IECC Committee Hearing Agenda  
August 15, 2019 2pm-5pm  
City and County of Denver, Room 4i5

1. Roll Call and Introductions

2. Discussion and voting on Chapter C4 of the IECC  
   a. (P83)381: C401.2  
   b. (P82)380: C401.2  
   c. (P167)485: C402.5.1  
   d. (P67)365: C404.2.2  
   e. (P129): IECC Section C405 (updated version as of 8/12)  
   f. (P58): IECC Section C405.1  
   g. (P65): IECC Section C405.2.7  
   h. (P62): IECC Tables C405.3.2 (1) & (2)  
   i. (P96): IECC Section C405.3  
   j. (P94): IECC Section C405.4 WITHDRAWN  
   k. (P54): IECC Section C406  
   l. (P43): IECC Section C406.1 and C406.2  
   m. (P61): IECC Section C406.12  
   n. (P55): IECC Section C406  
   o. #6: IECC Section C408.2.4.1

3. Discussion and voting on Chapter C5 of the IECC  
   a. (P56): IECC Section C502.2  
   b. (P168): IECC Section C502.3  
   c. (P57): IECC Section C503  
   d. #161: IECC Section C505.1

Please note that any items that we do not get to in this hearing will be automatically transferred to the next scheduled hearing date and will be the first items on the agenda for that hearing.

Denver 2018 IECC Committee Hearings

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https://global.gotomeeting.com/install/375634997
Proposal # P83 (Previously Tabled)
The purpose of this proposal is to limit ASHRAE Standard 90.1 compliance to the Appendix G approach and to ensure that the ASHRAE compliance path meets Denver’s energy code goals.

Public Testimony in Support: Proponent – Trying to simplify compliance paths. Eliminate some of compliance options so they don’t have to be updated and for remaining paths so they can be synchronized. This deals specifically with compliance paths in ASHRAE 90.1. Removes prescriptive and Chapter 11 modeling paths as options. Retains Appendix G approach for compliance, adds to performance cost index approach in 2016 adds to that a source-based approach. The purpose of that is to eliminate disadvantage with all electric buildings.

Public Testimony in Opposition: None

Questions from the Committee to Proponent:
1. Is it correct when making amendments to the IECC we effectively already made it that an ASHRAE path is going to be a different building performance than an IECC path?
   a. In base code all compliance paths lead to different energy outcomes. If Denver updates IECC without modifying Appendix G it will create a larger problem.
2. With this proposed amendment there are discrepancies between different paths and ultimate outcomes for buildings.
   a. As long as paths have different methodologies, they will lead to different energy outcomes.
3. Did this pass in the 2021 National Hearings?
   a. This was not proposed nationally because it pertains specifically to needs in Denver.
4. Will the software to comply with Appendix G need to be changed?
   a. No, the modeler will just report a different set of results.
5. How are we able to make this change when we are not allowed to amend ASHRAE 90.1?
   a. It is possible to take these revisions and put in to IECC code language that directs user how to use ASHRAE 90.1.

Original Motion: As-Submitted (AS); A/S with Intent to Modify (ASM); Disapprove (D)

Committee Discussion:
• Concerns about this amending ASHRAE 90.1 or being brought in to the code to direct users.
• Even if the technicality was resolved, there is a concern about using two codes back and forth. Don’t think we should shut out the path.
• Agree with promoting electric energy, but unsure this is the correct way to address.
• Series of discussions with energy modelers and stake holders regarding modeling we wanted 4 paths this code cycle, Appendix G, Appendix G using source, C407, C407 using EUI. Concern about the stakeholder’s input being opposed here with this proposal.
• Some resistance to idea of limiting the paths that the industry can choose, that with idea that larger buildings rely on gas right now. Until there are no more efficient technologies, some buildings would go to ASHRAE without this and it would be more economical for them.
• Denver did not agree to take out the prescriptive path. Committee believes this was a drafting error.
• This is to give a realistic credit to electric energy consumption. It would equalize the playing field.
• Under 2018 IECC if you want to go performance you can do IECC C407 or ASHRAE energy cost budget method or ASHRAE Appendix G, attempting to align those, give more options to comply. Worried that C407 may not feasible the way its written.
• Committee discussed that modeling community just doesn’t know enough about the paths of compliance to say one would be used more over the other, that’s why the 4 paths were proposed.

