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C-TRAC
Meeting # 4
Topic: IgCC Chapter 5 and 6
Wednesday June 16, 2010, 3 – 5:30 pm

PARTICIPANTS

Utilities Green Building Team

Amanda Sutton – Green Building Program Coordinator
Felix Lee – Green Building Code Project Manager
Gary Schroeder – Energy Engineer – Commercial GB Code Review

Facilitator

Susanne Durkin-Schindler

C-TRAC Members in Attendance

Company	Representative
Aller Lingle Massey Architects PC	Brad Massey
Beaudin-Ganze Consulting Engineers	Corey Rhodes
BHA Design	Angela Milewski
Bellisimo Inc.	Gino Campana
Dohn Construction	Doug Dohn
Institute for the Built Environment	Josie Plaut
Greg D. Fisher, Architect	Greg Fisher
Trane / IFMA	Matt Horner
Architecture West	Steve Steinbicker
PSD	Pete Hall
Bella Energy	Rick Coen

Building Officials

City of Longmont	Chris Allison
City of Fort Collins	Russell Hovland

Key Points:

Updates:

City Council Work Session - July 13th.

ICC 2009 Code Adoption

The City of Fort Collins building department is adopting the 2009 I-Code package. The green building team and building department are going to be working together to present an integrated approach to council. The I-Codes have been under review for over a year and the City would like to get those adopted and in place as soon as possible. The City is currently operating under several different code versions which is confusing. Adopting the 2009 I-Code package will eliminate confusion and update all of the codes for the City.

Process Review and Discussion

The committee gave staff a lot of constructive feedback at the last meeting. Staff would like to go over some of the key points from the last meeting to make sure that all comments were included.

Key Points from the previous Meeting:

- Green building is important and should be included in City building codes.
- The current templates have some very strict requirements that, if mandated, may have a negative impact on businesses due to increased construction and administration costs.
- The IgCC is a new code that is still under review by the International Code Council. Some of the requirements are still vague which make them difficult to implement, verify and enforce.
- Code needs to be effective and have an impact. Need to focus efforts on requirements that will be the most effective in helping the City reach community goals.
- Green building should be a fun, creative process. Should not mandate so much that it becomes a burden and limits creativity and innovation.
- If the green building code template is adopted as is it has the potential to create a large amount of work for the City's building department as well as the builders in the community, especially in the areas of documentation and verification. This could result in increased costs or longer permit review times or both.

- We have identified several areas in the land use code that should be updated or amended. It may make more sense to start with amending the existing codes and then having a broader set of electives.

Recommendations:

- Update identified Land Use Code sections to support green building.

- Have a more limited green building code that supports the 2009 I-codes. Make amendments to the municipal codes using the IgCC as a template to pull sections of value out of.

- Have parallel green building codes for both residential and commercial. Right now the templates are in very different formats which may be confusing.

- Education and Training is going to play a large role in this process.

- Providing financial incentives for projects is going to be difficult due to the current City budget. Need to consider incentives that provide flexibility to "green" projects.

Staff is proposing that we change our process to mimic the discussion from the last meeting. Staff will do an initial review to identify the "keepers" in the code. The TRAC will provide feedback. The "keepers" in the code will include both basic best management practices as well as the "low-hanging fruit" practices that will have the biggest impact for the dollar spent.

Committee Comments:

- Need to be clear about the requirements that are associated with each section and the cost impacts on both the City and the builders. For example, the green code talks about keeping construction materials clean and dry.
    - What will the documentation requirements be for making sure materials are covered and taken care of?
    - Will this be a box to check or will documentation need to be provided?

- Need to be careful about how the code review process is going to impact the builders financially and administratively. Don't want an onerous process but it needs to be verifiable and enforceable.

- Verification is important. If we do not verify that these requirements are actually being done, what is the point?

- The design and construction administration costs for projects may increase as projects become "greener." The design costs are higher to ensure that buildings are being done right in practice and not just on paper.

- These same arguments can be made for the codes that are currently in place. Just because it may be difficult to implement at this point does not mean that we should not do it. All codes have to start somewhere before they become common practice.

- Even if the code only has a few required elements and a lot of electives the City would still need to have someone review the documentation to confirm that those electives have been implemented. An option could be to use the LEED verification system and require all construction to reach a certain level of LEED certification. Use the third party verification system that is already in place. Don't want to make the building officials have to become LEED reviewers when there are already entities that exist to do this. LEED uses review teams of up to approximately 6 people, each with expertise in specific areas. This would be difficult for the building department to duplicate.

    - If we went down that path we would need to consider the size of a project and have an opt-out option if it is not feasible for a project. There are several cities that have adopted this type of program where buildings can be certified by a third party verification system that is authorized by the building department.

- Another recommendation could be to adopt a few of the "low hanging fruit" items without electives. Then offer rebates for people who get a LEED certified building. That encourages people to go above and beyond if they want to. Even if we have all of these electives the building department would still need to be able to verify them. It doesn't reduce the need for resources. One option could be to provide a rebate to offset some of the costs associated with LEED certification.

