Frequently Asked Questions (FAQ) – Module II

General:

Q: Is it the correct call to have building inspectors regulating compliance with energy regulations?
A: Yes, just as a lot of contractors don’t have a specialty, they are just “General Contractors” and inspectors are not different. Just like contractors, inspectors are trained to know where to find the information in the books, not to memorize all the code books.

Q: How do contractors handle situations where jurisdictions do not have enough staff to handle energy inspections?
A: They can get third party inspections or provide documentation to the building department but the building department will have their own policy on how to handle inspections that they don’t cover. No matter what, whether a building department inspects or not, it doesn’t allow the contractor out of the code requirements.

Q: What steps are being taken to ensure competency among code officials?
A: Training at the state, local and national level; Work experience; Networking opportunities with other inspectors; Colorado Chapter ICC Educational meetings. ICC offers certifications. There are probably more training opportunities for inspectors than there are for contractors, unfortunately.

Q: Will there be continued energy code training once the stimulus money is gone?
A: Colorado Chapter of ICC will continue to provide training. The Governor’s Energy Office is continuing to seek ways to offer more training. Xcel Energy is piloting a program to offer training for people in their service area. The tool kit at www.colorado.gov/energy codes will provide online classes and many training tools can be found at the Department of Energy’s website at www.energycodes.gov.

Q: Do I need to install ceiling insulation in older buildings?
A: The IECC does require existing buildings to be brought up to code if there is an alteration to that portion of the building. That being said, there is an exemption for historic buildings and for buildings where you don’t expose the cavity. One thing to keep in mind is the actual design of the snow load of that building because older designs that didn’t have insulation were not designed to a high snow load because the snow melted. If we put insulation in them now, there may be the need to get an engineer involved to assess if the roof will now hold the snow load.

Q: When do I have to use the default values for fenestrations?
A: When I am unable to verify by labels or testing what the u-values of windows will be.

Q: When is it a floor and when is it a ceiling?
A: If you are standing in conditioned space and the unconditioned air is below you, such as a crawl space, or a room over a garage, you use the floor value. If the unconditioned air is above you, such as an attic, then you use the ceiling R-value. The key is that you have to be standing IN the conditioned space to use this formula.
Q: When can I use UL181 tape?

A: Per the listing of UL181 tape it is listed for flex to flex or flex to metal duct connections but not for metal to metal duct connections. This is an ongoing issue for this tape and they are working on it, but as of now, it still may not be used for metal to metal connections.

Q: Is there a difference between a residential above-grade wall and a commercial above-grade wall?

A: Yes. The definitions for an above grade wall was actually meant for residential only and calls an above grade wall any wall that is 50% or more above grade. In the commercial chapter, in 502.2.2.1, an above grade wall for commercial is any wall that is more than 15% above grade. That is a big difference, so be sure to use the commercial section for commercial above grade walls.

Q: Do the pool requirements apply to indoor and outdoor pools?

A: Yes, the pool requirements are the same residentially and commercially and apply to both indoor and outdoor pools the same.

Q: What are internal loads versus external loads?

A: Internal loads are the people, the equipment and lights. External loads are the wind, heat, snow and infiltration.

Q: The IMC and IECC have a conflict, which code overrules?

A: The IMC. This code is not meant to abridge health or life safety, so the building, plumbing and mechanical codes take precedence over the IECC.

Q: There are a lot of times when projects do not have to comply with IECC per Chapter 1. What happens if my jurisdiction deletes Chapter 1?

A: It would be up to the jurisdiction to decide if those exceptions would be allowed. The building official always has the right to make that call.

Q: Why are the definitions for residential and commercial buildings different in the IECC compared to IBC and IRC?

A: The definitions in the IBC and IRC are based on occupancy and the way that occupancy behaves. The definition in the IECC is based on how the building behaves and the loads associated with each type of building. So while an R2 might be a commercial building per the IBC, it is still a residential building per the IECC as long as it is 3 stories or less. Buildings 3 stories or less perform one way. Buildings 4 stories and higher perform another way. The stack effect, the mechanical requirements and different internal loads make them different. It doesn’t matter what the occupancy of the building is in the IECC once you have 4 stories or more, it’s all commercial.

Q: Is there a way to create an implementation plan for IECC enforcement?