Committee Motion to Table: Would like to see NBI add the prescriptive option back in, and to see IECC language being modified instead of ASHRAE 90.1.

Vote: 12-2 Passes

Additional staff or committee comments for the record:
Shaunna, Sean, Katrina and Elizabeth will work together to bring this back.
**Proposal # P82 (Previously Tabled)**
The purpose of this proposal is to limit the number of compliance paths available in order to improve the consistency of energy outcomes among various compliance paths and to improve the usability and enforceability of the code.

**Public Testimony in Support:** Proponent – This is based on the stakeholder process, one thing stakeholders wanted to see out of modeling paths. These (P82&P83) address 2 modeling paths available, but different energy metrics. With C407 desire was to neutralize some of the non-modeling differences between modeling paths. ASHRAE 90.1 has requirements for energy metering and switch receptacles that aren’t in the IECC. That can drive which path to take. Stakeholders wanted monitoring requirements brought in to the IECC to neutralize those differences. Bulk of changes are around energy metering and monitoring, takes ASHRAE 90.1 metering language and requirements, and then converts it to I code language. It also adds in to compliance report that projects report their site EUI.

401.2 requirement is now 66 percent of the standard reference design building. Number proposed represents change in code stringency required for C407 in order to meet Denver’s goals.

**Committee Discussion:**
Idea that this and P83 be brought together for 1 modeling proposal. Need some more discussion on mandatory minimums.
Questions about 66% before or after Green Buildings Ordinance, that needs to be addressed as well within this proposal.
The idea here was that any modeling path would be calibrated to equal prescriptive path at the end of our process. 66% could change depending on what we decide in the other paths.
If we standardize all of the mandatory requirements aren’t, we taking away their options?
   Only trying to standardize mandatory requirements for performance paths. Heard from modelers that mandatory minimums are a loop hole and we should standardize the things that actual do conserve energy. Iva

**Committee Motion:** Table this until August 28th
**Vote:** Passes 10-0-4

**Proposal # P167 (Previously Tabled)**
This amendment basically codifies what has been standard practice in Denver for years, as code officials have looked the other way and not enforced the air barrier requirement at heated plenums. This amendment would align the rules around heated plenums with that of ASHRAE 90.1.

**Public Testimony in Support:** Looking to solve challenge with heated plenums between parking garages and conditioned space above. Where it is a challenge to get an air barrier in to a drop ceiling. Pulled ASHRAE language regarding semi heated spaces. Semi heated space under ASHRAE 90.1 2016 is a space that uses between 3.4 and 12 BTUs per square foot for heating. Proposing to allow drop ceiling to not have air barrier requirement instead have the space follow rules for semi heated space per ASHRAE. This then qualifies the slab as a semi exterior space. That space does need insulation, so we propose splitting insulation and putting R5 at Slab and R19 at drop ceiling. We reinforced that slab now is where air barrier continuity must be carried through. Also added ASHRAE language about how flexible bat insulation has to be supported in permanent manner by support no greater than 24 inches on center. Spoke with contractors and architects, all feel this is doable and a good solution.

**Original Motion: As-Submitted (AS)**
**Reason:** Missing link of real-world conditions, insulation gets moved and we lose energy, good
Proposal # P67
The purpose of this proposal is to discourage the practice of exposed slab edges and continuous slab balconies that penetrate the thermal envelope and to mitigate their energy impact when they are used in buildings.

