1. Roll Call and Introductions

2. Discussion and voting on IECC Staff Block Vote packaged proposals
   (All proposals that are marked with an X on the summary spreadsheet)

3. Discussion and voting on Chapter C1 of DBC-IECC and/or IECC
   a. something

4. Discussion and voting on Chapter C2 of DBC-IECC and/or IECC
   a. #43: IECC Definition and C403.6.1
   b. (P50)348: C202 Definitions: Above Grade Wall

5. Discussion and voting on Chapter C4 of the IECC and/or DBC-IECC
   a. (P83)381: IECC Section C401.2
   b. (P53)351: IECC Section C401.2
   c. (P82)380: IECC Section C401.2
   d. (P43)338: IECC Section C401.2 and C406
   e. (P86)393: IECC Table C402.1.2
   f. (P79)377: IECC Table C402.1.2
   g. (P59)357: IECC Table C402.4
   h. (P52)350: IECC C402.5
   i. (P122)440: IECC C402.5.2.1
   j. (P51)349: IECC C103.2 and C402.5.1.3
   k. (P95)400: IECC C403
   l. (P49)347: IECC C403.3
   m. (P46)341: IECC C403.4.6
   n. (P43)338: IECC C403.6.1
   o. (P133)451: IECC C403.7.1.2
   p. (P126)444: IECC C403.7.4
   q. (P123)441: IECC C403.7.4
   r. (P121)439: IECC C403.7.4 Exception 8
   s. (P125)443: IECC Table C403.7.4(1)
   t. (P124)442: IECC Table C403.7.4(2)
   u. (P47)342: IECC C403.9.6

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.
Block Vote Proposals

Proposal # 9 (Block Vote Item)
Section R202 to delete definition of historic building. This is already covered in the 2018 IECC
Committee ok with this one.

Proposal # 80 (Block Vote Item)
Fuel Burning Appliances not just for space conditioning also includes water heaters. Wording in
Committee Discussion:
Adding service water heating to the language? Yes
Modification: Change “and” to “or”. 2nd
Vote on Modification: Passes 13-0

Proposal # 74 (Block Vote Item)
To simplify the code requirement for economizers/individual fan systems.
Committee ok with this one.

Proposal # 76 (Block Vote Item)
Delete DBC-IECC Section 408.1 (General) due to the IEBC already covering
Committee ok with this one.

Proposal # 5 (Block Vote Item)
This amendment is now included in the 2018 IECC. No need for this amendment on Acceptance
Reports.
Committee ok with this one.

Proposal # 75 (Block Vote Item)
2018 IECC code has changed the numbering sequence of this section, to follow the new code
numbering the existing DBCA should renumber to reference the appropriate section.
Committee ok with this one.

Proposal # 7 (Block Vote Item)
C408.3 Change Title from Lighting Systems Function Testing to Functional Testing of Lighting
Controls.
Committee ok with this one.

Proposal # 345 (Block Vote Item)
Section C501.4 Compliance. Delete the reference to IPMC
Committee ok with this one.

Proposal # 8 (Block Vote Item)
Committee ok with this one.
Proposal # 160 (Block Vote Item) (Pulled for individual Agenda)
The purpose of the amendment is to add an exception to the requirement for increased above-deck roof insulation where the existing exterior wall openings would need to be modified to accommodate the increased roof-height. This Section presently requires elevating existing roof deck doors and infilling openings in walls abutting a roof replacement.

Final Vote for Block Vote Items: AM Passes 13-0
Modify #80 and Pull #160

Proposal # 160 (Previously Block Vote Item) (Pulled for individual Agenda)
The purpose of the amendment is to add an exception to the requirement for increased above-deck roof insulation where the existing exterior wall openings would need to be modified to accommodate the increased roof-height. This Section presently requires elevating existing roof deck doors and infilling openings in walls abutting a roof replacement.
Discussion: Concerns that this proposal may have been replaced.
Motion: Table until June 20th Meeting 13-0

Proposal # 143
Public Testimony in Support: Definition (2-part proposal) Proponent Shaunna – Direct Digital Controls, several proposals brought this in, the proposal that brought in the definition did not pass, so this proposal brings in the definition. Add the wording Direct Digital Control instead of just DDC.
Original Motion: As-Submitted (AS) Definition left out of the 2018 code.
Final Motion: As Submitted
Final Vote: AS Passes 13-0
Additional staff or committee comments for the record:

Proposal # P50
Definition for Above Grade Wall
Public Testimony in Support:
(Proponent) Trying to pull in edges between floor slabs multi family. Heat loss created by slab edges. Would bring it in to above grade walls.
Public Testimony in Opposition: None
Questions from the Committee to Proponent:
1. Is this for all slabs that can penetrate floors?
   v. This wouldn’t be slab on grade, that’s already covered, this would be above grade mass floor. Slab edges uninsulated would be the part that would be covered by this modified definition
6. Is this going to require ComCheck to be updated?
   a. Possibly yes. Hard to say b/c when you do exterior wall for ComCheck you’re supposed to put in that area any way. This will most likely pass is 2021 so ComCheck will have to be updated anyway.
7. Can you speak to how this would be introduced not using trade off speaking specifically to balconies?
   a. There are products out there for insulating balconies it would be difficult to insulate a balcony, you option would be to trade off or insulate.
8. What about Perimeter insulation?
   a. Use mass wall requirement, continuous insulation.
9. Is there anything to address top a bottom because it’s not insulated?
   a. Insulate between floor and balcony. Some type of trade off to get out of this.
10. Would you be a proponent of excluding balcony slab edges?
    a. It would still be a step forward to what you have now, it may make you slightly off

11. Can you go through items line by line?
   a. Everything is consistent with definitions of above grade walls, only thing I would change is strike basement knee walls, these are types of assemblies you could find in a commercial building.

12. In theory we could adopt a policy about slab edge.
   a. Yes.

13. How difficult is it to create that thermal break on balconies?
   a. It’s a cost thing, cost savings. It should be included because it is an energy loss. This is a big gap.

b.

Original Motion: ASM As Submitted with Intent to Modify
Modification: Remove the basement knee walls. Just take out “and basement”
Vote on Modification: Passes 12-0-1
Final Motion: A/M Elizabeth – Read current definition Above Grade Walls and Building Thermal Envelope. I feel like that addresses concern; it addresses everything in those 2 definitions.
Committee Discussion:
This is a way to create a prescriptively compliant building.

Everything vertical above grade is a wall,

Maybe this is an enforcement instead of definition. When architect draws their line around their building thermal envelope everything it touches is a part of thermal envelope, so it is already covered. Could still do Com check and comply

Might get missed with prescriptive check, other things are not integral part of this conversation. They would be forced into another method.

Because this says “this includes” it’s just a clarification, I wonder if there’s a downside to including this clarity.

Other words within code that point to this already, idea is good, but code already addresses.

Italicize Building Thermal Envelope.

Clarify exterior walls

Final Vote: A/M Passes 8-4-1
Additional staff or committee comments for the record:
Editorial Change: Italicize Building Thermal Envelope.

Proposal # P59
Public Testimony in Support: Table C402.4 Proponent – This proposal reduces the table down to only Denver climate zone; also recognize the fact 4 story building you can install different U factor window. You can comply with fixed fenestration, U Factors designed for that type of install. More efficient window that mimics what we are seeing for low rise bldgs. Group R occupancy requirement, they are the same right, issue is on windows, worse window low vs high rise. Glass % is going up in multifamily buildings, energy loss is significant. SHGC keeps same values, just reduces to Climate Zone 5 just makes it easier to use.

Study in multiple stores for residential windows .30 no issue in this area. .32 as well. That shouldn’t
be a concern about these being readily available.

Public Testimony in Opposition: None

Questions from the Committee to Proponent:
1. Are you asking to delete all other climate zones?
   a. Yes, this would shrink down the table to Denver climate zone.
2. Is .38 and .45 what is in now?
   a. No change from 2015 This proposal only to add that new category. Can overlay any other fenestration proposals that come in.
3. Should the .63 be .77?
   a. Was not intended to be changed. So, yes .77 should be correct.
4. Is this saying no more hunched aluminum windows?
   a. The U factor table is base code. You could put in punched metal windows, but they would have to be traded off. Not hitting the .30 with these windows, you would either need a different window or trade it off somehow
5. Is there a reason why we wouldn’t include all metal windows under fixed fenestration?
   a. If it’s fixed fenestration it would still be .38
6. Is there a reason why we would exclude punched operable windows?
   a. We were focused on punched operable not punched fixed. Could amend to be punched fixed/operable. Did go through the vote like this in Albuquerque. Punched openings would be ok to add.

Committee Discussion:
Sometimes we need metal for structural, very clear that their intent between fixed and operable was to keep metal windows getting a lower U factor.

If you wanted to modify you could add structural that you’re looking for. Type AW to include punched openings.

Original Motion: A/S with Intent to Modify (ASM)
(Use definition for Structural Metal Windows)
Vote on Modification: Passes 12-0-1

Discussion:
Like overall changes, windows are being made a lot more efficient. Big percentage of our buildings that will be impacted, don’t want to punish those high rises that need metal windows for structural.

