

2018 Code Change Training

Virginia Energy Conservation Code Commercial Provisions

Jack A Proctor Virginia
Building Code Academy

Department of Housing
and Community Development



Welcome!

- Please turn your cell phones off or set to vibrate.



Agenda

- Virginia energy conservation provisions and related laws
- Significant international changes and state amendments
- VA Changes marked in yellow



State Code Change



State Level Change



Section C202 Definitions

Definitions have been updated/clarified:

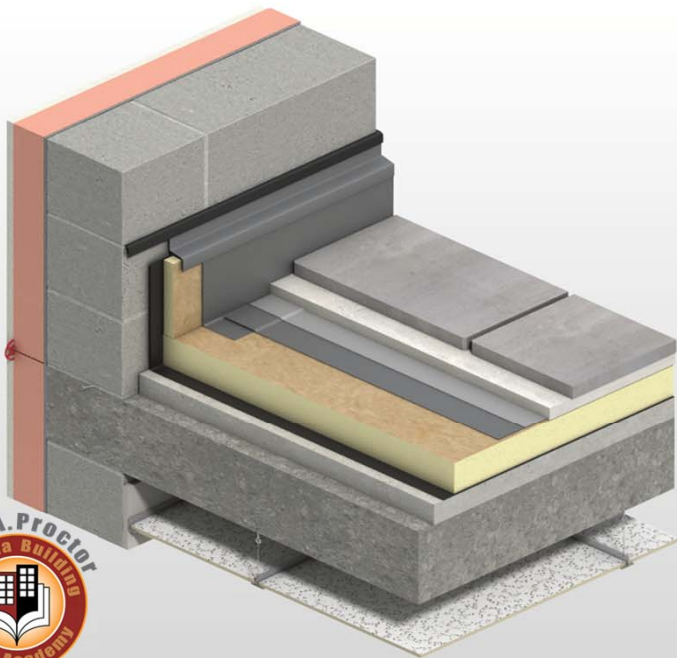
- Continuous air barrier
- Building thermal envelope
- Cavity insulation
- Coefficient of performance (cop) - cooling
- Computer room
- Fenestration
- Nameplate horsepower
- Onsite renewable energy





C303.1.1 Building Thermal Envelope Insulation

- Exception added for markings of roof decking insulation, which tends to be covered quickly in the field
- Product rating is to be marked on product packaging, as specified in VCC Table 1508.2





C303.1.3 Fenestration Product Rating

- Section reformatted
- U-factor for rolling doors to be determined according to NFRC 100 or ANSI/DASMA 105, same as garage doors



C303.1.3 Fenestration Product Rating

- U-factor tables updated to distinguish opaque doors from glazed windows, doors and skylights



Tables C402.1.3, C402.1.4 Opaque Thermal Envelope Insulation Component Minimum Requirements, R-value Method

- Updates U-factor values for garage doors



C402.1.4.2 and C402.2.1 Roof/Ceiling Assembly

- Section clarified for ease of use and application
- Clarifies U-factor method is valid for roof/ceiling assemblies
- Provides guidance for U-factors for tapered roof insulation

