

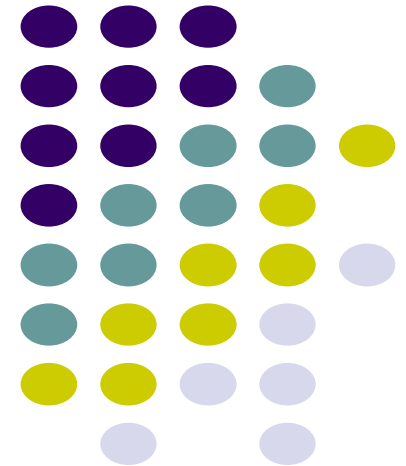
City of Scottsdale Energy Code Adoption



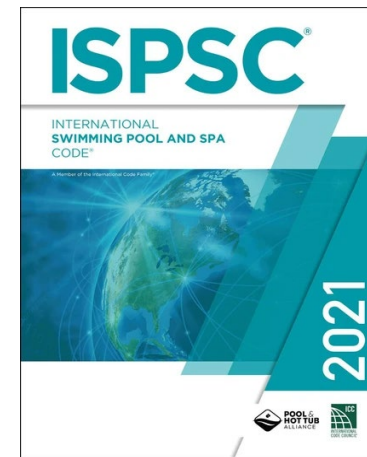
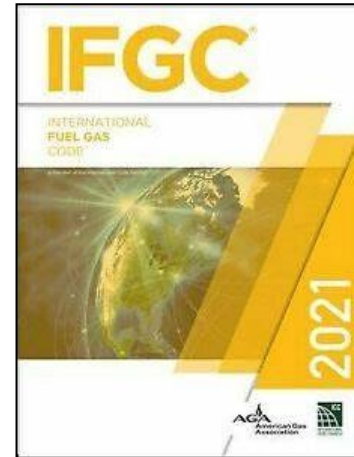
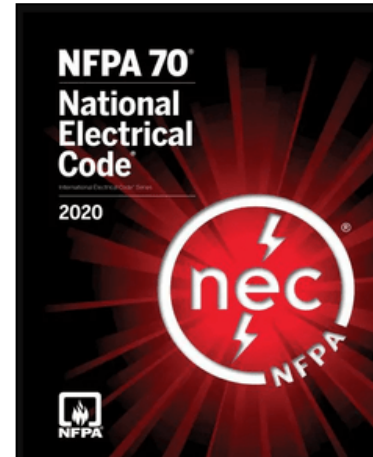
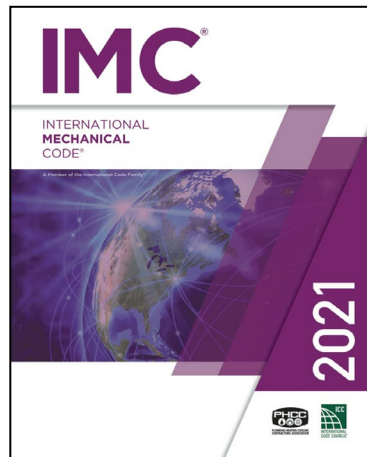
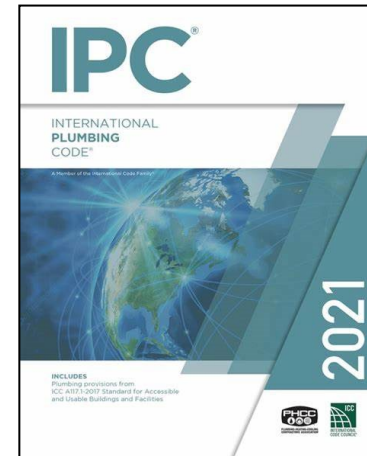
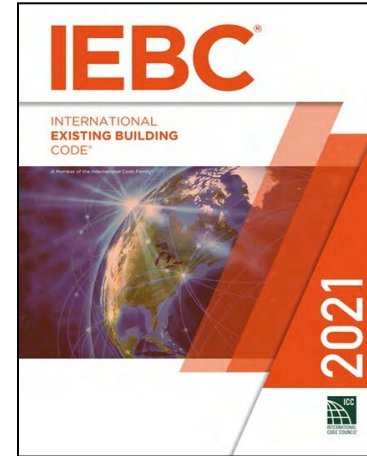
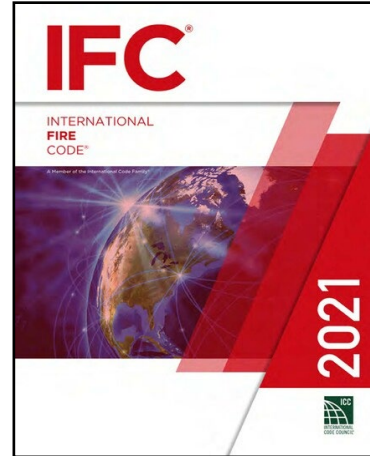
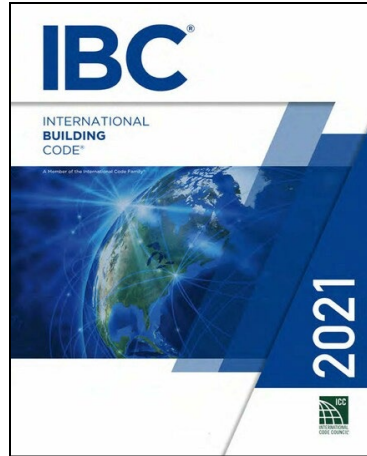
Top 10 Residential Energy Code Changes 2021 International Energy Conservation Code