A: Yes. When you adopt a code, you are supposed to start enforcing it. There is something to be said to taking a stepped approach to implementation. This approach allows building department staff, designers and contractors to learn a section of the code and work with it before moving to the next step. For instance, a jurisdiction that has never looked at air barriers, starts enforcing the air barrier requirements, and then 6 months later they start requiring insulation inspections and then 6 months later they start requiring Manual J’s, then 6 months later they start requiring Manual D’s, and so on. This allows them to step into energy requirements rather than just jumping in to them all together.
Q: What are the repercussions of adopting the 2009 IECC without adopting the other 2009 I Codes?

A: The codes are written as a “family of codes” and some thought usually goes into how a change in one code affects another one in the family but if you adopt different editions of the codes, you don’t have that same thought process. An example would be if a jurisdiction adopts the 2006 Building codes but is on the 2009 IECC for ARRA reasoning, then it could be possible that the jurisdiction wouldn’t have vapor barrier requirements to enforce because the vapor barrier requirements were in the 2006 and earlier editions of the Energy Code but in 2009 they were moved to the Building Codes so if you have the 2006 building code there were no vapor barrier requirements in there and if you have the 2009 IECC, there are no vapor barrier requirements in there and now you have nothing to go off of for enforcement in that area.

Q: How do you convert watts to btu’s?

A: Here is a link to a handy website that does those conversions for you:
http://www.unitconversion.org/power/watts-to-btus-it--per-hour-conversion.html

Residential

Q: What is the prescriptive approach in the 2009 IECC?

A: The prescriptive approach is a prescribed set of requirements that when used for a project in the correct climate zone leads to an Energy Code compliant building. The prescriptive approach is often considered the simplest approach because you just do exactly what is prescribed without trading off anything or trying to assess how the building performs.

Q: What is a trade-off approach, and can I still use it with the 2009 IECC?

A: A trade-off approach allows you to trade enhanced energy efficiency in one component against decreased energy efficiency in another component. The 2009 IECC only allows you to trade off levels of insulation and glazing efficiency. For example, trade decreased wall efficiency (lower R-value) for increased window efficiency (lower U-factor), or increase the roof insulation and reduce or eliminate slab-edge insulation. Typically, this method is less restrictive than prescriptive approaches because components that exceed the requirements can compensate for those that do not meet the code.

Q: What is a performance approach?

A: A performance approach (also known as a systems performance approach) allows you to compare your proposed design to a baseline or reference design and demonstrate that the proposed design is at least as efficient as the baseline in terms of annual energy use. This approach allows greater flexibility but requires considerably more effort. A performance approach is often necessary to obtain credit for special features, such as passive solar design, photovoltaic cells, thermal energy storage, and fuel cells. This approach requires an annual energy analysis for the proposed design and the reference design. DOE does not offer residential software products at this time to comply using this approach, but future versions of the REScheck™ software will include the DOE-2 energy analysis engine to perform the necessary calculations needed to determine compliance.

Q: What’s the difference between the ResCheck path and the performance path?

A: ResCheck is based on total UA and the Performance Path is based on a dollar amount of energy savings. With ResCheck you can only trade off items that can be converted to U-value (windows, doors, insulation). With the performance path you can trade off everything that you can trade off in ResCheck plus lighting, mass, air leakage and thermal distribution. On the performance path you have
to show that the house you are proposing to build will use less energy per year than the same house built to code.

Q: Is the HERS score in the 2009 Performance Compliance Report a true score?

A: It is now. The RemRate software has been updated to reflect the current 2009 requirements. In the beginning with the removal of the mechanical trade off the performance reports were not giving true HERS scores but this has been fixed.

Q: Which approach is the best for a particular residential building project?

A: Choosing the appropriate approach depends on the complexity and/or uniqueness of the building and the amount of time and money available for demonstrating compliance. The prescriptive approach allows quick review of the requirements. If these requirements are too restrictive, try a trade-off approach. For example, if the window area of the building exceeds that allowed by the prescriptive approach, a trade-off approach may be preferable. If nontraditional components are used or if energy use trade-off between building systems (e.g., envelope, mechanical) is desired, then use the performance approach.

• Additions may use the prescriptive or trade-off approach.

• An addition project that also includes alterations to the existing part of the building should show compliance separately for each part (the addition separately from alterations).

• For alterations, the prescriptive approach is preferable; otherwise the entire building should be brought up to code.

Q: Do the three approaches yield different results?

A: Yes, they can. Performance approaches require a higher degree of detail for an individual building to be designed to exactly meet the energy code requirements. Prescriptive approaches tend to be somewhat conservative and use worst-case default assumptions in order for the prescriptive packages to apply to all buildings. Although the prescriptive approach may result in a more energy-efficient building because of its conservative assumptions, this is not always the case. The prescriptive approach generally does not account for several features that affect energy use, such as the effect of window orientation and external shading on solar heat gain.