State Code Change



C402.2.7 Airspaces

- New section adding requirements for airspaces used to comply with the VECC

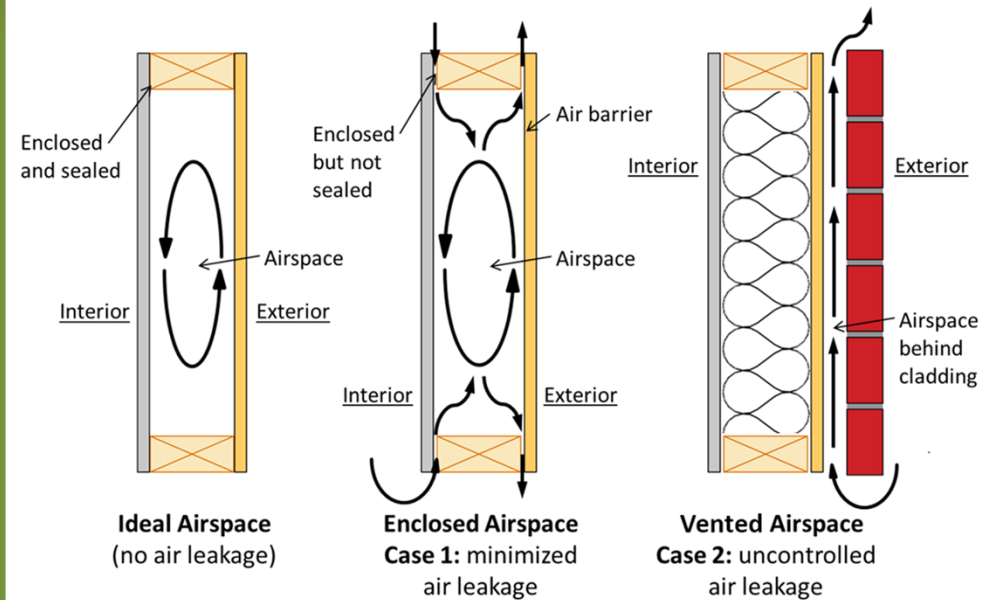


Table C402.4 Building Envelope Requirements: Fenestration

- Maximum SHGC values have decreased for climate zone 4





C402.4.1, C402.4.1.1, C402.4.1.2 Minimum Skylight Fenestration Area

- Minimum skylight fenestration area has been deleted
- Technical provisions for skylights still apply where installed



C402.4.4 (new), C405.2.3 Daylight Zones

- Daylight zone section rewritten
- Pointer provided in building thermal envelope section



C402.5.3 Rooms containing fuel-burning appliances

- New specific provisions added
- Where combustion air is supplied through openings in an exterior wall, components are treated as if they are outside the thermal envelope



C403 Building mechanical systems

- Entire section rearranged and renumbered
- Be aware of some minor changes throughout, including to tables



C403.2.8 & Table C403.2.8 Kitchen exhaust systems

- Deletion of Section C403.2.8 and Table C403.2.8 to maintain minimum exhaust flow rates for kitchen hoods for life safety, per VMC



