

**PLANNING AND ZONING BOARD
WORKSESSION AGENDA**

Friday, September 6, 2013, noon to 5 pm

NOTE: Worksession will be at Traffic Operations: 626 Linden Street

<p>Web users: Documents for the Consent and Discussion Items shown below can be found under September 12, 2013 hearing agenda.</p> <p>Consent: None Discussion: 45 minutes.</p> <ul style="list-style-type: none">• Midtown Plan (Bolin) <p>Worksession 15 minutes</p> <ul style="list-style-type: none">• Lincoln Corridor Update (Wray & Lewin) <p>BOARD TOPICS: 4 hours</p> <ul style="list-style-type: none">• Transportation Topics: Traffic Impact Study, Master Street Plan, Multi-Modal Master Plan with Guest Ruth Rollins – 90 minutes• 2012 ICode Update (Gebo) – 60 minutes• Debrief of August 8 Hearing• Debrief of City Council August 20 TOD Discussion (Kadrich)• TOD – Summit Update (Kadrich)• APU Citizen Task Force• Other	<p>City Council</p>
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Planning and Zoning Board September 6, 2013

Introduction for Adoption:

2012 International Building Code (IBC)
2012 International Residential Code (IRC)
2012 International Mechanical Code (IMC)
2012 International Fuel Gas Code (IFGC)
2012 International Energy Conservation Code (IECC)

Overview:

National building codes and standards are reviewed every three years and voted on by construction industry professionals from across the country under the oversight of the *International Code Council (ICC)*. The latest publications resulting from the ICC are the proposed *2012 International Codes (I-Codes)*

Since 1924 the City of Fort Collins has updated and adopted the latest nationally recognized building standards available for the times.

The proposed 2012 International Codes represent a comprehensive, fully integrated body of codes regulating building construction and systems using prescriptive and performance-related provisions. The purpose of these codes is to establish the minimum requirements to safeguard the public health, safety and general welfare by regulating structural strength and stability, sanitation, light and ventilation, energy conservation, and property protection from hazards attributed to the built environment within the City of Fort Collins.

Background:

In August 2012 a committee of volunteers from across the Front Range construction industry including designers, architects, builders, building officials from neighboring jurisdictions, fire officials and trades people convened to review current local amendments and significant changes in the new 2012 I-Codes. A stated goal of the committee members was to promote consistency in construction codes along the Front Range by supporting jurisdiction's adoption of the 2012 editions within the 2013 to early 2014 timeframe. Additionally, the members agreed to assist the construction industry through promoting consistency in codes across jurisdictional lines by limiting local amendments where possible.

2012 International Building Code (IBC): Minimum standards regulating construction of all commercial and multi-family projects. *(The review committee concluded that there are no significant changes in the 2012 IBC considered to be controversial or overly expensive to new construction.)*

2012 International Residential Code (IRC): Minimum standards regulating construction of all single-family, duplex, and townhome projects. This all-in-one code includes minimum standards for associated sub-trades such as plumbing, electric, mechanical and fuel gas appliances. *(The review committee concluded that the single most expensive and controversial provision is the requirement that single family homes be provided with a fire-suppression (sprinkler) system. The committee does not support adoption of this section. City staff will note that this requirement was deleted from the 2009 IRC when adopted and staff does support the requirement.*

2012 International Mechanical Code (IMC): Minimum standards regulating the installation of all mechanical air handling systems for buildings constructed under the IBC. *(Changes include amendments in the 2012 IRC mechanical sections addressing indoor air quality for dwellings of multi-family buildings.)*

2012 International Fuel Gas Code (IFGC): Minimum standards regulating the installation of all natural gas and propane fueled appliances and equipment for buildings constructed under the IBC. *(Changes include amendments in the 2012 IRC fuel gas sections addressing indoor air quality for dwellings of multi-family buildings.)*

2012 International Energy Conservation Code (IECC): Minimum energy efficiency criteria for all commercial and large-scale multi-family residential buildings. *(Changes address use of electric heat, requiring upgraded insulation values without the ability to use energy programs that typically use the trade-off approach.)*



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Residential Sprinkler Reports

NISTIR Report 7451 (reporting period 2002-2005)
U.S. Department of Commerce National Institute of Standards and Technology
Benefit Cost Analysis of Residential Fire Sprinkler Systems

Owners of homes with Fire-Suppressions Systems (sprinkler systems) installed benefit from;

- 1.) Reduction in the risk of civilian fatalities and injuries
- 2.) Reduction in homeowner's insurance premiums
- 3.) Reduction in uninsured direct property loss
- 4.) Reduction in uninsured indirect cost.

Homes equipped with smoke alarms and sprinklers experienced

- 1.) 100% fewer civilian fatalities
- 2.) 57% fewer civilian injuries
- 3.) 32% less direct and indirect property loss verses homes with just smoke alarms.
- 4.) According to the Insurance Service Office (ISO) insurance premiums were reduced by approximately 8%.

National Fire Protection Association (NFPA 2006) (reporting period 2002-2005).

- 1.) There were 296,500 residential fires (one and two-family dwellings)
- 2.) Causing 10,188 civilian injuries
- 3.) Causing 2566 civilian deaths
- 4.) Responsible for \$5.3 billion (2005 dollars) in direct residential property loss
- 5.) No civilian deaths in residential fires when provided with sprinkler systems

NISTIR Report 7277 (reporting period 2005)
U.S. Department of Commerce National Institute of Standards and Technology
Economic Analysis of Residential Fire Sprinkler Systems

- 1.) Using the multi-purpose network into the cold-water plumbing system (2012 *International Residential Code (IRC) Section P-2904*). The sprinkler system is an extension of the buildings cold-water system and is equivalent to NFPA 13D *Standard for the Installation of Sprinkler Systems in One- and Two- family Dwellings and Manufactured Homes*.
- 2.) Labor and material for the sprinkler system only added to the potable water system ranges from \$0.48 to \$0.57 per square foot, minus overhead and profit. (*Local market pricing of \$1.25 to \$2.00 per square foot has been reported*)

Residential Sprinkler

The Fire Protection Research Foundation

Home Fire Sprinkler Cost Assessment (September 2008)

- 1.) Using thirty (30) housing floor plans in ten (10) communities, one (1) in Canada and nine (9) throughout the US. Total area sprinkled includes basements, garages, and attics. *(2012 IRC P2904 would not require garages and attics to be sprinkled)*
- 2.) The cost range from \$0.38 to \$3.66 per square foot. The low range represents a California community with long standing ordinance requiring sprinkler systems and some potential for pricing benefits based on volume of homes being sprinkled. The high range represents a Colorado mountain home on well water, using an antifreeze system with copper piping.
- 3.) The average cost to the builder was \$1.49 per square foot. Higher cost per square footage were associated with local requirements for use of copper pipe versus CPVC or PEX plastic piping, on-site water supply versus municipal services, requirements to sprinkle attics and garages, and whether a stand-alone or combination potable water/sprinkler system was used.
- 4.) Five insurance companies with a market share of the communities surveyed reported a premium discount from 0% to 10% with an average premium discount of 7%.

The Fire Protection Research Foundation

Home Fire Sprinkler Impact on Fire Injury (October 2012)

- 1.) The analysis hypothesized that by making smaller fires, sprinklers might reduce the frequency of injuries and the average severity of the injuries.
- 2.) The model used the impact on injuries per one hundred (100) fires and injury cost per one hundred (100) fires. Cost data included: medical cost, legal and liability cost, cost from lost work time, and pain and suffering cost. Medical cost was evaluated separately from the other items identified as total cost.
- 3.) Primary results indicate that:
 - a. Sprinkler presence is associated with a 29% reduction in injuries per one hundred (100) reported fires
 - b. Sprinkler presence is associated with a 48% reduction in medical cost (approximately \$85,000.00) of injuries per one hundred (100) reported fires
 - c. Sprinkler presence is associated with a 40% reduction in total cost (approximately \$442,000.00) of injuries per one hundred (100) reported fires.
- 4.) Results by age of victim:
 - a. Children (age 14 and under) a sprinkler presence is associated with:
 - i. A 72% reduction in the number of fire injuries per one hundred (100) reported fires
 - ii. A 85% reduction in medical cost of injuries per one hundred (100) reported fires
 - iii. A 78% reduction in total cost of injuries per one hundred (100) reported fires.
 - (Children are much less likely to be cooking where a vast majority of small fires begin.)*
 - b. Adults (age 15 to 64) a sprinkler presence is associated with:
 - i. A 30% reduction in the number of fire injuries per one hundred (100) reported fires
 - ii. A 52% reduction in medical cost of injuries per one hundred (100) reported fires

Residential Sprinkler

- iii. A 39% reduction in total cost of injuries per one hundred (100) reported fires.
- c. Older adults (age 65 and older) a sprinkler presence is associated with:
 - i. A 12% *increase* in the number of fire injuries per one hundred (100) reported fires
 - ii. A 41% reduction in medical cost of injuries per one hundred (100) reported fires
 - iii. A 23% reduction in total cost of injuries per one hundred (100) reported fires.

(The hypothesis cites that sprinklers make for smaller fires and that a smaller fire may seem easier to fight. Injuries are increased particularly in older adults as it appears that this age group more often attempts fire-fighting efforts.)

Federal Emergency Management Association (FEMA)

Residential Fire Sprinkler Activation Report (January 2003 to June 2007)

- 1.) The Residential Fire Sprinkler Activation project is an on-line data gathering system used by the National Association of State Fire Marshals (NASFM) and the Residential Fire Sprinkler Institute (RFSI). The purpose is to gather current and relevant data pertaining to the activation of residential fire sprinklers, information necessary to assess the performance of these systems in real-life, non-laboratory conditions.
- 2.) In this reporting period 89 fire departments participated, reporting 556 incidents.
- 3.) Reporting data:
 - a. 62% of the activations were in multi-family buildings, 17.9% in single family buildings.
 - b. 40.6 % of the activations were in the kitchen with bedrooms second at 14.5%
 - c. Over 60% of the activations were in rooms of less than 150 square feet
 - d. Over 67% of the activations involved just one fast-response sprinkler head
 - e. While 73% of the activation included a smoke detector, only 58% of the detectors operated.
 - f. Over 47% of the incidents estimate dollars saved in the \$250,000 range
 - g. Over 57% of the incidents report a dollar loss of under \$5,000

FM Global Research Division

Environmental Impact of Automatic Fire Sprinklers (March 2010)

1. Two identical structure fire tests, one test included a single fire sprinkler head; the second test had no sprinklers.
2. A single fire event can negate any benefits from “green” construction due to the subsequent carbon dioxide and other greenhouse gases generated from burning combustible materials, in addition to the carbon associated with disposal of damaged materials and reconstruction, increasing “lifecycle carbon emission”.
3. The combustible material consumed in the tests was 3% in the sprinklered test and between 62% and 95% in the non-sprinklered test.
4. The use of automatic fire sprinklers reduced the greenhouse gas emissions, consisting of carbon dioxide, methane, and nitrous oxide by 97%.
5. Analysis of the tests indicates that the reduction in water use achieved by using sprinklers could be as much as 91% when extrapolated to a full-sized home.

Residential Sprinkler

Disaster Safety

Residential Fire Sprinklers (August 2012)

1. According to the U.S. Fire Administration (USFA), in 2007, 414,000 residential fires resulted in 2,895 deaths and 14,000 injuries, causing \$7.5 billion in property damage.
2. 90% of house fires with sprinkler systems are contained by the operation of a single sprinkler head.
3. In 1992 Prince George's County in Maryland enacted sprinkler ordinance mandating the installation of automatic fire sprinkler systems in new one- and two-family dwellings.
 - a. A study of Prince George's ordinance issued in 2009 stated that from 1992-2007 there were 13,494 fires involving single-family homes, resulting in 101 deaths and 328 injuries in non-sprinklered homes.
 - b. No deaths and only 6 injuries in homes with sprinkler systems.
 - c. Since the ordinance went into effect the cost of sprinkler systems have decreased to less than \$2.00 per square foot, according to sprinkler installers in the area.
4. Scottsdale Arizona enacted their sprinkler ordinance in 1986 and reported that:
 - a. The average fire loss in in a house with a sprinkler system was \$1,544, compared to \$11,624 for houses without fire- sprinkler systems.
 - b. The average sprinkler used 357 gallons of water per incident to extinguish the fire, while manual fire-fighting would have equaled 4,884 gallons of water per incident to extinguish the same fires.
 - c. Because sprinklers activate within a few minutes of the ignition, suppression efforts are underway before the arrival of fire department personnel, which can be in the 8-10 minute range.



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**Significant Changes Proposed for Adoption of the
2012 International Residential Code (IRC)
Applicable to New Single-family; Duplex; and Townhomes**

1. **New** exemption from permits for “hoop houses” if less than 5 feet tall or meet the requirements for shed exemptions.
2. Changes to fire rating of exterior walls due to location on the property in relation to property lines. The proposed changes assume that code-required fire-suppressions systems in single family dwellings will not be supported and adopted. *(The code review committee did not support the code requirement that sprinklers be installed in single family dwellings. Staff will be presenting the committees’ views while promoting the code requirement that fire-suppression sprinkler systems should be installed in new single family homes.) (See attached Residential Sprinkler Reports for sustainable benefits of fire-suppression systems.)*
3. **New** amendment that requires bedroom egress windows sills to be at least 24 inches above the floor when the window sill height is 72 inches or more above ground.
4. **New** amendment requiring basement window wells to have drainage and the drain inlet to be at least 4 inches below the window sill.
5. Existing amendments carried over from the Green Code Amendments of 2012. No longer identified as Green Code Amendments, but rather simply local amendments, including:
 - a. Construction Waste Management of new buildings and **New** to this code cycle: CWMP for remodels over 5,000 sq. ft.
 - b. **New** CWMP Documentation required prior to CO that indicates amounts and where materials recycled to.
 - c. **New** Demolition of entire buildings required to Soft Strip recyclable materials and recycle uncontaminated wood, concrete, metals, and cardboard.
 - d. Low VOC products,
 - e. Exterior “Dark Sky” lighting (***New** Clarified to reflect the International Dark-Sky Association (IDA) Lighting Zone-1 (LZ-1) which indicates that the lamp or the light shall not be directly visible beyond the property line.*)
6. **New** Electrically heated homes shall show energy compliance by the prescriptive path charts verses using a computer program such as RESNET or U of A Performance Path which allows for trade-offs of the insulation values.
7. Existing amendments carried over from the Green Code Amendments of 2012 which require mechanical system testing, building air-tightness testing, and mandatory requirements for insulation installation, combustion safety testing and garage to home isolation testing.
8. Whole-house ventilation (WHV) system now required in the code and amended to better match the Green Code Amendments providing clarity on how the system is to operate and owner controls.

2012 IRC
Significant Proposed Amendments

9. **New** amendment clarifying that HVAC ductwork shall not be located outside the interior vapor barrier. (*In other words, all duct work shall not be located in the exterior wall insulation.*)
10. **New** amendment dwellings with any gas cooking (*not just gas ovens*) will be required to have a range hood vented to the outside.
11. Existing amendments carried over from the Green Code Amendments of 2012 which set maximum flow rates of plumbing fixtures.



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**Significant Changes Proposed for Adoption of the
2012 International Building Code (IBC)
Applicable to all Commercial and Multi-Family Buildings**

1. **New** exemption from permits for “hoop houses” if less than 5 feet tall or meet the requirements for shed exemptions.
2. **New** propose requiring NFPA 13 in multi-family buildings. (*code allows 13R no attic sprinklers*)
3. **New** amendment that requires bedroom egress windows sills to be at least 24 inches above the floor when the window sill height is 72 inches or more above ground in multi-family buildings.
4. **New** Radon systems required in new I-1 occupancies and I-2 nursing homes. These are long term residential uses.
5. **New** Vinyl and Polypropylene siding is not allowed.
6. Chapter 36 Sustainable Building Construction Practices (*Green Code Amendments of 2012*) carried over:
 - a. **New** Chapter 36 now covers remodel work over 5,000 sq ft, as well as new buildings and additions.
 - b. **New** Buildings demolished required to Soft Strip recyclable materials and recycle non-contaminated wood, concrete, steel, and cardboards.
 - c. **New** Construction Waste Management Plan required for remodel work over 5,000 sq. ft.
 - i. **New** Verification required that addresses materials and where recycled to prior to CO.
 - d. The remaining Chapter 36 retained and unchanged addressing:
 - i. Low VOC Materials
 - ii. Ductwork controls limiting construction debris and dust.
 - iii. New Building Flush-Out requirements
 - iv. Acoustical controls and sound transmission
 - v. Building systems commissioning:
 1. HVAC
 2. Thermal envelope tightness
 3. Lighting controls
 4. Service water heating
 5. Renewable energy systems
 6. Background sound levels
 7. **New**, Cooling tower water use