December 22, 2022

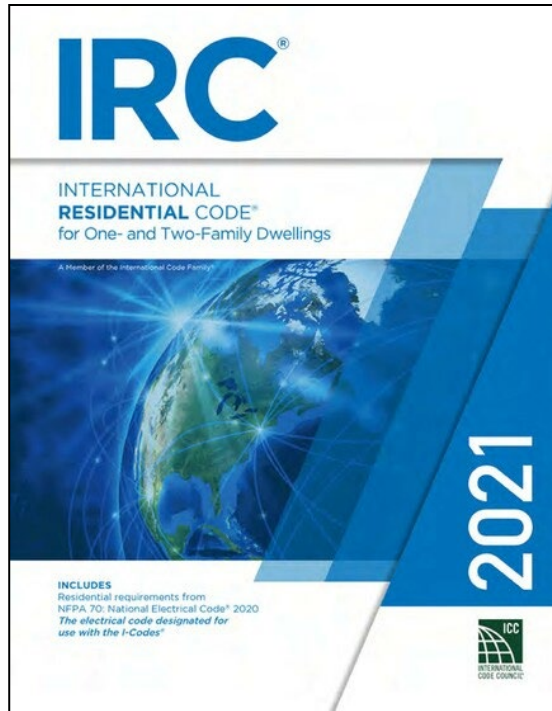
Anthony Floyd, FAIA, LEED BD+C, CEM
Office of Environmental Initiatives
Planning and Development
Community and Economic Development
City of Scottsdale



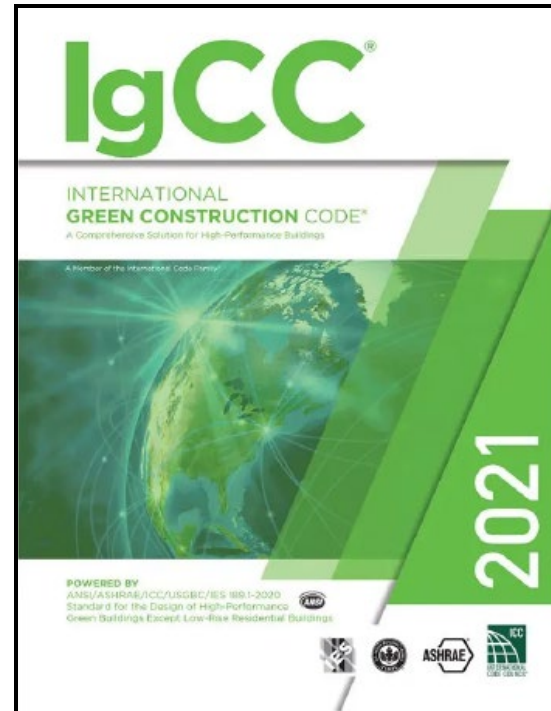
These codes are effective January 1, 2023