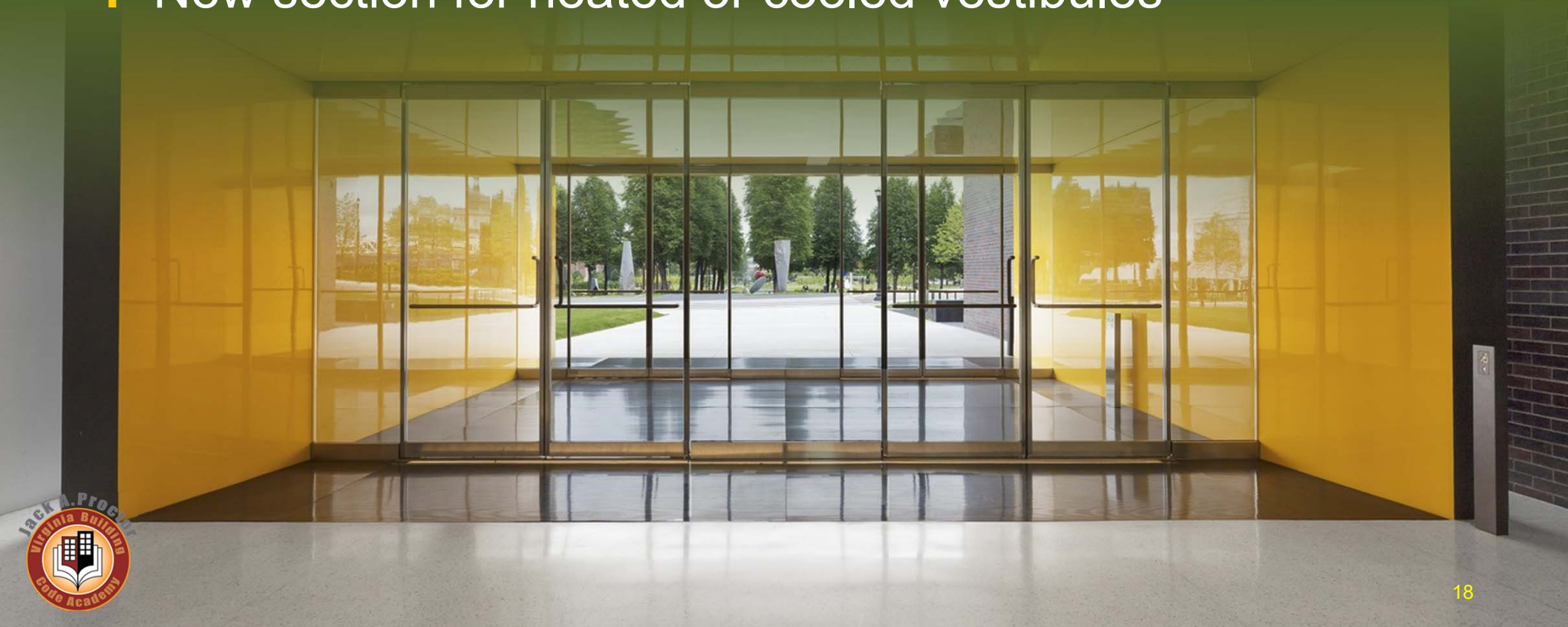
C403.3.1 Equipment sizing

- Clarifies that mechanical equipment is not to be undersized



C403.4.1.4 Heated or cooled vestibules

- New section for heated or cooled vestibules



C403.7.6, C403.7.6.1, C403.7.6.2 Automatic Controls of HVAC Systems Serving Guest Rooms

- Controls now required based on occupancy of the room.
- Incorporate new defined terms, “isolation devices” and “networked guest room control system”



Control Systems for VAV Units (many sections throughout 403)

- Provisions for control systems for VAV systems have been updated



403 Mechanical efficiency tables (many)

Tables updated to coordinate
with other standards and
references

- Table C403.3.2(4)
- Table C403.3.2(5)
- Table C403.3.2(8)



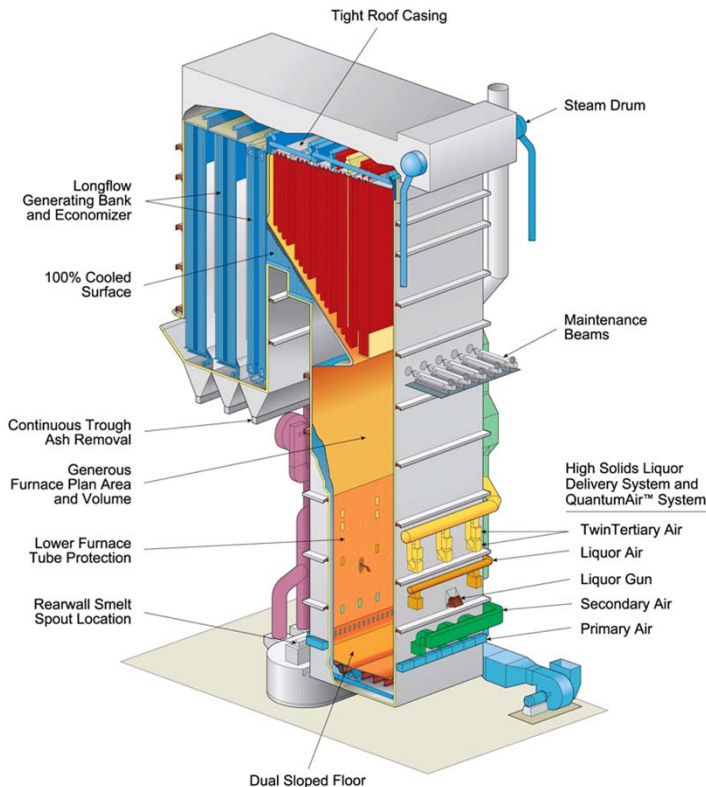


C403.5, C403.5.3, C403.5.4 Economizers

- Section reformatted
- Exceptions rewritten as requirements
- Some provisions added to address gaps

C403.5, Table C403.5(2) Equipment Efficiency Performance Exception for Economizers

- C403.5 exception 5 now applies in VA (zone 4A)
- Economizer not required for equipment that exceeds minimum required cooling efficiency performance by 20%