Trade-off approaches fall somewhere between the prescriptive and performance approaches in both flexibility and complexity.

Q: Why are there so many compliance approaches?

A: Over the years, residential energy codes have grown to provide different approaches of varying simplicity and flexibility in order to meet user needs. The simpler approaches are less flexible but are generally easier to use. Some of the approaches have considerable overlap.

Q: What compliance report do I need to submit for the trade-off approach in order to get my building permit?

A: Download REScheckTM software at no charge, or simply launch the REScheck-WebTM (both are available at www.energycodes.gov/software.stm). You will fill out forms with information about your project, such as square footage of the floors, walls, and ceilings, insulation levels, information about your windows and heating and cooling system. The menu driven software will show you when the
building has complied with the energy code. At that point, owners can print out the reports to submit for the building permit.

Q: In ResCheck, how do you determine whether it is continuous or cavity insulation?

A: Continuous insulation is insulation installed without being broken up by framing members. An example would be draped insulation in a basement or rigid foam insulation. Cavity insulation is insulation that is installed within a framing cavity; Batt insulation or insulation blown in to a cavity. In ResCheck when calculating ceiling insulation, the Department of Energy has stated that even with blown in insulation, if any of the insulation is installed in a cavity, then the entire amount must be considered cavity for purposes of entering insulation values into the program. For ceilings on ResCheck, you should not see an amount in the cavity column AND the continuous column.

Q: How do I determine area for slab edge protection?

A: Because we are just talking about the slab edge, when you are calculating area it should be the perimeter only, so it is measured in linear feet. And only measure the amount that is required to be insulated. So residentially, you are only talking about the portion of the slab that is 12 inches or less below grade.

Q: How do I show compliance with additions or alterations?

A: One of the keys to showing compliance for additions and alterations is to remember that you are only considering the new space, or the new walls, etc. You have the option of showing compliance for the entire space, but this is not necessary or typical. Using REScheck™, you will indicate “addition” or “alteration” on the project information tab, and need to enter the following information, as it applies to your project:

Ceiling – gross area (ft2) and insulation R-value of new ceiling,

Exterior walls – gross area (ft2) of new exterior walls and insulation R-value (the existing exterior wall(s) that will become interior wall(s) once the addition is built are to be considered interior walls and should not be entered as part of the addition wall area).

Windows/Doors – gross area (ft2) of windows and/or doors with U-factor from NFRC label or default table in the help section REScheck™.

Floor – gross area (ft2) of addition and insulation R-value. If the floor is a slab, the length of the exterior slab edge should be entered in linear feet. Performance software may best reflect the thermal heat capacities of mass walls (see What is a performance approach?).

Q: How do I show compliance for my basement?

A: I have a solid concrete wall as the exterior basement wall that goes up from the footing to midway up the first floor. I have a 2x6 stud wall framed on the inside of this wall with insulation. How do I report this on the software?

Enter your basement wall as solid concrete, square footage, height, height below grade, depth of insulation. Then enter your insulation R-value as cavity. The software will calculate the wall according to the amount of cavity insulation is shown and consider it as a furred out wall.
Q: Is there a difference between finished and unfinished and conditioned and unconditioned basements?

A: Yes. Finished and unfinished is about aesthetics. Conditioned and unconditioned is about the thermal environment. You can have an unfinished basement that is conditioned. In fact, because of the definition of conditioned space, it is very rare to have an unconditioned basement. Even if you provide no heating or cooling into the basement it can be considered conditioned just by containing un-insulated ductwork according definition of conditioned space in the IECC.

Q: How do I show compliance for mass walls?

A: You can use REScheck™ software, specifying the type of wall. Performance software may best reflect the thermal heat capacities of mass walls (see What is a performance approach?).

Q: How do I show compliance for log walls?

A: You can use REScheck™ software, specifying the type of wall. Performance software may best reflect the thermal heat capacities of mass walls (see what is a performance approach?).

Q: What do I need to know about duct leakage testing, 2009 IECC Section 403.2.2?

A: Beginning with the 2009 IECC, if any portion of the ducts or air handler are located OUTSIDE the conditioned space (e.g. in a garage, naturally ventilated crawlspace, naturally ventilated attic, etc.), duct tightness must be verified with a duct leakage test. Studies have shown that visual inspection of duct seals in residences is not enough. Estimates reveal that pressure testing ducts in new residential construction will reduce energy consumption in new homes by up to 10% on average and potentially much more in some homes. Accordingly, the code now requires a pressure test. Pressure testing ducts as required by the 2009 IECC is far superior to visual inspection and will definitively confirm that duct leakage is minimized. (2009 IECC Section 403.2.2)

Q: When can I use UL181 tape?

