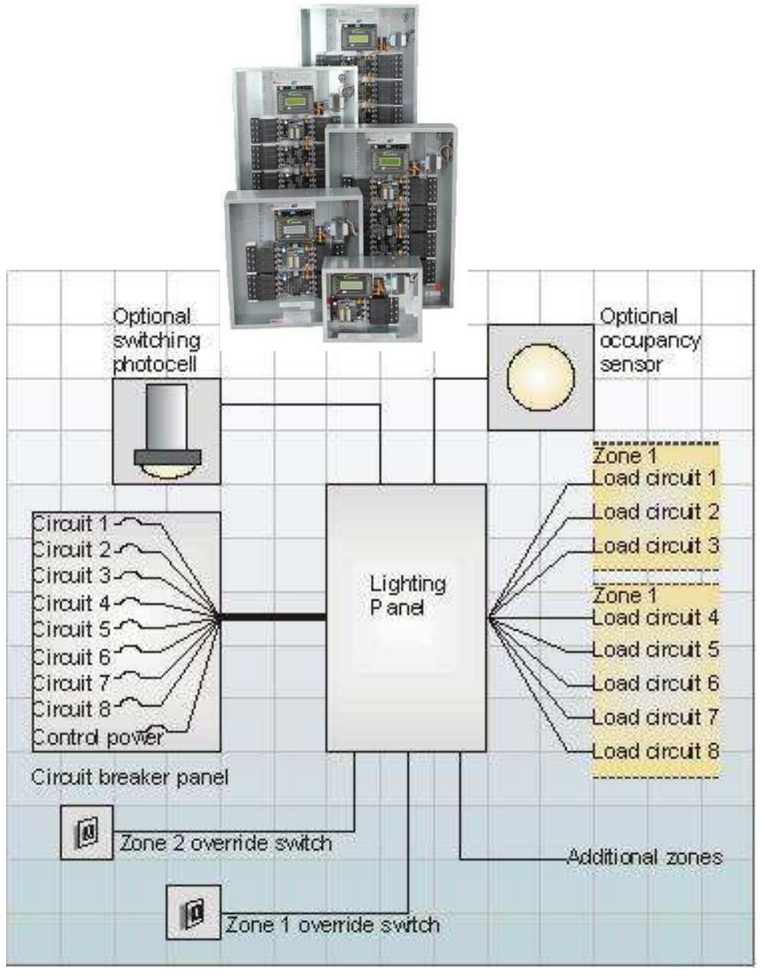
14 LED Fixtures – 2,716 W





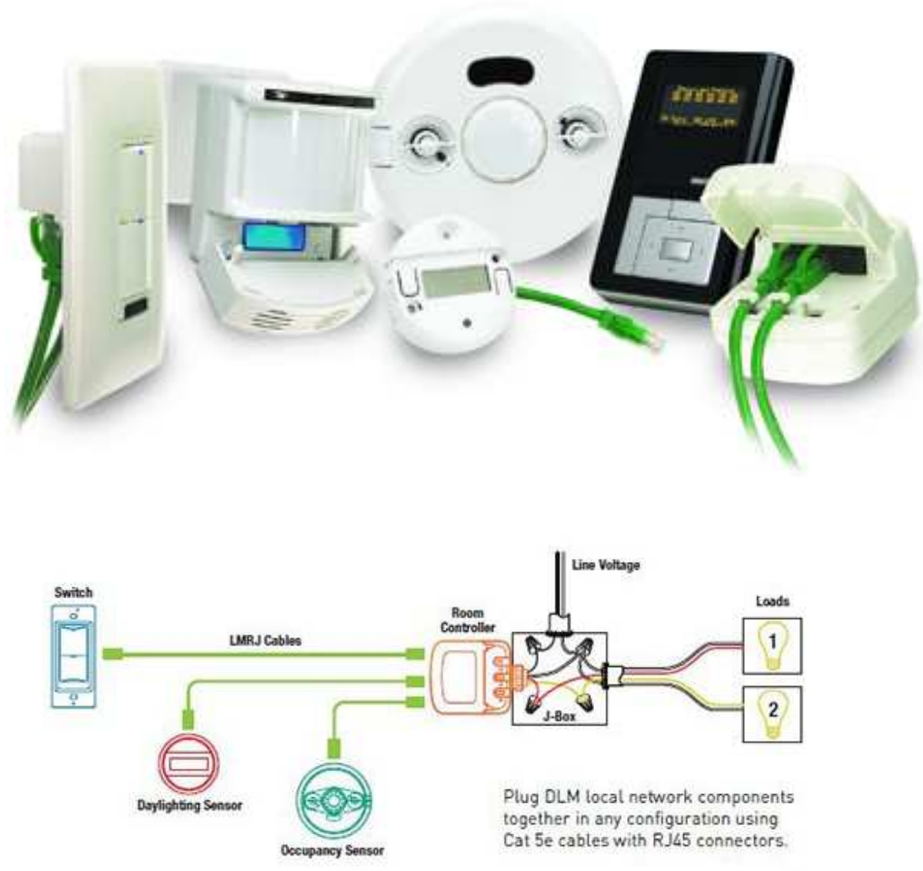
Electric Lighting and Control

The Control Dilemma



Central

vs



Modular