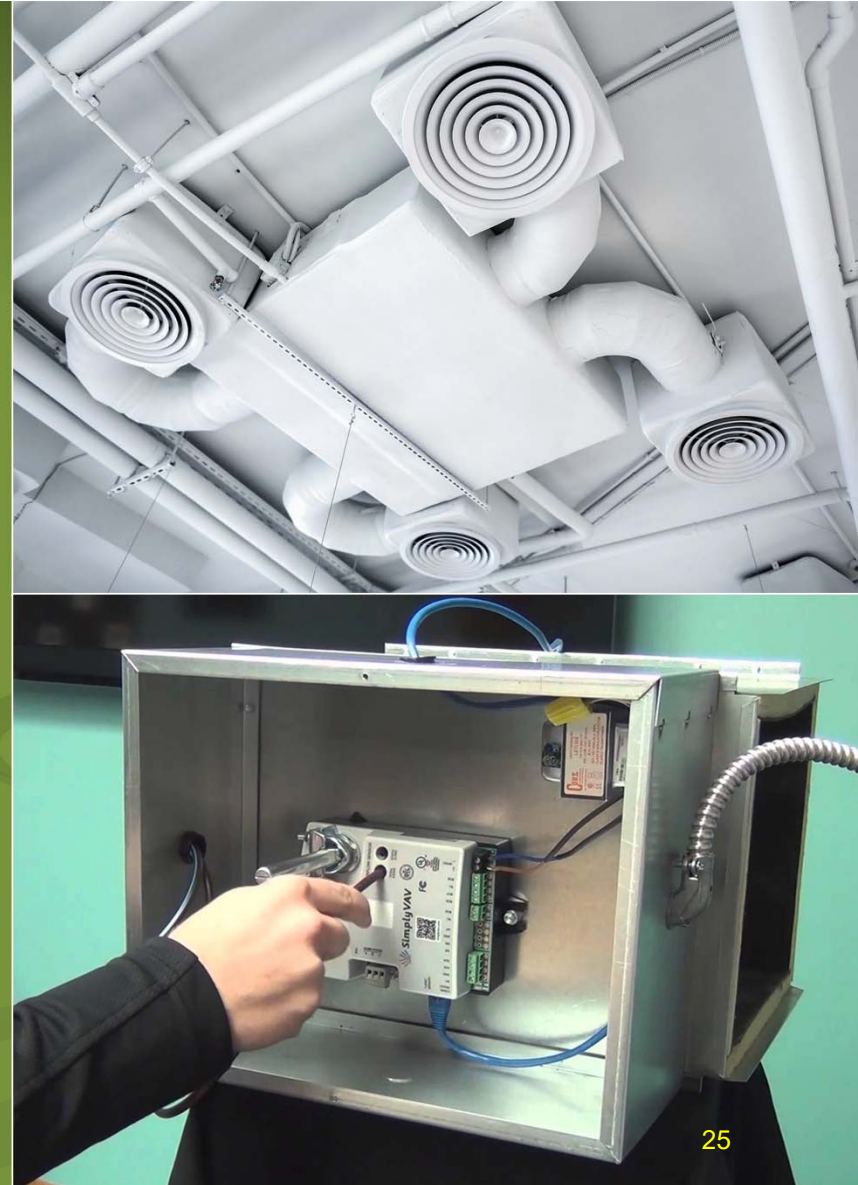
C403.4.4; Table C403.4.4 (new) Part-Load Controls

- Part-load controls now applies to systems of 300k btu/h or less, reduced from 500k
- Reduction in VSD now applies to motors 2hp or larger, reduced from 10hp



C403.6, C403.6.1 Requirements for Complex Mechanical Systems Serving Multiple Zones

- Section updated to reflect advancements in VAV technology
- Must meet required ventilation rate before reheating or recooling is permitted



C403.9, C403.9.1-2 Heat Rejection Equipment

- Reduced threshold for where variable speed drives are required for heat rejection fan systems
- Threshold reduced from 7.5hp to 5hp