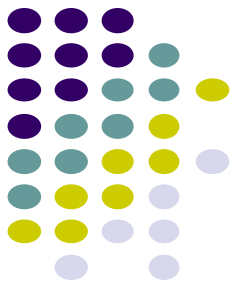


The IRC and IECC codes are effective January 7, 2023



The IgCC is effective July 1, 2023



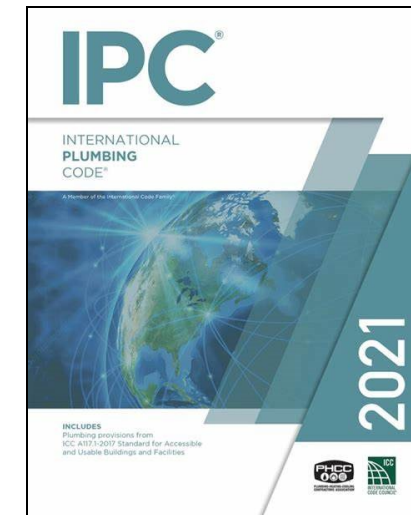


IRC/IPC Amendments

Single, Multifamily and Commercial

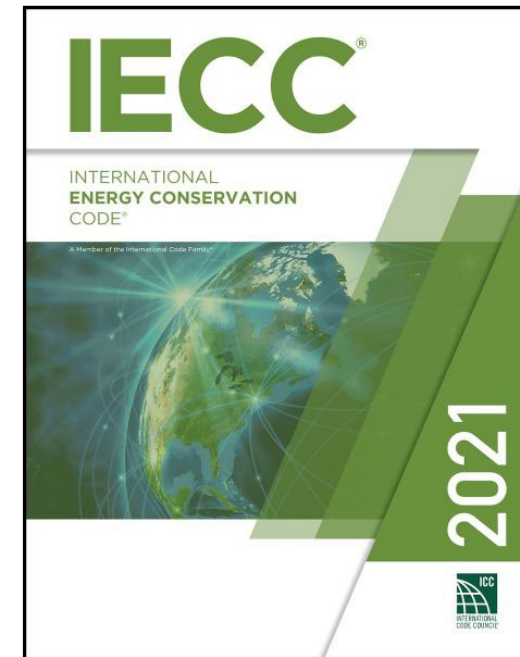
Water Efficiency addressed in plumbing code

- High-efficiency plumbing fixtures and fittings
 - Water closets, urinals, lavatory faucets, showerheads, kitchen faucets
- Efficient hot water delivery
 - Demand-controlled recirc. pump for remotely located water heaters
- Water-bottle filling stations
 - Water-bottle filling stations for all drinking fountains



IRC/IECC for Single Family Dwellings

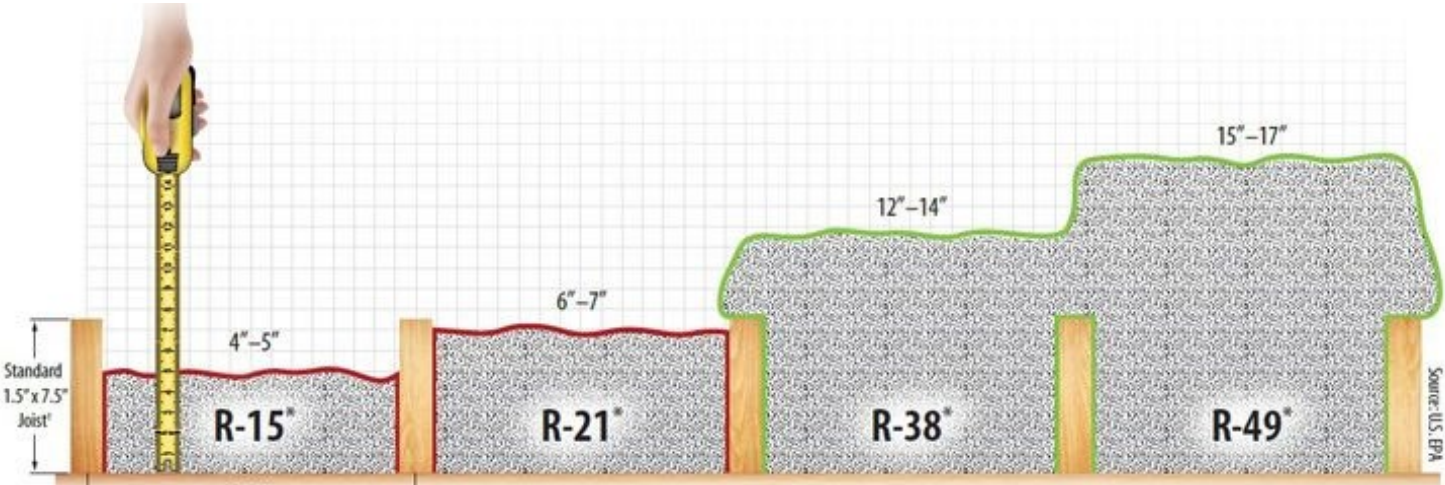
- **Top 10 Energy code Changes**
 1. R-38 ceiling insulation
 2. Cool roofs for low slope roofs
 3. Duct leakage test
 4. Mechanical ventilation flow rate test
 5. High-efficacy lighting (LED or similar)
 6. Interior lighting controls
 7. Exterior lighting controls
 8. Electric vehicle capable charging
 9. Additional efficiency package options
 10. Rooftop solar-ready zones