AW is the predominant national perspective structural standpoint. Main Motion A/M 12-0 (1 abstain) Passes

Final Motion: A/M

Final Vote: A/M Passes 12-0-1

Additional staff or committee comments for the record:

Editorial Change: Need and or, change title

Proposal # P95
Add new requirements to the code to address dehumidification efficiency for indoor horticulture.

Public Testimony in Support: Proponent - In general industry is for getting energy codes on the books for sustainability impacts. We think this amendment is a good start.
Questions from the Committee to Proponent:

1. Are we just calling out cannabis, are you not intending for this to incorporate other things?
   a. We were asked to put this together specifically for cannabis.

2. Have you brought this to entire cannabis industry? Are we adding additional requirements to the industry that they are not in favor or?
   a. Can’t answer that.

3. Are we going to affect their process with these proposed changes?
   c. Can’t speak to that, intent is for new buildings and alterations.

4. How does this affect hydroponics?
   a. Dehumidification is huge part of condition process of the environment. To achieve that process, it would need to be mechanically.

Committee Discussion:

If you’re growing in hydroponic is it unrealistic to think it’s cost effective, we can grow plants that way in Denver. We would be taking an industry out in Denver. This amendment eliminates electric resistance dehumidification, worst energy intensive for dehumidification, plenty of other options.

If you’re growing in water and now must dehumidify at a higher level it is going to be cost prohibitive.

General concern is that it’s odd to have an amendment for one industry. Looks like we are targeting the cannabis industry negatively.

Public Support: (Proponent) – Idea is that for grow operations that don’t have integrated systems that don’t take advantage of heat recovery systems. If you don’t have it’s generally much more efficient to have stand alone in flower rooms.

Discussion with Proponent:

If you’re saying when someone provides dehumidification this is the requirement are, we requiring dehumidifying?

All grow rooms must use some type of dehumidification. Trying to avoid bad design of using inefficient cooling.

Why would we propose a change for only one industry?

Indoor agriculture has different cooling loads than a standard building, Written based on cannabis specific lighting. 12 hours on. Different challenges. Can’t answer for all indoor agriculture. Maybe something to think about, didn’t write that.

In general, this is a lengthy proposal, it would say when dehumidification is provided with separate units. Reformatting could make it more code friendly.

2 liters per kw, 2nd part of that reads allowed to use something less efficient if you’re using a non-standalone dehumidification method, peak or back up emergency?

Proponent: We added this based on comments from design engineer, sometimes if you have a fancy system then sometimes you wouldn’t design that system to handle the whole thing, you
might want to use some conventional re heat. You could design to do part conventional with this amendment. Emergency is if something fails you use the conventional as back up.

Ask for clarification: Define peak time, and emergency. Motion to table ask proponent to bring back with more clarification.

Motion: Table until June 20th Daniel -2nd

Proposal # P49
Public Testimony in Support: Basically, VRF has simultaneous heating and cooling req, this is asking to remove economizer function which is a big energy saving in Colorado. Proposal is flawed. Most bldgs. Cooling between 30-45 not able to use site recovery heating you’d really want economizer. VRF often not doing heat recovery, just doing heat pumps. Systems are small, break up larger buildings into zones making simultaneous heating and cooling not happening.
Public Testimony in Opposition: None
Questions from the Committee to Proponent:
Committee Discussion:
Could be performance and not be required economizers.

Would this be better to modify removing #6
Maybe just modify the current section in base code.
That would make more sense than a blanket exception.
Original Motion: A/S with Intent to Modify (ASM)
Modification: To modify Exception 6 and not add an Exception 7.
Heat Recovery as approved by the building official.
Motion: To Table until June 20th Passes 13-0

Proposal # P46
The purpose of this code change proposal is to encourage optimized Delta T for water-chilling package system designs.
Motion: To Table until June 20th Passes 13-0

Proposal # P43
Motion: To Table until 406

Proposal # 43
Public Testimony in Support: Approved definition, just adding wording for DDC Direct Digital Control. In line with what we did earlier.
Public Testimony in Opposition: None
Final Motion: AS
Final Vote: AS Passes 13-0
Additional staff or committee comments for the record:

Proposal # P133
Public Testimony in Support: Proponent – Ventilation air is important but expensive, unit delivers more air flow to the space. By measuring or displaying air flow can be minimized. Sensors get more expensive, incrementally. $per CFM drops as unit gets larger. 400 CFM 5 year pay back, larger units even better, more savings to bldg. owners. Monitor air flow gives your quicker diagnostics. 66% in winter demand energy, less fan output. Good pay back, good carbon reduction. Air flow stations required on VAV but not on makeup air or DOAS units.
**Public Testimony in Opposition:**
Concern is that air flow monitoring systems not put on all units, not sure how many do that, but form our prescriptive would take a lot of our equipment out of the market. Pretty expensive, not something we tend to put in smaller A/C and high efficiency ones.