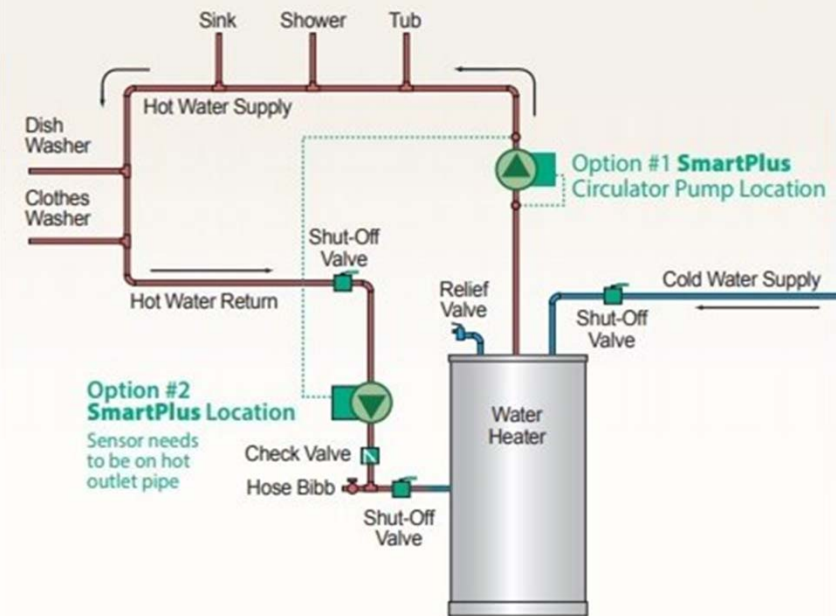
Table C404.2 Minimum Performance of Water-heating Equipment

- Table updated to federal min. standard values



C404.7 Demand Recirculation Controls; C202

- Revised definition for "demand recirculation water system"
- Clarification to C404.7 Demand recirculation controls



Q&A



Skill Check 1



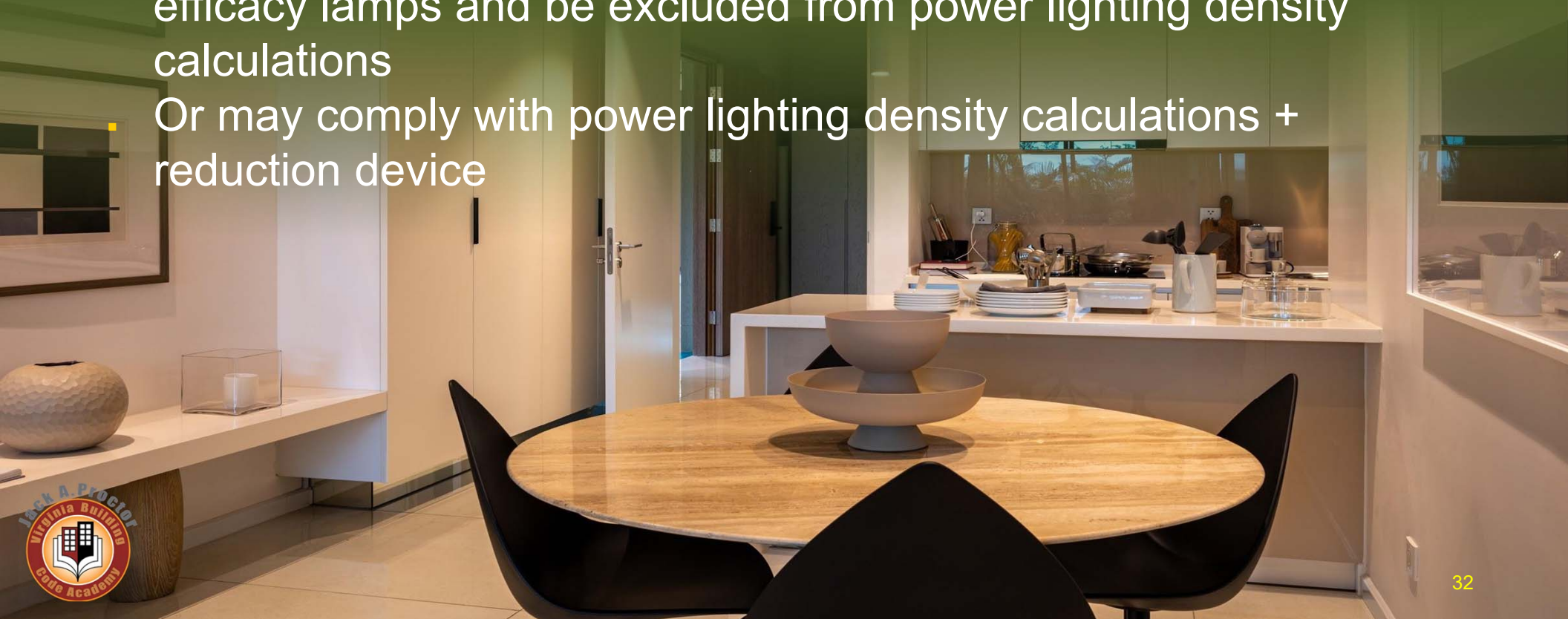
C405 Electrical Power and Lighting Systems