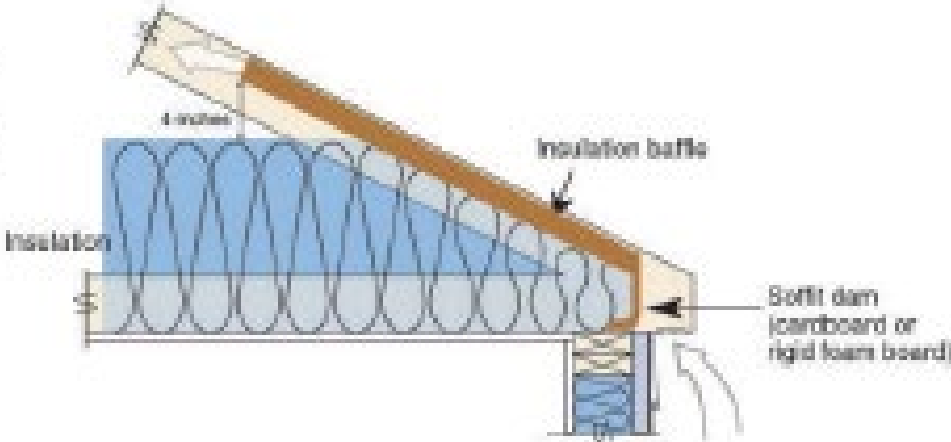
1

R-49 Ceiling Insulation – R402.1.3

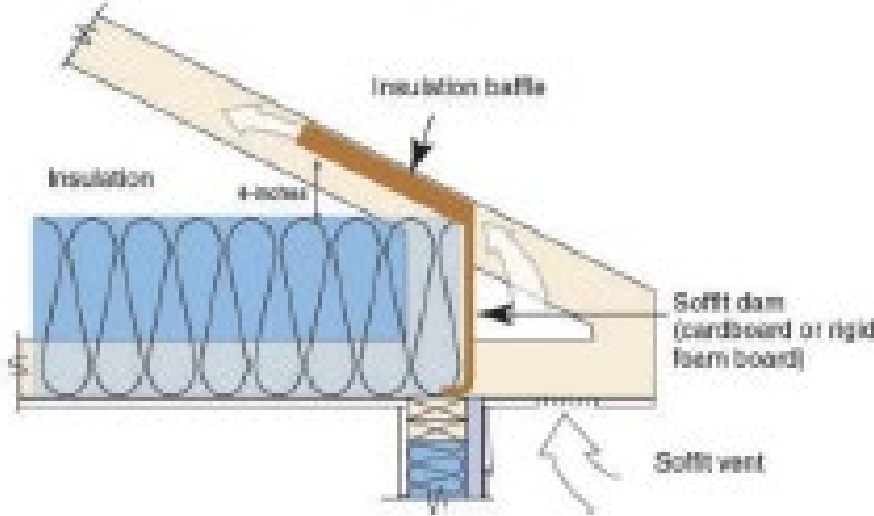
Prescriptive requirement

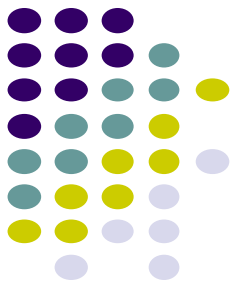


Standard Truss with tapered insulation depth



Energy Truss with full height insulation (recommended)



