2021 IECC Impactful Changes		
Code Section	**Significance**	**Notes**
Table C301.1	Climate Zones (CZ) changed for Virginia, from 4A (throughout VA) to 3A, 4A, and 5A, based on the geographical location.	Areas where the CZ has been changed to 3A will see a reduction in energy requirements when compared to the 2018 VECC/IECC. Conversely, areas changing to 5A, will see an increase in energy efficiency stringency. Thus, the construction costs will be reduced in the case of CZ 3A, but increase in areas designated as CZ 5A. Virginia CZ's under the 2021 IECC are: - 4A (all except as follows:) - 3A: Isle of Wight; Mecklenburg; Newport News; Norfolk; Pittsylvania; Portsmouth; South Boston; Southampton; Suffolk; Surry; Sussex; Virginia Beach. - 5A: Alleghany; Bath; Brunswick; Chesapeake; Clifton Forge; Covington; Emporia; Franklin; Greensville; Halifax; Hampton; Highland.
Table C402.1.3	Insulation R-value for "Attic and other" have been increased from R-38 to R-49 in CZ 4 & CZ 5. R-value for several other components increased as well. See attached Table C402.1.3 identifying all components with an increase R-value.	Increases construction costs. Below are some factors contributing to the increase: - additional material is required to achieve the specified R-values - additional labor time is needed for the installation of insulating material (i.e. it takes longer to spray foam insulation/blown-in insulation due to the additional thickness). - the increase in insulation thickness, in most cases, requires the installation of bigger trusses (i.e. high heel trusses) and/or bigger ceiling/roof rafters. The design and construction of bigger trusses is more expensive due to the need for additional lumber, gusset plates, labor, etc. Furthermore, additional truss bracing (i.e. individual truss bracing to prevent rotation, twisting, bending of web members), as well as wall sheathing material (i.e. braced wall panels are normally required to continue for the height of the wall. Increase heel trusses means higher braced wall panels) are normally needed for the installation. Lastly, additional labor time is needed for setting up higher heel trusses. Longer installation times means increased cost due to labor and equipment rental (i.e. crane rental, etc.).
Table C402.1.4	Insulation U-factor for "Attic and other" reduced from 0.027 to 0.021 in CZ 4 & CZ 5. U-factor for several other components has been reduced as well. See attached Table C402.1.4 identifying all components with a reduced U-factor.	Increases construction costs. Same as comments on Table C402.1.3 above.
C402.5.1.2	Requires thermal envelope testing in accordance with ASTM E 779, ANSI/RESNET/ICC 380, ASTM E1827 or an equivalent method approved by the code official. Some exceptions apply. As an alternative to the testing, requires "Building envelope performance verification" (C402.5.1.5).	Increases construction costs due to additional need for air leakage testing, or commissioning report by registered design professional or approved agency. Note: This requirement is similar with the envelope testing already found in the residential (R) provisions of the IECC/VECC applicable to one - and two- family dwellings, townhouses.
C402.5.11	Operable openings larger than 40 square feet must be interlocked with the HVAC system to raise/lower temperature set points whenever the operable opening is in the open position.	Increases up front construction costs due to additional equipment (sensors, communication system between them and HVAC, labor etc.).; but, it has the potential to save energy in the long run if operated as installed/required.)
C405.2.8	New requirements for parking garages to have lighting controlled by either occupant sensors or time-switch controls.	Increases up front construction costs, but could potentially save energy in the long run.
C405.4	Requires photon efficiency of not less than 1.6 µmol/J (micromole per Joule) for lighting associated with plant growth and maintenance.	Unless qualifying as farm buildings, this could have an impact given the advent of facilities for medicinal and recreational marijuana growth and sales.
C405.11	Requires 50% of receptacles and 25% of branch circuit feeders to be automatically controlled receptacles.	This would increase the construction cost due to additional labor as well as equipment. It could reduce ongoing electricity costs.
C405.12	Requires buildings with a gross conditioned floor area of 25,000 square feet or larger to be equipped to measure, monitor, record and report energy consumption data. The following exemptions apply: - R-2 occupancies - Individual tenant spaces with less than 5,000 square feet of conditioned floor area and their own utility services and meters.	This could significantly increase the cost of construction due to additional specialized equipment and labor. The data could provide building owners with beneficial energy usage data but there is no guaranty that the monitoring will result in energy savings.
Table R301.1	Similar with Table C301.1 above.	Note: the 2018 IECC commercial provisions are incorporated as they are, without amendments, in the 2018 VECC. The residential provisions, however, are modified by VA (i.e. thermal envelope requirements). So, depending upon the stakeholder recommendations/BHCD decision, the existing amendments could potentially carry over to the 2021 VECC/VRC.
R401.2	The compliance paths have been revised/renamed.	The proposal names the compliance paths (i.e. prescriptive, performance, ERI, etc.), reorganizes, relocates and restructures several sections throughout the code. The "mandatory" provisions scattered in Sections R401 through R404 are no longer identified as mandatory but instead are being referred to for compliance, as/if applicable, based on the compliance path chosen. For example, for the ERI compliance path, the project must comply with Section R406 and all the sections identified in Table R406.2. Given the sheer mount of changes associated with this item and the fact that VA had previously amended Section R401.2, in creating the 2021 USBC Base Document, Staff has deleted the VA amendment to this Section as it would've been a monumental task to coordinate the existing amendment with the new 2021 changes. However, the stakeholders have been made aware of this change during Memo previously sent out. It will also be added as an item for discussion by the Energy SWG.
R401.2.5 & R408.2	Requires compliance with additional energy efficiency package - similar with current provisions applicable to commercial projects (i.e. 2018 VECC Section C406).	Increases construction costs.
Tables R402.1.2 & R402.1.3	U-factors have been reduced and the R-values increased.	Increases construction costs due to labor and material. See comments on Table C402.1.3 above for some examples.
R402.5	Area-weighted average maximum fenestration SHGC reduced to 0.3 from 0.5 in CZ 3.	Some VA localities (see above for complete list) will be designated as CZ 3A under the 2021 IECC. This provision is applicable to the Prescriptive compliance option where tradeoffs are used and to the Total Building Performance compliance option. Said projects will see an increase in construction costs due to more expensive fenestration products.
R403.3.5 (R403.3.3 in the 2018)	All ducts required to be pressure tested. Ducts located within the thermal envelope no longer exempted from the testing requirement.	Increases construction costs due to additional required labor.
R403.6.3	Requires testing of mechanical ventilation systems to ensure they are installed and operating as intended.	Increases construction costs due to additional required labor. It adds another step in the construction sequence and construction documents submittals.
R404.2	Requires permanently installed lighting fixtures (with some exceptions) to be controlled with either a dimmer, an occupant sensor control or other control that is installed or built into the fixture.	Increases construction costs. Given the additional technology these type of controls require, they are more expensive to manufacture. Also, given the additional technology built into the controls, it is possible that they would be more prone to failure. Thus, additional costs could be incurred by the building owner in the future if/when replacement would be necessary.
R404.3	Requires automatic controls for permanently installed exterior lighting power greater than 30 watts. These controls must have manual switches that allow automatic shutoff and lighting must automatically shutoff based on daylight. The provisions also outline the limits to the override functions of the controls. The type of control is not specified, only what it must accomplish.	Increases construction costs. Given the additional technology these type of controls require, they are more expensive to manufacture. Also, given the additional technology built into the controls, it is possible that they would be more prone to failure. Thus, additional costs could be incurred by the building owner in the future if/when replacement would be necessary.