- Consolidates lighting requirements for sleeping and dwelling units



C405.1 General (electrical)

- Multifamily building units shall comply with R404.1-90% high efficacy lamps and be excluded from power lighting density calculations
- Or may comply with power lighting density calculations + reduction device



C202 (new), C405.2 Lighting Controls

- New lighting compliance method for controlling systems
- New companion definition for "luminaire light level controls"



C405.2.4 #2 Specific Application Controls

- Section now applies to all sleeping units, not just hotel or motel
- Exception for patient care rooms and for captive key devices



C405.2.1, C405.2.1.1, C405.2.1.3 (new) Occupant Sensor Controls

- Occupant sensor controls now required in open office areas
- Requirements added for such controls, zone size, shut off time, lighting reduction percentage, daylight responsive controls





C405.2.1.1 Occupant Sensor Control Function

- Occupant sensor control shut off time reduced from 30 to 20 minutes



C405.2.3, C405.4 Demand Responsive Controls

- New option for lighting daylight zones
- May now omit daylight responsive controls in daylight areas, but must reduce lighting power density by 40% in those areas

C405.2.5; C405.2.5.1 through C405.2.5.4 (new) Exterior Lighting Controls

- New exception for lights controlled from dwelling units
- New subsections provide greater level of detail - daylight shut off decorative lighting shut off, lighting setback, exterior time-switch control function





C405.3 Exit signs (deleted)

- 2015 provisions deleted as redundant with federal regulation
- 405.3 reassigned to different provisions, and remainder of section renumbered accordingly

Table C405.3.2 (1) and (2) Interior Lighting Power

- All lighting budget allowance tables have changed significantly

TABLE C405.3.2(1)
INTERIOR LIGHTING POWER ALLOWANCES:
BUILDING AREA METHOD

BUILDING AREA TYPE	LPD (w/ft ²)
Automotive facility	0.71
Convention center	0.76
Courthouse	0.90
Dining: bar lounge/leisure	0.90
Dining: cafeteria/fast food	0.79
Dining: family	0.78
Dormitory ^{a, b}	0.61
Exercise center	0.65
Fire station ^a	0.53
Gymnasium	0.68

TABLE C405.3.2(2)—continued
INTERIOR LIGHTING POWER ALLOWANCES:
SPACE-BY-SPACE METHOD

COMMON SPACE TYPES ^a	LPD (watts/sq.ft)
Food preparation area	1.06
Guestroom ^{c, d}	0.77
Laboratory	
In or as a classroom	1.20
Otherwise	1.45
Laundry/washing area	0.43
Loading dock, interior	0.58
Lobby	
For an elevator	0.68
In a facility for the visually impaired (and not used primarily by the staff) ^b	2.03
In a hotel	1.06



Table C405.3.2 (2) Interior Lighting Power Allowances: Space By Space Method

- New footnotes create definitions of classifications for sports arenas



C405.3.2.2.1 Additional Interior Lighting Power

- Reduced power allowance for merchandise lighting, reflecting shift to more efficient lighting



C405.3.2.2.1 Additional Interior Lighting Power

- Reduced power allowance for lighting illuminating art or architectural features, reflecting shift to more efficient lighting

C405.4, C405.4.1, C405.4.2 (new), Table C405.4.2(3) (new), C405.4.2.1 (new) Exterior Lighting Power Requirements

- Exterior lighting requirements now apply no matter where the service is coming from
- Exterior section reorganized and rewritten to read more like the interior section