Public Testimony in Support: Proponent – Stand on reason statement. This is going through 2021 in a modified format.

Public Testimony in Opposition: None

Questions from the Committee to Proponent:
1. Is it floor slab and finished ceiling above slab or below the slab or both?
   a. Intent was floor slab up to the ceiling. Can see where it could be read either way.
2. It’s only the section above and below balcony?
   a. Yes, just section above slab penetrates thermal envelope
3. Is this in ASHRAE 90.1?
   a. ASHRAE tried to do a complicated way to address this problem, it failed so we proposed a simplified change.
4. How do you envision showing or documenting this within COMcheck?
   a. You would have to create those areas (D Rated) as their own wall assemblies. It would complicate how you put it in to Comcheck.
5. You wouldn’t have check box to automatically do it? So, they would have to calculate base U values and then manually D Rate them?
   Depends on what PNNL is willing to do to adjust COMcheck. It could be done by the user, but they would need to D rate it before entering in to COMcheck.
6. If we increase R and U value of wall above and below it doesn’t truly address the radiant heat. Will this truly make the building more energy efficient?
   a. Looking at requirement, it lowers the impact of that thermal bridge, you will have less energy loss through the envelope which would somewhat offset the energy loss. This requirement will likely discourage the practice.
7. Why was this method chosen to D rate the walls rather than include surface area of exposed slab?
   a. We already require that, this is just an addition.

Original Motion: Disapprove (D)
Reason: Concrete buildings will have balconies; this is not a valid argument. To compensate by having a different exterior wall type is not feasible.

Discussion:
- This could be an exponential cost that doesn’t have a large impact on energy savings.
- Seeing buildings now that are putting in curtain walls that may not be the most efficient. This could be accomplished without doing crazy changes to the systems being used.
- Modeling should address thermal bridging but currently it doesn’t address it.
- Committee feels that with city already being at 10% and this adding an additional 10% it is pushing too far.

Final Motion: Disapproval
Final Vote: D 13-0-1

Additional staff or committee comments for the record:
Proposal # **P129 Part 1 Commercial**

Adding new requirements for Electric Vehicle Charging

**Public Testimony in Support:**
- **Proponent** – In 2018 climate action plan released, plan had goals around climate change specifically addressed here are vehicle electrification goals. Goal is 30% electric by 2030 100% by 25. This would add charging stations in multifamily and residential buildings. Home charging is currently one of the biggest barriers to electric vehicles currently. Would encourage work place charging and public charging. Much less expensive to do during new construction, retro fitting can cost 4-8% more per site. Looking to require conduits in place so charging stations can be added later.
- **National Car Charging** – Some older buildings 5 figure cost just to get EV charging retro fitted. Most projects get killed because of the infrastructure cost. Some cities are stating that no gasoline powered vehicles will be allowed after a set point (2025-2030). Mercedes says 2039 will be their last gas-powered vehicle made.
- **Charge Point** – Ports throughout Denver (over 400), in support of these building standards nationwide. This will reduce cost of future charging stations installation. Can result in 70% cost savings in future installation.
- **Tesla** – Engaged in discussions across country, Denver is going in right direction. Studies Tesla has looked at, even at higher cost construction areas this represents less than 1% of construction cost up front.
- **SWEEP** – Other cities through out the country who are adopting these provisions Seattle, Portland, Tucson, Albuquerque, Atlanta. EV ready commercial requirements passed ICC National Hearings.
- **NBI** – This is being seriously considered by several cities in California, they have substantially higher numbers than proposed here, these numbers are conservative.

**Public Testimony in Opposition: None**

**Questions from the Committee to Proponent:**
1. Proposal has both commercial and residential in this proposal, are we voting together or separately?
   - Can vote together or split it up, would be up to the committee.
   
