Navigating the New Energy Code:

Discover the future of energy design under the new energy code and how it will impact both your district operations and your budget

#iasboAC26

LEADING WITH EMPATHY

2026 ANNUAL CONFERENCE

Introductions

Stuart, Brodsky, AIA., Speaker
- *Principal, PK-12 Education, Wight & Company*

Troy Kerr, AIA, LEED AP, CDT, Speaker
- *Vice President, Chicago Region PK-12 Practice Leader, FGM Architects, Inc.*

Brian Scully, AIA, LEED AP, SAAC, Speaker
- *Associate Principal, DLA Architects, Ltd.*

ABC

IECC

APPLICATION

BENEFITS

- Economic
- Environmental
- Health & Safety

COMPLIANCE

- Prescriptive
- Performance
- Energy Rating Index

SYSTEMS

- Building Envelope
- Mechanical
- Power & Lighting

ABC

IECC

APPLICATION

Illinois Schools

- IECC 2024 as of January 2025 based on date of design contract (former IECC 2021)

Systems

- Building Envelope
- Mechanical
- Power & Lighting

ABC

IECC

BENEFITS

Economic

- Lower energy consumption/cost
- Longer term affordability
- Larger investment

Environmental

- Lower greenhouse gas emissions
- Resiliency – grid demand reduction
- Preparation for future technologies

Health & Safety

- Greater Comfort - Better air sealing, increased insulation, and window efficiency
- Improved Indoor Air Quality - Enhanced filtering, air flow, and outdoor air mixing

ABC IECC

COMPLIANCE

3 Pathways:

Prescriptive

- Follow a set of specific requirements for each building component

Performance

- Use a performance-based energy model to show that the building's energy budget is met

Energy Rating Index

- Use a score based on an Energy Rating Index to demonstrate compliance

PATHWAYS

1

PRESCRIPTIVE

Follow a set of **specific requirements** for each building component

- **Least Flexible**
- **Must meet prescriptive criteria**
- Clear and assured route to compliance
- Example criteria: insulation values, window performance & max glazing %, sealing, renewable energy
- PV's required (0.74w/SF)
- Thermal bridge analysis & envelope testing required
- Also allows for ASHRAE 90.1 Prescriptive Path use

2

PERFORMANCE

Use a **performance-based energy model** to show that the building's energy budget is met

- **More flexibility**, but **more complex**, allows **trade offs**
- **Perform energy analysis through modeling** to confirm 5% better than Baseline
- Possible factors: insulation values, window performance & max glazing %, sealing, renewable energy
- Proposed **design estimated annual energy** cost for heating, cooling, ventilation, and water heating must meet code criteria
- **LEED projects**

3

ENERGY RATING INDEX

Uses a third-party **scoring system** to determine a building's energy efficiency.

- **Some flexibility**
- **Energy modeling** used to calculate **Energy Rating Index score**.
- Actual energy use must be lower than maximum allowed Building Energy Rating Index **score for the climate zone**.
- 24% better than code

2024 Energy code must be followed for all new construction projects & building additions:

How to Find Your Path during **Concept Design** - 2024 Energy Code (IECC 2024 or ASHRAE 90.1 2022):

Last Updated: 9/24/25

Prescriptive

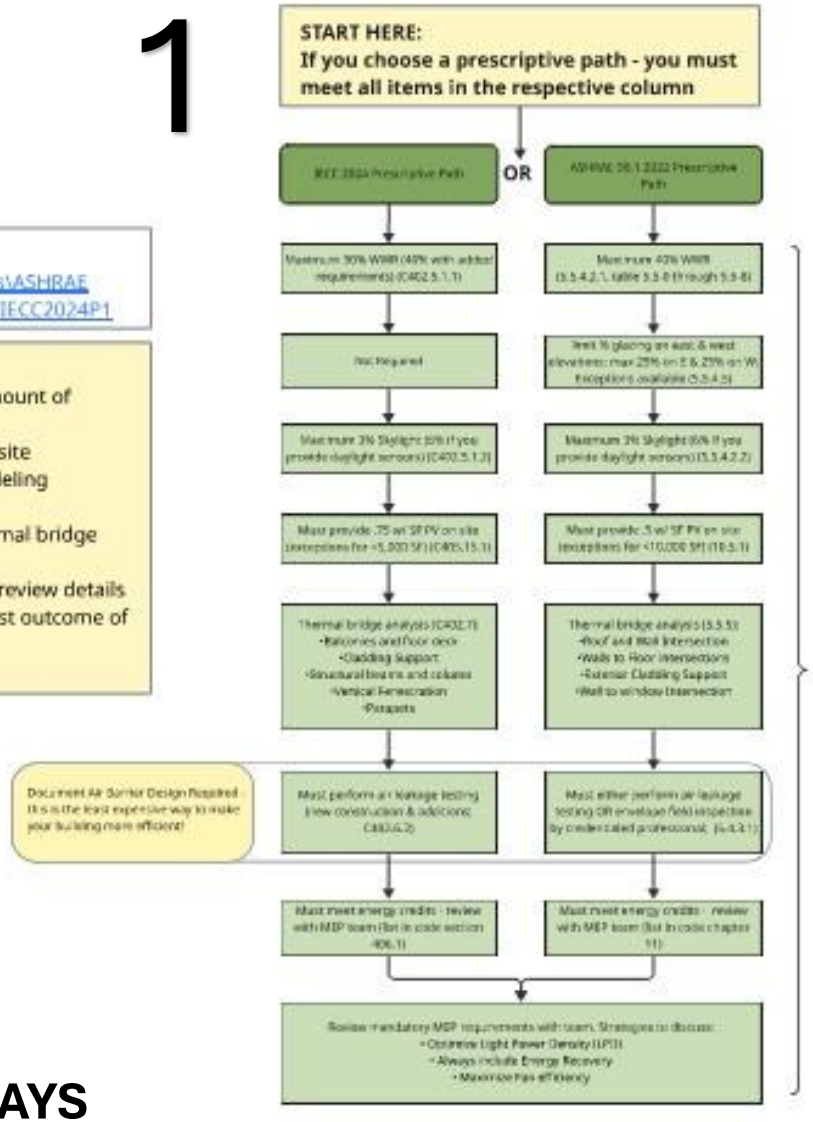
Energy Model

Guidance

Resources:
ASHRAE 90.1 2022: T:\Wight MEP\14-Codes\ASHRAE
IECC 2024: https://codes.iccsafe.org/content/IECC2024P1

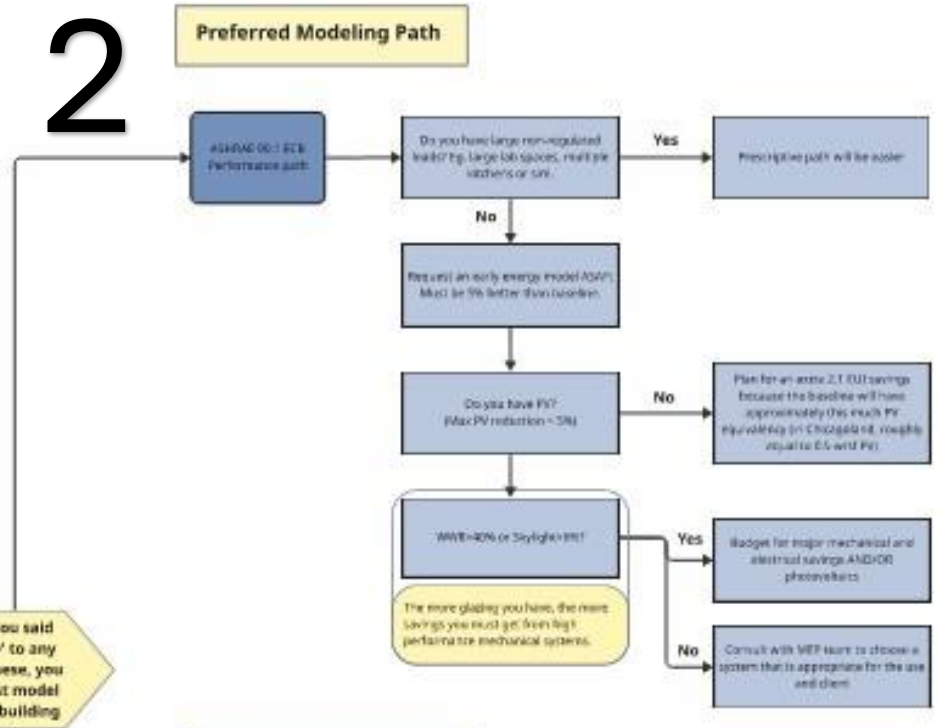
Early Design/ Cost implications:
- If you want >40% glass, budget for a large amount of renewable energy on site
- All early budgets should assume some PV on site
- If pursuing all-electric, you must follow a modeling pathway
- Assume money in the project budget for thermal bridge analysis (in house) and/or energy modeling
- Include fee to hire an envelope consultant to review details in the drawings and during construction for best outcome of passing the air leakage testing.

1



If you said 'NO' to any of these, you must model the building

2



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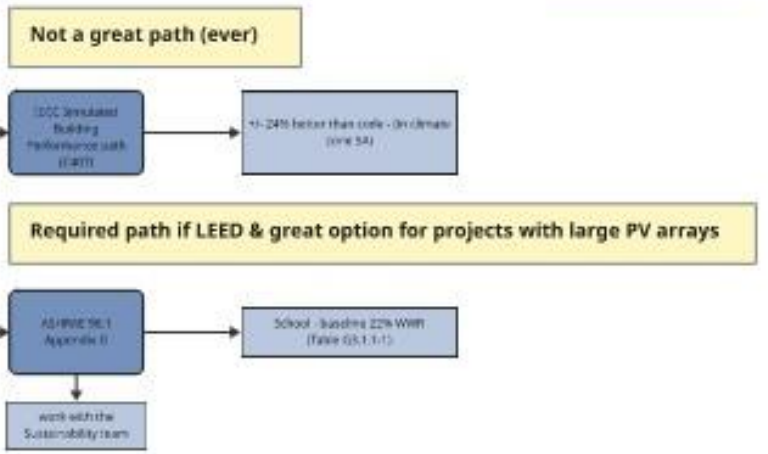