C405.4.1 Exterior Building Lighting Power

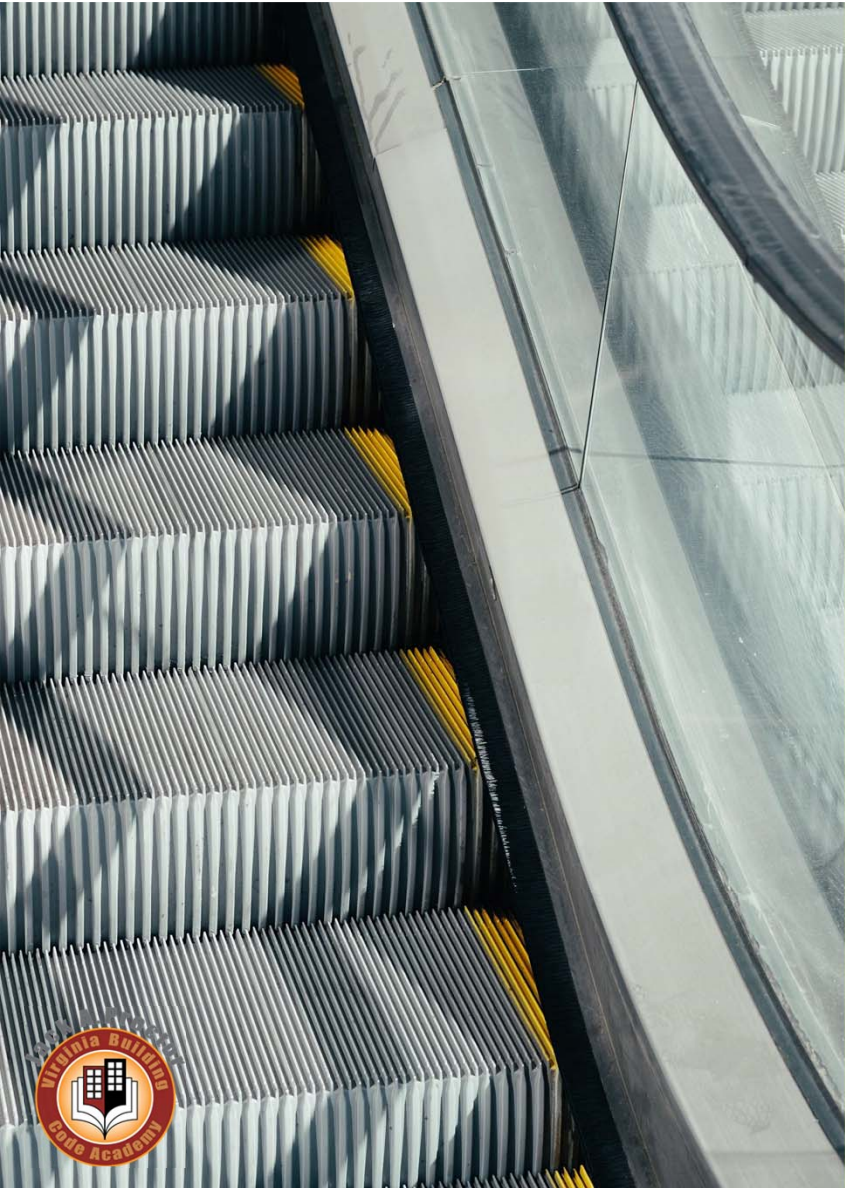
- Adds minor types of lighting to be exempted from limits