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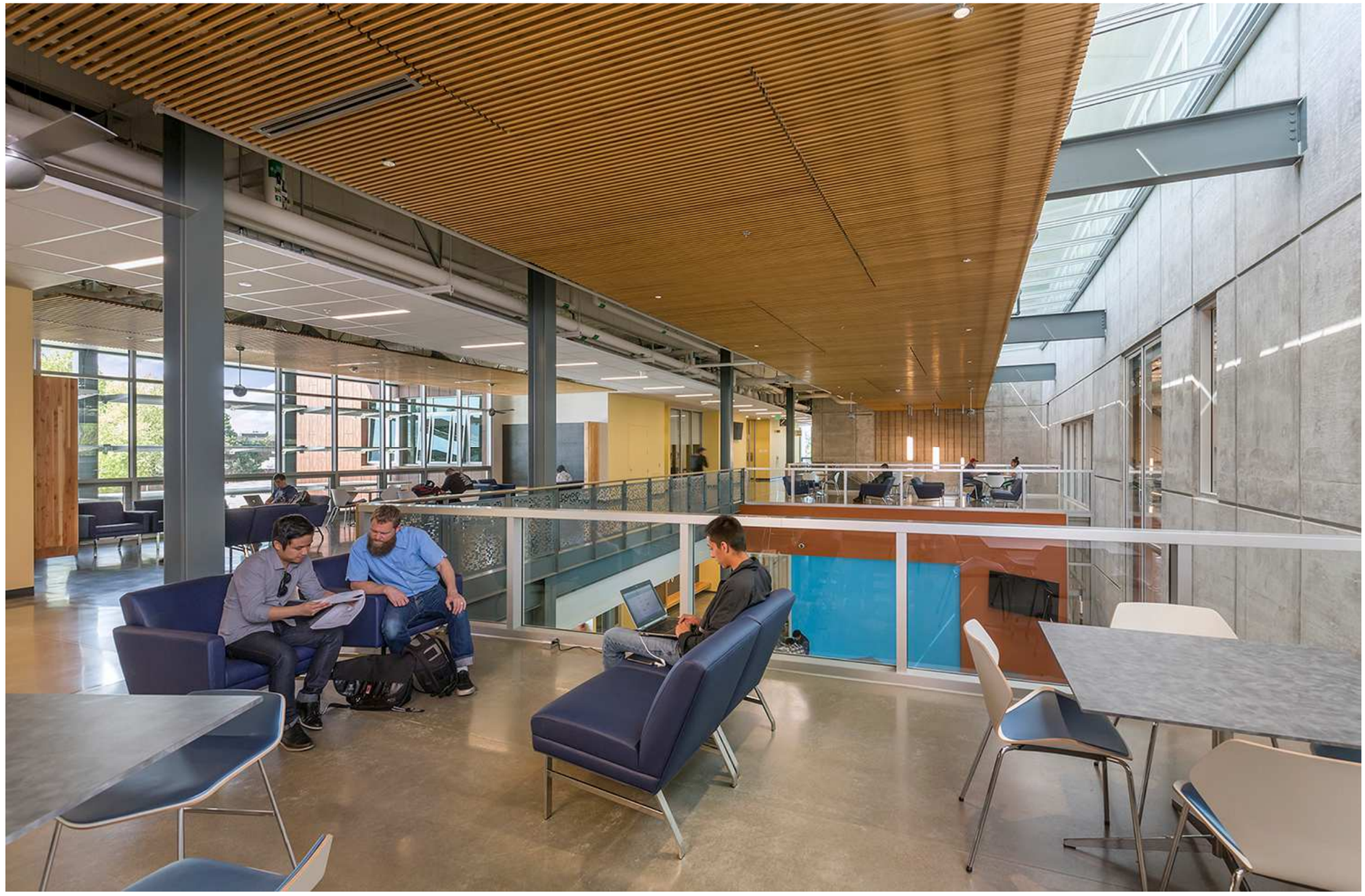
In The End, Communication Matters



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