A: Per the listing of UL181 tape it is listed for flex to flex or flex to metal duct connections but not for metal to metal duct connections. This is an ongoing issue for this tape and they are working on it, but as of now, it still may not be used for metal to metal connections.

Q: Who can do the testing?

A: For the most common methods, a variety of people can conduct the testing, including the building’s HVAC subcontractor, the primary builder, or a third-party. The tester should have experience or training in operating the pressure testing equipment and performing the test. Testing immediately after the ducts are put in while the installers are still at the site has the advantage of allowing leaks to be sealed right then if the leakage rate exceeds the code limit.

Q: Am I required to utilize diagnostic testing for assessing compliance with the 2009 IECC for home air leakage?

A: No, There are two options for assessing compliance with the home air leakage requirements of the 2009 IECC: 1) a rigorous visual inspection option and 2) the use of building diagnostic testing (blower door method).

The visual inspection option refers to the Air Barrier and Insulation Inspection Criteria of Table 402.4.2. Similar to the Thermal Bypass Inspection Checklist which must be completed for homes to earn the ENERGY STAR Qualified New Homes label, Table 402.4.2 requires field inspectors to use their
experience and discretion to verify that each component is installed in accordance with the Table 402.4.2 inspection criteria. The tabular criteria includes visual inspection of framing areas where air barriers are commonly missed, or over-stapled, and inspection of insulation to ensure proper alignment with air barriers, thus serving as an extra check that the air-barrier, thermal-barrier and drainage plane are continuous and complete.

The common tool used for measuring air tightness is the blower door, which accurately measures air pressure difference and flow rate. The blower door, as its name implies, is affixed to the front door of the home and using a variable speed fan and manometer, measures how tight a house is. A house air leakage rate (the inverse of air-tightness) can be quantified by inducing a pressure difference across the apparatus and between the interior and exterior of the house, measuring the airflow necessary to maintain this constant pressure difference. A diagnostician or field-inspector then locates air leakage sites requiring additional sealing. For compliance assessment, the blower door measurements, reported 50 Pascal, can be combined with a factor representing the dimensions of the home to yield the comparable air tightness value expressed in cfm/ft² @ 50Pa (L/min · m² @ 50Pa).

Note also, that resulting from final action to Code Change EC13-09/10 (AM PC5,19,20), the 2012 Edition of the IECC makes building diagnostic testing of air leakage (e.g., the blower door method) mandatory. (2009 IECC Section 402.4.2)

http://www.energysavers.gov/your_home/energy_audits/index.cfm/mytopic=11190

Q: With construction getting so much tighter, aren’t we just making sick houses?

A: That possibility definitely exists. Future editions of the code will bring in mandatory whole house ventilation but for now, some jurisdictions are writing it in to their own code just to be safe.

Q: What are insulation requirements between conditioned and unconditioned spaces under the 2009 IECC? When insulating the basement, does the 8” concrete wall that separates the basement and garage need to have a minimum of an R10 insulation value?

A: Interior walls that separate conditioned from unconditioned space are treated the same as an exterior wall that separates outside from the conditioned building thermal envelope, and must meet the same energy provisions. Therefore a below-grade wall that separates the basement from the garage would need to meet the same provisions and insulation levels based on the climate zone.

Q: What does the IECC say about ducts in conditioned crawlspace?

A: The 2006 IECC: ducts or portions of ducts located completely within the building envelope (i.e. conditioned crawl space) are exempt from having to be insulated; however, they still must be sealed properly.

Q: Do all ducts in attics require R8 insulation?

A: No. Although the wording in the 2009 IECC is confusing, the intent behind this section was that supply and return ducts in the attic will get the R8 insulation. Supply and return ducts in any other unconditioned space in the building get R6. The code did not intend for exhaust ducts in the attic to be insulated, although it is not a bad idea to do so.

Q: Is there a way to get out of duct insulation?

A: Yes, put all the ducts in the conditioned space or choose the performance path for compliance.
Q: Is there a way to get out of duct insulation?
A: Yes, put all the ducts in the conditioned space or choose the performance path for compliance.