Table C405.4.2(2) Individual Lighting Power Allowances for Building Exterior

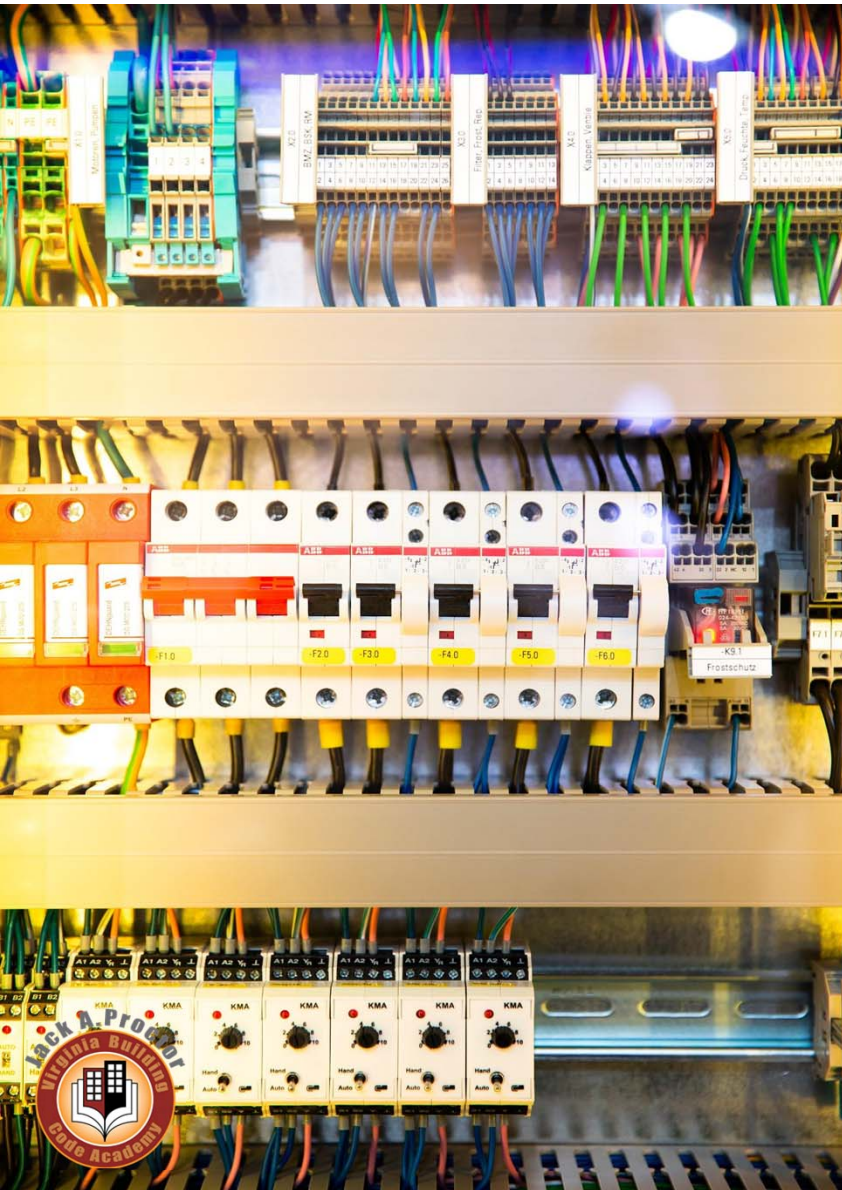
- Revised LPD tables to reflect current technology



C405.8.2 Escalators and Moving Walks

- Adds alternative means to comply with energy efficiency provisions
- Power factor controller may be used in lieu of speed reduction capability





C202 (new), C405.9 (new) Voltage drop in feeders and branch circuits

- The total voltage drop across the combination of feeders and branch circuits shall not exceed 5 percent



C406, C406.1, C406.8, C406.9 (new) Efficiency Packages

- Two additional options have been added to the required additional efficiency packages
- Section clarified as mandatory

C407.1 Total building performance

- Clarifies that EV charging stations are not included in the scope of this section



C407.3, C407.4.2 Performance-based compliance

- Max 5% 'trade-off' for on-site renewable energy for total performance



Chapter 5 Existing buildings



- Chapter 5 now valid, as referenced by VEBC
- Now points reader to VEBC for administration of existing building energy provisions for: additions, alterations, repairs





C502 Additions

- Now points reader to VEBC for administration of existing building energy provisions for additions

State Code Change



C503 Alterations

- Now points reader to VEBC for administration of existing building energy provisions for alterations

State Code Change

C504 Repairs

- Now points reader to VEBC for administration of existing building energy provisions for repairs



Skill Check 2



What questions do you have?



Thank You!

A special thanks to

Bruce Cornwall, Culpeper County
Rick Fortner, City of Norfolk (retired)
Haywood Kines, Prince William County
Donna Rubino, Prince William County

for their partnership, commitment of resources and time to the Jack A.
Proctor Virginia Building Code Academy in developing this
presentation.

