



NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

CONNECTICUT and NE-CHPS

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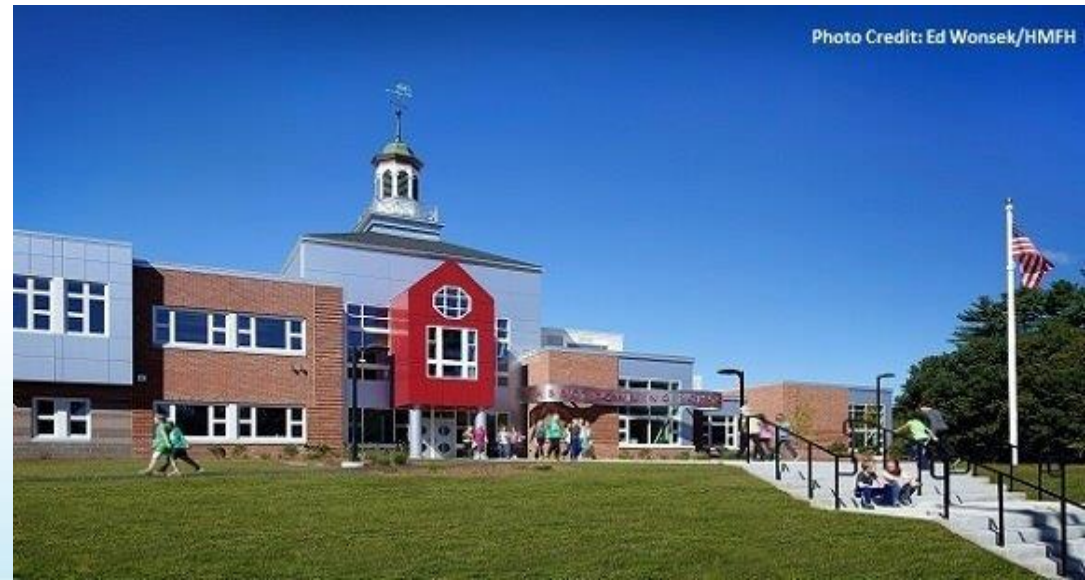
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PRESENTATION SUMMARY



1. About NEEP
2. NE-CHPS Overview
3. Deep Dive: Indoor Environmental Quality
4. Case Study
 - Profile School
5. Conclusions and Next Steps



1. ABOUT NEEP

NORTHEAST ENERGY EFFICIENCY PARTNERSHIPS

“Accelerating Energy Efficiency”

MISSION

Accelerate the efficient use of energy in the Northeast and Mid-Atlantic Regions

APPROACH

Overcome barriers to efficiency through
Collaboration, Education & Advocacy

VISION

Transform the way we think about
and use energy in the world around us.

One of six Regional Energy Efficiency Organizations (REEOs) designated by U.S. Dept. of Energy to work collaboratively with them in linking regions to DOE guidance, products



2. OVERVIEW:

NORTHEAST COLLABORATIVE FOR HIGH PERFORMANCE SCHOOLS

(NE-CHPS)

HISTORY OF CHPS CRITERIA



- First version released in California in 2002
- CHPS Criteria versions cover 13 states
- CHPS National Core Criteria developed 2009-2013



ABOUT NE-CHPS



- Licensed from CHPS 2006
 - Adapted for unique climate, characteristics, & codes
 - Vetted through **regional stakeholders**
 - NE-CHPS Version 2.0 completed '09
 - NE-CHPS O&M Guide