Q: Is it true that a space is considered conditioned just because the ducts aren’t insulated even though there is no heating or cooling to that space?
A: Yes, per the exact wording of the definition. This will be true so that spaces containing un-insulated ducts would need the walls insulated instead of the floor/ceiling and must meet any other requirements for conditioned space.

Q: What is a Manual J, S and D?
A: Manual J produces equipment sizing loads for single-family-detached homes, small multi-unit structures, condominiums, town houses and manufactured homes. The essential companion to Manual J, Manual S shows you how to select and size heating and cooling equipment to meet Manual J loads based on local climate and ambient conditions at the building site. Manual S covers sizing strategies for all types of cooling and heating equipment, as well as how to use comprehensive manufacturer’s performance data on sensible, latent, or heating capacity for various operating conditions. Manual D provides a single set of ANSI-recognized duct sizing principles and calculations that apply to all duct materials; system operating point (supply Cfm and external static pressure), and airway sizing for single-speed and multi-speed (ECM) blowers; a method for determining the impact of duct friction and fitting pressure drop on blower performance and air delivery; the most comprehensive equivalent length data ever published. You can apply the Manual D procedure to constant volume systems and zoned variable air volume systems, over a full range of duct construction materials. Manual D includes a number of informative appendices related to air distribution systems (e.g., equipment and air-side components, controlling excess air when VAV dampers close, duct loads, duct leakage and duct system efficiency, air quality issues, noise control, minimum air velocity for ducts; codes, standards and best practice issues; and commissioning issues). www.acca.org

Q: Are there any guidelines for manual D compliance?
A: Yes. While ACCA Manual D gives specific requirements for duct design, each jurisdiction is different in what they require. Most jurisdictions want a floor plan showing the location of all registers, the amount of cfm at each register, the duct sizes and lengths, static pressure and mechanical equipment sizes. It is important to check with each jurisdiction to see what they will require of you.

Q: How many building departments truly know how to review a manual J or D?
A: The number is increasing each year as more localized training is offered. Across Colorado there are approximately 30 jurisdictions that require manual J submittals.

Q: Per manual J, what internal loads are allowed in determining total internal heat gain?
A: You can use things like kitchen appliances, televisions, computers, home theater equipment, lights and people. Refer to Manual J for additional information

Q: Work proposed to a home consists of replacing existing window units in their entirety. Currently we do not require permits for window replacements. How do others interpret or enforce window replacements?
A: The 2009 IECC considers window replacements alterations to the building. Yet for some time, many municipalities have considered the replacement window issue a matter of jurisdictional choice by way of a jurisdiction’s unique adopting ordinance; most often reading, “If it fits into the same opening,
then you do not need to obtain a building permit. Where the new window size is different than the size of the opening, a permit application is required.”

To be code compliant however, *all* window replacements, as *alterations*, require a permit in accordance with the IECC. Jurisdictions under the 2009 IECC will need to perform compliance assessment for residential buildings, and thereby inspect and verify fenestration thermal performance (U-factor and Air leakage) for homeowners in their communities. Documentation shall be provided with the permit application indicating that the replacement window products afford a fenestration *U*-factor no greater than required by the IECC. This will take some extra public relations and communications to get the word out for the new permit requirement; a perfect opportunity for Building Safety Month.

Q: Why do we not regulate SHGC in Colorado climate zones?

A: Recognizing that there are certain times of year, such as winter, in Colorado that we actually benefit from the solar heat that can be gained through our windows, it was decided not to regulate windows for SHGC.

Q: If you put in a permanent heater into the garage does it have to meet the thermal envelope requirements?

A: Indeed. Once the input capacity of the heater (or unit heater) exceeds 3.4 Btu/h · ft² (1.0 W/ ft²) of floor area, the space, in this case the garage, is considered "conditioned." Therefore, the surrounding walls, windows, doors, overhead doors, roof, and slab-edge become the boundary of the building thermal envelope and must be insulated. Note also that the air-leakage requirements of the code apply to the enclosing doors and windows as well. (2009 IECC 101.5.2, 202 – BUILDING THERMAL ENVELOPE, CONDITIONED SPACE)

Q: Section 402.4.3 requires new, wood-burning fireplaces to have gasketed doors. What is the intent of this provision?

A: To be clear, Section 402.4.3 addresses “wood-burning fireplaces,” as derived from Code Change EC64-07/08, Part I (AM). In the supporting reason to this proposal, the conditions for adding the language were to address concerns for energy savings derived from the minimizing air leakage during periods of non-use and indoor air quality concerns.