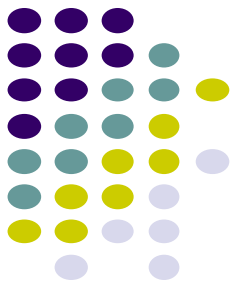


2 Cool/Light Reflective Coated Roofs

Low Slope roofs (less than 2 in 12 slope) – R402.6

- Minimum solar reflectance index (SRI) of 64 over conditioned and non-conditioned spaces





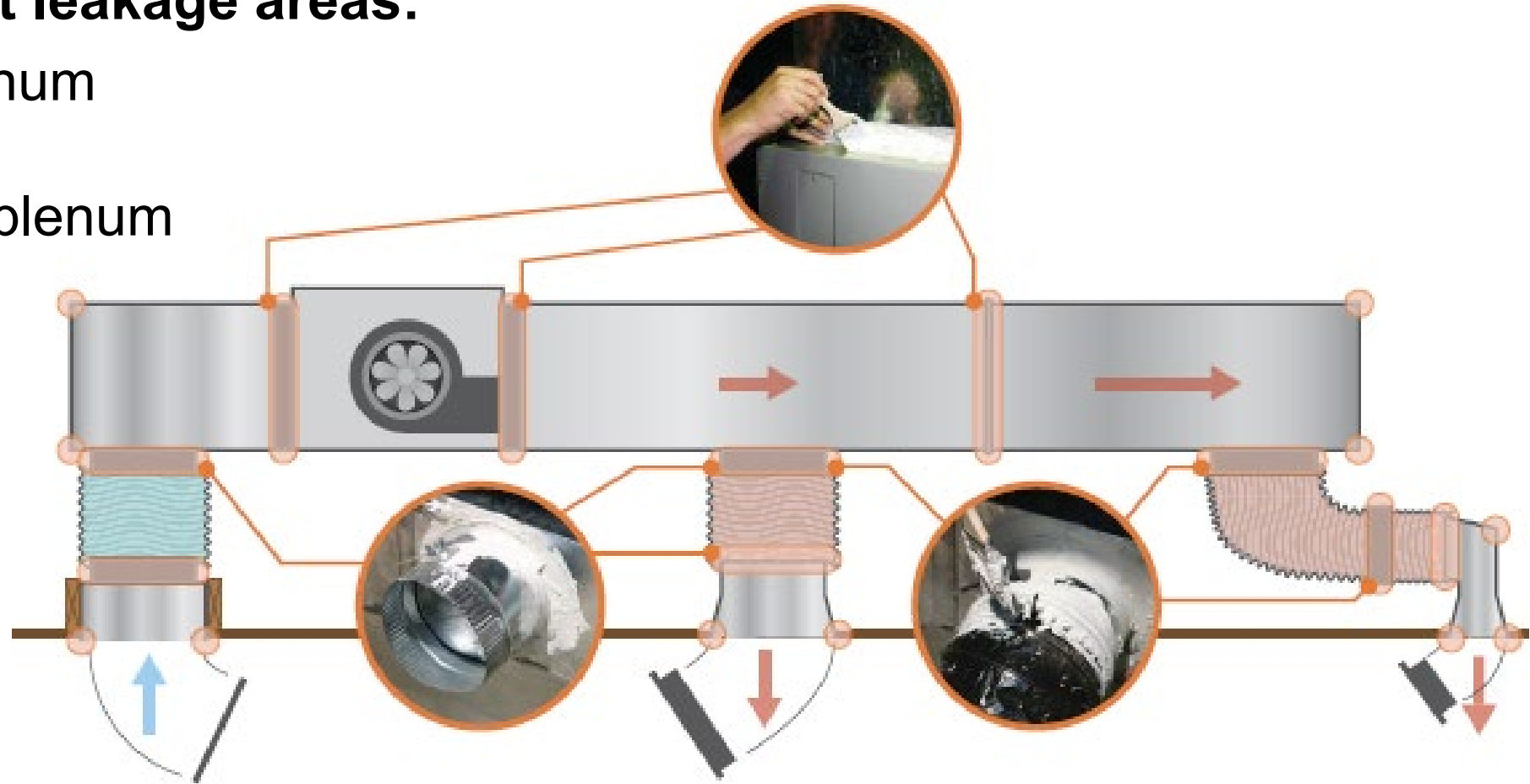
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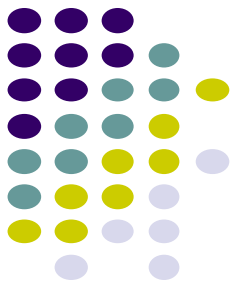
Duct Leakage Testing – R403.3.5

Most common duct leakage areas:

- Air handler to plenum
- Boot to gypsum
- Take-off collar to plenum
- Splices
- Connections
- Return platforms

Applies to ducts in both conditioned and unconditioned spaces.