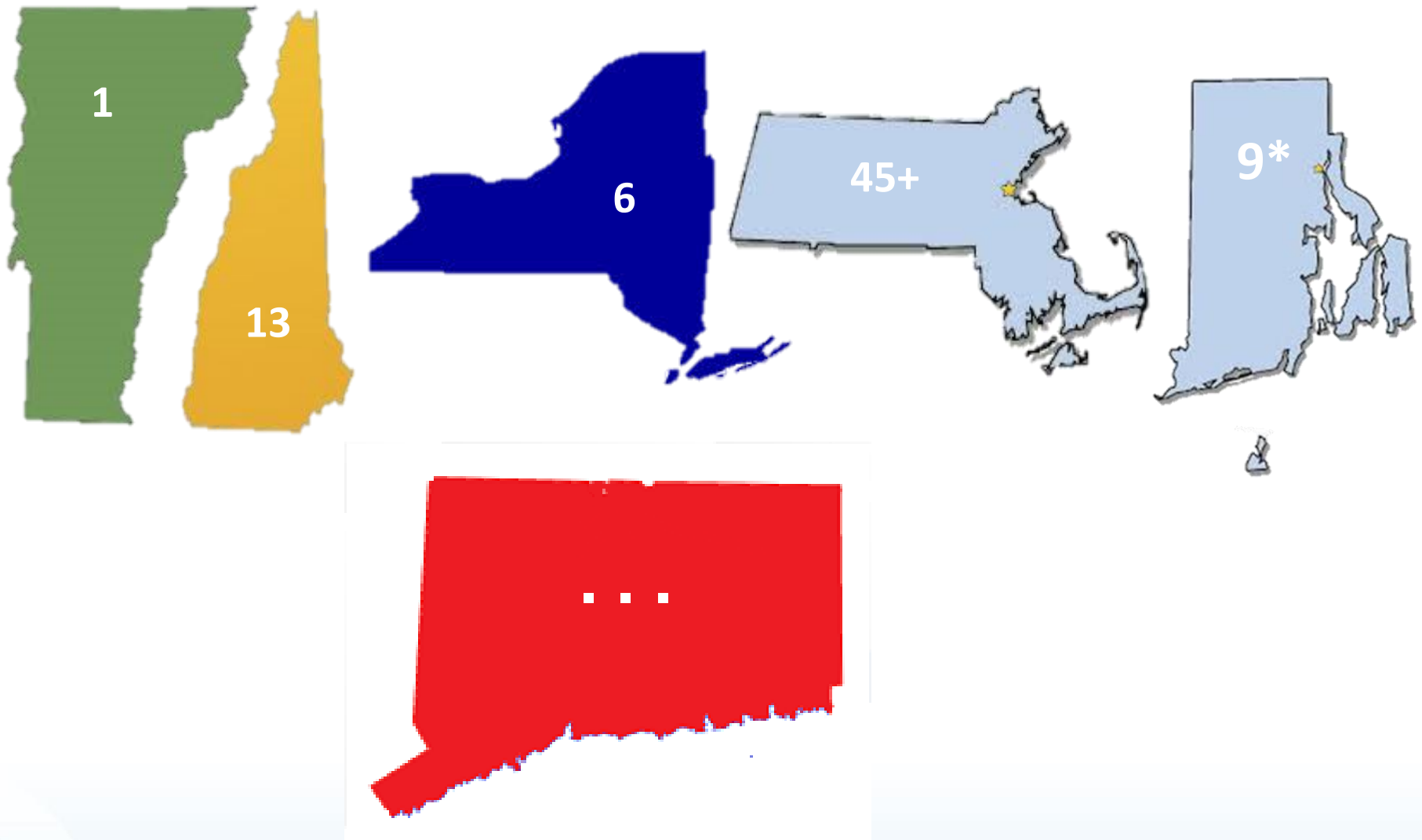
NORTHEAST COLLABORATIVE FOR HIGH PERFORMANCE SCHOOLS (NE-CHPS)



- NE-CHPS criteria is a points based new construction/renovation roadmap toward healthier, more efficient and more productive schools
- For all schools from pre-K through community colleges.
- Vetted through **regional stakeholders**
- Energy efficiency operational savings can quickly offset capital costs associated with air/environmental quality investments



CHPS IN THE REGION



CONNECTICUT AND NE-CHPS



“Agencies may meet the requirements. . . by meeting the criteria set forth in the **Northeast Collaborative for High Performance Schools Protocol**, also known as **NE-CHPS**”



WHY IS NE-CHPS DIFFERENT?



1. Developed with input from regional stakeholders

- Working group of state actors and industry professionals

2. Reflects the climate, building codes, and educational priorities of the Northeast

- Adopted and adapted throughout the Northeast

3. Emphasizes best practices for ongoing building operation and maintenance

- Includes companion Operation and Maintenance guide

4. Stresses Indoor Environmental Quality and Energy Efficient Design

- 40+ pages discussing energy efficient design
- 70+ pages discussing indoor environmental quality and

WHAT'S IN THE NE-CHPS CRITERIA?



Seven Basic Metrics	Related Example
1. Integrated Design Process	Engineers consult with teachers & students
2. INDOOR ENVIRONMENTAL QUALITY	Walk-off mats keep pollutants outside
3. Energy Usage	Photosensor activated lighting
4. Water Usage	Low-flow toilets & waterless urinals
5. Site Selection/Development	Facility located near public transportation
6. Materials & Waste Management	Locally produced materials
7. Operations & Metrics	Occupant behavior seminars

3. DEEP DIVE: INDOOR ENVIRONMENTAL QUALITY

NE-CHPS 3.0 (Pages 69-149)

INDOOR ENVIRONMENTAL QUALITY

NE-CHPS 3.0 (Pages 69-149)



“Asthma accounts for a total of *14 million* lost school days each year.”