Since certain UL-127 “factory-built” fireplaces are listed and labeled to burn wood, and the installation of gaskets would violate conditions of their listing; we interpret this to mean “masonry fireplaces” constructed in accordance with the **International Building Code**–Section 2111, and NOT “factory-built” fireplaces manufactured in accordance with the **International Mechanical Code**–Section 903. Our rationale is derived from the confusion with respect to requirements for “gasketed doors.”

Worth noting here, is that there are numerous ways to minimize air leakage through the fireplace during periods of non-use without requiring gasketed doors. For example, there are several low emission units considered part of the EPA **Cleaner Burning Fireplace Program** which are “tightly sealed,” yet do not utilize gasketed doors.

Accordingly, and solely for “factory-built fireplaces,” we recommend pursuing relief from the proviso for “gasketed doors” administratively vis-à-vis IECC Sections 101.3 (“… this code is not intended to abridge safety … requirements contained in other applicable codes or ordinances.”) and 102.1 (“… provided that such construction [or] design … has been approved by the code official as meeting the intent of this code.”). (2009 IECC 402.4.3)
Q: Is R-19 insulation allowed in a 2 x 6 cavity?

A: Yes. The reason this question comes up is because of footnote a in table 402.1.1 that states that R-19 batts compressed into a nominal 2 x 6 framing cavity such that the R-value is reduced by R-1 or more shall be marked… which makes it sound like you cannot fit an R-19 into a 2 x 6 cavity. However, there are no known jurisdictions within Colorado who do not accept R-19 in a 2 x 6 cavity.

Q: In climate zone 5, why did they change from R-19 to R-20 and not go to R-21?

A: At the code hearings, there was a blown in insulation manufacturer present who had a product that couldn’t quite make the R21 value in a 2 x 6 cavity so going to R-21 would have left that manufacturer out of the market. Therefore, it was decided to make the requirement R-20. You can use an R-21 high density batt or any blown in or sprayed manufacturer who has a product that can meet the requirement.

Q: Section 402.2.1 allows a trade-off for lesser ceiling insulation if the insulation is not compressed over the top of the exterior wall (at the eaves). Is the lesser value allowed for the entire ceiling?

A: Yes. Knowing that insulation gets compressed at the eaves for the whole perimeter of the roof, the code requirement for R-value was raised but if you don’t compress it at the eaves, you are allowed to use the lower R-value per that section of the code. The intent on this section was that the entire ceiling gets the lower R-value, not just the area around the perimeter. There are certain instances where a HERS rater may only allow the reduced R-value around the perimeter, but that is ONLY if you are going the performance path.

Q: The wall values in table 402.1.1 are only for wood framing. What if I have steel framing?

A: You would consult table 402.2.5 and convert the wood frame value to the value required for steel framing.

Q: The steel framing values in table 402.2.5 show an R-19 and an R-21 but R-20 is required. What should I do?

A: You would be required to go to the higher value rather than the lower, although the difference between the two is very minimal, so check with your jurisdiction to see what they will allow.

Q: What’s the difference between the U-factor alternatives and the Total UA alternative?

A: The U-factor alternative is just taking the same components from table 402.1.1 and converting them to a u-value and using table 402.1.3. There are no trade-offs. The UA alternative, commonly known as ResCheck path, also converts everything to a U-value but because it is the sum of u-factor times assembly area, it will allow trade-offs between other items that may be converted to a u-value, as long as the total UA is less than or equal to a prescriptive house (U= 1/R).

Q: Shouldn’t I get credit for air film and framing in ResCheck?

A: You do get credit for air film and framing in ResCheck. ResCheck includes all those calculations behind the scenes. All you have to put in is the R-value of your insulation and the U-factor of your windows and the software calculates the rest of the assembly based on values found in ASHRAE Handbook of Fundamentals.
Q: Does air permeable insulation have to be encapsulated on all 6 sides?

A: Yes. Air permeable insulation works by trapping air and must be encapsulated per table 402.4.2. You can see under air barrier criteria that the insulation has to be inside of an air barrier.

Q: Why is the Energy Certificate required to be placed on the electrical panel? Can we change the location?

A: When doing any type of remodel or renovation to a home, one of the last things to get changed out is the electrical panel so they asked for it to be placed there. A lot of jurisdictions do change the location to the attic or near the furnace.

Commercial:

Q: For commercial buildings, do 2009 IECC Sections 501.1, Scope, and 501.2, Application, allow the permit applicant to mix-and-match provisions of IECC Chapter 5 and ASHRAE Standard 90.1-2007 on a single permit application for compliance assessment?