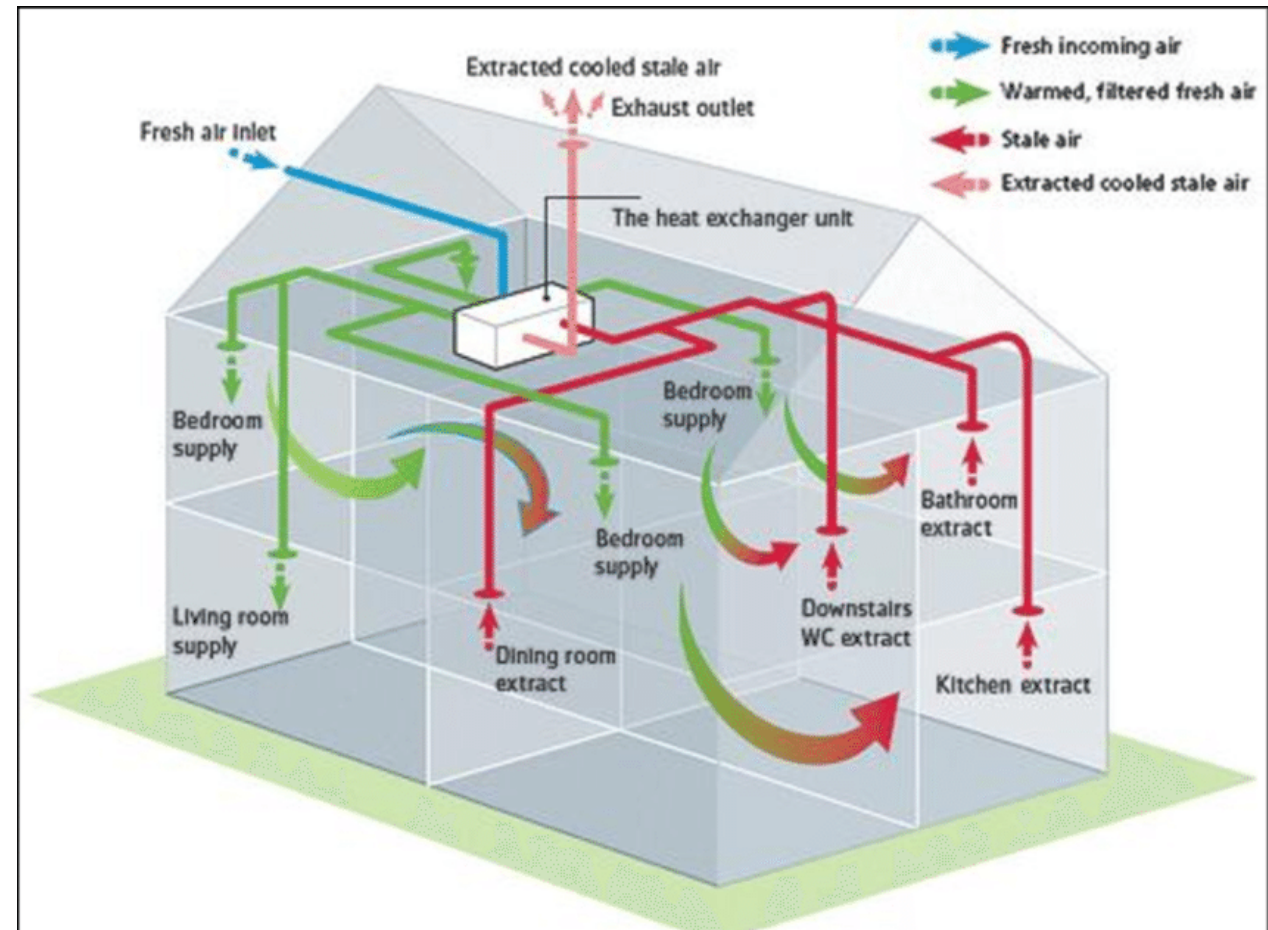


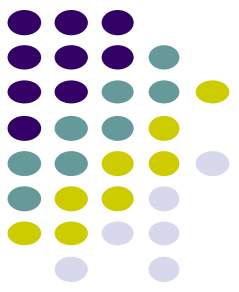
4 Mechanical Ventilation Flow Rate Testing – R403.6.3

R403.6.3 Testing. Mechanical ventilation systems shall be tested and verified to provide the minimum ventilation flow rates required by Section R403.6.