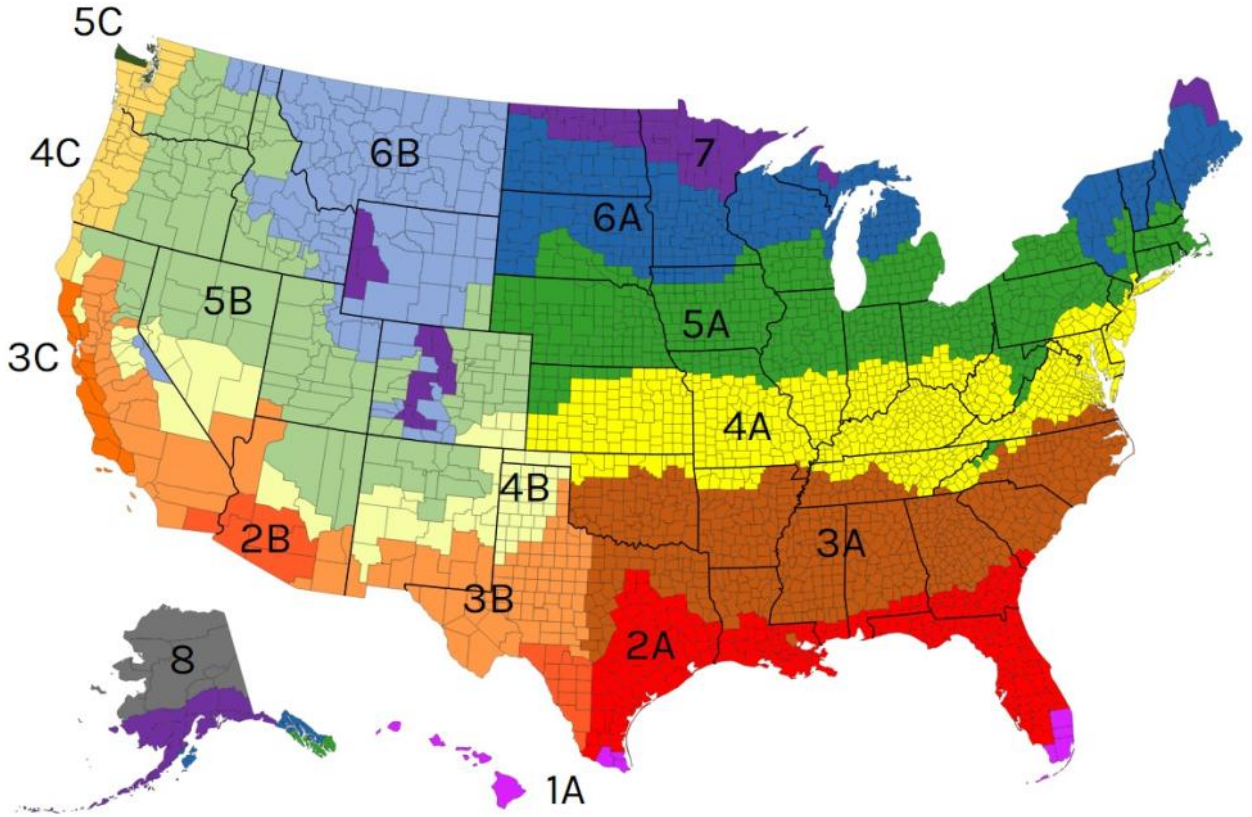
Wight

IECC PATHWAYS FLOW CHART

BUILDING ENVELOPE

Optimize your investment in systems
Start with an efficient envelope

- Enhanced R or U Values
- Decreased Maximum Glazing %
- Thermal Bridging Analysis
- Maximum Air Leaking Criteria Enhanced and Testing Requirements
- Inspection / Testing Requirements



Criteria driven by climate zone

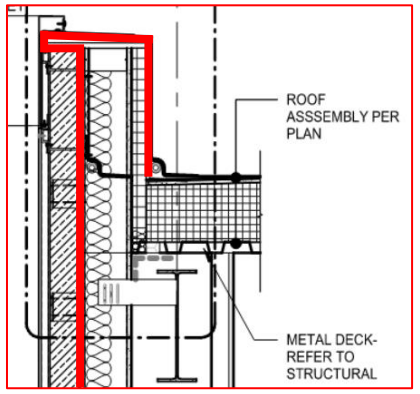
BUILDING ENVELOPE

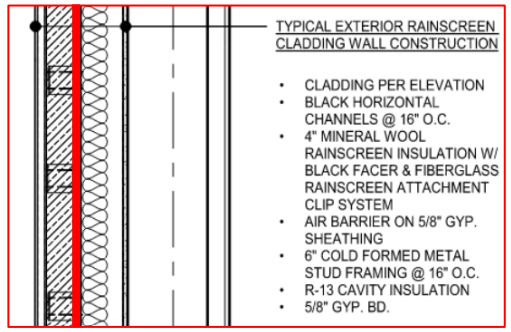
Enhanced R or U Values

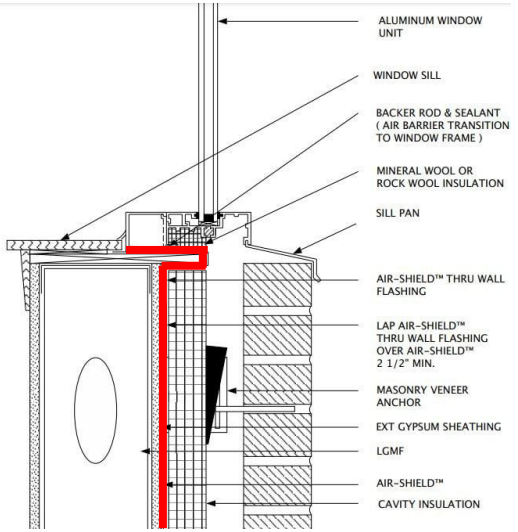
- Greater thermal resistance = lower energy loss
- Stricter limits on window and door thermal performance
- Improved glazing efficiency = reduced heat transfer
- Strategically place glazing
- Impacts HVAC sizing and overall energy modeling
- Higher continuous insulation values for metal framed walls

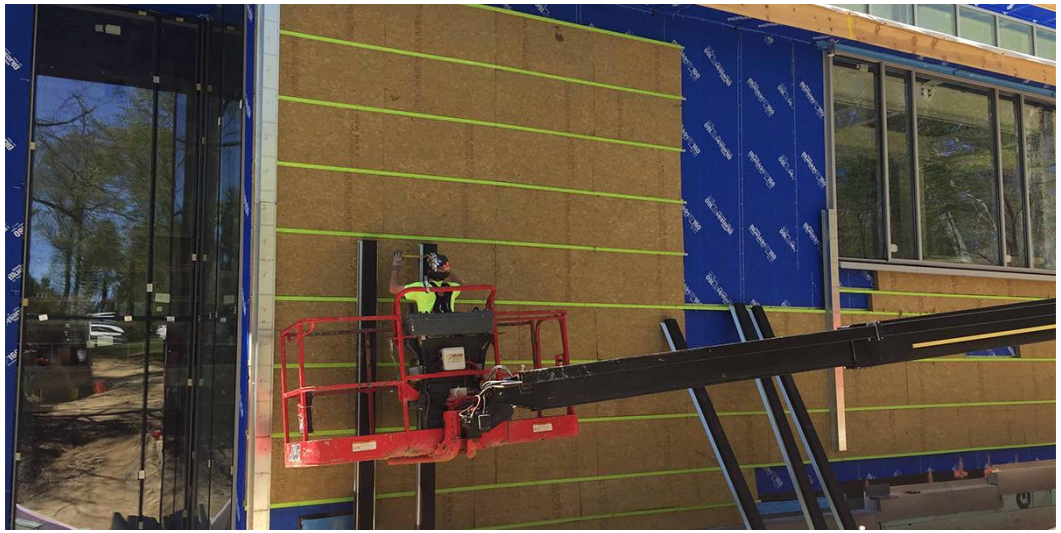
Strategic Envelope Design

- Envelope performance central to compliance and cost control
- Early design decisions affect long-term operational efficiency
- Coordinate transitions: Ensure continuity of air/vapor barriers at roof-wall, wall-floor, and window-wall junctions
- Plan for testing









BUILDING ENVELOPE

Decreased Maximum Glazing %

- Locate glazing strategically to balance daylighting potential with energy performance
- Allows a maximum 30% to 40% window to wall ratio (WWR) range for prescriptive path
- Allows a maximum 25% WWR on east and west elevations for prescriptive path

BUILDING ENVELOPE

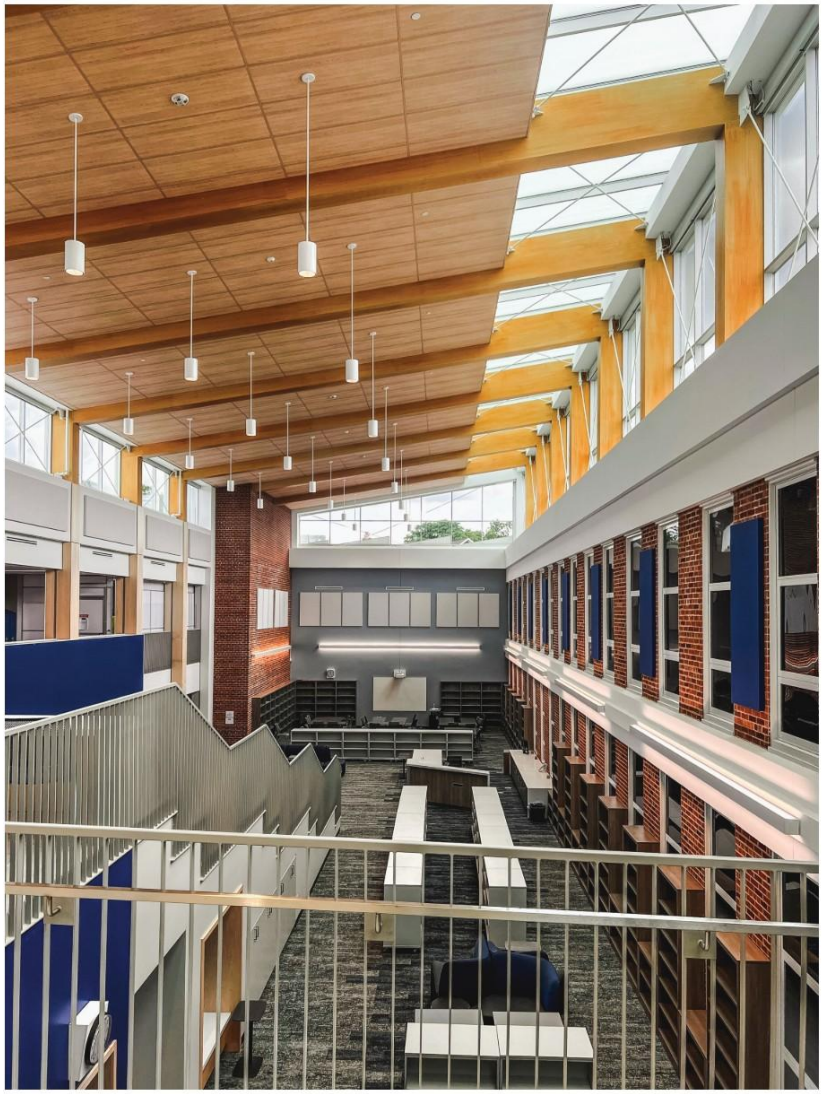
Skylight Considerations

The prescriptive method for both IECC and ASHRE 90.1 requires skylight area to stay **below 3% of roof area.** This limitation is increased to 6% if daylight sensors are provided.