-American Lung Association

- NE-CHPS provides a detailed roadmap toward improved environmental health
- Points awarded for:
 - Effectively designed and commissioned Heating, Ventilation and Air Conditioning systems and HEPA filters
 - Paints, sealants, wood, and carpets that contain low **volatile organic compound (VOC)** counts.
 - Dedicated mechanical exhausts in areas of chemical use such as copy or print rooms
 - Many more...

INDOOR ENVIRONMENTAL QUALITY



Required:

- HVAC Design - ASHRAE 62.1, MERV filter 11 or higher
- Direct exhaust of indoor pollutant sources (copier, printing rooms)
- Background noise limited to 35 dBA
- Outdoor moisture management keeps water away from building
- 90% of building materials meet stringent VOC requirements
- Glare protection limits direct sunlight to teaching area
- 70% of floor area has direct line of sight to outdoor views

Recommended:

- MERV Filtration of 13 or better
- Dedicated outdoor air system
- Pollutant and chemical source control
 - Walk off mats
 - No indoor burning of fossil fuels
 - Dedicated mechanical exhaust
- Ducted returns (no plenums allowed)
- More Stringent VOC emission rules
- Construction moisture/air quality management
- Radon testing and mitigation
- Thermal comfort standards
- Operable windows and
- Individually controllable thermostats
- Daylighting
- LEDs
- Enhanced acoustic performance
- Low EMF wiring
- Limited router exposure
- High intensity fluorescent fixtures

INDOOR AIR QUALITY



Walk Off Mats:

- Improving Indoor Air Quality AND Limiting Operational Costs by Keeping Out:
 - Dirt
 - Heavy Metals
 - Pesticides



High Efficiency Particulate Air (HEPA) Filters:

- HEPA filter with Minimum efficiency reporting value (MERV) of 11 required
- HEPA filter with MERV value of 13 satisfies enhanced filtration requirement

ACOUSTICS



Children are especially vulnerable to missed instruction due to background noise or reverberation

- Background noise with all operable windows open less than 35 dBA
- Maximum reverberation time limitations



OUTDOOR VIEWS



Courtesy Flansburg Architects

Direct Line of Sight to Outdoor Views required on 70% of combined floor area in student/administrative rooms

- A child's growing eyes requires distance viewing throughout the day for proper development

NE-CHPS AND LEED (IEQ)



IEQ Metric	LEED	NE-CHPS 3.0
1. Air Quality	ASHRAE 62.1 OR CEN Standards EN 15251-20007	ASHRAE 62.1 <i>plus</i> <ul style="list-style-type: none"> • MERV 11 filter requirement • Advanced Duct liners • Outdoor intake min, 6ft high • Advanced Duct Liners
2. Acoustics	Max 40 dBA Background	Max 35 dBA Background
3. Low Emitting Materials	Optional	Requires 90% of materials meet CARB VOC requirements, 75% for floors
4. Views	Optional (50% floor area)	Requires 70% of combined floor area have direct line to outdoor view
5. Green Cleaning	Policy Required	Policy and audit required 12-18 months after occupancy

NE-CHPS AND LEED (IEQ)



IEQ Metric	LEED	NE-CHPS 3.0
6. Outdoor Moisture Management	None	All outdoor building characteristics move water away from the building
7. Daylight Glare Protection	None	Daylight glare protection is required
8. Pollutant/Chemical Source Control	None	Includes <ul style="list-style-type: none">• walk-off mats requirement• off-gasing and direct ventilation requirements;• Electronic ignitions for gas-fired equipment;• Prohibition on indoor use of fossil fuel powered equipment
9. Tobacco Smoke	Prohibited near building perimeter	None

4. CASE STUDY: PROFILE, NH SCHOOL

PROFILE SCHOOL

Bethlehem, NH - *NE-CHPS Verified*



- Completed in 2009; new high school joined to existing middle school site
- More than 60% local construction materials
- More than 75% of construction waste recycled
- Exterior lighting fixtures are “full-cutoff” to significantly reduce light pollution and save energy.
- Indoor spaces provided with 100% outside air ventilation for good indoor air quality.
- Cafeteria, gym, and library, located to allow use by the community.
- Playing fields to be irrigated with collected rainwater
- Dedicated bicycle storage



PROFILE SCHOOL

Bethlehem, NH - NE-CHPS Verified



Principal Michael Kelley on the before and after...

Indoor environmental quality

“The air quality is unbelievably different. We also had tremendous difficulty in the old school with climate control; we were freezing in the winter and it felt like it was 100 degrees in the summer. Now it’s all set perfectly.”



Student behavior

“I think the kids are more positive, being in a space that is inviting and beautiful instead of one that is old and falling apart. They just seem to be happier in this space.”