- There are contractors that do not know anything about green buildings, contractors that try to skirt the rules, and contractors that know all about it. We need to be careful to not exclude the smaller contractors and make it extremely difficult for those contractors to do business in Fort Collins. We should not require that every project has to hire a LEED consultant.

- It is going to be difficult for the inspectors to keep up to speed on all of the new technologies that are coming out for buildings. If we require commissioning we are going to need to have a third party complete that

verification. A building is only new once, need to remember that the building will get turned over to the owner and they need to know how to maintain the systems.

- Need to keep in mind the size and scale of the project and all of the layers of people that will be needed to make these projects happen. Can we afford to elevate the per sq. ft. building costs for our community? Need to keep thinking about how this code will affect the market. We don't want to make it so expensive to build in Fort Collins that people can't do business.

- Electives may offer a fall back plan if the builder messes up or can't accomplish something. Things change as the construction process goes forward. The code may need to have some flexibility if we require a certain number of electives to be achieved. One issue could be that not all electives are equal. Some are easier to achieve than others. How do we account for that?

- Is there some type of grading system that can be used for contractors where they can be rated and rewarded for doing a good job? They can then use that for marketing purposes. Some type of better business bureau type rating system.

    - This may be difficult for the building department to enforce. Also, the contractors may not have control over what is done on the project. The owner tends to dictate what is ultimately done on a project.
    - There could be a City Web site that offers recognition by putting the builders on the web site who do some number of electives, for example. Builders who are building green get free publicity from the City. Climate Wise shows that free marketing is an effective incentive for businesses.

- Whether a measure is a requirement or elective, it still requires resources to administer.

- There are certain municipalities that are offering incentives through property taxes. Getting a credit on building green. This won't hurt the city because it is new revenue coming into the city. One year the owner gets a rebate of 75% on property taxes, then 65% the next year and so on until you get back to a point where they are paying all taxes.

- The general direction the committee is going is to choose the important items from the green building code (IgCC) and amend the existing building codes. Then look at implementing an elective based program

where there are a minimum number of electives per project OR a LEED verified system with a minimum size requirement where the project has to reach a certain level of LEED certification.

- This process will still be worthwhile because the committee and staff will be able to figure out what the minimum requirements are that should be included in the code and what should be electives. Then decisions can be made to determine how that program is going to be run.

Chapter 5 Discussion - Felix Lee

Mercury lighting:

This requirement is focusing on the mercury content in lamps. Low-mercury content lighting is a technology that is readily available and used in the market already. Putting it in the code would give the City something to reference in the situation where someone brought something else in that was less efficient.

Committee agrees that this should be included in the code.

Storage and Handling of Materials:

This requirement is focusing on how materials that are going to be used in the building are stored and handled on a construction site. This is something that most builders are already doing, but it is not currently in code. Again, putting this item in the code would give the City something to reference if necessary.

Committee agrees that this should be included in the code.

Building Service Life Plan

This requirement is asking for a building service life plan of at least 60 years to be included in the documentation for the building that describes the estimated service life of the building as designed. The intent is to build buildings that are going to last longer than 25 years.

City staff is looking for feedback from the committee on this requirement. Is there a way to certify the life of materials? How can you say that a building is going to last 200 years?

Committee Comments:

- This section may fit better in the Operations and Maintenance chapter.

- Builders have found that some material information can be difficult to get from the manufacturers. The installation, maintenance and use of a

product can influence its performance. Also, there are a large number of materials that are used in construction. It would be a huge undertaking to document the estimated lifespan of all of the materials used in a project.

- The intent of this requirement is really good and should not be tossed out but it may not fit as a requirement to meet code. There are building systems that last longer than others. It may be beneficial to come up with a list of materials that last longer.

- This may be too subjective to be included in the code. Everyone has a different idea of the full life expectancy of a material.

This section should be kept as an elective. It is also addressed again in Chapter 9 of the IgCC.

Multi-story building project electives

This elective is encouraging the stacking of stories instead of a single story design.

Committee Comments:

This is something that is going to be determined by land and project costs and owner preference. It does not seem like something that builders would do to get the elective credit and it should be removed from the elective list.

Construction Waste Management

The intent of this requirement is to divert construction materials from the landfill. The base requirement is set at a 35% diversion rate. To get the elective credit the builder must go at least 20% above the base requirement.

Committee Comments:

- Should another elective be added to the code that requires another 25% above the 55% diversion rate elective? There are some projects that have reached higher levels of diversion and this elective would encourage that.

- This section may require too much documentation as written. We could simplify this requirement by saying that all projects must have waste recycling on the site. Infill sites can still have off-site recycling. This way it could still be included in the code, but it is easier to verify and enforce.

- Another option is to require a plan before a permit is issued for demolition or new construction. How are you going to recycle the materials? You have to have a plan to recycle or you can't get the

permit. This could just include basic materials like concrete and steel at first and then become more inclusive as the market catches up.

- Another idea is to require the builder to pay a deposit that is refunded after the project reaches a certain diversion rate. This would not slow the process down, and would encourage recycling without having to provide financial incentives.