A: No, New to the 2009 IECC are revisions to the Scope and Application provisions of the Commercial Chapter 5, Sections 501.1 and 501.2, respectively. The revisions no longer allow designers to select a customized path to compliance using the provisions of both Standard 90.1 and the IECC Chapter 5. In fact, Sections 501.1 and 501.2 now require the designer to demonstrate compliance with either the provisions of IECC Chapter 5 (in its entirety) or the provisions of Standard 90.1 (in its entirety); no combination thereof is permitted.

Q: Can I still mix and match IECC and ASHRAE 90.1 for commercial buildings?

A: Not anymore. Previous versions of the code allowed you to mix and match the two documents. The 2009 requires that you do the entire building from one or the other.

Q: What path of compliance is ComCheck used for?

A: While most jurisdictions require ComCheck for all commercial projects, the true intent of ComCheck was to meet the UA Tradeoff path. That being said, there is no UA Tradeoff path for commercial, but the building official does have the authority to allow it. ComCheck is a good tool that shows that the designer has put some thought into the construction of the building, lighting and mechanical systems.

Q: What is a commercial performance approach?

A: A performance approach (also known as a systems performance approach) allows you to compare your proposed design to a baseline or reference design and demonstrate that the proposed design is at least as efficient as the baseline in terms of annual energy use. This approach allows greater flexibility but requires considerably more effort. A performance approach is often necessary to obtain credit for special features, such as passive solar design, photovoltaic cells, thermal energy storage, and fuel cells. This approach requires an annual energy analysis for the proposed design and the reference design. We do not offer commercial software products at this time to comply using this approach, but future versions of the COMcheck™ software will include the DOE-2 energy analysis engine to perform the necessary calculations needed to determine compliance. Samples of performance software available are listed in the Building Energy Software Tools Directory on the Building Technologies Program website (www.eere.energy.gov/buildings).
Q: How do I create an energy code compliance report to get my building permit?

A: Download COMcheck™ software at no charge, or simply launch COMcheck-Web™ (both are available at www.energycodes.gov/software.stm). You will fill out forms with information about your project, such as square footage of the floors, walls, and ceilings, insulation levels, information about your windows and heating and cooling system. The menu-driven software will show you when the building has complied with the energy code. At that point, owners can print out the reports to submit for the building permit.

Q: My project has both businesses and homes; is it residential or commercial?

A: For mixed-use buildings that are three stories or less and have residential and commercial space, the way to determine if the entire building can be shown to meet code under residential or commercial is the percentage of the space types. If residential is 10% or less of the overall building then the entire building can fall under the commercial provisions. It is always easier to show compliance for the entire exterior thermal building envelope instead of breaking the building apart, however, if the residential is greater than 10% then the residential portions of the building shall comply with Chapter 4 of the IECC and the commercial portions of the building shall comply with Chapter 5. If using COMcheck™, the apartments would be multifamily under the space-types option and the other areas should also be designated according to their activities. Remember, if the building is four stories or greater, it is all commercial.

Q: How do I show compliance with additions or alterations?

A: One of the keys to showing compliance for additions and alterations is to remember you are only considering the new space, or the new walls, etc. You have the option of showing compliance for the entire space, but this is not necessary or typical. Using COMcheck™, you will indicate “addition” or “alteration” on the project information tab, and need to enter the following information, as it applies to your project:

   Ceiling – gross area (ft²) and insulation R-value of new ceiling,

   Exterior walls – gross area (ft²) of new exterior walls and insulation R-value (the existing exterior wall(s) that will become interior wall(s) once the addition is built are to be considered interior walls and should not be entered as part of the addition wall area.

   Windows/Doors – gross area (ft²) of windows and/or doors with U-factor from NFRC label or default table in the help section of COMcheck™.

   Floor – gross area (ft²) of addition and insulation R-value. If the floor is a slab, the length of the exterior slab edge should be entered in linear feet.

Q: How do I show compliance for only lighting (or mechanical, or envelope)?

A: COMcheck™ will calculate compliance for your project as you define it. For example, if your project is a tenant improvement with new interior lighting, new exterior lighting and mechanical, you would not need to fill in the envelope tab. Conversely, if your project is new construction of an unoccupied commercial shell and there is no interior lighting or mechanical system, you would not fill out those tabs.

Q: On an existing core and shell does the new tenant need to meet the IECC requirements?