R403.6 Mechanical ventilation.

Dwelling units shall be provided with ventilation that complies with the Section M1505 of the *International Residential Code*. Outdoor air intakes and exhausts shall have automatic or gravity dampers that close when the *ventilation* system is not operating.



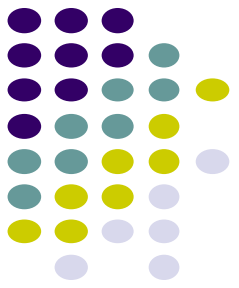


Mechanical Ventilation Airflow Rate

Ventilation rate in cubic feet per minute = $(0.01 \times \text{total square foot area of house}) + [7.5 \times (\text{number of bedrooms} + 1)]$
(Equation 15-1)

TABLE M1505.4.3(1)
CONTINUOUS WHOLE-HOUSE MECHANICAL VENTILATION SYSTEM AIRFLOW RATE REQUIREMENTS

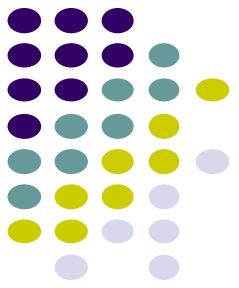
DWELLING UNIT FLOOR AREA (square feet)	NUMBER OF BEDROOMS				
	0-1	2-3	4-5	6-7	> 7
	Airflow in CFM				
< 1,500	30	45	60	75	90
1,501-3,000	45	60	75	90	105
3,001-4,500	60	75	90	105	120
4,501-6,000	75	90	105	120	135
6,001-7,500	90	105	120	135	150
> 7,500	105	120	135	150	165



Energy Efficiency Certificate – R401.3

- A permanent certificate shall be completed by the builder or other *approved* party and posted on a wall in the space where the furnace is located, a utility room or other *approved* location.
 1. *R*-values of insulation in/on ceilings, roofs and walls.
 2. *U*-factors and *solar heat gain coefficient*.
 3. Results from duct leakage and envelope air leakage testing.
 4. Types, sizes and efficiencies of heating, cooling and water-heating equipment.

Energy Efficiency Certificate			
Permit No.	_____		
Address	_____		
Insulation Ratings		R-Value	
Roof/Ceiling			
	Without attic	<i>R</i> -	
Walls	Frame	<i>R</i> -	
	Mass	<i>R</i> -	
	Basement	<i>R</i> -	
	Crawlspace	<i>R</i> -	
Floors	Over unconditioned space	<i>R</i> -	
	Slab-edge (depth)	<i>R</i> - / ft.	
Ducts	Frame	<i>R</i> -	
Fenestration Ratings		NFRC U-Factor	NFRC SHGC
Opaque doors	<i>U</i> -		
Windows	<i>U</i> -		
Skylights	<i>U</i> -		
Equipment Performance		Efficiency	
Heating systems	HSPF/AFU _E		
Cooling systems	COP/SEER		
Water Heater/Bolan	EF ₁ or <i>E</i> ₂		
Builder/Designer	_____		
Certified by	_____	Date	_____
Adopted Code Edition	_____		

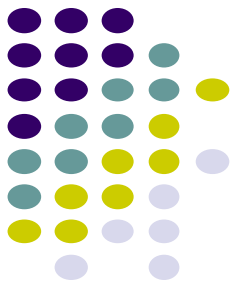


5

High-Efficacy Lighting – R404.1

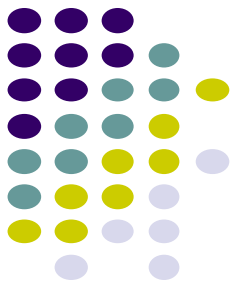
All permanently installed lighting fixtures shall contain only high-efficacy lighting.





HIGH-EFFICACY LIGHT SOURCES. Any lamp with an efficacy of not less than 65 lumens per watt, or luminaires with an efficacy of not less than 45 lumens per watt.





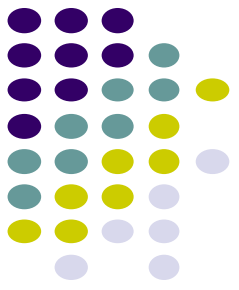
6 Interior Lighting Controls – R404.2

Permanently installed interior lighting fixtures shall be controlled with either a dimmer, an occupant sensor control or other control such as an automatic timer shut-off switch.

Exceptions: Bathrooms, hallways & lighting designed for safety or security



Note: Dimmers and occupant sensors have manual controls to turn the lights on or off.

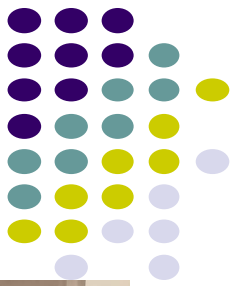


7

Exterior Lighting Controls – R404.3

Where the total permanently installed exterior lighting power is greater than 30 watts, the permanently installed exterior lighting shall have automatic shut-off actions





8 Electric Vehicle Charging Capacity

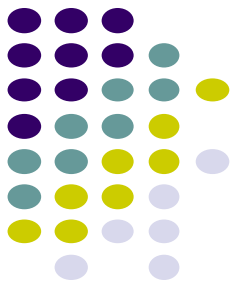
R404.1

- **EV-capable for new single-family homes**
 - Reserve electrical service panel space for a full size 2-pole circuit breaker labeled “Future EV Charging”
 - A raceway shall be installed from the electrical service panel to a location within the garage, where it shall terminate in a junction box or outlet and be labeled “Future EV Charging”.



9

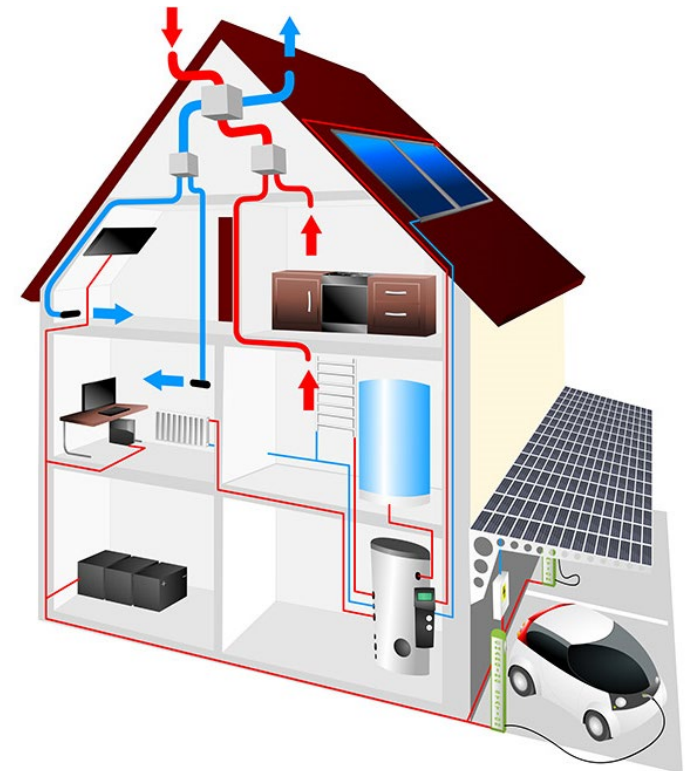
Additional Efficiency Package Options R408.2 – select one option or 5% reduced energy

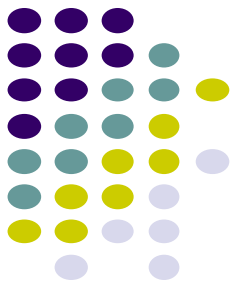


1. Enhanced envelope performance option
2. More efficient HVAC equipment performance
3. More efficient service water-heating
4. More efficient thermal duct distribution system
5. Efficient ventilation system

6. **On-site renewable energy**

- Generate not less than 2 watts/sq. ft. of total conditioned floor area or 50% of annual estimated energy use





10

Solar-Ready Zones – RB103

- Minimum 10% of roof area but not less than 300 sq. ft. free and clear of obstructions including mechanical equipment and vents
- Provide electrical pathway for conduit run from solar-ready zone to electrical service panel with reserved space for 2-pole circuit breaker
- Capped roof penetration sleeve shall be provided on roofs with a slope of 1 in 12 or less



Credit: Carlisle Roof Foam

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