Rebuttal: Only on makeup air and Dos units, already required on other units. Wouldn’t be 5-ton strip mall unit, just make up air.

Re Rebuttal: Different interpretation, weren’t under impression VAV need to have air flow monitor. Applicable to every unit was our interpretation. Different scope understood that what was just described.

**Questions from the Committee to Proponent:**

1. Over ventilating in DOAS and make up air units, is this from oversized or not balanced correctly?
   a. Not that they aren’t balanced. A fan is a constant volume device, fan is always moving, when it’s -5 there 17% more molecules gets you 17% more volume in the air. Control fan to correct volume, read it or monitor it.

2. Adding complexities to already complex systems. Is this going to be more challenging for those already complex systems, problematic like light sensors until they don’t work, if they go down how does it affect the system?
   a. 30% of the market on all VAV units have to by code have an air flow monitor, widely adopted technology. Most building with any size they already have them.

3. If it goes down, you have a section of the building affected?
   a. Nothing would happen, unit would continue to run.

4. In terms of energy savings that sensor reading incorrectly or not working could be a problem?
   a. It would revert to minimum set point, no worse than it is today.

5. Can you explain Provide fault on excessive outside air; 2 options tied to display?
   a. Manually be resetting the unit above or below air flow or through VAV VFD intent to allow both standalone without interface to DDC. Provide Fault- If above how much it’s supposed to be it will have a signal. Open to rewording.

6. Are we also asking for this to apply to make up air for restaurants?
   a. Yes, anything above 4000 CFM makes sense. 5 year pay back.

7. Can you speak to the testing and balancing complexities harder or easier?
   a. Should be easier, depends on the system should be able to open the door and look at the display. Coming back 3-4 years later you don’t know what’s going on. Having display is a huge troubleshooting help.

8. Issue with location of air flow sensor, manufacturers have x number of runs. If you don’t have a great section of straight, they really don’t do much. What would you suggest?
   a. Hadn’t thought of that. Could try to put in duct work if you had straight run, but common to put them in the outside air flow.

9. Are you seeing most units of this size have VFD’s of this size?
   a. Everything we see has VFD’s.

10. Some language for VAS has been updated, would you be open to changing to align with new language?
    d. Maybe to DDC.

11. Having it in outside air, could we not measure it easier?
    a. Yes
12. Why is this specific to Denver?
   a. Helps us get to goal of Net Zero.

*Committee Discussion:*

*Discussion:*

Original Motion: **A/S with Intent to Modify (ASM)**

Modification 1: Change BAS to DDC to match the definitions more clearly based on prior action.

**Vote on Modification: 13-0 Passes**

Modification 2: Take out “as measured and controlled by an airflow station” Feel it is already covered above. Just gives you options to have stand alone or fan or downstream of fan.

**Discussion:**

We don’t believe we need to put outdoor air measuring but means to control outside air. In favor of following IMC.

If you don’t have that language what would you use instead.

Read section from IMC Committee concerns about dampers vs VAV measures.

Code doesn’t address single zone VAV. Need to make sure ventilating correctly.

Amendment needs a measurement.

Don’t believe you have to measure, just increase outdoor air to take care of that situation. Why it doesn’t say measure in IMC.

This reads in a way inconsistent with proponents’ intent. Display could be taken out. We would be mandating this automated correction. “Measure and Maintain”

**Modification 3:** DDC and measure and maintain flow rate of outdoor air, at a rate...

**Vote on Modification: 13-0 Passes**

**Discussion:**

Why limit to those 3?

Intent was pressures are changing where you have high outside air, those 3 units where its really applies.

IMC is already stricter other than this display portion, includes all VAV.

Daniel – Modify for last sentence to be Exception #1 to this section.

**Modification 4:** Editorial Make up air units no apostrophe.

**Vote on Modification: 13-0 Passes**

**Discussion:**

At least you have a reading, if you struck that it gives people more options depending on building type.

Controlled is no longer in there. We need to keep maintained.

Doesn’t read and we can’t enforce maintaining it.

Doesn’t mean maintenance, means a duration.

Won’t maintain flow rate.

If it’s automatic it will but it won’t manually.
If we take out maintained, you’re not forcing them to comply. Not solving the problem.

Daniel – Intent of proposal is not to have to report.

If you’re measuring monitors manual or auto, you need the word maintain

How about regulate?

Better matches intent to take out and add display or report.

Intent is if you have display you can read a value. Either way you get a visual read out.

Simple output 0-10 signal that could control variable speed drive. More complex.

**Motion:** Motion to Table and work with Mike to bring something back. - 2nd – 13-0 Passes