   **Committee would like to split and just vote commercial right now. Proposal was split in to Part 1 Commercial and Part 2 Residential.**

**Original Motion:** *As-Submitted (AS)*

**Reason:** Both in Commercial and Residential in order to compete with the market it will cause older buildings to implement these charging stations which will create a compounding positive affect. The sooner we can get convenience factor up; we will see a rise in people purchasing electric vehicles.

**Discussion:**
- One proponent gave 5-digit cost to modify the building where they don’t currently have these. Not sure this takes a look at which point Level 3 Alteration becomes applicable. (C405.10 Level 3 Alteration)
- Committee concerns with alterations of over 50% of building would need to be upgraded to meet this requirement.

**Final Motion:** *As Submitted*

**Final Vote:** AS 11-2

Proposal # **P129 Part 2 Residential**

**Motion:** *As Submitted*

**Reason:** Same testimony as above.

**Committee Motion:** Table until we get to Residential Discussion

**Discussion:**
Some committee members agree there are components that are different in residential.

**Public:** Instance where homeowner wants to put in but panel is on opposite side, can be huge cost
to install in their garage, having in code can make easier for homeowners to implement with the requirement being in the code.

**Direction for Proponent from Committee:**
How does this affect if you’re adding a 2nd dwelling unit on the property? Committee would like to see more information in regard to this concern.

**Vote to Table:** 14-0 Passes

**Additional staff or committee comments for the record:** None

**Proposal # P96**
The purpose of this proposal is to close a loophole in the IECC that leaves horticultural lighting completely unregulated, which is an especially important omission considering Colorado’s burgeoning cannabis industry.

**Public Testimony in Support:** Proponent – 4% of Denver’s electricity consumptions is accounted for by the cannabis industry, most grows are indoor. 3 phases of cannabis growth. Mothering, Vegetative and Flowering, usually separate rooms for each phase. Flower rooms are 50-60% of the energy consumption and same for lighting. Lighting is 50-60% of total energy consumption, other 20-40% is heating and dehumidification. With this standard at 1.6 there are 2 technologies that meet this Double Ended High Pressure Sodium, which is almost standard practice, other technology is LED’s. This would basically require LEDs in veg rooms. LEDs provide 50% energy savings over fluorescent lighting. 2 main concerns in industry. 1 how it applies to an existing grow 2. How it would apply to an expansion. We would like to propose if you change 10% of lights in grow room standard should apply to replacement bulbs.

Request to delay effective date 1 year to allow workshops to educate growers on best practices and benefits of LED’s and saving energy.

**Public Testimony in Opposition:**
- Live Well – In support for more efficient practices. Electricity is core to manufacturing process. Changing lighting technology is not the same as changing out a light bulb in an office. Horticultural lighting has huge impact on processes. Takes years to vet and adapt new lighting technologies to our process. Could impact all businesses.
- ASABE – American Society Agriculture and Biological Engineers that is the referenced standard in the proposal, it was only published 2 years ago. Measuring fixtures using micro moles per jewel is a developing metric. As it stands this does not consider certain wave lengths of light outside of 400-100 nanometers that affect plant development, as it is calculated now it is an incomplete benchmark. No current studies to determine average lighting efficiency of the industry. Unclear where this would kick in for it to be applicable in alterations. Consideration needs to be made for legacy lighting. Suggested replacements for Single Ended HPS lamps are most commonly used and would be affected by this proposal are Double Ended HPS lamps which cannot just be swapped out with Single Ended lamps. They have different mounting height requirements and higher output which can create challenges or make them impossible to use by certain cultivators. LED’s are up to 5 times more expensive and can drastically change cultivation environment and how the plant grows. It is unknown how this will impact access to rebate incentives that have fueled the movement towards LED lighting in the cannabis space. Currently Xcel overs 30% back on LED purchases, they are calculated based on kilowatt hour savings relative to base line equipment which is fluorescent and single ended HPS lamps. The incentives combined with ROI from power savings have created a large impact on lighting technology advancements as well as sustainability goals. Denver cultivators reduced energy consumption by 8% last year and Denver’s revenue for cannabis increased 4% over that same time. Changing base line, rebates will shrink or disappear. The long-term consequences of mandating this could be smaller business being unable to expand due to the inability to absorb this cost putting them out of business.
• Simply Pure – Lights cannot be simply swapped out; some are vented which means that hot air is being pulled off and directed somewhere else, which means that AC needed for room is needed for the removal of the redirected heat. This would then require AC upgrades. Anything done in these businesses (changing a counter, adding a camera, changing structure to support these lights) requires a modification (zoning), not an easy process and can be a lengthy process. Without years of testing up front we have no data to support this. Feel this doesn’t take in to account the existing facilities. Unclear what triggers the requirements listed here.

