



AOBA COMMENTS ON THE PROPOSED MONTGOMERY COUNTY INTERNATIONAL GREEN CONSTRUCTION CODE

302.1 AOBA STRONGLY SUPPORTS INCLUDING ICC 700/ NATIONAL GREEN BUILDING STANDARD (NGBS)

AOBA strongly supports including ICC 700 – National Green Building Standard (NGBS) as an alternative compliance option to the proposed International Green Construction Code (IGCC).

Prior to approval of the NGBS, apartment firms considering building green had to follow guidelines designed for either high-rise commercial properties or single-family houses. As a result of participation by AOBA’s national associations, the National Multi-Housing Council and National Apartment Association, in the standards development process, this is the only green criterion that addresses all residential construction.

The NGBS serves dual purposes. Not only can it provide apartment firms with uniform guidance on green building practices appropriate for low-, mid- and high-rise apartment construction, it offers local jurisdictions an alternative to non-standardized green rating systems (like the U.S. Green Building Council’s LEED criteria).

Importantly, because the NGBS was a joint effort by the International Code Council and the National Association of Home Builders, the NGBS is specifically written to be compatible with existing building codes.

As published, the IgCC directs users to follow the NGBS in low-rise residential buildings, and provides an optional compliance pathway for high-rise apartment buildings. This reflects an understanding that apartment buildings are better served by green building criteria specifically designed for residential construction.

Residential occupancies were not included in the original scope of the IgCC; therefore, provisions

The *District of Columbia Green Construction Code* (2013), referred to as the “*Green Construction Code*,” consists of the 2012 edition of the *International Green Construction Code* published by the International Code Council (ICC), as amended by the *District of Columbia Green Construction Code Supplement* (2013) (12 DCMR K). The *International Green Construction Code* is copyrighted by the ICC and therefore is not republished here. However, a copy of the text may be obtained at:
<http://publicecodes.cyberregs.com/icod/igcc/2012/index.htm?bu=IC-P-2012-000023&bu2=IC-P-2012-000019>.

important to the construction of green apartments were never fully vetted for multifamily construction. As such, the IgCC requires the use of products and practices not typically used by the apartment industry. Importantly, given the multifamily exclusion, comments were not submitted during the full development process to address issues of concern to apartment projects.

By contrast, the NGBS is the first and only green building standard for all residential construction types, including single-family, multifamily and mixed-use properties. Developed with significant input from multifamily stakeholders, the NGBS addresses the diversity of multifamily construction types and does not differentiate between low- and high-rise properties.

Compliance with the NGBS is based on a combination of mandatory elements and a point system. Points are allotted for green building practices in six different areas including: site development; water conservation; material resource efficiency; energy efficiency; indoor air quality; and operations and maintenance. While a threshold number of points must be earned in each category, users may select the practices that are most meaningful and cost-effective for their projects.

First published in 2009, the NGBS has been updated to make it an even more usable and effective green building tool for residential construction. For example, the NGBS addresses a critical issue for apartment buildings not fully considered by other green buildings programs. The updated NGBS clarifies the requirements for residential common areas versus apartment units, which has a meaningful impact on the operation, maintenance and resident comfort of apartment properties. In addition, numerous substantive changes were made throughout the standard to bolster the baseline environmental performance levels and incorporate new products and practices. For instance, the minimum energy performance criterion was raised by approximately 15 percent, recognizing improvements in building energy codes nationwide. The NGBS has been widely used throughout the apartment industry and has been incorporated into numerous sustainability initiatives at the jurisdictional level. Therefore, we urge that the ability of apartment properties to satisfy Montgomery County’s green code using the NGBS be maintained.

AOBA Comments	
CHAPTER 4	LANDSCAPE IRRITATION AND OUTDOOR FOUNTAINS
401	
402	AOBA supports proposed deletion of 402.2 and 402.3 but recommends deletion of all of 403. DC deleted because it doesn’t apply or is already covered by existing regulations. To the extent the same may be true for MoCo we would urge similar revision.
403	DC deleted because doesn’t apply or already covered by existing regulations. AOBA supports the proposed deletion of this section in Montgomery County.
404	DC deleted because doesn’t apply or already covered by existing regulations. To the extent the same may be true for MoCo we would urge similar revision.
405 Soil and water quality protection	
405.1.1 -1.3	DC Deleted without substitution. Rationale: Some of section 405 is already covered by regulation or not relevant to the District. To the extent the same may

	be true for MoCo we would urge similar revision.
405.1.4	DC adopted revised section
405.2	Strike 405.2 in its entirety and insert new section 405.2 to read as follows (DC language): 405.2 Invasive plant species. Invasive plant species shall not be planted on a building site. Containment or removal of any invasive plant species currently on the site is required
405.3	Strike 405.3 in its entirety and insert new section 405.3 to read as follows (DC language): Rationale: Though the goal of having 75 percent plant species is admirable, it is better to transition the market gradually by lowering the number to 50 percent. (DC CCCB Green TAG). 405.3 Native plant landscaping. Where new landscaping is installed as part of a site plan or within the building site, not less than 50 percent of the newly landscaped area shall be planted with native plant species. Exceptions: 1. Locations where non-native plant species are required by laws or regulations of Montgomery County; 2. Vegetative roofs for buildings or structures; or 3. Trees.
407 TRANSPORTATION IMPACT – Delete in its entirety. (Note: The District also deleted this section noting provisions would be or were already covered by existing law, zoning or other regulations.	
407.1	
407.2	AOBA is concerned about the cost impact of mandating this. Delete and move to Appendix A as in the District (See Table A104 Site Project Electives – A104.7 Changing and Shower Facilities).
407.3	Bicycle parking and storage already covered by existing law. Delete and move to Appendix A as in the District (See Table A104 Site Project Electives – A104.8 – Long-term bicycle parking and storage). <u>http://www6.montgomerycountymd.gov/content/council/pdf/zta/2003/0317.pdf</u> <u>Existing Parking Requirements in the Montgomery County zoning</u>
407.4	Delete and move to Appendix A as in the District (See Table A104 Site Project Electives – A104.11 – Electrical vehicle charging infrastructure project elective).
408.3	Delete in its entirety. Rationale: The District deleted because the language did not apply to the District or was covered elsewhere in regulation.
409.1	Revise to add additional exceptions and limit application to new construction and level 3 alterations. Rationale: Lighting provisions are possibly unsafe if applied to emergency and egress lighting. Amendment below mirrors existing DC IGCC language. 409.1 Light pollution control. Uplight, light trespass, and glare shall be limited for all exterior lighting equipment as described in Sections 409.2 and 409.3. The

	<p><u>provisions of this section shall only apply to new construction and Level 3 Alterations complying with the applicable requirements of the Existing Building Code.</u> Exceptions: Lighting used for the following exterior applications is exempt where equipped with a control device independent of the control of the non-exempt lighting:</p> <ol style="list-style-type: none"> 1. Specialized signal, directional, and marker lighting associated with transportation. 2. Advertising signage or directional signage. 3. Lighting integral to equipment or instrumentation and installed by its manufacturer. 4. Theatrical purposes, including performance, stage, film production, and video production. 5. Athletic playing areas where lighting is equipped with hoods or louvers for glare control. 6. Temporary lighting. 7. Lighting for industrial production, material handling, transportation sites, and associated storage areas where lighting is equipped with hoods or louvers for glare control. 8. Theme elements in theme and amusement parks. 9. Roadway lighting required by governmental authorities. 10. Lighting used to highlight features of public monuments and registered landmark structures. 11. Lighting classified for and used in hazardous areas. 12. Lighting for swimming pools and water features. <p><u>13. Means of egress and emergency lighting.</u> <u>14. Lighting for public safety.</u> <u>15. Lighting for security</u></p>
409.2	<p>Revised to add two exceptions for lighting below canopies and for flagpoles. Language suggested mirrors existing DC IGCC language.</p> <p>409.2 Uplight. Exterior lighting shall comply with the requirements of Table 409.2 for the exterior lighting zones (LZ) appropriate to the building site. Exceptions: Lighting used for the following exterior applications shall be exempt from the requirements of Table 409.2.</p> <ol style="list-style-type: none"> 1. Lighting for building facades, landscape features, and public monuments in exterior lighting zones 3 and 4. 2. Lighting for building facades in exterior lighting zone 2. <p><u>3. Lighting installed below canopies.</u> <u>4. Lighting for flag poles.</u></p> <p><u>DC CCCB Green TAG amendment rationale:</u> Downlights that are not provided with uplight ratings or uplights that would not comply with this section could be installed below canopies where the result would yield the same or better uplight characteristics. Unrevised, this provision would unnecessarily restrict the lighting designer. Also, limiting uplighting on flag poles was determined to be too limiting.</p>

AOBA COMMENTS	
CHAPTER 5 MATERIAL RESOURCE CONSERVATION AND EFFICIENCY	
501	
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504 Waste Management and recycling	<p>AOBA supports the proposal to delete section 504 Waste Management and Recycling in its entirety as existing law already governs post-occupancy recycling. See for example, <u>Executive Regulation 15-04AM: Residential and Commercial Recycling</u>.</p>
505	<p>505.2: Lower the compliance threshold from the 55% proposed in the IGCC to 40%</p> <p>Rationale:</p> <p>See for example, DC IGCC 505.2 Material selection. Not less than 40 percent of the total building materials used in the project, based on cost, shall comply with Sections 505.2.1, 505.2.2, 505.2.3, 505.2.4, or 505.2.5. Where a material complies with more than one section, the material value shall be multiplied by the number of sections that it complies with. The value of total building material cost shall remain constant regardless of whether materials are tabulated in more than one section.</p>

CHAPTER 6 ENERGY CONSERVATION, EFFICIECY, AND CO₂e EMISSION REDUCTION

<p>603.1 Scope</p>	<p>Revise to read as follows:</p> <p>603.1 Scope The provisions of Section 603 shall only apply to new construction and projects that are undertaking a complete electrical system replacement. Section 603 shall not apply to Group R occupancies.</p> <p>Rationale: (1) See DC IGCC 603.1; compliance considerably more burdensome and less cost-effective than beneficial in R uses, especially non-high rise.</p>
<p>603.3.7 Solar Thermal</p>	<p>Revise heading for 603.5 – Renewable and waste energy. Delete 6.3.3.7.2 in its entirety. In the District, the Green TAG felt that solar thermal metering is in its infancy and did not want to create a disincentive for solar thermal installations. Waste heat metering is also in its infancy and wasn't especially relevant in the District given the limited industrial base in the District.</p>
<p>603.4 Energy load type submetering</p>	<p>AOBA recommends deleting or alternatively, raising the square footage requirement so as not to overburden smaller projects too much.</p> <p>Strike the reference to “25,000 square feet” and replace with “100,000 square feet) and limit application to nonresidential buildings.</p> <p>603.4 Energy load type sub-metering. For <u>nonresidential</u> buildings that are not less than 25,000 square feet (4645 m²) <u>100,000 square feet</u> in <i>total building floor area</i>, the energy use of the categories specified in Table 603.2 shall be metered through the use of sub-meters or other <i>approved</i> equivalent methods meeting the capability requirements of Section 603.3.</p> <p>603.4.1 Buildings less than 25,000 square feet. For buildings that are less than 25,000 square feet (4645 m²) <u>100,000 square feet</u> in <i>total building floor area</i>, the energy distribution system shall be designed and constructed to accommodate the future installation of sub-meters and other <i>approved</i> devices in accordance with Section 603.4. This includes, but is not limited to, providing access to distribution lines and</p>
<p>603.6 Energy Display</p>	<p>AOBA recommends deleting this provision. In the District, the Green TAG felt that this section would be too onerous too require. Note too, here in the County, the recent adoption of a benchmarking law which will require the disclosure of benchmarking data for, first, public buildings, followed by nonresidential buildings. The County may wish to consider moving this section to Appendix A. See, for example, DC IGCC A106.7 Energy Display.</p>
<p>604</p>	<p>AOBA supports the recommendation to move to Appendix A.</p> <p>Greater energy efficiencies will be achieved when applying the requirements of this section to new construction and where there is a complete replacement of</p>

	<p>the electrical system. The same efficiencies cannot be achieved on a tenant by tenant or floor by floor basis. Complying with the proposed language on a tenant by tenant basis or allowing the actions of one tenant to trigger requirements for all tenants is costly and unfair.</p> <p>Background – DC</p> <p>Strike the exception to Section 604. Rationale: The proposed language in 604.1 raises significant concerns about the practicality of demand response systems in residential occupancies. The standard energy setback used in commercial buildings is not appropriate for 24-hour residential occupancies. Additionally, individual occupants who have control over their own systems do not need an owner-controlled energy management system. Further, where residents don't control their systems, owners are still not in a position to setback or power down HVAC units. These are very expensive energy control systems that do not have proven use in the multifamily setting.</p> <p>Insert a new section 604.3 in its place to read as follows:</p> <p>Exceptions: The Auto-DR strategy is not required to include the following buildings and systems:</p> <ol style="list-style-type: none"> 1. Hospitals and critical emergency response facilities. 2. Ventilation and exhaust systems required by Chapter 5 of the Mechanical Code for the control or removal of dust, particles, odors, fumes, spray, gas, smoke or other hazardous materials, considered to be irritating or injurious to health or safety, and produced by or involved in operations or processes, including hazardous materials storage. 3. Manufacturing process systems. 4. Group R occupancies.
605	
606.2	Delete section in its entirety. The District's Green TAG did not feel the need to list efficiency ratings for GSHPs as they are already very efficient by nature. Also, many of the versions of the GSHPs in the table were not permitted in the District.
606.3	
606.4	Delete in its entirety. The District's Green TAG determined that the insulation levels and the method for calculating in the 2012 IECC were sufficient. DC IGCC - 606.4 Heating, ventilating and air-conditioning (HVAC) piping insulation.[Deleted]
606.5	Revise to reflect current DC IGCC 606.5 below. DC IGCC 606.5 Economizers. Economizers shall comply with the requirements of the Energy Conservation Code
607.2.2	Revise subsection as noted below. Rationale: The District's Green TAG determined that the stricken language was confusing and potentially

	inappropriate. 607.2.2 Water heater controls for dwelling units. Water heaters installed in dwelling units in buildings shall be equipped with external water temperature thermostat controls. The controls shall allow the occupant to set the water temperature at a setting that is below 100°F (38°C) and greater than or equal to 50°F (10°C).
607.3	DELETE: DC Green Tag felt that this section did not have particular relevance to the conditions in the District. If the same may be true for Montgomery County, AOBA recommends similar revision.
607.4 Snowmelt systems	DELETE: DC Green Tag felt that this section would be too costly and did not have particular relevance to the conditions found in the District. If the same may be true for Montgomery County, AOBA recommends similar revision.
607.5	DELETE: DC Green Tag felt that though cost-effective on single-family homes, experts on the TAG stated that waste heat recovery, as described in Section 607.5, was not cost effective in the type of buildings covered by the IGCC.
607.6	DELETE
607.7	DELETE: DC Green Tag felt that this subsection was too onerous to require.
SECTION 608 BUILDING ELECTRICAL POWER AND LIGHTING SYSTEMS	
608.4	Delete in its entirety (including 608.4.1 and 608.4.2) and replace with the following language: 608.4 Exterior lighting reduction. Exterior lighting shall be controlled by a time switch and configured so that the total exterior lighting power is automatically reduced by not less than 30 percent within two hours after facility operations conclude. Exceptions: An exterior lighting time switch shall not be required for the following occupancies and conditions: 1. Group H occupancies. 2. Group I occupancies. 3. Group R occupancies. 4. Lighting that is connected to occupant sensor controls. 5. Means of egress lighting required by the Building Code or the Fire Code. 6. Solar powered luminaires that are not connected to a centralized power source. RATIONALE: The exemption for residential occupancies is necessary since the use of residential buildings, as homes, never “concludes.”
608.4.1 Exterior light reduction	Delete: The DC CCCB’s Green TAG voted to delete this subsection (GC-G-6-1-13). Per the amendment, the TAG noted that requiring “[s]ignage shutoff was deemed excessive.”
608.4.2	Strike 608.4.2 of the International Green Construction code in its Entirety. Rationale:
608.5	

608.7	Strike Section 608.7 Fuel gas lighting systems of the International Green Construction Code in its entirety without substitution. Rationale: Unnecessary, given the minimum prevalence of fuel gas lighting in the District. See GC-G-6-32-13 expressing Green TAG member concerns. If the same may be true for Montgomery County, AOBA recommends similar revision.
608.08	
608.09	
608.10	Strike Section 608.10. Verification of lamps and ballasts of the International Green Construction Code in its entirety without substitution. Rationale: There was concern among the District's CCCB Green TAG members about linking a lighting inspection to a certificate of occupancy, and the burden that this section would impose on inspectors. (See Green TAG amendment GC-G-6-15-13). AOBA notes that DCBIA also recommended striking this language. Note: DC deleted this section.
608.11	Strike Section. Note: DC deleted this section. Strike Section 608.11. Verification of lighting controls. Rationale: The District's Green TAG felt that this section would be too onerous on DCRA and was concerned about the time it would take to implement.. See also Green TAG amendment GC-G-6-6-33 approved June 14, 2012. AOBA notes that DCBIA also recommends striking this language
608.12	Strike Section. Note: DC deleted this section.
610 Building Renewable systems.	AOBA supports the County's' proposal to delete and move to Appendix A. The DC CCCB's Green TAG voted to delete as it was too aggressive to require either the installation of renewable energy or the purchase of green power on construction projects at this time.
611 ENERGY SYSTEMS COMMISSIONING AND COMPLETION – LIMIT TO NONRESIDENTIAL PROPERTIES	
AOBA recommends limiting application to nonresidential properties. See also comments to proposed chapter 9.	

CHAPTER 7 WATER CONSERVATION, QUALITY AND EFFICIENCY	
702 FIXTURES, FITTINGS, EQUIPMENT AND APPLIANCES	
AOBA COMMENTS	
702.6	Strike Section 702.6 of the International Green Construction Code in its entirety without substitution. RATIONALE: The Code should not mandate the purchase of Energy Star certified appliances.

702.7	Strike Section 702.7 of the International Green Construction Code in its entirety without substitution. RATIONALE: Considered too granular to require and regulate, for nominal savings likely to result
	Strike Section 702.9 of the International Green Construction Code in its entirety without substitution. RATIONALE: Considered too granular to require and regulate, for nominal savings likely to result
702.11	Strike Section 702.11 of the International Green Construction Code in its entirety without substitution RATIONALE: Considered too granular to require and regulate, for nominal savings likely to result
702.17	Strike Section 702.17 of the International Green Construction Code in its entirety without substitution. RATIONALE: Considered too granular to require and regulate, for nominal savings likely to result
702.18	Strike Section 702.18 of the International Green Construction Code in its entirety without substitution. RATIONALE: Considered too granular to require and regulate, for nominal savings likely to result
703 HVAC SYSTEMS AND EQUIPMENT AOBA COMMENTS	
703.1	Strike Section 703.1 of the International Green Construction Code in its entirety without substitution. RATIONALE: The DC CCCB’s Green TAG voted to delete this subsection. “Due to minimal losses, GSHPs sometimes require a small amount of make-up water to operate. The TAG felt that the minimal amount required was not worth restricting, given that we want to support the installation of hydronic and ground source heat pump systems. (Amendment No. GC-G-7-5-13)
703.2	Strike Section 703.2 of the International Green Construction Code in its entirety without substitution. RATIONALE: The DC CCCB’s Green TAG voted to delete this subsection, finding it was unnecessary in the District. Same may be true for the County.
703.3	Strike Section 703.3 of the International Green Construction Code in its entirety without substitution.
703.4 Condensate drainage recovery	Strike Section 703.4 of the International Green Construction Code in its entirety without substitution. RATIONALE: The DC CCCB’s Green TAG voted to delete this subsection as it felt that condensate drainage recovery has many challenges and requiring it would be too onerous. There was some interest in mobbing to Appendix A.
703.6	Strike Section 703.6 of the International Green Construction Code in its

	<p>entirety without substitution.</p> <p>RATIONALE: The DC CCCB’s Green TAG voted to delete this subsection and felt that humidifier discharge has many challenges, and requiring it would be too onerous.AOBA recommends similar revision for Montgomery County,.</p>
703.7.5	Strike Section 703.7.5 of the International Green Construction Code in its entirety without substitution.
703.8	Strike Section 703.8 of the International Green Construction Code in its entirety without substitution.
706 Nonpotable Water Requirements	<p>Strike Section 706 of the International Green Construction Code in its entirety without substitution.</p> <p>RATIONALE:</p>
707 Rainwater Collection And Distribution Systems	<p>Strike Section 707 of the International Green Construction Code in its entirety without substitution.</p> <p>RATIONALE: The District moved to place the relevant language in the Plumbing Code instead.</p>
708 Gray Water Systems	<p>Strike Section 708 of the International Green Construction Code in its entirety without substitution.</p> <p>RATIONALE: The International Plumbing Code already adequately covers gray water. DC Green TAG voted to delete this section for that reason. See Amendment GC-G-2-13.</p>
709 RECLAIMED WATER Systems	<p>Strike Section 709 of the International Green Construction Code in its entirety without substitution.</p> <p>RATIONALE: The DC CCCB’s Green TAG voted to delete this subsection. Since the District does not have a reclaimed water system, the proposed section would be inappropriate and unnecessary.</p>
710	<p>710 ALTERNATE ONSITE ONPOTABLE WATER SOURCES:</p> <p>Strike Section 710 of the International Green Construction Code in its entirety without substitution.</p> <p>RATIONALE:</p>

CHAPTER 8	INDOOR ENVIRONMENTAL QUALITY AND COMFORT
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803 HVAC SYSTEMS	
803.2	Strike Section 803.2 of the International Green Construction Code in its entirety without substitution
803.3	AOBA supports the County's' proposal to delete.
803.4	Strike Section 803.4 of the International Green Construction Code in its entirety without substitution. Rationale: In the District, the CCCB's Green TAG felt that exhaust of janitorial and print rooms were adequately covered in the International Mechanical Code and did not feel the need to retain this language.
803.5	Strike Section 803.5 of the International Green Construction Code in its entirety and insert new Section 803.5 in the Green Construction Code to read as follows: 803.5 Filters. Filters for air conditioning systems that serve occupied spaces and handle a component of outdoor air shall be rated at MERV 11 or higher, in accordance with ASHRAE Standard 52.2, and system equipment shall be designed to be compatible. The air handling system design shall account for pressure drop across the filter. Filter performance shall be shown on the filter manufacturer's data sheet.
804 Specific Indoor Air Quality And Pollutant Control Measures	<i>Strike Section 804 of the International Green Construction Code in its entirety without substitution.</i>
807	807 ACOUSTICS: Strike Section 807 of the International Green Construction Code in its entirety without substitution. Rationale: In the District, the CCCB's Green TAG recommended deletion because the language in 807 was poorly written and overly complicated and too prescriptive and difficult to enforce.
808 Daylighting	AOBA supports the County's' proposal to delete and move to Appendix A.

AOBA COMMENTS ON CHAPTER 9 COMMISSIONING

AOBA RECOMMENDATION: 901.1 Scope. The provisions of this chapter are intended to facilitate the commissioning of non-residential buildings constructed in accordance with the *Green Construction Code*. The requirements shall only apply to *equipment* and systems covered by the code that are new or are being replaced in total.

RATIONALE: The 2012 code requires that common area spaces, office space and back of house spaces of high-rise multifamily buildings be “commissioned.” While commissioning is becoming more common for commercial buildings, it will be new to the multifamily sector. There are multiple issues with imposing this requirement on multifamily buildings, including, for example, the training and resources to perform commissioning. Consider still other challenges, including the fact that mechanical systems are generally decentralized, so commissioning becomes a greater challenge because of dealing with so many different systems.

Costs are significant. Costs below are calculated based on a model multifamily building design, which is suitable in all climate zones. This model was used for both the low-rise, three-story and high-rise, four-story calculations:

- Units per floor: 9 - with 2 one-bedroom units, 3 two-bedroom units and 4 three-bedroom units;
- Corridors are enclosed with no exterior exposure;
- Staircases: 2;
- Elevators: 0;
- Gross floor area per floor: 10, 174 square feet;
- Construction: Slab on grade, with 2x4 wood framing;
- Exterior: The three-story model is all brick. The four-story model is brick for the first three floors, with fiber cement lap siding at the balconies and at the fourth story and above;
- Fenestrations: 3’x5’ windows and 3’x7’ doors. Glass balcony doors. Majority of rooms, with the exception of closets, have one window. Corner rooms have two windows;
- Insulation: Exterior wall insulation is batt insulation in the framing cavity. Attic insulation is blown-in fiberglass insulation;
- HVAC: Split system, with ground-mounted condensing units and a SEER 13 efficiency; and
- Lighting: Incandescent at vanities; fluorescent for general room lighting in kitchens, bathrooms and bedrooms.

Zone 4 (Not Marine) with R-20 Insulation Option

- Building Envelope Testing – Blower Door \$300 - \$350
- R-20 Cavity Insulation \$1,139.68 - \$1,307.28

- Additional Duct Insulation \$10 - \$12.50
- General Contractor Overhead and Fees \$144.97 - \$183.68
- \$1,594.65 - \$1,853.46**

Zone 4 with R-13 and R-3.8 Insulation Option

- Building Envelope Testing – Blower Door \$300 - \$350
- Additional Duct Insulation \$10 - \$12.50
- General Contractor Overhead and Fees \$31 - \$36.25
- \$341 - \$398.75**

Additional Costs and Fees

• Commissioning will result in additional professional design fees to the project's cost. A commission agent will need to be retained to develop the plan, review shop drawings, conduct field inspections, and review test reports on the systems to be commissioned. The commissioning agent can be a third-party hired by the owner or be a member of the mechanical, engineering and plumbing design team. The commissioning fees are project-specific based on the types of systems being commissioned. Based on the cost model, the fee will range from \$100 to \$120 per unit.