A: The new tenant would need to comply with the Energy Code for any changes that may be made to the building envelope, mechanical system, service water heating system or the electrical power and
lighting. For example, if they decide to just come in do some painting and finish work then it is possible that there would be no requirements to comply with the Energy Code. If the new tenant were to come in and make changes to the ductwork or mechanical equipment then all or at least the new portion of the mechanical system would need to comply with the Energy Code. If they changed the windows then the all or at least the window portion of the building envelope would have to comply. Remember, IECC 101.4.3 gives you 8 exceptions of items that do not have to comply with the code for additions, alterations, renovations or repairs and Exception 4 states that if you don’t expose a cavity, you don’t have to make it comply; also exception 3 states that if you do end up exposing a building cavity but it is already filled with insulation then it does not have to comply.

If there is a change in occupany for the space then IECC 101.4.4 does state that if the new occupany would increase the demand for either fossil fuel or electrical energy then the space shall comply with the Energy Code. Also, be aware of the different uses outlined in IECC Table 505.5.2 because a change in use from one of these occupancies to another would require the installed lighting wattage of that space to comply as well.

If the space had never been conditioned but will now undergo space conditioning for the new tenant then the space shall be brought into full compliance with the code per IECC Section 101.4.5

It is important to become familiar with the scope and applicability of the code to know when a project does or does not have to comply with the provisions set forth within that code.

Q: Is the installation of an air curtain a suitable alternative to the vestibule requirements of 2009 IECC Section 502.4.6?

A: No. Doors opening into spaces greater than 3,000 square feet, that are intended as building entrance doors and not otherwise dedicated to a dwelling unit, guest room, material handling, mechanical equipment or electrical service function, are required to be provided with a vestibule.

Note however, it is at the discretion of the designer to select the path to energy code compliance most appropriate to the circumstances and the owner’s project requirements. Sections 501.1 and 501.2 afford the designer the opportunity to comply with either the provisions of IECC Chapter 5 (in its entirety) or the provisions of Standard 90.1 (in its entirety). More specifically, Section 5.4.3.4 does not require vestibules for buildings in Climate Zones 1 and 2, Buildings in Climate Zones 3 and 4 that are three stories or less in height and <10,000 ft² in area, and Buildings in Climate Zones 5-8 <1,000 ft² in area.

Q: How do you evaluate u-value for store front glazing?

A: The energy code does not allow us to use center of glass u-value. U-value for all buildings is calculated for the whole assembly, including frame, sash, thermal breaks, etc. Because this type of glazing does not come with labels, it becomes necessary for NFRC to either test the glazing or you can use the CMA program to determine compliance based on the different components.

Q: For commercial metal buildings, is there an alternative to the ceiling and wall insulation installation requirements per table 502.2(2)?

A: Yes. Choose the performance patch for commercial metal buildings.

Q: What’s the difference between tradable and non-tradable surface areas on commercial buildings for lighting?

A: Tradable surfaces are surfaces where if you don’t use all the lighting allowed on one of the surfaces you can use the left over on another one of the tradable surfaces. Example: I don’t use all my parking
lighting so I can use it for my canopy. Non-tradable surfaces are allowed a certain amount of lighting and you cannot use the excess somewhere else nor can you use excess from somewhere else on these surfaces.

Q: How do economizers work?

A: In climates like Colorado, where it is hot in the afternoon and we use air conditioning, then it cools off in the evening and the outside air is cooler and we no longer need the chilled air, the economizer would allow for the equipment to bring in the outside air rather than cooling it.

Q: The code requires a light switch in every space. How does this relate to energy efficiency?

A: The light switch isn’t so much for people entering the room as it is for people leaving a room. If you can turn a switch off as you are leaving a room you are more apt to turn the lights off. If you have to go in to another room or go back and turn a lamp off then you’ll more likely leave a light turned on.

Q: My Planning and Zoning department exterior lighting ordinances are different than the code, what do I do?

A: State and local requirements take precedence over this code.

Q: Are green houses exempt from the energy code?

A: Yes. Green Houses are considered a processing type facility that are exempt from both the lighting and mechanical requirements of the IECC.

Q: Are the commissioning requirements found in Section C408 of the 2012 IECC meant to be mandatory or not. The word (Mandatory) doesn’t appear anywhere in the section but it is its own section and it isn’t performance so do they have to do it or not?

A: Because the Commissioning requirements are new, ICC wanted them to be in their own section. The actual requirement for the commissioning comes from Section C403.2.9 Mechanical Systems Commissioning and Completion Requirements, which states that the Mechanical systems shall be commissioned and completed in accordance with Sections C408.2.