EAST BAY MET (ZNE DESIGNED)

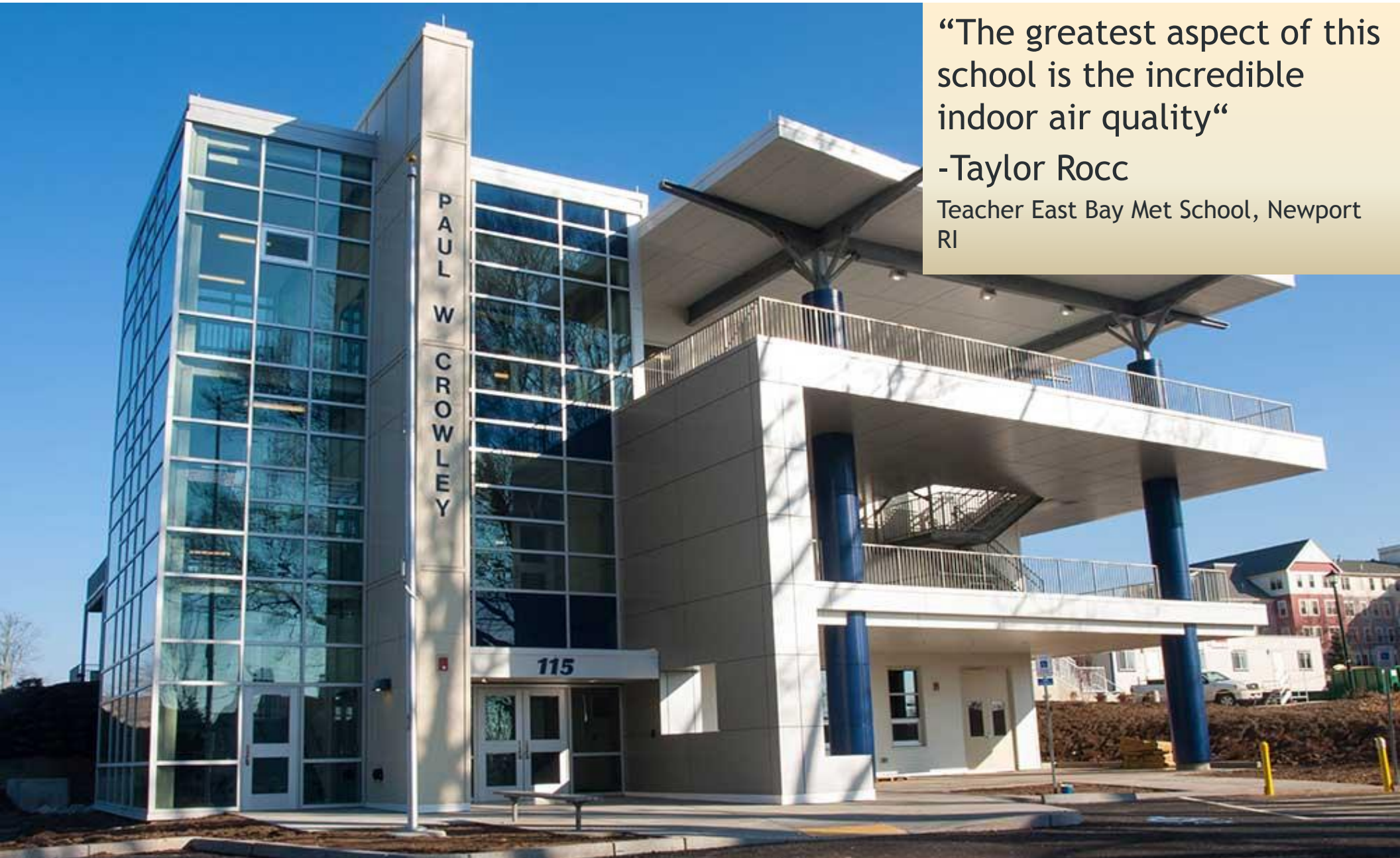
Newport RI



“The greatest aspect of this school is the incredible indoor air quality”

-Taylor Rocc

Teacher East Bay Met School, Newport RI



5. CONCLUSIONS AND NEXT STEPS

CONCLUSIONS:



1. Energy efficiency upgrades, environmental quality improvements, and sustainable building design can lead to *healthier, less costly, and more productive* Connecticut schools.
2. The NE-CHPS criteria *satisfies Connecticut school construction regulations*, but--unlike in the rest of New England--currently receives rare attention in the state.
3. The NE-CHPS criteria is a proven school construction and renovation guide with which our region's *industry professionals* are *already familiar*.

NEXT STEPS:



For further info:

- Visit the NEEP's NE-CHPS [website](#)
- Access the [latest version](#) of NE-CHPS
- Check out the Public Buildings [Operation & Maintenance Guide](#)
- Contact:
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THANK YOU

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