- This is a topic where additional education and training needs to be provided. This may be as simple as having an additional handout with resources listed that is given to the builder with their permit.

Introduction: Chapter 6 - Energy - Gary Schroeder

See Appendix A for presentation

Staff would like to give the committee a brief overview of Chapter 6 which is the Energy chapter of the code.

The current commercial energy code is ASHRAE 90.1 2007. The building department is working on the adoption of the 2009 I-Code package which would include the 2009 IECC. Part of the IECC states that you can use ASHRAE 90.1 as an alternate compliance path.

The IgCC template is using the 2012 IECC as a reference point. This makes it difficult to know what the baseline will be. Staff is working with the ICC and building department to figure out the best way to integrate the IgCC with the 2009 IECC.

In chapter 6, there is a prescriptive path and a performance path. The performance path applies to buildings that are over 25,000 sq. ft. Buildings smaller than that can choose to comply with either the performance path or the prescriptive path.

The IgCC introduces a new concept of representing energy savings called, Total Annual Net Energy Use (TANEU). TANEU is defined by the IgCC as "A ratio representing the energy performance of the *proposed design* compared to the energy performance of a *standard reference design*." This can be determined by equation 6-2 in the code book. This concept will be discussed more in the next meeting.

Chapter 6 also allows the jurisdiction to choose to require sections on CO2e emissions calculation and reporting, lower TANEU targets, and post Certificate of Occupancy TANEU and CO2e reporting.

At our next meeting the committee will provide feedback on sections in Chapter 6 as well as have a higher level discussion about how to integrate the IgCC with the 2009 IECC and what TANEU level should be targeted for green buildings in Fort Collins.

Homework:
Review Chapter 6 in the IgCC.

NEXT MEETING
June 30th – C-TRAC Meeting #5:
3-5:30 p.m. City of Fort Collins Streets Facility

Appendix A

Staff Presentation

IGCC Chapter 6 Overview and Context

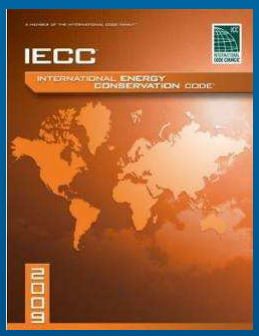
Energy Conservation, Efficiency, and Atmospheric Quality

C-TRAC Meeting
June 16, 2010

City of Fort Collins

Energy Code Change

- Current commercial code is ASHRAE 90.1 – 2007
- 2009 "I-codes" package being considered for adoption in Fall 2010
  - Includes 2009 International Energy Conservation Code (IECC)



City of Fort Collins

IGCC and Energy Code

- Public Version 2.0 of IGCC due November 3, 2010
- Final version of IGCC published early 2012
- IGCC Chapter 6 foundation will be IECC 2012

IGCC Chapter 6 Compliance Paths

- Buildings > 25,000 SF must use Performance-based compliance path.
- Buildings ≤ 25,000 SF can use Prescriptive or Performance-based compliance path.

Prescriptive vs. Performance

Section	Description	Prescriptive	Performance
604	Energy Metering, Monitoring & Reporting	x	x
605	Automated Demand Response Infrastructure	x	x
606	Building Envelope Systems	x	
607	Building Mechanical Systems	x	
608	Building Service Water Heating Systems	x	
609	Building Electrical Power & Lighting Systems	x	(x)
610	Specific Appliances & Equipment	x	x
611	Building Renewable Energy Systems	x	x
612	Energy Systems Commissioning & Completion	x	x

(x) = 609.6 Plug load controls only

Total Annual Net Energy Use (TANEU)

DEFINED. A ratio representing the energy performance of the *proposed design* compared to the energy performance of a *standard reference design*. Determined by **Equation 6-2**.

- **TANEU = 77 x (PD - RE - WE) / RD**
- PD = Annual energy consumed by *proposed design* on site
- RE = Annual energy savings from *renewable energy* on site
- WE= Total annual waste energy recovered on site (CHP, Cogeneration)
- RD = Annual energy consumed by *standard reference design* on site

TANEU Example

Reference Design (RD) = 10,000 kBtu/year
Proposed Design (PD) = 9,500 kBtu/year
Renewable Energy (RE) = 400 kBtu/year
Waste Energy (WE) = 0

TANEU = 77 x (PD - RE - WE) / RD

TANEU = 77 x (9,500 – 400) / 10,000
= 77 x 0.91
= 70 (meets minimum compliance for IGCC)

TANEU Relationships

Version	IECC	IGCC
2006	100	N/A
2009	85	N/A
2012	77	70

Peak Demand

- Proposed Design peak energy demand not greater than 0.90 times that of Reference Design

Other considerations for Jurisdiction
(from Table 302.1)

- CO_{2e} emissions calculation and reporting
- TANEU of jurisdictional choice – enhanced energy performance (63 or less)
- Post C. of O. TANEU, energy demand, and CO_{2e} reporting

High-level Topics

- Coordination/timing with IECC 2009
- TANEU targets

Fort Collins Green Building Program