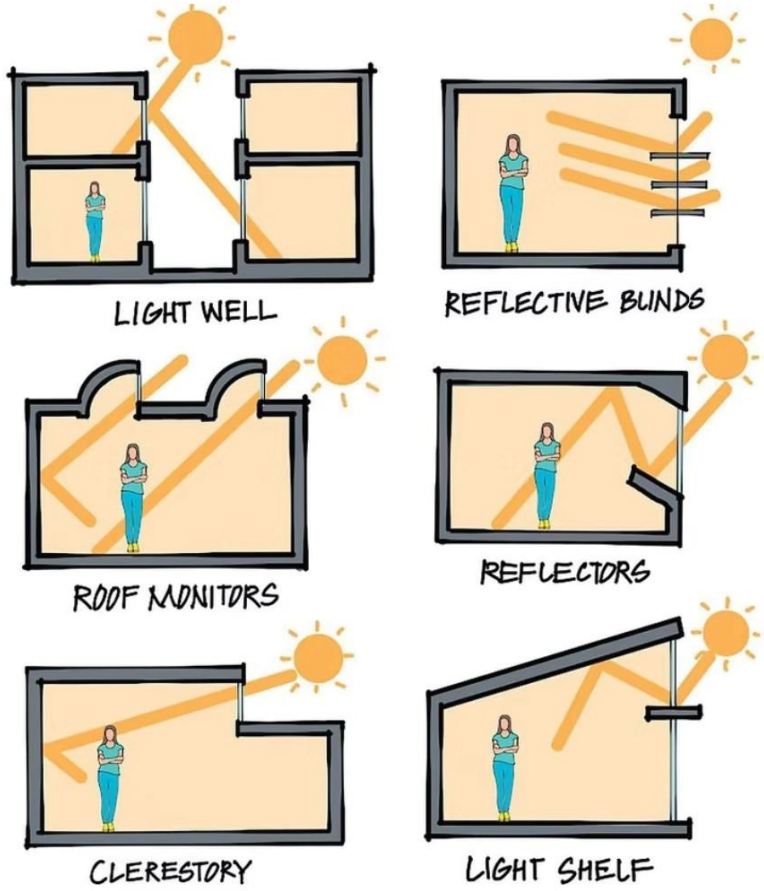
If a project exceeds the allowable skylight area, then an Energy Modeling Compliance Path is required. Here, the project has to "compete" against a reference code baseline. **Energy savings will have to be found elsewhere in the project to compensate for the additional skylight area.** This could likely require budgeting for additional mechanical and electrical savings and/or photovoltaics.

BUILDING ENVELOPE

Skylight Considerations



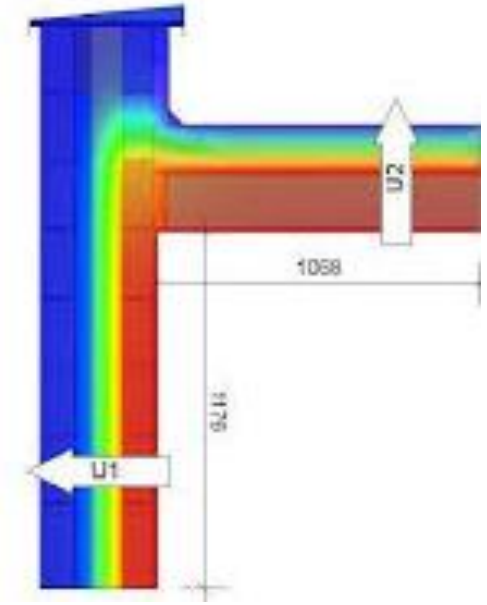
Skylight definition updated: The 2024 IECC clarifies skylights as any glazing installed at a slope <60° from horizontal.



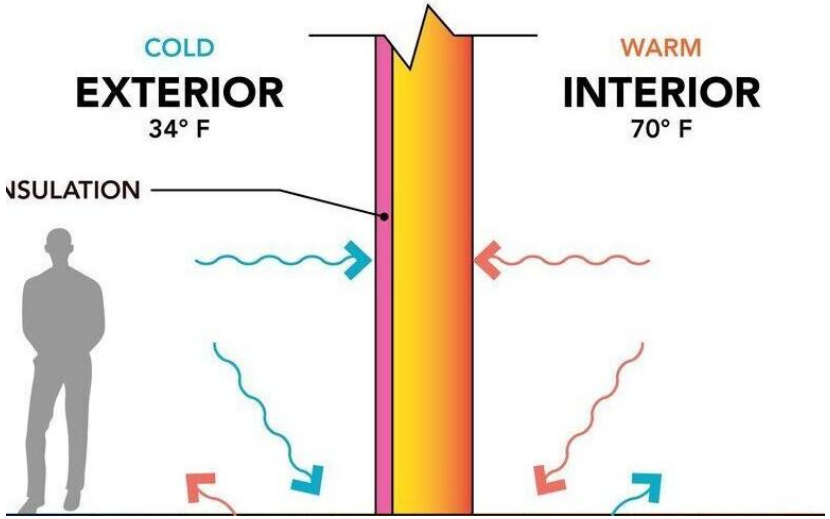
BUILDING ENVELOPE

Thermal Bridging Analysis During Design Phase

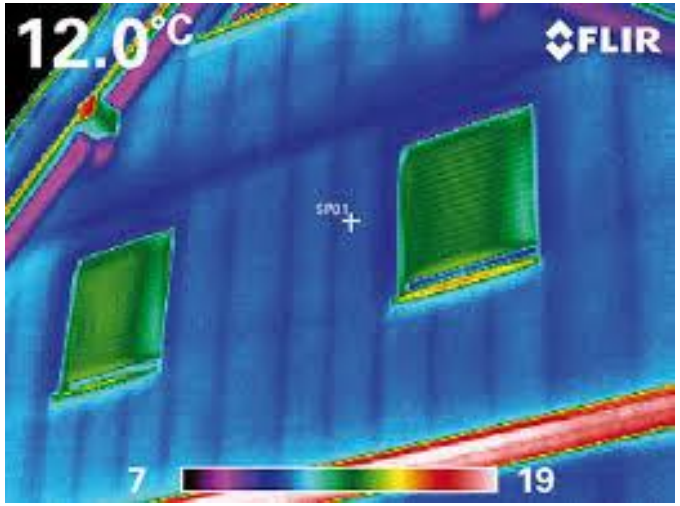
- Eliminate or minimize materials that transfer temperature through the wall
- Requires continuous insulation
- Coordinate continuous air/vapor barrier
- Manage continuity through transitions – roof/wall, wall/floor, exterior cladding supports, wall/window



Continuity through system transitions



Interior / exterior thermal differences



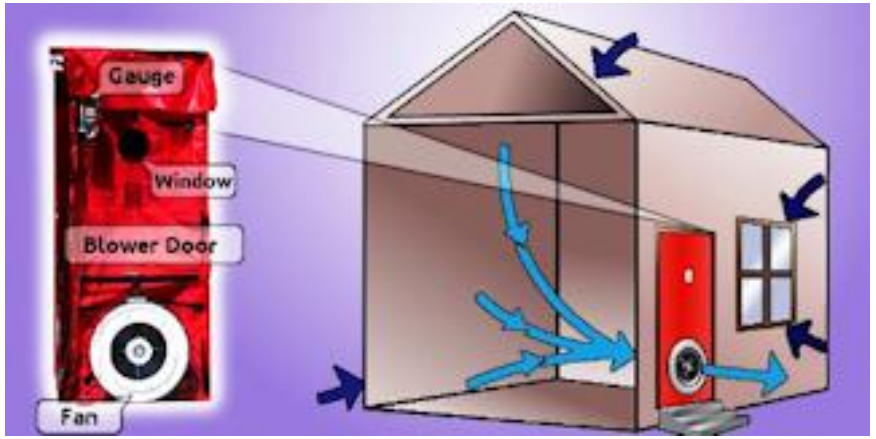
Thermal bridges due to non-continuous insulation

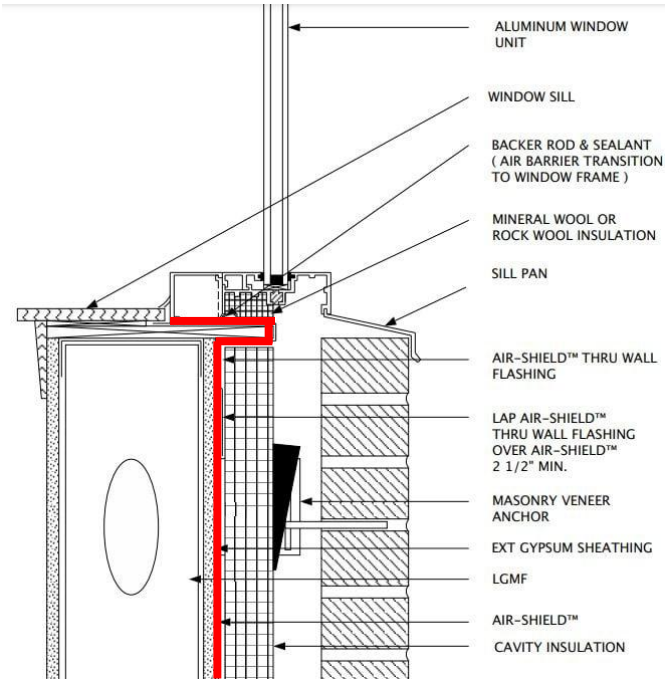
Continuous insulation example

BUILDING ENVELOPE

Enhanced Maximum Air Leakage Criteria and New Testing Requirements

- Continuous air barrier required
- Has substantial impact on building energy efficiency
- Air leakage testing or field inspections by credential professional required





Mechanical Requirements

Basic Requirements

- Equipment Efficiency
- Setpoints & Thermostats
- Demand Control Ventilation
- Occupied Standby
- Exhaust Fans

Equipment Efficiency

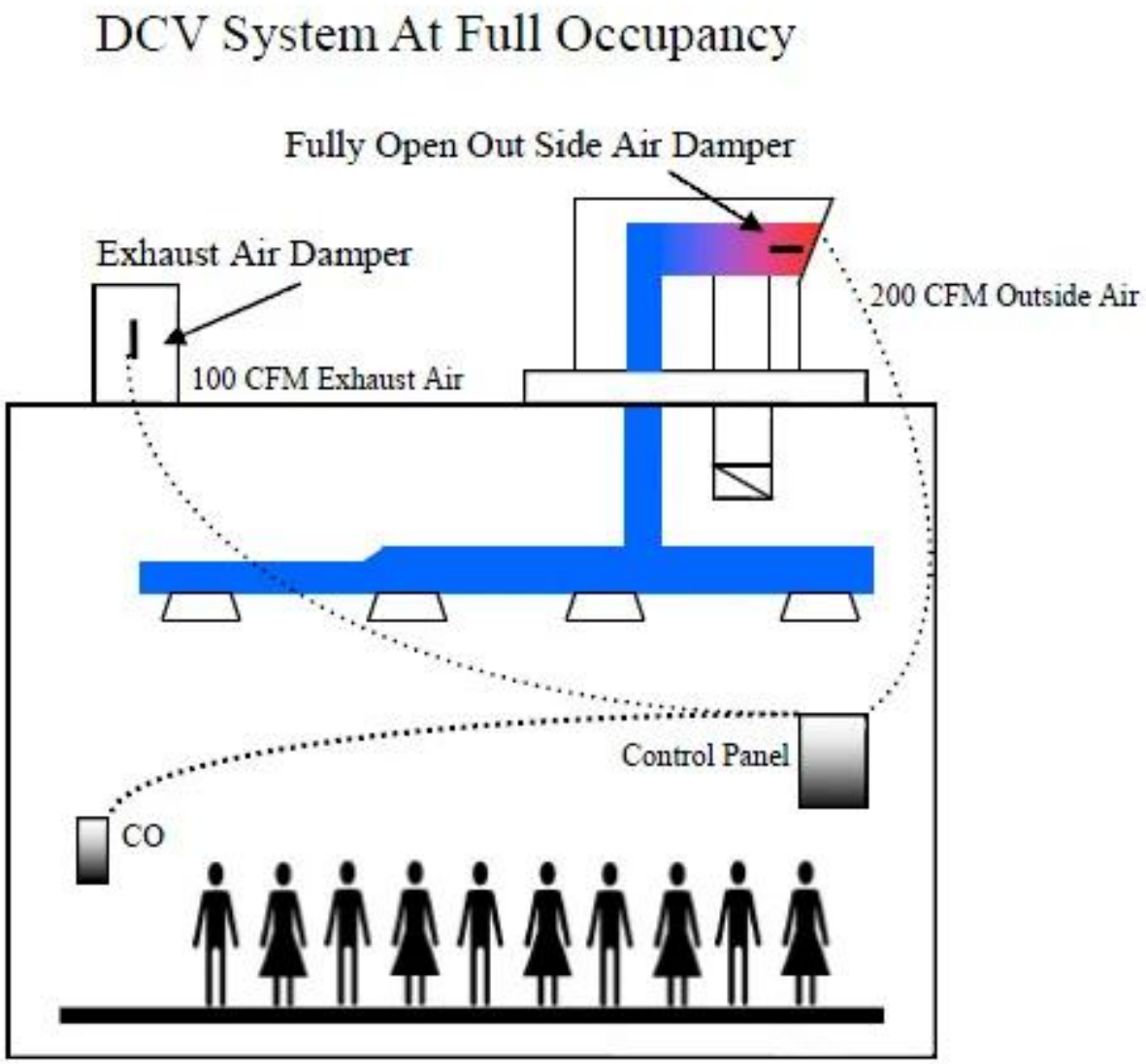
ASHRAE 90.1

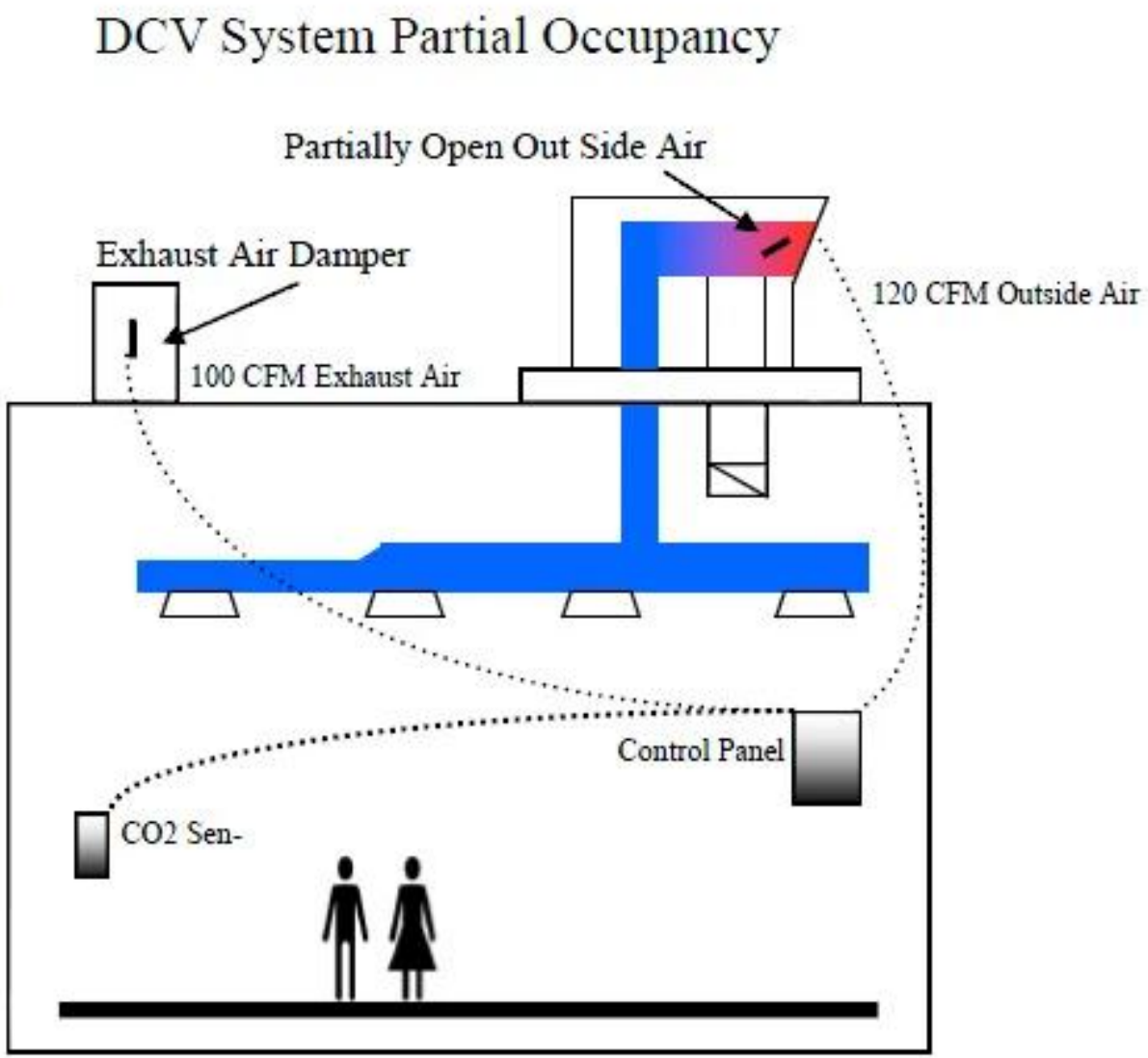
- Aggressive mechanical efficiency targets compared to IECC 2015 & IECC 2021

Setpoints & Thermostats

- Separate setpoints for heating and cooling
- Initial configuration shall provide a deadband between setpoints of at least 5 degrees
    - Supply to zone greatly reduced or shut off
- Minimum 1 degree deadband when setpoints manually adjusted
- Occupant adjustment of setpoints (if allowed) for heating is independent of cooling

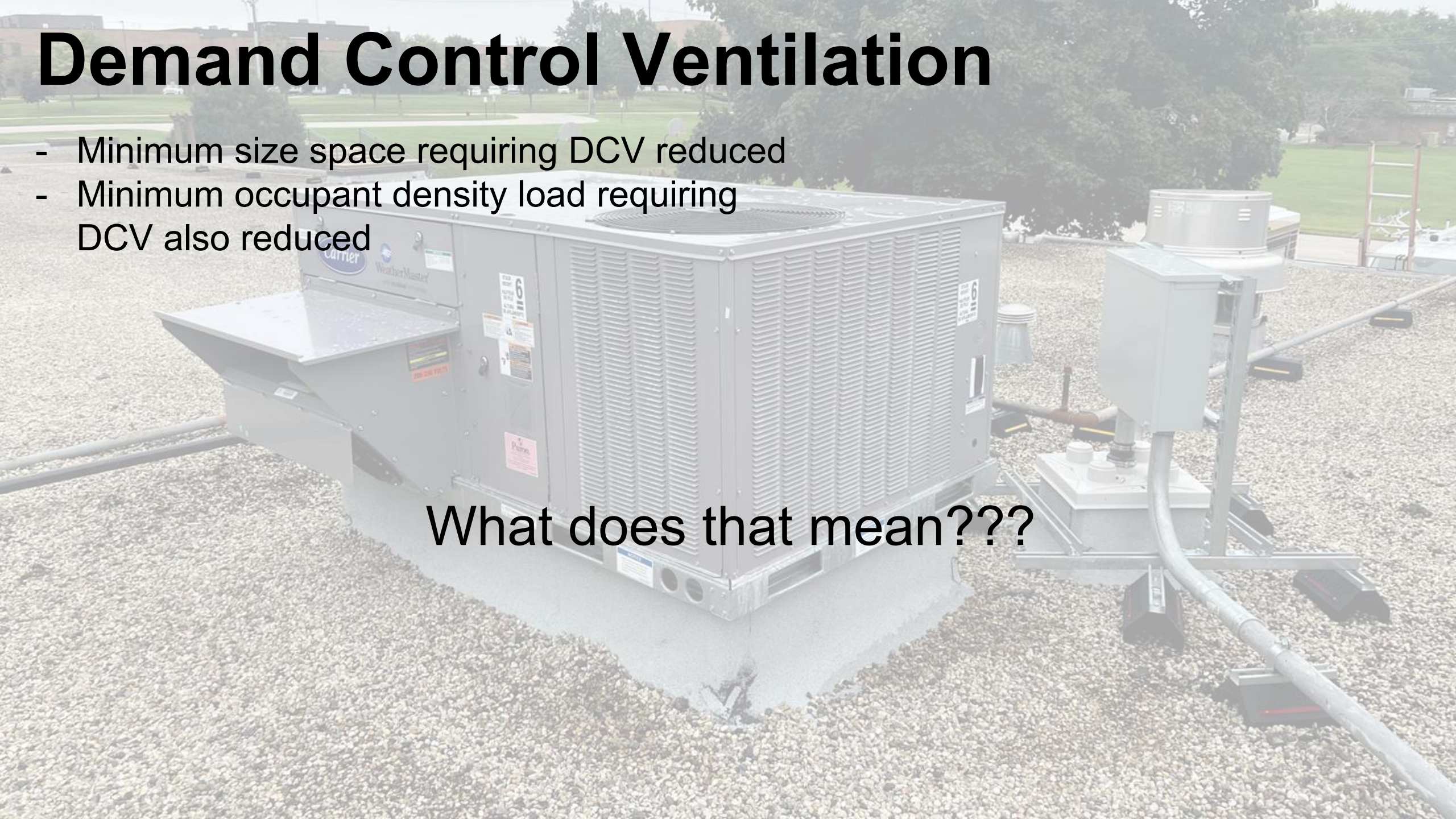
Demand Control Ventilation





Demand Control Ventilation

- Minimum size space requiring DCV reduced
- Minimum occupant density load requiring DCV also reduced



What does that mean???

Demand Control Ventilation

- Minimum size space requiring DCV reduced
- Minimum occupant density load requiring DCV also reduced

Occupied Standby

The tables and chairs don’t have access to School Dude!

Why are we conditioning these spaces?

Occupied Standby

- Controls must be provided that setback the heating and cooling by not less than 1 degree and shut off airflow supply when space is unoccupied
- Required for:
    - Lecture halls
    - Conference rooms
    - Meeting rooms
    - Lounges/breakrooms
    - Enclosed offices
    - Open offices
    - Corridors

Exhaust Fans

For toilet rooms

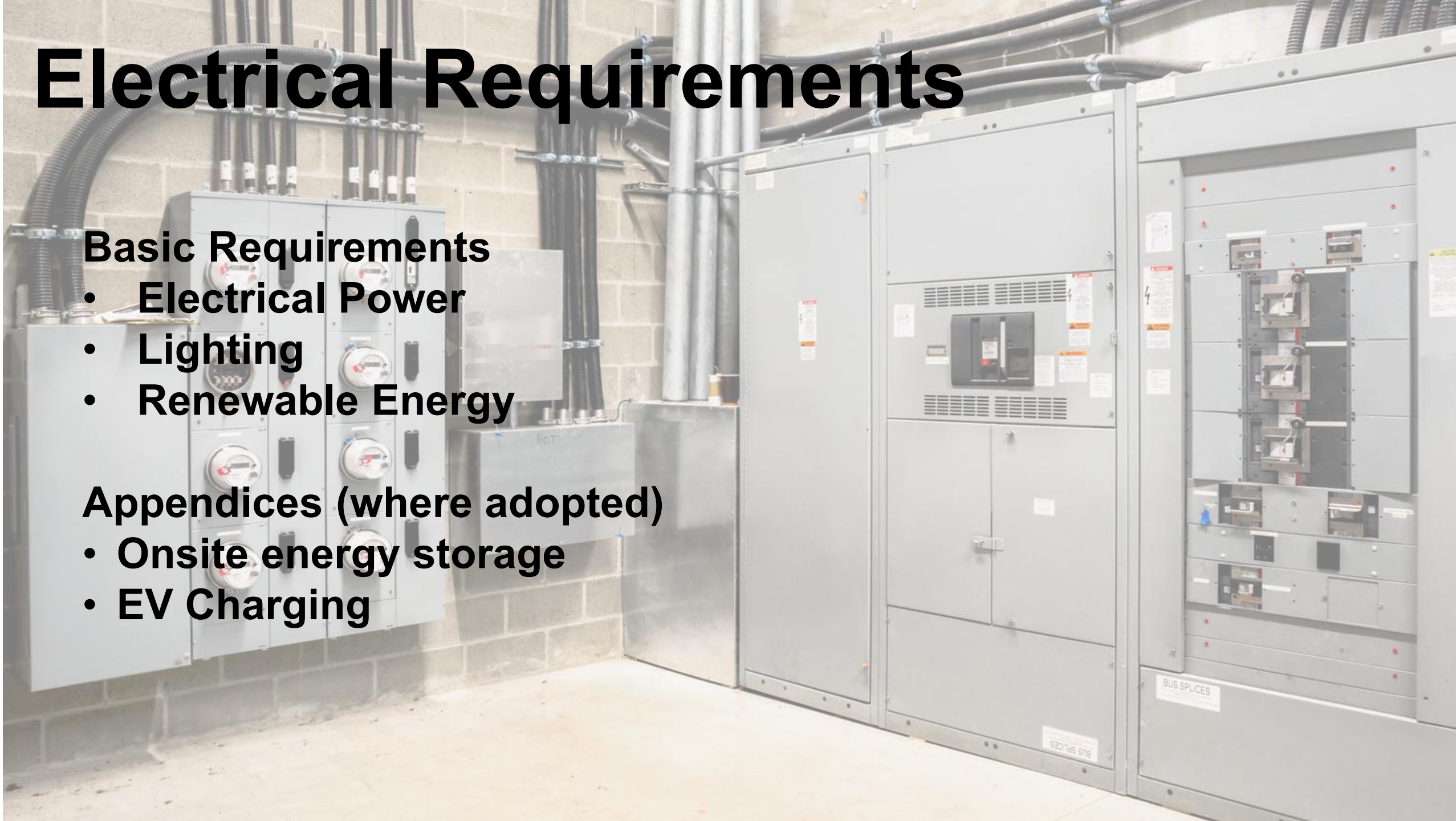
- Exhaust fans must now have manual ON capability coupled with :

  - Occupancy sensor
  - Humidity sensor

    or

  - Contaminant sensor

Electrical Requirements



Basic Requirements

- Electrical Power
- Lighting
- Renewable Energy

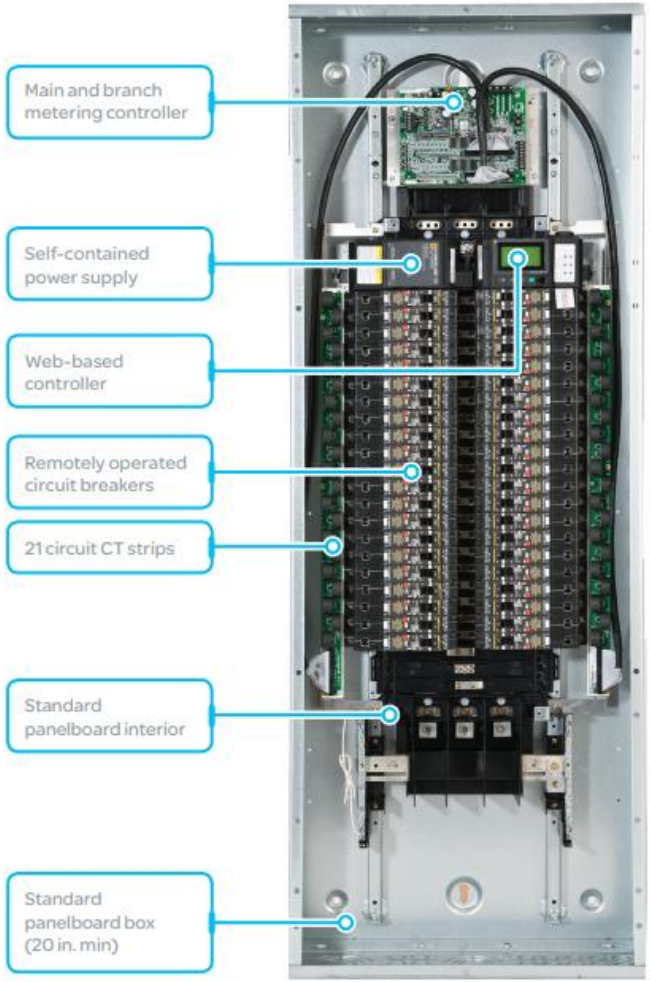
Appendices (where adopted)

- Onsite energy storage
- EV Charging

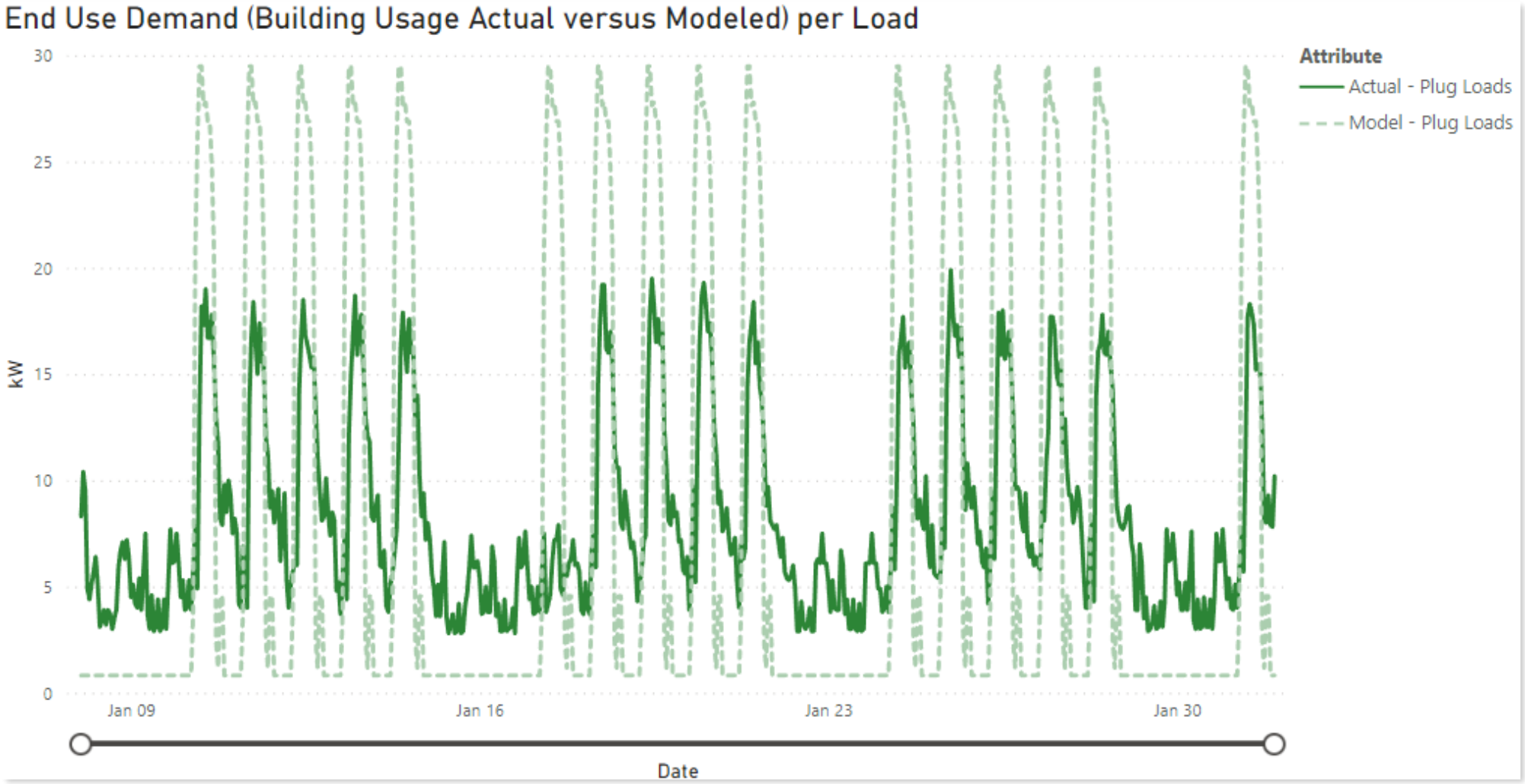
Electrical Power

Energy Metering, Monitoring, and Reporting

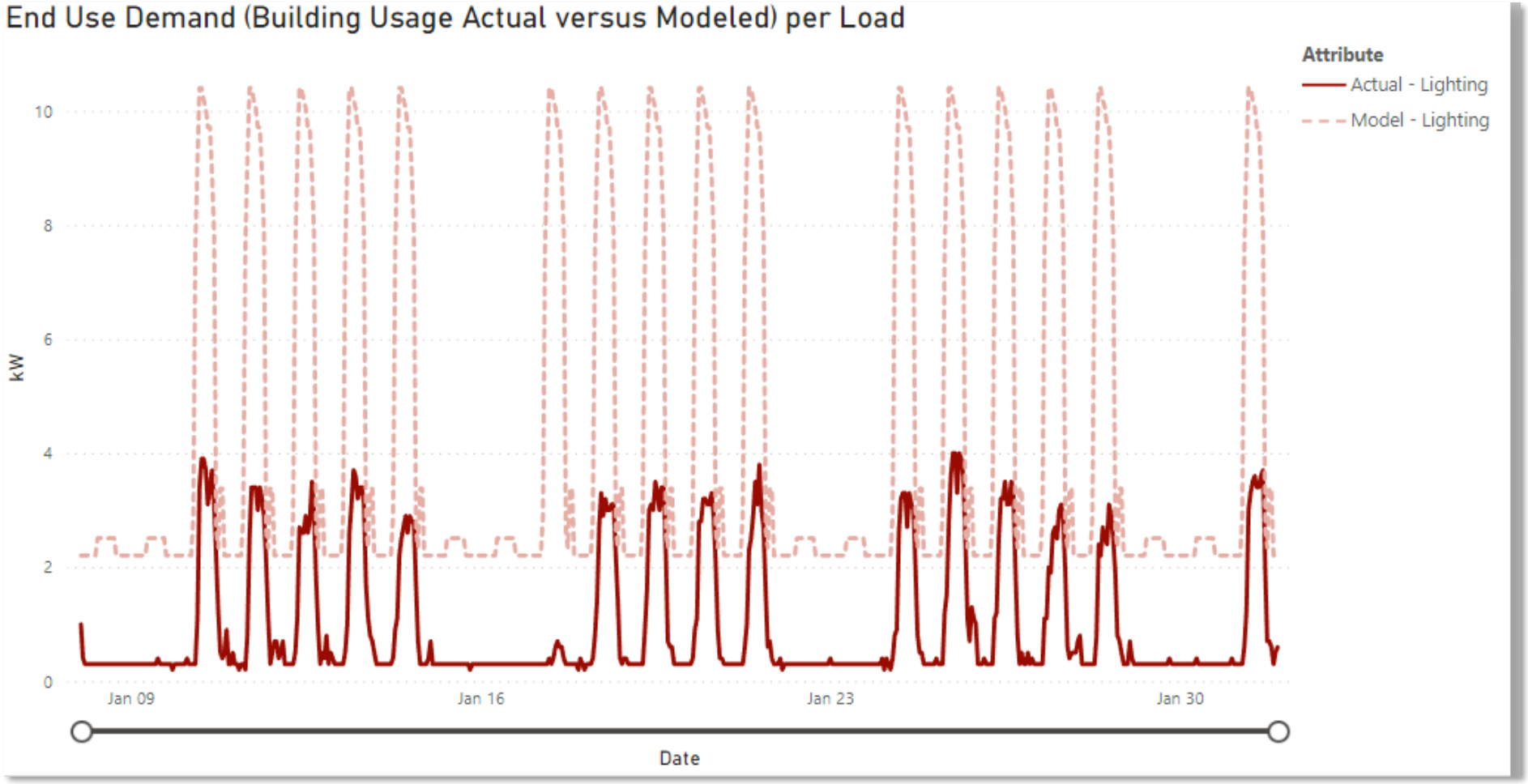
- Applicable to buildings over 10,000 SF
- Submetering for:
    - Total HVAC usage
    - Interior Lighting
    - Exterior Lighting
    - Plug Loads
    - Process Loads
    - Any other single load that exceeds 5% of peak connected load
    - Building Operations/Other: Vertical transportation, swimming pools, etc.
- Data must be available for 36 months (hour, day, month, and year)



Electrical Power



Electrical Power



Electrical Power

Automatic Receptacle Control

- At least 50% of all 125V, 15A and 20A receptacles AND at least 25% of branch circuit feeders for furniture must turn off based on a schedule or be tied to an occupancy sensor

Lighting

Occupancy Sensors

- Similar to previous versions of the code
- Added dimming control function

Max Lighting Power Density

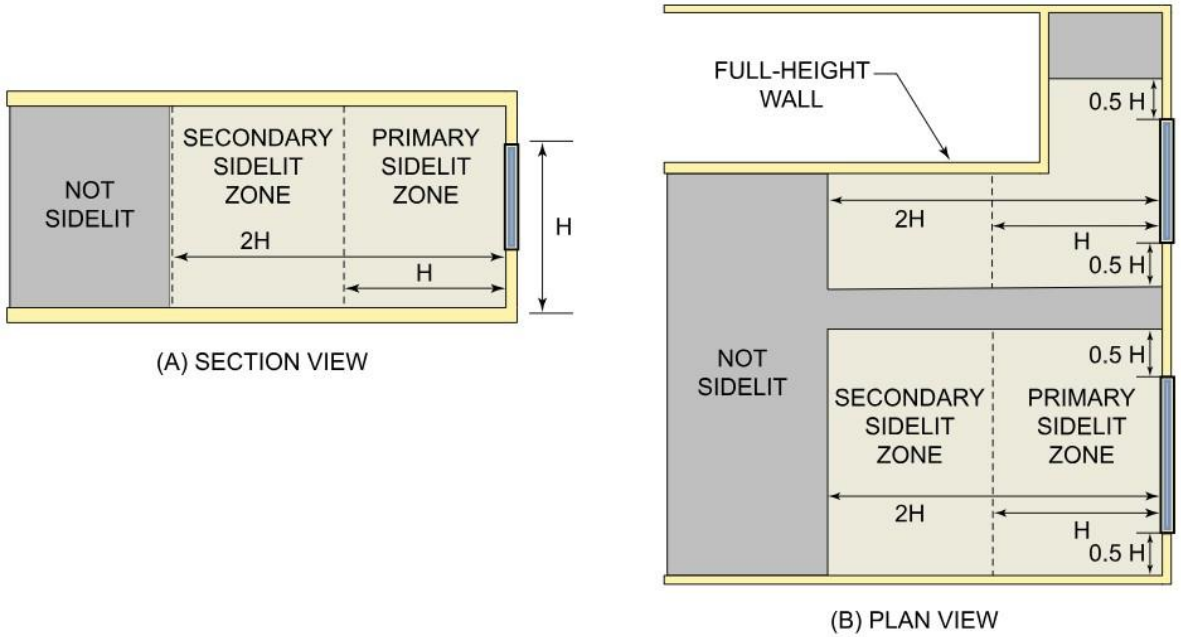
- Reduced to 0.70 watts/square foot (it was 0.72 in 2021, and 0.81 in 2018)

Lighting

Daylight Responsive Controls

- Dimming has to be able to drop to 10% of max
- Side lit (windows) and top lit (skylights and roof monitors) zones must be controlled independently
- Multiple zones for side lit areas

FIGURE C405.2.4.2(1) PRIMARY AND SECONDARY SIDELIT DAYLIGHT ZONES



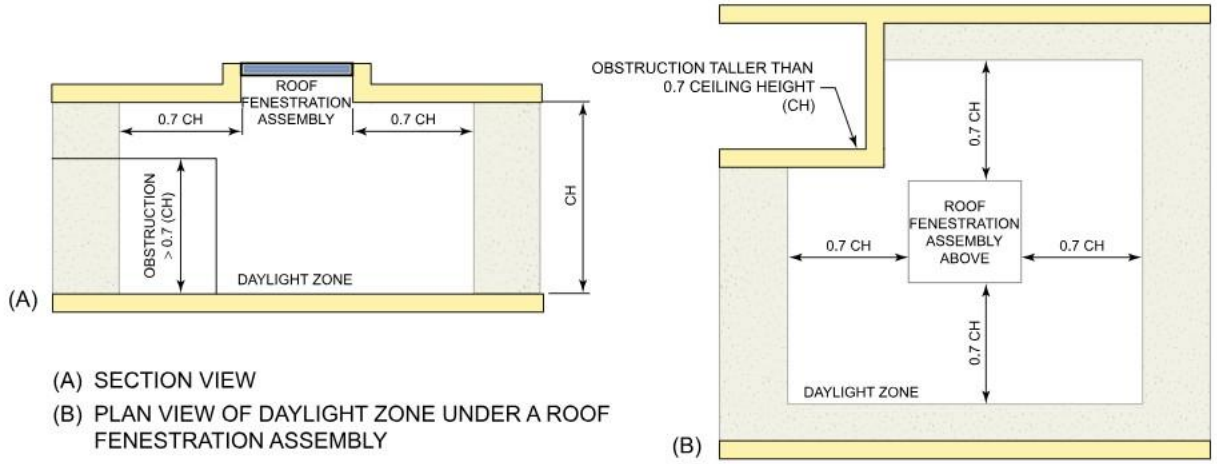
Lighting

Lighting

Daylight Responsive Controls

- Dimming has to be able to drop to 10% of max
- Side lit (windows) and top lit (skylights and roof monitors) zones must be controlled independently
- Single zone for top lit areas

FIGURE C405.2.4.3 TOPLIT DAYLIGHT ZONE



(A) SECTION VIEW
(B) PLAN VIEW OF DAYLIGHT ZONE UNDER A ROOF FENESTRATION ASSEMBLY

Lighting


Maya
Shane
Ari
Anna
Lucy
Henry
Riley
Morgan
Piper
Anthony
Wyatt
Justin
Tucker
Justin
James
Chloe

Lighting

Exterior Lighting

- Building-mounted façade lighting and ground-mounted landscape lighting must turn off 1 hour after business closes, and not turn back on until 1 hour before business opens.

Lighting

Exterior Lighting

- Parking lot lights greater than 40W and less than 24’ tall must reduce by 50% of total wattage when no activity is detected for more than 15 minutes
- Lights must be zoned into groups no larger than 1500W

Renewable Energy

Renewable Energy Systems

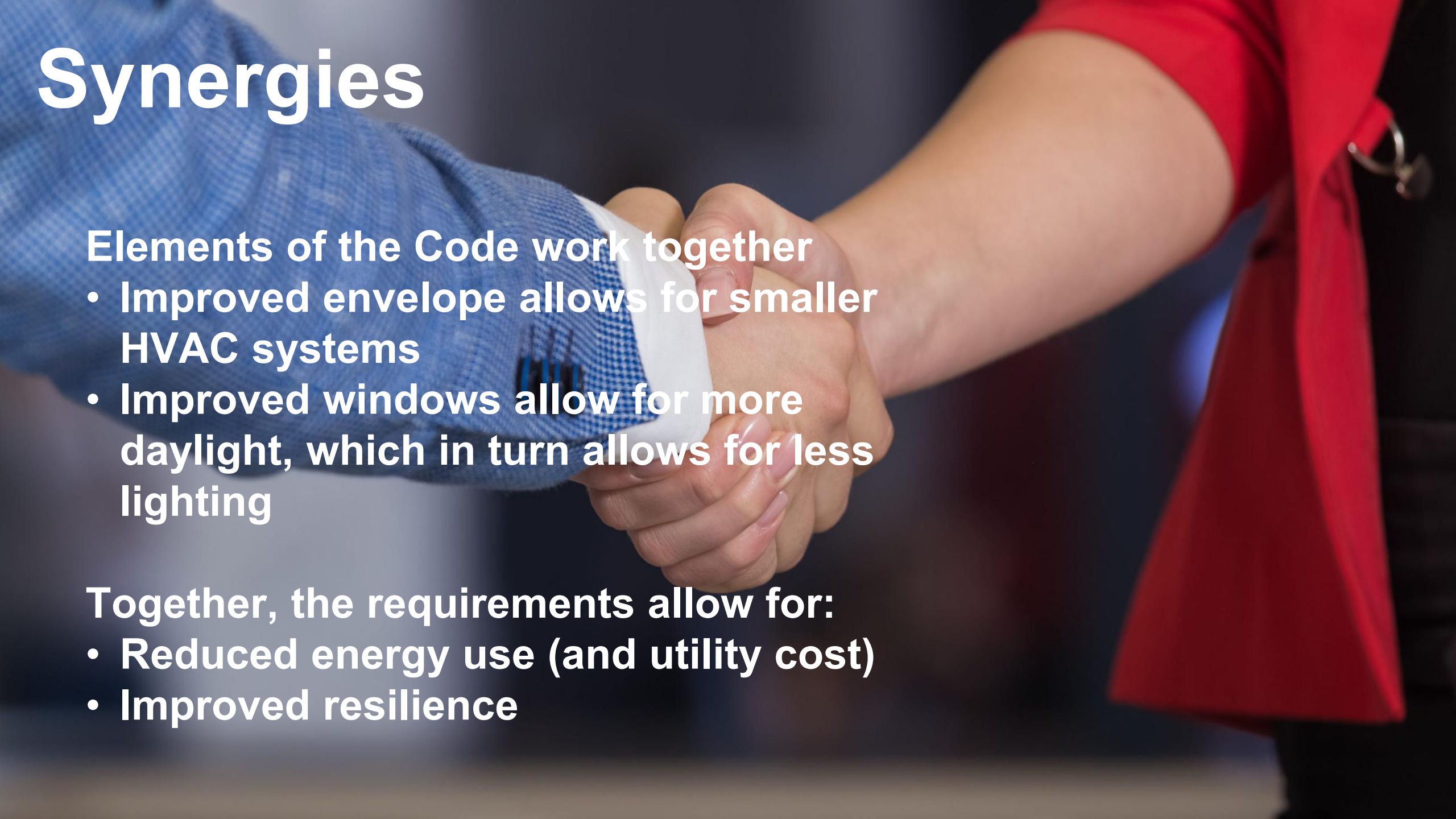
- Buildings must produce onsite electricity (0.75 watts/square foot) of the conditioned floor area
- If onsite generation is not possible (or can’t meet minimum wattage), renewable offsite power can be purchased (1.35 kWh/watt required), contracted for not less than 10 years
- Some exceptions are included that are not typically applicable to schools

Appendix Requirements

Appendices must be specifically adopted to be applicable. They have not yet been adopted into the Illinois School Code. If adopted, they include:

- EV Charging for 15% of parking spaces
- Infrastructure for future installation of EV Charging for an additional 30% of parking spaces
- Onsite Energy Storage: Capacity greater than or equal to the amount of onsite renewable energy generated

Synergies



Elements of the Code work together

- Improved envelope allows for smaller HVAC systems
- Improved windows allow for more daylight, which in turn allows for less lighting

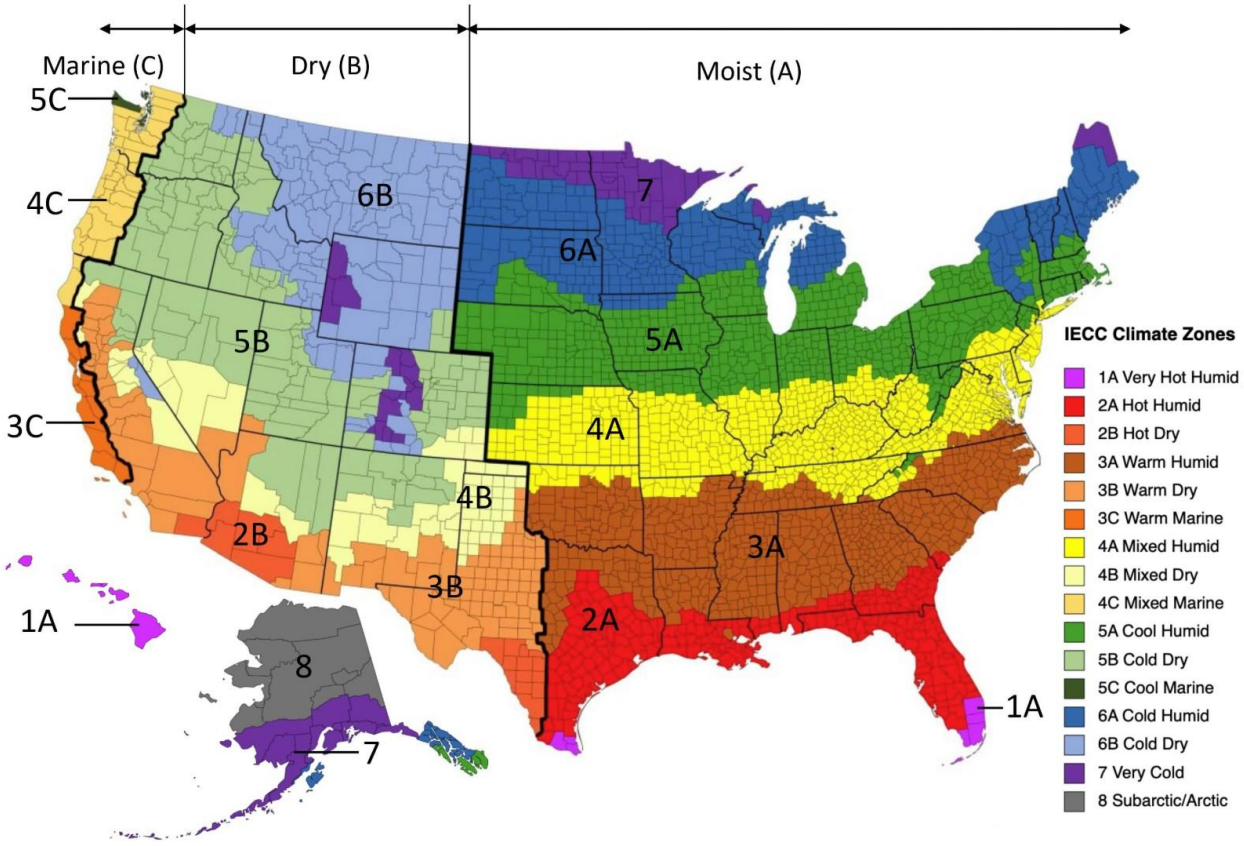
Together, the requirements allow for:

- Reduced energy use (and utility cost)
- Improved resilience

Additional Credits

Projects must earn additional credits beyond code minimum requirements

- Credits were introduced in the 2021 IECC (10 additional credits required)
- 2024 IECC makes it a sliding scale based on Climate Zone
- Renewable Energy and Load Management credits are <u>required</u> to be earned as part of the total



Additional Credits - 2021

TABLE C406.1(3) ADDITIONAL ENERGY EFFICIENCY CREDITS FOR GROUP E OCCUPANCIES

SECTION	CLIMATE ZONE																
	0A & 1A	0B & 1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
C406.2.1: 5% heating efficiency improvement	NA	NA	NA	NA	1	1	1	1	1	2	1	2	1	2	2	3	4
C406.2.2: 5% cooling efficiency improvement	4	4	3	3	2	2	2	2	1	1	1	1	NA	1	1	1	NA
C406.2.3: 10% heating efficiency improvement	NA	NA	NA	1	1	1	1	2	3	4	3	4	3	4	3	5	7
C406.2.4: 10% cooling efficiency improvement	7	8	7	6	5	4	3	4	3	1	2	2	1	2	2	2	1
C406.3: Reduced lighting power	8	8	8	9	8	9	9	8	9	9	8	9	8	7	8	7	7
C406.4: Enhanced digital lighting controls	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	2	1
C406.5: On-site renewable energy	6	6	6	6	6	6	6	6	6	6	6	6	6	6	6	5	5
C406.6: Dedicated outdoor air system	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
C406.7.2: Recovered or renewable water heatinga	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
C406.7.3: Efficient fossil fuel water heatera	NA	1	1	1	1	1	1	2	2	3	2	3	2	3	3	3	5
C406.7.4: Heat pump water heatera	NA	NA	NA	NA	NA	NA	NA	1	NA	NA	1	1	NA	1	1	1	1
C406.8: Enhanced envelope performance	3	7	3	4	2	4	1	1	3	1	2	3	NA	4	3	6	9
C406.9: Reduced air infiltration	1	1	1	2	NA	NA	NA	NA	NA	NA	1	NA	NA	4	1	4	3
C406.10: Energy monitoring	3	3	3	3	3	3	3	3	3	2	2	3	2	2	2	2	2
C406.11: Fault detection and diagnostics system	1	2	1	1	1	1	1	1	1	1	1	1	1	1	1	1	2

NA = Not Applicable.

a. For schools with showers or full-service kitchens.

Additional Credits - 2024

TABLE C406.1.1(1) ENERGY CREDIT REQUIREMENTS BY BUILDING OCCUPANCY GROUP

BUILDING OCCUPANCY GROUP	CLIMATE ZONE																		
	0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
R-2, R-4 and I-1	65	66	67	77	80	86	80	81	90	86	90	90	86	90	90	70	89	80	78
I-2	43	42	38	37	36	38	32	32	30	36	36	35	43	43	44	46	47	50	53
R-1	63	62	66	65	70	71	77	80	84	81	83	88	85	86	90	83	87	87	85
B	62	62	64	66	66	65	64	64	68	70	72	74	71	73	77	71	74	74	71
A-2	70	70	72	72	75	75	70	73	82	69	74	78	67	72	78	60	67	57	51
M	80	79	83	79	81	84	67	74	87	80	66	65	79	62	50	75	67	75	58
E	56	57	55	58	58	57	59	62	59	61	66	62	64	67	67	65	67	63	58
S-1 and S-2	61	60	61	60	58	57	44	54	62	85	68	75	90	82	72	90	89	90	90
All other	31	31	31	32	32	33	30	32	36	35	35	35	37	36	36	36	37	36	34

Additional Credits - 2024

TABLE C406.2(7) BASE ENERGY CREDITS FOR GROUP E OCCUPANCIES[a]

ID	ENERGY CREDIT MEASURE	SECTION	CLIMATE ZONE																		
			0A	0B	1A	1B	2A	2B	3A	3B	3C	4A	4B	4C	5A	5B	5C	6A	6B	7	8
E01	Envelope performance	C406.2.1.1	Determined in accordance with Section C406.2.1.1																		
E02	UA reduction (15%)	C406.2.1.2	8	18	7	19	12	13	20	17	11	24	20	17	33	32	29	40	38	46	44
E04	Add roof insulation	C406.2.1.4	8	8	4	9	5	7	16	7	1	14	7	10	18	13	13	23	25	22	28
E05	Add wall insulation	C406.2.1.5	5	7	4	8	3	6	8	6	2	6	3	6	5	5	6	7	6	7	8
E06	Improve fenestration	C406.2.1.6	8	10	6	9	11	11	15	9	1	16	8	15	22	18	19	33	29	19	18
H01	HVAC performance	C406.2.2.1	30	28	25	26	23	21	20	18	15	19	18	17	19	20	15	23	20	25	29
H02	Heating efficiency	C406.2.2.2	x	x	x	x	x	x	4	3	3	5	5	10	9	11	6	15	11	18	26
H05	DOAS/fan control	C406.2.2.5	45	42	37	41	36	34	41	39	30	43	46	58	57	65	40	79	63	88	117
W01	SHW preheat recovery	C406.2.3.1 a	7	7	9	8	10	11	13	13	15	14	15	15	15	14	17	13	15	14	12
W02	Heat pump water heater	C406.2.3.1 b	4	4	6	5	7	7	9	9	10	10	10	11	11	10	12	10	11	10	9
W03	Efficient gas water heater	C406.2.3.1 c	4	4	6	5	6	7	8	8	9	9	9	10	9	9	11	8	10	9	7
W04	SHW pipe insulation	C406.2.3.2	3	3	4	4	4	4	4	5	6	5	5	6	5	5	7	4	5	4	4
W05	Point of use water heaters	C406.2.3.3 a	3	4	4	4	4	5	5	5	6	5	5	5	5	5	6	4	5	4	3
W07	SHW heat trace system	C406.2.3.3 c	4	4	4	4	5	5	5	6	7	6	6	7	6	6	8	5	7	5	5
W10	Shower heat recovery	C406.2.3.6	2	2	2	2	3	3	3	3	4	3	3	4	3	3	4	3	3	3	3
P01	Energy monitoring	C406.2.4	4	4	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	3	4
L02	Lighting dimming & tuning	C406.2.5.2	5	5	5	6	6	6	5	6	7	6	6	6	5	5	6	4	4	3	2
L03	Increase occp. sensor	C406.2.5.3	4	4	5	5	5	6	6	6	7	6	6	5	4	4	5	3	4	3	2
L04	Increase daylight area	C406.2.5.4	6	6	7	7	7	7	7	7	8	6	6	6	5	5	6	5	5	5	4
L06	Light power reduction	C406.2.5.6	6	7	7	7	8	8	8	8	10	7	8	7	6	7	8	5	6	4	2

Power and Lighting

Commissioning: The Strong Finish

Commissioning

- Begins during design
    - Establish a plan
    - List of activities, personnel, and equipment/systems to be tested
- After start-up
    - TAB
    - Verification of installation
    - Functional performance testing
    - Documentation & report

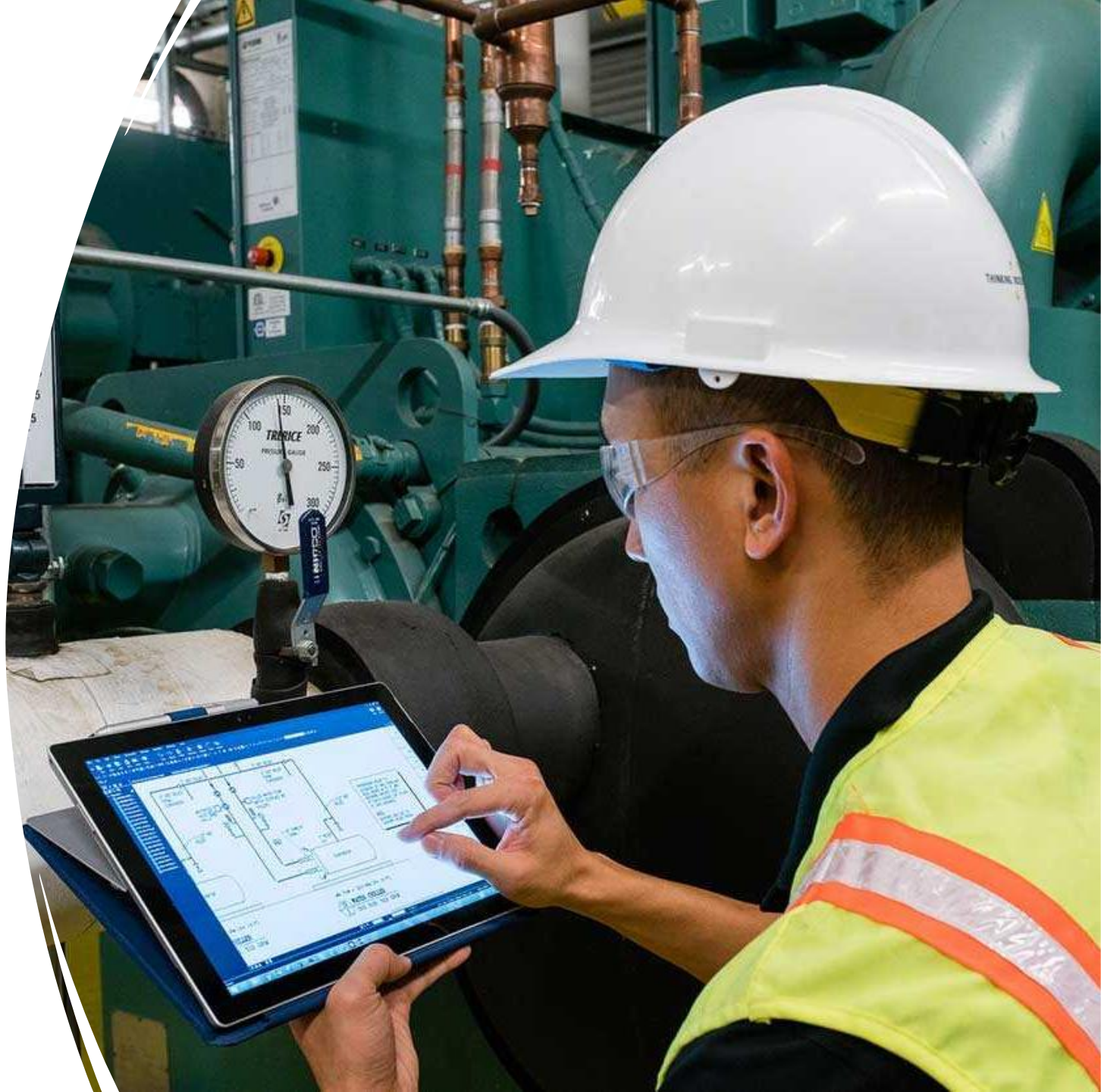


FIGURE C408.2.4 COMMISSIONING COMPLIANCE CHECKLIST

Project Information: _____ Project Name:_____

Project Address: _____

Commissioning Authority: _____

Commissioning Plan (Section C408.2.1)

☐ Commissioning Plan was used during construction and includes all items required by Section C408.2.1

☐ Systems Adjusting and Balancing has been completed.

☐ HVAC Equipment Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ HVAC Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Economizer Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Lighting Controls Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Service Water Heating System Functional Testing has been executed. If applicable, deferred and follow-up testing is scheduled to be provided on:_____

☐ Manual, record documents and training have been completed or scheduled

☐ Preliminary Commissioning Report submitted to owner and includes all items required by Section C408.2.4

I hereby certify that the commissioning provider has provided me with evidence of mechanical, service water heating and lighting systems commissioning in accordance with the 2024 IECC.

Signature of Building Owner or Owner's Representative _____ Date_____

But Why Commissioning?

- Ensures equipment is installed and functioning correctly (as designed)
- Catches issues early (before true occupancy)
- Ensures controls are properly established and communicating with equipment

- **Saves energy and money long term**
- **Reduces complaints immediately**


ENERGY
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POLICE

Questions and Answers

We thank you for your time!

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