• Be Good – A lot of these businesses have original lightning from 2009, this could put some businesses out of business because of the large changes required here. Uncomfortable with the 10% mentioned. Most changes seem to be triggered at 50% not the low 10% mentioned here.

• The Health Center – Change wouldn’t affect us specifically because we are currently using the lighting suggested here. Cost alone to replace in smaller places wouldn’t be able to absorb that cost, lights are not the only things affected here, heating and cooling systems, dehumidification as well as lighting. Need more planned out and a goal to work towards. Trickle affect with failing smaller businesses will affect the entire industry.

• Marijuana Industry Group – Looking at economical impact. Lighting is the wine barrel for wine manufacturer. Concerned about timeline of implementation and unintended consequences particularly with existing facilities. Need to continue this process to create a better plan. Concerned that we don’t understand the full impact of this change.

Rebuttal in Support:
• There is a lot of data and case studies where people switch to LED’s with no impact. Lighting is not a key part of the process.
• You can switch out double ended HCS for a single. We do need to continue the conversations and pay attention to energy efficiencies.

Rebuttal in Opposition:
• Disagree that lighting is not a key part of the process. Spectrum of light and wave lengths are all key points. It takes years to get comfortable with changing lighting and adjust to yields. It is a core piece of technology that dramatically affects the growth process. LED’s lose the head radiant factor for these plants that is so important.
• Disagree with double ended and single ended swap out, not always feasible to install these. Can change dynamics of cultivation operation.

Questions from the Committee to Proponent:
1. In the IECC currently what is measure for efficacy for upgrade package?
   a. Lumens per watt.
2. If we made these lumens per watt, can we convert?
   a. No, lumens are for humans, plants need photons, that are meaningful for plants.
3. Trying to capture energy savings, could there be a way to get to another formula that’s measurable?
   a. Certain measurements may not work for this specific process.

Discussion:
• Code should not impede a business or someone’s livelihood. Industries as big as this need to consider energy conservation. Could everyone work together to come up with a solution that would work for the industry and does have energy savings that the city is comfortable with. Building code doesn’t say we have to implement, and change is immediate.
• Something similar has been proposed by NBI at the national level and NBI does have a lot of research.
• Understand that lighting is crucial to this industry but feel there are ways to address this where everyone is comfortable.
• Would propose that a group get together and look at this proposal and find something everyone is comfortable with, NBI, Carol Pafford, Neil Kolwey, Marijuana Industry, Live Well.
• Would like to see the 1 for 1 swap. It seems this issue is truly with alterations.

Current section proposed only applies to new buildings, alterations would direct you to Chapter 5.
503.6 is the lighting systems for alterations.

Original Motion: Table until September 11th

Proposal # 6
Preliminary commissioning report section is amended to include the Commissioning Compliance Checklist.

Public Testimony in Support: Trying to document in an amendment the commissioning compliance checklist that is currently in policy. This brings the one we currently use in to the code and directs away from the IECC.

Public Testimony in Opposition: None

Questions from the Committee to Proponent: None

Original Motion: As-Submitted (AS)

Final Motion: As Submitted

Final Vote: AS Passes 13-0

Additional staff or committee comments for the record: