11-22-13

donnay homes, Inc.

9655 63rd Avenue N. • Maple Grove, MN 55369
Phone: 763/531-0714 • Fax: 763/531-0601

November 21, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and we have several models that would trigger the requirement to install sprinklers in this unheated space.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 60% of homes built by our company would trigger the sprinkler mandate.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms -- the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under $0.70 per square foot [Note Sonar says $0.27 to $0.30]. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Paul J. Donnay

Sincerely,

Paul Donnay

Donnay Homes, Inc.

Dear Administrative Law Judge Eric L. Lipman,

It has come to our attention that the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

Sincerely,

Fargo-Moorhead Area Association of REALTORS®

Marti Kaiser, RCE
Executive Vice President
Fargo-Moorhead Area Association of REALTORS®
813 North University Drive
Fargo, ND 58102
phone (701) 235-6679 fax (701) 232-1831
www.FMREALTOR.com

November 22, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and we have several models that would trigger the requirement to install sprinklers in this unheated space.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

12701 WHITEWATER DRIVE, SUITE 120, MINNETONKA, MN 55343
TEL: (952) 944-3455 FAX: (952) 944-3437 KHOV.COM

- Approximately 50% of homes built by our company in our newest communities would trigger the sprinkler mandate, perhaps more.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes can appraise for less than the sale price agreed upon between the builder and homebuyers. When this occurs, buyers would need to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. We are not aware of a single fatality from fire in a home built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Jeff Parks, Division President

K. Hovnanian Homes of Minnesota, LLC

KUEPERS INC
ARCHITECTS & BUILDERS

November 21, 2013

The Honorable Eric L. Lipman, Administrative Law Judge
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
Saint Paul, MN 55164-0620

Dear Judge Lipman:

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States" Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).
- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable.
- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.
- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.
- Our company has built approximately 5 homes over the past 5 years that would trigger the sprinkler mandate.

17018 Commercial Park Road | Brainerd MN 56401
Ph: 218-829-0707 | Fax: 218-829-0383 | Toll-Free: 888-829-0707
www.kuepers.com

MN Lic. #0002599

- The cost to install fire sprinklers will be passed on to the consumer.
- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers often have to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. Many will choose to build a home under the 4,500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.
- Our customers simply do not want fire sprinklers. Over the past 5 years, our company has built over 35 homes. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.
- Our coverage area includes many cities, counties and townships that are not covered by building officials. We run the risk of losing jobs to unlicensed contractors who do not adhere to codes as we do.
- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, interconnected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, interconnected smoke alarms.
- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under $0.20 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Ray Austin
Field Operations Manager

SWWOLD
CONSTRUCTION, INC.
9457 State Hwy 10, Suite 200
Ramsey, MN 55303

November 25, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and we have several models that would trigger the requirement to install sprinklers in this unheated space.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 1% of homes built by our company would trigger the sprinkler mandate.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under .30 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Scott Wold, President

S W Wold Construction, Inc.

Phone (763) 205-2037
Fax (763)421-5616

November 21, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- 41 states have rejected the code change and 87% of Minnesotans polled do not support the mandate
- There has been zero fire deaths in MN in the past 10 years in homes built since requiring interconnected fire alarms
- We theoretically all live in a free market and have the option to purchase a sprinkler system but 99% of buyers choose not to—Tollberg Homes has never even been asked about installing a fire sprinkler. Why would we mandate something that isn't "worth" the value (estimated over $9,000)

This is a case of government overreach trying to solve a problem that doesn't exist. We once again urge you to reject the sprinkler mandate. Thank you for your consideration.

Regards,

Nathan Jones
Chief Operations Officer
Tollberg Homes

THE
MARVIN
COMPANIES

December 5, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- The added cost to install fire sprinklers will be passed on to the consumer who's already hard pressed to finance affordable housing.

- We are advised that fire sprinklers will add, on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often required to pay out of pocket even more than the standard percentage required by the buyer's mortgage company if they can secure a mortgage at all. We anticipate substantial resistance to this by potential buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Based on feedback from builders, we understand that their customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, they would of course install one, but this request is rarely, if ever, been made.

- The fire sprinkler mandate is neither necessary nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). It is far less expensive and less intrusive than fire sprinklers, and achieves the goal if there is a perceived need for additional fire protection.

This fire sprinkler mandate will not advance safety as a practical matter but will force up the cost of housing and deprive home owners of the freedom of choice as to how they may spend their limited housing dollars.

Sincerely,

Jake Marvin

Chief Executive Officer

Cc: Susan Marvin - President, Windows and Doors

Integrity from MARVIN
MARVIN Windows and Doors
Built around you
INFINITY from MARVIN

Home Builders Association of Fargo-Moorhead

1802 32nd Avenue South · Fargo, ND 58103 · (701) 232-5846 · Fax (701) 280-1108
info@hbafm.com · www.hbafm.com

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National Association of Home Builders

December 2, 2013

Administrative Law Judge Eric. L. Lipman
Office of Administrative Hearings
600 N Roberts St.
PO Box 64620
St. Paul, MN 55164-0620

Dear Judge Lipman,

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than 40 states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa and Wisconsin).

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- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add an average of at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and home buyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. Therefore, it is likely that home buyers will pay the entire cost of the fire sprinkler mandate up front. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- We work directly with Moorhead, Dilworth and other border communities. They are already competing with a North Dakota market that includes less restrictions and regulations combined with the likelihood of a lowered property tax. Having an additional and substantial cost requirement on one side of the border but not on the other would have a devastating impact on the Minnesota markets in our region. In this area, most consumers who are undecided about where to build or buy a newly constructed home would choose the more affordable option: the North Dakota side. As Moorhead and Dilworth-area home building numbers get back on track post-recession, this mandate could effectively "kill" that resurgence.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½-inch gypsum wall board for fire protection of floors. This is in the 2012 IRC, is far less expensive and intrusive than fire sprinklers and achieves the goal of increased fire protection. Our North Dakota-member builders have noted that this was added to the North Dakota State Building Code as a reasonable alternative to the sprinkler mandate, and their state fire marshal's office supported the move.

We appreciate your vigilance in this challenging and important matter. Thank you!

Sincerely,

Bryce Johnson

Bryce Johnson
HBA Executive Vice President

Darrick Guthmiller
HBA President

THE CHAMBER
FARGO MOORHEAD WEST FARGO

RECEIVED
2013 DEC -9 AM 7:58
ADMINISTRATIVE HEARINGS

December 6, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

Dear Judge Lipman:

The Fargo Moorhead West Fargo Chamber of Commerce is a bi-state federation of more than 2,100 business members with more than 94,000 employees living and working in a border state community. As such, the imposition of costly mandates such as the residential construction fire sprinkler rule, as proposed by the Minnesota Department of Labor and Industry, threatens to dramatically disrupt the regional market and deter economic investments in Minnesota.

The residential fire sprinkler rule will be costly for consumers. Estimates indicate this provision will add a minimum of $9,000 to the cost of a home attached to municipal water and sewer, and more than $14,000 if the home has a private water source. This additional cost may result in homeowners looking to neighboring North Dakota, which does not mandate this expense, to build their homes. This extra expense could be detrimental to Moorhead's resurging home building economy.

The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the Department of Labor and Industry advisory group. We respectfully request that you reject the fire sprinkler mandate once again and seek other solutions for enhancing fire protection.

Respectfully,

Craig Whitney
President & CEO
Fargo Moorhead West Fargo Chamber of Commerce

Dear Judge Lipman:

My name is David Werschay, I have a Design/Build residential Homes company in St. Cloud, MN and I have great concern about the negative effects of the upcoming fire sprinkler code change for new residential homes.

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. I request that you reject the fire sprinkler mandate once again.

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- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 60% of homes built by our company would trigger the sprinkler mandate. This means that potentially 60% of my business could be "gone" due to this mandate.

28 – 11th Ave S., Suite 101, St Cloud, MN 56301 (320) 230-9909
www.werschayhomes.com

- The cost to install fire sprinklers will be passed on to the consumer. This is not something that we can simply absorb, it is a hard cost that will ultimately be absorbed by the consumers……assuming they can get a loan due to probable appraisal issues.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers often have to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. For example, the buyer agreed to pay $ 700,000 for a recent home that we constructed. The buyer's preliminary loan approval required a 5% down payment. Because of the market forces described above (foreclosures, short sales, etc.), the home only appraised for $600,000. As a result, the buyer had to come up with another $100,000 beyond the minimum (5%) $35,000 that they initially planned for a down payment. I have been in the industry for 22 years and I know that the cost of the sprinklers will not increase the appraised value of the home. As a result, home buyers will likely need to pay the entire cost of the fire sprinkler mandate up front. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. Over the past 10 years, our company has built over 100 homes. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.

  2 years ago we were fortunate to be chosen to re-build a home for a family in St. Cloud who had a total loss of their home due to a fire. During our due diligence in the building process, we asked them if they wanted a fire sprinkler system in the new home. They declined the option due to expense and they said; "the smoke alarms saved our lives"….as a side note, the smoke alarms were not even hard wired, and they saved this family.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- On occasion we build homes for our clients on their land in the rural areas that are code or inspection enforced. As a licensed builder with strong ethics, I

would have to include the sprinklers and follow code. However, if my client wanted to have a non licensed builder build their home, they could dodge this mandate. This is not good for the consumer or the building industry.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is less than $0.30 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

In summary, this mandate will have a direct impact on my company and all of its employees and their families. Whether we are building a $200,000 home or a $2 million home, everyone has a budget. I can confidently tell you that a we have lost transactions over as little as $2000 with a $300,000 buyer, so a impact of $9000 or more will definitely have a negative impact on our business and the consumers ability to afford to build a new home.

Please please please, reject the fire sprinkler mandate once again. Please feel free to contact me with any questions regarding this matter.

Regards,

David R. Werschay
CEO Werschay Homes, Inc.
St. Cloud, MN
320.230.9909

SEMLER HOMES

1875 Station Parkway NW • Andover, MN 55304
763-754-5578 Fax 763-767-2345

12-9-2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and we have several models that would trigger the requirement to install sprinklers in this unheated space.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 10% of homes built by our company would trigger the sprinkler mandate.
- The cost to install fire sprinklers will be passed on to the consumer.
- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.
- Our customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.
- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.
- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under .29 per square foot [Note Sonar says $0.27 to $0.30]. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Pete Semler, President

Semler Homes, Inc.

RESOLUTION 2013-1209-E

Resolution Opposing Proposed Amendments to Minnesota Rules, Chapter 1309, Requiring Fire Sprinkler Systems in Single-Family Homes

WHEREAS, the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new single-family homes with more than 4,500 finished and unfinished square feet; and

WHEREAS, the SONAR does not correctly analyze the potential costs and impacts of such a rule; and

WHEREAS, the fire sprinkler mandate has been rejected in the vast majority of other states across the country, twice by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue; and

WHEREAS, the State of North Dakota has already rejected the fire sprinkler mandate statewide, as have the States of South Dakota, Wisconsin and Iowa; and

WHEREAS, the city of Moorhead being a border city competes with cities in North Dakota for new residential construction and development; and

WHEREAS, according to the 2011 Minnesota State Survey conducted by the University of Minnesota, Minnesota Center for Research, 88% of Greater Minnesota Residents believe that the decision whether to install sprinklers should remain a homeowner's choice; and

WHEREAS, the fire sprinkler mandate will increase the cost of building new homes in Moorhead compared to the cost of doing so in North Dakota; and

WHEREAS, increasing the cost to build new homes in Moorhead will encourage homeowners to build in North Dakota, rather than Moorhead; and

WHEREAS, increasing the cost to build new homes in Moorhead will encourage homeowners to use unlicensed contractors and build in non-code-enforced areas; and

WHEREAS, Moorhead already recognizes an ongoing problem with homeowners choosing to use unlicensed contractors to build in non-code-enforced areas and the fire sprinkler mandate will only exacerbate this problem; and

WHEREAS, the SONAR does not consider that any alleged benefits from fire sprinklers will not be achieved in border cities because of the likelihood that new homes will be built without sprinklers in other states or in non-code-enforced areas; and

WHEREAS, a decrease in new home-building in Moorhead will result in a decreased tax base for Moorhead, and will significantly adversely affect Moorhead; and

WHEREAS, the SONAR does not consider the significant effect that the fire sprinkler mandate will have on Moorhead; and

WHEREAS, the fire sprinkler mandate is neither needed nor reasonable because there have been zero fatalities from fire in single-family homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Moorhead that the City of Moorhead opposes the proposed amendments to the Minnesota Rules, Chapter 1309, requiring automatic fire sprinkler systems in single-family homes.

PASSED: December 09, 2013 by the City Council of the City of Moorhead.

APPROVED BY:

Mark Voxland

MARK VOXLAND, Mayor

ATTEST:

Michelle French

MICHELLE FRENCH, City Clerk

CERTIFICATION

STATE OF MINNESOTA
COUNTY OF CLAY
CITY OF MOORHEAD

I do hereby certify that the above Resolution is a true and accurate copy of the Resolution adopted by the Council of the City of Moorhead at an authorized meeting held on the 9th day of December, 2013. as shown by the minutes of the meeting in my possession.

Dated this 10th day of December, 2013.

Michelle French

Michelle French, City Clerk

RESOLUTION 13 – 12 - 120

Resolution Opposing Proposed Amendments to Minnesota Rules, Chapter 1309, Requiring Fire Sprinkler Systems in Single-Family Homes

WHEREAS, the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new single-family homes with more than 4,500 finished and unfinished square feet; and

WHEREAS, the SONAR does not correctly analyze the potential costs and impacts of such a rule; and

WHEREAS, the fire sprinkler mandate has been rejected in the vast majority of other states across the country, twice by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue; and

WHEREAS, the State of North Dakota has already rejected the fire sprinkler mandate statewide, as have the States of South Dakota, Wisconsin and Iowa; and

WHEREAS, the City of East Grand Forks competes with cities in North Dakota for new residential construction and development; and

WHEREAS, according to the 2011 Minnesota State Survey conducted by the University of Minnesota, Minnesota Center for Research, 88% of Greater Minnesota Residents believe that the decision whether to install sprinklers should remain a homeowner's choice; and

WHEREAS, the fire sprinkler mandate will increase the cost of building new homes in East Grand Forks compared to the cost of doing so in North Dakota; and

WHEREAS, increasing the cost to build new homes in East Grand Forks will encourage homeowners to build in North Dakota, rather than East Grand Forks; and

WHEREAS, increasing the cost to build new homes in East Grand Forks will encourage homeowners to use unlicensed contractors and build in non-code-enforced areas; and

WHEREAS, East Grand Forks already recognizes an ongoing problem with homeowners choosing to use unlicensed contractors to build in non-code-enforced areas and the fire sprinkler mandate will only exacerbate this problem; and

WHEREAS, the SONAR does not consider that any alleged benefits from fire sprinklers will not be achieved in border cities because of the likelihood that new homes will be built without sprinklers in other states or in non-code-enforced areas;

WHEREAS, a decrease in new home-building in East Grand Forks will result in a decreased tax base for East Grand Forks and will significantly adversely affect East Grand Forks; and

WHEREAS, the SONAR does not consider the significant effect that the fire sprinkler mandate will have on East Grand Forks; and

WHEREAS, the fire sprinkler mandate is neither needed nor reasonable because there have been zero fatalities from fire in single-family homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of East Grand Forks:

That the City of East Grand Forks opposes the proposed amendments to the Minnesota Rules, Chapter 1309, requiring automatic fire sprinkler systems in single-family homes.

Voting Aye: *Buckalew, Tweten, Olstad, Leigh, Grassel, Vetter, and Vonasek.*
Voting Nay: *None.*

The President declared the resolution passed.

Passed: December 3, 2013

Attest:

City Administrator/Clerk-Treasurer

C. Craig Buckalew
-President of Council

I hereby approve the foregoing resolution this 3rd of December, 2013.

Lynn Stauss
Mayor

RESOLUTION 13-38

Resolution Opposing Proposed Amendments to Minnesota Rules, Chapter 1309, Requiring Fire Sprinkler Systems in Single-Family Homes

WHEREAS, the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new single-family homes with more than 4,500 finished and unfinished square feet; and

WHEREAS, the SONAR does not correctly analyze the potential costs and impacts of such a rule; and

WHEREAS, the fire sprinkler mandate has been rejected in the vast majority of other states across the country, twice by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue; and

WHEREAS, the State of North Dakota has already rejected the fire sprinkler mandate statewide, as have the States of South Dakota, Wisconsin and Iowa; and

WHEREAS, the City of Dilworth competes with cities in North Dakota for new residential construction and development; and

WHEREAS, according to the 2011 Minnesota State Survey conducted by the University of Minnesota, Minnesota Center for Research, 88% of Greater Minnesota Residents believe that the decision whether to install sprinklers should remain a homeowner's choice; and

WHEREAS, the fire sprinkler mandate will increase the cost of building new homes in Dilworth compared to the cost of doing so in North Dakota; and

WHEREAS, increasing the cost to build new homes in Dilworth will encourage homeowners to build in North Dakota, rather than Dilworth; and

WHEREAS, increasing the cost to build new homes in Dilworth will encourage homeowners to use unlicensed contractors and build in non-code-enforced areas; and

WHEREAS, Dilworth already recognizes an ongoing problem with homeowners choosing to use unlicensed contractors to build in non-code-enforced areas and the fire sprinkler mandate will only exacerbate this problem; and

WHEREAS, the SONAR does not consider that any alleged benefits from fire sprinklers will not be achieved in border cities because of the likelihood that new homes will be built without sprinklers in other states or in non-code-enforced areas;

WHEREAS, a decrease in new home-building in Dilworth will result in a decreased tax base for Dilworth, and will significantly adversely affect Dilworth; and

WHEREAS, the SONAR does not consider the significant effect that the fire sprinkler mandate will have on Dilworth; and

WHEREAS, the fire sprinkler mandate is neither needed nor reasonable because there have been zero fatalities from fire in single-family homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Dilworth, that the City of Dilworth opposes the proposed amendments to the Minnesota Rules, Chapter 1309, requiring automatic fire sprinkler systems in single-family homes.

PASSED AND APPROVED this 9th day of December, 2013.

Mayor _____
Chad Olson

ATTEST: _____
Ken L. Parke, City Administrator

Rochester Area Builders Inc.

108 Elton Hills Lane NW
Rochester, MN 55901
507-282-7698 Phone
507-282-6351 Fax
RAB@rochesterareabuilders.com
rochesterareabuilders.com

December 11, 2013

To: Administrative Law Judge Eric L. Lipman

From: Matt Limoges, Public Affairs Director

Re: Fire Sprinkler Mandate

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC. The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and we have several models that would trigger the requirement to install sprinklers in this unheated space, forcing additional expense in heating and/or insulating the sprinkler systems.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the

Affiliated with the Builders Association of Minnesota and National Association of Homebuilders

Rochester Area Builders Inc.

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rochesterareabuilders.com

responsibility of making a recommendation to the Department of Labor and Industry.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. Rochester Area Builders Inc. has represented the building industry for 60 years, and knows that the cost of the sprinklers will not increase the appraised value of a home. As a result, home buyers will likely need to pay the entire cost of the fire sprinkler mandate up front. We will see substantial resistance to this by buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- If this mandate is enforced buyers will simply choose to live across state borders and commute into Minnesota. This is of particular concern for our member's business area, which encompasses the entire southeastern portion of the state of Minnesota. When buyers choose to build in other states, it not only affects our members' business, but it also reduces any revenues municipalities can raise through property taxes.

- This mandate only affects areas where the building code is enforced. As a home builder's association we strive for our members to comply with the building code. There is a large portion of Southeast Minnesota where the building code is not enforced due to jurisdictions not having enough resources to be able to enforce it. Even in those situations, our members build to code. If this mandate is enforced, our members will lose business to companies who don't build to code and get away with it due to lack of enforcement. This hurts the builders who comply with the law.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been

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proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our members' cost to install this board is close to $0.50 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Jean DeWitz
President, Rochester Area Builders

John Eischen
Executive Director

Matt Limoges
Public Affairs Director

Affiliated with the Builders Association of Minnesota and National Association of Homebuilders

310 County Road 9 SE
Willmar MN 56201
Phone 320-235-7906
Fax 320-235-7999

Lic# 20518550

Judge Eric L Lipman,

The Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new residential construction with more than 4,500 finished and unfinished square feet. The SONAR offers no support for the 4,500 square foot trigger, nor does it correctly analyze the potential costs and impacts of such a rule. The fire sprinkler mandate has been rejected in the vast majority of other states across the country, by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue. We request that you reject the fire sprinkler mandate once again.

- Minnesota law requires that the code conform to other codes "generally accepted and in use throughout the United States." Minn. Stat. § 326B.106. The fire sprinkler mandate is not "generally accepted and in use throughout the United States." Rather, it has been approved by only two states (California and Maryland), and has been rejected in more than forty states, including each state that borders Minnesota (North Dakota, South Dakota, Iowa, and Wisconsin).

- The Minnesota fire sprinkler mandate also differs from the 2012 International Residential Code ("IRC") because Minnesota is requiring fire sprinklers to be installed in attached garages and covered patios, decks, porches, and similar structures that exceed 40 square feet. These areas are generally unheated, and because of Minnesota's extremely cold winters, this additional requirement will pose additional expense and complication over the requirements in the standard IRC.The SONAR does not state why this additional requirement is needed or reasonable. Forty square feet is small, and over 95% of the homes we build each year would be effected in the covered front entry alone.

- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 50% of homes built by our company would trigger the sprinkler mandate.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. I have been in the industry for 29 years and I know that the cost of the sprinklers will not increase the appraised value of the home. As a result, home buyers will likely need to pay the entire cost of the fire sprinkler mandate up front. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. Over the past 29 years, our company has built over 150 homes. If a customer requested a fire sprinkler system, we would of course install one, but we have never been asked to install a fire sprinkler system.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under $0.44 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Chad Kompelien
C.F.O.
Mike Kompelien Custom Homes Inc.

FORX BUILDERS ASSOCIATION

519 DeMers Avenue • Grand Forks, ND 58201 • (701) 746-4536 • Fax (701) 746-6356
www.forxbuilders.com

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NORTH DAKOTA ASSOCIATION OF BUILDERS

December 10, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearing
600 N Robert St
St. Paul, MN 55164-

Honorable Judge Lipman,

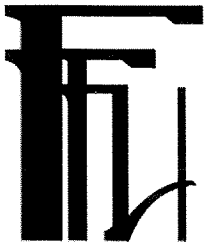
We at the Forx Builders Association are very concerned with the possibility of the State of Minnesota's proposal to mandate sprinkler systems in new homes. North Dakota is one of the many states that do not require this mandate. Our association is based in Grand Forks, ND on the border of East Grand Forks, MN. We have members in both states that this mandate would affect greatly. Sprinkler systems in residential homes would substantially increase the cost of building a new home. It is proven that the requirement of the code to hard wire fire detectors in new homes has prevented the loss of life. Potential home owners would be attracted to North Dakota which does not require the expense of sprinkler systems in new homes or worse yet look for unlicensed builders that would not build to code. This could be detrimental to the housing industry in border counties of Minnesota.

The building industry is definitely not against saving lives. We just would like our elected leaders to look at this sensibly. Why put more codes on the books and add thousands of dollars to the price of new homes when there is no apparent problem?
We appreciate your time.

Sincerely,

LeRoy Kurtyka, President
Forx Builders Association

FIELDSTONE FAMILY HOMES, INC.
801 CLIFF ROAD E, SUITE 135, LAKEVILLE, MN 55337 P: 952.469.8800 FAX: 952.469.8803 FIELDSTONEFAMILYHOMES.COM



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December 11, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
Saint Paul, MN 55164-0620

VIA ELECTRONIC MAIL

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- The fire sprinkler mandate has twice been rejected by the Minnesota Legislature, once in 2011 and once in 2012.

- The fire sprinkler mandate was rejected twice by the 1309 Residential Code Committee, the group tasked with the responsibility of making a recommendation to the Department of Labor and Industry.

- Approximately 60% of homes built by our company would trigger the sprinkler mandate.

- The cost to install fire sprinklers will be passed on to the consumer.

- We believe that fire sprinklers will add on average at least $9,000 to the cost of a home attached to municipal water and sewer, and at least $14,000 if the home has a private water source. Because existing homes are used as comparables for newly-constructed homes for appraisals, and because of the number of foreclosures, short sales, and other market factors, newly-built homes are often appraising for less than the sale price agreed upon between the builder and homebuyers. As a result, buyers are often having to pay out of pocket even more than the standard percentage required by the buyer's mortgage company. We will see substantial resistance to this by our buyers. Many will choose to build a home under the 4500 square foot limit. If they desire to have a larger home, they will later add to it, which would not trigger the sprinkler requirement.

- Our customers simply do not want fire sprinklers. If a customer requested a fire sprinkler system, we would of course install one, but we have only installed one in the last 500 homes we have sold and built and it cost $10,350 for a 300 square foot home.

- The fire sprinkler mandate is neither needed nor reasonable in light of the state's requirement that new homes have hard-wired, inter-connected smoke alarms – the effectiveness of which have been proven. There have been zero fatalities from fire in homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

- Although we believe that new homes are the safest, if greater fire safety is required, there is a far less costly and intrusive method to achieve the goal, namely, adding ½ inch gypsum wall board for fire protection of floors. This is in the 2012 International Residential Code ("IRC"). Our cost to install this board is under $1.00 per square foot. This is far less expensive and less intrusive than fire sprinklers, and achieves the goal of increased fire protection.

Sincerely,

Bryan Wolfe

Fieldstone Family Homes, Inc.

Minnesota-Dakotas Conference

NATIONAL ELECTRICAL CONTRACTORS ASSOCIATION
GOVERNMENT AFFAIRS OFFICE / 830 TRANSFER ROAD / ST. PAUL, MN 55114 / (651) 646-2121 / FAX (651) 646-9678

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
Saint Paul, Minnesota 55164-0620
rulecomments@state.mn.us.

December 17, 2013

Re: Proposed Amendment to Rules Governing the Adoption of the International Residential Code, Minnesota Rules, chapter 1309; Revisor's ID Number R-04144

Dear Judge Lipman:

The Minnesota contractors of the National Electrical Contractors Association consist of over 120 electrical contractors with local chapters in Minneapolis, St. Paul, Duluth and Fargo (covering Northwestern Minnesota). These licensed Minnesota contractors perform all types of electrical work, including adding outlets in your home, wiring new and remodeled office buildings, supplying power to production lines, installing security systems in prisons and nurse call systems in hospitals, and wiring ethanol plants. High voltage, regular voltage, and low voltage; if you need power, light, or communications a NECA contractor can perform the work. Minnesota NECA contractors spend over $5 million a year on training registered apprentices and licensed journeyman.

NECA supports the following rules as outlined by the Department:

> 1309.0010 subpart 1, subpart 3, A. NECA supports the Department's position of deleting Chapter 1 of the 2012 IRC and replacing it with Minnesota Rules, Chapter 1300 of the Minnesota Building Code, Administration.
>
> 1309.0010 subpart 1, subpart 3, B. NECA supports the Department's position of deleting any references to residential or commercial energy code and replacing it with the Minnesota Rules, Chapters 1322 and 1323, Minnesota Energy Code.

1309.0010 subpart 1, subpart 3, E. NECA supports the Department's position of deleting references to electrical matters in the IRC, other than section R314 Smoke Alarms, and replacing with Minnesota Rules, Chapter 1315, Minnesota Electrical Code.

Sincerely,

Gary Thaden
Government Affairs Director

CC:
Colleen Clayton
Department of Labor and Industry
443 Lafayette Road North
St. Paul, Minnesota 55155
colleen.clayton@state.mn.us

MINNESOTA MECHANICAL CONTRACTORS ASSOCIATION

Steven G. Peterson
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Dick Poser, President
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Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
Saint Paul, Minnesota 55164-0620
rulecomments@state.mn.us.

December 17, 2013

Re: Proposed Amendment to Rules Governing the Adoption of the International Residential Code, Minnesota Rules, chapter 1309; Revisor's ID Number R-04144

Dear Judge Lipman:

The **Minnesota Mechanical Contractors Association**, with 150 members, represent contractors who perform the installation and servicing of plumbing, heating, and cooling equipment. Whether it is water, natural gas, oil, air or any other medium – mechanical contractors do it. Our contractors range in size from a couple of employees to hundreds of employees, and in type from installing a water heater in your home to repiping Flint Hills Refinery. Minnesota MCA members hire over 6000 employees and performed over $1/2 billion of construction business last year. Our contractors spend over $5 million dollars every year on training apprentices and journeyman on all aspects of our industry, including construction codes. Minnesota MCA contractors and their employees are trained, qualified, and licensed to perform mechanical contracting work in order to protect the public and themselves.

The Minn. MCA supports the following rules as outlined by the Department:

1309.0010 subpart 1, subpart 3, A. Minn. MCA supports the Department's position of deleting Chapter 1 of the 2012 IRC and replacing it with Minnesota Rules, Chapter 1300 of the Minnesota Building Code, Administration.

1309.0010 subpart 1, subpart 3, B. Minn. MCA supports the Department's position of deleting any references to residential or commercial energy code and replacing it with the Minnesota Rules, Chapters 1322 and 1323, Minnesota Energy Code.

830 Transfer Road, Suite 1A • St. Paul, Minnesota 55114-1434 • (651) 646-2121 • Fax (651) 646-9678
Representing EEO Employers

1309.0010 subpart 1, subpart 3, C. Minn. MCA supports the Department's position of deleting any references to mechanical matters in the IRC and replacing it the Minnesota Rules, Chapter 1346, Minnesota Mechanical Code.

1309.0010 subpart 1, subpart 3, D. Minn. MCA supports the Department's position of deleting any references to plumbing in the IRC and replacing with Minnesota Rules, Chapter 4715, Minnesota Plumbing Code.

Minn. MCA Supports the Department's positions on:

- R305.2.1.1 Bathroom plumbing fixture clearance
- 1309.0307 Section R307 toilet, bath and shower space IRC deletion and replacement with Minnesota Plumbing Code

Fire sprinkler requirements. 1309.0313, section R313 and it's associated provisions.

The Minnesota Mechanical Contractors Association is disappointed by the Department's position in regards to fire sprinkler requirements. The Department's proposed exception for one and two family homes under 4500 square feet puts future residents, visitors, neighbors and fire fighters at risk. The exception is an unwarranted and unsafe concession to the home building industry. Any increased cost, should it exist, is more than offset the saving in property and lives.

The Minnesota Fire Chiefs Association of Minnesota (MSFCA) and the Minnesota Fire Marshals Association (FMAM) state that automatic fire sprinkler systems are critical to provide protection for occupants, fire fighters and property. The light construction of one/two family homes, with the possible collapse of floors and roofs, demands the installation of automatic fire sprinklers.

Some one/two family homes are already required to install automatic fire sprinkler systems. The Minnesota Departments of Human Services and Health require these systems for home that are licensed or registered with that agency; including, child and adult day care, supervised living facilities, hospice and foster care facilities, assisted living facilities, boarding care and lodging facilitates, and senior housing.

Due to cost concerns and to allow for closer family relationships, our society is increasing using unlicensed/unregistered versions of day-care/medical/senior activities in our one and two family homes. Under the Department's proposal these individuals would be more at risk that similarly situated individuals in license/registered homes.

In addition, the people living in smaller/regular sized homes need the same advantages as the people who live larger sized homes. Those advantages include increased life-safety and property protection for that home and close-by homes

(including sufficient time for occupants to escape), additional structural protection for first responders, and limiting the extent of structural damage at that home and nearby homes.

On balance, the Department of Labor and Industry's stance on fire sprinklers is inadequate and unnecessarily puts Minnesota lives and property at risk.

Sincerely,

Gary Thaden
Government Affairs Director

CC:
Colleen Clayton
Department of Labor and Industry
443 Lafayette Road North
St. Paul, Minnesota 55155
colleen.clayton@state.mn.us

VIKING
AUTOMATIC SPRINKLER CO.

RECEIVED
2013 DEC 30 AM 7:39
ADMINISTRATIVE HEARINGS

December 23, 2013

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
St. Paul, MN 55164-0620

Re: Proposed Amendment to Rules Governing Adoption of the 2012 International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID Number R-04144.

I would like to take this opportunity to state that the National Fire Sprinkler Association of Minnesota believes that the IRC should be adopted as written and should not be amended. The IRC is written as a minimum standard and amending it will only weaken the Minnesota Residential Building Code.
As you know, the proposed amendment to the 2012 IRC has been met with significant opposition from the home building industry. As such, there has been a great deal of incorrect information regarding the operation, cost and effectiveness of residential fire sprinkler systems presented by the builders as "fact". The National Fire Sprinkler Association of Minnesota would like to present some information, based on our experience and knowledge as Minnesota Fire Sprinkler Contractors.

Purpose of Residential Sprinkler Systems

Residential fire sprinkler systems are life safety systems. The purpose of a residential fire sprinkler system is to allow the occupants of a home the time to escape from the home in the event of a fire by containing a fire and preventing flashover. A residential sprinkler will activate when enough heat is generated by a fire to fuse the element in the head closest to the fire, allowing water to flow and either contain or extinguish the fire.

Water Supplies

Determining the volume and pressure of water required to allow a residential fire sprinkler system to properly operate is a key component to designing a residential fire sprinkler system. A typical residential sprinkler will flow approximately 15 gallons of water per minute. NFPA 13D (the Standard for the Installation of Sprinkler Systems in One- and Two-Family Dwellings) requires that the system be designed to allow two sprinklers to operate simultaneously. This means that the water supply must be capable of supplying approximately 30 gallons of water per minute (two sprinklers flowing 15 GPM each). When connected to a municipal water supply, this is simple to achieve since the system has a virtually unlimited water supply. When there is no municipal water supply and the home is supplied by a well, a stand-alone type system is utilized. In this situation, a plastic water storage tank and small booster pump are installed in the mechanical room to provide a 10-minute water supply duration. This duration has been determined by NFPA to be sufficient to allow all occupants to escape from a home fire. Therefore, the amount of stored required is determined by a simple formula. If the system requires 30 gallons of water per minute, a 300 gallon storage tank is required (30 GPM x 10 minute duration).
There is no need to drill multiple wells, install large pressure tanks or increase the size of wells or well pumps, as some in the home building industry would have you believe.

Sprinklers Are Affordable

We have determined that the average cost to install a residential fire sprinkler system in a new home in Minnesota, when connected to a municipal water supply is approximately $2.00 per square foot. The average cost when there is no municipal water supply is approximately $3.00 per square foot. This average is based on the actual costs of installations of systems performed by our member contractors over the past several years. In addition, once the code goes into effect, the cost of installation will be reduced due to economies of scale with the increased demand.

To put this in perspective, the cost to install a residential fire sprinkler system is roughly 1% of the overall cost of the home. That's a small price to pay for the life-saving benefit of a residential fire sprinkler system.

Sprinklers vs. Smoke Detectors

While some may say that smoke detectors are enough protection for homeowners, the truth is that a smoke detector will do nothing to physically protect the occupants of a home in the event of a fire. While a smoke detector will notify the occupants of a fire, a fire sprinkler system will actually respond to the fire. A fire sprinkler system will control a fire long enough to allow occupants to escape from a burning home and in most cases extinguish the fire before the fire department arrives on the scene. The quick response of a residential fire sprinkler system is critical to preventing fire growth by activating while the fire is in the earliest stage, thereby reducing the amount of toxic smoke generated and not allowing a fire to grow out of control and reach flashover.

Fire sprinklers in conjunction with smoke detectors are the most effective life safety system known.

Ongoing Maintenance Costs

There are no required annual inspections or required maintenance for residential fire sprinkler systems. Basically, when connected to a municipal water supply, if the homeowner has water when he opens his kitchen faucet, the sprinkler system also has water available to allow it to operate properly. When the home is on a well and is equipped with a stand-alone system, the homeowner simply needs to periodically open and close a test valve that will allow the pump to operate and circulate water back to the storage tank to ensure that the system is operational.

Accidental Discharge

The latest data we have from the fire sprinkler manufacturing industry states that only 1 in 16 million sprinkler heads manufactured and installed will operate prematurely. Typically, only the sprinkler head closest to the ignition source of the fire will activate and in 90% of those cases, a single head will control or extinguish the fire.

Water Damage

A sprinkler head will discharge approximately 15 gallons of water per minute and will activate within 2 minutes of fire ignition. This enables the home's occupants to escape from the fire and minimizes the extent of the fire damage. The sprinkler system can be shut off by the fire department when they respond.

When a fire department responds to a fire in an unsprinklered home, they will discharge approximately 150 – 250 gallons of water per minute from their hoses onto an exponentially larger fire. The resulting cost to repair the fire and water damage is typically ten times that of a sprinklered home.

Other Benefits of Sprinklered Homes

In addition to life safety benefits, there are numerous other benefits to both homeowners and communities when new homes are built with residential fire sprinkler systems installed:

- Discounts on homeowner's insurance are offered by nearly all insurance companies.
- Developments with sprinklered homes are allowed to have narrower streets and increased spacing between fire hydrants. This is a cost savings to the community by having fewer hydrants. It could also be an advantage to the developer/builder by allowing for more buildable lots if less road width is required. There could also be increased tax revenue to the city when more homes are built.
- The community may need fewer new fire stations since their response times are less critical for fully sprinklered developments.
- The millions of dollars spent annually to rebuild homes that have burned down can be reduced substantially when only minor repairs are required following a home fire.
- Far less water is used in the event of a fire in a sprinklered home, saving water for the community.

We trust that you will find this information useful. The National Fire Sprinkler Association of Minnesota would be happy to answer any other questions you may have regarding residential fire sprinkler systems.

Sincerely,

Sean Flaherty

Sean Flaherty
President – Elect, Minnesota Chapter
National Fire Sprinkler Association

Honorable Eric Lipman
Minnesota Office of Administrative Hearings
PO Box 64620
St. Paul, MN 55164-0620

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13 DEC 26 PM 3:47
ADMINISTRATIVE HEARINGS

Re: International Residential Code (IRC) Adoption
ELL hrg 1900-30855 Rules-International Residential Code

December 26, 2013

Honorable Eric Lipman:

Please accept the following comments, documents, and videos as additional information submitted with regard to the rulemaking adoption process for the International Residential Code specific to case number ELL hrg 1900-30855 Rules-International Residential Code.

This material is being submitted by the Minnesota State Fire Chiefs Association, Fire Marshal's Association of Minnesota, Minnesota State Fire Department Association and the Minnesota Professional Firefighters Association.

Our Position:
We support the adoption of the model International Residential Code as published by the International Code Council which uses a consensus process to promulgate model codes. The model code requires that all newly constructed single one and two family homes, as well as townhomes, be fitted with an automatic fire suppression system. The Department of Labor and Industries proposal is a significant departure from the model code.

Cost Position:
Sprinkler systems will cost homeowners money. Substantive evidence already provided shows the current installation costs from between $1.61 and $2.00 a square foot for single family and much less for townhomes. For a typical home of 2500 to 3000 square feet this equates to a one-time construction cost of $4,000 to $6,000.

However, their true value comes over the entire life of the home which must be measured in the life saving and property conservation benefit they provide. While consumers will realize savings through trade-offs and insurance premium reductions, a typical homeowner will spend a sum of much greater significance on things such as cell phones and cable bills. Firefighters will be required to protect the structure and current occupants for the entire life of the structure which ranges from 75 to 200+ years.

4,500 Square Feet Requirement and Alternatives:
Builder groups are opposed to the 4,500 square feet and offered little substantive evidence regarding that threshold; however, they even opposed this high threshold

The Fire Service groups offered nine (9) trade-offs during the hearing process. These included the elimination of egress windows estimated at a cost of $1,000 per window installed if sprinklers were installed. This was rejected by the committee along with the other eight (8) – (attached). Opponents supported the application of sheetrock on basement ceilings. However, this provision already exists in the code.

Life Safety – Smoke Detectors and Sprinklers:
The core component of life saving systems whether they be fire departments, ambulance services, fire sprinkler systems or smoke detectors; is redundancy. Fire Departments and Ambulances Services operate with multiple pieces of apparatus and equipment as well as numerous trained individuals.

Failure to maintain these systems coupled with impairment issues ranging from drug to age to disability impairments, all limit their overall effectiveness. Much like a car, which has seat belts, air bags, ABS braking systems, crash/crumple zones, and reinforced structural support; a home must have more than just smoke detectors.

Attached, please find the following reports specific to smoke detectors describing their inherent deficiencies. In summary, smoke detectors are passive systems requiring regular maintenance, proper placement and installation, and rely on the assumption that occupants are alert and capable of rapid exiting. This simply is not true in far too many instances.

1. **Comparison of a Personalized Parent Voice Smoke Alarm with a Conventional Residential Tone Smoke Alarm for Awakening Children.**
   October, 2006
   American Academy of Pediatrics
   Research into determining a more effective (parental voice) notification alert system versions a traditional (tone) fire alarm system. Research indicated success rate increased from 38% effectiveness for tone systems to 83% effectiveness using parental voice system. More research needed.

2. **Community Based Research on the Effectiveness of the Home Smoke Alarm in Waking up Children.**
   March, 2011
   Victoria University, Australia
   123 Children tested in semi-scientific research to determine if they would awaken upon activation of smoke detector. Results indicate the younger the child, less chance of waking (78% failed to awaken) and for those who were awoke, not all recognized need to leave the house.

3. **Smoke Detector Effectiveness**
   University of Strathclyde
   June, 2013
   Study of 34 children aged 2 to 13; 80% slept through smoke alarm.

4. **Rossen Reports**
   March, 2013
   Three males aged 4, 8 and 9 slept through a smoke detector activation simulation.

5. **Video on DVD (Note will not play using Windows Media – Use DVD Player)**
   Bloomington, Minnesota Fire Marshal Robert James conducting a home fire drill at 4 homes in Bloomington where small children reside. Children did not react properly.

6. **Written Testimony**
   December 12, 2013
   St. Paul Fire Chief Tim Butler
   Written copy of testimony at DOLI - IRC hearing by St. Paul Fire Chief Tim Butler

Sprinkler systems provide the highest proven level of active prevention and in combination with working smoke detectors , give occupants the greatest chance of survival should a fire occur.

1. **Video on DVD (Note – will not play using Windows Media – Use DVD Player)**
   House Fire demonstration – one with sprinkler protection, the other without.

2. **Home Fire Protection**
   February, 2008
   U.S. Fire Administration
   Brief overview of residential fire problem in the United States and the role sprinkler systems play in reducing the problem.

3. **A 15 Year Update on the Impact and Effectiveness of the Scottsdale Sprinkler Ordinance.**
   Spring 2001
   Jim Ford – Fire Marshal Scottsdale Fire Department
   Report detailing impact of mandatory sprinkler systems in Scottsdale, Arizona

4. **YouTube Video – Burning Down the House**
   State Farm Insurance
   October, 2010
   Video produced by State Farm Insurance of side by side fire demonstration showing an unchecked fire growing to point of flashover and second fire showing effectiveness of sprinklers in controlling a similar fire.
   http://www.youtube.com/watch?v=HUYkvjqm1f0

Fire Conditions:
Attached please find the following reports, digital images, and videos specific to fire growth and spread. In summary, modern day home fires migrate to untenable conditions with respect to supporting life in 3 to 4 minutes as compared to fires of 20 or more years ago where legacy construction and different furnishings were present. Fuel loads in today's homes are both greater in overall quantity but also burn at a much greater intensity as the BTU content of the fuels (plastic appliances, synthetic carpets, drapes and furniture), is significantly more; thus causing more intense fires. When present in homes with modern day lightweight construction, structural failure is occurring earlier and on occasion, prior to the arrival of the fire department. Smoke Detectors may not provide sufficient time based upon mobility of the occupants (very young, old, and impaired) thus, sprinkler systems provide the additional needed protection.

1. **Analysis of Changing Residential Fire Dynamics and Its Implications on Firefighter Operational Timeframes.**
   United Laboratory
   2012
   Analysis of fire environment in modern day homes – larger homes, different geometrics, increased synthetic fuel loads and changing construction materials. Flashover occurring in under 5 minutes (flashover occurs when entire room becomes engulfed in fire – fatal condition for human life including firefighters in full protective gear) as compared to past where 30 minutes was more the norm.

2. **Study of the Effectiveness of Fire Service Vertical Ventilation and Suppression Tactics in Single Family Homes.**
   United Laboratory
   2013
   Research results from construction of two homes built for the purpose of conducting experiments specific to fire ventilation. Total of 17 experiments conducted. Executive Summary and Summary Findings (Page 311) discuss results - fire growth occurs at a much greater rate than in the past, in all experiments except the one with the legacy construction; tenability was exceeded prior to the fire departments arrival.
   Research document also includes a significant amount of scientific research data.

3. **That's the Way We've Always Done it Isn't Good Enough Anymore**
   United Laboratory
   2013
   Print- out of PowerPoint Presentation developed by Fire Research Director Steve Kerber that combines the above two studies for educational purposes.

4. **Video – Side by Side room burn**
   St. Paul Fire Department
   Fall, 2011
   While similar to other side by side burn demonstrations, this video includes data collected from scientific instruments details temperature conditions at the ceiling, mid-level, and floor as well as the aftermath in both situations. It also notes the time the smoke detectors activated.

Summary:
Home fires had experienced a continued decline over the past decade until recently, when in 2010, they began to trend up again. The majority of fire deaths continue to occur in the home with 2,450 lives of lost in 2011[1]. Smoke detectors played a significant role in reducing home fire deaths which were occurring at the rate of 10,000 or more per year prior to their required installation.

The National Fire Protection Association Report – Smoke Alarms in U. S. Home Fires – published in September of 2013 and submitted earlier in this adoption process details that over 33% of the homes in the United States do not have a working smoke alarm. Additionally, the report discusses the limitations of mobility as it related to age and impairment.

Thus, smoke detectors are not enough. Sprinklers have proven their effectiveness as evidenced by volumes of data and research submitted earlier in this process.

The cost of most residential systems will be approximately $3,500 or the equivalent of a typical families of four cell phone and cable bill for a couple of years (our opinion based on our personal experience). This one-time cost will protect that family and home for the entire life of the structure. Insurance savings, construction trade-offs, and likelihood of reduced property taxes from a more efficient fire department will lessen the initial cost impact.

However, life safety remains the primary investment. Today's home are more dangerous than ever before when a fire occurs. Those homes built with legacy construction will provide greater time for occupants to escape; however, the abundance of furnishings and concentration of synthetic materials are dramatically altering the fire growth. For homes built in the last 15 years with lightweight construction, the risk is dramatically higher.

On behalf of the Minnesota Fire Service and the 20,300 Firefighters in the State of Minnesota;

Tom Brace
Executive Director, Minnesota State Fire Chiefs Association

[1] http://www.usfa.fema.gov/statistics/estimates/index.shtm

The Honorable Eric L. Lipman
Administrative Law Judge
Office of Administrative Hearings
600 N. Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620

RE: OAH Docket 8-1900-30855 – Adoption of International Residential Code

Dear Judge Lipman,

We would like to offer the following information as a follow-up to the December 12, 2013 hearing at the Department of Labor and Industry (DOLI). The City of Minnetonka has long supported fire sprinkler systems, including residential sprinklers. Attached is a list of the 87 properties where residential sprinkler systems (NFPA 13D) have been installed since 1991.

We have good data (square footage of the structure and installation cost) on 71 of those systems so we can calculate the "per square foot" installation price. For these 71 residential sprinkler installations, the average size of the residence was 4,030 sq. ft. The average installation price was $5,971. The average price per square foot for the residential sprinkler system was $1.51 (with the low cost being less than $1.00 per square foot and the high being $5.15 per square foot).

Please accept this information as an official part of the hearing record.

Respectfully submitted,
Luke Berscheit
Fire Marshal
City of Minnetonka
Office (952) 939-8332
Cell (612) 919-9636

-Expect the Unexpected!

ADDRESS	OCCUPANCY TYPE	13D INSTALL YEAR	HOME VALUATION (EXCLUDING LAND)	SQUARE FEET	13D VALUATION	13D PRICE PER SQ. FT.	BLDG. PERMIT	FIRE PERMIT	NOTES
11323 CLARION WAY	TOWNHOUSE	2005	$ 250,000	3,934	$ 3,450	$0.88	MI109223	MI128499	
11347 CLARION WAY	TOWNHOUSE	2005	$ 250,000	3,934	$ 4,100	$1.04	MI109222	MI128500	
11369 CLARION WAY	TOWNHOUSE	2005	$ 298,698	3,934	$ 4,100	$1.04	MI109221	MI128501	
11419 CLARION WAY	TOWNHOUSE	2005	$ 320,000	3,934	$ 3,450	$0.88	MI111852	MI128496	
11443 CLARION WAY	TOWNHOUSE	2005	$ 316,000	3,934	$ 4,100	$1.04	MI111851	MI128497	
11467 CLARION WAY	TOWNHOUSE	2005	$ 305,000	3,002	$ 4,100	$1.37	MI111850	MI128498	
12811 LAKE ST. EXT.	SINGLE FAMILY	2000	$ 234,628		$ 2,600		MI087990	MI088052	
13612 WENTWORTH TR.	SINGLE FAMILY	1999	$ 265,000	4,800	$ 4,400	$0.92	MI082964	MI085925	
13618 KNOLLWAY DR. N.	GROUP HOME	2004			$ 4,800			MI121314	sprinklers retrofitted
14200 GLEN LAKE DR.	TOWNHOUSE	2006	$ 201,185	2,396	$ 4,000	$1.67	MI134013	MI136733	
14202 GLEN LAKE DR.	TOWNHOUSE	2006	$ 196,791	2,339	$ 4,000	$1.71	MI134014	MI136734	
14206 GLEN LAKE DR.	TOWNHOUSE	2011	$ 195,000	3,630	$ 4,700	$1.29	MI137205	MI168739	
14208 GLEN LAKE DR.	TOWNHOUSE	2011	$ 195,000	3,630	$ 4,700	$1.29	MI137204	MI168740	
14226 TRACE RIDGE RD.	SINGLE FAMILY	2003	$ 900,000	5,238	$ 9,780	$1.87	MI109465	MI111649	
14238 TRACE RIDGE RD.	SINGLE FAMILY	2005	$ 900,000	4,922	$ 11,800	$2.40	MI126709	MI130137	
14629 LAKE ST. EXT.	SINGLE FAMILY	2011	$ 480,000	4,220	$ 8,750	$2.07	MI168133	MI170748	
14814 CROWN DR.	GROUP HOME	2011	$ 392,000	2,898	$ 7,825	$2.70	MI169123	MI170464	13D with antifreeze
15709 EXCELSIOR BLVD.	SINGLE FAMILY	2011	$ 361,064	4,433	$ 4,400	$0.99	MI168025	MI172714	
16325 GLEASON LK. RD.	GROUP HOME	2000	$ 350,000	4,642	$ 4,300	$0.93	MI086102	MI088144	
16510 BLACK OAKS CIR.	SINGLE FAMILY	2013	$ 400,772	4,948	$ 7,900	$1.60	MI186108	MI187761	
16523 BLACK OAKS CIR.	SINGLE FAMILY	2013	$ 2,000,000	5,385	$ 9,980	$1.85	MI180078	MI183200	
1708 PONDVIEW TER.	GROUP HOME	2004			$ 15,050			MI125229	sprinklers retrofitted
17216 LAKE ST. EXT.	SINGLE FAMILY	2008	$ 525,000	5,120	$ 9,728	$1.90	MI149208	MI150878	
17403 SANCTUARY DR.	TOWNHOUSE	2006	$ 410,000	3,936	$ 3,940	$0.99	MI134606	MI137452	
17412 SANCTUARY DR.	TOWNHOUSE	2011	$ 320,000	2,706	$ 5,300	$1.95	MI170889	MI172791	
17428 SANCTUARY DR.	TOWNHOUSE	2005	$ 504,000	3,386	$ 4,218	$1.25	MI126342	MI129507	
17435 SANCTUARY DR.	TOWNHOUSE	2012	$ 320,000	2,614	$ 5,300	$2.02	MI176380	MI178153	
17436 SANCTUARY DR.	TOWNHOUSE	2004	$ 300,000	2,820	$ 3,300	$1.17	MI117374	MI120148	
17440 SANCTUARY DR.	TOWNHOUSE	2004	$ 280,000	2,820	$ 4,100	$1.45	MI117373	MI119090	
17448 SANCTUARY DR.	TOWNHOUSE	2005	$ 570,000	3,404	$ 3,840	$1.13	MI120455	MI127084	
17460 SANCTUARY DR.	TOWNHOUSE	2005	$ 442,000	3,266	$ 3,400	$1.04	MI120772	MI127956	
17481 SANCTUARY DR.	TOWNHOUSE	2012	$ 320,000	2,911	$ 5,300	$1.82	MI176379	MI179943	
17482 SANCTUARY DR.	TOWNHOUSE	2004	$ 378,000	3,010	$ 3,150	$1.05	MI118548	MI121312	
17524 HAMPTON CT.	SINGLE FAMILY	2006	$ 514,600	4,348	$ 9,385	$2.16	MI136432	MI139664	re-build after house fire
17530 SANCTUARY DR.	TOWNHOUSE	2004	$ 463,000	3,526	$ 3,600	$1.02	MI118059	MI120578	
17534 SANCTUARY DR.	TOWNHOUSE	2013	$ 320,000	2,820	$ 5,300	$1.88	MI180327	MI182085	
17538 SANCTUARY DR.	TOWNHOUSE	2013	$ 320,000	2,773	$ 5,300	$1.91	MI180282	MI182086	
17562 SANCTUARY DR.	TOWNHOUSE	2013	$ 320,000	2,765	$ 5,300	$1.92	MI180281	MI182087	
17808 TOWNLINE RD.	TOWNHOUSE	1998	$ 143,000	2,397	$ 3,000	$1.25	MI065014	MI071121	
17812 TOWNLINE RD.	TOWNHOUSE	1998	$ 143,000		$ 3,000		MI065013	MI071122	
2001 YORKSHIRE AVE. S.	SINGLE FAMILY	2008	$ 850,000	5,823	$ 8,800	$1.51	MI152048	MI156458	
208 PARK LN. S.	SINGLE FAMILY							MI145376	Extreme Home Makeover House
211 XENIUM LN. S.	SINGLE FAMILY	2003	$ 274,144	4,467			MI112967	MI114741	
2412 SHERIDAN HILLS CURVE	GROUP HOME				$ 6,600			MI095260	
2435 EMERALD TR.	SINGLE FAMILY	2004	$ 650,000	6,322	$ 6,200	$0.98	MI115062	MI121313	

ADDRESS	OCCUPANCY TYPE	13D INSTALL YEAR	HOME VALUATION (EXCLUDING LAND)	SQUARE FEET	13D VALUATION	13D PRICE PER SQ. FT.	BLDG. PERMIT	FIRE PERMIT	NOTES
2452 EMERALD TR.	SINGLE FAMILY	2005	$ 750,000	5,787	$ 18,500	$3.20	MI130950	MI132177	
2602 CROSBY RD.	SINGLE FAMILY	2011	$ 1,465,000	7,367	$ 10,575	$1.44	MI165125	MI168735	
2618 CROSBY RD.	SINGLE FAMILY	2010	$ 1,900,000	7,855	$ 16,600	$2.11	MI160357	MI163320	
2647 PLYMOUTH RD.	SINGLE FAMILY	2005	$ 659,000	5,858	$ 18,000	$3.07	MI128884	MI131851	
3149 LAKE SHORE BLVD.	SINGLE FAMILY	2005	$ 399,000	5,420	$ 10,000	$1.85	MI130277	MI132874	
3502 THE MALL	SINGLE FAMILY	2007		3,186	$ 6,000	$1.88	MI141402	MI143321	sprinklers added during remodel
3800 TONKAWOOD RD.	GROUP HOME	2008	$ 525,000	4,110	$ 8,745	$2.13	MI150853	MI152506	
3919 HAVEN RD.	SINGLE FAMILY	2013	$ 4,000,000	5,156	$ 8,500	$1.65	MI184416	MI186532	
4294 WINDWOOD WAY	SINGLE FAMILY	2000	$ 275,000		$ 6,374		MI088706	MI091075	
4406 JULEENA PL.	SINGLE FAMILY	2013	$ 4,000,000	5,534	$ 11,000	$1.99	MI182072	MI183068	
4410 JULEENA PL.	SINGLE FAMILY	2013	$ 4,000,000	5,080	$ 6,550	$1.29	MI184069	MI184991	
4414 JULEENA PL.	SINGLE FAMILY	2013	$ 404,872	5,070	$ 7,935	$1.57	MI184183	MI185781	
4530 HIGHLAND RD.	SINGLE FAMILY	2006	$ 320,000	3,582	$ 3,000	$0.83	MI134272	MI136212	
4538 HIGHLAND RD.	SINGLE FAMILY	2005	$ 720,000		$ 14,800		MI127550	MI131510	
4554 HIGHLAND RD.	SINGLE FAMILY	2011	$ 630,000	6,838	$ 2,160	$0.32	MI114178	MI167281	
4605 FAIRHILLS RD. E.	GROUP HOME	2004			$ 13,500		MI034265	MI124703	
4701 CARIBOU DR.	GROUP HOME	2013			$ 6,500			MI182673	sprinklers retrofitted
4731 CLEAR SPRING RD.	GROUP HOME	2006	$ 200,000	2,376	$ 9,440	$3.97	MI135927	MI138034	
4733 CLEAR SPRING RD.	GROUP HOME	2006	$ 900,000		$ 27,800		MI135924	MI138950	
4735 CLEAR SPRING RD.	GROUP HOME	2006	$ 380,000	3,256			MI135925	MI138951	
4737 CLEAR SPRING RD.	GROUP HOME	2006					MI135926	MI138952	
4817 WILLISTON RD.	SINGLE FAMILY	2004	$ 250,000	2,301	$ 11,850	$5.15	MI115813	MI117644	
4831 WILLISTON RD.	SINGLE FAMILY	2002	$ 246,173	4,320	$ 4,200	$0.97	MI107590	MI109462	
4904 SHADY OAK RD.	SINGLE FAMILY	2005	$ 260,000	4,292	$ 1,980	$0.46	MI121181	MI126911	may not have sprinkled basement
5126 MAYVIEW RD.	GROUP HOME	1991			$ 9,397			MI022296	sprinklers retrofitted
5425 SPRING LN.	SINGLE FAMILY	2008	$ 238,000	2,296	$ 6,500	$2.83	MI152205	MI153905	
5621 EDEN PRAIRIE RD.	SINGLE FAMILY	2013	$ 311,228	3,675	$ 3,000	$0.82	MI183255	MI185844	homeowner install
6010 CLARION CIR.	TOWNHOUSE	2004	$ 305,000	3,002	$ 3,233	$1.08	MI115686	MI123157	
6014 CLARION CIR.	TOWNHOUSE	2004	$ 316,000	3,934	$ 3,233	$0.82	MI115685	MI123158	
6018 CLARION CIR.	TOWNHOUSE	2004	$ 310,000	3,283	$ 3,233	$0.98	MI115684	MI123159	
6027 CLARION PASS	SINGLE FAMILY	2001	$ 515,000		$ 4,600		MI093308	MI094850	
6089 CLARION CIR.	TOWNHOUSE	2004	$ 320,000	3,934	$ 3,233	$0.82	MI116181	MI120126	
6093 CLARION CIR.	TOWNHOUSE	2004	$ 320,000	3,934	$ 3,233	$0.82	MI116182	MI120125	
6097 CLARION CIR.	TOWNHOUSE	2004	$ 280,000	3,283	$ 3,233	$0.98	MI116183	MI120124	
9823 ENCLAVE DR.	TOWNHOUSE	2001	$ 670,000	5,832	$ 4,500	$0.77	MI093588	MI098911	
9857 ENCLAVE DR.	TOWNHOUSE	2001	$ 347,500	3,760	$ 3,850	$1.02	MI093564	MI099341	
9875 ENCLAVE DR.	TOWNHOUSE	2001	$ 345,000	3,492	$ 4,100	$1.17	MI093587	MI099342	
9901 ENCLAVE DR.	TOWNHOUSE	2001	$ 340,500	4,320	$ 3,800	$0.88	MI091468	MI094751	
9923 ENCLAVE DR.	TOWNHOUSE	2001	$ 340,500	4,012	$ 4,100	$1.02	MI091466	MI094752	
9945 ENCLAVE DR.	TOWNHOUSE	2002	$ 458,000	4,064	$ 4,250	$1.05	MI096731	MI103319	
9967 ENCLAVE DR.	TOWNHOUSE	2002	$ 143,000	2,228	$ 3,100	$1.39	MI096741	MI103320	
9989 ENCLAVE DR.	TOWNHOUSE	2002	$ 427,000	4,044	$ 4,000	$0.99	MI096732	MI103316	

January 2, 2014

The Honorable Eric L. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Revisor's ID Number R-04144 Minnesota Department of Labor & Industry - Proposed Amendment to Minnesota Rules, chapter 1309;

Dear Judge Lipman:

Thank you for the opportunity for the Minnesota Housing Partnership to present our views opposing the requirement for fire sprinklers in single family homes and for dry head sprinklers in all IRC occupancies. I would have given my comments verbally but had a conflicting board meeting on December 12, 2013.

The Minnesota Housing Partnership (MHP) strives to provide affordable, quality housing for all Minnesotans. Our organization's leadership includes nonprofit, public and for-profit leaders in affordable housing.

MHP supports life safety requirements in the Minnesota State Building code that are proven and cost effective. We believe, however, that the proposed standards go too far, and provide little additional safety benefit for the substantial cost required. While the current proposal, in part, is for larger homes we believe it sets a bad precedent; further, the townhouse proposal will negatively impact our efforts to affordably house Minnesotans.

Our positions regarding fire sprinklers in the 2012 IRC are:

1) There should be no requirement for dry head sprinklers in exterior locations for any type of housing in the IRC whether installed according to NFPA 13D Standards (for one- and two-family dwellings) or NFPA 13R Standards (for IRC townhomes).
2) There should be no requirements for 13D fire sprinkler systems in one-family dwellings of any size.

No Dry Head Sprinklers

The 2012 IRC does not require fire sprinklers in exterior locations. The Minnesota Department of Labor and Industry's proposed code language requires dry sprinkler heads in garages and covered exterior spaces over 40 square feet. NFPA 13D states "8.6.4* Sprinklers shall not be required in garages, open attached porches, carports and similar structures."[1] The National Fire Protection Association (NFPA) explains why the requirement for sprinklers was not included in NFPA 13D:

> "Many people are surprised to find that NFPA 13D does not require sprinklers in garages. But the simple truth is that very few deadly fires start in garages. A simple cost/benefit analysis, together with the fact that most codes require a 1-hour fire resistance rating for the wall between the garage and the rest of the home, led the committees to permit sprinklers to be omitted from garages."[2]

Fire sprinklers are not required in NFPA 13R systems in exterior areas of townhomes. NFPA 13R section 6.6.5 states, "Sprinklers shall not be required in any porches, balconies, corridors, carports and stairs that are open and attached."[3,4] The NFPA document further explains

> "Mandatory sprinkler protection for many of the areas in 6.65 and 6.6.6 would necessitate the use of dry pipe or antifreeze system in areas where freezing weather is encountered. Such systems would dramatically impact the cost of the sprinkler system without correspondingly increasing the life safety offered by the sprinkler system. Very few deadly fires tend to start in these spaces."[5]

We are requesting that the standards for dry head sprinklers that go above and beyond the 13D and 13R standard be removed from the proposed State Building Code.

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[1] Lake, James D. NFPA 13D & 13R 2010 Edition Automatic Sprinkler Systems for Residential Occupancies Handbook. (National Fire Protection Association, 2010. Page 121.

[2] *Ibid.*, page 122.

[3] *Ibid.*, page 199.

4 The language in NFPA 13R also allows builders the option of fire separating a garage from an attached residence in place of sprinklering garages.

[5] *Ibid.*, page 198.

No Fire Sprinklers in Single Family Dwellings and Smaller Multi-Unit Dwellings

MHP also requests that the requirements for fire sprinklers in one- and two-family dwellings remain the same as the existing State Building Code. Those requirements are outlined in the table below. This language would omit the requirement for fire sprinklers in all single-family (one-family) dwellings. MHP has always opposed the requirement for fire sprinklers in single-family homes due to high installation costs and low increase in fire safety for occupants. The SONAR at p. 33 states that the "MSFCA recommended phasing in the automatic fire sprinkler system requirement beginning at 4,000 square feet in area" and that the Fire Marshals Association of Minnesota recommended starting the phase in at 5,000 square feet. It appears that DOLI has split the difference. We oppose the 4,500 square foot trigger proposed by DOLI because it is clear that the goal is to require fire sprinklers in all homes in a future version of the building code, which will directly affect those we are trying to house.

MHP also believes the existing exemption for two-family and townhome dwellings of under 9,500 feet remain intact in the building code. This exemption has allowed the continued construction of smaller, affordable townhome units without fire sprinklers. The specific code language we are recommending based on the 2007 Minnesota State Building Code is included in this letter. Note that the sections may have to be renumbered to mesh with the 2012 IRC.

The occupants served by MHP's affordable housing initiatives are most likely moving from substandard housing that has much lower fire safety measures protecting them. Living in a new one- or two-family dwelling that includes hard-wired interconnected smoke alarms will increase the safety of these families tremendously. Any code requirements that prevent modern housing from being built will ensure that more Minnesotans will continue to live in less safe housing. The cost effectiveness of hardwired, interconnected smoke alarms versus those alarms plus fire sprinklers simply is not warranted by the life safety data presented to you during the ALJ Trial on December 12, 2013.

2007 Minnesota State Building Code Requirements based on 2006 IRC

	National Code (2006 IRC)		Minnesota Amendments to 2006 IRC [More stringent than the national building code]		
Type of Building	**Fire Sprinklers Installed according to NFPA 13D Standard**	**Unfinished basements require fire protected floor assemblies**	**Fire Sprinklers Installed according to NFPA 13D Standard with Size of Building Trigger**	**Fire Sprinkler Dry Head Required in Garage**	**Fire Sprinkler Dry Head Required in Covered Porches, Patios, Decks & Balconies**
One-Family Homes	NO	NO	NO	NO	NO
Two-Family Homes (duplexes)	NO	NO	YES, if floor area of both dwellings including basements & garages is over 9,250 sq. ft.	YES, if floor area limit is triggered	YES, if floor area limit is triggered AND covered area is over 40 sq. ft.
Townhomes (multi-family)	NO	NO	YES, if floor area of entire building including basements & garages is over 9,250 sq. ft.	YES, if floor area limit is triggered	YES, if floor area limit is triggered covered area is over 40 sq. ft.

Shaded areas indicate where existing State Minnesota Code is stricter than National 2006 IRC

Proposed Code Language Based on the 2012 IRC and Current State Building Code

R301.1.4 Automatic sprinkler systems (general). All IRC-2 and IRC-3 buildings shall be provided with an automatic sprinkler system.

Exception:

IRC-2 and IRC-3 buildings less than or equal to 9,250 square feet of floor area. Floor area shall include all floors, basements, and garages.

R301.1.4.1 State licensed facilities. IRC-1, IRC-2, and IRC-3 buildings containing facilities licensed by the state of Minnesota shall be provided with a fire suppression system as required by the applicable licensing provisions or this section, whichever is more restrictive.

R301.1.4.2 Installation requirements. Where an automatic sprinkler system is required in an IRC-2 and IRC-3 building, it shall be installed in accordance with NFPA 13D-2010 edition ~~and the following:~~

~~Attached garages are required to have automatic sprinklers with a minimum of one dry head, located within five lineal feet of each door installed in the common wall separating the dwelling unit and the attached garage.~~

~~Attached covered patios, covered decks, covered porches, and similar structures are required to have automatic sprinklers with a minimum of one dry head for every 20 lineal feet of common wall between the dwelling unit and the covered patios, covered decks, covered porches, and similar structures.~~

~~**Exception:**~~

~~Attached roofs of covered patios, covered decks, covered porches, and similar structures that do not exceed 40 square feet of floor area.~~

~~For the purposes of this section, fire-resistance-rated floor, wall, or ceiling assemblies separating dwelling units of IRC-2 and IRC-3 buildings shall not constitute separate buildings."~~

None of the code language proposed by MHP would affect the construction of apartment buildings or townhomes over three stories because these are required to be constructed to the 2012 International Building Code, not the 2012 IRC.

We appreciate the opportunity to share our views on this important topic. The decision to require fire sprinklers to more types of housing in Minnesota will have a direct and negative impact on the Minnesota populations we are trying to serve. Thank you for considering our perspective on this important topic.

Sincerely,

Chip Halbach
Executive Director

MINNESOTA DEPARTMENT OF PUBLIC SAFETY

State Fire Marshal Division

444 Cedar Street • Suite 145 • Saint Paul, Minnesota 55101-5145
Phone: 651.201.7200 • Fax: 651.215.0525 • TTY: 651.282.6555
www.dps.state.mn.us

Alcohol and Gambling Enforcement
Bureau of Criminal Apprehension
Driver and Vehicle Services
Emergency Communication Networks
Homeland Security and Emergency Management
Minnesota State Patrol
Office of Communications
Office of Justice Programs
Office of Pipeline Safety
Office of Traffic Safety
State Fire Marshal

December 30, 2013

The Honorable Eric L. Lipman
Administrative Law Judge
Office of Administrative Hearings
600 N. Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620

RE: OAH Docket 8-1900-30855 – Adoption of International Residential Code

Dear Judge Lipman,

Thank you for the opportunity to provide additional comments regarding the adoption of the International Residential Code® (IRC) – 2012 edition and, specifically, the proposed requirements for residential sprinkler systems.

We would like to offer the following information that is in addition to our written and verbal comments submitted at the December 12, 2013 hearing at the Department of Labor and Industry (DOLI).

Fire Death Statistics:
At the hearing, a comment was made that fire deaths have dropped in the past ten years. While this may be a trend nationally or in other states, it has not been our experience in Minnesota.

The number of fire deaths in Minnesota in the past decade has pretty much plateaued. While we did see an overall downward trend of fire deaths in the 1980s and 1990s, this downward trend is no longer apparent. Actually the downward trend of fire deaths in Minnesota in the 1980s and 1990s appears to be reversing and has been going up since 2009.

Time will tell if this upward trend continues; we hope it reverses and we again see a decline in fire deaths. See Graph #1 entitled: "Minnesota Fire Deaths 1970-2012".

For the past ten years in Minnesota (2004-2013), 58.7% of the fire fatalities have occurred in 1 & 2 family dwellings; this is by far the most common location for fire deaths to occur. See Chart #1 entitled "Fire Deaths by Occupancy".

State Building Code:
One of the presenters commented that the building code is not applicable throughout Minnesota; this is an inaccurate statement. Since August 1, 2008, the building code has been in effect throughout the entire state. Since the building code (and the residential code which is part of the state building code) is in effect throughout the state, an argument that there is a competitive advantage from a "code area" to a "non-code area" is a specious one.

Residential Sprinkler Costs:
The State Fire Marshal Division issues permits and inspects fire sprinkler systems. In recent years we have issued permits for a handful of residential sprinkler systems in 1 & 2 family dwellings. Here is a break-down of those project valuations:

Address:	Size (in Sq. Ft.):	Cost of Sprinklers:	Cost / Sq. Foot:
xxx Montauk Lane – Duluth	3,600	$ 6,200	$ 1.72
xx Eastridge Blvd – Duluth	5,622	$ 7,300	$ 1.30
xxx Montauk Lane – Duluth	8,793	$ 9,530	$ 1.08
xxxx-xxxx 16th St NE – St. Michael	7,227	$ 16,295	$ 2.25
xxxxx 49th St NE – Albertville	2,800	$ 5,000	$ 1.79

Municipal Water Supplies vs. Private Water Supplies (e.g. Wells);
Due to our division's statewide fire code efforts, we deal with unique water supply issues frequently. While it is true that there is a cost increase associated with increasing the well size, casing diameter, and pump capacity to handle additional demands for sprinklers, it should also be considered that there are no development costs for municipal utilities when private water supplies are utilized.

Typically, in areas with public utilities, either the developer pays for the utility installation costs or the homeowner pays for these as an assessment. If there is no municipal water, there are no installation or assessment costs to be passed along to the homeowner. Also, lot prices in areas without municipal utility services are often less expensive than lot prices that have municipal services (utilities, roads, parks, etc.).

In order to conduct a true comparison of the costs for a private water supply, these other factors (such as lack of utility or assessment costs and cheaper lot prices) should be part of the equation.

Mutual Aid Responses:
Fire departments often request assistance from neighboring fire departments during emergencies; these responses are called "mutual aid". Mutual aid is requested for various reasons: need for additional resources for a large incident, staffing reductions, faster response times from fire departments with closer fire stations, etc.

During the hearing, a valid question was raised about the number of mutual aid calls and why mutual aid is being requested more often. The State Fire Marshal collects fire incident data from the 784 fire departments in Minnesota. Included in this data is the number of times mutual aid is requested.

From 1989 through 2012 the number of fire department incidents requiring mutual aid climbed from 2,227 to 6,028. We then further filtered the mutual aid responses to only include fires in 1 & 2 family dwellings (since they were the subject of the recent residential code hearing). From 1989 through

2012 the number of mutual aid responses to 1 & 2 family dwelling fires increased from 319 to 720 (see Graph #2 entitled: "Mutual Aid Fire Calls – 1 & 2 Family Dwellings").

In analyzing the data, we are unable to determine a root cause for this increase in mutual aid requests; it is likely a combination of staffing and changing fire dynamics (faster, hotter fires and light-weight construction methods). What we did notice, however, was an increase in these responses for the past ten years (from 2003 to present). This roughly coincides to the point in time when fire departments identified the increased hazards associated with light-weight construction during fire conditions in newer houses (those constructed within the previous decade or so).

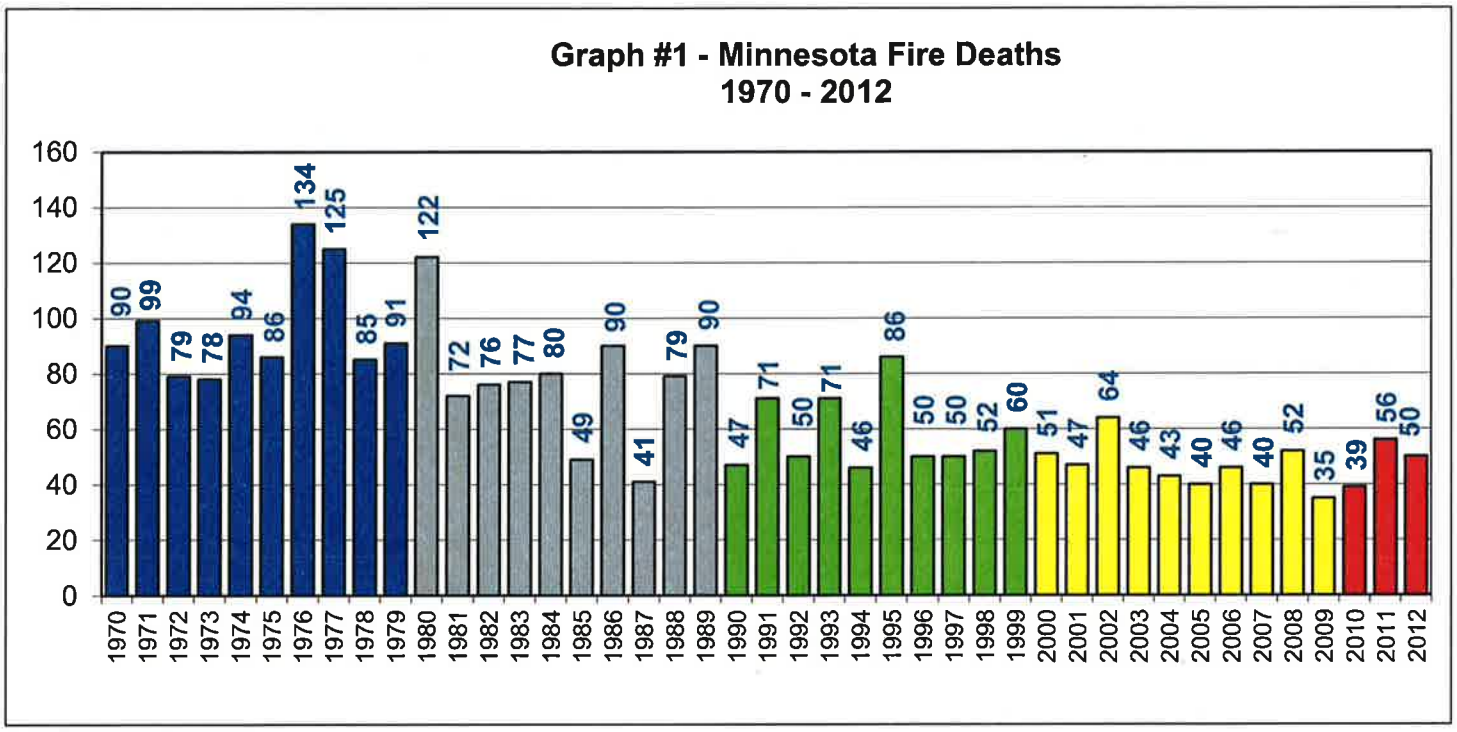
This mutual aid data seems to be an indicator of the changing dynamics for fire departments. As a former fire chief and Past President of the Minnesota State Fire Chiefs Association, staffing for fire departments has been and continues to be a problem. The number of firefighters in Minnesota has remained at a fairly constant number since 1990 – about 20,000.

While the number of firefighters has remained fairly constant, Minnesota's population has grown about 25% since 1990 and the number of fire department responses has more than doubled during this same period of time. This is placing a burden on an already fragile delivery system. The installation of residential sprinkler systems provides a clear and effective solution to this over-loaded emergency services delivery system.

Thank you for the opportunity to provide this additional information for your consideration of this important fire and life safety matter. If you have any questions or need additional information, please feel free to contact me at 651-201-7201 or via e-mail at bruce.west@state.mn.us.

Sincerely,

Bruce West
Minnesota State Fire Marshal


Graph #1 - Minnesota Fire Deaths
1970 - 2012
160
140
120
100
80
60
40
20
0
90 99 79 78 94 86 134 125 85 91 122 72 76 77 80 49 90 41 79 90 47 71 50 71 46 86 50 50 52 60 51 47 64 46 43 40 46 40 52 35 39 56 50
1970 1971 1972 1973 1974 1975 1976 1977 1978 1979 1980 1981 1982 1983 1984 1985 1986 1987 1988 1989 1990 1991 1992 1993 1994 1995 1996 1997 1998 1999 2000 2001 2002 2003 2004 2005 2006 2007 2008 2009 2010 2011 2012

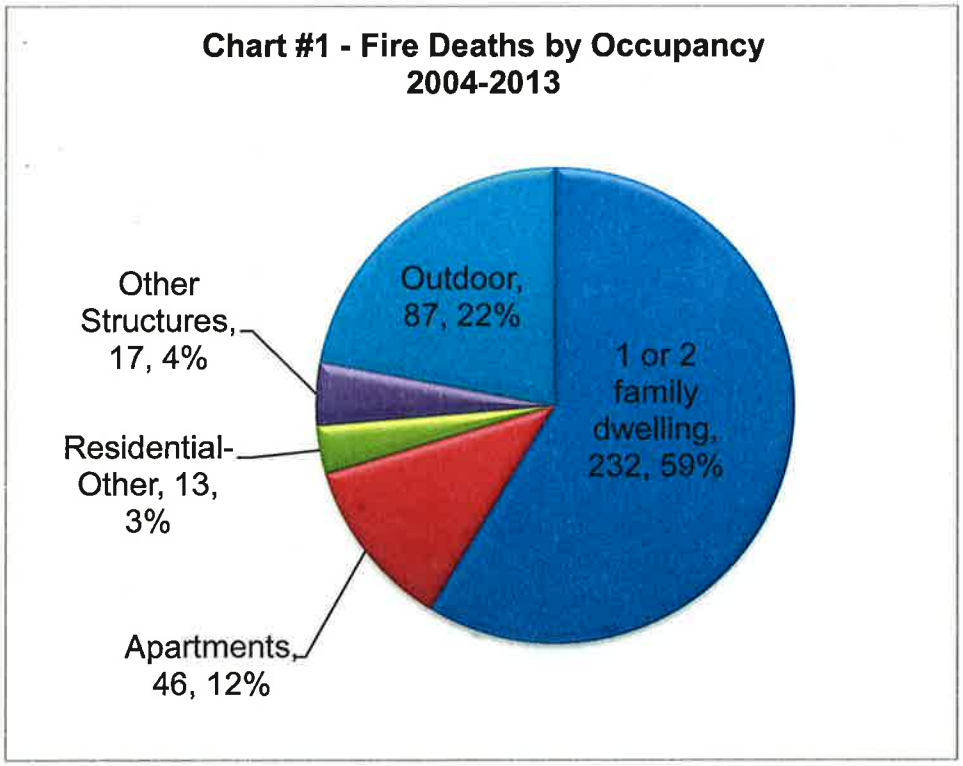
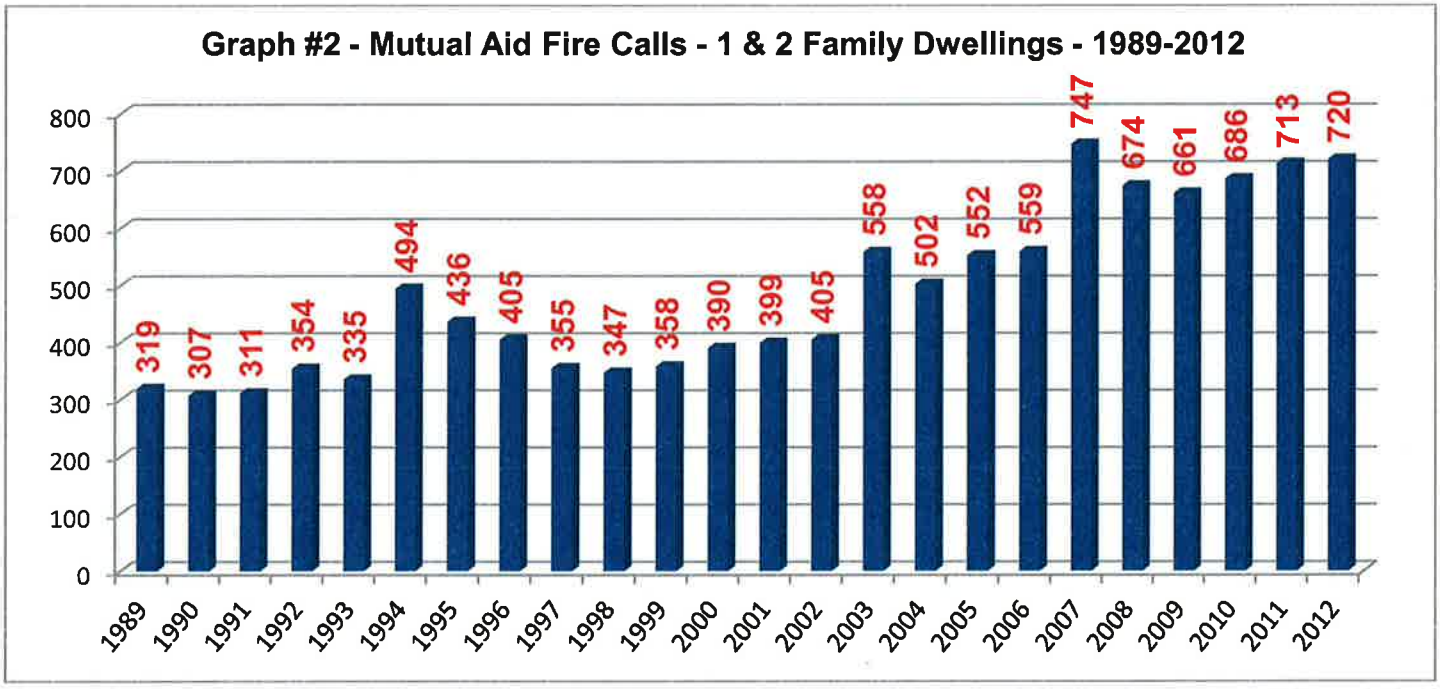


Chart #1 - Fire Deaths by Occupancy
2004-2013
Outdoor, 87, 22%
1 or 2 family dwelling, 232, 59%
Other Structures, 17, 4%
Residential-Other, 13, 3%
Apartments, 46, 12%


Graph #2 - Mutual Aid Fire Calls - 1 & 2 Family Dwellings - 1989-2012
800
700
600
500
400
300
200
100
0
319
307
311
354
335
494
436
405
355
347
358
390
399
405
558
502
552
559
747
674
661
686
713
720
1989
1990
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
2011
2012

CERTIFICATION

I, the City Clerk of the City of Breckenridge, Minnesota, hereby certify that I have carefully compared the foregoing copy of Resolution No. 12397-102/2013, A resolution opposing proposed amendments to Minnesota Rules, Chapter 1309, requiring fire sprinkler systems in single-family homes.
with the original of said instrument on file in my office and that the same is a true and correct copy of the whole thereof of such original instrument.

WITNESS my hand and the official seal of the City of Breckenridge, a Municipal Corporation under the laws of the State of Minnesota, this 20th day of December, 2013.

seal

Renae Smith

RENAE SMITH, City Clerk-Treasurer

RESOLUTION NO. 12397-102/2013

RESOLUTION OPPOSING PROPOSED AMENDMENTS TO MINNESOTA RULES, CHAPTER 1309, REQUIRING FIRE SPRINKLER SYSTEMS IN SINGLE-FAMILY HOMES

WHEREAS, the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new single-family homes with more than 4,500 finished and unfinished square feet.

AND WHEREAS, the SONAR does not correctly analyze the potential costs and impacts of such a rule.

AND WHEREAS, the fire sprinkler mandate has been rejected in the vast majority of other states across the country, twice by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue.

AND WHEREAS, the State of North Dakota has already rejected the fire sprinkler mandate statewide, as have the States of South Dakota, Wisconsin and Iowa.

AND WHEREAS, the City of Breckenridge competes with cities in North Dakota for new residential construction and development.

AND WHEREAS, according to the 2011 Minnesota State Survey conducted by the University of Minnesota, Minnesota Center for Research, 88% of Greater Minnesota Residents believe that the decision whether to install sprinklers should remain a homeowner's choice.

AND WHEREAS, the fire sprinkler mandate will increase the cost of building new homes in Breckenridge compared to the cost of doing so in North Dakota.

AND WHEREAS, increasing the cost to build new homes in Breckenridge, will encourage homeowners to build in North Dakota, rather than Breckenridge, Minnesota.

AND WHEREAS, increasing the cost to build new homes in Breckenridge will encourage homeowners to use unlicensed contractors and build in non-code-enforced areas.

AND WHEREAS, Breckenridge already recognizes an ongoing problem with homeowners choosing to use unlicensed contractors to build in non-code-enforced areas and the fire sprinkler mandate will only exacerbate this problem.

AND WHEREAS, the SONAR does not consider that any alleged benefits from fire sprinklers will not be achieved in border cities because of the likelihood that new homes will be built without sprinklers in other states or in non-code-enforced areas.

AND WHEREAS, a decrease in new home-building in Breckenridge will result in a decreased tax base for us and will significantly adversely affect the City.

AND WHEREAS, the SONAR does not consider the significant effect that the fire sprinkler mandate will have on Breckenridge.

AND WHEREAS, the fire sprinkler mandate is neither needed nor reasonable because there have been zero fatalities from fire in single-family homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

NOW THEREFORE, Be It Resolved by the City Council of the City of Breckenridge, Minnesota:

> That the City of Breckenridge opposes the proposed amendments to the Minnesota rules, Chapter 1309, requiring automatic fire sprinkler systems in single-family homes, be and it hereby is approved.

Adopted this 16th day of December, 2013.

CLIFFORD W. BARTH, Mayor

ATTEST:

RENAE SMITH, City Clerk-Treasurer

Dear Judge Lipman,

This letter is in regards to the adoption of the International Residential Code (IRC) - 2012 edition and the requirements for residential sprinkler systems.

I am Brian Hoffman a Certified Fire Inspector and a Licensed Journeyman Sprinkler Fitter in the State of Minnesota and Wisconsin. I am writing this letter in support of the inclusion of fire sprinklers in new one and two family dwellings. The Minnesota Department of Labor and Industry has proposed that new dwellings over 4,500 square feet in size be equipped with residential sprinkler systems. Although there is much opposition for this adoption from the builder's view point due to financial needs it is hard for me to grasp since we are already installing fire sprinklers in townhome units with substantially less square footage.

I have a couple personal examples for you that I would like to share. One is that I own a home in Somerset, Wisconsin which has a fire sprinkler system in it. I can not provide any cost facts to you because I installed it. It is about 1800 square feet and when the system was installed the upstairs was finished and the basement area was not. From start to finish I was able to have a complete Fire sprinkler system in about 4 hours. The amazing part is I completed this in that time frame. If the upstairs wasn't already finished, it could have been a lot more efficient if it was installed during the construction process. I lived in this house for 8 years and now rent it out. I have not had one issue with my system since it was installed nor have there been any problems since I rented the property out. The time frame for this installation is great example of costs. Although this is a much a smaller house than 4,500 square feet it took less time than a mechanic working on my car. It costs approximately $900.00 for labor in an 8 hour period to hire one sprinkler installer. I did this house in four hours which is not much of a financial burden as builders portray it to be.

A second example I have for you is about home owners choices they make on their homes. Approximately 5 years ago a close family member of mine had a house fire in Woodbury Minnesota. It was caused by a candle that tipped over and started the bed on fire. The fire quickly spread across the bedroom and continued into the hallway. Two of my family members were rushed to HCMC for smoke inhalation. They made it out of the house and recovered thankfully. When it was time to gut the house and rebuild it I approached them on putting a fire sprinkler system in there home. They thought it would be a good piece of mind and told me they would think about it. Later I find out they decided they would rather spend the money on a two person Jacuzzi and granite countertops. This is a sad but perfect example on the American materialistic way we think. The average home owner would rather take a chance with there own life and safety for looks and comfort even after they experienced tragedy first hand. The only way homes can be safe from fire is making the right decisions for people. In a perfect world before a home is built the Builder's would educate the future home owner's on fire sprinklers and encourage them to install them. Since this will never happen the decision will have to be made for them.

Fire sprinklers are definitely the answer to our home fire problems. I have over twelve years in installation and service work on sprinklers. I have seen multiple sprinkler saves each year I worked in the field. Now that I am on the inspection side of the field I can see the need for fire sprinklers now more than ever before. No one ever wants change forced upon them but nothing would ever become safer unless people are educated on why regulation is needed. In this case history can be made through adoption of residential fire sprinklers in one two family dwellings over 4,500 square feet. Costs with mortgage rates this low will only slightly raise the monthly payments on these homes, and if this is a problem for the home owner I am sure they can sacrifice a Jacuzzi or a counter top upgrade.

Sincerely,

Brian Hoffman
Fire Inspector, CFI #26689
Journeyman Sprinkler Fitter MN#2146, WI#1030034

BUILDERS ASSOCIATION OF MINNESOTA

THE STATEWIDE VOICE OF MINNESOTA'S BUILDERS AND REMODELERS

525 Park Street, Suite 150, St. Paul, MN 55103 | Phone 651-646-7959 | www.bamn.org

31 December 2013

The Honorable Eric L. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Concrete Footings. Minnesota Department of Labor & Industry - Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, chapter 1309; Revisor's ID Number R-04144

Dear Judge Lipman:

The Builder's Association of Minnesota ("BAM") submits these comments on behalf of its members, and in opposition to the rule proposed by the Department of Labor and Industry ("DLI") requiring a minimum specified compressive strength of 5000 psi for concrete footings in new single-family homes.

For the reasons set forth below, BAM respectfully requests that the proposed rule be disapproved.

I. OVERVIEW

BAM strongly supports addressing building durability as part of a reasonable assessment of proven risks associated with residential building customs, practices and materials that continue to demonstrate our national leadership. It is important to note that the current MN Energy Code requirements relative to foundation durability go above and beyond the requirements of the 2012 IECC in a material specific way. BAM believes other cold climate states that have adopted the 2012 IECC as written will experience durability issues.

DLI has proposed a rule for the Minnesota State Building Code that would require a minimum specified compressive strength of 5000 psi for concrete footings in new single-family homes and a new footnote "g" relating to the footing specifications, Table R402.2. (See pages 26 & 27, lines 26.10-27.26 at http://www.dli.mn.gov/PDF/docket/1309rule.pdf).

The rule has been proposed pursuant to Minn. Stat. § 326B.118 Energy Code. This statute states, in part, that ***"[t]he commissioner may not adopt all or part of a model energy code relating to the construction of residential buildings without research and analysis that addresses, at a minimum, air quality, building durability, moisture, enforcement, enforceability cost benefit, and liability***."

BAM opposes the proposed rules because:

- The proposed rule is based on the development of new rules for foundation insulation systems as part of the model energy code that DLI has not released for public review and comment;

- The computer simulation technique employed to develop the proposed rule is currently under development and has not yet been validated against experimental data; and,

- The proposed rule is based on simulations restricted only to hollow core cement masonry unit (CMU) walls representing a worst-case scenario.

II. THE PROPOSED RULES ARE NOT NECESSARY AND REASONABLE

The Department cannot show that the proposed rules are necessary and reasonable in light of the fact that DLI has not published the proposed language for the 2012 MN energy code, which is referenced in the SONAR, allowing adequate notice and time for fact gathering and a public hearing.

It is not reasonable to consider the 5000 psi requirement outside the context of a proposed energy code for which it is based. BAM has requested a copy of the proposed energy code from DLI, however, as of this date we have not been provided a copy.

Given the acknowledged limitations of the technique employed to assess the proposed foundation as it intersects with the energy code, BAM asserts that DLI has not met the requirements of Minn. Stat. § 326B.118.

In fact, DLI cites building science research and report from Dr. Louise Goldberg, Building Scientist from the University of Minnesota.[1] The report notes that the computer simulation methodologies performed:

a. Employ a technique still under development; and,
b. The technique has not yet been validated against experimental data.

(See *Page 2, Section B.1 Simulation Methodology, Paragraph 1)*:

[1] A copy of Dr. Goldberg's research and report is reproduced on the Department's website and may be viewed at: http://www.dli.mn.gov/CCLD/rm/PDF/1309_pub_energy.pdf.

In addition, Minn. Stat. § 326B.118, requires "...[t]he research and analysis must be completed in cooperation with practitioners in residential construction and building science...". The SONAR fails to address the required cooperation with practitioners in residential construction.

The 5000 psi concrete footing requirement is arbitrary. The requirement is based on a simulated "worst case" analysis of only hollow core cement masonry unit (CMU) foundation walls. The referenced report further notes that, "poured concrete walls are more durable than CMU walls owing to the absence of vapor filled cores and thus were excluded as a means of executing the review." The SONAR fails to address this acknowledged difference in durability of foundation wall material applications.

III. CONCLUSION

The proposed rule is contrary to state statute. It is proposed based on a testing technique still under development. It is premature as it relates to sequencing with a yet to be released new energy code. It is a costly way of fixing a problem that does not exist.

In light of the issues and evidence discussed above DLI cannot show that the proposed rules are needed and reasonable. Accordingly, BAM respectfully requests that the proposed rules be disapproved.

Sincerely,

Chad Kompelien

Chad Kompelien
President

Remi Stone

Remi Stone
Executive Vice President

BROOKLYN PARK

FIRE DEPARTMENT

5200 85th Ave. N., Brooklyn Park, MN 55443-4301 • Phone 763-424-8000 • Fax 763-493-8391
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Kenneth T. Prillaman, Fire Chief

December 30, 2013

The Honorable Eric L. Lipman
Administrative Law Judge
Office of Administrative Hearings
600 N. Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620

RE: OAH Docket 8-1900-30855 - Adoption of International Residential Code

Dear Judge Lipman,

This letter in is regards to the adoption of the International Residential Code (IRC) - 2012 edition and the requirements for residential sprinkler systems.

I am the Fire Chief and Fire Marshal and I am writing to support the inclusion of fire sprinklers in new one and two-family dwellings. The Minnesota Department of Labor and Industry (DOLI) has proposed that new dwellings over 4,500 square feet in size be equipped with residential sprinkler systems. I would ask that you consider the following;

Model Building, Fire, & Life Safety Codes:
There are six model codes in the United States dealing with building, fire, and life safety. All six of these model codes - including the IRC - have adopted requirements for sprinkler-protecting newly constructed homes. These codes have recognized the changing environment of home fires and, as a fire safety professional who has witnessed these changes; I can only comment that home sprinklers are truly necessary.

Fire Deaths:
Remarkable strides were made in the 1980s and 1990s to reduce fire deaths. Many of these fire deaths were averted because of smoke alarms. Unfortunately, the recent trend is that fire deaths are no longer going down - in Minnesota the number of fire deaths is no longer decreasing; the number of people dying from fire in recent years has been rising.

Fire Sprinkler Operation:
The most effective fire extinguishing method is water. The quicker water is applied to a fire, the sooner it can be controlled or extinguished.

Smoke Alarms Are Not Enough:
Smoke alarms were initially effective in reducing fire deaths in the 1980s and 1990s. While they still provide some level of fire and life safety, it appears that they are no longer adequate.

The Minnesota State Fire Marshal Division reports that there have been 232 persons killed in one and two-family dwelling fires in the past 10 years. For 111 of these victims smoke alarms were not present, the smoke alarms did not function, or smoke alarms functioned but were unable to alert the occupants to life-threatening conditions. That equals 48% of these unfortunate fire deaths where smoke alarms were not effective. All too often these victims are the young, the old, and persons with physical impairments.

Changing Fire Conditions in the Home:
As was shown at the December hearing, home fire conditions are changing. Much of this is attributable to two factors: the composition of modern home furnishings and the increase in light-weight construction.

Size Threshold of 4,500 Square Feet:
The IRC, as written, requires sprinklers in all newly constructed one and two-family homes (regardless of size). As a fire safety professional who has responded to many house fires, I would have preferred that the IRC be adopted, as written, requiring sprinklers in all new homes.

One of the arguments that I have heard from the homebuilder's representatives is that adding residential sprinklers will have a negative impact on affordable housing.

Personally, I have trouble believing that a 4,500 square foot home would be considered "affordable housing". Bear in mind that we are not talking about a $200,000 home when addressing something that is 4,500 square feet in size.

Thank you for the opportunity to provide these comments, Judge Lipman. When you consider all of the issues identified above, I hope that you will agree that residential fire sprinklers are needed and a reasonable solution to the home fire problem. If you have any questions or would like additional information, you can feel free to contact me at ken.prillaman@brooklynpark.org.

Sincerely,

Kenneth T Prillaman

Kenneth T. Prillaman
Fire Chief & Fire Marshal

January 2, 2013

The Honorable Eric L. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Minnesota Department of Labor & Industry – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID No. RD-4144; OAH No. 1900-30855.

Dear Judge Lipman:

I am writing to express my opposition to the rules proposed by the Department of Labor and Industry that would require fire sprinklers in single-family homes 4,500 square feet and larger. These rules are not necessary, and I believe that they would have a negative impact, especially in outstate Minnesota. I have read the SONAR, but it did not address my concerns.

I have worked as a certified building official for 19 years. I am currently the building official for the cities of Hermantown, Rice Lake, Two Harbors, Beaver Bay, and Silver Bay. Much of the area outside of these cities is not code-enforced. That means that, rather than getting a building permit and the required minimum building code enforcement from a city to build a new home, a homeowner only needs to get a land use permit from the county. It also means that there are no inspections for any of the construction or life-safety items such as smoke alarms, egress windows, etc. in these areas. When an applicant receives a land use permit only there is no reference to the MN State Building Code and its requirements.

In my experience, there is already incentive for homeowners to build in non-code-enforced areas, and it is difficult to get people to build to code in those areas. I am worried that adding an expensive requirement like fire sprinklers will just provide more incentive to build new homes in non-code-enforced areas, and not be built to code. For example, I have heard people complain about the cost of building permits vs the cost of land use permits. Building permits usually cost between $2,000-3,000, and land use permits usually cost about $150-250. As an example, in non-code-enforced areas, it is difficult to get homeowners to put in a layer of drywall between the house and garage, like the code requires. This is a relatively small cost but can provide great fire safety integrity to the dwelling and its occupants. If homeowners are concerned about these minimal costs, I imagine that the cost of putting in fire sprinklers will lead

more homeowners to build in non-code-enforced areas, and not build to code. This would not make Minnesota's homes safer.

I also know that there has been no loss of life because of fire in single family homes since the installation requirement of hardwired, interconnected smoke alarms. Given this fact, I do not understand what the purpose of putting fire sprinklers in single family homes is if we have proven that early smoke detection has saved lives. The installation of fire sprinklers is very expensive, and there are other, cheaper options to protect property. A great percentage of the homes I inspect rely on private water wells which will only provide limited coverage at best without adding excessive additional equipment to their systems.

I personally have had conversations with several adjusters from large national and international insurance adjusting firms regarding this issue and they have larger concerns with water damage and mold issues than they do fire damage.

Finally, I think that the fire sprinkler requirement would burden small towns who do not have large code enforcement offices. This requirement adds another inspection requirement, and it could be hard for small towns to find the manpower to perform these additional inspections. I do not think that the SONAR considered this.

Sincerely,

Jim Rich
MN Certified Building Official #1583
BOCA Housing Inspector
ICC Building Inspector

MANUFACTURED & MODULAR HOME ASSOCIATION
OF MINNESOTA

Opening doors to better living.

December 30, 2013

The Honorable Eric Lipman
Assistant Chief Administrative Law Judge
Office of Administrative Hearings
600 North Robert Street
St. Paul, MN 55101

RE: OAH Docket No. 8-1900-30855
MN Chapter 1309 Rules-International Residential Code

Dear Judge Lipman:

I am writing to add additional facts and information to my oral and written testimony provided during the December 12, 2013 MN Chapter 1309 Rules hearing, in opposition to requiring fire sprinklers in all residential construction greater than 4,500 sf.

Subsequent to the December 12, 2013 hearing, I was informed that the US Department of Housing and Urban Development, (HUD), on December 9th, had published in the Federal Register, a Final Rule, effective June 9, 2014, updating the Manufactured Home Construction and Safety Standards, (MHCSS), for the construction of new manufactured homes. This new HUD construction standard will become a part of the MN State Building Code, by reference, effective June 9, 2014.

As a part of HUD's Rulemaking process in updating the MHCSS, which commenced in 2010, HUD addressed a recommendation that fire sprinklers be mandated in manufactured homes. In its Analysis of Public Comments to the Final Rule, (see attached Federal Register / Vol. 78, No. 236 / Monday, December 9, 2013 / Rules and Regulations... page 73967), HUD responded to a commenter who recommended that HUD consider whether sprinkler systems should be required in manufactured homes. The commenter stated that while retrofitting manufactured housing units with this type of system might be expensive, the incremental cost impact, using sprinklers to extinguish fires rapidly has proven to save lives and dramatically reduce property damages.

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In HUD's official response, as published in the Federal Register, HUD stated that "recent fire data analysis prepared by the National Fire Protection Association (NFPA) indicated that HUD Standard units have a similar fire safety record to that of one- and two-family dwelling units. In addition, a comparison of code requirements between manufactured homes and one- and two-family homes shows many fire safety provisions for manufactured homes that are not included in model building codes for one- and two-family homes. Further, there is considerable cost impact to install a sprinkler system in a manufactured home for what would appear to be marginal benefits."

I thought making you aware of HUD's position on this issue related to manufactured homes might offer additional clarity to my oral and written testimony, where I specifically identified what we believe to be significant deficiencies in the SONAR not meeting its statutory requirements under MN Chapter 14.131 related to Factor 5, Factor 7, and Factor 8, relative to the MHCSS requiring manufactured homes be constructed to more stringent fire protection standards than currently or as otherwise proposed in MN Chapter 1309.

Thank you for the opportunity to provide additional comments as a part of the official record, regarding the MMHA's opposition to requiring residential fire sprinklers as proposed in MN Chapter 1309.

Sincerely,

Mark Brunner

Mark Brunner
President

Attachment 1: Federal Register / Vol. 78, No. 236 / Monday, December 9, 2013 / Rules and Regulations... reference page 73967)

AUTHENTICATED
U.S. GOVERNMENT
INFORMATION
GPO

FEDERAL REGISTER

Vol. 78 Monday,
No. 236 December 9, 2013

Part III

Department of Housing and Urban Development

24 CFR Part 3280
Manufactured Home Construction and Safety Standards; Final Rule

also made certain editorial revisions to other sections in the proposed rule. In general, the revisions adopt changes to the codified regulations that reflect code revisions adopted by private standard-setting organizations. HUD declined to adopt some standards in selected instances based on such considerations as cost and public safety. In addition, HUD has decided at this time not to adopt the some code revisions because they have been implemented for only a short period of time and their effect is uncertain.

II. Analysis of Public Comments

The Commenters

The public comment period on the proposed rule closed on September 10, 2010, and five public comments were received. Comments were submitted by a code-making organization, a manufactured housing trade association, two material trade associations, and a member of the public, and covered a wide range of subjects. This section presents the significant issues, questions, and suggestions submitted by public commenters, and HUD's response to these issues, questions, and suggestions.

The commenters were generally supportive of the proposed rule but offered specific recommendations to particular sections of the construction and safety standards. For instance, they supported the proposal's recognition of model codes and other standards and the potential benefit of uniform and effective enforcement of Federal construction and safety standards for manufactured homes. One commenter, for example, stated that the regulation's safety driven requirements will prevent, mitigate, or reduce the number of injuries to people living in HUD-constructed homes and promote honesty among contractors who are inclined to take short cuts that frequently create safety hazards and/or substandard conditions for the people who reside in the homes. Nevertheless, the commenters raised a number of technical cost and safety issues that are discussed in the following section. The following is a summary of the comments received on the proposed rule:

Comment: Requirements for code references for similar building materials should be consistent with the International Residential Code. One commenter noted that it would be preferable for requirements for manufactured housing that are consistent with code references and with requirements for similar materials and building elements regulated by the International Residential Code (IRC), for consistency of enforcement by various compliance authorities. It was noted that standards contained in the proposed rule for areas such as glazing and water conservation were consistent with the IRC. However, the commenter noted there were inconsistencies between the proposed rule and the IRC, including, for example, alternate test methods in the IRC for determining flame spread ratings of thermal insulating materials.

Response: This recommendation was not accepted by HUD. HUD did not include certain IRC standards since those reference standards were not included in the proposed rule and no technical comparisons or cost data was provided between IRC references and HUD reference standards in support of the recommendation.

Comment: Exit Facilities: Exterior Doors Width. A commenter suggested that IRC Section R311, Means of Egress, requires doors to provide a minimum clear width of 32 inches and a minimum height of 78 inches, which are 4 inches larger for both dimensions than HUD's requirements under § 3280.105. The commenter suggested that the difference may be explained by the interest of minimizing costs. (See § 3280.105.)

Response: HUD did not accept this recommendation, as the issue of exterior passage door width for egress is currently being reviewed by the MHCC. In addition, there are two exterior doors required in manufactured homes for egress by the HUD Standards while only one exterior passage door is required for egress by the IRC.

Comment: Toilet Compartment Width. A commenter noted that while the proposed rule is generally consistent with IRC Section R308, Toilet, Bath and Shower Spaces, the proposed rule permits a minimum dimension of 12 inches from a tub edge, while the IRC requires a minimum of 15 inches from the tub edge. The commenter suggests that cost may be a factor. (See § 3280.111.)

Response: HUD did not accept this proposal to increase the minimum dimension of 12 inches to 15 inches from the toilet to a bathtub edge due to room geometry constraints and the generally smaller room sizes in manufactured homes. In addition, it would be burdensome and costly for the industry to redesign toilet compartment spaces for a practice that has been ergonomically acceptable since the inception of the HUD Standards.

Comment: Adopt the Performance Requirement for Individual Thermostatic Pressure Balancing and Combination Control for Bathing Facilities. A commenter recommended that HUD update the ASSE 1016 standard, Automatic Compensating Values for Individual Shower and Tub/Shower Combinations, from the 1996 edition to the 2005 edition. (See § 3280.607 Plumbing Fixtures.)

Response: HUD accepted this comment, and the ASSE 1016 standard, 2005 edition, has been included in the final rule. (See § 3280.607 Plumbing Fixtures.)

Comment: Require sprinkler systems in manufactured housing. A commenter recommended that HUD may want to consider whether sprinkler systems should be required in manufactured housing. The commenter stated that retrofitting manufactured housing units with this type of system might be expensive, but despite the incremental cost impact, using sprinklers to extinguish fires rapidly has proven to save lives and dramatically reduce property damages.

Response: HUD declined to adopt the commenter's recommendation, as adoption of standards in this area would be premature. This issue is currently being considered by the MHCC. Recent fire data analysis prepared by the National Fire Protection Association (NFPA) indicated that HUD Standard units have a similar fire safety record to that of one- and two-family dwelling units. In addition, a comparison of code requirements between manufactured homes and one- and two-family homes shows many fire safety provisions for manufactured homes that are not included in model building codes for one- and two-family homes. Further, there is considerable cost impact to install a sprinkler system in a manufactured home for what would appear to be marginal benefits.

Comment: Include anti-scald valves in the standards. Another commenter expressed support for the proposal to include anti-scald valves in the standards to prevent accidental burn injuries to children and others. (See § 3280.607 Plumbing Fixtures.)

Response: HUD adopted the commenter's recommendation and included it in the final rule. (See § 3280.607 Plumbing Fixtures.)

Comment: Revise the Reference Standards for Polyethylene (PEX) tubing and hot and cold water distribution systems. A commenter suggested updates for the new reference standards for polyethelene tubing and hot and cold water distribution systems.

Response: HUD accepted the commenter's recommendations and incorporated these standards in the final rule (See § 3280.604(b)(2)). However, suggestions to add a number of other plumbing reference standards were not

UNIVERSITY OF MARYLAND

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Mr. Thomas R. Brace
Executive Director
Minnesota State Fire Chiefs Association
1433 Idaho Avenue West
St. Paul, MN 55108

RE: Residential Sprinklers and Smoke Alarm Study

Dear Mr. Brace,

It is my understanding that a research study led by me in the Department of Fire Protection Engineering at the University of Maryland was recently used in testimony in Minnesota as an argument against the need for residential sprinkler systems. That report was entitled: "Performance of Smoke Detectors and Sprinklers in Residential and Health-Care Occupancies" and was released in May of 2010. While I am gratified to know that our research is being used, I believe that some of the data and research statements have been used in an inappropriate manner.

While the study showed that smoke alarms (in residential buildings) and smoke detectors (in commercial buildings) typically responded faster than sprinkler system activation during hostile fire conditions, both protection features are needed to protect occupants from the dangers of fire. I point to a statement in the Executive Summary to support this: "While responding later, sprinklers provide the complementary function of fire suppression to limit the development of hazardous conditions."

As the lead researcher in this study, any attempt to discredit the need for residential sprinklers by placing sole protection responsibilities on smoke alarms is a misrepresentation of our research study. To the contrary, this study showed that both smoke alarms and residential sprinklers were necessary.

Sincerely,

James A. Milke, Ph.D.

Professor and Chair

MINNESOTA RESORT & CAMPGROUND ASSOCIATION

December 31, 2013

Hon. Eric L. Lipman
Administrative Law Judge
600 North Robert Street
P.O. Box 64620
St. Paul , MN 55164-0620

Ref: Minnesota Rules Chapter 1309
OAH Docket No. 8-1900-30855

Dear Judge Lipman,

The members of the Minnesota Resort and Campground Association are very concerned about the proposed adoption of the 2012 International Residential Code as proposed by the Department of Labor and Industry. The provision requiring all residences, regardless of location or circumstances, to have fire suppression sprinklers would have a significant negative affect on our industry. The number of resorts in Minnesota has declined dramatically in recent years and the industry has been hard hit by the great recession.

It is vital to the future viability of the resort industry that our members are able to replace older units and build new structures that are more energy efficient and have the amenities which are in demand by our guests. The proposed code requirement would hurt our industry without enhancing public safety or protecting fire fighters from danger.

Resorts are different that residential neighborhoods and should be treated differently in the code.

- Almost all resorts are adjacent to a lake or a river.
- Most resort structures do not have basements.
- Most resorts are seasonal and are not occupied year around.
- Egress from most resort structures is quick, easy and direct.
- Most resorts are operated by their owners who reside on the property.

We believe that residences at resorts licensed by the Minnesota Department of Health as defined in MS 157.15 subd. 11 should exempt from the proposed provisions requiring fire suppression sprinklers.

Sincerely,

Dan McElroy

Dan McElroy
Executive Vice President

305 Roselawn Avenue East, St. Paul, MN 55117-2031 ▪ (651) 778-2400
industry website **www.hospitalitymn.org** ▪ consumer website **www.mnresortsandcampgrounds.com**

Dear Judge Lipman,

I am writing to you regarding the adoption of the residential sprinkler system requirements of the International Residential Code (IRC) - 2012 edition. I have had the privilege to work in the fire service for 33 years and have been a firefighter, public educator, fire investigator, fire inspector and fire marshal. I am in full support of residential sprinklers being required in all new one and two family dwellings as required by the code. I attended the first day of the hearings and found the arguments against the adoption to be a bit hollow.

I have retrofitted an existing home and can attest to the fact that it is affordable, inconspicuous and can be done with an existing water service. I was able to do my home for less than $1.00 a square foot including the garage head referred to in the hearing.

Smoke detectors are not enough. Smoke detectors have been referred to as protection. They are actually detection, giving you early warning, assuming that you hear them and are able to act. Sprinklers are protection and will act automatically to suppress a fire. My experience has been that usually only one head activates and the fire is kept to the area of origin. Without sprinklers, the smoke detectors sound an alarm but the fire continues to grow unchecked until the fire department puts the fire out.

Another argument is that new homes are safer. A home is a home. While fires caused by the home's built in systems may occur less often because they are newer, fires such as candle fires, cooking fires and other fires caused by the occupants happen regardless of how the home's age. Either way, there is no information collected in the Minnesota Fire Incident Reporting System regarding the age of the structure therefore any information provided by the opposition is supposition. What we do know is that new homes pose a higher risk to responding firefighters. Light weight construction burns faster and fails faster than legacy solid lumber construction. Larger homes with open floor plans result in larger fires with more fire spread throughout the structure.

I could go on and on refuting their arguments but I won't waste your time. Sprinkler technology has progressed over the last 100 years to a point where it can be included in residential structures efficiently, inexpensively and inconspicuously. It is time to begin including this lifesaving technology in our homes. The opposition argued that today's homes are safer. Even if that were true, today's new home become the futures old homes. If we begin today, all homes may be protected and our fire loss of life could be zero one hundred years from now.

As a fire service member who has listened to all the arguments pro and con, sat in code hearings, and responded to numerous deaths that could have been prevented by residential sprinklers, I wonder what the argument was when we began requiring indoor plumbing and electricity in all new homes .... I'm sure that there were those that said an outhouse and whale oil lamps were just fine too.

It is time to require the technology that is available to minimize the impact fire has on our society, just like the toilet impacted public health. Please join me in supporting this change. It may be the single most important thing we contribute to society in our lifetimes.

Jeffrey G. Schadegg
Fire Marshal
Inver Grove Heights Fire Department

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December 31, 2013

The Honorable Eric L. Lipman
Administrative Law Judge
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St. Paul, MN 55164-0620

RE: OAH Docket 8-1900-30855 - Adoption of International Residential Code

Dear Judge Lipman,

This letter in is regards to the adoption of the International Residential Code (IRC) - 2012 edition and the requirements for residential sprinkler systems.

I am a Fire Protection Engineer, a Certified Building Official, a mother, a wife, a daughter, and a sister and I am writing to support the inclusion of fire sprinklers in new one and two-family dwellings. I spoke at the hearing on behalf of the Fire Marshals Association of Minnesota, of which, I am President. This letter is more towards my personal and professional experience with residential sprinklers.

Model Building, Fire, & Life Safety Codes:

There are six model codes in the United States dealing with building, fire, and life safety. All six of these model codes - including the IRC - have adopted requirements for sprinkler-protecting newly constructed homes. I have personally been on the international hearing committee of the International Fire Code for the 2012 and 2015 cycles. These codes have recognized the changing environment of home fires and, as a fire safety professional who has witnessed these changes; I can only comment that home sprinklers are truly necessary. If the environment around us didn't change, there wouldn't be a need to change any of the codes.

Fire Deaths:

Remarkable strides were made in the 1980s and 1990s to reduce fire deaths. Many of these fire deaths were averted because of smoke alarms. Unfortunately, the recent trend is that fire deaths are no longer going down - in Minnesota the number of fire deaths is no longer decreasing; the number of people dying from fire in recent years has been rising.

I have smoke alarms on every level of my home and in all of the sleeping rooms. Still, I don't smoke, I don't light candles, don't own a space heater, don't leave the kitchen when I have something on the stove, don't overload my electrical outlets, and we sleep with our doors closed at night to slow the path of smoke. Even as a fire protection engineer, who sees a fire in Saint Paul nearly every day, I know I am not immune to a

fire in my home. Furthermore, I know without a home fire sprinkler system, I have little to no chance of saving my 2 year old daughter if I indeed had a fire.

Fire Sprinkler Operation:

The most effective fire extinguishing method is water. The quicker water is applied to a fire, the sooner it can be controlled or extinguished. Fires double in size every minute so time is of great importance. People believe they discover a fire the second it starts. This simply isn't the case and with fire, time matters. They also believe that people die of fire, that is, heat. In reality, the majority die from smoke inhalation long before the fire reaches them.

Fire sprinklers activate individually within a minute or two in flaming fire conditions when temperatures reach 155-200° F. This would be happening long before temperatures and smoke development reach lethal levels.

Smoke Alarms Are Not Enough:

Smoke alarms were initially effective in reducing fire deaths in the 1980s and 1990s. While they still provide a level of fire and life safety, it appears that they are no longer adequate.

The Minnesota State Fire Marshal Division reports that there have been 232 persons killed in one and two-family dwelling fires in the past 10 years. For 111 of these victims smoke alarms were not present, the smoke alarms did not function, or smoke alarms functioned but were unable to alert the occupants to life-threatening conditions. That equals 48% of these unfortunate fire deaths where smoke alarms were not effective. All too often these victims are the young, the old, and persons with physical impairments.

I have a spacious 5 bedroom, 3 bathroom home though it is no where near 4,500 square feet. It will take just 25 sprinklers to retrofit my home per NFPA 13D. I plan to this by the end of 2014.

Changing Fire Conditions in the Home:

As was shown at the December hearing, home fire conditions are changing. Much of this is attributable to two factors: the composition of modern home furnishings and the increase in light-weight construction.

As you saw in the testimony and videos, a few short decades ago residents had 15-20 minutes to escape fire conditions. This time has now dropped to slightly over 3 minutes. While on the surface 3 minutes may seem like an adequate amount of time, consider that many fatal fires happen at night when people are sleeping. In fire conditions, the occupants must be awakened from their sleep, get dressed, and get others awake and out. As I alluded to earlier, children and the elderly often do not respond promptly to

smoke alarms placing them and others trying to assist or rescue them at risk. And that is assuming they are able to respond at all.

After I install sprinklers, I am *not* going to remove my smoke alarms, start smoking in bed, use candles, use space heaters to warm my home, leave food on the stove while I get the mail or sleep with my door open at night. No one thing is going to save me and my family from the devastation of fire.

Thank you for the opportunity to provide these comments, Judge Lipman. When you consider all of the issues identified above, I hope that you will agree that residential fire sprinklers are needed and a reasonable solution to the home fire problem. If you have any questions or would like additional information, you can feel free to contact me at angie.wiese@yahoo.com

Sincerely,

Angie Wiese

Angie Wiese, PE, CBO

RESOLUTION 13-121
RESOLUTION OPPOSING PROPOSED AMENDMENTS TO MINNESOTA RULES, CHAPTER 1309, REQUIRING FIRE SPRINKLER SYSTEMS IN SINGLE-FAMILY HOMES

WHEREAS, the Minnesota Department of Labor and Industry recently issued a "Statement of Need and Reasonableness" ("SONAR") that proposes a rule that would require fire sprinklers in all new single-family homes with more than 4,500 finished and unfinished square feet; and

WHEREAS, the SONAR does not correctly analyze the potential costs and impacts of such a rule; and

WHEREAS, the fire sprinkler mandate has been rejected in the vast majority of other states across the country, twice by Minnesota's legislature, and by the very group tasked with advising the Department of Labor and Industry on this issue; and

WHEREAS, the State of North Dakota has already rejected the fire sprinkler mandate statewide, as have the States of South Dakota, Wisconsin and Iowa; and

WHEREAS, the City of Ortonville competes with cities in South Dakota for new residential construction and development; and

WHEREAS, according to the 2011 Minnesota State Survey conducted by the University of Minnesota, Minnesota Center for Research, 88% of Greater Minnesota Residents believe that the decision whether to install sprinklers should remain a homeowner's choice; and

WHEREAS, the fire sprinkler mandate will increase the cost of building new homes in the City of Ortonville compared to the cost of doing so in South Dakota; and

WHEREAS, increasing the cost to build new homes in the City of Ortonville will encourage homeowners to build in South Dakota, rather than Ortonville; and

WHEREAS, increasing the cost to build new homes in Ortonville will encourage homeowners to use unlicensed contractors and build in non-code-enforced areas; and

WHEREAS, Ortonville already recognizes an ongoing problem with homeowners choosing to use unlicensed contractors to build in non-code-enforced areas and the fire sprinkler mandate will only exacerbate this problem; and

WHEREAS, the SONAR does not consider that any alleged benefits from fire sprinklers will not be achieved in border cities because of the likelihood that new homes will be built without sprinklers in other states or in non-code-enforced areas;

WHEREAS, a decrease in new home-building in Ortonville will result in a decreased tax base for Ortonville, and will significantly adversely affect Ortonville; and

WHEREAS, the SONAR does not consider the significant effect that the fire sprinkler mandate will have on Ortonville; and

WHEREAS, the fire sprinkler mandate is neither needed nor reasonable because there have been zero fatalities from fire in single-family homes built since Minnesota began requiring hard-wired, inter-connected smoke alarms.

NOW, THEREFORE, BE IT RESOLVED by the City Council of the City of Ortonville, Minnesota:

That the City of Ortonville opposes the proposed amendments to the Minnesota Rules, Chapter 1309, requiring automatic fire sprinkler systems in single-family homes.

Upon roll call vote the following voted Aye: Hausauer, Sykora, Dorry, Berkner, Hasslen, Thomas, Reinke. Nay: None.

Resolution 13-121 passed this 16th day of December 2013.

APPROVED:

Steve Berkner
Mayor

ATTEST:

Charleen Grossman
Clerk-Administrator

I certify this to be a complete, exact and true copy of Resolution 13-121 as it appears in the December 16, 2013 Ortonville, Minnesota City Council Minutes.

Susan Lundell
Deputy City Clerk

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[illegible] is [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible] [illegible]

[illegible] [illegible] [illegible] [illegible] [illegible]

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December 31, 2013

Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert St.
P.O. Box 64620
St. Paul, MN 55164-0620
Fax#: 651-361-7936
Email: rulecomments@state.mn.us

RE: Revisor's ID number R-04144
Minnesota Rules 1309 - Proposed Single Family Residential Sprinkler Requirement

Dear Judge Eric L. Lipman:

The City of Lakeville has been a long time leader in issuance of new single-family home permits in the metropolitan area as well as the state of Minnesota. The City of Lakeville has issued nearly 400 new single-family home permits in 2013 and anticipates issuance of at least 400 permits in 2014. In addition, the City of Lakeville has 1,129 single family lots in the preliminary planning stages for future development.

The 2012 edition of the International Residential Code (IRC) is being evaluated for its possible adoption as the Minnesota State Building Code Chapter 1309. The 2012 IRC section R313 contains the requirement for an automatic residential fire sprinkler system to be installed in one and two family dwellings with one exception for additions and alterations to existing buildings that are not already provided with an automatic residential sprinkler system.

In 2011 and again in 2012, the Minnesota State Legislature passed bills that would have prohibited the Department of Labor and Industry (DLI) from including the residential fire sprinkler requirement in the updated Minnesota State Building Code. Governor Dayton vetoed this legislation, allowing the fire sprinkler requirement to be discussed and debated during the rule making process. During the rule making process, the International Residential Code Committee (IRCC), an advisory committee created by DLI, recommended approval of the proposal submitted by Builders Association of Minnesota (BAM) that eliminated the requirement to install sprinklers in single-family homes while retaining the requirement for two-family homes.

After several meetings with Fire officials and BAM representatives the Department of Labor and Industry is proposing an exception to the requirement of fire sprinklers for new single-family homes that are less than 4500 square feet excluding the area of the garage.

The City of Lakeville did a random sampling of the single family home permits that were issued in 2013 for the months of June, September and December. Of the 88 total single-family home permits issued in those three months 29 homes, or approximately 33%, were over the 4500 square foot threshold and thus would have required installation of a fire sprinkler system if the provision was adopted.

The City of Lakeville estimates that approximately 33% of new homes constructed would be required to have fire sprinkler systems installed to meet the proposed new provision. The Lakeville City Council has adopted a position of being opposed to requiring fire sprinklers in new single-family and two-family homes for the following reasons:

1. the cost of installing fire sprinklers will result in an average cost of $6-7,000 for a new single family home and will have a direct impact to home affordability;
2. twenty-seven (27) states including Iowa, Wisconsin, North and South Dakota have not adopted fire sprinklers for new single family homes; and
3. homeowners can still choose to install a fire sprinkler system.

Thank you for your consideration of the City of Lakeville's position on this important matter. We hope that you will agree with the City of Lakeville by eliminating the requirement to install sprinklers in new one and two family homes. If you have any questions regarding this matter, please call me at 952-985-4401.

Sincerely,

Steven C. Mielke
City Administrator

C: *State Senator Dan D. Hall*
State Senator Greg D. Clausen
State Senator Dave A. Thompson
State Representative Mary Liz Holberg
State Representative Will Morgan
State Representative Tara Mack
Lakeville Mayor and City Council Members
David Olson, Community and Economic Development Director
Mike Meyer, Lakeville Fire Chief
Gene Abbott, Building Official

443 Lafayette Road N.
St. Paul, Minnesota 55155
www.dli.mn.gov

MINNESOTA DEPARTMENT OF
LABOR & INDUSTRY

(651) 284-5005
1-800-342-5354

December 31, 2013

The Honorable Eric L. Lipman
Administrative Law Judge
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
Saint Paul, Minnesota 55164-0620

Re: In the Matter of the Proposed Amendment to Rules of the Department of Labor and Industry Governing the Adoption of the 2012 International Residential Code; OAH Docket No. 8-1900-30855; Revisor's ID Number R-04144

Dear Judge Lipman:

Please accept this letter as the Minnesota Department of Labor and Industry's Response to comments it has received and testimony provided relative to the proposed amendments to Minnesota Rule Chapter 1309 governing the adoption of the 2012 International Residential Code. The proposed rules generated a great deal of interest from stakeholders as made evident by the attendance at the public hearing and the written submissions made since that hearing concluded. Many comments were made and many issues were raised during this time. The Department intends to address both the comments received and testimony heard by summarizing the issues and positions of the affected parties and respond with a global response as provided below. The failure, if any, to address each and every concern raised by the interested parties is not necessarily an indication of agreement. In addition to the information contained in this Response, the Department also stands by and relies on the affirmative presentation contained in its Statement of Need and Reasonableness filed with the court as Exhibit B.

The Department has operated within its legal authority to adopt the proposed rules, it has met all procedural requirements necessary to do so under the Administrative Procedure Act, and it has established that the proposed rules are both necessary and reasonable. Therefore, the Department requests that you issue an Order recommending the adoption of these proposed rules.[1]

[1] Please note that the Department has re-examined the need for dry-head sprinkler installation for porches and garages of detached single-family dwellings and agrees that a modification to the proposed rules which will eliminate that requirement for those structures is appropriate. An analysis of that provision and a red-lined version of the proposed modification to the rule draft are contained in Section IV, below.

This information can be provided to you in alternative formats (Braille, large print or audio).
An Equal Opportunity Employer

I. The Department of Labor and Industry Has Operated Within Its Legal Authority to Adopt the Proposed Rules.

As indicated on pages 2-3 of the Department's Statement of Need and Reasonableness ("SONAR"), the Commissioner's authority to adopt the proposed rules is found in Minnesota Statutes §§ 326B.02, subd. 5 (General Rulemaking Authority), 326B.101 (Policy and Purpose), and 326B.106, subd. 1 (Adoption of Code). Additional guidance and authority can be found in Minnesota Rules, Part 1300.0030, subpt. 1 (Purpose), which provides:

> The purpose of this code is to establish *minimum requirements* to safeguard the public health, safety, and general welfare through structural strength, means of egress facilities, stability, sanitation, adequate light and ventilation, energy conservation, and *safety to life and property from fire* and other hazards attributed to the built environment and to *provide safety to firefighters and emergency responders during emergency operations.*

Id. (emphasis added).

Citing to Minnesota Statutes § 326B.106, many of those who submitted written comments and some of those who testified at the hearing argued that the proposed rule's residential sprinkler provisions are beyond the Commissioner's authority because those provisions are not "generally accepted and in use throughout the United States" as "required" by that statute and have instead been rejected by 41 states that have adopted the 2012 International Residential Code ("IRC"), including each state that borders Minnesota.

Those who commented may be correct in observing a lack of general acceptance of the IRC's residential sprinkler provisions among those states that have adopted that model code. However, this observation does not mean that the Department's proposed residential sprinkler rules are therefore beyond the Commissioner's authority to adopt rules governing the Minnesota State Building Code. Minnesota Statutes § 326B.106, subd. 1 (2012) addresses the Commissioner's authority to adopt by rule a code of building standards that contains provisions unique to the state of Minnesota. It states, in part: "The code must conform *insofar as practicable* to *model building codes generally accepted* and in use throughout the United States, including a code for building conservation." *Id.* (emphasis added). By the plain language of the statute itself, it is "model building codes" that must be generally accepted and in use throughout the United States as a whole, not each specific portion of those model codes. Moreover, the statutory language is permissive. Not every portion of a model code need be adopted or be generally accepted, as made evident by the use of the phrase "insofar as practicable." *See id.* Because the 2012 IRC as a whole is "generally accepted and in use throughout the United States," the Commissioner's

authority is not abrogated simply because one or more specific sections of that generally accepted model code have not been agreed to and adopted by the majority of individual states that have adopted the 2012 IRC model code. Accordingly, the Department has operated within the Commissioner's legal authority to adopt the proposed rules.

Citing to Minnesota Statutes § 326B.101, many of those who submitted written comments and some of those who testified at the hearing also argued that the proposed rules exceed the Code's enabling statute by allegedly not conforming to the statutory "Policy and Purpose" for development of the State Building Code as set forth in Minnesota Statute § 326B.101 (2012). That statute provides, in relevant part:

> The commissioner shall administer and amend a state code of building construction which will provide basic and uniform performance standards, establish reasonable safeguards for health, safety, welfare, comfort, and security of the residents of this state and provide for the use of modern methods, devices, materials, and techniques *which will in part tend to lower construction costs*. The construction of buildings *should be* permitted at the *least possible cost* consistent with recognized standards of health and safety.

Id. (emphasis added). Those who commented argued that the proposed rules would violate this statute because requiring automatic fire sprinklers in newly constructed residential dwellings would actually add to construction costs, not lower them, and that a lower cost "alternative" (the addition of gypsum board underfloor protection) is available. While those who commented may be correct in asserting that the sprinkler requirement will increase residential construction costs for detached single-family homes of 4500 square feet or more, the Department does not believe that the addition of gypsum board is an equivalent method of protection for dwelling occupants, first-responders, and property. Nevertheless, like the language contained in Minnesota Statutes §326B.106 discussed above, the language contained in §326B.101 is permissive. That language clearly requires the Commissioner to adopt a building code "*which will in part tend to*" lower construction costs. *See id.* (emphasis added). It further indicates that the construction of buildings "*should be*" permitted at the "*least possible cost*" consistent with recognized health and safety standards. *See id.* (emphasis added). Nothing in that statute mandates that the proposed rules adopting and amending the 2012 IRC *must* lower construction costs in all instances. Similarly, nothing in that statute mandates that the construction of new residential dwellings *must only* be allowed at the least possible cost. Minnesota Statutes §326B.101 merely sets forth a general policy directive to keep down construction costs to the extent possible when adopting and administering a state building code. The Department is committed to following that directive and has made every effort to abide by the same when possible throughout the adoption of the 2012 IRC and its numerous amendments discussed in the SONAR. Accordingly, the

Department has not exceeded the Code's enabling statute and has operated within its legal authority throughout this rulemaking.

II. The Department of Labor and Industry Has Met All Procedural Requirements Under the Administrative Procedures Act for Adoption of the Proposed Rules.

As made evident by Exhibits A through J introduced at the hearing, the Department has established that it has properly met all procedural requirements necessary for the adoption of the 2012 IRC and its proposed amendments contained in Minnesota Rule Chapter 1309. Testimony and comment by Mark Brunner, President of the Manufactured & Modular Home Association ("MMHA"), however, disputes whether the Department's Regulatory Analysis section of the SONAR adequately meets the requirements of Minnesota Statutes §14.131.[2] Specifically, Mr. Brunner asserts that the SONAR is deficient because it fails to distinguish between manufactured/modular homes and other single-family dwellings in its regulatory analysis under Factors (1),(5),(7),and (8) contained in §14.131.[3]

While Mr. Brunner may be correct in asserting that the Department did not specifically include the manufactured home and modular building industry in the list of affected parties under Factor (1) of the list contained in Minnesota Statutes §14.131, the failure to do so affected neither that industry's actual notice of the proposed rules and rulemaking hearing, nor did it impact that industry's ability to comment and otherwise fully participate in the hearing. Moreover, the proposed rule's probable impact and effect on the manufactured home and modular building industry is no different than the proposed rulemaking's impact on other conventional builders of detached single-family dwellings of 4500 square feet or more as is already discussed in the existing Regulatory Analysis section of the Department's SONAR. In fact, that impact may even be less than that for the conventional home building industry for several reasons which will be discussed below.

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[2] *See generally* Transcript ("T.") at 211 - 219; Exhibit AB

[3] Minnesota Statutes § 14.131 (2012) addresses the required contents of a SONAR prepared by an agency to explain and justify the promulgation of a rule being offered to OAH for approval. The statute lists a minimum of eight informational factors that an agency must address in its SONAR to the extent the agency, through reasonable effort, can ascertain that information. *See Id.* For purposes of the instant discussion, Mr. Brunner focuses on four of the eight factors identified in § 14.131 as follows: Factor (1) ("a description of the class of persons who probably will be affected by the proposed rule, including the classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule"); Factor (5) ("the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as separate classes of governmental units, businesses, or individuals"); Factor (7) ("an assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference"); and Factor (8) ("an assessment of the cumulative effect of the rule with other federal and state regulations related to the specific purpose of the rule").

To be sure, the two industries that Mr. Brunner represents will be affected by the proposed rulemaking. Nevertheless, the Department does not believe that the industry will be affected to the extent that Mr. Brunner claims. Mr. Brunner testified that he was representing MMHA and its 300 members, but he did not clarify that of that membership only five members are manufacturers located in Minnesota.[4] Based on Department of Labor and Industry plan review records and correspondence with those five manufacturers, in the past year combined they have produced only thirteen modular homes of 4500 square feet or more, and of those only five would have been subject to the proposed rules due to final site locations within Minnesota's borders.[5] Even assuming that each of these five homes were constructed for single-family dwelling occupancy, this represents a small fraction of the overall production of these units built within the past year and certainly fewer than those actually built by many mid-sized conventional builders here in Minnesota. Therefore, it is difficult to understand how Mr. Brunner can assert that 25 to 30 percent of modular plant stock production will be affected by the proposed rules since those homes must be both over 4500 square feet or more and intended for single-family dwelling purposes located within the boundaries of state of Minnesota for the proposed rules to apply.[6] Moreover, there are two components to the industry that Mr. Brunner represents. One is the traditional manufactured home industry regulated by the Federal Department of Housing and Urban Development ("HUD") under 24 CFR Part 3280 and the other segment is manufacturers that construct enclosed building components in a factory to be assembled on a separate building site. Many types of structures are manufactured by these industries, but only those manufactured/modular structures that are 4500 square feet or more and built for single-family residential dwelling purposes permanently sited within the state of Minnesota are subject to the proposed rules.

Concerning the probable costs of complying with the proposed rules as set out in Factor (5), Mr. Brunner testified and commented that his industry would experience a disproportionate impact because 80 to 90 percent of new manufactured and modular homes sold in Minnesota are permanently sited in rural areas not serviced by municipal water supply.[7] Indeed, new single-family modular/manufactured homes 4500 square feet or more located within the state of Minnesota will experience an increased cost associated with drawing water for the sprinkler system from a well or by installing a holding tank and pump. However, these costs and challenges are no different for the manufactured/modular home building industry than for other builders of conventional single-family dwellings located in any given rural market area already addressed in the SONAR since there is nothing unique about how water sourcing is provided for manufactured/modular homes.

Factor (7) of Minnesota Statutes §14.131 (2012) requires an agency assessment of any "*differences* between the proposed rule and *existing* federal regulations," while Factor (8) requires an assessment of the "cumulative effect of the rule" with other regulations "*related to* the specific purpose of the rule." *Id.* (emphasis added). As noted in the Department's SONAR,

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[4] T. at 211

[5] *See* Affidavit of Randy Vogt, DLI Manufactured Structures Section Chief (attached)

[6] T. at 213-214; Exhibit AB (attached December 10, 2013 correspondence from Dynamic Homes)

[7] T. at 214; Exhibit AB at 7

there are no applicable federal regulations which address automatic fire sprinkler installation requirements for single-family dwellings. This is true for the conventional home building industry, as well as for the manufactured/modular home building industry. Although HUD does regulate manufactured home building construction and safety by way of the Manufactured Housing Improvement Act of 2000, neither that Act nor the federal regulations passed to implement it address fire sprinkler requirements in manufactured home structures.[8] As correctly testified to by Mr. Brunner, in areas where the federal manufactured housing code is silent, including mechanical fire suppression, a state agency may require that state building code requirements apply instead.[9] Because no federal regulations addressing fire sprinklers in manufactured homes exist, there are no differences between the proposed rule and federal regulations that need be assessed by the Department in addressing Factor (7) of its Regulatory Analysis section contained in the SONAR.

While there are no existing federal regulations which address fire sprinkler requirements for manufactured homes for purposes of responding to Factor (7), there are "related" fire safety provisions in the manufactured home federal standards which arguably could affect Factor (8)'s cumulative effect assessment conducted by the Department in its SONAR. As noted by Mr. Brunner in his testimony and comments, the federal manufactured housing code already contains general fire safety standards that apply to manufactured homes that may differ slightly from the requirements under the 2012 IRC, such as additional flame spread requirements for wall and ceiling finishes, smoke alarm placement requirements, and egress requirements.[10] Automatic fire sprinkler requirements are absent from the federal manufactured housing code, so adoption of the proposed rules would result in additional fire safety requirements that would have a cumulative effect of increasing life safety and property damage protection in manufactured homes. While the existing federal manufactured housing code may already contain heightened fire protection requirements, those standards are passive fire protection requirements that are already required because of other risk factors and fire history unique to manufactured homes. Automated fire sprinkler protection, however, is an active fire protection requirement which addresses the size and growth of a fire, protection of egress routes, and protection from further destruction of property which is not covered under the existing passive federal manufactured home fire safety standards.

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[8] *See generally* 42 USC §5401, *et. seq*; 24 CFR Part 3280

[9] T. at 218; *see also* 42 USC §5422 (a)("Nothing in this chapter shall prevent any State agency or court from asserting jurisdiction under State law over any manufactured home construction or safety issue with respect to which no Federal manufactured home construction and safety standard has been established...") and 24 CFR 3282.11 ("No State manufactured home standard regarding manufactured home construction and safety which covers aspects of the manufactured home governed by the Federal standards shall be established or continue in effect with respect to manufactured homes subject to the Federal standards..."). Indeed, as indicated in HUD's Recent Program Activity Report (http://portal.hud.gov/hudportal/HUD?src=/program_office), "[t]hough HUD always had general fire safety standards, HUD has no standard for mechanical fire suppression. HUD has long held that state and local sprinkler requirements are, therefore, not preempted by [HUD's] general fire safety standards. This [leaves] state and local government free to dictate all elements of the sprinkler system that a manufactured home must have in order to be sited in the jurisdiction." *Id.*

[10] T. at 215-216; Exhibit AB at 8-9; *see also* 24 CFR 3280, subpt. C

Based on the above, the Department has properly met all of the necessary procedural requirements for the consideration and adoption of the proposed rules, including any assessment of Minnesota Statute §14.131's impact on the manufactured/modular home building industry.

III. The Department of Labor and Industry Has Established That the Proposed Rules Are Both Needed and Reasonable as Required By The Administrative Procedure Act.

A. Background Information and General Response.

Minnesota Statutes § 326B.106, subd. 1 (2012) states, in part:

> The code must conform insofar as practicable to model building codes generally accepted and in use throughout the United States...Model codes with necessary modifications and statewide specialty codes may be adopted by reference. The code must be based on the application of scientific principles, approved tests, and professional judgment.

Id.

The 2012 International Residential Code ("IRC"), the model code the Department proposes to adopt as published by the International Code Council ("ICC"), is *generally accepted and in use throughout the United States* as it has been adopted in many areas throughout all fifty states. Many of the other compatible "I" codes, including the International Building Code ("IBC"), have been adopted by several federal agencies, including the Architect of the Capitol, the National Park Service, the Department of State, the U.S. Forest Service, and the Veterans Administration. The Department of Defense references the IBC for constructing military facilities, including those that house U.S. troops around the world. During the economic recession of 2007 to 2009, most states made policy decisions to foster an economic recovery of the home building industry either through eliminating or postponing new cost-sensitive provisions such as residential fire sprinklers or by postponing the adoption of the new model codes altogether, as Minnesota did. Although this is basically confirmed in Exhibit L at tab 13, the Department counts 31 states, as opposed to 41 as stated in Exhibit L's memorandum at p. 3, that outright *precluded* adoption of the IRC's residential fire sprinkler provision, as opposed to merely postponing adoption of either the model code itself or specific provisions therein. An example of this can be found in the description of Nevada's action that states, "Both the city of Las Vegas and Clarke County have decided not to require sprinklers in new one- and two- family dwellings until housing market improves."[11] Not unlike Nevada, Minnesota decided to postpone adoption of any new fire sprinkler requirements by not adopting the 2009 edition of the IRC. However, instead of waiting, the Department began a study of the residential fire sprinkler issue for a future adoption,

[11] Exhibit L, tab 13 at p.3

eventually with the 2012 IRC. This allowed the discussion to occur on the merits of the requirement and not solely on costs and the current economic climate.

The International Code Council maintains an open, competent, and comprehensive process of evaluating changes to these codes. The Council uses numerous code and knowledge-specific committees with broad technical representation of experts to assist them in development of the various model codes.[12] The Department relied upon this process and knowledge that the International Residential Code is developed nationally on the basis of *scientific principles*, *approved tests*, and the *professional judgment* of many subject matter experts. Because the Department cannot duplicate that effort, it acknowledges the need and due process demonstrated in ICC's technical review process sufficient to warrant the requirement in the 2009 and 2012 editions of the IRC that new single-family dwellings be provided with an automatic fire sprinkler system.

Minnesota Statutes § 326B.101 (2012) states, in part:

> The commissioner shall administer and amend a state code of building construction which will provide basic and uniform performance standards, establish *reasonable safeguards* for health, safety, welfare, comfort, and security of the residents of this state and provide for the use of modern methods, devices, materials, and techniques which will in part tend to lower construction costs. The construction of buildings should be permitted at the *least possible cost* consistent with recognized standards of health and safety.

Id. (emphasis added).

The fire service has long argued that *reasonable safeguards* had not been adequately afforded to those fire fighters and first responders who enter buildings under emergency fire conditions. The ICC finally responded to this concern when Section R101.3 of the 2006 International Residential Code was changed to state that, "...the purpose of this code is to establish minimum requirements to safeguard the public safety, health and general welfare...and safety to *life and property from fire* and other hazards attributed to the built environment and to provide *safety to fire fighters and emergency responders* during emergency operations." *Id.* (emphasis added). This purpose was subsequently adopted in Minnesota Rules, Part 1300.0030, subpart 1 (2007), which also recognizes that in addition to protecting life and property from fire hazards, the code also must provide for the safety of fire personnel and first responders when responding to fire emergencies. *See id.*

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[12] *See* http://www.iccsafe.org/cs/codes/Documents/misc/CodeDevelopmentProcess.pdf

During that same model code cycle of the "I" codes, it was successfully demonstrated through the ICC's code change process that the most effective way to save lives, protect property and provide this expected safety to fire fighters and first responders was through the installation of automatic fire sprinklers in new homes *in addition to* the passive protection already afforded occupants by smoke alarms and gypsum board protection of light-weight floor design. In addition to addressing the threats of flame, smoke, and hot gases, sprinklers have proven to be the best way to combat one of the newest threats to fire fighters and first responders' safety when entering homes-- the widespread use of unprotected "light-weight" engineered floor construction.

As set forth in Minnesota Statutes §326B.101, it is the Department's responsibility to evaluate new provisions of the model codes for their impact on Minnesota, specifically for coordination and amendments that may be needed to address matters unique to other legislative concerns, climatic concerns, reasonableness, and cost considerations. As already mentioned in the Department's hearing statement, the Department held no less than seven separate meetings with stakeholders and nine separate Advisory Committee meetings to discuss the concerns of adopting the provision in the IRC that fire sprinklers be installed in new single-family homes.[13] The Department reviewed all the verbal and written information provided and studied the merits of various options. Considerations in the development of the proposed Rule included:

1. *Protection to occupants.* Data provided by the Builder's Association of Minnesota suggested that statistically most new homes did not present a significant fire threat to the life of their occupants. The Department acknowledged the validity of this data, but also recognized its limitations concerning injury from fire and smoke inhalation, as well as the particular vulnerabilities of children, the elderly, and the disabled;
2. *Cost.* The Department understood and was aware of Minnesota Statutes §326B.101's statutory charge to develop codes that "provide for the use of modern methods, devices, materials, and techniques which will in part tend to lower construction costs" and that "[t]he construction of buildings should be permitted at the least possible cost consistent with recognized standards of health and safety." *Id.* The Department also recognized that under any estimate, the addition of automatic fire sprinklers to newly constructed single-family dwellings would increase the costs of new homes, clearly impacting the entry and mid-level market; and
3. *Fire fighter safety.* The Department understood the safety concerns expressed by the Minnesota Fire Service when fighting structure fires:
    a) *Engineered lumber used in floor systems.* As explained in the Department's SONAR, this type of construction is subject to rapid premature failure and collapse by fire, putting fire fighters and first responders at risk while engaged in suppressing fire or trying to rescue occupants;
    b) *Combustible loading.* Today's dwellings and furnishings have a higher degree of combustibility than in the past. The larger the building, the greater the quantity of both combustible construction materials and furnishings; and

[13] T. at 26-28

c) *Size of dwelling.* The risk to fire fighters and first responders when performing fire suppression and rescue operations is clearly related to the size of the structure. The larger the building, the greater the difficulty in performing fire-fighting and rescue due to greater travel distance, number of rooms, and areas to search and suppress fire conditions.

In its development of the proposed rule, the Department considered various options, including:

- protection of all single-family homes, regardless of size;
- protection of only two-family and larger residential buildings;
- partial systems in all dwellings to address the most likely sources of fire;
- phased approach for all dwellings based on size;
- protection of engineered floor systems with sprinklers and/or protective sheathing;
- enabling local government the option to decide the need for protection of dwellings with fire sprinkler systems in their community; and
- "trading off" existing passive fire safety requirements for the active sprinkler system.

As a result, the Department proposed a rule that properly balances its statutory charge to *establish reasonable safeguards for the health and safety* of all Minnesotans, including fire fighters and first responders, while considering the costs of meeting those standards.

The Department's proposed rules adopt and retain the 2012 International Residential Code requirement to sprinkle all one and two-family and larger residential structures with an exception that excludes most newly constructed single-family homes. As addressed in the Department's SONAR, this *exception* was established at less than 4,500 square feet and represents a clear majority of the new single-family homes being constructed in Minnesota.[14] The Department believes this exception is needed and reasonable based on the following:

- *Life Safety/Property Protection*:
  - Provides safety to fire fighters and first responders when performing firefighting and rescue operations in larger single-family dwellings, while providing added protection to property and safety of occupants, particularly children, the elderly and the disabled who may not benefit from passive fire protection systems like inter-connected smoke alarms.
  - Provides safety to fire fighters and first responders by providing fire-resistant sheathing protection to light-weight engineered floor construction in homes less than 4,500 square feet.
- *Cost Effectiveness*:
  - Most homes being constructed in Minnesota incur minimal added cost since the clear majority of new home construction is less than 4500 square feet and would

[14] SONAR at pp. 31-33

therefore only be subject to the required addition of fire-resistant sheathing protection to light-weight engineered floor protection systems.
    - The creation of new affordable housing in Minnesota is not impaired.
    - Those newly constructed single-family homes that are subject to the sprinkler requirement would incur increased costs, but those costs are a small and reasonable percentage of the over-all costs necessarily incurred in building a home of 4500 square feet or more.
- *Uniformity*:
    - It applies uniformly throughout the state of Minnesota.

The Department's proposal reflects the facts and concerns communicated by all stakeholders throughout the process. Paired with today's existing smoke detection requirements, it is the Department's belief that implementation of this proposed rule is *needed* and a *reasonable* way to protect houses, occupants, property, and firefighters and other first responders from the danger of fire in residential dwellings, all while not being a detriment to the construction of affordable housing.

B. Response to Testimony and Comments Received.

Roger Axel, Building Official for the City of New Hope, testified at the hearing. Mr. Axel commented in general on the process the ICC followed in adopting the single-family dwelling sprinkler requirement and supported that organization's efforts in doing so despite the obvious pressure put on it by individuals and business organizations that had a proprietary interest in doing so.[15] Mr. Axel also testified that he generally supports the Department's proposed rules, including the 4500 square foot threshold, and urged this administrative tribunal to be mindful of the competing interests of those impacted by the proposed rules who will be testifying and submitting comments.[16] According to Mr. Axel, "[t]he best people to make the decisions are those that do not have a financial stake in this, but purely public safety and therefore code officials."[17]

The Department agrees with Mr. Axel's testimony and also urges this Court to be mindful of the inherent bias present in the testimony, comments, and other written submissions provided to it by many of the various individuals, business organizations, municipalities, and government officials involved.

Steven Orlowski (National Association of Home Builders), Karen Linner (Builders Association of Minnesota), Clay Dietrich (Dietrich Homes), Dave Neisen (City of Perham Building Official), Joe Ranweiler (B-Dirt Construction), Chris Contreras (Ryland Homes), and Mark Brunner

[15] T. at pp. 37-40
[16] T. at pp. 39-40
[17] T. at 40

(Manufactured and Modular Home Association) submitted comments and provided testimony in opposition to the Department's proposed fire sprinkler requirements for single-family homes 4500 square feet or more as provided for in the rule drafts for proposed Minnesota Rules, parts 1309.0309 and 1309.0313.[18] These individuals, municipal officers, and business association representatives state that the proposed rules are not needed because there allegedly have been no fire fighter or occupant deaths in single-family dwellings located in Minnesota since 2003 and that single-family dwellings are therefore already safe enough or can be adequately protected by an alternative gypsum board under-floor protection.[19] This group also contends that the proposed rules are not reasonable because the 4500 square foot threshold is allegedly not supported by the SONAR and has not been analyzed correctly regarding the potential costs and impact of the requirement on new single-family dwelling construction, particularly in rural areas not serviced by municipal water systems or located in non-code enforcement areas and border communities that must compete with the Dakotas and other surrounding states that have not adopted the 2012 IRC single-family sprinkler requirements.[20]

Ms. Linner's testimony and several other comments opposing the proposed rule's sprinkler requirements focused on the proposition that the requirements are not needed or reasonable since single-family home construction is already "safe" and there have been no documented fire fighter deaths in Minnesota since inter-connected smoke alarm systems have been required by the code in 2003. Moreover, these opponents argue that in combination with inter-connected smoke alarms, a "lower cost alternative" in the form of gypsum board under-floor protection is sufficient to keep these homes safe in lieu of automated fire sprinkler protection.

While the Department agrees that inter-connected smoke alarms and fire-resistant sheathing applied to light-weight engineered floor systems assist in the protection of occupants and contribute to the general safety of new home construction, the Department believes that fire sprinklers will significantly contribute additional safeguards for the protection of fire fighters, property, and those unable to respond in a timely fashion to smoke alarms such as young children, the elderly, the alcohol and chemically impaired, and the disabled. Moreover, unlike passive smoke alarms and under-floor protection systems, fire sprinklers are active systems which directly address protection of property, protection of egress routes, reduction of smoke and fume proliferation, protection against fire temperature flashpoints, and prevention of injury to fire fighters and home occupants during a fire emergency.

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[18] *See generally* T. at pp. 41-61, 62-109, 164-181, 181-186, 186-192, 206-210, 210-219, respectively; Exhibits L, X, Y, and AB; *see also* written comments opposed to proposed rules received from Paul Donnay (Donnay Homes, Inc.), Jeff Parks (K. Hovnanian Homes, LLC), Ray Austin (Kuepers, Inc.), Scott Wold (S.W. Wold Construction, Inc.), Nathan Jones (Tollberg Homes), Jake Marvin (The Marvin Companies), Bryce Johnson (Home Builders Association of Fargo-Moorhead), Craig Whitney (Fargo Moorhead West Fargo Chamber of Commerce), David R. Werschay (Werschay Homes, Inc.), Pete Semler (Semler Homes, Inc.), Mark Voxland (Mayor, City of Moorhead), Lynn Stauss (Mayor, City of East Grand Forks), Chad Olson (Mayor, City of Dilworth), Matt Limoges (Rochester Area Builders), Chad Kompelien (Kompelien Custom Homes, Inc.), LeRoy Kurtyka (Forx Builders Association), Bryan Wolfe (Fieldstone Family Homes, Inc.)

[19] *See id.*

[20] *See id.*

To be sure, single-family homes today are safer than they were in the past. Nevertheless, newly constructed single-family homes can be even safer with the addition of an installed automatic fire sprinkler system. Despite inter-connected smoke alarms and under-floor protection systems, the proposed rules are needed and reasonable because they not only address deaths from fire, they also address increased risk of injury to both fire fighters and vulnerable home occupants, as well as protection of the dwelling itself and property contained therein, as required by Minnesota Statutes §326B.101 and Minnesota Rule, Part 1300.0300, subpt. 1.

Many of the comments and testimony of those opposing the Department's proposed rules also assert that the 4500 square foot threshold is not reasonable or supported by the Department's SONAR. However, as indicated in Section IIIA above and pages 27, 32-33 of the SONAR, the Department met numerous times over a three-year period with all stakeholders concerning the single-family sprinkler requirements contained in this rulemaking in an attempt to reach some agreement or consensus concerning adoption of the sprinkler provisions of the IRC. Both sides of the debate dug in their heels and in no uncertain terms refused to willingly compromise their respective positions. There also was no consensus reached by the members of the 1309 Advisory Committee who were tasked with providing recommendations to the Department concerning this contentious issue, despite the Fire Service offering no less than nine trade-offs during the committee process to assist the members in reaching some sort of agreement or consensus among them. The Department recognized the added fire safety and property protection value that residential fire sprinklers would bring to the existing State Building Code, but was also cognizant of the additional costs associated with that requirement that would ultimately be passed on to the homeowner by the residential building industry. It was made apparent to the Department by the Fire Service representatives that larger homes pose additional risks to both fire fighters and building occupants because it takes a longer time for occupants to exit and larger homes are more difficult to deal with during firefighting and rescue operations due to greater combustible loading, the number of rooms and areas to search and suppress fire and smoke, and other factors. Moreover, 4500 square feet is approximately one-half of the square footage that current building code requirements for automatic fire sprinkler installation in two-family homes of 9,250 square feet or more. Accordingly, a 4500 square foot compromise between the competing stakeholders' all-or-none positions for requiring fire sprinklers in single-family homes was decided upon by the Department to be incorporated into the proposed rules.[21] Contrary to the proposed rule's opponents, this proposed threshold is rational, reasonable and based on several factors as discussed above and in Section IIIA of this Response, as well as contained in the Department's existing SONAR.

Another common theme addressed by the proposed rule's opponents in their comments and testimony is that the Department's cost analysis of the sprinkler requirement is too low. This position is based on information obtained and analyzed by Ms. Linner herself wherein she sought

[21] As is common in reaching final numerical standards in adopting building code provisions, the 9250 square foot threshold for two-family homes and townhouses contained in the current State Building Code also derived its factual basis from a compromise between the positions held by competing stakeholders at the time of last IRC rulemaking adoption. *See* November 28, 2006 SONAR for the Proposed Amendments to Rules Governing the Adoption of the 2006 International Residential Code, Minnesota Rules, Chapter 1309, at pp. 3-5, 11-12 (attached)

sprinkler installation bids from members of her own industry in an attempt to establish a square footage approximation of sprinkler installation costs, including holding tank systems for well water sourcing in rural areas of the state.[22] As indicated in the Department's SONAR, cost estimations received from competing stakeholders varied widely during the rule development stage and ranged from $1.61 per square foot to over $4.00 per square foot, and an additional $2500 to $4000 to install well pumps and holding tanks for those homes that receive their water supply from private wells.[23] There is a good reason for this wide range in cost estimations other than simply explaining it as inherent bias attributable to both sides of the debate and their methodologies behind their research: 1) actual construction costs depend on a multitude of differing variables unique to each individual structure, its location, water sourcing, and labor/materials used; and 2) Minnesota has little past experience in single-family fire sprinkler installation from which to draw and prepare accurate Minnesota cost estimates.

In light of these two factors, it is reasonable for the Department to rely on cost estimations produced by all parties involved in this rulemaking and those based on analogous Minnesota multi-family and commercial sprinklered structures, and to look to the proven experience of other states and municipalities that already require single-family home fire sprinkler systems and who can report actual costs associated with those systems, rather than mere anecdotal estimations.[24] Admittedly, the Department cannot provide the parties to this rulemaking with an actual dollar amount for each and every sprinkler application that will be required under the proposed rules. However, it is not required to do so under Minnesota Statutes §14.131. The Department can reasonably rely upon the totality of the information provided to it by the stakeholders to predict an estimated square footage cost somewhere between the $1.61 average cost per square foot reported by the Fire Protection Research Foundation's 2008 and 2013 Home Fire Sprinkler Cost Assessments and the $4.00 cost per square foot reported by Ms. Linner and the Builders Association of Minnesota.[25] It is also reasonable for the Department to rely upon the Fire Protection Research Foundation's 2013 Home Fire Sprinkler Cost Assessment in support of its position that estimated single-family home sprinkler installation costs will decrease and stabilize once implemented as they did on a national level based on improved installation methods and materials, standardized practices, and increase market competition.[26]

Contrary to the assertions made by the proposed rules' opponents, the Department did take into consideration all of the factors noted above in its cost analysis of the proposed rules under Minnesota Statutes §14.131, and reasonably concluded that the benefit of additional life-safety and property protections afforded home occupants and fire fighters through automatic home fire sprinklers is consistent with and supportive of the additional costs necessary to implement the proposed rules.

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[22] T. 94-106; Exhibit L, Tabs 32, 45-47
[23] Exhibit B (SONAR) at pp. 4-5, 31-33
[24] *See id.*
[25] Copies of the Fire Protection Research Foundation's 2008 and 2013 cost assessment reports, including a detailed explanation of the methodology involved behind those reports, can be found in Exhibits B.5 and B.6, respectively. Copies of Ms. Linner's cost assessment can be found in Exhibits B.3 and L, Tabs 32, 45-47.
[26] *See* Exhibit B.6 (cost per square foot decreased from $1.61 to $1.35 between 2008 and 2013)

Another common theme among those who testified and submitted comments was the impact the proposed rules would have on border communities and its implementation in non-code enforcement areas of the state.[27] Concerns ranged from unfair competition between Minnesota's border communities and surrounding states that have no single-family home sprinkler requirements to unfair competition between licensed contractors and unlicensed builders in non-code enforcement areas. While the Department is mindful that regulations concerning many building standards differ between Minnesota and its surrounding states, the State of Minnesota must take the actions it deems necessary to protect the safety of its residents, even when its neighbors do not. The Minnesota State Building Code can only regulate construction and conduct occurring within its boundaries and is clearly not intended or legally authorized to regulate any other sovereign states or their municipalities. Moreover, as noted by Minnesota Rule 1300.0030, subpt. 1 (2007), "[t]he purpose of the code is not to create, establish, or designate a particular class or group of persons who will or should be especially protected or benefited by the terms of the code." *Id.* This is true not only for our State Building Code, but it is also true of any other regulation adopted or law passed to govern the health, safety or welfare of the citizens of this state.

The further concern expressed by some regarding non-code enforcement areas and unfair competition is also without merit. The Minnesota State Building Code is the standard that applies statewide for the construction, reconstruction, alteration, repair, and use of buildings and other structures of the type governed by the code.[28] All contractors, whether licensed or not, are legally required to build to the state standard when working in Minnesota - - *even in non-code enforcement areas*. Failure to abide by Minnesota State Building Code standards while performing construction in non-code enforcement areas still subjects the builder, whether licensed or not, to private legal liability to the homeowner for failing to abide by the code's minimum standards. Moreover, unlicensed builders are still subject to the Department's administrative penalty authority and enforcement provisions of Minnesota Statutes §326B.082, whether violating relevant provisions of Chapter 326B in a non-code enforcement area or not. If a licensed contractor is aware of another contractor that is not building to the state code standard or is operating without a valid contractor's license, then a complaint should be registered with the Department and the complaint will be investigated and action will be taken against that individual if the complaint can be substantiated.

Angie Weise (City of St. Paul), Jeffrey Hudson (National Fire Protection Association), Ronald Farr (Underwriters Laboratories), Sean Flaherty (National Fire Protection Association), Chief Ulysses Seal (City of Bloomington), Chief Tim Butler (City of St. Paul), Chief Wayne Kewitsch (Minnesota State Fire Chiefs Association), and Buddy Dewar (National Fire Sprinkler Association) provided testimony at the hearing that generally supported the proposed rules, but

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[27] *See e.g.* T. at pp.183-186, 187-190; Exhibits X, Y; *see also* written comments received from Bryce Johnson (Home Builders Association of Fargo-Moorhead), Craig Whitney (Fargo Moorhead West Fargo Chamber of Commerce), Mark Voxland (Mayor, City of Moorhead), Lynn Stauss (Mayor, City of East Grand Forks), Chad Olson (Mayor, City of Dilworth), and Matt Limoges (Rochester Area Builders, Inc.)

[28] Minn. Stat. § 326B.121, subd. 1 (a) (2012).

disagreed with the Department's decision to require automatic fire sprinklers only in single-family dwellings of 4500 square feet or more.[29] Instead, this Fire Services group believed that the proposed rules should adopt the 2012 IRC fire sprinkler requirements as written, requiring that *all* new single-family homes be constructed with automatic fire sprinklers installed.[30]

The Fire Services group raised concerns about fires and the relationship to the size of new homes being built, the open design of new homes, and the common use of light-weight framing construction. They recognized that the proposed rules do address light-weight framing to a certain extent by requiring the addition of fire-resistive panels to the ceilings of unfinished basements, but the size, open design, and increased combustible loads of larger new homes remain a concern. In previous attempts to reach a compromise or consensus among the stakeholders, the Fire Service did propose sprinklering thresholds of 4000 and 5000 square feet for single-family dwellings, believing that while the issues and concerns raised above affect all new homes, single-family dwellings beginning at this size range were particularly problematic and less manageable from a fire fighting perspective due to their large size. The additional costs associated with automatic fire sprinkler systems, however, make it difficult to be applied to all newly constructed homes at the present time during the economic recovery, so the Department chose to require fire sprinkler systems only to those new homes where the Fire Service's concerns were the greatest- - larger homes of 4500 square feet or more. As more and more competition between contractors develops, it is anticipated that the associated costs will lower and eventually stabilize. However, at this time, the Department does not agree that all single-family dwellings should be required to be built with fire sprinkler systems because it may negatively affect smaller homes and the affordable housing markets. For these reasons, the Department does not agree with the Fire Service group's contention that all newly built single-family dwellings should be required to be equipped with fire sprinkler systems. Instead, the Department believes that it is reasonable to require only those homes of 4500 square feet or more to have fire sprinkler systems installed.

Chief Deputy Robert Dahm (State Fire Marshal's Office/Department of Public Safety), accompanied by Fire Safety Supervisor Jon Nisja (same), testified at the hearing in support of the Department's proposed rules.[31] Chief Deputy Dahm recognized the Fire Service group's position concerning the adoption of the 2012 IRC without amendment, but expressed support nevertheless for the Department's proposed rules as written in light of economic and other conditions, and the Department's statutory mandate to adopt a building code at the least possible cost consistent with recognized standards of health and safety.[32] The Department agrees with Deputy Chief Dahm's testimony in support of the proposed rules.

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[29] *See generally* T. at pp. 131-134, 135-146, 147-163, 192-199, 199-206, 219-229, 230-235, 235-252, respectively; Exhibit V; *see also* written comment and attachments received from Executive Director Tom Brace (Minnesota State Fire Chiefs Association) and Sean Flaherty (National Fire Sprinkler Association)
[30] *See id.*
[31] *See generally* T. at pp. 124-130
[32] *See id.* at pp. 125-126

The National Electrical Contractors Association ("NECA"), by and through Government Affairs Director Gary Thaden, submitted a comment supporting the following parts contained in the Department's proposed rules: Parts 1309.0010, subpt. 3(A); 1309.0010, subpt. 3(B); and 1309.0010, subpt. 3(E). These parts address various chapters of the 2012 IRC that are being proposed by the Department to be replaced with analogous chapters of the Minnesota State Building Code. The comment is silent on NECA's position concerning adoption and amendment of the single-family dwelling sprinkler requirement as proposed by the Department's rules.

The Minnesota Mechanical Contractors Association ("MMCA"), by and through Government Affairs Director Gary Thaden, submitted a comment supporting the following parts contained in the Department's proposed rules: Parts 1309.0010, subpt. 3(A); 1309.0010, subpt. 3(B); 1309.0010, subpt. 3(C); and 1309.0010, subpt. 3(D). Again, these rule parts address various chapters of the 2012 IRC that are being proposed by the Department to be replaced with analogous chapters of the Minnesota State Building Code. The MMCA's written comment also supports the Department's positions on IRC Sections R305.2.1.1, *Bathroom plumbing fixture clearance*, and R307, *Toilet, bath and shower space*, found at proposed Minnesota Rules Parts 1309.0305 and 1309.0307, respectively. The comment further supports the Fire Service group's position that *all* new single-family dwellings be required to be installed with automatic fire sprinkler systems, not just those consisting of 4500 square feet or more. The Department's response to the MMCA's position on required sprinkler systems for single-family homes is the same as the response to the Fire Service group's testimony and comments as found above.

The Department has responded to and addressed many of the concerns raised during the hearing and comment period by those who testified and by those who submitted written comment. The Department has shown that the proposed rules are needed and reasonable. Therefore, with the following modifications to the proposed rules concerning dry-head sprinkler requirements for porches and garages of newly built single-family dwellings, the Department requests that the proposed rules be recommended for adoption.

IV. The Department of Labor and Industry Agrees That it is Appropriate to Modify The Proposed Rules By Excluding the Dry-Head Sprinkler Requirement For Porches and Garages of Single-Family Dwellings of 4500 Square Feet or More.

The requirement to install automatic fire sprinkler dry-heads in porches and garages was initially adopted in Minnesota in 2007 as an amendment to the 2006 IRC and applied to two-family dwellings and townhouses.[33] When drafting the proposed rules for the current rulemaking adoption of the 2012 IRC, the Department included this requirement for single-family dwellings of 4500 square feet or more. Since listening to testimony and reviewing written comments on this topic, the Department has re-examined the requirement for installation of fire sprinkler dry-heads in garages and porches of single-family dwellings and has determined that this requirement is not necessary for that application. The need for dry-head sprinklers in garages

[33] *See* Minnesota Rule Part 1309.0301, subpt. 1(Section R301.1.4.2, *Installation requirements*)(2007)

and porches of attached dwellings was based in part on the threat of fire spreading between these attached structures. Because single-family dwellings are not attached to other family homes with a common wall between them, the need for sprinkler heads in fire spread points such as garages and porches is not as critical as it is for attached multi-family dwellings due to the lack of common walls between dwelling structures. It is therefore appropriate to strike this requirement from the proposed rules as follows:

Revise proposed sections R309.5 and R313 as shown below to eliminate dry-head installations from garages and porches in single-family dwellings (modifications shown in RED).

Subp. 4. section R309.5, Fire sprinklers. Section R309.5 is amended to read as follows:

R309.5 Fire sprinklers. Attached garages of two-family dwellings and townhouses shall be protected by fire sprinklers and installed in compliance with section R313.3. ~~**Attached garages of single-family dwellings shall be protected by fire sprinklers and installed in compliance with section R313.3 when the dwelling's floor area, including basement, is 4500 square feet (418.06 m^2)or more. Floor area excludes garages.**~~

1309.0313 ~~SMOKE ALARMS~~ SECTION R313, AUTOMATIC FIRE SPRINKLER SYSTEMS

IRC section ~~R313.2.1~~ R313 is amended to read as follows:

R313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in townhouses.

> **Exception:** An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.
>
> **R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for townhouses shall be designed and installed in accordance with IRC section P2904 or NFPA 13D.

R313.2 One-and-two-family dwellings automatic fire systems. An automatic residential fire sprinkler system shall be installed in one- and two-family dwellings.

> **Exceptions:**
> 1. Detached one-family dwelling, less than 4500 square feet of floor area. Floor area shall include all floors and basements, excluding garages.

2. An automatic residential fire sprinkler system shall not be required if additions, alterations, or repairs are made to existing buildings that do not have an automatic residential sprinkler system installed.

R313.2.1 Design and installation. Automatic residential fire sprinkler systems shall be designed and installed in accordance with IRC section P2904 or NFPA 13D

R313.3 Installation requirements. When an automatic sprinkler system is required in ~~one-and-~~two-family dwellings, **and townhouses,** it shall be installed in accordance with section P2904 or NFPA 13D.

Automatic sprinkler systems required in ~~one-and-~~two-family dwellings and townhouse buildings shall be installed in accordance with the following:

1. Attached garages are required to have one dry head sprinkler located within 5 lineal feet of each door installed in the common wall separating the dwelling unit and the attached garage;
2. Attached covered patios, covered decks, covered porches, and similar structures are required to have automatic sprinklers with a minimum of one dry head for every 20 lineal feet (6.096 m) of common wall between the dwelling unit and the covered patio, covered deck, covered porch, or similar structure.

Exception: Attached roofs of covered patios, covered decks, covered porches, or similar structures that do not exceed 40 square feet (3,716 m^2)of floor area.

R313.4 State licensed facilities. One-and two-family dwellings and townhouse buildings containing facilities required to be licensed or registered by the state of Minnesota shall be provided with an automatic sprinkler system required by the applicable licensing provisions of that agency or according to this part, whichever is more restrictive.

The Department believes that the modifications above are not substantially different from the proposed rules according to the standards set out in Minnesota Statutes §14.05, subd. 2 (2012). That statute provides that a modification does not make a proposed rule substantially different if the differences are within the scope of the matter announced in the notice of hearing and are in character with the issues raised in that notice; the differences are a logical outgrowth of the contents of the notice of hearing and the comments submitted in response to the notice; and the notice of hearing provided fair warning that the outcome of the rulemaking proceeding could be the rule in question. *See id.*

The modification to the proposed rule provided above is within the scope of the matter announced in the notice of hearing because the scope of this rulemaking is the adoption of the 2012 International Residential Code, with amendments. The purpose of the rulemaking is to

adopt this model code and amendments thereto. The modification to the proposed rules is in character with the issues raised in the Notice because the notice of hearing specified that the proposed rule may include modifications to specific provisions so that the IRC would be consistent with Minnesota provisions, and to address issues that are not addressed by the 2012 IRC. The Department also announced that these rules were proposed in order to provide the most current set of residential building criteria. The difference between the modification presented in this Response and the proposed rules is a logical outgrowth of the contents of the notice and the comments submitted in response to the notice for the same reasons.

Fair warning that the outcome of the current rulemaking proceeding could be the modified rule provision in question was provided to the public by the broad scope of the notice for hearing. The Department also held numerous advisory committee meetings, attended by representatives of broad interest groups, where the development of these proposed rules were discussed, referred to this rulemaking in seminars and continuing education opportunities pertaining to the construction industry and the application of the Minnesota State Building Code. Those interested in the Code also had an additional opportunity to participate in the development of these proposed rules because updating the model codes includes input through public submittal and hearings at the national level. As a result, persons interested in the State Building Code have had the opportunity to participate in the development of the underlying model codes if they had chosen to do so, as well as in the instant rulemaking process.

Additionally, the Minnesota Supreme Court and Court of Appeals have affirmed in their opinions that the rulemaking procedure expressly contemplates modifications of proposed rules. *See* Minnesota Ass'n of Homes for the Aging v. Department of Human Services, 385 N.W.2d 65, 68 (Minn. Ct. App. 1986), *review denied* (June 13, 1986); City of Morton v. Minnesota Pollution Control Agency, 437 N.W.2d 741, 746 (Minn. Ct. App. 1989); Minnesota Chamber of Commerce v. Minnesota Pollution Control Agency, 469 N.W.2d 100,105 (Minn. Ct. App. 1991), *review denied* (July 24, 1991). In particular, the Courts have expressed approval of modifications made as a result of public comment and in response to ALJ recommendations. *See* Minnesota Chamber of Commerce v. Minnesota Pollution Control Agency, 469 N.W.2d 100, 106 (Minn. Ct. App. 1991); Minnesota League of Credit Unions v. Minnesota Department of Commerce, 486 N.W.2d 399, 406 (Minn. Ct. App. 1992). Further, the Supreme Court made clear in Minnesota Ass'n of Homes for the Aging that it is not mandatory that modifications be discussed in the statement of need and reasonableness or even at the hearing to withstand a "substantial change" challenge. *See id.*, 385 N.W.2d at 68.

The modification of the proposed rules as discussed above is within the Department's legal authority and not substantially different from the rules as proposed in the Notice of Hearing. Therefore, the Department requests that the proposed rules as modified be recommended for adoption by this administrative tribunal.

V. Conclusion.

The Department has operated within its legal authority to adopt the proposed rules, has met all procedural requirements necessary to do so under the Administrative Procedure Act, and has established that the proposed rules are both necessary and reasonable. Moreover, the modification of the proposed rules as discussed above is within the Department's legal authority and not substantially different from the rules as proposed in the Department's Notice of Hearing. Therefore, the Department respectfully requests that an Order be issued which recommends the adoption of the proposed rules with the noted modification.

Dated: 12/31/13

By:

KEN B. PETERSON
Commissioner of Labor and Industry

JEFFREY F. LEBOWSKI
General Counsel (#0190020)

Attachments: 1.) Affidavit of Randy Vogt
2.) November 28, 2006 SONAR for the Proposed Amendments to Rules Governing the Adoption of the 2006 International Residential Code, Minnesota Rules, Chapter 1309

STATE OF MINNESOTA

COUNTY OF RAMSEY

OFFICE OF ADMINISTRATIVE HEARINGS

In the Matter of:

OAH Docket No. 8-1900-30855
Revisor's ID Number R-04144

The Proposed Amendment of Rules of the Department of Labor and Industry Governing the Adoption of the 2012 International Residential Code

AFFIDAVIT OF RANDY VOGT

STATE OF MINNESOTA)
) ss.
COUNTY OF RAMSEY)

RANDY VOGT, being first duly sworn on oath, hereby states as follows:

1. I am the Construction Codes and Licensing Division Section Chief for the Manufactured Structures section of the Minnesota Department of Labor and Industry. As such, I have knowledge of the matters set out herein. The matters set forth in this affidavit are within my personal knowledge based on my position with the Department.

2. On December 16, 2013, I corresponded via email with the five modular home manufacturers in Minnesota to ask them how many homes of 4,500 square feet or more they built in 2013 and of those, how many were shipped to Minnesota. The inquiries were sent to: Friendship Homes of Minnesota (located in Montevideo, Minnesota); Dynamic Homes (located in Detroit Lakes, Minnesota); Hyland Manufacturing (located in Worthington, Minnesota); Homark Homes (located in Red Lake Falls, Minnesota); and CMH-Schult Homes (located in Redwood Falls, Minnesota).

3. Friendship Homes replied that they built three homes over 4,500 square feet (including the basements) but none of those homes were shipped to Minnesota. Rather, the Friendship homes were shipped to North Dakota, South Dakota, and Wyoming. Dynamic Homes replied that they built three homes of 4,500 square feet or more that remained in Minnesota and four homes that were shipped to North Dakota. Highland Manufacturing responded that they have not built any homes that were 4,500 square feet or more. Homark Homes stated that they only built one home that was intended to be 4,500 square feet or more when completed.

However, that home was shipped to North Dakota to be used as a display home and has not yet been installed on a basement. Schult Homes stated that they built two homes that were 4,500 square feet or more to be located in the state of Minnesota.

4. This affidavit represents a complete representation of the facts contained in my correspondence with the above-referenced modular home manufacturers. Further, your affiant sayeth not.

RANDY VOGT

Subscribed and sworn to before me
this 23rd day of December, 2013.

NOTARY PUBLIC

COLLEEN D. CHIRHART
Notary Public-Minnesota
My Commission Expires Jan 31, 2017

Minnesota Department of Labor and Industry

STATEMENT OF NEED AND REASONABLENESS

Proposed Amendment to Rules Governing the Adoption of the 2006 International Residential Code, Minnesota Rules, Chapter 1309, and repeal of rule parts 1309.0312, 1309.0315, 1309.0316, 1309.0322, 1309.0506, and 1309.0703, subparts 1, 2, 4, 5, 6, 7, and 8.

INTRODUCTION

The Commissioner of the Minnesota Department of Labor and Industry proposes to adopt amendments to the Minnesota State Building Code, Minnesota Rules, chapter 1309. The proposed rules will adopt by reference the 2006 edition of the International Residential Code (IRC), with amendments.[1]

The International Code Council (ICC) promulgates the IRC. The ICC routinely reviews, modifies, and updates the IRC to provide the most current and complete criteria relating to the design and installation of residential building systems. Because the 2006 IRC offers the most current set of criteria, the Minnesota Department of Labor and Industry proposes to amend Chapter 1309, in order to incorporate the 2006 IRC, with amendments where necessary.

ALTERNATIVE FORMAT

Upon request, this Statement of Need and Reasonableness can be made available in an alternative format, such as large print, Braille, or cassette tape. To make a request, contact Carrie Rohling, Department of Labor and Industry, 443 Lafayette Road North, St. Paul, Minnesota 55155-4341; phone (651) 284-5217; FAX: (651) 284-5725. TTY users may call the Department of Labor and Industry at (651) 297-4198.

STATUTORY AUTHORITY

The Department's statutory authority to adopt the rules is set forth in Minnesota Statutes sections 16B.59, 16B.61, and 16B.64.[2]

Minnesota Statutes, section 16B.59 states in pertinent part,

> [T]he State Building Code governs the construction, reconstruction, alteration, and repair of buildings and other structures to which the code is applicable. The commissioner shall administer and amend a state code of building construction which

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1 The 2006 IRC is available for review at the Minnesota Department of Labor and Industry by contacting Rich Lockrem, Construction Codes and Licensing Division, 443 Lafayette Road N., St. Paul, MN 55155-4341; phone: (651) 284-5868; fax: (651) 284-5749. TTY users may call the Department at (651) 297-4198.

2 All sources of statutory authority were adopted and effective prior to January 1, 1996, and so Minnesota Statutes, section 14.125, does not apply. See Minnesota Laws 1995, chapter 233, article 2, section 58.

will provide basic and uniform performance standards, establish reasonable safeguards for health, safety, welfare, comfort, and security of the residents of this state and provide for the use of modern methods, devices, materials, and techniques which will in part tend to lower construction costs. The construction of buildings should be permitted at the least possible cost consistent with recognized standards of health and safety.

Minnesota Statutes, section 16B.61, subdivision 1, states in part,

[T]he commissioner shall by rule establish a code of standards for the construction, reconstruction, alteration, and repair of buildings, governing matters of structural materials, design and construction, fire protection, health, sanitation, and safety, including design and construction standards regarding heat loss control, illumination, and climate control. The code must also include duties and responsibilities for code administration, including procedures for administrative action, penalties, and suspension and revocation of certification. The code must conform insofar as practicable to model building codes generally accepted and in use throughout the United States, including a code for building conservation. In the preparation of the code, consideration must be given to the existing statewide specialty codes presently in use in the state. Model codes with necessary modifications and statewide specialty codes may be adopted by reference. The code must be based on the application of scientific principles, approved tests, and professional judgment. To the extent possible, the code must be adopted in terms of desired results instead of the means of achieving those results, avoiding wherever possible the incorporation of specifications of particular methods or materials. To that end the code must encourage the use of new methods and new materials...

Minnesota Statutes, section 16B.64, subdivision 6, states, "The commissioner shall approve any proposed amendments deemed by the commissioner to be reasonable in conformity with the policy and purpose of the code and justified under the particular circumstances involved..."

Pursuant to the *Department of Administration Reorganization Order No. 193*, dated April 4, 2005, the responsibilities of the Department of Administration in relation to State Building Codes and Standards as set forth in Minnesota Statutes, sections 16B.59 through 16B.76 (2004) were transferred to the Department of Labor and Industry.[3]

Pursuant to these statutes and the reorganization order, the Department of Labor and Industry has the authority to adopt these proposed rules.

REGULATORY ANALYSIS

3 Reorganization Order No. 193 was effective upon filing with the Secretary of State on May 16, 2005, and shall remain in effect until amended, repealed, or superseded. For a copy of the reorganization order, please contact Carrie Rohling by e-mail at dli.rules@state.mn.us, or phone to (651) 284-5217.

Minnesota Statutes, section 14.131, sets out seven factors for a regulatory analysis that must be included in the SONAR. Paragraphs (1) through (7) below quote these factors and then give the agency's response.

(1) a description of the classes of persons who probably will be affected by the proposed rule, including classes that will bear the costs of the proposed rule and classes that will benefit from the proposed rule:

The persons who probably will be affected by the proposed rule include: residential contractors and builders, designers, certified building officials, materials manufacturers of building components, and homeowners.

The persons who probably will bear the costs of the proposed rule include: residential contractors and builders and the consumers to whom they are likely to pass the costs.

The persons who will benefit from the proposed rule include all of the above.

(2) the probable costs to the agency and to any other agency of the implementation and enforcement of the proposed rule and any anticipated effect on state revenues:

There are no costs to the agency or any other agency with respect to the implementation and enforcement of the proposed rule nor any anticipated effect on state revenues.

(3) a determination of whether there are less costly methods or less intrusive methods for achieving the purpose of the proposed rule:

There are no less costly or intrusive methods for achieving the purpose of this rule. The adoption of this code will provide uniform application of construction standards that parallel very closely those found in the IRC. The uniform application of these standards will result in predictable code application, which will tend to lower costs.

(4) a description of any alternative methods for achieving the purpose of the proposed rule that were seriously considered by the agency and the reasons why they were rejected in favor of the proposed rule:

The agency's statutory authority requires the code to "conform insofar as practicable to model codes generally accepted and in use throughout the United States." The best way to achieve this result is to incorporate by reference those recognized national model codes into rule. In 2003, Minnesota adopted the 2000 edition of the IRC, with amendments, as the Minnesota Residential Code. The 2006 edition of the IRC updates the 2000 IRC. Because the IRC serves as the base document for the residential code and it is the model building code that is generally in use and accepted throughout the United States, alternative model codes were not considered.

(5) the probable costs of complying with the proposed rule, including the portion of the total costs that will be borne by identifiable categories of affected parties, such as

separate classes of governmental units, businesses, or individuals:

The proposed rule does not require any changes to existing buildings. Rather, the proposed rule affects only new construction or remodeling. As a result, it is difficult to quantify actual cost for compliance in connection with the construction or remodeling of a building since these costs are dependent upon the building's design, use, age, condition, and intended future use.

Although it is difficult to quantify actual costs, the Department anticipates that the global costs associated with this rule will be indistinguishable from the rule it is replacing. While some specific requirements of this rule may be considered more restrictive than current rule, others are clearly less restrictive. In any particular case, the cost savings associated with the less restrictive provisions could outweigh any increased cost based on a more restrictive requirement; however, the actual costs for compliance on any one particular residential structure could vary. Having said that, there are three areas that could result in additional costs that are likely to be passed onto the homeowner.

First, proposed rule 1309.0301, addresses a requirement for sprinklers in two-family dwellings and townhomes with more than 9,250 square feet of aggregate area. The Department's Construction Codes and Licensing Division consulted with a Minnesota builders association and fire service personnel in an effort to determine a minimum threshold that is beneficial and acceptable for the basic fire protection of residential dwelling structures that is not cost prohibitive. As a result of this consultation, these stakeholders and the Department agreed that 9,250 square feet of aggregate area was a reasonable threshold to provide the minimum level of protection. Having said that, there may be costs associated with the requirement. However, any additional costs may also be minimized through the design process. It is likely that any costs associated with this requirement will ultimately be borne by the homeowner.

Secondly, proposed rule 1309.0310 repeals an amendment to the 2000 IRC, which could result in an increased cost to homeowners in that the installation of an additional egress window may be required in certain circumstances, which has the potential to result in additional costs related to the cost of materials and the installation.

Finally, proposed rule 1309.0311, which in part addresses stairways, could result in an increase in cost to the homeowner.[4] As the Department indicated when the current rule was adopted, this proposed rule will use the 2006 IRC requirements rather than the amendments that were made to the 2000 IRC, which has the potential to result in additional design and construction costs to residential builders and designers, who are likely to pass any costs on to the homeowner. These costs specifically relate to the time/labor necessary for revising existing "model" building plans, additional material costs for meeting the new standards and additional costs relating to the space needed to make residential stair assemblies larger in floor area. Larger stair assembly area(s) also contribute to a loss of useable residential floor area, so dwellings may generally be enlarged to make up for the loss in useable floor space. Depending on the necessary design change parameters, those residential designers and builders that are not currently

4 For additional discussion of proposed rule 1309.0311, see page 14.

designing and building to this standard, the probable cost could be anywhere from several hundred to several thousand dollars per dwelling when there are stair assemblies within a dwelling. For those that are already designing and building to this standard, the probable costs of complying with this rule will be minimal.

(6) the probable costs or consequences of not adopting the proposed rule, including those costs or consequences borne by identifiable categories of affected parties, such as separate classes of government units, businesses, or individuals:

The Department anticipates that the construction costs of not adopting the proposed rule for those persons working within the residential building industry would be indistinguishable from the costs of adopting the proposed rule. The costs of not adopting the less restrictive portions of the proposed rule would be comparable to the cost savings of not adopting the more restrictive portions of the proposed rule.

The Department anticipates that the consequence of not adopting the proposed rules could create confusion to those persons working within the residential building industry because they will be referring to more than one chapter in the family of codes that in turn incorporate versions of the national model codes from varying years. Likewise, the Department and local municipalities may encounter confusion and inconsistency in administering and enforcing the family of codes should each code chapter incorporate the national model code from differing years. Ultimately, to not update the residential code by adopting these proposed rules could result in confusion among those persons working in the residential construction industry, and to municipalities and the Department as they administer and enforce the family of codes.

(7) an assessment of any differences between the proposed rule and existing federal regulations and a specific analysis of the need for and reasonableness of each difference:

There are no applicable federal regulations that address safety in the construction of residential dwellings.

PERFORMANCE-BASED RULES

Minnesota Statutes, section 16B.61, authorizes the Department to establish, by rule, a code of standards for construction. This statute requires the code to "conform insofar as practicable to model building codes generally accepted and in use throughout the United States." At the same time, this statute mandates, that *"to the extent possible,"* the code be adopted in terms of desired results instead of the means of achieving those results, avoiding wherever possible, the incorporation of particular methods or materials.

The 2006 IRC establishes minimum regulations for building systems using prescriptive and performance based provisions with emphasis on performance. The Chapter 1309 amendments to the IRC are intended to incorporate the philosophy required by Minnesota Statutes, section 16B.61.

ADDITIONAL NOTICE

This Additional Notice Plan was reviewed by the Office of Administrative Hearings and approved in a November 22, 2006 letter by Administrative Law Judge Richard C. Luis.

The Department will mail or email the Dual Notice of Intent to Adopt Rules to the following interested parties:

1. All municipal code officials and others involved in code administration. This list includes all municipal building officials responsible for administration of the state building code;
2. The Metropolitan Council;
3. League of Minnesota Cities;
4. Builders' Association of Minnesota;
5. Builders' Association of the Twin Cities;
6. Minnesota Masonry & Plaster Association;
7. American Council of Engineering Companies of Minnesota;
8. Council of American Structural Engineers/Minnesota;
9. American Society of Civil Engineers, Minnesota Section
10. International Masonry Institute;
11. Minnesota Concrete Masonry Association; and the
12. Minnesota Concrete Foundation Association.

We will also publish the proposed rules, Statement of Need and Reasonableness, and Dual Notice on the Department's website.

Our Notice Plan also includes giving notice required by statute. We will mail the Dual Notice to everyone who has registered to be on the Department's residential code rulemaking mailing list under Minnesota Statutes, section 14.14, subdivision 1a. Those persons include:

1. Municipalities;
2. Counties;
3. Architects and architectural firms;
4. Professional engineers and professional engineering firms;
5. Residential Builders;
6. Consultants;
7. Inspection service companies;
8. Certified building officials;
9. St. Paul Building Owners & Managers Association'
10. Elevator Consulting Services;
11. Minnesota Building Trades Council;
12. Minneapolis Building Trades Council;
13. Minnesota Mechanical Contractors Association;
14. National Electrical Contractors Association;
15. Minnesota Building Trades Council;

16. Minnesota Health & Housing Alliance;
17. Minnesota Multi Housing Association;
18. Minnesota Lath & Plaster;
19. Fire Marshal's Association of Minnesota;
20. American Institute of Architects—Minnesota; and
21. Association of Minnesota Building Officials.

We will also give notice to the Legislature per Minnesota Statutes, section 14.116.

CONSULT WITH FINANCE ON LOCAL GOVERNMENT IMPACT

As required by Minnesota Statutes, section 14.131, the Department has consulted with the Commissioner of Finance. We did this by sending Keith Bogut, Executive Budget Officer at the Department of Finance, copies of the documents sent to the Governor's Office for review and approval by the Governor's Office prior to the Department publishing the Notice of Intent to Adopt. We sent the copies on October 26, 2006. The documents included: the Governor's Office Proposed Rule and SONAR Form; almost final draft rules; and almost final SONAR. Mr. Bogut sent a memorandum dated November 13, 2006, which included the following comments:

> "As part of the rulemaking process, DLI has invited comment from representatives of local governments on the proposed changes. In my opinion, the proposed changes will not impose a significant cost on local governments."

COST OF COMPLYING FOR SMALL BUSINESS OR CITY

Agency Determination of Cost

As required by Minnesota Statutes, section 14.127, the Department has considered whether the cost of complying with the proposed rules will exceed $25,000 for any small business with less than 50 full-time employees[5] or any statutory or home rule charter that has less than 10 full-time employees[6] in the first year after the rules take effect. The Department has determined that the cost of complying with the proposed rules in the first year after the rules take effect will not exceed $25,000 for any small business or small city because the proposed rules do not require any modification to existing structures. The proposed rules only affect new construction and remodeling. Any small city or small business contemplating new construction or remodeling will decide whether and when the new construction or remodeling will occur. Because no new construction or remodeling is required by the proposed rules, no new construction or remodeling needs to be undertaken during the first year after the rules take effect.

LIST OF WITNESSES

If these rules go to a public hearing, the Department anticipates having the following witnesses testify in support of the need for and reasonableness of the rules:

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5 Hereinafter referred to as a "small business."
6 Hereinafter referred to as a "small city."

1. Department of Labor and Industry, Construction Codes and Licensing Division staff as to the reasonableness of the rules.
2. Advisory Committee members representing public interests, builders' associations, a code official association, associations related to masonry, concrete, lath and plaster, and a representative of the League of Minnesota Cities.[7]

RULE-BY-RULE ANALYSIS

1309.0010 ADOPTION OF INTERNATIONAL RESIDENTIAL CODE (IRC) BY REFERENCE.

This entire rule part is revised to reflect the 2006 version of the IRC, which is proposed for adoption.

Subpart 1. Generally. This subpart has been modified to correctly call out the 2006 IRC, and to change a reference to the commissioner of administration to the commissioner of labor and industry in accordance with Reorganization Order No. 193.[8]

Subp. 2. Mandatory chapters. This revision deletes a reference to Appendix Chapter K, which has been added into chapter 3 of the IRC. Because Appendix K is now a part of 2006 IRC, Chapter 3, the reference is no longer needed.

Subp. 3. Replacement chapters. Item E has been modified to reflect the ICC's renumbering of the IRC, which changes a reference from Section R317 to Section R313.

Subp. 5. Flood hazard or floodproofing provisions. This is a new subpart. The current residential code does not include language regarding flood-resistant construction. However, flood-resistant construction requirements have been introduced into the 2006 IRC. This subpart is necessary to delete the floodproofing provisions in the IRC and replace them with Minnesota Rules, chapter 1335, which incorporates regulations promulgated by the Office of the Chief Engineers, U.S. Army. The purpose of this proposal is to globally replace the provisions rather than amend every IRC section that references flood hazards or flood-proofing conditions.

Subp. 6. Elevators and platform lift provisions. This is a new subpart. Currently, the residential code does not include language regarding elevators and platform lifts; however, elevator and platform lift requirements have been introduced into the 2006 IRC. Any requirement for these conditions in the 2006 IRC should be replaced with Minnesota Rules, Chapter 1307, Elevators and Related Devices. The purpose of this proposal is to globally replace the 2006 IRC provisions rather than amend every IRC section that references elevators and related devices.

1309.0020 REFERENCES TO OTHER ICC CODES

Subpart 1. Generally. This subpart is revised to reflect the 2006 updated version of the IRC that

7 A list of the committee membership is attached as Exhibit A.
8 For a discussion of Reorganization Order No. 193, see page 2.

is proposed for adoption and adds a reference to "subparts 2 to 11" for clarity.

Subp. 5. Fuel gas code. This subpart corrects a typographical error by properly reflecting the Mechanical Code, Minnesota Rules, chapter 1346.

1309.0100 CHAPTER 1, ADMINISTRATION.

Subpart 1. IRC chapter 1. The revision made corrects a typographical error by properly identifying the IRC rather than the International Building Code (IBC).

Subp. 2. Existing buildings and structures. This new subpart exempts additions, alterations, or repairs to existing buildings or structures meeting the scope of the IRC from chapter 1311, Minnesota Conservation Code for Existing Buildings. The proposed subpart also clarifies that only the actual addition, alteration, or repair need comply with chapter 1309 requirements. The proposal also specifies that the existing elements of the structure that are unrelated to the actual addition, alteration, or repair are not retroactively required to comply with the current Residential Code since those buildings or structures are assumed to have been installed and maintained to the code that was in effect at the time of the installation.

1309.0202 SECTION R202, DEFINITIONS.

This rule part does not currently contain subparts. The existing language has been organized into subparts that amend Section R202 by modifying definitions and adding definitions that are not currently included in that Section of the IRC.

Subpart 1. Modifications. This new subpart specifies that IRC Section R202 be amended by modifying certain definitions so that the terms, as used in the residential code, are clearly understood.

DWELLING.

Single-family. This definition is needed to eliminate confusion regarding what structure can be classified as an IRC-1 single-family dwelling, and to differentiate between a two-family dwelling and a townhouse.

Two-family. This definition is needed to eliminate confusion regarding what structure can be classified as an IRC-2 two-family dwelling and to differentiate between a single-family dwelling and a townhouse.

Townhouse. This definition is needed to eliminate confusion regarding what structure can be classified as an IRC-3 Townhouse and to differentiate between a single-family dwelling and a two-family dwelling. This definition is needed because, traditionally, property lines have been used to determine when buildings are considered to be separate. The IRC does not require property lines between single-family dwellings in a townhouse group; however, the IRC intends that each be treated as a separate building. This amendment clarifies that dwellings in a townhouse group are separate buildings regardless of property lines. This amendment also clarifies that separate utilities are governed by the code chapters regulating those utilities.

Subp. 2. Additional definitions. This new subpart retains the definition of "crawl space," and adds definitions to IRC Section R202.

CONNECTOR. This definition is needed to clearly define what devices are "connectors."

CRAWL SPACE. This definition has not been modified in these proposed rules.

DAMPPROOFING. This definition is needed to eliminate confusion regarding the terms dampproofing and waterproofing. The proposed language comes from ICC-ES AC29[9] section 1.4.1.

FASTENER. This definition is needed to clearly define what devices are "fasteners."

FLASHING. Although "flashing" is a term that is used extensively in various code sections it's meaning has not been clearly defined. The Merriam-Webster definition is "sheet metal used in waterproofing (as the angle between a chimney and a roof)."[10] This definition focuses on the use of flashing in a roof-wall intersection, however flashings are not only used in roofing but are also widely used in a variety of other construction applications including but not limited to: exterior wall covering materials, windows, decks, stairs, trim, plumbing, chimney crickets, roof vents, and intersections of dissimilar materials etc. The proposed definition is needed because the term, as used within the context of the residential code, is more broadly based than the Merriam-Webster definition provides.

The word "approved" was included in the definition to delineate the role of the code in the selection of flashing materials and to provide an opportunity for input from manufacturers or industry representatives on the appropriateness of a particular material for its intended use. "Corrosion-resistive" is a phrase that was added from the model code that encompasses a wide range of materials. As to the purpose of "flashing," it is common knowledge that its use is to "resist" the exposure of the assembly to the effects of water by "deflecting" it away from its point of likely entry. For example, flashing would include the flange of the protective boot used around a plumbing soil stack that penetrates through roof shingles. In this case, the upper half of the flange would be concealed under the shingles and the lower half exposed to allow incidental moisture to "deflect" from the protrusion of the soil stack.

KICK-OUT FLASHING. This definitition is needed to clarify the distinction between "flashing" and "kick-out flashing" as used within the residential code. The kick-out or diverter flashing is used at the intersection of roof eaves and exterior walls. The kick-out flashing "deflects" water that runs down the inclined surface of the roof rake and "prevents" it from funneling into the wall assembly at this vulnerable location. Finally, "construction assembly" is used to broaden the scope of the use of flashing to all construction applications.

OCCUPANCY CLASSIFICATIONS. This definition is needed to clearly define the occupancy

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9 International Code Council Evaluation Service Acceptance Criteria Number 29.
10 www.m-w.com

classifications that are used to identify particular types of residential dwellings. Like the definitions for single-family dwelling, two-family dwelling, and townhouse (see above) the occupancy classifications provided clarity to the code official, who has to classify the structure, as well as the residential designers and builders that must design and build structures that comply with the residential code.

STAIR. The residential code does not currently include a definition of "stair." The proposed language mirrors the definition appearing in the 2006 IBC section 1002[11].

STORY ABOVE GRADE PLANE. This definition is needed to clearly define what constitutes a story. Currently, confusion regarding the definition of a story makes it difficult to determine whether a structure complies with the story limitations of the residential code. For example: When is a walkout basement, lookout basement or split-level floor considered a story? The proposed definition is needed to provide a clear answer for the residential designer, builder, and code official.

WATERPROOFING. This definition is needed to eliminate confusion regarding the terms waterproofing and dampproofing. The proposed language comes from ICC-ES AC29[12] section 1.4.2. The phrase "and bridges non-structural cracks" was included to bring clarity to the difference between waterproofing and dampproofing by stating clear, key performance expectations that complies with the intent of the provisions of the code.

1309.0300 SECTION R300, CLASSIFICATION.

This rule part is new language, which is intended to amend chapter 3 of the IRC by adding a new section. The proposed language is intended to provide an easy to use chart that specifies which occupancy classification refers to what type of dwelling.

1309.0301 SECTION R301, DESIGN CRITERIA.

Subpart 1. IRC Section R301.1.4. This new subpart amends section R301 by adding a section requiring all IRC-2 and IRC-3 buildings to have an automatic sprinkler system unless the building has 9,250 or less square feet of floor area. The proposal requires all IRC-1, IRC-2, and IRC-3 buildings containing state licensed facilities to have a fire suppression system when section R301.4.1.1 is more restrictive than applicable facility licensing provisions. The proposal also addresses installation requirements for attached garages, and particular attached covered patios/decks/porches and similar structures, and exceptions for the attached roofs or covered patios/decks/porches and similar structures that do not exceed 40 square feet of floor area. Finally, language was added to clarify that a fire-resistance-rated floor, wall, or ceiling assembly that separates dwelling units of IRC-2 and IRC-3 buildings are not separate buildings in and of themselves.

The proposed language provides clarity as to when an automatic sprinkler system or fire

11 Although the 2006 IBC Section 1002 defines stair, this rule part amends 2006 IRC Section 202.
12 International Code Council Evaluation Service Acceptance Criteria Number 29.

suppression system shall be installed. The 2006 International Building Code (IBC) and the 2006 International Fire Code (IFC) are currently in the process of being incorporated by reference, with amendments, as the Minnesota Rules, chapters 1305 and 7511 respectively. These two codes, as written by the ICC, require the installation of a fire suppression system in any size and type of residential dwelling/occupancy classification. The Department recognizes that this may be a concern for those municipalities in greater Minnesota that have limited access to a water supply. The Department's Construction Codes and Licensing Division consulted with a Minnesota builders association and fire service personnel in an effort to determine a minimum threshold that is beneficial and acceptable for the basic fire protection of residential dwelling structures that is not cost prohibitive. As a result of this consultation, these stakeholders and the Department agreed that 9,250 square feet of aggregate area was a reasonable threshold to provide the minimum level of protection.

Subp. 2. Table R301.2(1). The proposed language is limited to changing the subpart reference from subpart 1 to subpart 2.

Subp. 3. Figure R301.2(5). The proposed language is limited to changing the subpart reference from subpart 2 to subpart 3.

1309.0302 EXTERIOR WALL LOCATION.

This new rule part amends IRC Section R302.1.

R302.1 Exterior walls. The 2006 IRC Table 302.1 includes a potentially confusing phrase: "one-hour fire-resistive construction on the underside." This phrase is not consistent with any listed or labeled design that is specifically for fire resistive on the "underside." In order to provide clarity to this phrase, a footnote (footnote "a") was added to the "one hour on the underside" requirement. Additionally, the table includes an exception for "...playhouses, and similar structures exempted from permits." The exception has been deleted because these types of structures do not require a permit in Minnesota.

1309.0309 SECTION R309, GARAGES AND CARPORTS.

This new rule part addresses floor surface materials in garages and carports, and automatic garage door opening systems.

Subpart 1. IRC Section R309.3, and Subp. 2. IRC Section R309.4. These amendments to the IRC clarify the types of permitted floor surface materials that may be used in garages and carports, which the 2006 IRC limits to non-combustibles, which have been interpreted to mean concrete. Currently, the residential code permits the use of sand, gravel, asphalt, and concrete as floor surface materials. The proposed language continues this tradition by including all currently permitted floor surface materials.

Subp. 3. IRC Section R309.6. This subpart addresses automatic garage door opening systems. The Legislature has regulated such systems in Minn. Stat. §§ 325F.82 to 325F.83 (2004) and

Minnesota Rules, part 1303.1400. The proposed amendment to Section R309.6 replaces the IRC language with language that mirrors Minnesota Rules, part 1303.1400 so that the residential code is consistent with Minnesota requirements that exist outside of this chapter. The modification is intended to eliminate confusion regarding interpretation and enforcement as it relates to automatic garage door opening systems.

1309.0310 SECTION R310, EMERGENCY ESCAPE AND RESCUE OPENINGS.

R310.1 through R310.1.4. These portions of the rule are being deleted because the ICC has included similar language in the 2006 IRC. The language of the 2006 IRC identifies that a window or door may be used for the purpose of emergency escape and rescue, and additional emergency escape and rescue openings are not required for areas adjacent to sleeping rooms with the required egress openings, which is consistent with the intent and purpose of the existing rule. Since this is now addressed by the 2006 IRC, it is no longer necessary to retain this language.

The 2006 IRC also modified the uniform ceiling height of 48 inches above the exterior grade from the exterior wall to a public way to 36 inches. Typically this means 36 inch ceiling from the grade to the underside of deck constructed above the emergency escape and rescue opening. The 2006 IRC has also modified the language to require emergency escape and rescue openings in "basements and every sleeping room." This is a major change from "basements with habitable space" as written in the 2000 IRC. Other language added to the 2006 IRC identifies that these openings must also open directly into a public street, public alley, yard, or court.

R310.5 Replacement Windows. This portion of the rule has been modified to clarify requirements for replacement windows. The proposed rule exempts replacement windows that are installed in buildings meeting the scope of the IRC from the requirements of Section R310.1, when the replacement window meets certain exceptions. Section R310.1 was added to the exempt references regarding opening area, opening height and opening width to allow modification to the sill height requirements for new window installations.

The proposed rule deletes item 3 because it pertains to Fire Code requirements that are not enforced by the building official.

The proposed rule deletes item 4 because a sleeping room receiving an addition or extensive remodel involving window replacement provides the opportunity to install a compliant emergency escape and rescue opening. In most cases an extensive remodel project will expose the framing system allowing the installation of an opening having proper area, height and height above the floor. An addition by its own nature will provide new wall framing also allowing a proper emergency escape and rescue opening.

The Division believes that homeowners are likely to experience a reduction in the overall costs of replacement windows since their installation is likely to require less modification to the existing window opening, fewer siding alterations, and reduction in interior finish repairs.

1309.0311 SECTION R311, MEANS OF EGRESS.

Landings

This new rule part reflects the renumbering of the IRC. The proposed rule includes language to clarify when a landing is required for a non-exit exterior door and the threshold requirements for exterior doors because this portion of the 2000 IRC[13] is frequently misinterpreted. The ICC attempted to clarify these requirements in the 2006 IRC Section R311.4.3. However, the language is difficult to understand. The proposed rule reorganizes the IRC text so that the requirements for non-exit exterior door landings and the threshold for exterior doors are easier for the reader to understand and apply. To achieve the clarity desired, the proposed rule adds two parts[14] to R311.4.3 to address these requirements individually. In this way, the user will be able to clearly identify and apply the correct requirements to the non-exit exterior door and the exterior door. The Department believes that this will result in more consistent compliance with these requirements.

The language of 2006 IRC Section R311.4.3 is the same as the proposed rule in many respects. However, some sentences appear in a different order or are repeated to accommodate the two parts that appear in the proposed language. Modifications were also made to clarify that, in some cases, landings are not required, and to replace a few words and phrases that could be ambiguous.

Additionally, the proposed language for R311.4.3.1, item 2, includes exit doors to more effectively prevent moisture problems due to rainwater splash back and snow build up in this area; R311.4.3.2 differentiates the provisions for an exit door from those of a non-exit exterior door; and R311.4.3.2, item 1, replaces the phrase "the landing at an exterior doorway" with "the exterior landing" to simplify the language.

Finally, the proposed language for R311.4.3.2, item 2, addresses the difficulties encountered in meeting the two-riser condition imposed by the 2006 IRC. Local builders need approximately 20 inches for many exterior stairs or temporary stairs placed on new dwellings. These initial stairs are typically built without frost footings and are normally replaced later by decks. If footings and a landing are required it unreasonably increases present and future costs for homeowners. The proposed 30-inch dimension will allow a reasonable tolerance and equals the maximum requirement for a floor or deck surface without requiring a guardrail in section R312.1. This modification is also consistent with the Minnesota Rule, part 1309.0315[15], which is not being modified in this rulemaking. The Division believes that the proposed rule will decrease construction costs as it relates to non-exit exterior doors, and thresholds for exterior doors because the number of landings constructed, where they are not required, would decrease.

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13 Landings at doors was Section R312.1.2 in the 2000 IRC.

14 The proposed rule creates two parts to 2006 IRC Section 311.4.3. They are R311.4.3.1 Landings at the exterior exit door required by Section R311.4.1, and R311.4.3.2 Landings at exterior doors other than those required by Section R311.4.1.

15 Minn. R. part 1309.0315 addresses handrails on stairs with four or more risers to address common garage stairs.

Stairways

The requirement for stairways are currently located in Minnesota Rules, part 1309.0314. To remain consistent with the numbering scheme of the 2006 IRC, Stairways are now located in Section R311.

The ICC's renumbering of IRC Section 314 to Section 311 impacts language that is proposed for deletion in Minn. R. ch. 1309.0314, which currently pertains to stairways, but with the ICC renumbering, now pertains to foam plastic.[16] The language currently in Minn. R. 1309.0314 is not proposed to be adopted as part of another rule, but rather would be incorporated by reference without the amendments that were adopted during the 2000 code cycle into this rule part. For those reasons, the changes pertaining to stairways are discussed in this part of the SONAR and the requirements of proposed rule 1309.0314 are discussed on page xx.

In some cases, the proposed rule deletes the amendments that were made to the 2000 IRC because the text of those amendments are in the 2006 IRC. Those sections are:

- R314.1 Width: This language has been renumbered as R311.5.1.
- R314.3 Headroom: This language has been renumbered as R311.5.2.
- R314.5 Spiral stairs: This language has been renumbered as R311.5.8.1.
- R314.6 Circular stairways: This language has been renumbered as R311.5.8.1.
- R314.7 Illumination: This language has been renumbered as R311.5.7.
- R314.8 Under stair protection: This language has been renumbered as R311.2.2.
- R314.9 Bulkhead enclosure stairways: This language has been renumbered as R311.5.8.2.

The proposed rule also deletes amendments that were made to the 2000 IRC as it relates to treads and risers, profile, and winders. The 2006 IRC does not include the text of these amendments, and the Department proposes to adopt these IRC Sections as written by the ICC. A summary of the current requirements and the requirements that would apply under the 2006 IRC if the proposed rule is adopted are:

- R314.2 Treads and risers: Currently, treads are required to be 9" and risers are 8". The proposed rule, by incorporating IRC Section R311.5.3, requires a 10" tread and a 7 ¾" rise.
- R314.2.1 Profile: Currently, open risers are permitted, provided that the opening between treads does not permit the passage of a 4" diameter sphere. The proposed rule, by incorporating IRC Section R311.5.3.3, retains that standard with the inclusion of nosing requirements that regulate the radius of the curvature and beveling of stair tread nosing.
- R314.4 Winders: Currently, the requirement is a minimum tread depth of 9" measured 12" from the narrower side of the stair. The proposed rule, by incorporating IRC Sections R311.5.3.2, R311.5, R311.5.6, and R311.5.8, requires a 10" minimum tread

16 For a discussion of foam plastic, see proposed rule 1309.0314, page 17.

depth measured at 12" from the narrower side of the stair.

These modifications were initiated by and supported through an informal agreement between the Minnesota Building Codes and Standards Division (BCSD) of the Minnesota Department of Administration, and the Builders Association of Minnesota (BAM). The history of the agreement stems from longstanding code provisions found in the State's previous building code (the UBC), which contained provisions comparable to the amendments that are proposed for deletion. The State of Minnesota had adopted and used the UBC during the 30-years before the adoption of the 2000 IRC. During that time, the standards described in the amendments proposed for deletion became accepted by residential designers and builders as the "norm."

Issues regarding these requirements surfaced with the adoption of the 2000 IRC. Without amendment, the 2000 IRC would have imposed requirements comparable to the requirements in the 2006 IRC. During the rulemaking process for the adoption of the 2000 IRC, BAM argued that these changes would be too significant and too costly, and that they were not adequately prepared for these changes. BAM made it clear that they were in favor of adopting the 2000 IRC, but that they did not support the IRC provisions regarding the amendments that are proposed for deletion. Again, during the rulemaking process, agency staff received requests and recommendations for changes to these requirements.

Because the IRC is a national model code and because it was the intent of surrounding states to adopt the same code, the agency determined that, for the sake of consistency and uniformity, it would work with surrounding states to adopt similar standards. After discussing the issues with surrounding states (Wisconsin, Iowa, North Dakota and South Dakota), it was apparent that the same design concerns raised by BAM in Minnesota were being discussed in those states. The surrounding states and Minnesota determined it would be best for each state to have the same provisions with respect to these issues. BAM agreed with this concept. The adoption of the IRC was critical to each state though, so the primary concern tended to be garnering support for the adoption of the 2000 IRC. To that end, and in an effort to provide consistency, each state's code agency formulated an informal agreement with the residential builders association in their state. The agreement in each state essentially amended the IRC to conform to the provisions previously found in the UBC with the understanding that each amendment would be repealed or deleted within one code cycle – to revert to the language of the IRC without further amendment. All parties agreed in principal, which is where we are today.

The one code cycle agreement terminates with the proposed adoption of the 2006 IRC. As a result, the Department proposes to delete these amendments and enforce the 2006 IRC parameters. In preparation for these changes, Department staff have promoted these changes at most - if not all - of its contractor training seminars, annual schools, conferences, etc., throughout the state while receiving little objection to the proposed change. Residential builders, presumably, have had over two years to revise building plans and prepare for the implementation of the IRC requirements.

By deleting the amendments that were made to the 2000 IRC, the State of Minnesota will be adopting the original language of the 2006 IRC. This brings the building code closer to: (1)

the requirement in Minnesota Statutes § 16B.59 that the state building code provide for uniform performance standards; and (2) the requirement in Minnesota Statutes § 16B.61, subdivision 1, that the state building code "conform insofar as practicable to model building codes generally accepted and in use throughout the United States."

1309.0312 SECTION R312, LANDINGS.

The rule part is proposed rule repeal because the ICC renumbered this section in the 2006 IRC Section R311.4.3. Please see proposed rule part 1309.0311 for an explanation of the proposed modifications[17].

1309.0313 SMOKE ALARMS.

This new rule part is the result of the ICC's renumbering of Section R317.1 to Section R313.2.1. The Department proposes to follow suit and renumber Minnesota Rules, part 1309.0317 to Minnesota Rules, part 1309.0313 so that it is easier for the user to find the code requirement.

In addition to relocating the requirements of Minn. R. 1309.0317 to proposed rule 1309.0313, the second exception was rewritten to remove language that is causing confusion and inconsistent enforcement due to the vast range of subjective interpretations that are possible in the rule as currently written. The proposed language is intended to clarify the exception.

Finally, the proposed rule adds a third exception. This exception is intended to clarify that plumbing work, electrical work, or mechanical work, do not require the installation of smoke alarms in existing dwellings. The Department believes will result in more uniform code enforcement and eliminate the possibility of an unnecessary smoke alarm installation where the installation is not required and the homeowner has not chosen to install a smoke alarm as a result of that work.

1309.0314 SECTION R314, FOAM PLASTIC.

This rule part has been modified to reflect the ICC's renumbering of the 2006 IRC. The current rule pertains to stairways, which is now located in proposed rule 1309.0311. For a discussion of the modifications to the current rule pertaining to stairways, please see proposed rule 1309.0311 above.

The ICC renumbering has re-used Section R314, which now applies foam plastic. As a result, the proposed rule shows stricken language pertaining to stairways and new language pertaining to foam plastic.

The proposed rule adds language to clarify the 2006 IRC Section R 314.5.11 reference to "sill plate and header" by including the phrase "rim joist" as a parenthetical because "rim joist" is the terminology used by Minnesota contractors. The Department believes that this change will

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17 See page 14.

eliminate any potential confusion of interpretation and enforcement.

1309.0315 SECTION R315, HANDRAILS.

This rule part is proposed for repeal because the ICC has renumbered that section as 2006 IRC Section R311.5.6, and the requirements are now located in that section and sections R311.5.6.1 and R311.5.6.2.[18]

1309.0316 SECTION R316, GUARDS.

This rule part is proposed for repeal because the ICC has renumbered that section as 2006 IRC Section R312.2, and the requirements are now located in that section.[19]

1309.0317 SECTION R317, DWELLING UNIT SEPARATION.

The proposed rule deletes the text related to smoke alarms because the ICC renumbered this language as 2006 IRC R313.1.1. This rule part also contains new language that is intended to clarify the requirements for dwelling unit separation. The proposed rule part includes subparts to address the particular needs of various types of dwellings.

Subpart 1. IRC Section R317.1. This new subpart clarifies how far separation needs to occur when the separation terminates at the roof eave in two-family dwellings. The proposed subpart is needed because the separation requirements for two-family swellings are routinely enforced differently throughout the state. The intent of the proposed rule is to bring clarity and uniform enforcement for these types of building elements.

This subpart also includes four exceptions: The first exception reduces the fire resistance rating to ½ hour when the building is equipped throughout with an automatic sprinkler system that is installed in accordance with Section R301.4. The second exception limits wall extensions into the attic area with permitted draftstops. The third exception addresses decks, balconies, patios, entries, and similar structures that are routinely attached to two-family dwellings. This new language is proposed because these types of structures are not addressed in the 2006 IRC. The intent of the language is to except the separation requirement for these types of structures because there is minimal hazard presented since these types of structures are exposed and they contain no concealed or habitable spaces. Finally, the fourth exception addresses decks, patios, entries and similar structures when a roof is covering the structure. The proposed language specifies a threshold based upon a reasonable square footage where there is minimal hazard, and the specific installation requirements of roofs over these structures and when separation is required.

This subpart also includes language specifying that when floor assemblies are required to be fire-resistance-rated, the supporting construction of those assemblies must have an equal or greater fire-resistive rating. This language is needed for uniform application of fire separation

18 This rulemaking does not propose any modification to these sections.
19 This rulemaking does not propose any modification to 2006 IRC Section R312.2.

requirements.

Subp. 2. IRC Section 317.2. This new subpart clarifies that each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies that meet the requirements of Section R302 for exterior walls.[20]

The proposed language includes three exceptions: The first exception specifies that a common two-hour fire-resistance-rated wall is permitted if those walls do not contain plumbing or mechanical equipment, ducts, or vents is the wall cavity. This exception also specifies that electrical installations must be installed in accordance with the Electrical Code,[21] and that the penetration of electrical outlet boxes must be in accordance with Section R317.3. The second exception addresses decks, balconies, patios, stoops, entries, and similar structures that are not covered by a roof because the 2006 IRC does not specifically address these situations as it relates to townhouses. However, these types of structures are routinely attached to townhouses and may cross over property lines both real and assumed. The intent of the language is to except the separation requirement for these types of structures because there is minimal hazard presented since these types of structures are exposed and they contain no concealed or habitable spaces. Finally, the third exception addresses decks, patios, stoops, entries, and similar structures when a roof is covering the structure. The proposed language specifies a threshold based upon a reasonable square footage where there is minimal hazard, and the specific installation requirements of roofs over these structures and when separation is required.

This subpart also specifies that the fire-resistance-rated wall or assembly separating townhouses must be continuous from the foundation to the underside of the roof sheathing, roof deck, or roof slab, and the required extension. This language is needed for uniform application of fire separation requirements.

Subp. 3. IRC Section R317.4. This subpart adds a new section to the 2006 IRC Section R317 in order to make the requirements of the 2006 IRC, Appendix K, which addresses sound, more easily accessible to users. The proposed language repeats the content of Appendix K, without modification, and brings it into the section of the Code to which it applies.

1309.0318 SECTION R318, MOISTURE VAPOR RETARDERS.

The modifications to this rule part include deleting the text related to Section R318.2.7 because the ICC renumbered this section as 2006 IRC Section R314.5.11.[22] The proposed rule also includes an amendment to 2006 IRC Section R318.1, which pertains to moisture control. The proposed language has been renumbered from Section R322.1, and is consistent with current code requirements and the Energy Code.[23] The proposal intends to prevent possible conflicts within the provisions of the residential code and the energy code.

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20 To review Section R302, see page 12.
21 The Electrical Code is found in Minn. R. ch. 1315.
22 To review section R314.5.11, see page 17.
23 The relevant Energy Codes are found in Minn. R. ch. 7670 and 7672.

1309.0322 SECTION R322, MOISTURE VAPOR RETARDERS.

This rule part is proposed for repeal because the ICC has renumbered that section as 2006 IRC Section R318.1, and the requirements are now located in that section.[24]

1309.0403 SECTION R403, FOOTINGS.

This language was proposed as an amendment to the national model code by the National Association of Home Builders and was accepted for the 2006 IRC at the national model code hearings in Nashville in 2003. This amendment to the model code was not challenged by anyone at the 2006 IRC national code hearings in Overland Park Kansas in May 2004.

For instances where the wood sill plate is 24 inches in length or less, such as short walls that provide offsets to long braced wall panels, the requirement for a minimum of two anchor bolts is excessive. This proposed change will allow the short walls, which do not provide any significant strength in the main force resisting direction, to be attached with fewer bolts, while still maintaining uplift protection. The uplift protection will be provided through the proper attachment of the short offset walls to the main braced wall line per the attachment requirements listed in the code. In addition, walls shorter than 12" in total length provide virtually no additional strength to braced wall lines and therefore need only to be protected from uplift forces, which can be accomplished by proper connections, such as those specified by the code and referenced in the proposed change.

1309.0404 SECTION R404, FOUNDATION AND RETAINING WALLS.

This rule part has been modified by renumbering two subparts, deleting the remaining subparts, and adding subparts that reflect the renumbering of the IRC by the ICC in 2006. As a result, some subparts have been renumbered to accommodate the organizational structure of the model code.[25] The Department recognizes that this may create confusion for the reader of this SONAR. However, we believe that using the numbering conventions of the 2006 IRC in this proposed rule will create a rule where the user can easily find the information needed because the references to the various IRC sections and tables will appear in numerical order.

Subpart 1. Section R404.1. This proposed rule amends items 4 and 5 of this section of the model code. Item 4 specifies that floors shall be blocked perpendicular to the floor joist, and that blocking shall be full depth within three joist spaces. This modification is necessary because, as written, the model code significantly increases the bracing requirements for floors supporting basement walls. The Department anticipates that this modification will also be reflected in the 2009 IRC since it was proposed and approved for inclusion in the 2009 IRC at the Orlando ICC Code Development Hearing, which took place in September 2006.

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24 For a discussion of moisture vapor retarders, see proposed rule 1309.0318 on page 19.

25 Currently this rule part has six subparts. Subparts 1-2 have been renumbered in the proposed rule, and subparts 3-6 appear as stricken language in the proposed rule. The language currently in subparts 1 and 2 have been renumbered as proposed subparts 4 and 5 respectively. Proposed subparts 1-3 and 6-9 are new amendments to the 2006 IRC.

Item 5 is amended by deleting the language corresponding to Table R404.1(3) because that table has been deleted from the residential code since it is restrictive when compared to current requirements.

Subp. 2. Table R404.1(2). This is new subpart adds a 2006 IRC table that specifies the maximum anchor bolt spacing for supported foundation walls. The proposed table amends the requirements by meeting the intent of the table in the 2006 IRC in a less restrictive and more economical way.

Subp. 3. Table R404.1(3). The modifications to this subpart delete the current rule, which deletes IRC Table R404.1.1(1) in its entirety.[26] The proposed subpart deleted Table R404.1(3) because the table is much more restrictive than current practice.

Subp. 4. Section R404.1.1. The current language of this subpart is proposed for deletion and has been replaced with the content of the text currently located in Minn. R. ch. 1309.0404, subp. 1. The proposed subpart includes grammatical modifications and adds a cross reference to Table R404.1.1(1) because the table is no longer deleted. Language has been added to maintain consistency with the 2006 IRC. Clarity has also been added by more clearly specifying when Tables R404.1.1(6), R404.1.1(7), or R404.1.1(8) should be applied.

Subp. 5. Section R404.1.2. The current language of this subpart is proposed for deletion and has been replaced with the content of the text currently located in Minn. R. ch. 1309.0404, subp. 2. The proposed subpart correctly identifies applicable tables and sections, and specifies the construction requirements for cantilevered concrete foundation walls. These changes provide clarity to the user without changing current requirements.

Subp. 6. Table R404.1.1(6). The current language of this subpart is proposed for deletion to reduce the number of amendments to the IRC and increase consistency with the IRC. The proposed language amends 2006 IRC Section R404 by adding a new table that specifies construction requirements for cantilevered concrete and masonry foundation walls with an 8" nominal thickness.

Subp. 7. Table R404.1.1(7). This new subpart amends 2006 IRC Section R404 by adding a new table that specifies construction requirements for cantilevered concrete and masonry foundation walls with a 10" nominal thickness.

Subp. 8. Table R404.1.1(8). This new subpart amends 2006 IRC Section 404 by adding a new table that specifies construction requirements for cantilevered concrete and masonry foundation walls with a 12" nominal thickness.

Subp. 9. IRC Section R404.1.3. The proposed language adds an exception to condition two of Section R404.1.3, which specifies that cantilevered concrete and masonry foundation walls that

26 Currently, subpart three deletes IRC Table R404.1.1(1) because the requirements of reinforcements in these low unbalanced backfill heights would add considerable and unnecessary cost to the construction of the wall.

are constructed in accordance with Tables R404.1.1(6), R404.1.1(7), or R404.1.1(8) are excepted from the requirements of this section.

1309.0406 SECTION R406, FOUNDATION WATERPROOFING AND DAMPPROOFING.

This new rule part specifies the Minnesota amendments to the 2006 IRC Section R406 in order to create compatibility with the Energy Code and other statutory requirements. Damp and wet foundations, while not unique to Minnesota, need to be addressed in the Code for building durability.

This rule part, in specifying requirements related to the waterproofing and dampproofing of foundations, uses two subparts to distinguish between the requirements for foundation waterproofing and foundation dampproofing so that the user can easily locate, understand, apply, and comply with the requirements.

Subpart 1. IRC Section R406.1. This subpart specifies requirements related to dampproofing concrete and masonry foundations. The proposed language adds "at a minimum" to encourage contractors to apply dampproofing products beyond the grade height adjacent to the foundation. This requirement is necessary because many dampproofing products require the product to be applied to the entire height of the foundation. Numerous dampproofing product manufactures required their product to be applied the entire height of the foundation. This additional language is intended to result in a more uniform application of dampproofing products.

Subp. 2. Section R406.2. This subpart specifies the requirements related to waterproofing concrete and masonry foundations. The proposed language encourages contractors to apply the waterproofing products beyond the grade height adjacent to the foundation. This requirement is necessary because numerous waterproofing product manufactures required their product to be applied the entire height of the foundation. Text was also added to eliminate the requirement for waterproofing in Group I soils due to their well draining soil characteristics. This additional language is also intended to result in a more uniform application of waterproofing products.

1309.0506 SECTION R506, CONCRETE FLOORS (ON GROUND).

This rule part is proposed for repeal because the 2006 IRC has amended the language that prompted the Minnesota amendment that was written for the adoption of the 2000 IRC. The 2006 IRC also includes text identifying the required vapor retarder mil thickness that was omitted in the 2000 IRC.

1309.0602 SECTION R602, WOOD WALL FRAMING.

Subpart 1. IRC Table R602.3.1. This new rule part amends the model code by providing a convenient way for builders to construct walls over 10' 0" under certain parameters without having to hire a structural engineer to approve individual house plans. As written in the model code, Minnesota contractors cannot use Table R602.3.1 because snow loads in Minnesota exceed

the table's maximum of 25 psf in footnote b. Several local code officials asked the Builders Association of Minnesota (BAM) to have this table modified to reflect conditions found in Minnesota.

BAM hired Don Stehler, a structural engineer with Stehler Structural Engineering, Inc. to update the table so Minnesota contractors and code officials could easily use Table R602.3.1 to build and approve taller walls that would be structurally sound in our climate. The following assumptions were used to produce the values in the proposed table:

1. The wind exposure was changed from 100 to 90 mph to match the climatic and geographic design criteria for Minnesota.
2. A ground snow load of 60 psf and a roof snow load of 42 psf were used, so that the table can be applied anywhere in the state.
3. Dimensional lumber of SPF#2 or better is required.
4. Only walls supporting a roof only were considered. Walls supporting either "one floor and a roof" or "two floors and a roof" were dropped from the table.
5. The table was analyzed using either Exposure categories B or C. The original IRC table did not specify an exposure category.
6. A deflection rate of L/120 was used.
7. A new warning was added to the top of table heading that warns the user that design is required if all assumptions in the footnotes are not met.
8. The columns previously titled "Height (feet)" was changed to "Maximum wall height (feet)" to clarify the provisions of this code section.

Given the extensive and thorough analysis of this issue the proposed rule is reasonable and will allow code officials the ability to approve walls taller than 10' 0" for spans up to 34' without compromising safety goals.

The Department believes that the proposed rule will reduce the cost of construction by allowing contractors to build tall walls that comply with the building code without having to hire a structural engineer solely to confirm that wall designs that have been used extensively in the past, without failures, are indeed safe.

1309.0703 SECTION R703, EXTERIOR COVERING.

Subpart 1. Weather resistive sheathing paper; and Subp. 2. Table R703.4. These two subparts are proposed for repeal because these amendments were intended to amend the 2000 IRC. The amendment required a weather-resistive sheathing paper over sheathing of all exterior walls. The 2006 IRC Section R703.2 and IRC Table R 703.4, as written, address the concerns that prompted the amendments that were made to the model code in 2000. As a result the amendments are no longer necessary.

Subp. 3. Section R703.6. The proposed rule includes the following modifications:

R703.6 Exterior plaster. The proposed modifications are intended to provide uniformity and

clarity for users. Currently, Minn. R. ch. 1309.0703 subp. 3, references ASTM C 926 and ASTM C 1063. Reference to ASTM C 926 did not exist within the Reference Standards chapter of the 2000 IRC so the reference was added by amendment in the 2000 code cycle. The 2006 IRC references ASTM C 926-98a and ASTM C 1063-03 within the text of Section R703.6. This amendment is proposed in order to remain consistent with the 2006 IRC. The words "and provisions of this code" were added for consistency with the 2006 IRC.

When utilizing the Reference Standards chapter of the 2006 IRC each of the reference standards noted above include the year of the reference standard, which is shown as ASTM C 926-98a and ASTM C 1063-03. The proposed rule includes the year the reference standard to provide a method to track the standard that was in effect at a given point in time, which, since the standards can change over time, will be extremely helpful when researching product or installation failures.

R703.6.1 Lath. The current amendment to the 2000 IRC has been modified to specify the minimum penetration of the fastener into the supports because the language in the 2006 IRC is vague. The proposed rule continues to identify the minimum gage of nails and staples but replaces the specified nail and staple length with a minimum ¾ inch penetration in to the supports. This requirement is necessary so that the weight of stucco[27] can be adequately supported.

ASTM C 1063-03 provides much more detailed language in this respect in maintaining a ¾" penetration into the support. Because the code provides minimum requirements and most contractors will not have immediate access to ASTM C 1063-03, the proposed rule reflects a minimum penetration into the support of ¾-inch.

ASTM C 1063-03 provides for minimum spacing requirements of 7 inches between fasteners. Because lath sheets are 25 ¾ inches wide and 98 inches long a spacing requirement greater 6-inches will limit the number of fasteners to three per support. The proposed rule requires a 6-inch spacing to provide a minimum of 4 fasteners at each support.

R703.6.1.2 Weep screeds. This IRC Section is numbered as R703.6.4 in the current rule. As a part of the renumbering of the 2006 IRC, the section has been renumbered as R703.6.1.2.

The proposed language correctly calls out the applicable ASTM reference by replacing ASTM C 926 with ASTM C 1063-99. The phrase "or plastic weep screed" was added to recognize other acceptable materials.

R703.6.1.3 Control and Expansion Joints. The proposed language clarifies the existing provisions of section 703.6 on Exterior Plaster, which references ASTM C 1063-03. As a result of this reference, sections 7.11.4 – 7.11.4.4 of this standard provides parameters for the installation of control joints. The proposed language is needed to clarify the requirements and address the unique character and architectural expression of the majority of today's residential

27 Stucco weighs approximately 9-lbs./sq. ft.

structures.

The decision to use control and expansion joints, the type selected and their location should be subject tot the plaster application designer's consideration based upon optimum function and aesthetics.

R703.6.2 Plaster. The proposed rule deletes text pertaining to plaster. By deleting this language, the user will refer to this section of the IRC for guidance. The language in 2006 IRC Section R703.6.2 mirrors the intent of this portion of the existing rule. The user will also find that additional options for backing materials are permitted, with the exception adding pressure-preservative treated wood or decay-resistant wood backing material for plaster applications. The text of 2006 IRC Section R703.6.2 is identical to the current amendment with the exception adding pressure-preservative treated wood or decay-resistant wood backing material for plaster applications.

R703.6.3 Weather-resistant barriers. The modification that was made to this section of the 2000 IRC is proposed for deletion because the 2006 IRC contains the language. The 2006 IRC also adds an exception that permits the installation of a weather-resistant barrier or wood-based sheathing that has a water resistance equal to or greater than that of 60 minute Grade D paper when separated from stucco by an interviening, substantially nonwater-absorbing layer or designed drainage space.

Subp. 3a. Section R703.7. The proposed language adds a sentence to the end of Section R703.7 that specifies the seismic design and limitations for those structures that are in a 90 mph wind speed region.

Subp. 4. Section R703.7.1, Subp. 5. Figure R703.7.1, Subp. 6. Section R703.7.2, Subp. 7. Section R703.7.2.1, and Subp. 8. Section R703.7.2.2. These subparts are proposed for repeal to reduce amendments and increase consistency with the 2006 IRC.

Subp. 8a. Section R703.7.4.3 Mortar or grout fill. Precast stone veneer has gained a wide and growing acceptance in popularity as an exterior cladding. With that growing acceptance comes the realization that the installation of this product is not well defined or regulated. It is then reasonable to establish uniform installation requirements that ensure minimum standards of practice.

While the issue of two layers of Grade D building paper is specific in the Minnesota State Building Code with respect to stucco installations over wood based sheathing, this requirement is apparently overlooked relative to masonry veneer and in particular to precast stone veneer. The obvious correlation between the two products is that stucco, in various compositions, is used as the base mortar coat or grout fill and the veneer is used as the finish material. Stucco, portland cement plaster, mortar fill and grout fill are in fact all essentially the same material. Precast stone veneer is also similar in composition to stucco and was actually invented by a stucco contractor. Referencing Sections R703.2 and R703.6.3 then reflects the uniformity between these two closely related operations, and the proposal adds references to other codes sections relating to

weather-resistive membrane material.

R703.7.4.4 Masonry veneer on sheathed substrates. As indicated above, precast stone veneer has gained a wide and growing acceptance in popularity as an exterior cladding. Since the installation of this product is not well defined or regulated, it is reasonable to establish uniform installation requirements that ensure minimum standards of practice.

A cursory review of some of the precast stone veneer manufacturers installation instructions reveal that in virtually every case, a weather-resistant barrier and galvanized expanded metal lath is necessary in an installation over sheathing. In Minnesota, the preferred method of installation for both stucco and veneer over a mortar or grout fill is to provide for a rigid sheathing back-up material behind such an installation.

A review of manufacturer installation instructions and Evaluation Reports indicates a wide level of acceptance for the requirement of fasteners penetrating the wood supports a minimum of 1-inch. Moreover, the reference to section R703.6.1 encompasses a range of fasteners that would be appropriate in such an installation.

Subp. 9. Section R703.8. This subpart has been modified to address concerns related to water intrusion. A term that has entered the construction vernacular in recent years is kick-out flashing. Kick-out flashing is located at a vulnerable point in a construction assembly where the intersecting elements of a lower roof and a wall cladding creates a void. If this area is left unattended by flashing, large volumes of water washing down a sloped roof deck can actually be funnelled directly into a wall envelope.

The cost of flashing material is in itself minimal and the Department anticipates that the cost will reduce as manufactured kick-out flashing becomes available. Currently the flashing can be field fabricated or shop manufacturered based on the builders preference. The benefits gained by the kick-out flashing out way the the minimal costs incurred by the requirement.

1309.0802 SECTION 802, WOOD ROOF FRAMING.

This new rule part amends 2006 IRC Section R802.10.5, by specifying that truss to wall connections must be made with approved fasteners or connectors.

The current section R802.10.5 text is confusing in a number of ways. It creates an inconsistency between truss-to-wall and rafter-to-wall connections. It is not clear whether toe-nails are an approved connector, and as a result causes enforcement problems. The 175-pound connector capacity is arbitrary, and it is not clear what to do if the uplift force is larger than 175 psf. It does not clearly state where this uplift force comes from. It also is intended to disallow toe-nails fasteners as a valid connector, even though toe-nails are a recognized fastener according to the National Design Specification (NDS).

The current section R802.10.5 text is intended to require metal connectors regardless of the truss uplift forces. Many trusses, particularly those with very short spans such as in hip sets,

have very low uplift forces. It seems unreasonable to require 175-pound capacity metal connectors for such trusses, especially when properly installed toe-nails are adequate and are recognized by the NDS. This section, as written causes unnecessary additional cost.

The proposed language change will clarify the paragraph, will reduce construction cost, and will help ensure that connections between the trusses and walls are adequate for the appropriate design loads. It makes enforcement easier because confusion is eliminated and the building official can clearly ask the builder or homeowner to show that design uplift forces are being resisted properly. Furthermore, it still provides direction for attachment of the trusses to the wall, which is the primary reason that section R802.10.5 was added in the first place.

1309.0806 SECTION R806, ROOF VENTILATION.

There is a need to delete this section from the 2006 IRC as it pertains to Minnesota because it references an ASTM Standard E-283, which only tests fenestration products and curtain walls. This section of the code addresses conditioned attic assemblies. These two very different assemblies and have no relation to each other. Therefore, the ASTM Standard has no bearing on this section of the code at all. Also, the exception to # 2 and all of #3 of section 806.4 of the code, are for climate zones other than those we have in Minnesota. As a result, it is reasonable and necessary to clearly state that this section of the 2006 is not a part of Minnesota's residential code.

1309.0903 SECTION R903, WEATHER PROTECTION.

This new rule part amends 2006 IRC Section 903.2.2, Kick-out flashing/diverter, by specifying that kick-out flashing/diverters must be installed where the lower portion of a sloped roof stops within the plane of an intersecting wall cladding. The proposed rule is tied to the proposals on the same issue under R202, Definitions and 1309.0703 Section R703.8.[28] While Section R903.2.1 provides information on the various locations of flashing, it is not clear as to where kick-out flashing/diverters must be installed so that these vulnerable areas of the construction assembly may be protected. Because these intersecting areas create a void, if left unattended by kick-out flashing/diverter, large volumes of water washing down a sloped roof deck could actually be funnelled directly into a wall envelope. The proposed rule is therefore necessary to prevent such water intrusions.

1309.0905 SECTION R905, REQUIREMENTS FOR ROOF COVERINGS.

This new rule part amends 2006 IRC Section R905.2.1 by specifying that asphalt shingles must be fastened to solidly sheathed decks or 1" think nominal wood boards. The proposed rule permits a method of construction that is already recognized by the Asphalt Roofing Manufacturers Association and most major shingle manufacturers. The proposed rule is also intended to provide for more uniformity of enforcement.

The amendment to the model code will reduce the cost of construction for re-roofing by

28 For further discussion, see page 26.

allowing the use of the original wood sheathing boards without the implied need to re-sheath the entire roof deck with a layer of plywood or oriented strand board sheathing.

CONCLUSION

Based on the foregoing, the proposed rules are both needed and reasonable.

11/28/06
Date

M. Scott Brener
Commissioner

CITY OF BLAINE
BUILDING INSPECTIONS
10801 Town Square Drive NE • Blaine, MN 55449
Business Phone: 763-785-6170 • Fax: 763-785-6111

January 2, 2014

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ADMINISTRATIVE HEARINGS

Administrative Law Judge Eric Lipman
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
St. Paul, MN 55164-0620
(651) 361-7842
Fax (651) 361-7936

Re: Proposed amendments to Minnesota Rules, chapter 1309, ID # R-04114

Honorable Judge Lipman,

The City of Blaine Building Inspections Department is recommended changes to the above proposed rules as shown on the following two pages. As you may be aware, the City of Blaine has been one of the fastest-growing suburbs in recent years and has issued building permits for 377 new homes this year, so we have experienced many of the issues confronting new home builders and have had to make quick decisions in the field to accommodate the many requests to meet the intent of the code with alternate construction practices. These proposals are just two examples of ways the code can be improved so that it is enforced more consistently.

Please consider these recommendations and contact me if you have any questions regarding these issues at 763-785-6176.

Sincerely,

Dan Hauck, Chief Building Official
City of Blaine

Comments on Proposed Rules Governing the Adoption of the International Residential Code, *Minnesota Rules*, chapter 1309, Revisor's ID Number R-04144

1309.0703 SECTION R703, EXTERIOR COVERING

We recommend that a new exception be added under Section R703.6.2.1 as follows:

> **Exception:** The weep screed for a manufactured stone veneer shall be permitted to be placed a minimum of 0.5 inch above a paved area if it is supported by a footing that extends below the frost line and is allowed by the manufactured stone veneer installation instructions.

Reason: The City of Blaine has had thousands of homes built in the last 10 years with manufactured stone veneer installed on the front of the home. It is been the desire of the builders to have a minimum amount of concrete wall or block exposed, so many of the manufactured stone veneers have been installed a minimum of 0.5 inch above finished paved surface area, such as concrete or asphalt, if supported by a frost footing. This results in an aesthetically pleasing look that would otherwise result in a minimum of 2 inches of exposed concrete wall or block above the paved area per Section R703.6.2.1 of the 2012 IRC. The City of Blaine is not aware of a single failure by allowing these installations, and only allows it if specified in the manufacturer's installation instructions or ICC-ES Evaluation Report (www.icc-es.org). The installation results in the veneer being protected from frost heave of the paved area since it is supported by a footing that extends below the frost line.

1309.0903 SECTION R903, WEATHER PROTECTION

We recommend that the current proposed exception under Section R903.2.1.1 be re-written as follows:

> ~~**Exception:** Kick out flashings are not required when only re-roofing existing buildings and structures.~~

> **Exceptions:**
> 1. Kick out flashings shall be required when only re-siding existing buildings and structures, but the kick out flashings shall be permitted to be installed in accordance with other approved methods.
> 2. Kick out flashings shall be required when only re-roofing existing buildings and structures, but the kick out flashings shall be permitted to be installed in accordance with other approved methods.

Reason: The proposed change clarifies that kick out flashings are required when either re-siding or re-roofing. It has been an industry-accepted best practice to install kick out flashing when re-siding or re-roofing for many years, so we should not take a step backwards and stop requiring it unless re-siding and re-roofing at the same time. The proposed language allows the building official to approve alternate methods of installation since strict compliance with Section R903.2.1 may not be possible when either re-siding or re-roofing. The City of Blaine has approved industry-accepted methods for installation of kick out flashings that have effectively prevented water intrusion into the structure and are a reasonable approach to having no requirement at all.

January 2, 2013

VIA EMAIL

The Honorable Eric J. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Minnesota Department of Labor & Industry – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID No. RD-4144; OAH No. 1900-30855.

Dear Judge Lipman:

I am the Third Ward City Council Member in the City of Moorhead, Minnesota. I am writing on behalf of Moorhead, as well as Minnesota's Border Cities: Breckenridge, Dilworth, East Grand Forks, Moorhead, and Ortonville. Our communities have been designated as Border City Zones by the Minnesota Legislature because we face tremendous competitive pressure from our North Dakota neighbors, located just across the Red River. Imagine property tax rates, utility fees, income tax, workers compensation rates, being significantly higher in St. Paul than in Minneapolis: that is the reality for our Border Cities each and every day. In the Fargo/Moorhead metropolitan area, we coordinate our transportation systems, we share a unified chamber of commerce and home builders associations, and we have mutual aid agreements with neighboring fire departments – but all things are not equal among municipalities regarding business, home ownership and now with the proposed fire sprinkler mandate. The fire sprinkler mandate will burden builders and consumers with a requirement that the State of North Dakota has already expressly rejected. Moorhead and its fellow Border Cities oppose the proposed fire sprinkler mandate in Minnesota because this regulation will create a disparity between Minnesota's Border Cities and their out-of-state neighbors that will result in an exodus of residential construction and growth in our communities.

This disparity is becoming more evident to citizens as they weigh their options as to where to live, work and play in the Fargo/Moorhead metro area. Moorhead's population in 2010 was 38,065 and represents 27% of the population between Fargo and Moorhead. In regards to new housing starts in Fargo and Moorhead, in the last two years, Moorhead has realized only 20% of the total new residential building permits between Fargo and Moorhead, and valuations of new residential building permits are even less, at 15% of the total new residential home

values. Moorhead is not realizing its fair share of new housing starts, and this gap in new home starts will only increase when the cost of new home construction is substantially greater on the Minnesota side of the river due to increased regulation.

Fargo & Moorhead - New Residential Building Permits

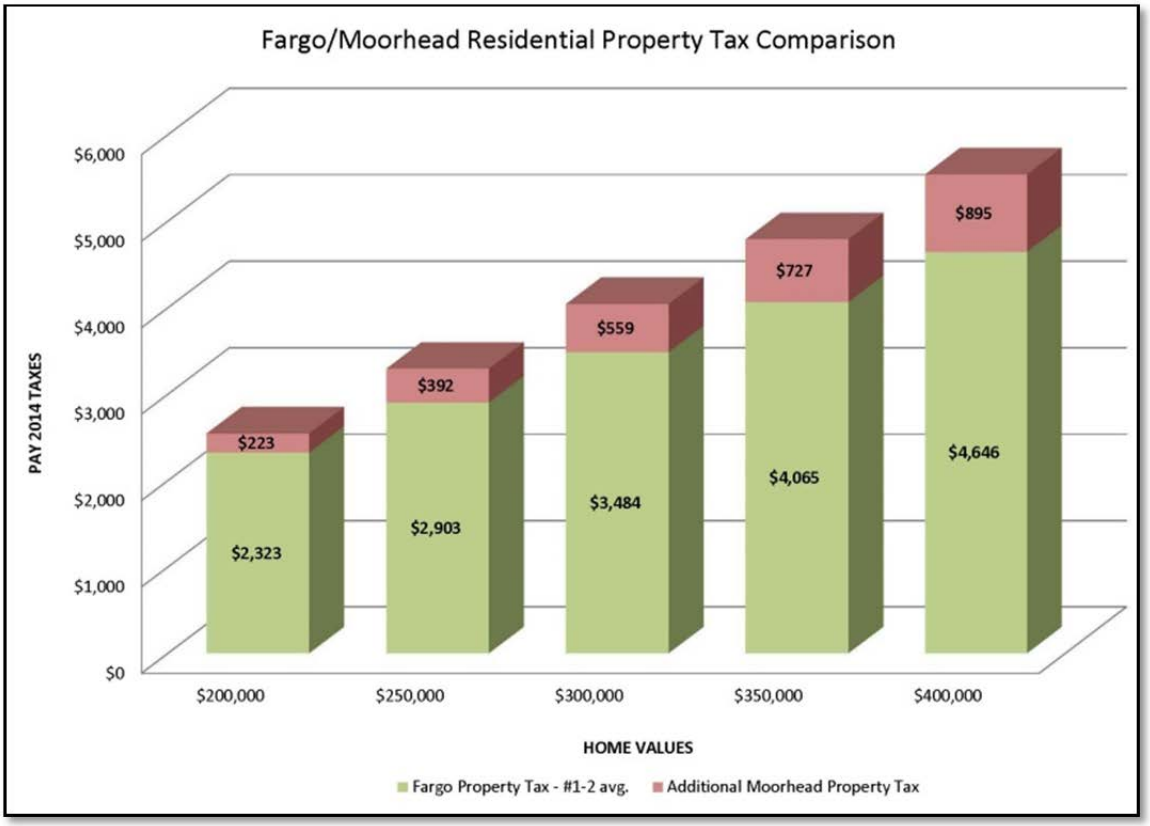
	2012						2013 (Thru 10/31/13)					
	Fargo			Moorhead			Fargo			Moorhead		
	Permit	Valuation	Market Share of Permits	Permit	Valuation	Market Share of Permits	Permit	Valuation	Market Share of Permits	Permit	Valuation	Market Share of Permits
New SF	280	$53,542,500	82%	62	$10,589,000	18%	384	$75,823,038	82%	83	$17,975,900	18%
New SF Attached/Twin	52	$7,657,000	72%	20	$2,300,000	28%	76	$13,160,100	64%	42	$4,948,400	36%
New Row/3 & 4 Family	39	$5,514,000	93%	3	$590,000	7%	32	$4,212,000	91%	3	$590,000	9%
New Multiple	21	$48,291,747	95%	1	$3,000,000	5%	29	$84,674,999	81%	7	$4,090,000	19%
TOTALS	392	$115,005,247	82%	86	$16,479,000	18%	521	$177,870,137	79%	135	$27,604,300	21%

			% Permits		% Valuation		Moorhead	MN
	Permits	Valuations	Fargo	**Moorhead**	Fargo	**Moorhead**	Permit Fees	Surcharge
2012 Totals	478	$131,484,247	82.0%	**18.0%**	87.5%	**12.5%**	$336,868.60	$31,324.95
2013 Totals	656	$205,474,437	79.4%	**20.6%**	86.6%	**13.4%**	$461,977.20	$40,416.62

Moorhead is a great place to live! Folks are drawn to Moorhead for great vibrancy and sense of place. Moorhead is home to Minnesota State University Moorhead, Concordia and M-State; these institutions draw more than 15,000 young adults to our community. Moorhead's arts, culture, entertainment activities and park amenities thrive and create a sense of place that draw people to the area. But when only a river separates the two communities, folks in the Fargo/Moorhead area have choices on where to live in proximity to work and play. I have to believe economics is the key factor in the decision. If folks choose Fargo, North Dakota to be their home, that results in fewer homes in Moorhead and other Minnesota border cities that contribute property tax dollars to support public safety, parks and schools. So far in 2013, the City of Moorhead has seen 128 new single family attached and detached homes which resulted in $86,982 building permit fees and $12,532 in Minnesota surcharges. These revenues will be lost if fewer homes are built in Moorhead and other border cities.

If it was your choice, what would be your decision when:

- Property tax rates are *10% less* in Fargo, North Dakota – that's approximately $279 saved by Fargo resident's each year when you compare new homes valued at $216,500 which is Moorhead's 2013 average new home price and Pay 2014 tax rates.
    - North Dakota has seen $1.5 Billion in local property tax reductions since 2009
    - In 2013, Moorhead lost its property tax advantage with continued reductions in North Dakota.
    - North Dakota has recently formed a task force to study permanent property tax reform.



- Income tax rates are *22% less* in Fargo, North Dakota for a family of 4 with an income of $100,000/year – that equals <u>$2805 saved</u> by Fargo residents each year.

MOORHEAD/FARGO/WEST FARGO COST OF LIVING COMPARISON
ANNUALIZED COSTS FOR PROSPECTIVE HOME BUYERS
(SEE ASSUMPTIONS USED-INDIVIDUAL CIRCUMSTANCES MAY VARY)

HOMEOWNER PROFILE			A. STATE INCOME TAX	B. FEDERAL INCOME TAX	TOTAL INCOME TAX	C. REAL ESTATE TAX	D. TOTAL HOUSE PAYMENT	E. ELECTRICAL RATES XCEL	E. ELECTRICAL RATES CCEC/MPS	F. OTHER UTILITIES	TOTAL COST XCEL	TOTAL COST CCEC/MPS
MARRIED FAMILY OF 4												
INCOME LEVEL :	HOME PRICE :											
$36,000	$125,000	MHD	$583	$890	$1,473	$1,471	$6,062		$955	$1,064		$11,025
	$125,000	FGO	$134	$890	$1,024	$2,042	$6,062	$969	$1,250	$865	$10,962	$11,243
	$125,000	WF	$134	$890	$1,024	$2,087	$6,062	$969	$1,250	$600	$10,742	$11,023
$60,000	$200,000	MHD	$1,847	$4,032	$5,879	$2,625	$9,699		$1,688	$1,064		$20,955
	$200,000	FGO	$497	$4,065	$4,562	$3,267	$9,699	$1,701	$2,134	$865	$20,094	$20,527
	$200,000	WF	$497	$4,065	$4,562	$3,339	$9,699	$1,701	$2,134	$600	$19,901	$20,334
$100,000	$300,000	MHD	$4,296	$8,876	$13,172	$4,164	$14,549		$1,793	$1,064		$34,742
	$300,000	FGO	$1,126	$9,241	$10,367	$4,900	$14,549	$1,805	$2,260	$865	$32,486	$32,941
	$300,000	WF	$1,123	$9,225	$10,348	$5,008	$14,549	$1,805	$2,260	$600	$32,310	$32,765

This Cost of Living Comparison was prepared by Fiebiger, Swanson, West, & Co., PLLP on April 26, 2013. It does not reflect the financial impact of the significant property tax reductions for North Dakota property owners due to actions of the 2013 North Dakota Legislature.

- Utility rates are less in Fargo, North Dakota. A family of 4 in Fargo with an annual income of $100,000 saves $187 each year on utilities compared to the same Moorhead family. Also consider by 2020, 20% of Minnesota's energy is mandated to be from renewable sources. This will have an impact on border city energy prices.

Additional Minnesota regulations like the fire sprinkler mandate will tip the scales, resulting in an overwhelming loss to Moorhead and other Minnesota Border Cities. I have reviewed the "White Paper on Residential Sprinkler Systems" by the Minnesota State Fire Chiefs Association which the summary states:

> ***Summary:***
> *Installing residential sprinklers in newly constructed one and two family homes will have a profound impact on the fire service, local governments, and society.*
>
> *An average homeowner will pay less than $4,000 for the installation of the system and will, in most cases, recoup that investment through the combination of insurance savings, possible construction tradeoffs, and reduced property taxes.*

They are right: installing residential sprinklers in newly constructed one and two family homes will have a "profound impact" on local governments and society, but in a *negative* way – especially in Moorhead and other border cities. This regulation will add at least $4,000, if not substantially more, to cost of every new home in Moorhead compared to new homes in Fargo. We understand that evidence was presented at the hearing that the average cost of complying with the residential sprinkler mandate was over $12,000. We do not believe that the cost will ever be recouped and that the initial cost will be a significant deterrent to residential construction in our City.

How do we know potential residents will build across the river in North Dakota or outside of City limits to avoid the residential sprinkler mandate?

- We already witness commercial and industrial building contractors designing buildings that are just under the square footage required for sprinklers. Even if it is in a business's interest to construct a larger facility, they are building less than what is needed specifically to avoid the cost of adding sprinklers.

- The same scenario would happen in the Moorhead residential market, except instead of building a smaller house, potential residents would choose NOT to build in Moorhead.

    - Potential residents will view the costs required to incorporate sprinklers in their home to far exceed the benefits of the sprinklers.
    - Furthermore, potential residents know that properly placed and installed fire alarms will provide the safety factor needed in case of a home fire and that, often

times, people who are injured or die in fires are the result of smoke inhalation, a factor that sprinklers do not solve.

- There is no enforcement of state building code outside of Moorhead city limits unless a home is built in another city that enforces the building code. The use of unlicensed contractors outside of Moorhead city limits is already an issue, and we expect that potential Moorhead residents will instead use unlicensed contractors and build outside of City limits to avoid the sprinkler mandate.

- Finally, we know potential residents will build across the river in North Dakota or outside of city limits to avoid the residential sprinkler mandate because we've already seen this occur.
    - In the 1970's, the advent of the Border Cities Program was because of MN regulations driving businesses across the border, and
    - In 2005, MN adopted the energy code before ND and Border Cities saw the impact.

Potential residents looking to build a new house analyze every cost. If you had the choice between building a new home that cost several thousand dollars more in Moorhead because of a requirement that you do not see value-added, where would you build? I would speculate the answer to the question is build in Fargo or West Fargo, North Dakota to avoid an unreasonable possible sprinkler costs for an unwanted product.

Moorhead is already struggling to hold its own. I fear the consequences of this requirement on Moorhead and other Border Cities will be devastating to the residential new home market. Revenues will be lost, students gone and businesses will lose customers.

Thank you for the opportunity to submit testimony.

Sincerely,

Brenda Elmer, Council Member
City of Moorhead

Judge Lipman: This is a follow-up response to validate my testimony and counter misrepresentations by others that occurred during the December 12th hearing. Attached are documents that clearly demonstrate the need for fire sprinklers in new homes. In an attempt to minimize your stress in reviewing lengthy documents that may not address specific issues that you are searching I have consolidated this information in Tabs and in the cover letter provide a brief description of what is addressed in each Tab. Also, the .pdf format will allow easy access to video links that are referenced that validate the fire safety problem in new home construction.

We tried to make the analysis of this complex issue as easy for you as possible and to that goal please feel free to ask me for any further clarification that you may seek.

Buddy Dewar
Vice President
National Fire Sprinkler Association
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850-566-8733
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The Voice of the Fire Sprinkler Industry

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January 1, 2014

Administrative Law Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert Street
PO Box 64620
St. Paul, MN 55164-0620

Re: Document Number 8-1900-30855. SONAR – Proposed Amendment to Rules Governing Adoption of the 2012 International Residential Code, Minnesota Rules, Chapter 1309

Dear Judge Lipman:

Thank you for the opportunity to share written comment on this critical case which impacts the health, safety and welfare of Minnesotans and its visitors. This is a difficult and complex issue of which I am confident the safety of the public will prevail.

The questions concerning "does the Department of Labor and Industry (DOLI) have authority to implement the proposed Rules and if so has DOLI followed Chapter 14 with respect to procedural requirements" are outside the scope of my expertise. I must say that I was impressed by the openness in your hearing and the want to receive factual information on this topic. I do have a response to the substantive question, "are the proposed Rules needed and reasonable?" A bio is attached at Tab H which outlines my fire service career. When it comes to fire safety, fire sprinklers and code applications I suggest I qualify under the Daubert expert witness doctrine.

To assist in your review of the many issues, I have highlighted discussion and supporting documents by Tab and provide a brief description of the substance in each Tab in this short cover document – this will help you focus on issues of interest to your review. Some items such as "insurance implications" and "liability concerns" were not discussed during the December 12, 2013 hearing but are important factors to consider showing ***the need*** for this Rule adoption.

TAB A. Today's Fire Safety Problem. Fire sprinklers are in the national model codes (NFPA in 2006 and ICC in 2009) because of an emerging fire problem linked to materials used in new furnishings and materials used in the construction of the home typically referred to as "Lightweight

Construction." The national code promulgating entities chose fire sprinklers as the least cost option to address this emerging fire safety problem that is dimensioned in an Internet search of "Lightweight Construction Fire Safety" with over 1.4 million sites. With over 1.4 million sites dimensioning today's fire safety problem in new homes, any argument that new homes are safe does not hold water particularly when many of these sites are posts from UL, Factory Mutual, and other highly credible non-stakeholders. At this Tab are links to videos – as discussed in my testimony the video on manufactured housing is a must see.

TAB B. The Economics of the Housing Market. At this Tab the asymmetric home sales environment is discussed, a sharing of facts I suggest would be strongly supported by the millions of homeowners who are underwater or owe much more than the house is worth. Discussion at this Tab also sets the foundation for Tab C. Also in Tab B is discussion on the impact of fire sprinklers on the sale of new homes in communities that have adopted fire sprinkler requirements, some ordinances in place for over 25 years. Comments about complying with the fire safety requirements of the national model codes will hamper housing market recovery is inaccurate. This opposition is about expanding the homebuilder profit margin.

TAB C. Consumer Choice. We suspect the consumer is not given the option of legacy wood products or the lightweight construction products. Should the consumer be given the option of 14 gage or 24 gage wire in 15 amp electrical circuits? No, base code requirements are intended to protect the consumer. In this Tab the code process with respect to new home sales is outline as we suggest the base code requirements makes the housing market close to equal competition and that the add-ons or consumer choice items provide the homebuilder with a stronger profit margin.

TAB D. Why the 4,500 square foot threshold? The fire service was quite clear they opposed the compromise threshold of 4,500 square feet as this threshold only solves the problem in large homes and safety to the public and responding firefighters still exists in the smaller new home. In this Tab we discuss the hazards in these very large homes that cannot be considered in the classification of affordable housing. We also discuss the impact larger homes have on community infrastructure and growth management.

TAB E. Insurance Implications. The insurance implications that result when the national model codes are not adopted in a timely basis or are amended absent alternative solutions is far-reaching and often misunderstood. At this Tab the Building Code Effectiveness Grading Schedule (BCEGS) and its impact on the National Flood Insurance Program premium rates and FEMA Disaster

Recovery Funding is discussed. Also at this Tab are pages from a report underscoring this concern in other states and also the current BCEGS status in Minnesota.

TAB F. Legal Liability. Minnesota is not a litigious state when compared to other states like New Jersey, New York, Florida, California and Illinois. But if I lobby to build new homes in non-compliance with the fire and life safety provisions of the national construction codes and a tragedy happens, will the liability train stop at my business in Minnesota? While I am not an attorney, I have served as an expert witness on many cases and after hearing from many trial bar attorneys from across this nation asking about the lightweight construction fire safety issue I have formed some thoughts that I strongly urge BAM to review and consider.

TAB G. Economic Incentives. Why should the homebuilder pay an impact fee for an 18-inch fire main when an 8-inch would be required in many cases if the national model code fire sprinkler requirement was enforced? Reports presented suggest 70%+ savings on municipal water during fire suppression operations. Code requirements at the hydrant is 500 gpm when the homes are fire sprinkler protected but 1,000+ gpm if no sprinklers are in the homes. My recommendation is that BAM shift their focus away from opposing code required life and property safety systems towards promoting tax and other incentives to help recover their added cost.

TAB H. A bio of Buddy Dewar is attached

Brief Comments. The substantive focus of the DOLI code adoption process is to protect the public and the process adopts current construction codes using the national model codes as a base code; the adoption process requires a review of the national model codes to ensure these national model code requirements are applicable to Minnesota; to adopt the national model codes absent this review would be an improper delegation of authority to the national model code promulgating entities; the review is intended to address ***state specific*** issues (hurricane wind protection in Florida, seismic bracing requirements in California, freeze protection issues in Alaska, for example) that may be substantive in one state but not significant to require other states to comply; the adopted code should then be enforced statewide to protect the public, keeping the ***con*** out of ***con***struction. I indicated my concern of construction practices in "no code enforcement" areas during the December 12th hearing and this concern was exacerbated by comments at the hearing from builders who indicated it was hard to compete against those who cut corners and ignore code requirements.

Opposition to the proposed amendment to the 2012 IRC has come from the homebuilders as they oppose this compromise amendment language. The clear focus from the homebuilding industry is to maximize their profit margin and any suggestion that the added cost of fire sprinklers will chase away potential homebuyers is false and misleading – how many potential homebuyers are chased away by the $10,000 granite countertops? Home sale prices are negotiated; rarely does the buyer not offer a lower price than the one the homebuilder has established; the homebuilder wants to spend the least amount of money building the home and they want to sell the home at the highest possible price regardless of what the home is truly worth – I suspect millions of families that are underwater will agree with this sentence. The Builders Association of Minnesota's (BAM) opposition is asking that they be allowed to build new homes unsafe and in non-compliance with the national model codes so they can maximize their profit margin. The National Association of Home Builders (NAHB) and its affiliated state builders associations are in place to attempt to *block any and all* actions by government and code promulgating entities that will add *any* amount of money to the cost of construction. And while I support efforts of the NAHB and BAM to control government imposed fees such as construction impact fees raising funds for activities outside of the scope of construction oversight, I do not and will not support efforts to ignore fire and life safety issues.

The Hidden Insurance Issues. The ISO Public Protection Classification is used by insurance companies for rate setting purposes. The Building Code Effectiveness Grading Schedule (BCEGS) is used for rate reductions which, depending on the insurance provider can be over 25%. But even more critical is the BCEGS is used for rate setting for the National Flood Insurance Program and is also used by FEMA in determination of Disaster Recovery Funding. What this critical point means is property owners, both commercial and residential, will pay substantially more for NFIP coverage and receive a smaller percentage of money from FEMA in a community with a bad BCEGS Grade verses one with a good grade. ISO, who manages the BCEGS system for FEMA has already opined that failure to adopt the fire sprinkler requirements in the national model codes will cause a degrade of 5 points, which could have the force and effect of changing the community's BCEGS classification to a weaker grade. To simplify this complex issue, failure to adopt and apply current editions of the national model codes within a reasonable time (5-years) will cause a degrade in a communities BCEGS grade, altering the national model codes like deleting fire sprinkler requirements will cause a point deduction that may cause a grade shift, the BCEGS grade is placed on the new properties (commercial and residential) and stays with that property even though a BCEGS community ranking may improve or degrade in the

future. Therefore, as this Rule is written, if there is a community degrade, the new homeowner with a property under 4,500 sq. ft. could pay up to 5-15% more for insurance than the 4,500 sq. ft. property owner who may receive a 5-15% reduction – see Tab E7 and E8.

Summary. The emerging fire safety problem in new homes is very real and critical to our next generation. The national model codes, UL, FM, and many non-stakeholder advocates have completed extensive research on this emerging fire safety problem and the mitigating need of residential fire sprinklers. The national model code promulgating entities have been addressing and debating this lightweight construction issue for over a decade and have opined that the least cost and best solution are residential fire sprinklers, newer residential systems than have been designed and engineered to quickly control or extinguish a fire at an affordable cost. The national model code committees identified their option; ban the use of engineer wood I-beams, require basement ceilings to be fire resistive rated including ceiling plumbing access panels, require fire resistive ceilings in garages that had sleeping or occupiable space above, require all roof supports using finger gusset plates to add nails or screws to each plate connection, require roof overhangs outside windows to be fire resistive rated to 5 feet on each side to restrict fast flame movement to the attic, the list is long or they could require the least cost fire sprinklers. The DOLI is now faced with the same issue; fire chiefs testifying we have a fire safety problem with new construction and our firefighters are falling through the floor because of quick failing engineered wood I-beams in the basement – should they allow unsafe construction practices to continue? If they remove fire sprinklers from the code, DOLI should remove engineered I-beams, finger gusset plates and the many other new construction products and practices that have led to today's fire safety problem detailed in Tab A. The homebuilders arguments can be traced back simply to their profit margin concern. The proposed amendment to the 2012 IRC needs to be simply changed to include all new homes regardless of its size. But without question, requiring townhouses and stand-alone homes greater than 4,500 square feet is a step towards a fire safe community. Please let us know what additional information is needed or if we may be of further assistance.

Sincerely,

Buddy Dewar, Vice President
Regional Operations

TAB A - OUR NATION'S FIRE PROBLEM

A. The Emerging Fire Safety Concern: Our nation's fire safety problem is getting worst, not better. Fire burn tests frequently conducted using today's furnishings have shown the time from the start of the fire to flashover in non-sprinklered rooms to frequently be less than 1 minute and 30 seconds. In these tests the smoke alarm activated in an average of 20 seconds. This means a person on the second floor of a home would have about one minute to respond to a smoke alarm, get the baby in an adjoining room then get downstairs and out the door – and going down the stairs as heat and smoke rises is difficult if not impossible. Tests demonstrating fire sprinkler protection show the benefits of fire sprinklers as the sprinkler activated in an average of 25 seconds controlling the fire making exiting possible. The leading activity of people before dying in fire is ***attempting to escape*** (36%) while is ***sleeping*** (34%) which held first place for http://www.usfa.fema.gov/downloads/pdf/statistics/v12i7.pdf decades has fallen to the second leading activity. The activity of attempting to escape once the smoke detector provides alert has increased to first place as a result of very flammable furnishings and lightweight construction material.

There has been much discussion on the fire safety of engineered wood and lightweight truss construction materials at the national code hearings – much of it coming from the professional firefighters who will not accept fire fighter death and injury as a result of this "NEW" construction process. How bad is the problem? Well, an Internet search of ***Lightweight Construction Fire Safety*** will identify over ***1.4 million*** results that clearly dimension the emerging fire safety problem. A NIST 2003 Report on Firefighter Fatalities Due to Structural Collapse provides data showing from 1983-1992, an era when legacy construction products were used, 13% of our nation's firefighter deaths due to building collapse were in homes. And this report shows from 1994-2002, the era of new lightweight construction products, 51% of our nation's firefighter deaths due to building collapse were in homes. Fire Chief testimony before the December 12th hearing clearly underscores this firefighter safety concern.

An Internet Search of *"Lightweight Construction Fire Safety"* will reveal over 1.4 MILLION sites that clearly dimension the fire safety problem government faces today.

It is important that all parties have comfort with these comments as this document outlines a process to mitigate this growing fire safety concern. Therefore we must suggest that a couple minutes be spent to review these short videos that validate comments herein. The first video is an investigative report that includes a description of UL testing showing lightweight construction failure.

http://www.cnn.com/video/data/2.0/video/living/2009/12/18/willis.new.housing.fire.danger.cnn.html

Detailed information with links to numerous studies clearly dimensioning today's fire safety problem in new homes can be found at:

http://www.firesprinklerinitiative.org/resources/lightweight-construction-and-firefighter-safety.aspx

There also is concern with modular housing. Many modular housing manufacturers have trained staff who install fire sprinkler infrastructure in the modules at the factory significantly reducing sprinkler installation costs – under $0.50 per sq. ft. The following video underscores the need for fire sprinklers in modular homes.

http://www.myfoxboston.com/video?clipId=7046668&autostart=true

And the floor plan of new homes is more open allowing greater fire loads to free burn in larger compartments. New furniture today burns hotter and quicker and releases more smoke and flame than older legacy furniture. This *absolutely must see* video from UL shows the fast burning typical with today's furnishings and underscores the rapid fire growth problem notwithstanding if the home is made with lightweight engineered wood or concrete.

http://www.ul.com/global/eng/pages/offerings/industries/buildingmaterials/fire/fireservice/ventilation/

And again smoke detectors and fire safety public education programs since 1975 have contributed to a reduction in fire deaths. The public education program "crawl low in smoke" and "stop, drop, and roll" has been effective. But the reality is smoke detectors do not save lives – they *give* the home occupant an opportunity to save their life. Unfortunately this opportunity is diminished by new home construction practices (homes collapsing in under 5 minutes), increased fire load with materials used in new furnishings, greater size of the fire because of larger rooms and energy efficiency containment. And today's fire deaths are disproportionate with the young and elderly being high fire death per population classifications.

This video shows the concerns with smoke detectors.

http://wallacefd.org/smoke_alarm_report.html

The least cost solution to mitigate the problem is requiring fire sprinklers in all new homes, a requirement that has been added to the newer editions of all our national model building and fire codes.

Seven young college students died in this beach house fire. One can quickly see the collapsed roof as well as an absence of siding which disappeared in the flames exposing support beams. Collapse began before firefighters arrived on the scene.

A very detailed UL University test funded by a Federal grant of the fire stability of these new construction products and other related fire safety information sites can be found at http://content.learnshare.com/courses/73/187716/player.html

B. Our Nation's Fire Death Statistics. Homebuilders argue new homes are safer; not true. We are doing better but the United States still has one of the highest fire loss rates of the industrialized world - in both terms of fire deaths and fire losses. This unenviable status has mystified world fire service experts because the solution to significantly reduce the fire death rate is available and affordable. The simple solution to minimize our nation's fire death rate is residential fire sprinklers. But there exists opposition to installing these new technologically advanced residential fire sprinklers because of perceived economic reasons which are quickly mitigated through Growth Management incentives discussed later in this document.

There is a significant reduction in the number of fire incidents even though there has been a growth in the number of properties. During the 1970s, the U.S. Fire Service embarked on an extensive Public Education program – all must recall one example promoted by the National Fire

Protection Association (NFPA) the "Stop, Drop, and Roll" program. The three main causes of fire are men, women, and children – people cause fires - and these public education and public

Home structure fires by year

Year	Fires	Civilian deaths	Civilian injuries	Direct property damage (In billions) As reported	Direct property damage (In billions) In 2007 dollars
1977	723,500	5,865	21,640	$2.0	$7.0
1978	706,500	6,015	20,400	$2.1	$6.7
1979	696,500	5,500	18,825	$2.4	$6.8
1980	734,000	5,200	19,700	$2.8	$7.2
1981	711,000	5,400	19,125	$3.1	$7.1
1982	654,500	4,820	20,450	$3.1	$6.8
1983	625,500	4,670	20,750	$3.2	$6.7
1984	605,500	4,075	18,750	$3.4	$6.7
1985	606,000	4,885	19,175	$3.7	$7.1
1986	565,500	4,655	18,575	$3.5	$6.6
1987	536,500	4,570	19,965	$3.6	$6.6
1988	538,500	4,955	22,075	$3.9	$6.8
1989	498,500	4,335	20,275	$3.9	$6.5
1990	454,500	4,050	20,225	$4.2	$6.6
1991	464,500	3,500	21,275	$5.5[1]	$8.3[1]
1992	459,000	3,705	21,100	$3.8	$5.6
1993	458,000	3,720	22,000	$4.8[2]	$6.8[2]
1994	438,000	3,425	19,475	$4.2	$5.9
1995	414,000	3,640	18,650	$4.3	$5.8
1996	417,000	4,035	18,875	$4.9	$6.4
1997	395,500	3,360	17,300	$4.5	$5.8
1998	369,500	3,220	16,800	$4.3	$5.4
1999	371,000	2,895	16,050	$5.0	$6.2
2000	368,000	3,420	16,975	$5.5	$6.7
2001	383,500	3,110	15,200	$5.5	$6.5
2002	389,000	2,670	13,650	$5.9	$6.8
2003	388,500	3,145	13,650	$5.9[3]	$6.7[3]
2004	395,500	3,190	13,700	$5.8	$6.4
2005	381,000	3,030	13,300	$6.7	$7.1
2006	396,000	2,580	12,500	$6.8	$7.0
2007	399,000	2,865	13,600	$7.4[4]	$7.4[4]
2008	386,500	2,755	13,160	$8.2	$8.6[5]
2009	362,500	2,565	12,650	$7.6	$8.0
2010	369,500	2,640	13,350	$6.9	$7.1
2011	370,000	2,520	13,910	$6.9	$6.9

Figure 1. Source: NFPA.org

[1] Includes $1.5 billion in damage caused by the Oakland Fire Storm, most of which was lost to homes but for which no detailed breakdown by property type was available.

[2] Includes $809 million in damage caused by Southern California wildfires.
[3] Does not include the Southern California wildfires.
[4] Does not include the California Fire Storm 2007 with an estimated property damage of $1.8 billion.
[5] Does not include the CA wildfires 2008 with an estimated property damage of $1.4 billion.

Direct property damage figures do not include indirect losses, like business interruption. Inflation adjustment to 2007 dollars is done using the consumer price index.

fire safety awareness programs proved very successful in reducing the number of fire incidents as one can see in Figure 1 from 723,500 fires in homes in 1977 to 370,000 in 2011. This 48.9% reduction in the amount of fires occurring in homes during the past 35 years again is from increased public awareness of fire safety. Some argue the reason we have had a reduction in fire deaths is because of smoke detectors – true to some degree but not the sole cause of the reduction. Smoke detectors do not stop fires, they detect fires. The number of new homes during this period did not diminish the number of older homes – in fact, many new homes built during this 35 year window are clearly existing or older homes in today's database. Some falsely argue that new homes do not burn; that fires and fire deaths occur in older homes. Well, the duh statistic here is there are many more older homes than new homes – yes there will be more fires in older homes. And remember people cause fires notwithstanding the age of the home. And when does a new home become an old home – mine is 30 years old?

Some argue that the number of fire deaths has significantly reduced in the past 35 years because of smoke detector installation. Statistics show that the *48.9% reduction in the number* of fires in homes during the past 35 years but only a *15.9% reduction in the number of fire deaths per fire.*

Another great statistic here is the reduction in the number of fire deaths. Using the data in Figure 1, we see that while we have had 48.9% reduction in the number of fires in homes during this 35-year period, if we compute the number of ***fire deaths per fire*** we only had a 15.9% reduction in fire deaths. In 1977 we had 723,500 fires in homes and the fire death rate computes to one fire death in 123.4 fires. In 2011 we had 370,000 fires in homes and the fire death rate computes to one fire death in 146.8 fires. One could argue if we had a 48.9% reduction in the number of home fires during the past 35 years if all contributing variables to fire death are equal we should have a 48.9% reduction in fire deaths per fire – why only 15.9%? ***While the aggregate of the number of fire deaths reduced by half during the past 35 years, the reduction in the number of fires in homes also came near to this same rate of reduction. But the number of fire deaths per fire changed only 15.9%! Stated another way, in 2011 we have, on average, only an additional 23.4 home fires without a fatality than we did in 1977.***

During the ten-year period of 2002-2011, an estimated 383,750 home structure fires, on average, were reported per year. These fires caused an annual average of 2,796 civilian deaths, 13,347 civilian fire injuries, and $7.2 billion in direct property damage. Home fires accounted for 73% of all reported structure fires, 91% of civilian structure fire deaths, 86% of the civilian structure fire injuries, and 69% of the direct property loss. Cooking equipment is the leading cause of home structure fires and home fire injuries, while smoking materials are the leading causes of home fire deaths. Roughly half of all home fire deaths result from incidents reported between 11:00 p.m. and 7:00 a.m. Twenty-four percent of all home fire deaths were caused by fires that started in the bedroom; 23% resulted from fires originating in the living room, family room, or den. Although smoke alarm operation was confirmed in 52% of all reported home fires, validating if a smoke detector operated is impossible to determine when the smoke detector has been damaged by flashover as undetermined smoke alarm operation was noted in 63% of the home fire deaths.

C. Our Nation's Fire Injury Statistics. Table 1 also reports fire injury statistics. It is important to understand that the vast majority of burns are never reported – the data in Table 1 are burn injuries requiring emergency care. ***The cost of providing long-term burn injury care is substantial and underscores the need for the adoption of the DOLI Rule.***

The following statistics are the latest available from the National SAFE KIDS Campaign and the United States Fire Administration (part of the Federal Emergency Management Agency):

Burn injury and incidence rates:

Injury and death rates:

- The majority of fire-related deaths (75 percent) are caused by smoke inhalation of the toxic gases produced by fires. Actual flames and burns only account for about one-fourth of fire-related deaths and injuries. Fire causes smoke.
- The majority of fires that kill or injure children are residential fires (85 percent).
- The majority of children ages 4 and under who are hospitalized for burn-related injuries suffer from scald burns (65 percent) or contact burns (20 percent).
- Fireworks-related injuries sent more than 3,800 children to hospital emergency rooms each year.
- Fires kill more than 600 children ages 14 and under each year and injure approximately 47,000 other children.

- Approximately 88,000 children ages 14 and under were treated at hospital emergency rooms for burn-related injuries 62,500 were thermal burns and 25,500 were scald burns.
- Hot tap water scald burns cause more deaths and hospitalizations than any other hot liquid burns

Causes:

- The leading cause of home fires and related injuries is home-cooking equipment. However, most fire-related deaths are from residential fires ignited by smoking materials such as cigarettes.
- The leading cause of residential fire-related death and injury among children ages 9 and under is due to carelessness.
- The most common causes of product-related thermal burn injuries among children ages 14 and under are hair curlers, curling irons, room heaters, ovens and ranges, irons, gasoline, and fireworks.
- Most scald burns to children, especially small children between the ages of 6 months and 2 years, are caused by hot foods or liquids spilled in the kitchen, or other areas where food is prepared and served.

Where and when:

- Over half of children ages 5 and under who die from home fires are asleep at the time of the fire. Another one-third of these children are too young to react appropriately.
- Deadly residential fires are most likely to start in a living or sleeping area.
- Residential fires and related deaths occur more often during cold-weather months, December through February, due to portable or area heating equipment.
- Most child play related home fires begin in a bedroom or living room where children are left unattended. The majority of these fires are started by children playing with matches or lighters.
- Approximately 58 percent of all fireworks-related injuries are burns that usually occur to the hands, head, and eyes. The majority of fireworks-related injuries (75 percent) occur during July 4 celebrations.
- Electrical cords and extension cords cause almost two-thirds of electrical burn injuries to children ages 12 and under.

- Two-thirds of residential fires that kill children occur in homes without a validated working smoke alarm. But fire damage makes determining if the smoke alarm was functional difficult if not impossible.

Who:

- Children in homes without working smoke alarms are at greater risk of fire-related death and injury in the event of a fire.
- Children ages 5 and under are more than twice as likely to die in a fire than any other age group.
- Boys are at a higher risk of fire and burn-related death and injury than girls.
- More than one-third of children ages 6 to 14 reportedly have played with fire at least once. Boys are nearly twice as likely to have played with fire than girls.
- Children in rural areas are two and a half times more likely to die in a residential fire than children in large cities.
- African-American children are more than three times as likely to die in a fire than Caucasian children.
- Native American children are more than two times as likely to die in a fire than Caucasian children.
- Almost half of residential fire-related deaths among children ages 9 and under (40 percent) occur when the child is attempting to escape, is unable to act, or is acting irrationally.
- Children ages 4 and under and children with disabilities are at the greatest risk of burn-related death and injury, especially scald and contact burns.
- Boys, especially between the ages 10 and 14, are at the highest risk of fireworks-related injuries. Children ages 4 and under are at the highest risk for sparkler-related injuries.

Smoke alarm and sprinkler system statistics:

- By 2005, the majority of homes (96 percent) in the United States had at least one smoke alarm. However, only three-quarters of all homes had at least one working smoke alarm.
- Automatic sprinkler systems reduce the chance of dying in a residential fire by approximately 62 percent.
- Smoke alarms and sprinkler systems combined can reduce fire-related deaths by 82 percent and injuries by 46 percent.

The ***need*** for the adoption of the DOLI rule is more than just lightweight construction and furnishing mitigation. ***Sprinkler Impact on Fire Injury,*** published by NFPA in October 2012, addressed reductions in rates of fire injuries associated with home fire sprinklers. This project was initiated to develop better estimates of the impact of home sprinklers on fire injury costs, using a more sophisticated approach which explores the impact of sprinklers on fire size, the impact of fire size on burn and other fire related injury, and then assesses the data available on the costs associated with those injuries.

While there has long been data correlating sprinklers with reductions in deaths and property loss, recent research also shows a significant impact on injury cost when sprinklers are present. The cost of burn injuries, in healthcare dollars, is $3.8 billion per year. The average length of stay for a hospital burn patient is 24 days, although it can be months for the severely burned patient. Patients, who do survive acute hospitalization stays, require rehabilitation that is a minimum of seven-times longer than their stays in the hospital, and they may require years of psychological intervention. In addition to the direct health care costs, the social costs of burn injury are staggering. Over one million workdays are lost each year. Human costs are even greater.

- **Sprinklers reduce civilian fire injury medical costs by 53%,**
- **Sprinklers reduce civilian fire injury total costs by 41%.**
- **Sprinklers are responsible for an estimated 65% reduction in firefighter fireground injuries.**

Each year, it is estimated that about one percent, or 2.5 million Americans, sustain a burn injury and one-half will require medical attention or sustain an injury severe enough to restrict some activities of daily living.

- Minor burns, self treated 1,750,000
- Treated by physician (outpatient) 650,000
- Burn patients hospitalized 120,000
- Deaths per year 6,000

Annually, 120,000 people sustain major burn injury that is serious and life-threatening, requiring hospitalization. One in five burn injuries requiring hospitalization exceed 25 percent of the total body surface.

D. Our Nation's Fire Service Response. Ninety-one percent of our nation's fire deaths in structures are in homes! One must not assume that the fire service is willing to ignore the fact that 91% of our nation's fire deaths and 94% of firefighter deaths occur in residential occupancies. There are numerous examples where smoke detectors have saved lives and their use is highly recommended by our nation's fire service. But the reality of smoke detection devices – they give the home occupant *the opportunity* to respond to save their life. Fire death statistics show that the most vulnerable to fire are the young and the old – or those who often cannot respond promptly to the fire alarm. It is significant to note that today's new home and its contents burn at a much faster rate than older homes significantly reducing safe exit timelines. Children under five and adults 65 and over face the highest risk of fire death.

What has the fire services so convinced is the reality that these fire deaths can be ***reduced by a minimum of 82%*** if new technology residential fire sprinklers were installed along with the smoke detectors. But this study was done 25 years ago when quick-response residential fire sprinkler technology was at its infancy. If this test were to be done today, we suspect the reductions in fire deaths if a fire sprinkler was installed in homes along with smoke detectors to approach 98%. Approximately 134,985 lives were lost in homes during the past 35 years in our nation – a 98% reduction would mean 132,285 lives could have been saved and even with the dated 82% conservative reduction rate we still could have saved over 110,687 lives from home fires. The fire service has been asking for decades – ***when are we going to start building new homes fire safe?*** Actually today's homes because of lightweight construction practices and faster burning furnishings are less safe than homes built 20 years ago.

Code revision cycle after cycle, fire safety features felt needed by our nation's fire service have not been approved by the code committee. The voting process of ICC requires a 2/3rds vote to overrule a committee vote. Those who vote on final code adoption are code officials, the building and fire officials, but getting a 2/3 vote to overrule the committee is difficult if not impossible. The fire service came in force at one code hearing in New York state but it was still not enough to produce the 2/3 vote. This motivated the fire service whose large contingent came to the Minnesota hearing of the 2009 edition of the IRC where the committee vote was overturned in favor of life and property safety by over 73% of the votes. Then at the Baltimore ICC Code Hearings, the IRC Committee finally got the message from the fire service; the IRC Committee voted to retain the fire sprinkler requirement in the 2012 Edition of the IRC. The

message from the fire service is simply this – we have had enough; it is time all embrace fire safety to protect the public and the firefighters of America; if you responded to the concerns of the fire service in 1982 when the first study promoting the fire sprinkler concept in homes was released, tens of thousands of lives would have been saved. But then the $8 billion annual home rebuild market would also be diminishing.

TAB B – HOUSING MARKET ECONOMICS

The key factors in home buying are the amount of money available for down payment, credit rating, ability to make the monthly payment and interest rates. Granite countertops, kitchen islands, the cost of electrical wiring, fire sprinkler systems and other construction features are not factored in to one's ability to qualify for a home loan. In reviewing my bio at Tab H you will see that one of my degrees is in Economics.

The homebuyer comes with an upper borrow limit, say $250,000 for example, which is again based upon credit rating, income, down payment and other financial factors. So the homebuyer looks for the home (new or existing) that is under the $250,000 limit and notwithstanding the cost of the granite countertop, exotic bathroom fixtures or other visible and non-visible features such as fire sprinklers, the buyer decides which home they wish to purchase that is priced within their limit. The homebuilder builds a home with a target price range, prices that will mostly peak at the high end of housing that will sell in the neighborhood within which the home is built. Housing prices are based on the maximum one can expect to get for the new home. To maximize profit margin as the selling price is negotiated and not fixed, the builder wishes to spend the least amount of money building the home to maximize profit margin. To put this point another way, if the homebuilder was building a home to be offered for $250,000 and the lumber costs came in $5,000 under budget, and all other construction costs were on target, does this mean that the home now will be listed for $245,000? And what if during construction the house next door sells for $350,000, will the listing price stay at the planned $250,000.

And we have homebuilders that offer free granite countertops; they obviously are not free to the builder. http://www.hhhunthomes.com/hhhunt-homes-to-give-first-three-collington-homebuyers-free-granite-kitchen-countertops-and-up-to-7000-in-paid-closing-costs/ We also have homebuilders that offer free fire sprinkler systems; again they are not free to the builder. http://www.islandharborconstruction.com/

The root to the homebuilder's opposition is simply profit margin. The homebuilder wishes to build the home at the absolute lowest cost and sell the home at the absolute highest price. The homebuilder associations have a long history of opposing any code requirement that adds to then construction cost including strong opposition when smoke detectors (Tab B1), GFCIs, arc-fault detectors (Tab B2) and other life safety features were added into the national

model codes. Instead of embracing fire and life safety concerns the builders argue the added cost will chase away homebuyers and the reason the requirement was added to the codes was because of greedy product manufacturers (B2). But the reality is the homebuilder's effort is to protect their bottom line by opposing anything that adds cost to construction, the profit margin is the major factor. Fire sprinklers were added into the national model codes to mitigate fire safety concerns with newly constructed homes clearly outlined at Tab A; fire and life safety concerns the homebuilding industry chooses to ignore and DOLI chooses not to ignore as they see a ***need*** to correct the emerging national fire safety problem in new homes and the proposed Rule is a step towards fire safe Minnesota. So now you face the question of identifying if there is a ***need*** for this Rule adoption and we suggest that allowing homebuilders to build new homes in non-compliance with the national model codes is not in the best interest of the public, local government and inevitably the homebuilder (Tab F).

How do fire sprinklers or granite countertops factor in on housing market recovery? They simply do not. The sales price of the home is negotiated. The negotiated sales price is for the entire package, it does not matter to the buyer what the electrical wiring costs, or the cost of drywall or fire sprinklers, they are paying for the entire package. What the issue is really about is what it cost the homebuilder to build as they seek the greatest margin between the cost to build and the negotiated sales price. The negotiated sales price is also impacted by many other factors such as community taxes. The best path for BAM is to accept building in compliance with the national model codes and shift their efforts towards seeking incentives as outlined at Tab G.

Understanding the Root Cause of Housing Market Problems and Recovery: To put this into a real world perspective, the 2003-2006 rapid growth of the housing market, or the bubble, as prices rose at an incredible rate; *there was also a rapid increase in sales* – never been better for the homebuilder – huge increases in prices and huge increase in sales. Economic theory suggests as prices goes up sales go down. The rapid growth market experienced by the homebuilding industry from 2003-2006 will never return – mortgage lender restrictions are in place to help prevent a recurrence. And the housing market has changed and with the change must come change within the building industry with the first being acceptance of the concept of protecting the buyer from tragedy.

The mortgage system must be understood. When you take out a mortgage, it is typically packaged with thousands of others and turned into a security that is bought and sold by investors.

During the height of the bubble in 2005-2006, the mortgage securities industry flowed huge sums of money. About $1.2 trillion worth of mortgaged backed securities were issued in 2005. As the housing market bubble burst and losses piled up, the value of new securities issued annually plummeted 90%. Most of the securities business in 2009 was repackaging old loans into new investment packages.

Now comes the Federal government to bail-out holders of these failing securities who experienced a 90% loss in value of mortgage securities. Mortgage brokers were not concerned about the borrower's ability to pay as they sold the mortgage in the securities market soon after closure. The government rescued a large part of the securities as they invested $1.25 trillion into home loans buying virtually all the mortgage bonds churned out by Fannie May and Freddie Mac; both probably would have collapsed if the government did not come in with the bail-out money picking up bad loans. The government has replaced private investors such as pension funds and mutual funds that have shied away the mortgage security market since the subprime mortgage crisis. More than 90% of home loans today have some form of government backing compared to 30% at the peak of the housing boom. Foreclosures have escalated. Private investors want to return but fear systemic problems and excessive government controls. For housing recovery to occur the Federal government needs to shed its near total control over mortgage bonds and securities – restore the free market trading of mortgage securities. But unless there are some mortgage lending controls consumer and investment confidence will wane.

But private investors will be extremely cautious as many lost huge sums of money when mortgage security values plummeted and huge security firms continue to spend billions in employee bonus pools. For certain the private mortgage securities investors will be extremely cautious and are likely to buy only the safest mortgages: those made to buyers with down payments of 20% +, rock solid credit scores and proof of income – no more $500,000 mortgages for part-time taxicab drivers.

Having said all this, the path towards housing market recovery is mortgage security recovery, increases in private investing in mortgage securities, and many other barriers to mortgage lending must improve before there will be housing market recovery. Leading this will be the Federal Government's retreat from holding 90% of mortgage securities rolling back towards its usual 30% backing mostly of lower income homebuyers and this is beginning to happen. Lower income homebuyers are not in the market to buy a 4,500 sq.ft. new home. This

will bring more private investors back to the securities market but the paramount change will be complete and total comfort by private investors that the mortgage borrower WILL be able to make the payments; again high percentage of down payments and strong credit ratings. Then housing sales will increase and as the vast inventory of existing homes is significantly decreased, new housing starts will continue to grow.

While the disconnect between home prices and home sales was not present during the housing boom, it most certainly is now. The public has either lost interest or simply cannot afford to buy into the current housing market. People are paying mortgage rates on a home that is now valued at 30-40% less than what they paid if they bought at the top of the bubble. Home sales are down significantly in cities throughout the nation and will only get better when mortgage lenders again begin to lend and homebuyers have confidence they will be able to sustain a mortgage through this very deep economic recession that is leading to unemployment figures second only to those of the Great Depression. In many regions supply exceeded demand and the new housing recovery was dependant on reducing the existing housing stock. Home sales are picking up, home prices are starting to improve, consumer confidence is improving, mortgage controls are in place and the housing market is seeing recovery but the recovery will not reach the sales level that led to the bubble that burst and caused this recession.

Detailed Economic Theory. As an economist I would like to offer further documents per your request on ***Price Elasticity of Demand for Housing***. The paper is filled with graphs and charts that describe, using studies done by Harvard University and other highly recognized economists, that the price elasticity of demand for housing is very inelastic underscoring the fact that notwithstanding what is added or not added to the home the final sales price is negotiated. This lengthy document is not included here as a distraction but the point I wish to make is not only I but Harvard University studies and others argue the price elasticity of demand for new housing is very inelastic. The focus of this paper is to determine if a minor increase (1%) in the price of a new home has a substantive impact on the ability of the homebuilder to sell new housing stock, the demand for housing and the finding that there are no measurable impact. Again, this document will be forwarded upon request

The "Glitter" Factor. The new homebuilder's biggest competition is the existing home market. The National Association of Home Builders (NAHB) and the National Association of Realtors both have active web sites that paint the housing market picture. From these sites one

can gleam a number of key factors. One, the volume of new homes available for sale verse existing homes is less than 10%. This means the potential homebuyer has 90%+ more existing homes to view than new homes when deciding what to buy. The median price for new homes is higher than the median price of existing. Many existing homes were purchased at a much lower cost and over time their value per square foot has escalated mainly because of inflation but not to the point where the new builder has priced their product.

How does the new home builder sell homes when 90% of their competition typically has a lower price per square foot? Well, the NAHB actively surveys consumers to identify their wants and needs. Used to be that sunken tubs with water jets were high on the list but most who bought homes with this item say they rarely use the tub. So now high on the consumer want list are exotic showers with water release from multiple points. The highest on the consumer want list is a kitchen island and along with this is a high demand for granite or other stone type countertops.

So the existing homebuilder, who only has 10% of the supply available for sale, gains their competitive advantage by adding more "glitter" to their new home. The kitchen island, the granite countertop, and the other high demand items that will make their home stand out above the existing home market is how the new homebuilder gains a competitive advantage. But adding these glitter items cost money – often the reason the median price for new homes is above the median price for existing. To ensure more money can be spent on glitter items, the new homebuilder opposes any and all actions that may raise the cost of the home; thus the root cause for their opposition to fire sprinklers and any other item that adds to the cost of construction.

So when a homebuilder argues that the cost of adding fire sprinklers is chasing away potential homebuyers, what they are really saying is: that they put profit margins above life safety; that the money to be spent for fire sprinklers would be better spent on "glitter" items so they can gain a competitive advantage over the existing home market; that because of high demand the mark-up on glitter items is ten-fold higher than the mark-up they can place on the fire sprinkler system unless they shift sprinklers to consumer choice; and that they do not care about their liability exposure.

There are numerous communities across the nation that have had single-family detached home fire sprinkler requirements for decades and there is no example of a reduction in community growth because of the fire sprinkler requirement – not one example – in these

communities! Scottsdale Arizona is a rapid growth city with over 50% or 45,000+ homes fire sprinkler protected. Prince George's County Maryland showed rapid growth even with the fire sprinkler mandate. And over 160 cities in California have long had home sprinkler requirements and these are rapid growth communities. So suggesting that fire sprinklers alone will drive up the cost of housing making the market fail does not hold water any more than making the same assumption for granite countertops, kitchen islands, and exotic showers. The reality is all of these features can be added into the new home – the homebuyer is stopped by the upper buying price limit established by their creditors, at least now after the inflated housing balloon burst.

The real economic issue is homebuilder profit margin. It is unfortunate that so many cost drivers impact the housing industry to the extent that they aggressively react to each and every cost increase even if it is intended to mitigate a significant life safety concern with their product. The final sales price is negotiated, not set in granite! Again, the homebuilder's mission is to build at the lowest cost and sell at the highest price. Yes, fire sprinklers will add to their costs which they hopefully recover in the negotiated sales price. My recommendation is the builders seek incentives from government as there are significant cost savings achieved by government if a new community is fire sprinkler protected (Tab G).

Zoning rules called factor in housing costs

By G. DAVID WALLACE
Associated Press Writer

WASHINGTON (AP) — The nation's home builders are organizing to fight zoning and code requirements which they say are unnecesary and add 10 per cent or more to the already spiraling cost of a new house.

The builders say the added costs are part of the reason why the price-tag on housing is so high that many Americans cannot afford to buy a new home. Others say that land costs are more directly to blame.

Still others say the cost of financing over the past 10 years has added much more to the price of housing than have building costs; and these costs, responsible for a widening gap between average worker income and new home prices, have priced more and more of the population out of the market altogether.

The builders' answer to this problem recently has been the "no frill" house — an effort up to now largely unsuccessful, which is one reason for seeking reconsideration of regulations such as those requiring wide streets, outdoor electrical outlets and smoke detectors.

The median price of new homes sold in the United States during April was $48,600, an increase of $4,100 from April 1975. The 9.2 per cent jump compares to a 6.1 per cent jump in all consumer prices.

Zoning ordinances, building codes, environmental regulations and federal construction standards add to the cost of a new home, but there is disagreement about which items are among those the Florida Home Builders Association calls "nice, but not necessary."

In its listing, the Florida group finds 64 stipulations it considers unnecessary in local, state or federal laws.

"There are a lot of things we've had to add that provide a benefit. But in view of all the people we are putting out of the market, is it reasonable to have all these rules and regulations?" asks John Crosland, a North Carolina builder who heads the newly formed National Association of Home Builders panel coordinating the nationwide deregulation effort.

However, Robert W. Buskirk, U.S. Department of Housing and Urban Development regional director in Florida, says, "They are beating the wrong horse. The builders should approach the problem of land costs. They have not been innovative in trying to meet this situation."

The builders say land is not a commodity they produce and they thus have little control over it. They also say the increases in home prices come despite their best efforts to hold their own costs in check.

Michael Sumichrast, chief economist for the National Association of Home Builders, says that in 1970 a developed lot accounted for 20.3 per cent of the cost of the $24,500 median-priced new home.

By 1974 a 61.6 per cent jump in land costs had outpaced the over-all increase of 53.5 per cent for the median home and land and development costs now account for 25 per cent of the cost of a new home. Even so, lots are generally smaller.

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Your Home Is Our Business

5

February 15, 2011

To: Senator Joan Hartley, Co-Chairman
Representative Steve Dargan, Co-Chairman
Members of the Public Safety and Security Committee

From: Bill Ethier, Chief Executive Officer

Re: **House Bill 6296, An Act Adopting the National Electrical Code, the International Plumbing Code, the International Mechanical Code, and the International Fuel Gas Code**

The HBA of Connecticut is a professional trade association with 1,100 member firms statewide, employing tens of thousands of Connecticut citizens. Our members, all small businesses, are residential and commercial builders, land developers, home improvement contractors, trade contractors, suppliers and those businesses and professionals that provide services to our diverse industry. Our members build 70% to 80% of all new homes and apartments in the state each year.

Summary & Background: The HBA of Connecticut strongly opposes HB 6296. The National Electrical Code (NEC) is a national model code written by the National Fire Protection Association (NFPA). The NFPA is different from the International Code Council (ICC) that writes many other model building codes, including the international codes referenced in HB 6296. Both NFPA and ICC update and amend their model codes on a three to four year cycle. Both organizations support themselves financially by selling their new code versions. The Connecticut State Building Code is made up of mostly ICC model codes and some NFPA model codes, with Connecticut specific amendments and exceptions. The current Connecticut State Building Code includes the 2005 NEC. The state Codes & Standards Committee within the Dept. of Public Safety is currently reviewing for adoption the 2008 NEC version, along with the 2009 versions of the ICC set of model codes, of which there are many.

Reasons to Oppose HB 6296:

- **Current law requires the state to adopt a State Building Code "based on a nationally recognized model building code." Reference to any specific national model is not in the statute for good reason.** By not referencing any specific national model, the Codes and Standards Committee may review, adopt and coordinate the model codes it determines to be best for Connecticut. HB 6296 would severely restrict this beneficial goal.

- **The model codes are not perfect and they require technical review before adopting them as law. House Bill 6296 would require the adoption of the latest revision to the NEC and other models referenced and subsequent versions within one year of publication.** The language "as deemed necessary" is qualified by "but in no event later ...." This is contrary to the State Codes & Standards Committee's beneficial practice of reviewing but not necessarily adopting each version of national model building codes. The state occasionally skips a model code version or waits for other states to adopt a specific version to see what problems arise or how known issues are addressed so that Connecticut can adopt better-informed amendments and exceptions. Skipping

certain versions of model codes also saves the state money because the code adoption regulatory process is very expensive and time consuming. Thus, this bill will cost the state more money to implement.

- **Moreover, the 2008 NEC version contains specific requirements, not included in the currently used 2005 NEC, to which we strongly object.** These include the requirement to install arc-fault circuit interrupters (AFCI's) in every branch circuit in a new home, and the requirement to install tamper-resistant (TR) receptacles throughout a new 1 & 2 family home. Proponents of these requirements, including the Electrical Manufacturers Association, have argued that these are safety measures, but we urge you to review the attached documentation that seriously questions these safety claims. On the contrary, there are strong profit motives (to the tune of $2 billion) for the electrical manufacturers that produce AFCI's and TR receptacles to promote the adoption of the mandatory installation requirements contained in the 2008 NEC. The model code organizations also have a vested interest in promoting mandatory adoption of each version of their codes because they make money by selling new books. **The important point relative to HB 6296 is that these technical arguments should be made before the State Codes & Standards Committee when, and if, it considers the adoption of the next version of the NEC and other model codes.** It is the only technically-competent body to determine whether a particular model code version should be adopted and if so with or without exceptions.

- **The training of electrical or other trade contractors that is conducted by certain organizations should be based on the current code that is in place (i.e., the State Building Code), not on a national model code that has yet to be adopted in Connecticut.** To argue that training must keep up with the model code adoption process makes no sense if for legitimate reasons the state does not adopt that latest version. Contractors, then, would be learning practices and code provisions that are not yet applicable to Connecticut, and may never be. Rather than change the law to accommodate current training practices, which produce substantial revenues for the organizations offering the training, we suggest their training practices should change when Connecticut's regulations change.

- **These bills are also contrary to the goals of the Coalition for the Adoption of a Unified Code (CAUC) to eventually have Connecticut adopt one, coordinated, unified set of codes by which building designers, building engineers, builders, subcontractors and code officials can use to ensure the safety of Connecticut's citizens in the most cost efficient manner as possible.** While we are one of the founding members of CAUC, we do not presume to speak for the coalition, but statutorily mandating the adoption of one specific national model code (e.g., NFPA's NEC) for one component of building construction (i.e., electrical) greatly subverts this goal.

Conclusion: For all of the reasons above, please do not support HB 6296. Let the state's Codes and Standards Committee decide which model code, which version and what exceptions, if any, may be appropriate for Connecticut. Thank you for the opportunity to comment on this legislation.

National Association of Home Builders Recommended State & Local Amendments to the 2008 Edition of the National Electrical Code (NEC)

Issue: Arc-Fault Receptacles

2008 NEC Section: Section 210.12 (B)

Recommended Amendment: Delete text as follows

~~(B) Dwelling Units. All 120-volt, single phase, 15- and 20-ampere branch circuits supplying outlets installed in dwelling unit bedrooms, family rooms, living rooms, parlors, libraries, dens, sun rooms, recreation rooms or similar rooms shall be protected by a listed arc-fault circuit interrupter, combination type installed to provide protection of the branch circuit.~~

Reason:

During the recent code revision cycle to the 2008 *National Electrical Code,* there was a lack of fire data used to support the expansion of arc-fault circuit interrupters (AFCI's) to all receptacles in the dwelling, let alone the mandatory installation of AFCI's in bedrooms. Looking at the latest data from NFPA in the report "The U.S. Home Product Report (Appliances and Equipment Involved in Fires)", by John R. Hall, Jr. of the Fire Analysis and Research Division of NFPA dated November 2005, the report shows that the annual average of fires in all homes is 372,900, with direct property damage of $443,000,000. Of this number 32,000 (or 9% = $39,870,000) of these fires are caused by "electrical distribution equipment." Of that 9%, only 14,500 (or 4% = $17,720,000) of those fires are attributed to "fixed wiring, switches, outlets, and receptacles." And, there is no data or study to support that of these 14,500 fires the installation of an AFCI device would have prevented the fire. Using the U.S. Census Bureau data on building permits for 2004 (Table (S-3) Final) shows 1,656,413 one- & two-family dwelling units and 413,664 multifamily units for that year.

Calling this a "limited approach to the expansion of AFCI" still does not result in any cost-benefit to society. It just needlessly increases the cost of housing. There is still no justification for any jurisdiction to burden its citizens with this unneeded expense. As it was during the 1999 revision cycle, there has been a failure to provide any fire study or cost benefit study to support installing these devices in bedrooms. Since then NO data or study has ever been assembled to support the expansion to the whole house.

There are typically 20 (twenty) 120-volt, single phase, 15- and 20-ampere branch circuits in each one- & two-family dwelling unit, and 10 in each multifamily dwelling unit. Using these numbers, there will be approximately 33,128,260 AFCI's in one- and two- family dwellings and 4,136,640 for multifamily units, for a total of 37,264,900 AFCI's. Using a wholesale cost of $34.00 per breaker, marked-up the industry standard percentage of 66%, produces a cost per breaker of $56.44 to the home owner. In all, the average annual total cost to the public for the mandatory installation of AFCI's will be $2,103,230.956 ($1,267,006,600 wholesale). That is 2 BILLION, 130 MILLION, 230 THOUSAND, and 956 DOLLARS, per year. Using current fire loss data, society will be spending $2,103,230.956 per year to cover losses of only $39,870,000 [and that is assuming AFCI's will prevent ALL electrical distribution equipment caused fires].. That means spending 52 times the amount of money that would be loss if the devices were not installed, and that is if the devices work 100% of the time. If you use the losses relating only to "fixed wiring, switches, outlets, and receptacles" (the part of the wiring that is claimed to be protected by AFCI breakers) the ratio to money spent relative to monetary loss ($17,720,000) is 119 times, again, if they work 100% of the time.

If you break that down by each state, that lack of a cost-benefit becomes apparently clear. All jurisdictions that contemplate adopting the 2008 NEC, especially jurisdictions that are required by law to show a cost-benefit in the adoption, are encouraged to look closely at this cost-benefit fact and not adopt the 2008 NEC until all provisions requiring AFCIs are stricken (Section 210.12). In addition, there is no data to support the contention of neither "excellent track record", nor information that these "installations have found numerous wiring errors" or "they have found wiring damage and equipment damage that could have been a potential sources of fire." That statement alone provides no correlation between the purported problems and the use of AFCI's. The Panel needs to reconsider the mandatory installation of AFCI's, let alone the expansion of requiring these devices for all 120-volt, single phase, 15- and 20-ampere branch circuits in dwelling units. Until true field test data on the efficacy of AFCI's can be directly related to saving society monetary loss there is no cost benefit in this provision.

Staff Contact: Steven Orlowski - sorlowski@nahb.com - 800-368-5242, ext. 8303

National Association of Home Builders Recommended State & Local Amendments to the 2008 Edition of the National Electrical Code (NEC)

Issue: Tamper-Resistant (TR) Receptacles

2008 NEC Section: Section 406.11 Tamper-Resistant Receptacles

Recommended Amendment: Delete text as follows

~~**406.11 Tamper Resistant Receptacles in Dwelling Units. In all areas specified in 210.52, all 125-volt, 15- and 20-ampere receptacles shall be listed tamper resistant receptacles.**~~

Reason:

This new requirement is not based on sound technical information that adequately substantiates that such a requirement will result in protecting small children from burns or injury. During the previous code revision cycle to the *National Electrical Code*, the supporting documentation for the proposal was based on the summarization of several National Electronic Injury Surveillance System reports from 1991-2001. The NEISS system gathers its data by sampling a group of monitored hospitals for the total number of injuries treated. They then take these figures and calculate the estimated national average. The NEISS reports do not provide any supporting information of where the child was located at the time the injury occurred, much less that that all incidents occurred in dwelling units or if any child safety devices were present at the time the injury occurred. There is no scientific research available which has proven tamper-resistant receptacles are more effective than other safety devices that are currently available on the market. The fact sheet, produced by the National Fire Protection Association, states that TR receptacles are preferred over plastic safety caps for the reason that the caps **may** be lost and **may** be a choking hazard for some ages.

Based on the supporting information given at the time of the proposal, it is still unclear why dwellings were singled out among all other related occupancies were children are found and often left unattended. In the substantiation it was noted that these devices are designed to protect children when their parents or guardians turn away for that split moment when a tragedy could occur. This type of tragedy could occur in any number of occupancies that children are present, not just in one- and two-family dwellings. As written, the proposal is too broad in scope and requires tamper-resistant receptacles in areas of the home that should not pose a threat to unattended children. Receptacles that are not readily accessible or that are dedicated for equipment should not be required to be tamper resistant. Examples of these areas that tamper-resistant receptacles should not be required are those found in attics, crawlspaces, mechanical rooms, behind equipment such as dishwashers, stoves, refrigerators, countertops, etc. To require tamper-resistant receptacles in these and other areas, not accessible to children under the age 4, shows a complete lack of forethought of the code requirement and a lack of common sense on the part of the committee that approved the proposal. To arbitrarily require without any supporting statistics or data linking these areas to any recorded instance of an injury, shows a complete lack of due process.

Another concern that was shared by many on the technical review committee was the amount of force that must be applied to insert cords into the tamper-resistant device and how it will affect the elderly community. The devices are designed in a way that the springs will not open unless the prongs are properly aligned with the shutters and are receiving equal amounts of pressure. Many on the panel voiced their opinions that there was a lack of product testing showing whether there will be an impact to the aging community's ability to use the new devices.

NAHB urges all jurisdictions that will be adopting the 2008 edition of the National Electrical Code to amend by deleting Article 406.11.

Notes/additional background:

During the 2008 revision Cycle, the National Electrical Manufacturers Association submitted the proposal to require tamper-resistant receptacles in all areas of a dwelling as indicated in Article 210.52 of the NEC©. Over 29 negative comments were submitted in response to the proposal and all 29 comments were rejected by the technical committee. The negative comments were submitted by electrical contractors, electrical inspectors, and some manufacturers. Below is a list of concerns that were raised by negative comments:

1. The required force to insert cords into the device may prove too much for the elderly or disabled.

2. There is no scientific data directly comparing current available safety devices to tamper-resistant receptacles to support the claim that TR are more effective and will reduce the number of accidents.

3. That the proponent should provide data listing the areas of the dwelling where injuries have occurred, thereby proving the need for tamper receptacle in areas such as attics, crawlspaces, mechanical rooms, countertops and other areas where the receptacles are normally out of reach of children.

4. At the time the proposal was approved, it was unknown whether any manufacturers were producing tamper-resistant devices that were compatible or integrated with arc-fault and ground-fault circuit interrupters.

5. The supporting documentation submitted by the proponent clearly stated "the results of these incidents are rarely fatal", and that further research should be conducted along with more product development before any such mandate should be implemented.

6. That the technical committee should remember, the code is not able to protect each person, in every situation, from every conceivable harm and should not be used as a tool to differ the responsibilities of the parent or caregiver who should be monitoring the children.

7. That the substantiation lacked any credible justification for disallowing the use of plastic safety caps other than claiming that they could be lost or become a choking hazard.

8. Why limit tamper-resistant receptacles to dwellings? There are several other occupancies that do not require these devices, yet children are present and the receptacles are accessible.

9. Tamper-resistant receptacles should be an option for dwellings that children occupy and not mandatory for dwellings where children are not present.

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TAB C – CONSUMERS CHOICE

The homebuilders argue let the owner decide on whether they want fire sprinklers in their new home. This is like saying let the truckers decide what the speed limit will be on our highways. However, there is a difference, the truckers know the consequences of their speeding; the homebuyer is not aware of the consequences of deleting fire safety and other code required features in their homes. Should the uneducated homebuyer decide on roof truss strength, electrical grounding, load-bearing walls, 14-gage or 24-gage wire in 15 amp electrical circuits? Construction codes are in place to help keep the *Con* out of *Con*struction. Are homebuyers advised that fire sprinklers are code required to offset early home collapse in fires; that if fire sprinklers are deleted that great rooms will be smaller because legacy wood will be used, that escape time is less than 3 minutes because of rapid burning furnishings, basements will have fire resistant ceilings, may need another stairway from the second floor, and a wavier or indemnification is needed to protect the homebuilder from litigation after a fire tragedy. But most critical here is many new homes are already under construction before a homebuyer is identified – are these spec built homes built with old legacy lumber and smaller great rooms and basement ceilings, issues that cannot be corrected after construction has begun? Why should safety items that are required in our nation's model codes be subjected to a decision from the untrained and not technically knowledgeable homebuyer? The homebuilder is placing unknown technical items that have life safety consequences on the same level as the color of the granite countertop. National code requirements must be enforced by government, not left as an option for the untrained consumer to choose. Taking this farther, should the consumer decide on whether or not to build to code, new housing will become the trial bar's new asbestos.

The construction code requirements are in place to protect the public and are considered the base construction costs. Homebuilders make a smaller profit margin on base construction code compliance costs as all builders follow or should follow the same code. The huge homebuilder profit comes from consumer add-ons such as granite countertops, type of flooring, kitchen islands and other glitter items that make the new home attractive. I have seen examples where sprinkler bids to the homebuilder were $2,250 but the builder tells the homebuyer the fire sprinkler will cost $15,000 – a 567% markup. Again, the untrained and uneducated homebuyer needs to be protected in the housing market, the reason the construction codes are in place.

Altering these codes absent alternative safeguards places the buyer in peril. Tab A clearly dimensions the fire safety problem that fire sprinklers mitigate. Eliminate fire sprinklers and failing to address the fire safety problem is not in the best interest of anyone.

BAM, during their presentation cited a survey they conducted which they claim resulted in the majority indicating they wished not to have fire sprinklers installed in their home. The substantive question is, "were those surveyed asked to Internet search ***lightweight construction fire safety*** before they answered the survey?" The US Fire Administration funded Fire Team USA presented educational seminars across the nation detailing today's fire safety problem and demonstrating fire sprinklers in an actual burn, one of hundreds posted on YouTube can be seen at http://www.youtube.com/watch?v=0pFB_N79DiM. Data from Fire Team USA indicates that over 98% of the attendees who attended the day long presentation and witnessed the side-by-side burn demonstration wanted fire sprinklers in their new homes.

My son just bought a house, a new home. He discussed building a new home with the builder and when it came time for discussions on fire sprinklers the builder quickly indicated no interest, said the fire sprinkler would flood the entire house and the annual maintenance cost would be over $1,000, both false and misleading comments. When my son told the builder that he was a Fire Protection Engineer the builder indicated they would install the system but it would cost around $20,000. My son ended up buying a spec built model home from the builder and retrofitted the fire sprinkler system after he moved.

Many within the fire service suggest the biggest opposition from the homebuilders is based on the success of fire sprinklers. Communities that have had fire sprinkler requirements for decades show a significant reduction in property damage, over 95% reduction in property damage. Current data shows annual single-family home fire losses at $8+ billion or a very large rebuild market? There is little to no rebuild market in Scottsdale Arizona which has required new homes to be fire sprinkler protected for over 25 years. The builders position, let the consumer decide we will profit from the mark-up, if they say no we retain our rebuild market.

Let the consumer decide on carpeting or wood floors, granite colors and other features but base construction code requirements should not be an option, particularly when the buyer has no knowledge in the construction process. My son was lucky because of his education.

TAB D – 4,500 FT^2 THRESHOLD

The simply logic is the bigger the home the bigger the fire. The question is at what point will the fire suppression task overwhelm available fire suppression resources? The national model codes will not allow the construction of a 10-story wood frame multi-family structure because it is unquestionably unsafe. These same codes place restrictions on types of construction and size of structures in what is known as Area and Height Tables. But there are far fewer restrictions on single-family homes than commercial structures but restrictions do exist.

As a former fire marshal I was tasked with the role of assisting the community's Growth Management Council. The major task faced by many Growth Management Councils is managing water infrastructure growth. Often there is an impact fee imposed on the homebuilder than is intended to "help" offset the infrastructure build-out but this one-time fee typically does not cover all development costs or long-term maintenance costs.

The criteria in the national model codes for fire hydrant location, spacing and the volume of water flow for fire suppression operations known as *needed fire flow* (NFF) is applied and must be applied to ensure acceptable insurance ratings for the community as discussed at Tab E. Using the simple logic of the bigger the home the bigger the fire suggests the need for more water at the hydrant and this means larger water main infrastructure and higher costs for long term maintenance.

The national model codes provides a *needed fire flow* reduction for all properties that are fire sprinkler protected. For example, in Chapter 18 of NFPA 1, the *National Fire Code,* the needed fire flow at the hydrant can be reduced from 1,000 gpm to 500 gpm which means the water piping can be downsized from an 8-inch to 6-inch. However, this only applies to homes under 5,000 sq. ft. As the size of the home increases so does the needed fire flow and unsprinklered homes 5,000 sq.ft. or more would quickly require the NFF to go to 1,750 gpm or more depending on distances between homes and type of construction, we now are looking at a 12-inch water main.

There is a difference in identifying square footage from a code enforcement and a homebuilder perspective. The homebuilders advertise what they call as "conditioned space" which typically does not include garages and unfinished basements. So a home may be advertised as a 3,000 sq. ft. home with basement and the basement square footage is not figured

into the 3,000 sq. ft. If the basement is finished with ceilings and walls and lighting it may be included in the sellers size estimates. From the code enforcement perspective a basement and a garage is occupiable space and is computed in the total square footage with no distinction between “conditioned space” or built-out and finished space. The number used for NFF are based on the total square footage, not ignoring fire flow demands of the basement and garage settings.

The substantive issue is if there was no threshold the water infrastructure for the new development would have to be planned based upon potential size of the homes. The builders would argue the new home is 3,250 sq.ft. of condition space and the code official would argue yes and we need to add the basement and the garage and other unconditioned space and the home NFF is for 5,000+ sq.ft. meaning I need a larger water infrastructure, a 12-inch water pipe instead of a 6-inch pipe.

The 4,500 sq.ft. threshold in the DOLI Rule is total space, not condition space, and allows for a buffer to avoid water infrastructure upsizing concerns. If the threshold was set at 5,000 sq. ft. then the water infrastructure would have to be upsized from 1,000 gpm to 1,750 gpm or even more if the housing density places homes closer than 30 feet apart, a move from 8-inch piping to 12-inch or even more depending on the density and materials used in construction. If all are fire sprinkler protected then the pipe size could be 6-inches.

While we support the fire service in their request for a zero sq.ft. threshold, we also agree the 4,500 sq.ft. threshold established by the DOLI is not arbitrary and was developed in support of growth management interests.

TAB E: INSURANCE IMPLICATIONS

Code enforcement can have a major influence on the economic well-being of a municipality and the safety of its citizens. Municipalities that adopt up-to-date, unamended codes — and rigorously enforce them using a sufficient number of trained and certified code-enforcement professionals — minimize damage from natural hazards, fire, and other perils, ultimately reducing insurance costs. But there is more than the ISO Public Protection Classification (PPC) or the most commonly known community insurance grading system. This is a multi-faceted issue; the far-reaching implications addressed herein.

Summary. In an effort to simplify the scope of this critical issue I will start with the summary and if more detail is wanted to validate the summary, supporting comments exist in this lengthy document and the many attached Tabs.

Failure to adopt and enforce the national model codes impacts the Building Code Effectiveness Grading Schedule (BCEGS) and will impact insurance costs and disaster funding for a community. What does all this mean? Well, if Community A has a BCEGS Grade of 2 and the neighboring Community B has a BCEGS Grade of 5 there could be 15% less FEMA Disaster recovery funding offering after a tornado disaster for example. Let's use an scenario using two houses of equal value, let's say $300,000, one located in Community A and the other in Community B, each having equal hurricane damage, $60,000 roof and interior damage. The Governor declares a Natural Disaster and FEMA Disaster recovery funding kicks in. FEMA may offer the home in Community A $40,000 to help recover. But the identical home in Community B may only be offered $34,000 or 15% difference. There is a possible 5% change in disbursement between each BCEGS Grade or Community A is a BCEGS Grade 2 and Community B is a Grade 5 or three grade difference = 15%.

And further on this example, the National Flood Insurance Program (NFIP) also uses the BCEGS for rate setting. Those having flood insurance in Community B could be paying more than those for the same value policy in Community A. But it is not just Federal programs; many insurance providers use the ISO Public Protection Classification (PPC) and BCEGS for rate setting and claims payout. ***So failure to enforce the national model code required fire sprinklers in new residential occupancies could lead to a lower disaster recovery rate for all***

commercial and residential property in the community. Please review attached documents to validate these comments and in particular the comments from the South Carolina DOI that analyzed the impact in their state if the code requirements were not adopted, Tab E7 and E8.

A community insurance rating is based upon many factors and one of the most significant factors is water supply or needed fire flow. Applying the fire sprinkler requirement in all new homes during growth means the NFF can be reduced by 50% or stated another way the cost for infrastructure build-out can be substantially reduced. We recommend that incentives to assist the homebuilder in absorbing the added cost of fire sprinklers be offered – see Tab G.

The insurance grading of a community through the ISO PPC program uses water supply as 40% of the grading criteria. The ISO PPC community grade then is a key factor in insurance policy rates within the community. Managing growth ensuring the current national model codes are followed is the basis for the FSRS criteria used by ISO to grade a community. A critical factor ensuring a positive outcome is growth management; installing a water infrastructure for 4,500 sq.ft. homes then building 5,000+ sq. ft. homes results in insurance grading problems.

The BCEGS grade is used by insurers to provide premium reductions established by the ISO PPC. But again, extremely critical is the fact that the BCEGS grade is also a key factor in NFIP premium rates and the percentage of funding that may be available through the FEMA Disaster Funding program.

ISO has informed many communities in the nation that failure to adopt the fire sprinkler requirements in the International Residential Code will cause a one grade change to the worst meaning NFIP rates will increased by at least 5% and FEMA Disaster recovery may be reduced an equal percentage. As communities go through the ISO re-grade process these changes are noted and reported. See Tabs E1-E6.

The South Carolina Department of Insurance reported to its Legislature that of the 241 communities in the state that were under the BCEGS, 129 would be impacted by failure to adopt the code required fire sprinklers in new homes – Charlestown NFIP policy holders would be expected to pay $104 a year more for NFIP coverage. See Tabs E7 and E8.

What will be the insurance implications in the 360 Minnesota communities that are in the BCEGS program should the fire sprinkler requirements in the national model codes be rejected? This should be answered. A BCEGS Grade change clearly impacts new property owners but most importantly it impacts new and existing NFIP policy holders and could also reduce the

percentage of FEMA disaster funding made available to rebuild the community should a natural disaster occur.

Because of multi-billion in claims as a result of flood incidents across the nation in 2012 and 2013, coupled with the NFIP premium rates are expected to increase in an attempt to keep the NFIP actuarially sound. Should the 12,000+ NFIP policy holders in Minnesota pay more so the homebuilders can maximize their profit margin? Tab E9.

The insurance implications are very real and far-reaching and underscore the DOLIs ***need*** to take action to adopt current national model codes.

A more detailed explanation of the issue to validate the above summary follows.

A. Public Protection Classification. ISO's PPC gauges or measures the fire protection capability of the local fire department to respond to structure fires in properties in the community. ISO collects information on a community's public fire protection and analyzes the data using the Fire Suppression Rating Schedule (FSRS). ISO then assigns a Public Protection Classification from 1 to 10. Class 1 represents the best public protection, and Class 10 indicates no recognized protection. A good insurance classification is critical if a community wishes to draw businesses to invest within the community. If I were to build a business that would employ over 100 people one factor in the decision will be what will it cost me to run my business within targeted communities? If insurance grades are excessive in one community I would seek another community that has managed growth with a fire safety focus.

Most insurance companies use ISO's PPC evaluations as a factor in setting the premiums they charge for property insurance; the better the community's PPC grade, the lower the premiums the insurance company would charge for property insurance in that community. ISO's data on fire losses indicates that communities with better fire protection as evaluated by the PPC do in fact tend to have lower losses from fire damage than other communities.

This section gives an overview of the factors that affect a community's PPC rating, how these ratings affect insurance premiums, how the city can have its rating reviewed, and where the city can get more information on the ISO PPC process. Most communities plan their water infrastructure and their fire suppression staffing based upon the American Water Works Association (AWWA) standards, the building and fire codes, and the Insurance Services Organization (ISO) Public Protection Classification (PPC).

Factors for PPC Ratings

ISO's PPC system has been in use since the early 1900's, and has been continuously modified and refined over that time. Using the Fire Suppression Rating Schedule (FSRS), ISO looks at a great deal of specific information about the fire department, the water supply, and the types of property in the community, and uses a fairly complex process to evaluate that information. In general though, here are the factors the PPC system looks at.

Water Supply

Water supply is the most important single factor, and accounts for 40% of the total rating. The FSRS compares the water supply available at representative areas of the community with the amount needed to fight a fire in the types of buildings there are at that location. In addition, there are some specific minimum requirements for specific classes; to be Class 8 or higher, for example, the city must have the water supply and equipment to deliver at least 250 gallons per minute for at least two hours.

Fire Equipment

Fire equipment accounts for 26% of the rating. Again, there are both some specific minimum equipment requirements, and additional equipment standards based on the numbers and types of structures in the community. Regular testing of the equipment is also a factor.

Personnel

Personnel accounts for 24% of the rating; 15% of that is based on the numbers of firefighters available for the initial response and how quickly the firefighters can respond. The other 9% reflects the initial and ongoing training the firefighters receive.

Alarm/Paging System

The alarm and paging system accounts for the remaining 10% of the rating.

When ISO rates a community's fire protection, using the FSRS they then prepare a "Classification Detail Report" which shows in detail how much credit the city received in the rating process for each item reviewed, compared to the maximum credit possible for that item. ISO will also prepare an "Improvement Statement" which identifies what changes a city would need to make in order to move up to a particular grade.

Re-rating the City's Fire Protection

ISO will periodically send the city a "Community Outreach Questionnaire", asking for information about the city's fire protection system. If the city completes and returns the

questionnaire, ISO will check for significant changes in the city's fire protection system that might merit a review of the city's current classification.

Changes in the area served, improvements in the city's water system improvements, additional fire stations constructed, new equipment added, improvements in the city's alarm and paging system, etc., are some of the items most likely to trigger a review. If the city has made improvements in any of these areas, it may be worthwhile to contact ISO to request a survey. The city can also download a copy of the community Outreach Questionnaire from ISO's web site, complete the survey, and return it to ISO to get the process started.

Again, ISO shares the PPC and cost/loss fire data for communities and in some cases differences within large communities with insurance providers who then use this information for premium rate setting purposes. Some communities have little to no growth and a reclassification visit would not be cost/effective. But many rapid growth communities in states like Texas, Florida, California, Arizona can expect accelerated ISO PPC review periods as rapid growth could change the community PPC grade creating less or more risk for insurance providers – many expect at least a 5-year review in rapid growth communities.

ISO is in the process of updating and amending its FSES. It recently changed the grading point schedule to recognize the importance and insurance cost savings of residential fire sprinklers – they have long recognized fire sprinkler protection in commercial occupancies. The new FSES went into effect for all communities that are evaluated or re-evaluated after July 1, 2013. But finding a more prominent standing in the ISO process is the effectiveness of code adoption and enforcement. ISO manages the Building Code Effectiveness Grading Schedule (BCEGS).

B. Building Code Effectiveness Grading Schedule. *The ISO Public Protection Classification is used by insurance companies for rate setting purposes. The BCEGS is used for rate reductions which, depending on the insurance provider can be over 25%. For example Citizens Insurance of Florida, the 9th largest insurance carrier in the nation offers up to a 20% rate reduction based upon the BCEGS grade. But even more critical is the BCEGS is used for rate setting for the National Flood Insurance Program and is also used by FEMA in determination of Disaster Recovery Funding. What this critical point means is property owners, both commercial and residential, will pay substantially more for NFIP coverage and receive a smaller percentage*

of money from FEMA in a community with a bad BCEGS Grade verses one with a good grade. The attached letters at this Tab clearly show the problem.

The BCEGS initiative largely grew out of insurance companies' experience with Hurricane Andrew during 1992 and the Northridge earthquake during 1994. Both disasters demonstrated that buildings that had been built in accordance with recognized building code standards suffered less damage than those that were not. This concept was strongly validated by Hurricane Katrina, which caused $106 billion in damage when adjusted for inflation.

Studies of the Hurricane Andrew catastrophe suggest that total property damage losses might have been 30 to 40 percent less if Florida communities had met current building codes. In addition, it was found that some communities simply didn't have building codes in effect at all. Other places had great building codes in place on paper, but in practice didn't enforce those codes very well.

The prospect of lessening catastrophe-related damage and ultimately lowering insurance costs provides an incentive for communities to enforce their building codes rigorously — especially as they relate to windstorm and earthquake damage. The Building Code Effectiveness Grading Schedule (BCEGS) assesses the building codes in effect in a particular community and how the community enforces its building codes, with special emphasis on mitigation of losses from natural hazards. For each community, ISO's BCEGS program develops a relative Building Code Effectiveness Classification for insurance rating and underwriting purposes. ISO will analyze the data and assign each municipality a BCEGS grade of 1 (exemplary commitment to building-code enforcement) to 10. A community's classification depends on key criteria, including staffing levels and qualifications of plan reviewers and field inspectors, code adoption and amendment, and the community's commitment to building-code enforcement. ISO also takes into account public-awareness programs and code-development activities in a community, details of the building department's review of plans for residential and commercial buildings, thoroughness of the inspection process, and zoning provisions in force to mitigate natural hazards. Again, the ISO PPC establishes insurance premium rates and the BCEGS establishes discounts.

The ISO generated BCEGS is a prime factor in Federally Funded National Flood Insurance Program (NFIP) and FEMA Disaster Recovery Funding. And because of the growing

acceptance of the BCEGS concept we expect more of its features will find its way into the ISO PPC assessment program.

In response, the BCEGS was designed to mitigate losses from natural hazards. For all practical purposes, municipalities with effective, well-enforced codes should demonstrate better loss experience, and their insurance rates should reflect that growth management plan.

BCEGS Rating Factors

The BCEGS rating process is voluntary, and not all cities have chosen to respond to ISO's request for the information needed for the rating process. If a city decides to participate in the rating process, ISO will distribute to city building officials a detailed questionnaire. Once completed, a BCEGS representative visits the city and verifies the city's building capabilities. They use a point-based system to assign the city to a rating class, based on the following elements:

Staffing - 61%; Codes - 18%; Plan review - 11%; Inspection - 10%.

- *Staffing* is the most important single factor, and accounts for over 60% of the total rating. The BCEGS looks at whether the city has enough code enforcement staff for the numbers of permits, plan reviews, and inspections the city handles; the staff's background and experience; the ongoing training staff receives; and the city's practices in supervising and evaluating the code enforcement program.
- The *codes and ordinances* that are in force are the next most important factor, accounting for 18% of the rating. In many states this is largely out of the city's control, since the building and related codes are adopted at the state level. But many states that have adopted statewide codes allow for local amendments to the code. Therefore, if the state removes a critical portion of the national model code the city can retain its higher BCEGS classification through local adoption. If the city doesn't receive the full amount of points possible for having complete and current building and related codes in effect, the points the city receives for its staffing and enforcement practices are reduced by a similar percentage.
- The city's practices and procedures for reviewing building plans (11%) prior to construction and for on-site inspections (10%) account for the remainder of the rating.

After ISO rates a city, the city will receive a "Classification Report". This report shows each item reviewed, the maximum number of points possible for that item, and the number of points the city received. ISO then gives the city a BCEGS grade of 1 through 10 – the lower the city's BCEGS grade the more likely they will receive a lower premium rate for their property insurance. ISO representatives are available to assist the city identify where the city could make changes to improve its BCEGS rating.

BCEGS and Insurance Premiums

Besides developing the grading system itself, ISO also developed a recommended schedule of premium credits to be used with the BCEGS ratings. These recommended credits don't apply to the entire property premium; they're applied only to the "extended perils" portion of the premium. Every insurance company sets its own rates, and it is the decision of the insurance company to adopt ISO's recommended premium credit schedule.

Even with the best possible BCEGS rating, the potential premium savings are modest in many states. ***"Extended Perils" premium rates differ throughout the nation with high risk states for disasters like hurricanes, earthquakes and/or tornados paying much higher premium rates for extended perils than lower risk states.*** And other factors such as NFIP premium rates and FEMA disaster funding create a much larger economic concern for community stability.

Obviously, a good BCEGS rating offers the biggest potential savings in cities experiencing substantial growth and construction. Of course, that's not to say that other cities shouldn't worry about code enforcement. Obviously there are many other good public policy reasons to do a good job of enforcing building codes.

ISO's Public Protection Classification Versus BCEGS

The way the two systems affect premiums is different in a couple important ways. First, when the city receives a BCEGS rating, the rating only affects new construction. There's no effect on the premiums for existing structures. Again, there is an exception to this point being some insurance providers use the BCEGS for premium rate setting purposes instead of the ISO PPC. If an insurer uses the BCEGS for rate setting and the BCEGS degrades, then there could be an impact on existing properties upon policy renewal but there will be an impact in BCEGS grade changes on all new properties. Citizen's Insurance of Florida uses the ISO PPC and BCEGS.

Second, the BCEGS rating that applies to a particular building stays with that building indefinitely. If the city later improves its BCEGS rating, the BCEGS rating that applies to an already existing building doesn't change. Although, if a structural engineer certifies the building's actual construction meets higher standards than what was required by the codes when the building was built, the BCEGS does allow for an upgrade to its rating.

The idea is that the premium rate that applies to a particular building should reflect the construction standards according to when the building was actually built – not the standards that it would have to meet if it were built today.

BCEGS and Flood Insurance Premiums

The city's BCEGS rating can also affect the premiums city residents pay for flood insurance under the National Flood Insurance Program (NFIP). NFIP's Community Rating System (CRS) offers ***substantial discounts*** on flood insurance premiums for property owners in cities who have taken steps to reduce flood risk.

The city's BCEGS rating figures into the NFIP Community Rating System in two ways:

- The CRS gives additional credit points if the city's BCEGS rating is 6 or better.
- A city must have a BCEGS rating of 6 or better in order to qualify for a CRS rating of 7 or better.

In a city where many property owners purchase flood insurance, the effect of the BCEGS rating on the cost of flood insurance through the CRS rating could actually be significantly more financially beneficial than the effect BCEGS has on property premiums directly.

FEMA Disaster Recovery Funding

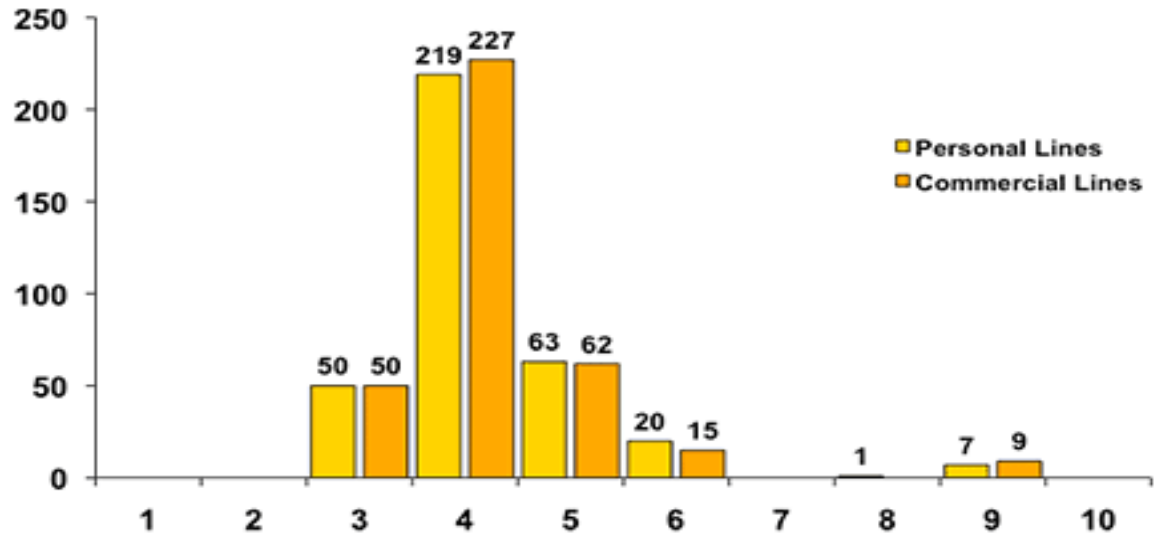
Many natural disasters have had a major impact on FEMA Disaster recovery Funding. The substantive question is should there be a limit? If I build a home or a business in non-compliance with seismic bracing requirements and an earthquake flattens my properties should there be a limit on the money our Federal government distributes? These questions have been answered by Hurricane Andrew and the Northridge Earthquake as many properties built in non-compliance with national model codes were more severely damaged.

What Does Failure to Adopt the Current Model Codes Mean for Minnesota Communities? Minnesota has a very good statewide BCEGS grades compared to other states – very few if any states have a worst BCEGS rating than Illinois. This is largely due to Minnesota community leaders recognizing the need to manage growth. But does a community in Minnesota

have the power to overrule the statewide code requirements? Should the state adopt the codes but remove the fire sprinkler requirement there will be a BCEGS degrade in many Minnesota communities due to action outside of their control; over 50% of the South Carolina Communities were impacted based on a SC DOI study (Tab E7 and E8). This means many Minnesota residents will receive less FEMA Disaster Recovery funding than they would have received prior to the adoption of the current codes – some communities may have already been impacted if an ISO review has recently occur because of the state skipping a code cycle.

MINNESOTA

Distribution of Communities by BCEGS Class
Number within Classifications



Source: http://www.isomitigation.com/bcegs/1000/graphs/MN.html

The BCEGS community ratings as published by ISO show many communities with very good BCEGS grades. This is largely due to the statewide code adoption process although this code may not be applied in rural communities; 87 counties, 202 cities over 3,000 residents and 2,775 townships.

INSURANCE SERVICES OFFICE, INC.

March 24, 2010

ISO has received various requests for information regarding the 2009 International Residential Code (IRC) requirement for sprinkler systems in new one and two family dwellings. In an effort to offer concise and consistent information, we have developed the following information for your consideration when deciding to adopt the 2009 IRC.

Public Protection Classification (PPC™)

ISO has a procedure that reduces the Needed Fire Flow (NFF) for new subdivisions that are built in compliance with NFPA 13D systems (the sprinkler mandate).

Typically, an action such as this would reduce the fire demand and tend to make it easier for the water system – supply works, main capacity and hydrant distribution - to meet the lower fire demand. Therefore, the adoption of a model building code containing a residential sprinkler requirement would be a positive result under the PPC classification process.

The specific purpose of the ISO PPC Program is to gather information needed to determine a fire insurance classification that may be used in the calculation of property insurance premiums or underwriting of insurance risk. It is not specifically designed for property loss prevention or life safety purposes, thus we make no comments on life safety or property loss prevention elements of residential sprinklers.

Building Code effectiveness Grading Schedule (BCEGS®)

BCEGS is another community mitigation program administered by ISO. The BCEGS program gathers information on building code enforcement and adoption to develop a building classification similar to the PPC class. Insurers may use the BCEGS classification as a factor in their underwriting and rate making process. For BCEGS, non-adoption of the residential sprinkler code, or any other modification of the International Residential Code in a negative way, could result in a maximum loss of 5 points out of the 100 point classification schedule. This 5 point loss may or may not result in change to the BCEGS grade. Further, depending on the current BCEGS classification in a community the point loss for lack of sprinkler requirements could affect a community's CRS classification for National Flood Insurance rating.

Homeowner Policy Program Manual

Additionally insurers use a Homeowners Policy Program Manual published by ISO to determine the cost of homeowner insurance. The Department of Insurance in each state approves this manual. The manual allows an insurer to give up to a 13% discount for homes with residential fire sprinkler systems installed. As these credits are optional, companies determine eligibility and availability.

Example of Rating Impact in Florida

Assuming a Homeowners policy premium of $1000, the following is an example of the potential impact of removing the sprinkler mandate from the International Residential Code under the ISO filed manual rules in Florida:

BCEGS Impact - (assuming community moves from one BCEGS rating band to another BCEGS rating band due to the 5 point reduction in BCEGS points)
Could result in a premium increase of $15 to $60 per policy - depending on the rating territory.

Sprinkler Discount - Could result in ineligibility for a sprinkler discount which could be as high as $130 per policy, for those homes that did not install sprinklers.

NOTE: THIS EXAMPLE IS FOR ILLUSTRATIVE PURPOSES ONLY AND DOES NOT REFLECT THE ACTUAL PREMIUM IMPACT ON ANY PARTICULAR INSURER'S BUSINESS IN FLORIDA

INSURANCE SERVICES OFFICE, INC.

www.isomitigation.com 800-444-4554

RESIDENTIAL SPRINKLERS ISO FACT SHEET

ISO is an independent statistical, rating, and advisory organization that serves the property/casualty insurance industry. ISO is the leading supplier of underwriting information, advisory loss costs, supplementary rating information and standardized policy language to insurers in all 50 states and the District of Columbia. ISO offers the following regarding how residential sprinklers are reflected in ISO's advisory residential property programs:

PREMIUM DISCOUNTS

The standard ISO Dwelling Fire and Homeowners Programs contain available premium Credits for installation of fire sprinkler protection up to a maximum of:

- 13% for full sprinkler protection that includes all areas of a home, including attics, bathrooms, closets, and attached structures;
- 8% for fire sprinkler protection of all areas of a home excluding the attic, bathrooms, closets, and attached structures as long as fire detection equipment is installed in those areas where sprinklers are omitted;

Individual insurer programs may provide different credits.

SPRINKLER "LEAKAGE" COVERAGE

The presence of a residential sprinkler system may raise concern about the risk of accidental water leakage from the system. ISO's standard Homeowners policy forms provide coverage for "…accidental discharge or overflow of water…from within a…fire protective sprinkler system…". This coverage is included in the basic policy. There is no extra charge for this coverage.

Also, coverage is provided for water damage related to the suppression or extinguishment of a covered fire.

Individual insurer programs may provide variations to this coverage.

BUILDING CODE EFFECTIVENESS GRADING SCHEDULE

The ISO Building Code Effectiveness Grading Schedule (BCEGS®) is used to review public building code enforcement agencies and to develop a classification that is provided as advisory information to insurers who may use it for insurance underwriting and rating. If the requirement of the International Residential Code (2009) for automatic fire sprinkler protection of residential dwellings was removed by legislation or local ordinance, BCEGS would not provide full recognition for adoption of code without amendments. A building code enforcement agency which adopted a code with amendments that weaken hazard mitigation issues as defined in the model codes and referenced standards would not receive maximum recognition for code adoption.

TRAVIS 981-524-1026

ISO

4 B EVES DRIVE SUITE 200 MARLTON, NJ 08053 (856) 985-5600 FAX: (856) 810-9065

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January 27, 2010

Honorable Claire Higgins, Mayor
Northampton
210 Main Street
Northampton, MA 01060

RE: Building Code Effectiveness Grading Schedule Classification Results
Northampton, Hampshire County, MA

Dear Mayor Higgins:

We wish to thank you and Mr. Anthony Patillo for the cooperation given to us during our recent Building Code Effectiveness Grading Schedule (BCEGS) survey. Insurance Services Office, Inc. (ISO) is the leading supplier of statistical data, underwriting information, and actuarial analysis to the property/casualty insurance industry in the United States. The BCEGS classifications are distributed by ISO for use by property/casualty insurers to assist in their insurance underwriting and premium development programs for residential and commercial properties. Insurers can use the BCEGS classification number to offer insurance premium discounts to eligible properties in Northampton.

ISO has completed its analysis of the building codes adopted by your community and the effort put forth to enforce those codes. The resulting BCEGS Classification is a Class 9 for 1& 2 family residential property and a Class 9 for commercial and industrial property. The new Classification is a regression from the former Class 5 for 1& 2 family residential property and Class 5 for commercial and industrial property. The principal reason contributing to this regression is:

- MA State Building Codes do not represent the latest edition of Model Codes available.

A revised BCEGS classification would apply to new buildings receiving a Certificate of Occupancy during or after the calendar year in which the revision takes place.

It is apparent that the primary reason for this regression is mandated by a higher authority and not within the control of your jurisdiction. Nevertheless, before we re-classify your community to reflect this change, we would like to know if Northampton desires to develop an improvement program in other areas to better their BCEGS classification.

If this letter is acknowledged by March 1, 2010 advising us that this matter will be reviewed within the next three months we will postpone the implementation of the classification changes.

After review, if it is your decision to begin an improvement program to regain PL Class 5 and CL Class 5, we will need to receive, by June 1, 2010, a list of the changes you intend to make. Additionally, we would appreciate your estimate of the amount of time which will be needed to complete each item. No re-classifying action will be taken if changes are implemented to regain the current classification within one year of the receipt of this letter.

We want to highlight the fact that the ISO Building Code Effectiveness Grading program is an advisory insurance underwriting information and rating tool. It is not intended to analyze all aspects of a comprehensive building code enforcement program. It is not for purposes of determining compliance with any state or local law nor is it for making loss prevention or loss safety recommendations.

If you have any questions about the classification that was developed, please let us know.

Sincerely,

Jeff Howe

Community Mitigation Analyst
(856) 985-5600 FAX (856) 810-9065

cc: Mr. Anthony Patillo, Building Commissioner

INSURANCE SERVICES OFFICE, INC.

111 NORTH CANAL STREET SUITE 950 CHICAGO, ILLINOIS 60606-7270 (312) 930-0070 (800) 444-4554 FAX: (312) 930-9394

March 9, 2011

Mr. Craig Owens, City Manager
City of Clayton
10 North Bemiston Avenue
Clayton, MO 63105

RE: Building Code Effectiveness Grading Schedule Classification Results
City of Clayton, St. Louis County, Missouri.

Dear Mr. Owens:

We wish to thank you and Mr. Steven Askins, CBO, for the cooperation given to us during our recent Building Code Effectiveness Grading Schedule (BCEGS) survey. Insurance Services Office, Inc. (ISO) is the leading supplier of statistical data, underwriting information, and actuarial analysis to the property/casualty insurance industry in the United States. The BCEGS classifications are distributed by ISO for use by property/casualty insurers to assist in their insurance underwriting and premium development programs for residential and commercial properties. Insurers can use the BCEGS classification number to offer insurance premium discounts to eligible properties in Clayton.

ISO has completed its analysis of the building codes adopted by your community and the effort put forth to enforce those codes. The resulting BCEGS Classification is a PL Class 3 for 1& 2 family residential property and a CL Class 2 for commercial and industrial property. The new Classification is a regression from the former PL Class 2 for 1& 2 family residential property. The principal reason contributing to this regression is:

- The adopted residential code does not contain a mandatory requirement for the installation of fire sprinklers in all one and two family dwellings. The residential code has been amended in compliance with a Missouri State Law regarding the installation of fire sprinklers.

A revised BCEGS classification would apply to new buildings receiving a Certificate of Occupancy during or after the calendar year in which the revision takes place.

It is apparent that the primary reason for this regression is mandated by a higher authority and is not within the control of your jurisdiction. Nevertheless, before we re-classify your community to reflect this change, we would like to know if Clayton desires to develop an improvement program in other areas to better their BCEGS classification. If this letter is acknowledged by April 9, 2011 advising us that this matter will be reviewed within the next three months we will postpone the implementation of the classification changes.

After review, if it is your decision to begin an improvement program to regain PL Class 2, we will need to receive, by June 9, 2011 a list of the changes you intend to make. Additionally, we would appreciate your estimate of the amount of time which will be needed to complete each item. No re-classifying action will be taken if changes are implemented to regain the current classification within one year of the receipt of this letter.

We have attached a copy of our report which will provide you additional information about the classification process and how we evaluated various aspects of your community's building codes and their enforcement. We want to highlight the fact that the ISO Building Code Effectiveness Grading program is an advisory insurance underwriting information and rating tool. It is not intended to analyze all aspects of a comprehensive building code enforcement program. It is not for purposes of determining compliance with any state or local law nor is it for making loss prevention or loss safety recommendations.

If you have any questions about the classification that was developed, please let us know.

Sincerely,

Thomas A. Geibel
Building Code Department
Building Code Department
(800) 930-1677 ext. 6208
(312) 930-0038 fax

Enclosure

cc: Mr. Steven Askins, CBO, Building Official w/enclosure

111 NORTH CANAL STREET SUITE 950 CHICAGO, IL 60606-7270
TEL: (312) 930-0070 (800) 444-4554 FAX: (312) 930-0017

January 6, 2011

Mr. Chris Kukulski, City Manager
City of Bozeman
P.O. Box 1230
121 N. Rouse Ave
Bozeman, MT 59771

RE: Building Code Effectiveness Grading Schedule Classification Results
Bozeman, Gallatin County, MT

Dear Mr. Kukulski:

We wish to thank you and Mr. Bob Risk for the cooperation given to us during our recent Building Code Effectiveness Grading Schedule (BCEGS) survey. Insurance Services Office, Inc. (ISO) is the leading supplier of statistical data, underwriting information, and actuarial analysis to the property/casualty insurance industry in the United States. The BCEGS classifications are distributed by ISO for use by property/casualty insurers to assist in their insurance underwriting and premium development programs for residential and commercial properties. Insurers can use the BCEGS classification number to offer insurance premium discounts to eligible properties in Bozeman.

ISO has completed its analysis of the building codes adopted by your community and the effort put forth to enforce those codes. The resulting BCEGS Classification is a Class 4 for 1& 2 family residential property and a Class 3 for commercial and industrial property.

The new Classification is a regression from the former Class 3 for 1& 2 family residential property. The principal reasons contributing to this regression are:

- Jurisdiction did not adopt the residential sprinkler section of the 2009 international residential code which weakens and modifies the code.
- Jurisdiction did not adopt the full code in a timely unamended manner.
- Reduction in inspection staff since last evaluation

A revised BCEGS classification would apply to new buildings receiving a Certificate of Occupancy during or after the calendar year in which the revision takes place.

Before we re-classify your community to reflect this change, we would like to know if Bozeman desires to develop a program to regain PL Class 3. If this letter is acknowledged by February 6, 2011 advising us that this matter will be reviewed within the next three months we will postpone the implementation of the classification changes.

After review, if it is your decision to begin an improvement program to regain PL Class 3, we will need to receive, by April 6, 2011 a list of the changes you intend to make. Additionally, we would appreciate your estimate of the amount of time which will be needed to complete each item. No re-classifying action will be taken if changes are implemented to regain the current classification within one year of the receipt of this letter.

We have attached a copy of our report which will provide you additional information about the classification process and how we evaluated various aspects of your community's building codes and their enforcement. We want to highlight the fact that the ISO Building Code Effectiveness Grading program is an advisory insurance underwriting information and rating tool. It is not intended to analyze all aspects of a comprehensive building code enforcement program. It is not for purposes of determining compliance with any state or local law nor is it for making loss prevention or loss safety recommendations.

If you have any questions about the classification that was developed, please let us know.

Sincerely,

BCEGS Building Code Department
(800) 930-1677 Ext. 6204 FAX: (312) 930-0038

cc: Mr. Bob Risk

enclosure

David Bruell
Vice President
V.206.273.7196
F.206.217.9392
david.bruell@wsrb.com

DATE: MAY 25, 2011

FOR IMMEDIATE RELEASE TO WASHINGTON STATE BUILDING OFFICIALS

RE: Building Code Effectiveness Grading Schedule Classifications

Dear Building Officials,

The purpose of this letter is to provide advance notification for you and your communities regarding the potential impact on a community's Building Code Effectiveness Grading Schedule (BCEGS) classification, as a result of recent changes to the International Residential Code.

BCEGS classifications are distributed by the Washington Surveying and Rating Bureau (WSRB) for use by the property/casualty insurance industry in Washington. These classifications are intended to evaluate how effectively communities are enforcing model building codes. They are used by insurers in their underwriting and premium development programs for residential and commercial properties, and insurers can use them to offer premium discounts to eligible properties. In addition, a community's BCEGS classification is a consideration in determining eligibility and premiums for FEMA's flood insurance program, as well as eligibility for and amounts of FEMA's Hazard Mitigation grants in Washington. WSRB strives to evaluate every building department on a five-year schedule.

As you are aware, starting in 2011, the 2009 IRC model code requires fire sprinklers in one- and two-family dwellings. In 2010, Washington adopted this code with the sprinkler requirement removed from the main body of the code and returned to the appendix. The State Building Code Council left the decision to adopt the sprinkler requirement up to the local building officials of Washington State.

As part of its evaluation of a community's compliance with model codes, BCEGS provides reduced credit for communities which adopt codes with removed or weakened mandatory requirements. This situation applies to non-adoption of the requirement for sprinklers in one- and two-family dwellings.

The reduction in credit is significant enough that, all other factors remaining the same, failure to reinstate the sprinkler requirement in the residential code in a community could result in a one-class reduction in the community's residential BCEGS classification. In this situation, the reduced classification would apply to all residential property receiving a Certificate of Occupancy during or after the calendar year in which the new classification takes effect. This reduced classification could also impact FEMA's CRS classification of a community without regard to a property's date of occupancy.

David Bruell
Vice President
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david.bruell@wsrb.com

If, at a later date, the mandatory portion of the code were adopted by a community and the community's BCEGS classification improved, the new classification would affect only new buildings, not buildings built during the period of the previous classification.

We would like to highlight the fact that the BCEGS program is an advisory insurance underwriting information and rating tool. It is not intended to analyze all aspects of a comprehensive building code enforcement program. It is not for purposes of determining compliance with any state or local law nor is it for making loss prevention or loss safety recommendations.

If you have any questions about how this might affect your community, please contact Robert Ferrell, Manager of Fire Protection Systems and Services, at 509.228.8062, or Dave Tofte, BCEG Specialist, at 206.273.7159.

Sincerely,

David Bruell
Vice President

What effect will the passage of S. 1057 have on our citizens' insurance premiums?

We have had conversations with DOI, DNR, LLR, and insurance carriers, as well as requesting information from Insurance Services Office, Inc. (ISO), in an effort to accurately answer the above question. A lot of answers to our questions have been ambiguous; however, the statements below are accurate based on the information we have at this time. This issue is still being researched by DOI to determine other communities that might be affected by a CRS retrograde.

1057: Below is language that opts SC out of the 2009 IRC relative to sprinklers.

6-9-55(A) No building code provision that requires an automatic residential fire sprinkler system be installed in a new one-family or two-family dwelling shall be enforced.

6-9-60 The ability of a local government to adopt by reference a nationally recognized code or its appendices does not apply to building codes for the construction of new one-family and two-family residential homes.

Sprinkler Discounts

Many homeowner's insurance carriers in South Carolina currently offer voluntary discounts and credits for installation of a fire sprinkler system. These credits can range from 0% (for carriers that don't currently offer such a discount/credit) up to 20% for installation of a sprinkler system covering all areas of the home. Given that the South Carolina Building Codes Council included the sprinkler requirement passed by the IRC in the SC Residential Building Codes, passage of this bill will effectively mean that all new homes that are constructed after January 1, 2011 will cost up to 20% more to insure as these homes will not be able to take advantage of the sprinkler system credits and discounts they would have otherwise qualified for if built to the sprinkler standards as passed by the Codes Council.

Flood Insurance:

The National Flood Insurance Program's (NFIP) Community Rating System (CRS) is a voluntary incentive program that recognizes and encourages community floodplain management activities that exceed the minimum NFIP requirements. The CRS Classification is applied to all properties in the community who purchase NFIP flood insurance. The passage of S. 1057 that removes the requirement in the 2009 edition of the IRC that an automatic residential fire sprinkler system must be installed in new one-family or two-family dwellings beginning January 1, 2011 could

result in a community's CRS classification being retrograded that would further result in a 5% increase in a home's flood insurance premium, i.e. a $1,000 policy would go up $50. There are 202,218 NFIP flood insurance policies in force in SC (as of Dec. 31, 2009), totaling $113.7 million in premiums with a combined coverage value of $46.78 billion (as of 12.31.2009). Approximately 78% of these NFIP policies are in 34 South Carolina communities participating in the CRS program. If the entire 78% was retrograded, South Carolinians would be paying $4.4 million more for flood insurance.

At this time, it appears that only three CRS communities will be affected. The three communities are the City of Charleston, the Town of Rockville, and Beaufort County. These three communities have 43,847 NFIP policies, which is 28% of all NFIP policies in South Carolina CRS communities; however, the premiums for these three communities represent 30% of all the premiums written in CRS communities. A 5% increase in these three communities will result in an approximate $1.4M increase in flood insurance premiums. DOI is trying to confirm with DNR that this list of affected CRS communities is complete and accurate.

Property and Casualty Insurance - BCEGS - ISO Rating

The Building Code Effectiveness Grading Schedule (BCEGS) is a rating system developed by the Insurance Services Office, Inc. (ISO), an insurance rating organization. The BCEGS rating assesses the building codes in effect in a community and how the community enforces its building codes, particularly noting efforts relating to mitigation of losses from natural hazards.

BCEGS classifications range from 1 (highest) to 10 (lowest) and are determined by a community's evaluation score out of a possible 100 points available. A community's BCEGS classification determines the advisory credits applicable for certain lines of insurance in that community. Some homeowners' insurance companies in South Carolina use the BCEGS classification as a part of their rate-making process. State Farm does not use the ISO grading system. (See State Farm's rating system below and State Farm contact to confirm this information.)

Some insurance carriers may apply BCEGS classification at the time a certificate of occupancy is issued to determine a homeowner's premium rate (as is recommended by ISO). **However, other carriers could apply BCEGS classification on <u>ALL</u> homes they insure in a community. Also, carriers that currently rate based upon certificate of occupancy could change the way they rate to affect existing homes.**

ISO has indicated that non-adoption of the 2009 IRC sprinkler requirements would result in the statewide loss of 5 points of the 100 points possible. This would result in 129 communities - half of the 244 South Carolina communities participating in the BCEGS program - experiencing a BCEGS class retrograde. Therefore, new homes and possibly existing homes in these 129 communities could cost more to insure based upon which insurance carrier the homeowner chooses and if/ how that insurance carrier utilizes the BCEGS program.

County	2009 Structure Fires			2009 Residential Structure Fires by Property Type					Total Structure Dollar Loss	Total Residential Structure Dollar Loss	Total Civilian Injuries	Total Fatalities
	Non-Residential	Residential	Total Structures	Other Residential	Hotels, Motels	Mobile Home	Apartments	1-2 Family Dwellings				
Abbeville	4	41	45	2	0	1	2	36	$ 26,450	$ 26,150	0	0
Aiken	36	162	198	3	1	14	5	139	$ 3,105,360	$ 2,262,810	7	2
Allendale	6	21	27	1	0	0	3	17	$ 359,600	$ 248,600	0	0
Anderson	51	225	276	13	0	0	15	197	$ 3,412,676	$ 2,312,176	7	2
Bamberg	9	37	46	1	0	1	1	34	$ 333,515	$ 182,515	0	0
Barnwell	2	12	14	1	0	1	0	10	$ 120,300	$ 91,300	0	0
Beaufort	11	43	54	0	1	3	11	28	$ 766,870	$ 744,700	0	1
Berkely	14	61	75	4	0	4	3	50	$ 2,243,455	$ 1,193,455	0	0
Calhoun	2	21	23	0	0	3	2	16	$ 322,600	$ 322,100	0	3
Charleston	70	346	416	17	0	13	70	231	[illegible]	$ 2,540,510	16	5
Cherokee	13	52	65	10	0	1	8	33	$ 720,501	$ 565,500	1	2
Chester	8	39	47	0	0	2	0	37	$ 371,150	$ 258,450	0	0
Chesterfield	4	28	32	0	0	3	4	21	$ 465,500	$ 435,500	1	0
Clarendon	11	54	65	1	0	12	2	39	$ 1,046,135	$ 1,021,535	1	0
Colleton	17	79	96	0	1	34	0	44	$ 2,520,810	$ 1,600,810	14	2
Darlington	3	42	45	1	0	5	3	33	$ 550,000	$ 550,000	0	1
Dillon	2	20	22	0	0	4	0	16	$ 121,400	$ 120,900	0	1
Dorchester	8	43	51	3	0	5	3	32	$ 1,040,070	$ 792,550	3	0
Edgefield	2	4	6	0	0	1	0	3	$ 87,000	$ 87,000	0	0
Fairfield	1	31	32	5	0	4	0	22	$ 974,500	$ 974,500	1	0
Florence	8	14	22	0	1	3	19	113	$ 3,512,465	$ 2,399,505	3	5
Georgetown	8	14	22	0	0	0	3	11	$ 3,857,150	$ 1,892,100	1	2
Greenville	53	319	372	8	1	21	43	246	$ 6,043,446	$ 5,819,841	7	7
Greenwood	6	31	37	8	0	0	7	15	$ 115,333	$ 100,733	2	2
Hampton	1	21	22	0	0	2	0	19	$ 539,500	$ 539,500	0	0
Horry	50	150	224	6	30	15	32	91	$ 2,806,061	$ 1,297,301	22	1
Jasper	16	43	59	0	1	11	2	29	$ 1,571,500	$ 550,500	0	0
Kershaw	4	25	29	0	1	1	3	20	$ 892,850	$ 858,850	3	0
Lancaster	12	111	123	0	0	11	2	98	$ 417,500	$ 392,500	0	0
Laurens	15	70	85	1	1	8	8	52	$ 1,007,458	$ 973,848	3	1
Lee	2	17	19	0	0	8	0	9	$ 1,067,500	$ 866,500	0	2
Lexington	4	61	65	3	0	3	20	35	$ 768,515	$ 768,015	8	11
Marion	1	8	9	0	0	0	0	8	$ 92,000	$ 90,000	0	0
Marlboro	13	69	82	0	0	5	11	53	$ 400,900	$ 281,000	0	0
McCormick	2	7	9	0	1	2	0	4	$ 59,700	$ 53,200	0	0
Newberry	5	19	24	1	0	0	5	13	$ 253,500	$ 240,500	2	2
Oconee	19	42	61	2	0	10	3	27	$ 1,246,300	$ 861,300	3	0
Orangeburg	31	175	206	4	2	22	13	134	$ 2,107,140	$ 1,668,540	3	4
Pickens	21	104	125	7	0	8	15	74	$ 3,393,801	$ 3,179,501	1	2
Richland	64	362	426	20	5	7	89	241	$ 7,632,031	$ 6,783,681	26	6
Saluda	2	12	14	0	0	1	0	11	$ 95,000	$ 65,000	0	0
Spartanburg	59	179	238	6	2	10	13	148	$ 2,082,871	$ 2,012,076	3	9
Sumter			0	NO DATA								2
Union	5	23	28	5	0	3	0	15	$ 453,230	$ 440,200	0	1
Williamsburg	2	11	13	0	0	0	2	9	$ 175,011	$ 175,011	0	0
York	32	193	225	14	0	13	17	149	$ 7,465,900	$ 2,060,900	6	3
SC TOTALS	**709**	**3440**	**4173**	**147**	**56**	**281**	**439**	**2662**	**$ 70,954,664**	**$ 51,670,963**	**144**	**79**

Impact of S. 1057/ H. 4663 on Insurance Rates

S. 1057/ H. 4663 would prohibit the enforcement of any building code provision that requires an automatic residential fire sprinkler system be installed in a new one-family or two-family dwelling.

As detailed below, passage of these bills could impact premium rates charged for homeowner's insurance policies by increasing the base rates and preventing homeowners from taking advantage of credits and discounts for installation of sprinkler systems for which they would otherwise be eligible. This bill could also impact flood insurance rates for individuals purchasing flood insurance coverage through the National Flood Insurance Program.

Sprinkler Discounts and Credits

Many homeowner's insurance carriers in South Carolina currently offer voluntary discounts and credits of up to 20% for installation of a fire sprinkler system. **These credits vary by carrier (some do not currently offer any discount) but can range from 4% to 20% for installation of a sprinkler system covering all areas of the home**.

The average amount of the discount offered for a full sprinkler system is estimated to be 12% based on information collected by DOI from the largest carriers writing homeowner's insurance premiums in the state. **This equates to about $60 on a $150,000 homeowner's policy in Columbia and about $200 on a $150,000 homeowner's policy in Charleston**.

Impact of S. 1057/ H. 4663 on Sprinkler Discounts and Credits

Given that the South Carolina Building Codes Council included the sprinkler requirement passed by the IRC in the SC Residential Building Codes, passage of S. 1057/ H. 4663 will effectively mean that all new homes that are constructed after January 1, 2011 will cost up to 20% more to insure as these homes will not be able to take advantage of the sprinkler system discounts they would have otherwise qualified for if built to the standards as passed by the Building Codes Council.

Homeowner's Insurance Premiums

Some homeowner's insurance carriers in South Carolina use the Building Code Effectiveness Grading Schedule (BCEGS) as a part of their rate-making process. BCEGS is a rating system developed by the Insurance Services Office, Inc. (ISO), an insurance rating organization.

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The BCEGS rating assesses the building codes in effect in a community and how the community enforces its building codes, particularly noting efforts relating to mitigation of losses from natural hazards. BCEGS classifications range from 1 (highest) to 10 (lowest) and are determined by a community's evaluation score out of a possible 100 points available. A community's BCEGS classification determines the advisory credits applicable for certain lines of insurance in that community.

If a community's BCEGS classification changes, it could impact the insurance rates charged to homeowners in that community. Some insurance carriers may apply BCEGS classification at the time a certificate of occupancy is issued to determine a homeowner's premium rate (as is recommended by ISO) while others could apply BCEGS classification on all homes they insure in a community.

ISO has indicated that non-adoption of the 2009 IRC sprinkler requirements would result in the statewide loss of 5 points of the 100 points possible. This would result in 108 communities – 44% of the 244 South Carolina communities participating in the BCEGS program - experiencing a BCEGS class retrograde, as noted in the chart below. Therefore, new homes and possibly existing homes in these 108 communities could cost more to insure based upon which insurance carrier the homeowner chooses and if/ how that insurance carrier utilizes the BCEGS program.

Summary of SC Communities Impacted by a Loss of 5 BCEGS Points - By BCEGS Class			
BCEGS Classification	# SC Communities in Class	# Communities in Class Impacted by 5 Pt Loss	% Communities in Class Impacted by 5 Pt Loss
Class 1	0	-	-
Class 2	8	8	100%
Class 3	10	9	90%
Class 4	119	54	45%
Class 5	42	26	62%
Class 6	13	4	31%
Class 7	7	5	71%
Class 8	41	2	5%
Class 9	4	0	-
Class 10	0	-	-

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South Carolina Communities Impacted by a Loss of 5 BCEGS Points

The following South Carolina communities would experience a BCEGS class retrograde by losing 5 points due to non-adoption of the residential fire sprinkler requirement of the 2009 IRC.

Listing of SC Communities Impacted by a Loss of 5 BCEGS Points, By BCEGS Class				
Jurisdiction Name	County	Serviced Community	BCEGS Class	CRS Class
Charleston Co	Charleston	All Unincorporated Areas	2	5
Charleston Co	Charleston	Awendaw	2	6
Charleston Co	Charleston	Hollywood	2	5
Charleston Co	Charleston	Kiawah Island	2	6
Charleston Co	Charleston	Meggett	2	6
Charleston Co	Charleston	Ravenel	2	6
Charleston Co	Charleston	Rockville	2	6
Charleston Co	Charleston	Seabrook Island	2	6
Surfside Beach	Horry		3	
Beaufort	Beaufort		3	8
Ridgeland	Jasper		3	
North Augusta	Aiken, Edgefield		3	
Hardeeville	Jasper		3	
Charleston	Charleston, Berkeley		3	7
Camden	Kershaw		3	
Greenville	Greenville		3	7
Lancaster	Lancaster		3	
Clemson	Pickens, Anderson		4	
Greer	Greenville, Spartanburg		4	
Sullivans Island	Charleston		4	8
Abbeville Co	Abbeville	Abbeville	4	
Abbeville Co	Abbeville	All unicorporated areas	4	
Abbeville Co	Abbeville	Calhoun Falls	4	
Abbeville Co	Abbeville	Donalds	4	
Abbeville Co	Abbeville	Due West	4	
Abbeville Co	Abbeville	Lowndesville	4	
Cottageville	Colleton		4	
Folly Beach	Charleston		4	8
Beaufort Co	Beaufort	All Unicorporated Areas	4	7
Beaufort Co	Beaufort	Bluffton	4	7
Beaufort Co	Beaufort	Cat Island	4	7
Beaufort Co	Beaufort	Gardens Corner	4	7
Beaufort Co	Beaufort	Harbor Island	4	7
Beaufort Co	Beaufort	Lobeco	4	7

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Listing of SC Communities Impacted by a Loss of SBCEGS Points & BCEGS Class				
Jurisdiction Name	County	Serviced Community	BCEGS Class	CRS Class
Rock Hill	York		4	
Bamberg Co	Bamberg	All Unincorporated Areas	4	
Bamberg Co	Bamberg	Bamberg	4	
Bamberg Co	Bamberg	Denmark	4	
Bamberg Co	Bamberg	Ehrhardt	4	
Bamberg Co	Bamberg	Govan	4	
Bamberg Co	Bamberg	Olar	4	
Isle of Palms	Charleston		4	7
Orangeburg Co	Orangeburg	All Unincorporated Areas	4	
Orangeburg Co	Orangeburg	Bowman	4	
Orangeburg Co	Orangeburg	Branchville	4	
Orangeburg Co	Orangeburg	Cope	4	
Orangeburg Co	Orangeburg	Cordova	4	
Orangeburg Co	Orangeburg	Elloree	4	
Orangeburg Co	Orangeburg	Holly Hill	4	
Orangeburg Co	Orangeburg	Livingston	4	
Orangeburg Co	Orangeburg	Neeses	4	
Orangeburg Co	Orangeburg	North	4	
Orangeburg Co	Orangeburg	Norway	4	
Orangeburg Co	Orangeburg	Rowesville	4	
Orangeburg Co	Orangeburg	Santee	4	
Orangeburg Co	Orangeburg	Springfield	4	
Orangeburg Co	Orangeburg	Vance	4	
Orangeburg Co	Orangeburg	Woodford	4	
North Charleston	Charleston, Berkeley, Dorchester		4	7
Fort Mill	York		4	
York Co	York	All Unincorporated Areas	4	9
York Co	York	Hickory Grove	4	9
York Co	York	Sharon	4	9
York Co	York	Smyrna	4	9
Holly Hill	Orangeburg		4	
Mount Pleasant	Charleston		4	7
Fairfield Co	Fairfield	All Unicorporated Areas	4	
Fairfield Co	Fairfield	Jenkinsville	4	
Fairfield Co	Fairfield	Ridgeway	4	
Saint George	Dorchester		4	
Seneca	Oconee		4	

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Listing of SC Communities Impacted by A Loss of 5 BCEGS Points, By BCEGS Class				
Jurisdiction Name	County	Serviced Community	BCEGS Class	CRS Class
Cheraw	Chesterfield		5	
Berkeley Co	Berkeley	All unicorporated areas	5	9
Berkeley Co	Berkeley	Jamestown	5	9
Georgetown	Georgetown		5	8
Pageland	Chesterfield		5	
Hanahan	Berkeley		5	
Kingstree	Williamsburg		5	
Clarendon Co	Clarendon	All unicorporated areas	5	
Clarendon Co	Clarendon	Manning	5	
Clarendon Co	Clarendon	Summerton	5	
Lincolnville	Charleston		5	
Chesterfield Co	Chesterfield	All unicorporated areas	5	
Chesterfield Co	Chesterfield	Jefferson	5	
Chesterfield Co	Chesterfield	Mt Croghan	5	
Chesterfield Co	Chesterfield	Patrick	5	
Chesterfield Co	Chesterfield	Ruby	5	
Port Royal	Beaufort		5	
Newberry Co	Newberry	All Unicorporated Areas	5	
Newberry Co	Newberry	Chappells	5	
Newberry Co	Newberry	Little Mountain	5	
Newberry Co	Newberry	Peak	5	
Newberry Co	Newberry	Pomaria	5	
Newberry Co	Newberry	Prosperity	5	
Newberry Co	Newberry	Silverstreet	5	
Newberry Co	Newberry	Whitmire	5	
Clover	York		5	
Carlisle	Union		6	
Bennettsville	Marlboro		6	
Andrews	Georgetown, Williamsburg		6	
McBee	Chesterfield		6	
Columbia	Richland, Lexington		7	
Cayce	Lexington		7	
Loris	Horry		7	
Jasper Co	Jasper	All unicorporated areas	7	
Jasper Co	Jasper	Ridgeland	7	
Latta	Dillon		8	
Barnwell	Barnwell		8	

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Impact of S. 1057/ H. 4663 on Insurance Premium Rates

According to information obtained by the Department of Insurance, one of South Carolina's top homeowner's insurance writers currently uses BCEGS ratings in developing its premium rates for the coastal areas of the state. This carrier applies a premium discount based upon a coastal community's BCEGS classification as follows:

Example of BCEGS Use in Insurance Ratings for Coastal Communities	
BCEGS Classification	Premium Reduction
Class 1 – 2	5%
Class 3 – 4	4%
Class 5 – 6	3%
Class 7 – 8	2%
Class 9	1%
Class 10	0%

Given the credits used by this carrier, passage of S. 1057/ H. 4663 will result in a 1% increase in insurance rates on new homes in 22 coastal communities that currently have a BCEGS Class 2, 4, 6, 8, or 9. (A total of 37 coastal communities would experience a BCEGS class retrograde by losing 5 points due to non-adoption of the residential fire sprinkler requirement of the 2009 IRC).

Listing of Coastal Communities w/ BCEGS Classes 2, 4, 6, 8 & 9 Impacted by a Loss of 5 BCEGS Points, By BCEGS Class				
Jurisdiction Name	County	Serviced Community	BCEGS Class	Current Premium Reduction
Charleston Co	Charleston	All Unincorporated Areas	2	5%
Charleston Co	Charleston	Awendaw	2	5%
Charleston Co	Charleston	Hollywood	2	5%
Charleston Co	Charleston	Kiawah Island	2	5%
Charleston Co	Charleston	Meggett	2	5%
Charleston Co	Charleston	Ravenel	2	5%
Charleston Co	Charleston	Rockville	2	5%
Charleston Co	Charleston	Seabrook Island	2	5%
Sullivans Island	Charleston		4	4%
Cottageville	Colleton		4	4%

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Listing of Coastal Communities w/ BCEGS Classes 2, 4, 6, 8 & 9 Impacted by a Loss of 5 BCEGS Points By BCEGS Class				
Jurisdiction Name	County	Serviced Community	BCEGS Class	Current Premium Reduction
Folly Beach	Charleston		4	4%
Beaufort Co	Beaufort	All Unicorporated Areas	4	4%
Beaufort Co	Beaufort	Bluffton	4	4%
Beaufort Co	Beaufort	Cat Island	4	4%
Beaufort Co	Beaufort	Gardens Corner	4	4%
Beaufort Co	Beaufort	Harbor Island	4	4%
Beaufort Co	Beaufort	Lobeco	4	4%
Isle of Palms	Charleston		4	4%
North Charleston	Charleston, Berkeley, Dorchester		4	4%
Mount Pleasant	Charleston		4	4%
Saint George	Dorchester		4	4%
Andrews	Georgetown, Williamsburg		6	3%

In addition to utilizing the BCEGS classification of a coastal community in setting its premium rates, this same carrier also offers a 13% discount for installation of a sprinkler system in all areas of a home. As a result, the 1% increase in insurance premiums will be compounded by these new homes not being eligible to take advantage of the 13% discount offered by this carrier.

Example of Impact on Homeowner's Insurance Premiums for a Coastal Community with a BCEGS Class 4

A homeowner's insurance policy on a single family, owner occupied home with $150,000 in coverage with full replacement cost coverage, $100,000 in liability coverage, $5,000 in medical coverage, and a 2% deductible would currently receive a 4% premium credit for being located in a BCEGS Class 4 community, costing $1,938.70 in annual premiums to insure (after a savings of $80.78).

A new home built in 2011 in a BCEGS Class 4 coastal community to the standards adopted by the Building Codes Council would cost $1,686.67 to insure after earning a total of $332.81 in premium credits ($80.78 for being a BCEGS Class 4 and $252.03 for installation of a sprinkler system covering all areas of the home). **This same home would cost $1,958.90 to insure if S. 1057/ H. 4663 were to be enacted, losing a total of $272.23 in unrealized savings**.

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04/15/2010 13:28 8037993076 TOMPKINS KINARD PAGE 08/09

Flood Insurance Premiums

Failure to adopt the residential fire sprinkler requirements of the 2009 IRC could adversely impact flood insurance premiums in communities that participate in the Community Rating System. CRS is a voluntary incentive program that rewards communities, through flood insurance premium deductions, for implementing floodplain management and flood loss reduction activities that exceed the minimum National Flood Insurance Program (NFIP) requirements.

Flood insurance premium rates are discounted to reflect the reduced flood risk. CRS communities receive a CRS Classification of 1 through 10. Class 1 communities receive the largest premium reduction of 45% (for Special Flood Hazard Areas – those areas within the floodplain that have a 1% chance of being flooded in any given year and at least a 26% chance of being flooded over a 30-year period). Flood insurance premium rates discounts are awarded in increments of 5% – from 45% for Class 1 communities to 5% for Class 9 communities. Class 10 communities receive no premium reduction. The CRS Classification is applied to all properties in the community who purchase flood insurance.

NFIP Flood Insurance Coverage in South Carolina

There are 202,218 NFIP flood insurance policies in force in SC, totaling $113.7 million in premiums and a combined coverage value of almost $46.78 billion (as of 12.31.2009).

According to FloodSmart.gov, the average flood insurance policy costs $540 per year.

South Carolina Communities Participating in the CRS Program

South Carolina has 34 communities that are currently participating in the CRS, with classifications ranging from a CRS Class 5 to a CRS Class 9. Nearly 78% of the in-force NFIP policies in South Carolina are in CRS participating communities, with an average savings of $104 per policy and an overall savings of $16.113 million.

Impact of a CRS Retrograde on Flood Insurance Premium Rates

If a CRS community experiences a retrograde in its CRS classification as a result of non-adoption of the residential sprinkler code, the community would lose 5% of its flood insurance premium discount (for Special Flood Hazard Area policies). Note that the CRS Classification is applied to all properties in the community who purchase flood insurance.

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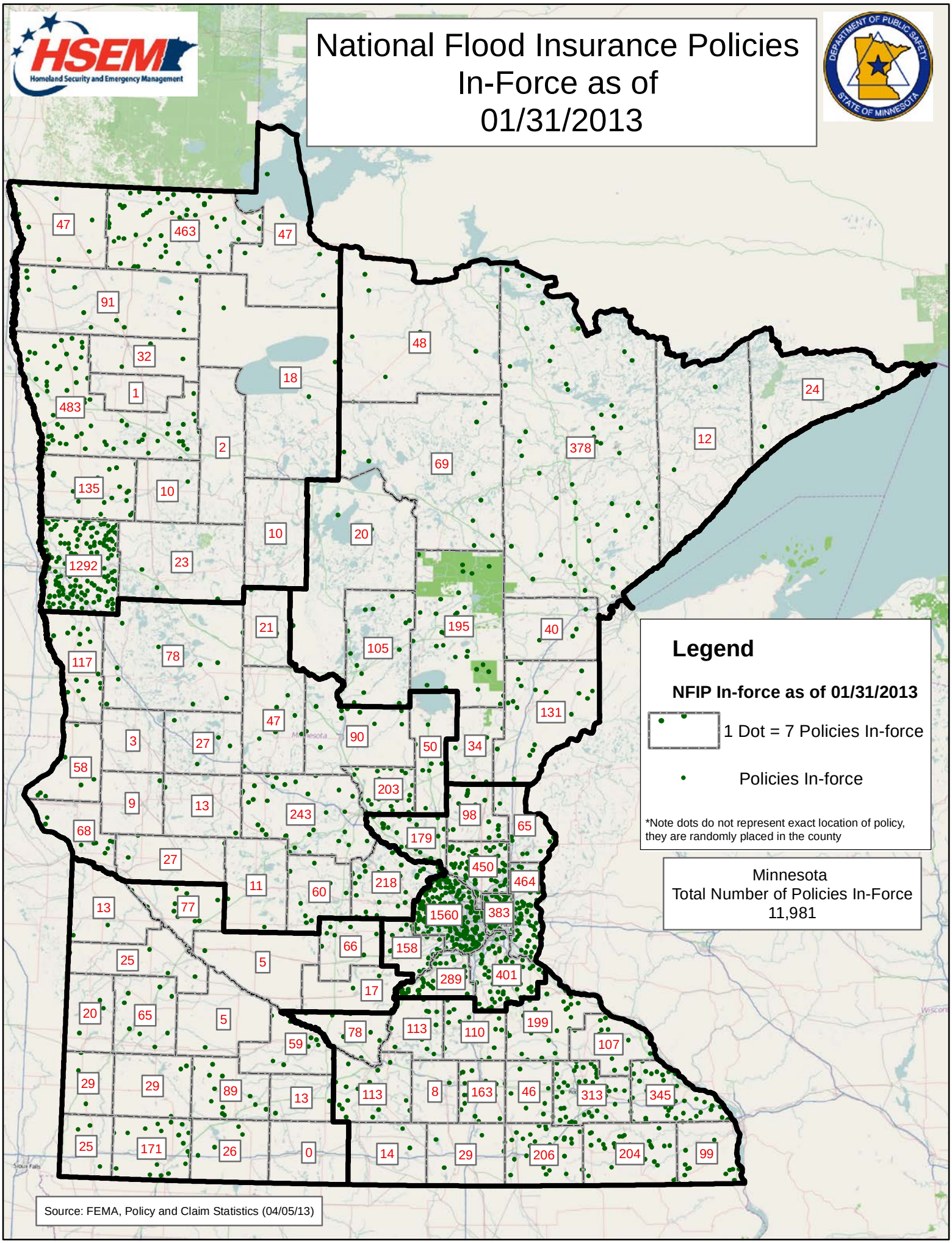
National Flood Insurance Policies In-Force as of 01/31/2013



TAB F: LIABILITY IMPLICATIONS

Minnesota is not ranked as being a litigious state when compared to New Jersey, New York, California, and many other states. However, that does not mean that tort cases do not occur in Minnesota. One clear way to witness this concern is to watch television advertisements for personal injury cases.

Some may argue if government does not make me do it there is no liability. We must raise the point – if government passes a law that says it is acceptable not to wear a seatbelt does this indemnify the car manufacturer who does not place seatbelts in a new car?

Rarely a day goes by when I do not notice a safety warning; the visor of my car warns me about seatbelts and airbags, labels on the food I eat warn me I will get fat. The substantive question is where is the *early collapse during fires* and the *you have less than a couple minutes to escape* warning that should be given to the homebuyer from the homebuilder and Realtor when they sell a house that is made of the new lightweight construction material and filled with synthetic fast-burning furnishings? The homebuilder and Realtor knows or should know that new construction practices have created a less safe environment for the homebuyer – they should have an obligation to inform them of fire escape practices. The 1.4+ million sites found at an Internet search of "Lightweight Construction Fire Safety" did not appear overnight – this has been an emerging problem for over a decade. The wood-products industry has known for decades that engineered wood fails quicker in fires – where is their notice to the public; why have they failed to respond to the repeated concerns of the fire service? There is an entire class of people who are in harm's way and the people creating the hazard willfully and wantonly failed to provide for mitigation. And now when the homebuilder comes to an elected body such as a state legislature, a city council, and a code commission and persuades them to pass a law prohibiting local government from applying the national model safety codes does this not create a liability link when the new home fails during a fire and lives are lost or there is excessive property damage?

The homebuilders have to be able to say convincingly in a court of law where this issue will inevitably go that it did everything they possibly could to lower the risk of death, injury, and excessive property loss from fire. One cannot assume the homebuyer will accept 100% of the risk of death, injury, and excessive property loss from fire when the homebuilder knowingly uses

construction products that have been proven, from very credible sources, to fail quickly in fires and they use these new construction products for the sole reason of reducing construction costs thereby maximizing profit margins. Add in the facts that the homebuilders fail to inform the buyer of the fire risk in new homes and actively lobby at the national, state, and local level to ignore the fire safety problem and allow them to build in non-compliance with national construction and safety codes and standards then the future liability exposure for the homebuilder, the Realtor failing to inform the buyer, and the industry producing these new construction products absent consumer warnings appears to be very concerning.

Disclaimer: *I am not now nor do I wish to be a trial lawyer involved in this type of litigation. The thoughts and comments expressed herein are simply my opinion based on numerous calls from trial lawyers and having witnessed the litigation that evolved when the homebuilders opposed smoke detectors. There is no doubt in my mind that notwithstanding what government does or does not do, the clearly defined fire safety problem dimensioned in an Internet Search of "lightweight construction fire safety" is very real and must not be ignored. Those constructing properties have an obligation to build a safe property and lobbying against code safety measures coupled with the failure to build a safe property will lead to litigation.*

TAB G – ECONOMIC INCENTIVES

Why should a community install 12-inch water mains when 8-inch or smaller may be used if the national model code required fire sprinklers are enforced? The national model codes allow for 500 gpm at hydrants for fire sprinklered communities but 1,000 gpm for non-sprinklered smaller homes. The substantive question the homebuilders should ask is if you are saving so much money in infrastructure build-out because of the code required fire sprinklers, why do you not decrease your impact fees to help offset our costs? Scottsdale, Prince George's County, hundreds of California communities got the message which is we need to better manage growth; we should not cause future taxpayers to pay more funds simply because the homebuilder wants to maximize their profit margin.

The Washington state legislature got the message and passed a financial incentive (Tab G1) to offset the cost of fire sprinklers and addressed water utility issues – in some communities the builder made money on the incentives.

Government saves money in many direct and indirect ways. The cost of water infrastructure build-out has been discussed but again the needed fire flow at the hydrant can be reduced by at least 50% and even more based on housing density if fire sprinklers are present. Fire suppression costs are less; firefighter workers' compensation costs decrease; community taxes as discussed in Tab E, the list is long. Fire burn injuries is a significant health care cost driver. The severely burned patient remains hospitalized much longer than the other injuries requiring hospitalization. Fire sprinklers are a win-win solution.

Sprinkler Impact on Fire Injury, published by NFPA in October 2012, addressed reductions in rates of fire injuries associated with home fire sprinklers. This project was initiated to develop better estimates of the impact of home sprinklers on fire injury costs, using a more sophisticated approach which explores the impact of sprinklers on fire size, the impact of fire size on burn and other fire related injury, and then assesses the data available on the costs associated with those injuries.

While there has long been data correlating sprinklers with reductions in deaths and property loss, recent research also shows a significant impact on injury cost when sprinklers are present. The cost of burn injuries, in healthcare dollars, is $3.8 billion per year. The average length of stay for a hospital burn patient is 24 days, although it can be months for the severely

burned patient. Patients, who do survive acute hospitalization stays, require rehabilitation that is a minimum of seven-times longer than their stays in the hospital, and they may require years of psychological intervention. In addition to the direct health care costs, the social costs of burn injury are staggering. Over one million workdays are lost each year. Human costs are even greater.

- **Sprinklers reduce civilian fire injury medical costs by 53%,**
- **Sprinklers reduce civilian fire injury total costs by 41%.**
- **Sprinklers are responsible for an estimated 65% reduction in firefighter fireground injuries.**

Each year, it is estimated that about one percent, or 2.5 million Americans, sustain a burn injury and one-half will require medical attention or sustain an injury severe enough to restrict some activities of daily living.

- Minor burns, self treated 1,750,000
- Treated by physician (outpatient) 650,000
- Burn patients hospitalized 120,000
- Deaths per year 6,000

Annually, 120,000 people sustain major burn injury that is serious and life-threatening, requiring hospitalization. One in five burn injuries requiring hospitalization exceed 25 percent of the total body surface. Having served as a firefighter I have seen firsthand the devastating effect of burn injuries.

Time for Change – We Need Incentives! Many local governments have adopted residential fire sprinkler ordinances, some decades ago. These growing communities chose residential fire sprinklers as a method of controlling the cost and size of their infrastructure as well as recurring operating costs. For example, fire sprinklers use approximately 90% less water to fight fires; the national water distribution system design standards allow for less water when all buildings are fire sprinkler protected; less water means smaller water mains; smaller water mains means less water supply and less maintenance and less cost to install – the list of savings is very long. Yes, fire sprinklers are environmentally friendly. So now comes the question, if these communities have had fire sprinkler ordinances in place for decades, is there data available that shows a return on investment?

Prince George's County Maryland also has exemplary data showing the result of its residential fire sprinkler ordinance including homes effective January 1, 1992. The results of fire sprinkler success outlined in the 12-year report by Prince George's County are equally impressive. Over 30 fires in single-family homes were detailed in this report showing an average loss of $3,673 per fire in sprinkler protected homes and $31,667 average loss in non-sprinkler protected homes. This report indicates there were 33 fire deaths in single-family homes from 1988 to 1999 and ZERO fire deaths during this period in sprinkler protected homes.

Data from Scottsdale Arizona where over 44,000 homes are fire sprinkler protected shows that the fire loss in Scottsdale is 1/3 that of the average fire losses reported in a comparable sized community; that Scottsdale water infrastructure installation and infrastructure costs are significantly less than a comparable community with water consumption during fires 90% less in sprinkler protected homes; there are many economic benefits for the public and government. This community success data can be found at the Home Fire Sprinkler Coalition http://www.homefiresprinkler.org/

The City of Altamonte Springs, Florida has had a residential fire sprinkler ordinance in place for decades. They offer a 40% reduction in the water utility impact fee, a 30% reduction in permit fees and a 25% reduction in the annual fire suppression taxes.

The National Association of State Fire Marshals has developed a guide to residential fire sprinkler adoption in which there are incentive recommendations for government to adopt. http://nasfm-training.org/virtual-help-desk/resources/residential-sprinkler-guide.pdf. .

The data from communities with longstanding residential fire sprinkler ordinances is impressive. The cost savings to government, burn centers, fire department reduction in firefighter injuries, the enhancement of community insurance ratings, tax reductions because of reduced water infrastructure all bring value. ***It is time this value is shared with the builder in the form of financial incentives to help offset their costs of installing fire sprinklers.*** Washington State has it right as do many communities that offer substantial reduction in water tap fees and impact fees.

We are committed to work with BAM and the Minnesota Legislature to help identify an incentive to assist the builder and allow the construction of compliant new homes for the residents on Minnesota and implore the DOLI to call a meeting to discuss potential incentives that could be addressed by the Minnesota Legislature, water utilities and local government.

ENGROSSED SUBSTITUTE HOUSE BILL 1295

State of Washington 62nd Legislature 2011 Regular Session

By House Local Government (originally sponsored by Representatives Van De Wege, Hurst, Tharinger, Fitzgibbon, and Liias)

READ FIRST TIME 02/17/11.

AN ACT Relating to installation of residential fire sprinkler systems; amending RCW 18.160.050, 82.02.100, and 70.119A.180; adding a new section to chapter 70.119A RCW; and creating a new section.

BE IT ENACTED BY THE LEGISLATURE OF THE STATE OF WASHINGTON:

NEW SECTION. **Sec. 1.** The legislature recognizes that fire sprinkler systems in private residences may prevent catastrophic losses of life and property, but that financial, technical, and other issues often discourage property owners from installing these protective systems.

It is the intent of the legislature to eradicate barriers that prevent the voluntary installation of sprinkler systems in private residences by promoting education regarding the effectiveness of residential fire sprinklers, and by providing financial and regulatory incentives to homeowners, builders, and water purveyors for voluntarily installing the systems. It is the further intent of the legislature to fully preserve the rulings of *Fisk v. City of Kirkland,* 164 Wn.2d 891 (2008), *Stiefel v. City of Kent,* 132 Wn. App.523 (2006), and similar cases.

Sec. 2. RCW 18.160.050 and 2008 c 155 s 2 are each amended to read as follows:

(1)(a) All certificate of competency holders that desire to continue in the fire protection sprinkler business shall annually, prior to January 1st, secure from the state director of fire protection a renewal certificate of competency upon payment of the fee as prescribed by the state director of fire protection. Application for renewal shall be upon a form prescribed by the state director of fire protection and the certificate holder shall furnish the information required by the director.

(b) Failure of any certificate of competency holder to secure his or her renewal certificate of competency within sixty days after the due date shall constitute sufficient cause for the state director of fire protection to suspend the certificate of competency.

(c) The state director of fire protection may, upon the receipt of payment of all delinquent fees including a late charge, restore a certificate of competency that has been suspended for failure to pay the renewal fee.

(d) A certificate of competency holder may voluntarily surrender his or her certificate of competency to the state director of fire protection and be relieved of the annual renewal fee. After surrendering the certificate of competency, he or she shall not be known as a certificate of competency holder and shall desist from the practice thereof. Within two years from the time of surrender of the certificate of competency, he or she may again qualify for a certificate of competency, without examination, by the payment of the required fee. If two or more years have elapsed, he or she shall return to the status of a new applicant.

(2)(a) All licensed fire protection sprinkler system contractors desiring to continue to be licensed shall annually, prior to January 1st, secure from the state director of fire protection a renewal license upon payment of the fee as prescribed by the state director of fire protection. Application for renewal shall be upon a form prescribed by the state director of fire protection and the license holder shall furnish the information required by the director.

(b) Failure of any license holder to secure his or her renewal license within sixty days after the due date shall constitute

sufficient cause for the state director of fire protection to suspend the license.

(c) The state director of fire protection may, upon the receipt of payment of all delinquent fees including a late charge, restore a license that has been suspended for failure to pay the renewal fee.

(3) The initial certificate of competency or license fee shall be prorated based upon the portion of the year such certificate of competency or license is in effect, prior to renewal on January 1st.

(4) The fire protection contractor license fund is created in the custody of the state treasurer. All receipts from license and certificate fees and charges or from the money generated by the rules and regulations promulgated under this chapter shall be deposited into the fund. Expenditures from the fund may be used only for purposes authorized under this chapter and standards for fire protection and its enforcement, with respect to all hospitals as required by RCW 70.41.080((~~, and~~)); for providing assistance in identifying fire sprinkler system components that have been subject to either a recall or voluntary replacement program by a manufacturer of fire sprinkler products, a nationally recognized testing laboratory, or the federal consumer product safety commission; and for use in developing and publishing educational materials related to the effectiveness of residential fire sprinklers. Assistance shall include, but is not limited to, aiding in the identification of recalled components, information sharing strategies aimed at ensuring the consumer is made aware of recalls and voluntary replacement programs, and providing training and assistance to local fire authorities, the fire sprinkler industry, and the public. Only the state director of fire protection or the director's designee may authorize expenditures from the fund. The fund is subject to allotment procedures under chapter 43.88 RCW, but no appropriation is required for expenditures.

Sec. 3. RCW 82.02.100 and 1992 c 219 s 2 are each amended to read as follows:

(1) A person required to pay a fee pursuant to RCW 43.21C.060 for system improvements shall not be required to pay an impact fee under RCW 82.02.050 through 82.02.090 for those same system improvements.

(2) A person installing a residential fire sprinkler system in a single-family home shall not be required to pay the fire operations

portion of the impact fee. The exempted fire operations impact fee shall not include the proportionate share related to the delivery of emergency medical services.

Sec. 4. RCW 70.119A.180 and 2010 1st sp.s. c 7 s 121 are each amended to read as follows:

(1) It is the intent of the legislature that the department establish water use efficiency requirements designed to ensure efficient use of water while maintaining water system financial viability, improving affordability of supplies, and enhancing system reliability.

(2) The requirements of this section shall apply to all municipal water suppliers and shall be tailored to be appropriate to system size, forecasted system demand, and system supply characteristics.

(3) For the purposes of this section:

(a) Water use efficiency includes conservation planning requirements, water distribution system leakage standards, and water conservation performance reporting requirements; and

(b) "Municipal water supplier" and "municipal water supply purposes" have the meanings provided by RCW 90.03.015.

(4) To accomplish the purposes of this section, the department shall adopt rules necessary to implement this section by December 31, 2005. The department shall:

(a) Develop conservation planning requirements that ensure municipal water suppliers are: (i) Implementing programs to integrate conservation with water system operation and management; and (ii) identifying how to appropriately fund and implement conservation activities. Requirements shall apply to the conservation element of water system plans and small water system management programs developed pursuant to chapter 43.20 RCW. In establishing the conservation planning requirements the department shall review the current department conservation planning guidelines and include those elements that are appropriate for rule. Conservation planning requirements shall include but not be limited to:

(A) Selection of cost-effective measures to achieve a system's water conservation objectives. Requirements shall allow the municipal water supplier to select and schedule implementation of the best methods for achieving its conservation objectives;

(B) Evaluation of the feasibility of adopting and implementing water delivery rate structures that encourage water conservation;

(C) Evaluation of each system's water distribution system leakage and, if necessary, identification of steps necessary for achieving water distribution system leakage standards developed under (b) of this subsection;

(D) Collection and reporting of water consumption and source production and/or water purchase data. Data collection and reporting requirements shall be sufficient to identify water use patterns among utility customer classes, where applicable, and evaluate the effectiveness of each system's conservation program. Requirements, including reporting frequency, shall be appropriate to system size and complexity. Reports shall be available to the public; and

(E) Establishment of minimum requirements for water demand forecast methodologies such that demand forecasts prepared by municipal water suppliers are sufficient for use in determining reasonably anticipated future water needs;

(b) Develop water distribution system leakage standards to ensure that municipal water suppliers are taking appropriate steps to reduce water system leakage rates or are maintaining their water distribution systems in a condition that results in leakage rates in compliance with the standards. <u>The standards shall include estimated additional metering losses and demand increases due to meter upsizing required when a residential fire sprinkler system is installed.</u> Limits shall be developed in terms of percentage of total water produced and/or purchased and shall not be lower than ten percent. The department may consider alternatives to the percentage of total water supplied where alternatives provide a better evaluation of the water system's leakage performance. The department shall institute a graduated system of requirements based on levels of water system leakage. A municipal water supplier shall select one or more control methods appropriate for addressing leakage in its water system;

(c) Establish minimum requirements for water conservation performance reporting to assure that municipal water suppliers are regularly evaluating and reporting their water conservation performance. The objective of setting conservation goals is to enhance the efficient use of water by the water system customers. Performance reporting shall include:

(i) Requirements that municipal water suppliers adopt and achieve water conservation goals. The elected governing board or governing body of the water system shall set water conservation goals for the system. In setting water conservation goals the water supplier may consider historic conservation performance and conservation investment, customer base demographics, regional climate variations, forecasted demand and system supply characteristics, system financial viability, system reliability, and affordability of water rates. Conservation goals shall be established by the municipal water supplier in an open public forum;

(ii) Requirements that the municipal water supplier adopt schedules for implementing conservation program elements and achieving conservation goals to ensure that progress is being made toward adopted conservation goals;

(iii) A reporting system for regular reviews of conservation performance against adopted goals. Performance reports shall be available to customers and the public. Requirements, including reporting frequency, shall be appropriate to system size and complexity;

(iv) Requirements that any system not meeting its water conservation goals shall develop a plan for modifying its conservation program to achieve its goals along with procedures for reporting performance to the department;

(v) If a municipal water supplier determines that further reductions in consumption are not reasonably achievable, it shall identify how current consumption levels will be maintained;

(d) Adopt rules that, to the maximum extent practical, utilize existing mechanisms and simplified procedures in order to minimize the cost and complexity of implementation and to avoid placing unreasonable financial burden on smaller municipal systems.

(5) The department shall provide technical assistance upon request to municipal water suppliers and local governments regarding water conservation, which may include development of best management practices for water conservation programs, conservation landscape ordinances, conservation rate structures for public water systems, and general public education programs on water conservation.

(6) To ensure compliance with this section, the department shall

establish a compliance process that incorporates a graduated approach employing the full range of compliance mechanisms available to the department.

(7) Prior to completion of rule making required in subsection (4) of this section, municipal water suppliers shall continue to meet the existing conservation requirements of the department and shall continue to implement their current water conservation programs.

NEW SECTION. **Sec. 5.** A new section is added to chapter 70.119A RCW to read as follows:

(1) A person or purveyor that owns, operates, or maintains a public water system shall not be liable for damages resulting from shutting off water to a residential home with an installed fire sprinkler system if the shut off is due to: (a) Routine maintenance; (b) nonpayment by the customer; or (c) a water system emergency.

(2) Any governmental or municipal corporation, including but not limited to special districts, shall be deemed to be exercising a governmental function when it acts or undertakes to supply water, within or without its corporate limits, to a residential home with an installed fire sprinkler system.

--- END ---

RESUME

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December, 2013

EDUCATION:

April 1972 - September 1973
Miami-Dade Community College, Miami, Florida
A.A. General Education Requirements.

September 1973 - December 1975
Florida Atlantic University, Boca Raton, Florida
BA. Economics
Special Emphasis on statistical analysis, economic development and urban planning.

January 1998 – July 1999
Nova Southeastern University, Fort Lauderdale, Florida.
Master of Business Administration.

June 2000 – Induction
Sigma Beta Delta – International Honor Society for Business, Management and Administration.

PROFESSIONAL EXPERIENCE:

January 1, 2000 To Date:

Vice President of Regional Operations, National Fire Sprinkler Association. This position involves management of 15 Regions of the National Fire Sprinkler Association covering the United States and the Caribbean. The major focus of Regional Operations is supporting NFSA membership. The three typical actions involve the creation of new fire sprinkler markets, the protection of existing fire sprinkler markets, and addressing concerns impacting the business environment. The Vice President also provides technical support on drafting of laws impacting the fire sprinkler industry and particularly those impacting the business environment or the bottom-line. The Vice President also provides testimony before various state and local elected officials and is a stabilizing force in conflict resolution and speaks at conferences of many interest groups throughout the nation on a frequent basis.

January 15, 1991 To January 1, 2000:

Executive Director of the Florida Fire Sprinkler Association. This position involves management of a statewide nonprofit association, A Chapter of NFSA, that has goals of promoting life and property safety through the installation of automatic fire sprinkler systems. This position also involves managing and delivering educational seminars, managing legislative affairs, and coordinating annual seminars and exhibitions. In addition to an active legislative and educational role, the Executive Director is intensely involved in community relations and assisting local government in growth management planning. As Executive Director, I successfully lobbied the Florida Legislature to pass a comprehensive fire safety law which requires all new buildings 3-stories and above, regardless of occupancy classification, to be equipped with an automatic fire sprinkler system. As a result of this law and others association actions, there has been an increase in the Florida fire sprinkler market from $70 to $231 million annual sales making Florida's fire sprinkler industry the healthiest in the nation; membership has grown from 12% to 73% of fire sprinkler contractors; over 1,000 local fire officials have received fire sprinkler educational programs; and a close relationship is established with the State Fire Marshal's Office and Florida's fire service leaders.

Buddy Dewar has conducted educational seminars covering the following subjects:

Design, Inspection & Plans Review of Fire Sprinkler Systems
Life Safety Code - NFPA 101
Reasonable Fire Code Application - Special for City of Ft. Lauderdale
Alternative Approaches to Life Safety Code Applications - NFPA 101A
Legal Liabilities of Fire Code Application
Fire Code Requirements for Elderly Housing
Inspection, Testing, & Maintenance of Water-based Fire Protection Systems
Fire Code Application in Mental Health Homes
Underground Fire Mains - NFPA 24.
Pumps for Fire Protection - NFPA-20.
Managing Community Growth – Building a Fire safe Community.
Cross-Connection Protection and Fire Suppression Systems.
Fraternity and Sorority Fire Protection

March 25, 1989 To October 30, 1996:

Senior Associate with Buddy Dewar & Associates, a fire science and technology consulting firm. Duties include overall management of consulting services, project selection and technical research and development. Consults in all aspects of fire service but concentrates in reasonable code conflict resolution, computer-aided equivalency determinations, plan review, educational seminars and expert witness appearances. Also conducts fire department efficiency and proficiency reviews. Buddy Dewar has qualified as an expert witness in State and Federal Courts and Florida Administrative Hearings in the fields of:

Fire Fighter Training

Fire Fighter Medical Standards
Fire Officer Training
Fire Code Interpretation and Compliance
Fire Fighting Operations
Fire Behavior and Flame Spread in Burning Buildings
Code Compliance and Fire Behavior

The time demands of the Florida Fire Sprinkler Association minimizes outside consulting. Buddy Dewar has cleared past expert witness commitments but still performs expert witness work for members of the Florida Fire Sprinkler Association on a pro bono basis.

April 1, 1976 - March 24, 1989
Division of State Fire Marshal

May 1, 1982 - March 24, 1989:

Office of the Director, Division of State Fire Marshal, Tallahassee, Florida; 181 authorized positions; eight field offices; $13.4 million budget.

Duties and Responsibilities: Served as ***Director*** of the Division of State Fire Marshal and was responsible for the overall management of all facilities, equipment and personnel for a variety of fire service activities involving the protection of life and property from fire and explosion. The Division operates four bureaus and one section. The Bureau of Fire and Arson Investigation responds to requests from agencies for investigation of fires and explosions that occur under suspicious or undetermined circumstance. The Bureau of Fire Prevention promulgates fire codes of statewide application and inspects state-owed and -leased buildings to assure compliance with fire codes. The Bureau of Explosives and Fire Equipment regulates fire equipment dealers, fire protection system contractors, and explosive handlers. The Bureau of Fire Fighter Standards and Training, also known as the Florida State Fire College, provides training and certification from basic fire fighting to advanced topics. This bureau delivers curriculum that lead to an accredited college degree. The Fire Incident Reporting section receives and compiles data on fires from fire departments throughout the state. These statistics are used to guide the state fire prevention efforts. Staff from these bureaus is located at seven field offices and at the State Fire College in Ocala. A significant percentage of time is spent mitigating conflicts between local fire officials, design professionals, and property owners in the statutory role as final administrative interpreting authority of fire codes that have statewide application, typically state adopted NFPA codes and standards.

Accomplishments: Established a statewide fire safety public awareness program and established a public educator network; lobbied intensely to obtain $9.6 million to construct a new Florida State Fire College; persuaded the Department of Corrections to provide some land on which to build the new Florida State Fire College; drafted legislative language and lobbied for successful passage of many of Florida's laws including: fireworks safety laws; building code and fire code parity laws; building code and fire code conflict resolution provisions; burn injury reporting; statewide licensure of

alarm contractors; mandatory statewide plans review for fire code compliance; a residential sprinkler contractor licensure classification for those interested in NFPA 13D installations; a nationally recognized hotel fire sprinkler retrofit law; boiler safety laws; and mandatory statewide application of the *Life Safety Code.* Also established a mid-rise fire sprinkler code that was used as a model for a subsequently adopted national fire sprinkler standard known as NFPA 13R.

April 1, 1976 - April 30, 1982

Served as Instructor, Program Coordinator and from March 1, 1979, served as the **Superintendent of the Florida State Fire College.**

The Bureau of Fire Fighter Standards and Training, commonly known as the Florida State Fire College, is the vehicle through which the vast fire service training and education responsibilities of the Division of State Fire Marshal are executed. The Bureau has the responsibility for functions relating to qualifications and standards for employment, training, education, and certification of fire fighters, forestry fire fighters, fire inspectors, fire officers, and training centers. The college also manages the statewide educational incentive program and curriculum development. The Florida State Fire College trains over 5,000 fire service students each year who accumulate over 40,000 contact hours of fire service training at courses conducted in-house and through the outreach delivery program.

Accomplishments: Developed and implemented statewide curriculum for statutorily mandated fire code inspector certification program; established a career ladder curriculum for the fire service following NFPA firefighter qualification standards; success in implementing firefighter certification qualifications resulted in appointment as a member of the NFPA 1001 Firefighter Professional Qualifications Committee, a committee Buddy later Chaired: computerized licensure and testing administrative functions; established a validation program for examination material; established a fire service training and education delivery system which has been used as a model by other states; established an educational delivery system quality control program; and negotiated with the local community college thereby allowing college credit for selected curriculum.

March 1973 - April 1976

Plantation Fire Department, Plantation, Florida

Combat Battalion Chief with a response area that included three hospitals and many large nursing homes and adult assisted living facilities and large shopping malls. With assistance from the Boca Raton Fire Department, developed a training manual for aerial apparatus, which eventually was delivered by the manufacturer with each new apparatus. Established a 24-contact hour training program for all volunteer fire fighters. Established a code enforcement program.

MILITARY SERVICE:

September 1966 - March 1972 - US Army

Attended Officers Candidate School, Fort Lee, Virginia. After completing a five-month program was commissioned as an officer and assigned to Viet Nam as an Economic Development Officer for the City of Vung Tau (Population 99,000). Projects included: development of cooperative pig farms; establishment of an orphanage; constructed public schools; and constructed a 6,900 kW power plant and power line system which provided complete and sufficient electrification of Vung Tau, a project which drew the personal praise from the Prime Minister of Viet Nam. Was awarded the Bronze Star Medal with First Oak Leaf Cluster and "V" Device for valor for ***taking command of fire fighting efforts during rocket attacks*** on a large petroleum storage tank farm fire when Vietnamese civilian fire fighters abandoned their trucks and equipment. Transferred to Frankfurt, Germany, and assigned as a Section Chief on a General Staff. Functions included, but not limited to, that of a Command Engineer for upgrading pre-W.W.II facilities and ***arson investigation for European military facilities.*** Left active duty in March 1972 at the rank of ***Captain***. Completed reserve officer commitment and awarded Honorable Discharge on June 5, 1975.

December 1967 - August 1968

Suburban Fire Department, Augusta, Georgia (now Richmond County Fire Department). Lived in the fire station while in the US. Army stationed at nearby Fort Gordon. Taught fire fighting and pump operations with Lt. Otis Spence for the Fire Institute of Georgia Technological University. Responded to over 60% of all fire calls. Received recognition for training presentations.

1961 - September 1966

New Rivers Volunteer Fire Department. Joined the department as a cadet while in high-school. Active volunteer fire fighter involved in the delivery of fire suppression, training and public education.

ACTIVITIES, COMMISSIONS AND APPOINTMENTS; PAST AND PRESENT:

- ***Past Chair 2003-2005, Florida Construction Coalition;*** a coalition of Florida's vast construction industry lobbyists. Also a founding member.
- ***Past Chair, Florida Fire Code Advisory Council,*** State Insurance Commissioner Appointment
- ***Past President, Florida State Firemen's Association.*** The first President to serve two terms since the Association was Chartered in 1925. Received recognition for drafting and successfully lobbying for a volunteer firefighter death benefit law.
- Former ***Commissioner, State Emergency Response Commission,*** Governor Appointment. Active during the ramp up of ALS services.
- Former Member, ***Florida Fire Safety Board,*** Governor Appointment.
- Former Member, ***Law Enforcement Coordinating Council, Middle District of Florida,*** US. Attorney General Appointment.
- Former Member, ***State of Florida Emergency Medical Service Council***

- Member, Fire Marshal's Association of North America – How renamed as the International Fire Marshals Association.
- Former Member, Portable Fire Extinguisher Committee, NFPA 10, 10L, National Fire Protection Association.
- Former Chairperson, ***Affordable Fire Sprinkler Systems Committee.*** The work product of this committee was used as the basis for NFPA 13R
- Former Chairperson and Member, ***Florida Public Service Education Advisory Committee,*** Department of Education, Education Commissioner Appointment.
- Former Member, ***State of Florida Uniform Building Code Committee,*** Governor Appointment.
- Currently serving as a Member of the Health Care Occupancies Committee, Life Safety Code, NFPA 101.
- Former Chairperson and Member, National Fire Protection Association, ***"Fire Service Professional Standards Development Committee for Fire Fighter Qualifications,"*** which promulgated:
  NFPA 1001, *Fire Fighter Professional Qualifications,*
  NFPA 1002, *Driver/Engineer Professional Qualifications,*
  NFPA 1003, *Airport Fire Fighter Professional Qualifications,* and
  NFPA 1004, *Fire Fighter Medical Technicians.*
  Buddy served as a member and Chair of this committee during the ramp up of national standardized firefighter professional qualifications. The cognitive and psychomotive skills necessary to perform as a firefighter vastly differed throughout the nation making firefighter certification reciprocity problematic. Buddy served on this committee during his tenure as Superintendent of the Florida State Fire College which resulted in the implementation of exceptional firefighter training standards in Florida.
- Fellowship of Christian Fire Fighters
- International Society of Fire Service Instructors
- Florida Fire Chief's Association
- Florida Fire Marshals and Inspectors Association

SPEAKER:

- *Frequently sought after as program speaker.*
- *Recognized as an outstanding public speaker.*
- Keynote Speaker at many Annual meetings of National fire service related organizations - Fire Equipment Manufacturers' Association, 1985; Annual Meeting Florida State Firemen's Association, numerous years; Florida Fire Marshals and Inspectors Association, numerous years including 2010; National Association of Fire Equipment Distributors, Sectional Conferences in New Orleans, Orlando, Boston, Seattle, and Chicago, 1984-85, Program Speaker at many state fire service events including the Washington State Fire Commissioners Association, 2009; Illinois Fire District Commissioners Conference, 2012.

ARTICLES PUBLISHED - PAPERS WRITTEN:

- "Competency-Based Education," *Rekindle,* ISFSI, 1978
- "Organizational Design for the Delivery of Fire Service Training and Education," National Fire Prevention and Control Administration Grant A7030, January 1979
- "Fire Fighter Certification, The Fire Service of the Future," *Speaking of Fire,* IFSTA, Summer, 1984.
- "Congressional Testimony, Puerto Rico DuPont Plaza Hotel Fire", Congressional Hearings, Committee on Science, Space, and Technology, United States House of Representatives, March, 1988.
- "Controlling Construction Costs of Educational Facilities", Buddy Dewar & Olin Greene, Florida House of Representatives, Select Committee on Educational Facility Funding, February, 1996
- "Controlling the Cost of Fire Protection in the Consolidated City of Jacksonville, Florida", July 15, 1996
- "The Role of Fire Codes in Building Construction", a paper prepared for the Governor's Building Code Study Commission, April 1997
- "Residential Fire Sprinklers For Life Safety: An Economic Perspective." December 1998
- "Performance-based Fire Safety Code for Existing Schools" November 1999.
- "Residential Fire Sprinklers and Housing Economics – A Legislator's Guide to Life Safety" – February, 2009.
- Numerous other papers.

HONORS:

A wall of plaques indicates numerous national and state awards and recognition of my service and ability. Recognition of my programs and efforts was noted in ***People*** magazine, May 28, 1979, and ***Fire Fighter of the Year,*** Plantation Jaycees, 1975, and recognition from the fire service and staff for my efforts in turning around the Florida State Fire College are among my personal favorites. I was awared the "Fire Sprinkler Advocate of the Year" in 2005 from the Florida American Fire Sprinkler Association. Three organizations have honored me with ***Life Membership;*** the Florida State Firefighters Association, the Florida Fire Marshals and Inspectors Association, and the National Fire Protection Association. The Florida Fire Sprinkler Association has named its annual golf tournament the Buddy Dewar Golf Classic. And the most recent recognition came from the National Association of State Fire Marshals where I was awarded the ***2013 Olin Greene Fire Prevention Service Award,*** the nation's highest fire service lifetime achievement award.

Table R702.1(3) is confusing, in error and does not comport with ASTM C926 Tables 2 and 3. There are many combinations of plaster materials that can be used compositionally as acceptable proportioned plaster mixes. Table R702.1(3) does not recognize all of them. The Code references ASTM C926 and should accurately reflect that reference.

- The predominant plaster mix in Minnesota recognized by ASTM C926 for the 1st coat contains 1 part portland, 1 part masonry, 2-1/2 - 4 volume of aggregate per sum of cementitious materials aggregate. For the 2nd coat, 1 part portland, 1 part masonry, 3-5 volume of aggregate per sum of volumes of cementitious materials aggregate. Table R702.1(3) does not even recognize this compositional mix.
- Table R702.1(3) First Coat, Masonry: Contains only Masonry in the scratch coat. There is no requirement for any Portland Cement.
- Minnesota Rule 1309.0703 Section R703.6 states that exterior plaster shall be in compliance with ASTM C926, which makes Table R702.1(3) redundant and unnecessary.

I have attached a PDF copy of page 4 of ASTM C926, Tables 2 and 3 as evidence.

Steven Pedracine CSI, CDT

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Steven Pedracine CSI, CDT, CEI

Minnesota Lath & Plaster Bureau

Executive Director
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Coon Rapids, MN 55448
phone: (763) 757-MLPB (6572)
cell: (612) 708-2444
e-mail: steve@mnlath-plaster.com
www.mnlath-plaster.com

TABLE 2 Base-Coat Proportions,[A] Parts by Volume[B]

Plaster Mix Symbols	Cementitious Materials					Volume of Aggregate per Sum of Separate Volumes of Cementitious Materials	
	Portland Cement or Blended Cement	Plastic Cement	Masonry Cement		Lime		
			N	M or S		1st Coat	2nd[C] Coat
C	1	...	...	...	0–¾	2½ –4	3–5
CL	1	...	...	...	¾ –1½	2½ –4	3–5
M	...	...	1	...	...	2½ –4	3–5
CM	1	...	1	...	...	2½ –4	3–5
MS	...	...	...	1	...	2½ –4	3–5
P	...	1	...	...	...	2½ –4	3–5
CP	1	1	...	...	...	2½ –4	3–5

[A] The mix proportions for plaster scratch and brown coats to receive ceramic tile shall be in accordance with the applicable requirements of ANSI A108.1 series applicable to specified method of setting time.

[B] Variations in lime, sand, and perlite contents are allowed due to variation in local sands and insulation and weight requirements. A higher lime content will generally support a higher aggregate content without loss of workability. The workability of the plaster mix will govern the amounts of lime, sand, or perlite.

[C] The same or greater sand proportion shall be used in the second coat than is used in the first coat.

TABLE 3 Job-Mixed Finish Coat Proportion Parts by Volume

Plaster Mix Symbols[A]	Cementitious Materials					Volume of Aggregate per Sum of Separate Volumes of Cementitious Materials[B]
	Portland Cement or Blended Cement	Plastic Cement	Masonry Cement[A]		Lime	
			N	M or S		
F	1	...	...	...	¾ –1½	1½ –3
FL	1	...	...	...	1½ –2	1½ –3
FM	...	...	1	...	...	1½ –3
FCM	1	...	1	...	...	1½ –3
FMS	...	...	...	1	...	1½ –3
FP	...	1	...	...	...	1½ –3

[A] Additional portland cement is not required when Type S or M masonry cement is used.

[B] In areas not subject to impact, perlite aggregate shall be permitted to be used over base-coat plaster containing perlite aggregate.

time only to restore the required consistency. Plaster not used within 1½ h from start of initial mixing shall be discarded.

NOTE 4—Severe hot, dry climate conditions accelerate the stiffening of plaster and require reduction of this limit. The use of cold waters will slow the stiffening process.

6.2.3 Finish-coat plaster shall not be tempered.

7. Application

7.1 *General*:

7.1.1 Portland cement plaster shall be applied by hand or machine to the nominal thickness specified in Table 4.

7.1.2 Plaster nominal thickness shall be measured from the back plane of the metal plaster base, exclusive of ribs or dimples, or from the face of the solid backing with or without metal plaster base, to the outer surface exclusive of texture variations.

7.1.3 Portland cement-based plaster shall be applied on furred metal plaster base when the surface of solid backing consists of gypsum board, gypsum plaster, wood, or rigid foam board-type products.

NOTE 5—On horizontal ceiling supports or roof soffits protected by a drip edge, gypsum board products shall be permitted to be used as backing

TABLE 4 Nominal Plaster Thickness[A] for Three- and Two-Coat Work, in. (mm)

BASE	Vertical				Horizontal			
	1st Coat	2nd Coat	3rd Coat[B]	Total	1st Coat	2nd Coat	3rd Coat[B]	Total
	Interior/Exterior							
Three-coat work:[C]								
Metal plaster base	⅜ (9.5)	⅜ (9.5)	⅛ (3)	⅞ (22)	¼ (6)	¼ (6)	⅛ (3)	⅝ (16)
Solid plaster base:								
Unit masonry	¼ (6)	¼ (6)	⅛ (3)	⅝ (16)		Use two-coat work		
Cast-in-place or precast concrete	¼ (6)	¼ (6)	⅛ (3)	⅝ (16)				⅜ (9.5), max
Metal plaster base over solid base	½ (12.5)	¼ (6)	⅛ (3)	⅞ (22)	½ (12.5)	¼ (6)	⅛ (3)	⅞ (22)
Two-coat work:								
Solid plaster base:								
Unit masonry	⅜ (9.5)	⅛ (3)		½ (12.5)				⅜ (9.5)
Cast-in-place or pre-cast concrete	¼ (6)	⅛ (3)		⅜ (9.5)				⅜ (9.5)

[A] Exclusive of texture.

[B] For solid plaster partitions, additional coats shall be applied to meet the finished thickness specified.

[C] For exposed aggregate finishes, the second (brown) coat shall become the "bedding" coat and shall be of sufficient thickness to receive and hold the aggregate.

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Please note the underlined which amends my comments from the previous e-mail.

Table R702.1(3) is confusing, in error and does not comport with ASTM C926 Tables 2 and 3. There are many combinations of plaster materials that can be used compositionally as acceptable proportioned plaster mixes. Table R702.1(3) does not recognize all of them. The Code references ASTM C926 and should accurately reflect that reference.

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- Table R702.1(3) First Coat, Masonry: Contains only Masonry in the scratch coat. There is no requirement for any Portland Cement.
- <u>IRC R702.2.2 cement plaster. Requires that cement plaster materials conform to ASTM C926</u> and Minnesota Rule 1309.0703 Section R703.6 states that exterior plaster shall be in compliance with ASTM C926, which makes Table R702.1(3) redundant and unnecessary.

I have attached a PDF copy of page 4 of ASTM C926, Tables 2 and 3 as evidence.

Steven Pedracine CSI, CDT

--

--

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FL	1	...	...	...	1½ –2	1½ –3
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FCM	1	...	1	...	...	1½ –3
FMS	...	...	...	1	...	1½ –3
FP	...	1	...	...	...	1½ –3

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[A] Exclusive of texture.

[B] For solid plaster partitions, additional coats shall be applied to meet the finished thickness specified.

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Lines 47.3 and 47.4 should be struck considering the actions of eliminating IRC Table R702.1(3)

Strike: "The proportion of aggregate to cementitious materials shall be as set forth in Table R702.1(3)."

--

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Steven Pedracine CSI, CDT, CEI

Minnesota Lath & Plaster Bureau

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Christopher Contreras
Vice-President of Sales & Marketing

Twin Cities

7599 Anagram Drive
Eden Prairie, MN 55344

952-229-6021 Office
952-229-6024 Fax

www.ryland.com

January 2, 2013

VIA EMAIL

The Honorable Eric J. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Minnesota Department of Labor & Industry – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID No. RD-4144; OAH No. 1900-30855.

Dear Judge Lipman:

I am the Vice President of Sales and Marketing for Ryland Homes, and I am submitting this letter to supplement my testimony at the December 12, 2013 hearing at the Department of Labor and Industry. During my testimony, I referenced elevations and floor plans for three of Ryland's homes. For your reference, I have included the specific square footages of those floor plans below:

House Name	First Floor	Second Floor	Total 1st and 2nd	Basement	Total
Linden	1468	1475	2943	1473	4416
Linden w/Morning Room	1638	1475	3113	1643	4756
Rutherford	1470	1730	3200	1486	4686
Prescott	1462	1918	3380	1474	4854

As I testified during the hearing, the prices for each of these models in different communities as advertised on our internet site is Exhibit L, Tab 54.

As I testified, the Linden is our number one selling floor plan last year. Last year we sold 51 Linden Models, and 33 of these included the morning room. Based upon the chart above, if

the morning room is excluded from the initial construction, no fire sprinklers would be required. The cost of the morning room option is approximately $17,000. If in addition to this, the homeowner must pay over $12,000 for the sprinkler system, now the morning room option becomes close to a $30,000 expense. We expect that at that cost, homeowners will choose to wait and add the morning room after the initial construction. By doing so, the homeowner will avoid the sprinkler mandate.

This same model with the morning room is not more dangerous than the same model without the morning room. There is no reason to require sprinklers if a homeowner chooses this popular option.

Sincerely,

Christopher Contreras
Ryland Homes, Inc.
Vice President of Sales & Marketing

Please see attached for consideration by Judge Lipman in the rule-making proceedings captioned Revisor's ID No. RD-4144, OAH No. 1900-30855. This pdf is being sent in three parts (1 of 3), and is related to my prior emails sending other state documents. I have attached the original submission letter for your reference.

Thank you – I apologize for any confusion,

Haley L. Waller Pitts
Attorney
Fredrikson & Byron, P.A.
200 South Sixth Street
Suite 4000
Minneapolis, MN 55402.1425

DIRECT: 612.492.7443

ASSISTANT: 612.492.7803

FAX: 612.492.7077

E-MAIL: hwallerpitts@fredlaw.com

This is a transmission from the law firm of Fredrikson & Byron, P.A. and may contain information which is privileged, confidential, and protected by the attorney-client or attorney work product privileges. If you are not the addressee, note that any disclosure, copying, distribution, or use of the contents of this message is prohibited. If you have received this transmission in error, please destroy it and notify us immediately at our telephone number (612) 492-7000. The name and biographical data provided above are for informational purposes only and are not intended to be a signature or other indication of an intent by the sender to authenticate the contents of this electronic message.

From: Waller Pitts, Haley
Sent: Thursday, January 02, 2014 2:51 PM
To: rulecomments@state.mn.us
Subject: FW: Revisor's ID No. RD-4144, OAH No. 1900-30855 (VA)

Please see attached for consideration by Judge Lipman in the rule-making proceedings captioned Revisor's ID No. RD-4144, OAH No. 1900-30855. This message is now being sent in three parts because of the size of attachments. This is email 2 of 3.

Haley L. Waller Pitts
Attorney
Fredrikson & Byron, P.A.
200 South Sixth Street
Suite 4000
Minneapolis, MN 55402.1425

DIRECT: 612.492.7443

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From: Waller Pitts, Haley
Sent: Thursday, January 02, 2014 2:40 PM
To: rulecomments@state.mn.us
Subject: FW: Revisor's ID No. RD-4144, OAH No. 1900-30855

Please see attached for consideration by Judge Lipman in the rule-making proceedings captioned Revisor's ID No. RD-4144, OAH No. 1900-30855. This message is being sent in two parts because of the size of attachments. This is email 2 of 2.

Thank you,

Haley L. Waller Pitts
Attorney
Fredrikson & Byron, P.A.
200 South Sixth Street
Suite 4000
Minneapolis, MN 55402.1425

DIRECT: 612.492.7443

ASSISTANT: 612.492.7803

FAX: 612.492.7077

E-MAIL: hwallerpitts@fredlaw.com

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From: Waller Pitts, Haley
Sent: Thursday, January 02, 2014 2:10 PM
To: 'rulecomments@state.mn.us'
Subject: Revisor's ID No. RD-4144, OAH No. 1900-30855

Please see attached for consideration by Judge Lipman in the rule-making proceedings captioned Revisor's ID No. RD-4144, OAH No. 1900-30855.

Thank you,

Haley L. Waller Pitts
Attorney

Fredrikson & Byron, P.A.
200 South Sixth Street
Suite 4000
Minneapolis, MN 55402.1425

DIRECT: 612.492.7443

ASSISTANT: 612.492.7803

FAX: 612.492.7077

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Fredrikson
& BYRON, P.A.

January 2, 2014

VIA EMAIL

The Honorable Eric L. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Minnesota Department of Labor & Industry – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID No. RD-4144; OAH No. 1900-30855.

Dear Judge Lipman:

Minnesota law requires the building code to conform to model building code "*generally accepted and in use throughout the United States*." Minn. Stat. § 326B.106. Testimony at the December 12, 2013 hearing on the above-captioned proposed rules showed that 41 other states have rejected requiring fire sprinklers in single-family homes. Attached for your review are materials from Minnesota's border states (Iowa, North Dakota, South Dakota, and Wisconsin) that reflect their rejection of the proposed rules. Also attached are materials from additional states that rejected the fire sprinkler mandate through their respective administrative processes, and from which materials reflecting a substantive consideration of the fire sprinkler mandate were available.

We hope that the attached materials will be useful in your review of the proposed rules, and appreciate the opportunity to participate in this process.

Very truly yours,

Joseph G. Springer
Direct Dial: 612.492.7168
Email: jspringer@fredlaw.com

Attachments

MAINE

MINUTES FROM THE 1ST SPRINKLER TAG
2/24/2010
Saco Town Hall
6:30 p.m.

TAG members present: Jeff Twitchell, Maurice Pilette, Rob Baker, Gerry Leach, Jeff Emerson, Peter Cutrer, Tim Travers, Lee DeVito, Mike Nugent, Carl Chretien, Rich Cromwell, Mark Cummings, Eric Ellis and Barbara Berry

Building Codes Board members present: Dick Tarr, Rich McCarthy, Barry Chase and Roger Rossignol

DPS Staff present: Dir. Dick Dolby and Kathy Chamberlain

Introduction: Rich McCarthy (FMO) advised that the 2006 NFPA 101 did ask for residential homes to be sprinkled. When the Fire Marshal's Office (FMO) adopted NFPA 101, that requirement was removed. The 2009 IRC is calling for sprinklers in 2010 for one and two family new construction.

Discussion points:

$4-$5 sq ft to sprinkler with all the costs figured in, using well water. 11 states have bills currently in, to ban mandatory sprinklers right now. Other states are looking at it.

Rich Cromwell advised he thought it wasn't right to force the costs of $11,000 - $12,000 on homeowners, but rather we should be looking to enforce that all homes had working smoke detectors. THAT is what saves lives, he feels, not forcing this mandatory sprinkler law on homeowners. Rich submitted to the Board his information as well as invoices where sprinkler systems had been installed in homes, that did cost this much.

Maine has about 500,000 homes – how many are sprinkled? How many have had fires?

Suggestion made that if the new code requires sprinklers – may it have any conflicts with the State Plumbing Code?

Manufactured homes – modulars are governed by IRC. Trailers and doublewides are governed by HUD, and not covered under the Building Code.

Of 470 communities in the state, only 83 currently have a code.

Maurice Pilette advised the group about NFPA 13-D basic sprinkler systems. If these are installed, there's no maintenance required. Once you start adding MORE to the system, that makes it much less maintenance free and costs more. He insists this would be the way to go as he has dealt with them for 25+ years and stands by what he advised the group.

Eric Ellis, FMO, submitted a Change to the 2009 IRC, to the Board. He would like to add the following, after the section that addresses one & two family dwellings to be sprinkled:
"This only applies to new subdivisions of five or more homes where none of the following options are available for a water source for fire protection:"

1. Hydrants off of the town water supply where there is at least one hydrant within 1,000 feet of every home within the subdivision.
2. Hydrants off of a fire pond where there is at least one hydrant within 1,000 feet of every home within the subdivision.
    a. The fire pond must have at least 120,000 gallons of water available under a maximum projected thickness of ice.
    b. The fire pond and hydrants must be maintained at owner's expense.
    c. The town will be free of any liability regarding the fire pond.
3. Hydrant(s) off of a cistern where there is at least one hydrant within 1,000 feet of every home within the subdivision:
    a. The cistern and hydrant(s) must be maintained at owner's expense.
    b. The cistern must be protected from freezing and maintain a volume of at least 30,000 gallons of water.
    c. The town will be free of any liability regarding the cistern.

Where the fire sprinkler option is used, then construction trade-offs shall be given, such as allowing longer dead-end roads, smaller turn-arounds, narrow roads, and tighter cluster housing.

Smoke detectors combined with sprinklers reduce fatalities 80%, it was reported.

Instead of making a major change to the Code – perhaps options could be considered such as: Pulling it out of the code; perhaps put it in slowly – like Eric's proposal; or wait and make it in effect in 2012 for example. Points to be considered.

Three towns in Maine currently that require sprinklers in new construction: Randolph, Rockland and Westbrook.

Conclusion:
The Sprinkler Board members will put together a list of questions for which the TAG to respond – and take those to the full board; have the TAG members get the information back to Kathy; and then have another Sprinkler TAG meeting.

Meeting adjourned at 9:15 p.m.

MINUTES FROM THE 2nd SPRINKLER TAG
3/23/2010
Saco Train Station Conference Room
6:30 p.m.

Meeting opened at 6:40 p.m. Introductions were done.

TAG members present: Jeff Twitchell, Rob Baker, Gerry Leach, Peter Cutrer, Tim Travers, Lee DeVito, Mark Cummings, Eric Ellis, Andrew Grant and Barbara Berry

Building Codes Board members present: Dick Tarr, Rich McCarthy, Barry Chase and Roger Rossignol

DPS Staff present: Dir. Dick Dolby and Kathy Chamberlain

Roger Rossignol, Board member addressed the group and suggested that the folks who are "for" putting in a sprinkler system in the adopted 2009 IRC Code as well as the folks who are "against" could perhaps give the Sprinkler Board members 10 "talking points" on why they feel the way they do. The regular Board will then go through the analysis matrix they have created to make a final decision as to putting the requirement of sprinkler systems for new construction one and two family homes or not. He would like to see these suggestions condensed to being a smaller working document instead of many pages, to make it easier for the Board to consider.

The Maine Realtors Association conducted a survey of 600 people.

Question 1. Should sprinklers be mandatory? 19% said yes.
Question 2. Should sprinklers be an option? 77% said yes.

1. Should sprinklers be mandatory? 19% of the 600 said yes.
2. Should sprinklers be an option 77% of the 600 said yes.

At the end of the survey, the questions were asked again, 16 % now favored mandatory sprinklers and 80 % did not favor mandatory sprinklers.

Gorham Fire Chief, Bob Lefebvre advised the board that Gorham has had a mandatory sprinkler requirement for new construction in place since 1987. They are given two options in order to comply: build a fire pond within 2000' of a subdivision or….install sprinklers in the homes. (It seems that the average cost per home for a sprinkler system is approximately $5,000 - $5,100 as reported by Rob Baker, Bridgton CEO, but others had echoed that approximately amount.) Rob got this average from the new home construction in Bridgton in 2007. He recommended to wait on adopting sprinklers.

Eric Ellis, SFMO, advised that if the board puts in sprinklers as written or required – there will be anti-legislation filed against it and there will be a huge outcry. If the Board does nothing about it, we will be in the dark ages. Sanford, Gorham and Falmouth each have about 50-60 houses sprinklered. Gorham doesn't mandate this, but they do try to work with the folks who are building by offering economic advantages such as letting subdivisions go in further on dead end roads, if they sprinkler, for example.

Peter Cutrer, Sanford Fire Marshal is in favor of the tiered approach to sprinklers, because it is a cost issue.

The "State" can't give concessions like extending dead end roads or smaller turnouts. Those are municipal decisions.

Possibilities:

1. Would it be possible to extend the time limit to maybe 2012 for the next adoption cycle for the codes?
2. Could a footage requirement be put in i.e over a certain footage of a residence be sprinklered only or perhaps encapsulate it with sheetrock?
3. Seasonable properties could be exempt.
4. Perhaps the egress windows size in basement bedrooms could be smaller if it was sprinklered.

Gorham's mandatory sprinkler code is a Life/safety code under the Land use and Planning Board, it's not a building code. Perhaps it won't have to go away if that is so. It will be considered.

Barbara Berry, Maine Realtor's Association still stressing that affordability is the huge issue, if it is mandated. She knows that some legislation will be submitted for sure, if the Board requires sprinklers in the adopted codes.

Rich McCarthy, board member offered that maybe we could treat this question as a conflict between NFPA 2009 which requires sprinklers and the MUBEC that might not. The Board might have more latitude to treat it as a conflict.

Can we reach a compromise with this issue?

Next meeting will be on 3/29 at 6:30 p.m. at the Scarborough Town Hall.

Respectfully submitted,
Kathy Chamberlain

MINUTES FROM THE 3rd SPRINKLER TAG
3/29/2010
Scarborough Town Office Conference Room
6:30 p.m.

Meeting opened at 6:30 p.m. Introductions were done.

TAG members present: Peter Cutrer, David Jackson, Jeff Twitchell, Eric Ellis, Carl Chretien, Lee DeVito, W. Mark Cummings, Gerald Leach, Tim Travers, Barbara Berry and Andrew Grant

Guests included: Brian Finn, Chief Michael Thurlow, Chief Pat Fairbanks, Chief Bob Lefebvre and Jon Michelson. (Chiefs Lefebvre and Fairbanks joined the TAG after this meeting)

Building Codes Board TAG members not required to attend this meeting.

DPS Staff present: Dir. Dick Dolby and Kathy Chamberlain

Dick Dolby passed out a Summary of what was discussed at the last TAG meeting which listed the areas of compromise that were reached or at least were middle ground discussions.
He advised that perhaps the towns that have already put sprinklers in place as a land use or Fire/Life Safety Code might possibly be able to keep it, as it's not part of the Building Codes for that town.

SUMMARY

The Sprinkler TAG has met several times in southern Maine to discuss relevant issues.

The TAG members reviewed the status of the NFPA 101 adopted by the Department of Public Safety, Office of State Fire Marshal. While the present edition of the NFPA 101, as written, does contain a provision requiring sprinkler protection in one and two-family dwellings, in the adoption of the code the specific provision requiring sprinkler protection in one and two-family dwellings were not adopted.

The TAG members reviewed the status of the International Residential Code, 2009 edition, under consideration for adoption as a portion of the Maine Uniform Building and Energy Code, and found the code does contain the specific provision requiring sprinkler protection in one and two-family dwellings.

Therefore the TAG found there is a conflict between the present regulations as proposed for adoption as a portion of the Maine Uniform Building and Energy Code. This recognition permitted the TAG to move forward with discussions aimed at resolution of the two opposing code provisions, if possible.

The TAG members identified a number of pros and cons that effected the discussion.

While our original discussions were significantly polarized at first, the TAG members did make significant progress in identifying areas where a majority of the TAG members were able to achieve limited agreement.

The group agreed that configurations identified as town houses should be subject to application of the adopted code provisions immediately.

The group generally agreed that a mandatory sprinkler provisions should be implemented in a phased time period of two (2) years.

The group generally agreed that the sprinkler provisions permitted by the IRC, notable NFPA 13D should not be permitted to be altered by individual communities.

The group generally agreed that a threshold size of the one and two-family dwelling should be established, below which the sprinkler provisions would not be required. The "size" should be strictly living area only, changes or modifications in the future would have the effect of nullifying the exception. Additionally, the addition of exterior porches or decks would not have the effect of increasing the "size" as long as they are open, specifically not enclosed to retain heat or smoke products. The threshold "size" was not firmly established but ranged from:

Year 1	3,500 sq. ft.	to	*Year 2*	3,000
	3,000 sq. ft.	to		2,500
	2,500 sq. ft.	to		2,000
	2,000 sq. ft.	to		1,500

- The group generally agreed that one and two-family dwellings below the threshold size should provide an increased level of protection when taking advantage of light-weight construction features. Specifically, basements with light-weight framing should be provided with a sheetrock ceiling system, equivalent to the construction methods employed in the remainder of the dwelling. As an alternative to the sheetrock ceiling sprinkler protection off the domestic water service was considered acceptable.

The Board Members present at the TAG meetings appreciated the spirit of cooperation expressed by all the members of the TAG to openly discuss the pros and cons in a meaningful dialogue.

It is my understanding the Board Members on the Sprinkler TAG will share their thoughts with the entire Technical Advisory Board and request the matter be voted on.

Peter Cutrer, Sanford Fire Marshal wrote to Bruce Johnson at ICC and asked the following questions of Bruce

1. Was the 2009 IRC written with the presumption of sprinklers being put in?
   Yes and it will remain in the 2012 code as well.
2. What, if any concessions favor new construction?
3. What benefits can be seen in installing these systems?

ISO is very interested in what Maine does with the MUBEC adoption.

The State Fire Marshal's Office (FMO) has 13 insurance companies listed that give reductions in homeowners insurance if they have a sprinkler in them.

Chief Lefebvre advised that NFPA 1 requires under water supply for construction – either temporary or permanent must be made available as soon as combustible materials are present on the building site.

Discussion on Summary handed out – would we exempt a garage if no one is living above it? The first floor being unlimited square feet?

Barb Berry wanted to reiterate her survey results as reported at the last meeting. The Maine Realtor's Association will fight it if sprinklers are made mandatory.

Eric Ellis, FMO, suggested that perhaps a house could be sprayed with non fire retardant materials as an option to having a sprinkler.

Gerald Leach advised that $2000 - $2500 can install a system for a 1,000 sq ft home. Many smaller homes are built here in Maine from 1,000 sq ft on up.

Summary discussion continued.....each person around the table was asked if they agreed or disagreed with the Summary as listed or with some changes made. (references made to sq ft means the amount of footage a new house being constructed would have to be to put in a sprinkler system i.e. starting with 3,500 sq ft and up.)

Results were:

1. Should be driven by a monetary value instead of a sq ft requirement
2. Thinks the code should stay intact with perhaps putting off the mandatory sprinkler requirement for a year or two. Perhaps the real estate agent or builder could have the new owners sign off they are buying a house that's not up to a nationally recognized code. Could open up for lawsuits if a house is not.
3. Consider changing "seasonal" to permanent housing – put the language in. the rest should stay as written.
4. Would like to see the requirement for sprinklers stay in the code.
5. In favor of the compromises reached.
6. Would like to see a compromise of 2500 sq ft to start out with.
7. Very much for sprinklers, wants to see us move ahead. Add the language that if a door to the outside was added to each bedroom, perhaps sprinkle only the "hot spots" in the house for one floor i.e. stove, furnace, etc.
8. Thinks costs are an issue. Would have liked more time to look at the costs. If a compromise can be made, then it won't be stopped and shouldn't be. Don't mandate particular combined systems because air/water quality folks can't do their work with these.
9. Might like to start at 3,000 sq ft instead of 2,000.
   Why is Maine different that we take it out of the code?
   A good issue made about lawyers, etc. getting into lawsuits over homes not built to National code.
   Concerned about the response time to a fire. A fire doubles half again in size each minute. The majority of fires responded to within 14-25 minutes, so without sprinklers, a house is toast.
10. Echoes what #9 said. Believes in sprinklers. Likes the Summary Dick did. Would like to see hot spots covered even in seasonal buildings.
11. We need to do something to get started. I can live with delayed time to start, change in the phased in process – maybe start with 3500 sq ft. then 3,000. thinks however that 2,000 sq ft is the right #. Could live with doing the hotspots and a door to the outside to each bedroom.

12. NFPA has evolved – that's what codes do. If we come up with something that's accepted, that's good. Don't agree with the 2,000 sq ft. Would want at least a minimum of 13-D system. Would like to see two-family houses start automatically or now, then phase in the sprinkler requirement for the one-family houses.
13. Likes the Summary. Likes the 2,000 sq ft but maybe start at 2,500 and then tier it down. Ask the FMO to get data like age of house, etc.
14. Likes providing options for people. Have to revisit and maybe consider two family for now.
15. In favor of sprinklers, thinks we should require the two-family new construction homes THIS year, one family next year. Thinks seasonal shouldn't be exempted. Go for full adoption as it is.
16. Should be kept simple, don't rewrite the code. Two years mandatory he likes, one year he doesn't. Start at 3,000 sq ft requirement. Doesn't believe homebuilders will be in favor.

Summary of members present:
Two family to be sprinklered – phased in application, maybe 3,000 sq ft this year, phased in approach. There needs to be large public education done on this.

Respectfully submitted,
Kathy Chamberlain
Secretary

Maine Building Codes and Standards Board Meeting Minutes
April 15, 2010
9:00 a.m.
Department of Public Safety
45 Commerce Drive, Augusta, Maine

Meeting opened at: 9:15 a.m.

Introductions of Board and Staff

Board members present: Rich McCarthy, Dick Lambert, Jeff Ohler, Roger Rossignol, Dick Tarr, Rick Karg, Mike Pullen, Paul Becker, Russ Martin, Shiloh Ring and Barry Chase

Board members excused: Commissioner Jordan

DPS Staff present: Dick Dolby and Kathy Chamberlain

Legal Counsel: Chris Mann

REVIEW OF THE 4/1/10 MINUTES

Motion: Jeff Ohler motioned to accept the minutes as presented
Seconded: Paul Becker
Vote: Unanimous with two abstentions

FINANCIAL UPDATE – Dick Dolby

As of this date, there is $219,928.04 in the commercial plans FMO surcharge account.

Training and Certification Committee Report and Vote

Final draft of the Rulemaking document on the training and certification that will be required for CEOs and Third-party Inspectors was reviewed for any final changes. Dick Lambert asked a question about the date of "grandfathering." Jody Harris will make the minor changes. The State Planning office will have a public hearing on this soon, if it is accepted by the Committee with minor changes to be made. A vote is not needed by the whole board, only the Training and Certification Committee. The Committee recommended accepting the final draft with changes made to go forward into the Rule-Making process.

Sprinkler TAG Members Report and Vote

Dick Tarr reported for the Sprinkler TAG board members. There is some common ground that was found amongst the Sprinkler TAG members. He recommended that the Board go through the decision tree. Should sprinklers be included in one and two family new construction in the adoption of the 2009 IRC?

The Fire Marshal's Office has been holding off adopting the 2009 NFPA codes to see what this Board is going to decide. In the initial law, the board was charged with resolving the conflicts between the NFPA (Fire and Life Safety Code) and the 2009 Building Codes to be adopted (IRC, IBC, IEBC and ICC). The 2006 NFPA doesn't have sprinklers in it, but the 2009 does contain it. That's the conflict.

Dir. Dick Dolby read a summary he had created from the Sprinkler TAG meetings, in the areas of consensus reached by the members. Some of these ideas included:

Delay sprinklers being mandatory for a year or two.
Use the NFPA 13-D system – should be followed verbatim in installation
Residential properties – seasonal considered?
No consensus to permit seasonal buildings out of the requirements.
Threshold size – living space only considered in the figuring of sq footage, not utility spaces, garages, decks, etc.
There was difficulty on deciding on the size to require sprinklers be installed – 3,000? 2,000? Sq ft.
Based on economics, mostly the low income couldn't afford to build perhaps if sprinklers are required, due to the additional cost projected to be approximately $1.25/sq ft.
If a requirement was not applicable to smaller buildings – perhaps have a protection system for ceilings and walls as in lightweight construction for example.
Almost all had polarization on mandatory or voluntary?

Mandate and cost are the two key factors in this issue. If the towns who have adopted sprinklers under their Fire/Life safety codes or perhaps Land use (subdivisions) rules that might be able to stay as it is not considered a building code.
Westbrook, Randolph and Rockland currently have sprinklers in their rules, unknown if it's in their own building codes or in Fire/Life safety or Land Use rules.

Rich McCarthy, FMO, wrote up a clarification to be included in our MUBEC adoption that states:
"3. Ordinances: Effective December 1, 2010, except as provided in subsection 4 and section 9725, any ordinance regarding a building code of any political subdivision of the State that is inconsistent with the Maine Uniform Building and Energy Code is void.
Clarification: This section of Statute would not apply to any adopted Fire & Life Safety Code, fire safety ordinance or any land use ordinance.

Motion: Dick Lambert - Adopt clarification in state Statute as written by the Fire Marshal's office dated 3/31/10.
Seconded by Jeff Ohler
Vote: 8 yes 3 no

2006 NFPA and the 2009 IRC

Roger Rossignol offered that because of the MUBEC (Maine Uniform Building and Energy Code) adoption in communities with no codes in effect right now that may contain sub-standard housing – the adoption of the codes along will raise the costs of construction. Adding sprinklers on top of that will add a lot more cost. The Board went down through the 'Decision tree" created by them to consider conflicts, on the issue of adding sprinklers to the adopted Code.

Conflict listed: 2009 IRC 313.2 vs 2006 NFPA 101 – Section 24.3.5.1
1. Does the more restrictive rule improve health, welfare or life safety? **Yes**
2. Identify potential financial impact: **Costs more**
3. Does Added Cost significantly influence health, welfare or life safety in the state? **No - Adopt Less Restrictive**

Motion: Roger Rossignol (referring to decision tree – see next page) does added cost significantly influence health, welfare, or life safety in the state? No. We should adopt the less restrictive in the 2009 IRC.
Sprinklers do save lives, but sub-standard housing costs more lives.
Second: by Rick Karg
Vote: 10 yes 1 negative (Rich McCarthy)

Discussion on residential construction using light weight components.....Have perhaps the Fire/Life Safety, IRC, IBC and Sprinkler TAGS meeting to discuss this issue.

Mr. Scott Rollins from LURC would like to address the Board at the next meeting to discuss what LURC does with building permits, etc.

Codes/Rule-making Continued Review – Chris Mann, Asst A.G.

Chris had sent out a questionnaire to the Board prior to today's meeting, for some of the answers he needs to finish up the Chapter 1 for the MUBEC rule-making. Questions were discussed and answers given. In the interest of time, we couldn't finish all of these and will continue at the next meeting.
*Decided the Board will meet on 4/29 to continue with these.

TAGS Update

Mechanical – have a meeting on 5/6/10
Energy – meeting today at 11:30 a.m.
Fire/Life Safety and IBC meet on 4/22 and 5/13

Public Comment

Peter Cutrer, Sanford Fire Marshal commented that he was disappointed that most of the realtors had left the room after today's vote on the sprinkler issue. He doesn't think that either side has made a victory today. He is disappointed that realtors have pushed against this because of affordability.

Ken Dixon, Chief of Andover F.D. addressed the board as well on the sprinkler issue. $1.50 to $6.00/sq ft. is the costs for installation of sprinkler systems. He is disappointed also that today's discussion about sprinklers evolved around affordability.

Barbara Berry, Maine Realtor's Association, commented that the people need to be educated about sprinklers and let them have a choice, not to make it mandatory.

Ashley Richards, homebuilder/remodeler who also does low income weatherization. When someone sells a house, it should be required to have hard-wired smoke alarms. She thinks folks won't give up granite counter tops in order to put in a sprinkler system, but believes it should be voluntary to put them in.

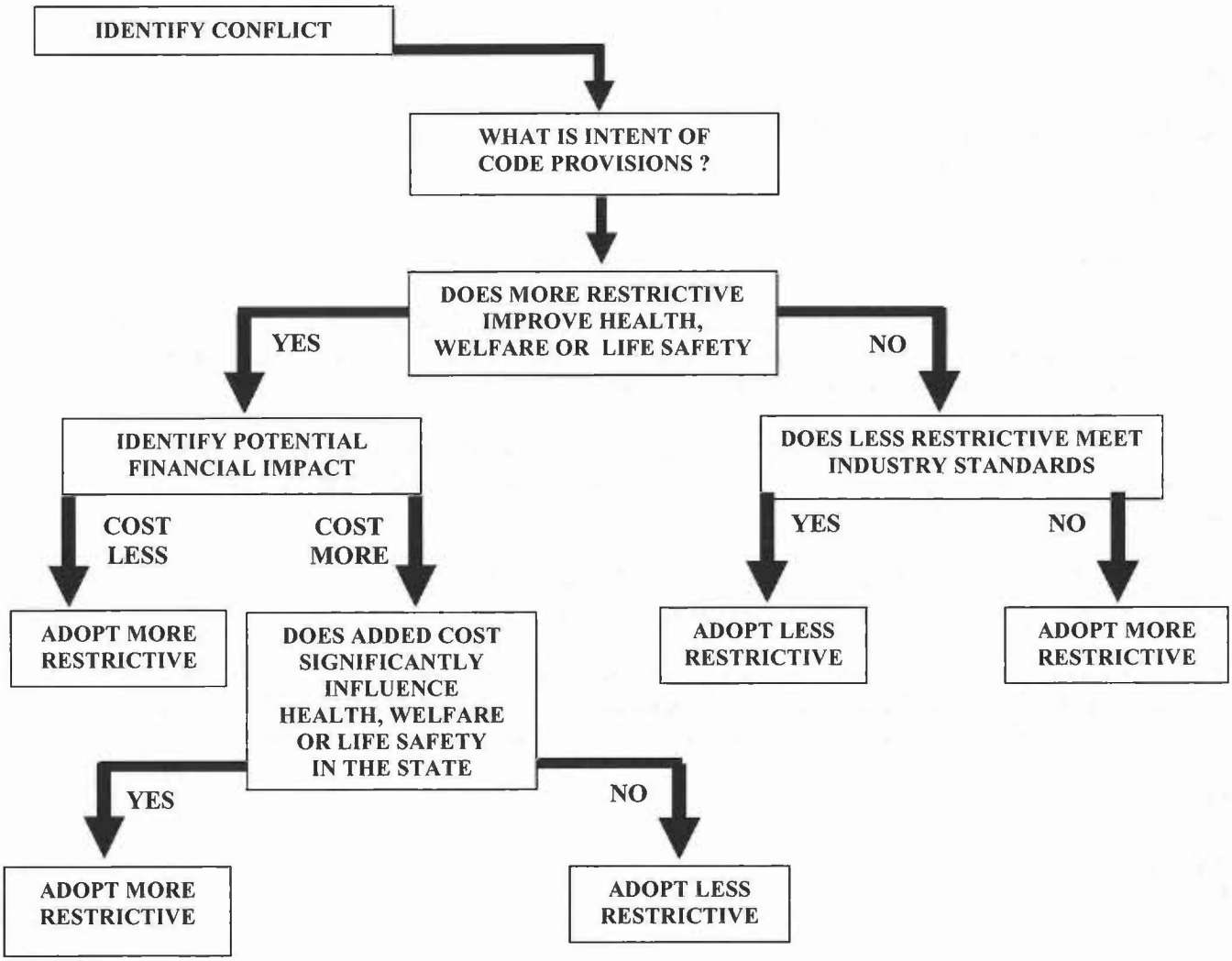
Meeting ended at 11:40 p.m.

Respectfully submitted,
Kathy Chamberlain
Secretary

See Decision Tree attached on next page.

ICC Section: (__ IBC; __ IEBC; __ IRC; __ IECC)

NFPA Section:



Date: ___ / ___ / 2010

By: _____

Draft 2 of the Maine Building Codes and Standards Board Meeting Minutes
August 19, 2010
9:00 a.m.
Department of Public Safety
45 Commerce Drive, Augusta, Maine

Meeting opened at: 9:05 a.m.

Introductions of Board and Staff

Board members present: Rich McCarthy, Chair; Jeff Ohler, Barry Chase, Dick Lambert, Rick Karg, Shiloh Ring, Roger Rossignol, Mike Pullen, Dick Tarr and Paul Becker

Board members excused: Russ Martin and Commissioner Anne Jordan

DPS Staff present: Dick Dolby and Kathy Chamberlain

REVIEW OF THE 5/27/10 MINUTES

Motion: Mike Pullen motioned to accept the minutes
Seconded: Rick Karg
Vote: Unanimous

Questions asked from these minutes, about the letters that were referred to – if were done re: tribal lands; LURC lands being included in the codes; and the questions about the ASHRAE and Radon Standards being mandatory or voluntary – what was the BRED committee's intent? We will check with Commissioner Jordan when she returns from vacation to see what the status is of these letters.

FINANCIAL UPDATE – Kathy

Checks were submitted to accounting this week totaling $6297.38 which are pending, so once added into the surcharge account, will total $243.783.00.

PUBLIC HEARING COMMENTS – Discussion/Responses (refer to 7/26/10 Public Hearing Minutes)

Chapter One – Administrative Procedures Comments/Responses

Jeff Austin, Maine Municipal Association

#1. Question: **Chapter 1 – Section 5 – Subsection 1 (page 3)** 25 MRS §2373 states "the codes **must** be enforced in a municipality." The first sentence in our Chapter One states "pursuant to 25 MRS §2373, in municipalities with a population over 2,000, enforcement of the provisions of the MUBEC **shall** be the responsibility of the municipality.
MMA requests the board not paraphrase §2373 and quote the statute directly to avoid confusion.

#1. Response: The wording noted: "enforcement of the provisions of the MUBEC **shall** be the responsibility of the municipality and shall be accomplished" is clear and definitive.

Vote: Unanimous with one abstention (Paul Becker arrived after the discussion had started)

#2. Question: **Chapter 1, Section 7** - Must Maine builders adhere to the ASHRAE and Radon Standards identified in Section 7, subsection 21?

#2. Response: Yes, it is a standard put forth, but clarification on which systems are mandatory needs to be done by Legislature. A letter needs to go to them before December 1, 2010.

Vote: Unanimous

#3. Question: **Chapter 1, Section 7 – subsection 2** - If builders must adhere to the standards, do the inspections required by 25 MRSA §2373 and the certifications by Code Enforcement Officers or Third-party Inspectors have to include these standards?

#3. Response: When a system is present, we (CEOs/BOs/TPIs) would follow through with inspections.

Vote: Unanimous

#4. Question: **Chapter 1 – Section 13** – Advisory Rulings (pg 6) Municipalities under 2,000 have no responsibility to interpret or enforce the code?

#4. Response: Pursuant to 25 M.R.S. §2373, in municipalities with a population over 2,000, the interpretation and enforcement of this Code are the responsibility of the local municipality through the means provided for in 25 M.R.S. §2373 and Section 5 of these rules. However, the Bureau is available to provide advisory rulings and technical support for the administration of this Code, amendments, conflict resolutions, and interpretations.

Vote: Unanimous

#5. Question: Chapter 1 – Section 13 – Advisory Rulings
MMA recommends to add the following phrase at the end of the first sentence: "The interpretation and enforcement of this code are the responsibility of the local municipality if the municipality is voluntarily enforcing this code by either conducting the inspections required by 25 MRSA §2373 (1) – (3), or has reserved by ordinance the right to review the inspection reports filed by third-party inspectors pursuant to 25 MRSA §2373 (4)."

#5. Response: Pursuant to 25 M.R.S. §2373, in municipalities with a population over 2,000, the interpretation and enforcement of this Code are the responsibility of the local municipality through the means provided for in 25 M.R.S. §2373 and Section 5 of these rules. However, the Bureau is available to provide advisory rulings and technical support for the administration of this Code, amendments, conflict resolutions, and interpretations.

Vote: Unanimous

#6. Question: Chapter 1 – Section 14 – Procedure for Code Amendment (pages 6-8)
Why aren't the objectives, requirements and standards stated here? It needs to be clarified.

#6. Response: The process for amendments is taken directly from statute: Title 10, §6, Subsection 3.

Vote: 8 yea – one board member had temporarily left the room.

#7. Question: Chapter 1 – Section 14(2) (C) Procedure for submitting proposed amendments
Why not identify these time frames and deadlines in the rule?

#7. Response: Discussion – we can reference the timelines in the Rule. Perhaps a "cheat sheet" can be put together for the website. We can also put a link on the website to the MAPA documents that included the timelines OR timelines can be stated.
*Dick Dolby will research for the correct language and report at the next meeting.

Vote: Unanimous

#8. Question: Chapter 1 – Section 14(2) (C) Procedure for submitting proposed amendments
Will there be a public hearing on proposed amendments prior to the "future rulemaking" process? Must the applicant request one?

#8. Response: Yes on both.

Vote: Unanimous

#9. Question: **Chapter 1 – Section 14(2) (C) Procedure for submitting proposed amendments**
Will the Board notify the public of proposed amendments prior to the Board's decision to file for "future rulemaking?"

#9. Response: Yes.

Vote: Unanimous

#10. Question: **Chapter 1 – Section 14(2) (C) Procedure for submitting proposed amendments**
If so, does the public have the ability to provide comments?

#10. Response: Yes

Vote: Unanimous

#11. Question: Section 15 – Conflicts (pg 8)

#11. Response: The board was tasked with identifying the conflicts between the State adopted Fire/Life Safety Codes and the Building Codes.

Vote: Unanimous

#12. Question: Section 16 – Experimental Buildings and Section 19 Native Lumber (pg 9)
How do those charged with the duty to enforce the Code know how to apply the Code to these kinds of projects?

#12. Response: The code officers will have to learn the difference between prescriptive and performance based construction. Experimental buildings are expected to comply with all the code provisions, but may do so using a performance based application.

**From Rick Karg – we need clarification from the Legislature in reference to exemptions for log homes, post & beam and timber frame.

Vote: Unanimous

Stewart Brooks, Code Enforcement Officer representing six towns.

#13. Question: Who is going to enforce this (code) in these small towns and what are the penalties if it is not enforced?

#13. Response: Those municipalities with less than 2,000 may elect to provide enforcement of MUBEC, communities not electing to do so may obtain the assistance of third-party inspectors in securing inspections and compliance requested by others.

Chapter 2 Third-Party Inspectors Comments/Responses

Barbara Berry, Maine Association of Realtors (MAR)

#14: Comment: MAR is concerned there won't be enough Third-party Inspectors to do inspections and therefore create delays. MAR hopes there will be statewide training for TPIs available.

#14. Response: Those individuals interested in obtaining training and certification as third-party inspectors may contact Maine State Planning for the schedule of training and examination opportunities.

Jeff Austin, Maine Municipal Association (MMA)

#15. Comment: MMA suggests there be a list of the type of inspections that will need to be done by the Third-party inspectors. The frequency of inspections will matter to all.

#15. Response: Municipalities without a building official should advise property owners to contact Maine State Planning for a current list of third-party inspectors. Frequency of inspections required will be determined by the workmanship.

Chapter 5 – IRC – Residential one and two family dwellings Questions/Comments

Carl Chretian, contactor in Southern Maine

#16. Comment: He is in favor of this Chapter 5 as written with no changes.

#16. Response: Thanks for this comment.

Mark Patterson, President of Maine Home Builders and Remodelers Association of Maine. (MHBRA)

#17. Question: They are pleased with the adoption of the statewide building code. However, MHBRA is not in favor of making sprinklers mandatory due to the costs which are estimated to be between $4,000 - $8,000.

#17. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

Barbara Berry, Maine Association of Realtors (MAR)

#18. Comment: MAR is concerned about housing affordability. IECC requirements will add to construction costs as well as a new requirement of several inspections. They are also concerned about the requirement to have a 20 minute fire rating when manufactured lightweight structural components are utilized in floor and ceiling assemblies. There is no language in the IRC that stated a 20 minute

rating. Did the Board have authority to do this, given that it is more stringent than the language in those codes.

#18. Response: The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

3. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

3.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

Question about 2" x 8" lumber to be used if it would save some costs, instead of 2" x 10" - if it has been UL tested. Vicki Schmidt, from Buckfield Fire Department present at the meeting advised that several types/sizes are being tested and she believes the report on that will be out in October.

#18.1. Comment: MAR advises there was a conflict between the IRC and the Fire/Life Safety codes regarding requirements for stair treads and risers which the Board settled in favor of the 7 ¾" riser, and 10" tread requirements in the Life/Safety Code, the less stringent of the two. However, this does not allow for the affordable 24' center stairway Cape to be built. Capes are the most appealing and popular of the affordable home styles as they allow for the easiest future expansion. Some towns have addressed this problem when adopting building codes by changing the requirement to 8 ¼" 9" which allows for a center stairway, 24' plan.

#18.1. Response: The IRC TAG determined that 7 - ¾" riser, and 10" tread would be less stringent. The Board recommends that MAR file an Amendment to change it to 8 - ¼" riser and 9" tread.

Peter Cutrer, Sanford Fire Marshal

#19. Comment: He is in favor of the addition of lightweight truss construction. Eight minutes is not enough time for fire personnel to go into a fire and rescue someone and get out themselves. It is a life safety issue.

#19. Response: The alternative protection included for lightweight construction is directly responsive to the elimination of residential sprinkler protection.

Vicki Schmidt, Buckfield Fire Department

#20. Comment: A 20 minute fire rating is good, but they would like to see a 30 minute rating back in, instead, more fire stops are needed. Suggested wording from R313.2 to be included.

#20. Response: Alternative fire ratings were discussed, consensus was achieved at the 20 minute requirement.

Chief Ken Dixon, Andover Fire Dept.

#21. Comment: He would like to support mandatory residential sprinkler systems.

#21. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

Alex McPhedran, Maine Federation of Firefighters and Readfield firefighter

#22. Comments: We need residential fire sprinklers and to please reconsider putting in the residential sprinklers back into the Maine statewide Building Code.

#22. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

John Poto, Schiavi Homes

#23. Comments: They are opposed to the inclusion of sprinklers in new homes. Homeowners aren't convinced they need sprinklers and need to be educated.

#23. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

Charles Heinonen, Old Town Code Enforcement Officer

#24. Comments: He strongly supports the IRC and strong standards for all to go by. He is tentatively opposed to mandatory sprinkler systems and the cost.

#24. Response: Thank you for the support. The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

John Martin, Lobbyist for Maine Fire Chiefs

#25. Comments: They are concerned about the sprinkler issue. What is the dollar cost?

#25. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code. Discussions surrounding this issue was unable to provide a definitive cost per square foot that was mutually accepted among those present.

#26. Comment: It should be part of the new construction package and is a life safety issue.

#26. Response: Residential sprinkler provisions are not included in the MUBEC, sprinklers are allowed as an owner option. The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

Larry Duell, Vice-President of Maine Homebuilders and Remodelers Association

#27. Comment: Feels that sprinklers should not be mandatory but an option.

#27. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Robert Duval, NE Regional Manager of the National Fire Protection Association

#28. Comment: Mr. Duval (NFPA) wanted to go on record in support for sprinklers to be required in one and two family dwellings in Maine.

#28. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Tim Travers, NE Regional Manager for the National Fire Sprinklers Association

#29. Comment: He/they are against the removal of the requirement for sprinklers for one and two family dwellings.

#29. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Benjamin Wallace, Jr. Fire Chief Cundy's Harbor Fire Department

#30. Comment: He is against the sprinkler requirement removal, specifically R313.2.

#30. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Peter Cutrer, Sanford Fire Marshal

#31. Comment: He is against leaving out the requirement of sprinkler systems for one and two family residential buildings. The IRC was designed to work with the inclusion of these systems.

#31. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Linda Gifford, legal counsel to the Maine Association of Realtors

#32. Comment: She hadn't addressed the sprinkler issue today as it was voted out earlier in the year. The Maine Realtors are still opposed to a mandatory requirement of sprinklers in new construction.

#32. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Jim Caldwell, civil engineer

#33. Comment: He is in opposition to mandatory sprinkler systems due to added expense and the ongoing maintenance.

#33. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code

Allison Hepler, member of the Woolwich Planning Board

#34. Comment: She would like to see a couple of things done – a list of inspections that need to be done.

#34. Response: The inspections required are noted in the IRC R109 and IBC 110.

#35. Comment: The codes are not available if you don't have a membership and she hopes that it's available somehow.

#35. Response: Those municipalities over 2,000 required to enforce MUBEC will receive a copy per municipality of the MUBEC at training sessions presented by the Maine State Planning Office.

#36. Comment: Woolwich doesn't issue Certificates of Occupancy, what should these be?

#36. Response: The code does tell what is needed. Training will also provide this information.

Charles Heinonen, Old Town Code Enforcement Officer

#37. Comment: He suggests the Board revisit this (code) in a year. Not a lot of understanding out there within CEOs about this – what is the liability?

#37. Response: A municipal employee assigned as a building official is covered under the Tort law. Third-party inspectors are not municipal employees, nor covered under the Tort law. They may require appropriate coverage as an independent business person.

#38 Comment: How do Third-party Inspectors fit into the community?

#38 Response: Third-party Inspectors are an enforcement option available to municipalities.

#39 Comment: Inspections?

#39 Response: The inspections required are noted in the IRC R109 and IBC 110.

#40. Comment: Radon?

#40. Response: Inspections conducted for MUBEC compliance shall include the provisions for radon mitigation.

Phil Petula, Winterport Town Manager

#41. Comment: He questions the costs of legislation coming down the pike, liability, certificates, where does the Tort law come in, what is the liability of a CEO that signs off on an inspection and something happens?

#41. Response: Third-party inspectors may serve as an option for municipalities with limited needs and resources. Send him the link to the liability info on the State Planning website as well as the Tort law information.

#42. Comment: What are the costs to homeowners to have a water supply available should it be needed?

#42. Response: Water supply is not a provision of MUBEC.

Jeff Austin, Maine Municipal Association

#43/44. Comment: Conflict with the Maine Tort Claims Act? (adoption of the MUBEC which contains a Tort law) Has anyone reviewed 104.8 to the Maine Tort Law?

#43/44.Response: Dir Dick Dolby will check with the AG's office on this.

**Due to time factors – this was the end of discussion on Public Hearing comments – will continue with the rest at the next board meeting.

AMENDMENTS FILED (TWO)

#1 Amendment filed by Acting Director Dick Dolby concerning window wells being allowed as a second egress in Maine (winter) climate.

Discussion by Board about how to deal with this amendment. Decision: to not address it at this time until the MUBEC is adopted and then it will be reviewed. Possibly send it to the IRC/Fire Life Safety TAGS for discussion.

#2 Amendment filed by Ben Johnson, Code Enforcement Officer, Hampden concerning the Air-Freezing Index for Penobscot County table numbers differ between the 2003 IRC and the 2009 IRC. He suggests the table be changed to be consistent.

Decision by the Board to address this Amendment at another time.

**Discussion by the board to adopt the proposed language by the ICC for R501.3 (See comment #18). Deletion stays for Section R313.2 and insert this language in R501.3

Motion by Rick Karg to do the above**
Second: Roger Rossignol
Unanimous vote

Next meeting will be September 2, 2010.

Meeting adjourned at 12 pm.

Respectfully submitted,
Kathy Chamberlain, Secretary

Maine Building Codes and Standards Board Meeting Minutes
September 2, 2010
9:00 a.m.
Department of Public Safety
45 Commerce Drive, Augusta, Maine

Meeting opened at: 9:05 a.m.

Introductions of Board and Staff

Board members present: Russ Martin, Dick Lambert, Barry Chase, Jeff Ohler, Rich McCarthy, Mike Pullen, Dick Tarr, Shiloh Ring, Roger Rossignol and Chair, Commissioner Jordan

Board members excused: Rick Karg and Paul Becker

DPS Staff present: Dick Dolby and Kathy Chamberlain

REVIEW OF THE 8/19/10 MINUTES

Motion: Dick Lambert motioned to accept the minutes
Seconded: Rich McCarthy
Vote: Unanimous with two abstentions

FINANCIAL UPDATE – Kathy

$242,000 approximately reported as the correct amount was not available at today's meeting. ($242,163.78 should have been the amount reported.)

PUBLIC HEARING COMMENTS – Discussion/Responses (refer to 7/26/10 Public Hearing Minutes)

Chapter 5 – International Residential Code - Continued Review – "neither for or against"

#43/44. Comment: **Jeff Austin, Maine Municipal Association (#43 through #52)**
Conflict with the Maine Tort Claims Act? (adoption of the MUBEC which contains a Tort law) Has anyone reviewed 104.8 to the Maine Tort Law?

#43/4. Response: Dir. Dick Dolby referred this to Chris Mann, A.G.'s office. A.A.G. Mann's recommendation was to delete the three provisions in the ICC codes that refer to the Tort claims liability (2009 IBC 104.8, 2009 IEBC 104.8 and the 2009 IRC R104.8). from our adoption to avoid conflict or confusion between the similar but not identical language to the Maine Tort Claims Act.

Motion: to remove these references from Chapter 5 (IRC) of the tort claims liability and replace with 14 MRS sec. 8101 (Maine Tort Claims Act) by Dick Lambert
Seconded: by Mike Pullen
Unanimous vote

Motion: to remove the ICC code references as listed above (IBC, IRC and IEBC) from the adopted Code in order to avoid conflict with the Maine Tort Claims Act made by Jeff Ohler
Seconded by Dick Tarr
Unanimous Vote

#45. Comment: R105.2 exempting accessory structures and certain water tanks from having to get a building permit.

#45. Response: Dick Lambert responded that towns adjust their land use ordinances if they chose to regulate the others that go beyond the building code.
Unanimous agreement.

#46 Comment: conflicting permit application response deadline – R105.3 which states that the building official will act on a building permit application "within a reasonable time." State law mandates permits be approved within 30 days or they are deemed denied. How do these two be reconciled?

#46. Response: **Motion** made by Shiloh to delete "within a reasonable time" and insert "30 days" and that the Board references 30-A MRSA §4103. Add this in to R105.3.
No second….

Motion: by Jeff Ohler that we add in the reference 30A MRSA §4103.
Second by Barry Chase
Unanimous vote

**Chapter 5 (IRC) will be changed to reflect Jeff Austin's comment.

#47. Comment: Mandatory Inspection Regime and tort liability implications – R109 mandates a particular inspection regime for municipal building officials in communities that are voluntarily enforcing the code.

#47. Response: Towns under 2,000 "electing to voluntarily enforce MUBEC" would be establishing consistent inspection guidelines with larger municipalities. Voluntary enforcement is not mandatory.

#48. Comment: In reference to the "mandatory" nature of this inspection, it heightens the potential tort claims liability of a municipality. Has the Bureau, Board, State Planning Office or AG's office reviewed each administrative provision in the ICC Codes to determine if they conflict with Maine statutory or case law?

#48. Response: The Board sought and received advice from the Attorney general's office on this code. We have not done a legal exhaustive review.

#49. Comment: **Request for the Board to review 10 MRSA §9724, the "application" section of the building code law.** Subsection 3 of this preempts any municipal ordinance that is inconsistent with MUBEC, except as provided in subsection 4. Request to add to each MUBEC Chapter a clear statement that the administrative and enforcement provisions in the Chapters 1 of each ICC Code are merely an option to be considered by municipalities and that municipalities are authorized to adopt their own enforcement ordinances that are inconsistent with the MUBEC.

#49. Response: Towns can still adopt ordinances (that aren't building codes) as to how they will enforce the building codes.

Motion to clarify Subsection 4 of §9724 by Shiloh Ring: No provisions of the MUBEC shall be construed to prohibit the adoption or enforcement of an ordinance of any political subdivision that sets forth provisions for local enforcement of building codes. Such ordinances may include items such as, permits, permit fees, boards of appeals and violations.

Seconded by Dick Tarr
Unanimous vote

**We will change Chapter 5 and insert this statement in all the Chapter 1's.

#50. Comment: re: Section R105.6 – repealing permits – a thorough review is needed.

#50. Response: Municipal permits are seen as a municipal option tool, not a mandate. They can still fall back on their own ordinances.

#51. Comment: Local amendments – towns cannot adopt local amendments, if there's a deficiency, towns can't fix it. In reference to the exclusion of 17 appendices in the IRC: Appendix G covers swimming pool regulations. The board doesn't adopt Appendix G, locally adopted swimming pool fencing ordinances would arguably become void as of December 1, 2010.

#51. Response: Title 22: §1632 provides a statutory requirement for pools and their enclosures. It also authorizes municipalities to adopt stricter or less restrictive requirements that need not be part of MUBEC.

#52. Comment: Availability of Codes to the general public.

#52. Response: the I-codes are available for viewing only at no charge through the Building Codes website. Other codes are routinely adopted i.e. electrical, plumbing, gas, etc. none of which are made publicly available to all. State Planning is providing copies for towns/CEOs over 2,000.

#53. Comment: Paul Demers, Code Enforcement Officer for Kennebunk
He thanks the board for their efforts. Consistency of Codes statewide is very welcome. He is concerned with training for CEOs. Commentaries to the codes are most helpful. Smaller communities are going to need some help to be consistent statewide.

#53. Response: Training is being provided and consistency is going to be an important factor in teaching the codes.

#54. Comment: Carl Chretien, contractor
Concerned that people need to be educated on what to do in terms of sprinkler systems, they can help themselves out. Appraisers also need to be educated who aren't putting a higher price on those homes that are sprinklered and should be.

#54. Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

Chapter 6 – International Energy Conservation CODE (IECC)

#55. Comment: Rick Meinking – Efficiency Maine Trust
Which version of NFPA 90A should be referenced? 2009 or 2002 in relation to Section 503.2.7.1 deleting the "International Mechanical Code" and inserting NFPA 90A?

#55. Response: NFPA #90A is at present not adopted by the State Fire Marshal's Office. This can be replaced by the Oil and Solid Fuel Standards.

Chp. 6 #2. Comment - Mark Tebbets – Building Energy Codes Project Manager, Northeast Energy Efficiency Partnerships (NEEP)

In the following sections of the 2009 IECC adoption as MUBEC Chapter 6, in order to bring additional clarity to the energy codes and coordinate them with other existing Maine regulations:

403.2.2 Sealing – "in accordance with Chapter 5 of the *International Energy Conservation Code*."

It is important to provide clear direction to the code user, as MUBEC Chapter 6 does not directly contain this information.

403.6 Equipment Sizing – (revise): should read "Heating and cooling *equipment* shall be sized in accordance with ACCA Manual S based on building loads calculated in accordance with ACCA Manual J or other *approved* heating and cooling calculation methodologies."

The reference standards are in the IRC and were amended, but only appear in the 2009 IECC 5th Edition as a result of corrections of errata. It is recommended to insert this correction, since not all users of the code will have access to the latest edition.

Chpt. 6 - #2. Response: These should be submitted as Amendments.

REVIEW OF THE AMENDMENT PROCESS

In Response to comment #7 Chapter 1 – Section 14(2) (c) Procedure for submitting proposed amendments….. Dir. Dick Dolby retrieved the information from the Board's document "Policies and Procedures for consideration of amendments to the MUBEC. The board may look at Amendments received by May 30, 2011 and put them into place January 2012.

REVIEW WRITTEN PUBLIC COMMENTS RECEIVED 7/7 – 8/5/2010

#1. From Rick Lang, CEO/LPI – Wiscasset, Maine

Comments:

A. The MUBEC is an unfunded mandate; none of the towns will receive copies of the codes nor receive funds to cover the cost of training for CEOs.
Response: Any unfunded mandates concerns should be addressed by the Legislature.

B. Training isn't developed yet – how will they expect to have inspectors trained prior to the date of the law going into effect?
Response: Training is in the process of being developed.

C. Doesn't believe the idea of third-party inspectors is covered in any of the codes because they are not readily available.
Response: It's addressed in Statute, not the Codes.

D. Will third-party inspectors be required to have the same training and take the same tests mandated for CEOs? If not, why?
Response: Yes, third-party inspectors will received the same training.

E. Builders and other trades not covered by the new codes – why write laws and try to train inspectors and leave out 1/3 of the equation?
Response: We don't have the authority to extend training to building trades at this time.

F. The time limit is ridiculous; no way everyone expected to can get on board in this time frame.
Response: The timeframe was mandated by Legislature.

G. A single building code is a great idea, and if a town needs or wants a building code, then that's the only one they could have.
Response: Thank you.

H. The cut off size of 2000 populations should be adjusted to 10,000. The whole system needs to be brought on line at a much slower pace giving everyone time to get on board, including the state, towns, builders and tradesmen.
Response: Statute set forth the numbers and can be address by Legislature.

I. Towns and cities need towns to be reimbursed for the cost of training and manuals.
Response: Statute set forth the numbers and can be address by Legislature.

#2. From Bruce Johnson, regional manager – government relations – International Code Council

Comments: ICC is in support of Maine's adoption of the 2009 IBC, IRC, IEBC and ECC. The Code Council commends the Maine Technical Building Code Board for its recommendations to adopt these codes with an effective date of December 1, 2010. These codes set out minimum standards for building construction and fire-safety systems in new and existing building construction. Adoption of these latest editions ensures that the MUBEC represents the latest in building construction technology, materials and processes while incorporating the provisions and requirements necessary to ensure the safety of the public and emergency responders in the built environment. Up to date codes is an economic incentive. This statewide code will reduce costs associated with personal injury in the built environment, reduce property damage and associated costs while providing for the safety of the public and emergency responders, which is critical in the present economy. Other economic benefits include improved safety, reduced maintenance costs, energy savings and lower insurance premiums. Another advantage of adopting a statewide code is the availability of technical assistance and training from the Code Council. Maine's design professionals, building officials and third-party inspectors will have access to ICC training materials, certification programs and ICC technical staff who can assist in code opinions and interpretations on the application of the 2009 I-Codes.
Response: Thank you.

#3. From Mike Shunney, design consultant EBS Ellsworth, Maine

Comments: Mr. Shunney urges the Board to make the installation of sprinkler systems in new homes a recommendation rather than a mandated requirement. In any case, all "owner-built" homes should be exempt from the requirement.

Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

#4 From Paul Montague, CEO from Wilton, Maine

Comments:

A. All building contractors must be licensed to the code prior to the code implementation or within a reasonable period of time, a year perhaps.

Response: Statute does not include the provisions for contractor licensing.

B. The Building Code should be required in towns of 5000 inhabitants or more, not 2000. Smaller communities will be hard pressed to fund more hours for CEOs and the third-party inspectors will add considerable cost to building construction. All of this is not good for the economy. The inspection/enforcement component should be optional for towns under 5000 population.

Response: The selection of the population size was chosen by Legislature and is consistent with existing requirements for having a building inspector.

C. The Life Safety 101 Fire Code that is being required with the building code should be far less restrictive of existing buildings. A great deal of expense to make marginal improvements to buildings in the name of Code conformance has been required. Existing building requirements should only be for the real safety issues.

Response: Life Safety 101 is not part of the MUBEC. It is adopted by the State Fire Marshal's Office.

D. Great concern that the Building code will increase the hassle factor and expense of getting a building permit, slow the construction process causing increased costs and generally make the process far more complicated than it needs to be for the average homeowner.

Response: Building permits are optional. MUBEC was established for the benefit of the public – health, safety and welfare.

#5. From Jim Cyr, master social worker – Caribou, Maine

Comments: In huge opposition to ANY attempt to mandate residential sprinkler systems as part of Maine's required building codes for new construction, for two reasons: social injustice and stopping the ravenous appetite of state regulatory boards and departments.
The proposed requirement would of course add significant cost to the housing in Maine and his clients who dream of owning their own home someday, may not be able to afford it if sprinklers are required to be installed

Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

#6 From James Trundy, Hebron Maine Fire Chief

Comments:

A. He would like to request that the MUBEC R313.2 standard require all wood floor and ceiling components, whether legacy or modern assemblies, to support a 30 minute fire rating protection as part of their installation.

Response: (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) <u>R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.</u>

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

3. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

3.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

B. Draft Stopping - Due to the open space design of large non-resident vacation homes, he would also like to request that void spaces (primarily attic, floor truss spaces and basements) meet a draft stopping requirement every 500 square feet. Without sprinklers and draft stopping measures, the heat release rates of modern furnishings and the highly insulative nature of modern construction, it does not give rural fire departments the response time needed to make successful life safety rescues in these homes.

Response: **The board feels this should be referred to a TAG. Suggestion that this also might be submitted as an Amendment.

#7. From Kathy Keneborus, Director of Government Relations and compliance, Maine Bankers Association

Comments: On Chapter 2, Third-party inspector of the proposed rule, MBA's members offer a wide range of construction loan products to Maine citizens, so we are interested in the TPI training taking place with the implementation of the new Code. The implementing law for MUBEC does allow a municipality to rely on a third-party inspection (TPI) report to issue the occupancy permit. Starting on 12/1/2010, Maine law requires all municipalities to issue occupancy permits after receipt of an inspection report confirming compliance with MUBEC, even if they are not required to enforce the code at that time. Currently, some municipalities do not issue occupancy permits. Those municipalities provide a lender with an occupancy permit opt-out letter which meets current lender underwriting criteria because the law allows a municipality to opt-out of issuing occupancy permits. After 12/1/10, lenders will require occupancy permits for most final construction financing disbursements because municipalities can no longer opt-out of issuing occupancy permits. Lenders will need to ensure the construction is compliant with MUBEC. Our association is concerned that there may not be enough MUBEC TPI professionals trained before 12/1/10. Municipalities relying on the TPI program may run into occupancy permitting delays, if there are not enough trained TPI professionals. Municipalities will not be able to issue an occupancy permit on a dwelling unless they get an inspection report certifying MUBEC compliance. MBA members recommend that the Board, recognize the need for rapid certification of inspectors in order to avoid or minimize delays in the building process. Construction funding delays due to regulatory issues would not help Maine's economy.

Response: This will be phased in compliance – only towns who are required to enforce is a deadline of 12/1/10. Towns not required to do so by 12/1/10 have the option to use the opt out letter. Those individuals interested in obtaining training and certification as third-party inspectors may contact Maine State Planning for the schedule of training and examination opportunities

#8. from Frank Walker, Deputy Fire Chief - Hebron Fire Dept

Comments: He supports the 30 minute fire rating protection of all assembly components as well as lightweight and exposed wood construction in all one and two family residential homes. Due to the rapidly consuming fire potential of modern construction and furnishings, he also supports the recommendation for functional draftstopping measures every 500 square feet in the open spaces of all one and two family dwellings

Response: (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

5. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

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7.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

8. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

#9. from Nancy Smith Executive Director, GrowSmart Maine

Comments: Strongly supports the proposed rules developed by the MUBEC Board. GrowSmart Maine is a statewide nonprofit membership organization that promotes sustainable prosperity for all Mainers by integrating working and natural landscape conservation, economic growth, and community revitalization. GrowSmart Maine was a significant supporter of the MUBEC and worked with the Legislature to adopt the statutory provisions which the Technical Building Codes and Standards Board has been developing rules to administer. Based on Lock Kiermaier's (Advocacy and Outreach Coordinator for GrowSmart Maine) comments, who attended our public hearing on 7/26/10, Ms. Smith has concluded that the adoption of the proposed codes is reflective of legislative intent and want to commend the members of the MUBEC board for incorporating the constructive comments and suggestions from members of the professions that will be working with these codes in the future.

Response: Thank you.

#10. from John Merrill, Merrill's Bookshop – Hallowell, Maine

Comments: Any proposed rule requiring that active fire protection systems be installed in new construction (or in existing buildings) needs to recognize that in some cases, a water-based "sprinkler" system is NOT appropriate. Needless to say, placing a sprinkler system above a space that houses rare books (anywhere from 200-500 years old) is absurd. There are appropriate alternatives (inert gas systems) that should be used in locations such as art galleries, computer centers or rare book stores.

Response: NFPA codes allow for alternative fire protection systems for commercial buildings.

#11. from Barbara Berry, Maine Association of Realtors

Comments: As a supplement to the testimony that was submitted during the public hearing on 7/26/10, MAR would like to reiterate their strong opposition to the inclusion of mandatory sprinklers in one and two family homes in the MUBEC. They believed the matter had already been settled by an earlier Board vote on this issue, yet were surprised at the lengthy discussion that was held during the public hearing on sprinklers.

Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code.

#12. from Elaine Morton, Andover Fire Department

Comments: She would like to request that the MUBEC R313.2 standard require all wood floor and ceiling components, whether legacy or modern assemblies, to support a 30 minute fire rating protection as part of their installation. She would also like to request that void spaces (primarily attic, floor truss spaces and basements) meet a draftstopping requirement every 500 square feet.

Response: (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

9. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

10. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

11. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

11.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

12. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

#13. from Pamela Parker – Damariscotta, Maine

Comments: Dismayed that passive fire protection standards are not included in the MUBEC. Firefighters do their best to arrive quickly on a fire scene, but there is no way that rural FDs can hope to save lives and structures without additional fire protection systems in new buildings. The level of highly flammable materials and the lightweight construction make these new structures tinder boxes. Furthermore, it puts the volunteer firefighters at serious risk of structure collapse. The cost of passive fire protection in new construction will be paid for many times over in insurance savings over the life of the structure. This doesn't take into account the value of lives of both the occupants and firefighters. Please include R313.2 in the MUBEC.

Response: The board has already discussed this and the TAG looked at it extensively. Residential sprinkler provisions are not included in the MUBEC. Municipalities can put this in as their own Life Safety Code, but not in a building code. (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

13. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

14. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

15. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

15.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

16. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

#14. from Greg Paxton Spokesperson for the Maine Downtown Coalition & Executive Director, Maine Preservation

Comments: The Downtown Coalition is a statewide alliance of individuals and organizations that have come together to advocate for downtown revitalization, sustainable economic development and various smart growth policy initiatives.
We were a significant supporter of the MUBEC and worked with the Legislature to adopt the statutory provisions which the Technical Building Codes and Standards Board has been developing rules to administer. Based on Lock Kiermaier's (Advocacy and Outreach Coordinator for GrowSmart Maine) comments, who attended our public hearing on 7/26/10, Ms. Smith has concluded that the adoption of the proposed codes is reflective of legislative intent and that it was apparent that the members of the Technical Building Codes and Standards board has worked diligently to adopt these codes in a manner which was also reflected through thoughtful comments and suggestions of the various professionals that will be working with these codes on a day-to-day basis. At the 7/29/10 Maine Downtown Coalition meeting, it was voted unanimously to endorse the aforementioned rules and to commend the board for its hard work in developing and adopting these rules.

Response: Thank you.

#15. from Kathleen Newman, President, Associated Builders and Contractors of Maine

Comments: "neither for nor against" concerns that a potential lack of third-party inspectors trained in the commercial code could erect a barrier to development and engender significant construction project delays in those municipalities without code enforcement officers. They also encourage us to broadly interpret the definition of third-party inspectors in MRSA 25, §2371-6 to allow a building official in one jurisdiction to act as a third-party inspector outside his or her jurisdiction. This could significantly alleviate any potential shortage.

Response: Statute is clear, this is not currently permitted. Take it up with Legislature.

#16. from Bruce Pierce, Chief of the Newry Volunteer Fire Dept.

Comments: Requesting that R313.2 standard requiring all wood floor and ceiling components, whether legacy or modern assemblies, to support a 30 minute fire rating protection as part of their installation. In addition I would like to see void spaces i.e. attic, floor truss spaces and basements, meet a draft stopping requirement every 500 square feet.

Response: (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

17. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

18. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

19. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

19.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

20. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

#17. from Vicki Schmidt, Maine Federation of Firefighters

Comments: She supports the inclusion of ICC life safety standards for citizens and firefighters within Section R313.2 of the MUBEC. Section R313.2 should establish standards for passive fire protection that support life safety of citizens and firefighters during emergency fire operations. These would include a 30 minute fire rating for all structural components and assemblies as well as the establishment of draftstopping measures in all voids, interstitial spaces and other unoccupied enclosed spaces in excess of 500 square feet.

Response: (The following is being proposed for passage for 2012 IRC version by the ICC.) The inclusion of fire protection for lightweight construction features was included to offset the removal of the residential sprinkler provision, and is not viewed as an addition but as an alternative method of protections for this construction method. The following is being proposed for passage for 2012 IRC version by the ICC: (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

21. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

22. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

23. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

23.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

24. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

Response: **The board feels this should be referred to a TAG. Suggestion that this also might be submitted as an Amendment.

FINAL ADOPTION OF THE MUBEC

Motion: the Board adopts Chapters 1-6 as written and amended for adoption
Seconded by Dick Lambert
Unanimous vote!

UNFINISHED BUSINESS

When is the FMO surcharge ending? No ending date set. The BRED (Legislative) report is due Jan 2011. Discussion for funding sources to continue the Building Codes Unit will need to be held by the Board in the near future. The report to BRED may include the suggestion to have MUBEC include the International Mechanical Code (IMC) and other issues to roll into that.

Commissioner Jordan was asked if she had written the letter to the Governor's office yet regarding tribal lands etc. She advised she was in discussion right now with the Governor's office about this.

PUBLIC COMMENT

Peter Cutrer, Sanford Fire Marshal – thanks the Board for all their hard work on these codes. He spent time on some of the TAGS himself and knows the amount of work that went into this. He is glad for the consistency coming with the adoption of the MUBEC.

Jeff Austin, Maine Municipal Association – he advised we should let the towns know that are considering enforcement what they need to know. He also had not asked the Board to review all his statements (given during the public hearing comment period). Also the Board sought and received advice from the Attorney general's office on this code in terms of administrative procedures for the municipalities. We have not done a legal exhaustive review (to determine any conflicts with the Maine Tort Claims Law).

****The two proposed Amendments (discussed at the last meeting) should be given to the IRC and Life Safety TAGS to consider**.

The adopted final MUBEC will be put on the website.

Training will be commencing soon, waiting for final adoption.

The adopted Rules will be going to the Secretary of State's Office for final review.

Next meeting date: 11/4/2010

Meeting ended at 11:35 a.m.

Respectfully submitted,
Kathy Chamberlain
Secretary

16 DEPARTMENT OF PUBLIC SAFETY

635 BUREAU OF BUILDING CODES AND STANDARDS

Chapter 5: MAINE UNIFORM BUILDING AND ENERGY CODE - RESIDENTIAL BUILDING CODE FOR ONE AND TWO-FAMILY DWELLINGS IN MAINE

SUMMARY: This chapter establishes the Residential Building code component of the Maine Uniform Building and Energy Code ("MUBEC"). The provisions of this chapter are based on a nationally recognized model building code published by the International Code Council, Inc., and is made part of the MUBEC through incorporation by reference. This chapter also contains requirements for the enforcement of the Residential Building code by local building officials in municipalities with a population of more than 2,000 residents.

SECTION 1. PURPOSE AND SCOPE

All building construction in Maine, with some exceptions, is governed by the MUBEC, which is adopted by the Technical Building Codes and Standards Board pursuant to 10 M.R.S. Chapter 1103. The primary objective of the Board is to establish a uniform building code throughout the State of Maine.

This chapter sets forth the standards for residential construction for one and two-family dwellings that are part of the MUBEC. It applies to the construction, alteration, movement, enlargement, replacement, repair, equipment, use and occupancy, location, removal and demolition of detached one- and two-family dwellings and townhouses not more than three stories above grade plane in height with a separate means of egress and their accessory structures.

SECTION 2. AUTHORITY

The authority for this Chapter is 10 M.R.S. §9722, which provides that the Maine Technical Building Codes and Standards Board shall promulgate rules which adopt, amend, and maintain the Maine Uniform Building and Energy Code.

SECTION 3. DEFINITIONS

1. **IRC**. "IRC" means the 2009 International Residential Code, in effect on June 1, 2010, published by the International Code Council, Inc.

2. **NFPA**. "NFPA" means The National Fire Protection Association.

3. **MUBEC**. "MUBEC" means the Maine Uniform Building and Energy Code adopted pursuant to 10 M.R.S. §9271 *et seq.*

4. **Technical Building Codes and Standards Board**. "Technical Building Codes and Standards Board" means the board established pursuant to 5 M.R.S. §12004-G, subsection 5-A and 10 M.R.S. §9722.

SECTION 4: INCORPORATION BY REFERENCE

1. The following Chapters of the 2009 International Residential Code, published by the International Code Council, Inc., in effect on June 1, 2010, are hereby adopted and incorporated by reference:

   A. Chapters 1 - 10
   B. Chapters 12 - 19
   C. Chapter 23
   D. Chapter 41
   E. Chapter 42
   F. Chapter 44

2. The following Chapters, and all appendices, of the IRC are specifically excluded from adoption:

   A. Chapter 11 Energy Efficiency
   B. Chapter 20 Boilers and Water Heaters
   C. Chapter 21 Hydronic Piping
   D. Chapter 22 Special Piping and Storage Systems
   E. Chapter 24 Fuel Gas
   F. Chapter 25 Plumbing Administration
   G. Chapter 26 General Plumbing Requirements
   H. Chapter 27 Plumbing Fixtures
   I. Chapter 28 Water Heaters
   J. Chapter 29 Water Supply and Distribution
   K. Chapter 30 Sanitary Drainage
   L. Chapter 31 Vents
   M. Chapter 32 Traps
   N. Chapter 33 Storm Drainage
   O. Chapter 34 General Requirements
   P. Chapter 35 Electrical Definitions
   Q. Chapter 36 Services
   R. Chapter 37 Branch Circuit and Feeder Requirements
   S. Chapter 38 Wiring Methods
   T. Chapter 39 Power and Lighting Distribution
   U. Chapter 40 Devices and Luminaries
   V. Chapter 43 Class 2 Remote-Control, Signaling and Power Limited Circuits
   W. Appendix A - Q

SECTION 5. REVISIONS TO THE IRC

The following additions, insertions, deletions, and other changes are hereby made to the 2009 International Residential Code:

1. Generally all sections

   Delete "International Mechanical Code"
   Insert "applicable state codes and statues"

2. Section R101.1

   Delete [NAME OF JURISDICTION]; *and*
   Insert "State of Maine" in its place.

3. Section R102.2.1

   Insert "No provisions of the MUBEC shall be construed to prohibit the adoption or enforcement of an ordinance of any political subdivision that sets forth provisions for local enforcement of building codes. Such ordinances may include items such as, permits, permit fees, boards of appeals and violations."

4. Section R102.7

   Delete "International Property Maintenance Code or the International Fire Code"; *and*
   Insert "NFPA #1; Fire and Safety Codes and standards adopted pursuant to Title 25, §§ 2452 and 2465" in its place.

5. Section R103

   Delete Section R103 'Department of Building Safety' in its entirety, without substitution.

6. Sections R104, R105, R106 R107, R109, R110, R111, and R114 and any amendments thereto shall only be applicable:

   A. In a municipality with a population of 2,000 or more residents, beginning:

      (1) No later than December 1, 2010, if the municipality had previously adopted any building code on or before August 1, 2008; or

      (2) No later than July 1, 2012, if the municipality had not adopted any building code on or before August 1, 2008.

   B. In a municipality with a population of less than 2,000 residents, if the municipality voluntarily elects to enforce the MUBEC.

7. Section R104.8

   Delete all language in Section R104.8; and
   Insert "See 14 MRSA §8101" in its place.

8. Section R105.1

Insert "where required by municipal ordinance." at the end of the paragraph.

9. Section R105.2

Insert "Structures exempt from permits shall be located in compliance with zoning and floodplain regulations." at the end of the paragraph.

10. Section R105.3

Delete "department of building safety" in the first paragraph; *and*
Insert "municipality" in its place.

11. Section R105.3.1

Delete "within a reasonable time after filing"
Insert "in accordance with 30A MRSA §4103"

12. Section R105.3.1.1

Delete "finding shall be provided to the board of appeals for a determination of substantial damage. Applications determined by the bar of appeals to constitute substantial improvement or substantial damage"; *and*
Insert "Building Official" in its place.

13. Section R108

Delete Section R108 "Fees" in its entirety, without substitution.

14. Sections R112 and R113

Delete Section R112 "Board of Appeals" and Section R113 "Violations" in their entirety, without substitution.

15. Section R202

Delete "Conditioned space: Fore energy purposes, space within a building that is provided with heating and/or cooling equipment of systems capable of maintaining, through design or heat loss/gain 50° F (10° C) during the heating season and 85° F (29° C) during the cooling season, or communicates directly with a conditioned space. For mechanical purposed, an area, room or space being heated or cooled by any equipment or appliance"

Insert "An area or room within a building being heated or cooled, containing un-insulated ducts, or with a fixed opening directly into an adjacent conditioned space." in its place.

16. Section R310.1, First Exception

Insert "if the dwelling unit is protected throughout by an approved automatic sprinkler system in accordance with R313." at the end of the first exception.

17. Section R310.1.1

Delete "Exception: Grade floor openings shall have a minimum net clear opening of 5 square feet (0.465 m^2)."

18. Section R313.2

Delete Section R313.2 in its entirety.

Insert (IRC) R501.3 Fire protection of floors, Floor assemblies, not required elsewhere in this code to be fire resistance rated, shall be provided with a ½ inch gypsum wallboard membrane, 5/8 inch wood structural panel membrane, or equivalent on the underside of the floor framing member.

Exceptions:

1. Floor assemblies located directly over a space protected by an automatic sprinkler system in accordance with Section ~~P2904,~~ NFPA 13D, or other approved equivalent sprinkler system.

2. Floor assemblies located directly over a crawl space not intended for storage or fuel-fired appliances.

3. Portions of floor assemblies can be unprotected when complying with the following:

3.1 The aggregate area of the unprotected portions shall not exceed 80 square feet per story.

3.2 Fire blocking in accordance with Section R302.11.1 shall be installed along the perimeter of the unprotected portion to separate the unprotected portion from the remainder of the floor assembly.

4. Wood floor assemblies using dimension lumber or structural composite lumber equal to or greater than 2-inch by 10-inch nominal dimension, or other approved floor assemblies demonstrating equivalent fire performance.

19. Section: Table M1507.3

Delete Table M1507.3; *and*
Insert See ASHRAE 62.2 – 2007 edition; Table 5.1 and 5.2

STATUTORY AUTHORITY: 10 M.R.S. §9722

EFFECTIVE DATE:
October 11, 2010 – filing 2010

OREGON

Code Amendment Proposal Application

Department of Consumer & Business Services
Building Codes Division
1535 Edgewater NW, Salem, Oregon
Mailing address: P.O. Box 14470, Salem, OR 97309-0404
Phone: (503) 378-4133, Fax: (503) 378-2322
Web: bcd.oregon.gov

STAFF USE ONLY
Application no.:
☐ Approved ☐ Denied

Instructions: Fill in all the following information, attach any supplementary information you relied on, and mail to the address listed above. For more information, please refer to the Building Codes Division Web site, bcd.oregon.gov.

APPLICANT INFORMATION		
Name: **Robert Rice**		Date: **June 8, 2010**
Representing: **Oregon Building Officials Association**		Phone: **(541)474-5109 x2410**
Address (street or P.O. Box): **700 NW Dimmick St., Suite A**		Fax:
City: **Grants Pass**	State: **OR**	ZIP: **97526**
E-mail address: **RRice@co.josephine.or.us**		

PROPOSED CODE LANGUAGE
This proposed code amendment (check one):
☐ **Amends** (code, edition, section):
☐ **Adopts a new section** (code, edition):
☒ **Repeals** (code, edition, section): **Sections R313.2 and R313.2.1 of the 2009 International Residential Code**

You must provide language for review by the division. Failure to provide language will invalidate the application.

Please use the following format to show additions and deletions from the code — strike through ~~deleted text~~, underline and bold **new text**.

Use arrow keys to advance to the next text box.

Proposed language:

~~**R313.2 One- and two-family dwellings automatic fire systems.** Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.~~

> ~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

Continued

APPLICATION CRITERIA

Attach to this application written responses to the following questions. If needed, include in the response an explanation as to why a question does not apply to your proposed code amendment. The division may reject an incomplete application.

Questions:

1. Is your proposed code amendment necessary to correct any unforeseen or probable outcomes resulting from the application of a code section, and if so, why? **Yes. Although OBOA agrees that sprinkler systems are a life safety feature that adds protection, the overall cost of the systems with additional local fees associated with upgrading meter sizes and other fees can be fairly large. In some cases it could result in a $10,000 to $12,000 increase per home.**
2. Is your proposed code amendment needed to protect the health, safety, welfare, comfort, and security of occupants and the public, and if so, why? **No**
3. Does your proposed code amendment correct inadequate application by a code section to a method, material, or design, and if so, how? **No**
4. Is your proposed code amendment necessary to correct unique geographic or climatic conditions within Oregon, and if so, why? **No**
5. Is your proposed code amendment needed to eliminate conflicting, obsolete, or duplicative code provisions or standards among Oregon-adopted codes, statutes, or regulations, and if so, why? **No**
6. Does your proposed code amendment work to conserve scarce resources, and if so, how? **No**
7. Does your proposed code amendment provide for the use of unique or emerging technologies or promote advances in construction methods, devices, materials, and techniques, and if so, how? **No**
8. Does your proposed code amendment meet any energy conservation or indoor air quality requirements, and if so, how? **No**
9. Does your proposed code amendment involve the adoption of an electrical or plumbing building product? If an electrical or plumbing building product is involved, note if the appropriate board approved the product. **No**
10. Does your proposed code amendment create any adverse fiscal impact or cost savings for the general public, the construction industry, local and state governments, or small businesses? If so, please describe the added or reduced cost of the proposed code amendment, the adverse fiscal impact or cost savings in relation to the current Oregon specialty code, and any standards of measure used to arrive at the result given. **Yes. See Question #1**
11. If your proposed code amendment relates to the development of a 6,000-square-foot parcel and the construction of a 1,200-square-foot detached single-family dwelling on that parcel, please provide information to assist the division in preparing a housing cost impact statement. **It would keep these structures in a status quo position.**

APPLICANT SIGNATURE

Signature: Date: **June 8, 2010**

***Copyright notice**: By signing this proposed code amendment application, I understand and acknowledge that the work contained in this application is original, or if not original, I have the right to copy the work. By signing this work, I understand that any rights I may have in this work, including any form of derivative works and compilations, are assigned to the Department of Consumer and Business Services. I also understand that I do not retain or acquire any rights once this work is used in a Department of Consumer and Business Services publication.*

APPLICATION PROCESSING

The Building Codes Division screens proposed amendments to determine whether they meet the requirements of Oregon Administrative Rule (OAR) 918-008-0060. The division will return proposed code amendments that do not substantially meet the requirements of OAR 918-008-0060, with specific reasons included in the returned application

If you submit completed proposed code amendments to the division before the end of the timetable established under OAR 918-008-0020, the division will forward them to the appropriate advisory board for review. The division will not forward proposed code amendments that are not completed before the end of the timetable.

If you complete proposed code amendments but do not submit them to the division before the end of the timetable, you may submit them as completed applications for consideration during the next opportunity given to make amendments to the state building code.

Note: The division is not obligated to examine a proposed code amendment submitted after the end of the timetable.

Code Amendment Proposal Application

Department of Consumer & Business Services
Building Codes Division
1535 Edgewater NW, Salem, Oregon
Mailing address: P.O. Box 14470, Salem, OR 97309-0404
Phone: (503) 378-4133, Fax: (503) 378-2322
Web: bcd.oregon.gov

STAFF USE ONLY
Application no.:
☐ Approved ☐ Denied

Instructions: Fill in all the following information, attach any supplementary information you relied on, and mail to the address listed above. For more information, please refer to the Building Codes Division Web site, bcd.oregon.gov.

APPLICANT INFORMATION		
Name: **Robert Rice**		Date: **June 8, 2010**
Representing: **Oregon Building Officials Association**		Phone: **(541)474-5109 x2410**
Address (street or P.O. Box): **700 NW Dimmick St., Suite A**		Fax:
City: **Grants Pass**	State: **OR**	ZIP: **97526**
E-mail address: **RRice@co.josephine.or.us**		

PROPOSED CODE LANGUAGE
This proposed code amendment (check one):
☐ **Amends** (code, edition, section):
☐ **Adopts a new section** (code, edition):
☒ **Repeals** (code, edition, section): **Delete Section R313 in its entirety, 2009 International Residential Code**

You must provide language for review by the division. Failure to provide language will invalidate the application.

Please use the following format to show additions and deletions from the code — strike through ~~deleted text~~, underline and bold **new text**.

Use arrow keys to advance to the next text box.

Proposed language:

~~**SECTION R313**~~
~~**AUTOMATIC FIRE SPRINKLER SYSTEMS**~~

~~**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in *townhouses*.~~

> ~~**Exception:** An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residential fire sprinkler system installed.~~
>
> ~~**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.~~

~~**R313.2 One- and two-family dwellings automatic fire systems.** Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.~~

> ~~**Exception:** An automatic residential fire sprinkler system shall not be required for *additions* or *alterations* to existing buildings that are not already provided with an automatic residential sprinkler system.~~

~~**R313.2.1 Design and installation.** Automatic residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.~~

Continued

APPLICATION CRITERIA

Attach to this application written responses to the following questions. If needed, include in the response an explanation as to why a question does not apply to your proposed code amendment. The division may reject an incomplete application.

Questions:

1. Is your proposed code amendment necessary to correct any unforeseen or probable outcomes resulting from the application of a code section, and if so, why? **Yes. Although OBOA agrees that sprinkler systems are a life safety feature that adds protection, the overall cost of the systems with additional local fees associated with upgrading meter sizes and other fees can be fairly large. In some cases it could result in a $10,000 to $12,000 increase per home.**
2. Is your proposed code amendment needed to protect the health, safety, welfare, comfort, and security of occupants and the public, and if so, why? **No**
3. Does your proposed code amendment correct inadequate application by a code section to a method, material, or design, and if so, how? **No**
4. Is your proposed code amendment necessary to correct unique geographic or climatic conditions within Oregon, and if so, why? **No**
5. Is your proposed code amendment needed to eliminate conflicting, obsolete, or duplicative code provisions or standards among Oregon-adopted codes, statutes, or regulations, and if so, why? **No**
6. Does your proposed code amendment work to conserve scarce resources, and if so, how? **No**
7. Does your proposed code amendment provide for the use of unique or emerging technologies or promote advances in construction methods, devices, materials, and techniques, and if so, how? **No**
8. Does your proposed code amendment meet any energy conservation or indoor air quality requirements, and if so, how? **No**
9. Does your proposed code amendment involve the adoption of an electrical or plumbing building product? If an electrical or plumbing building product is involved, note if the appropriate board approved the product. **No**
10. Does your proposed code amendment create any adverse fiscal impact or cost savings for the general public, the construction industry, local and state governments, or small businesses? If so, please describe the added or reduced cost of the proposed code amendment, the adverse fiscal impact or cost savings in relation to the current Oregon specialty code, and any standards of measure used to arrive at the result given. **Yes. See Question #1**
11. If your proposed code amendment relates to the development of a 6,000-square-foot parcel and the construction of a 1,200-square-foot detached single-family dwelling on that parcel, please provide information to assist the division in preparing a housing cost impact statement. **It would keep these structures in a status quo position.**

APPLICANT SIGNATURE

Signature: Date: **June 8, 2010**

***Copyright notice**: By signing this proposed code amendment application, I understand and acknowledge that the work contained in this application is original, or if not original, I have the right to copy the work. By signing this work, I understand that any rights I may have in this work, including any form of derivative works and compilations, are assigned to the Department of Consumer and Business Services. I also understand that I do not retain or acquire any rights once this work is used in a Department of Consumer and Business Services publication.*

APPLICATION PROCESSING

The Building Codes Division screens proposed amendments to determine whether they meet the requirements of Oregon Administrative Rule (OAR) 918-008-0060. The division will return proposed code amendments that do not substantially meet the requirements of OAR 918-008-0060, with specific reasons included in the returned application

If you submit completed proposed code amendments to the division before the end of the timetable established under OAR 918-008-0020, the division will forward them to the appropriate advisory board for review. The division will not forward proposed code amendments that are not completed before the end of the timetable.

If you complete proposed code amendments but do not submit them to the division before the end of the timetable, you may submit them as completed applications for consideration during the next opportunity given to make amendments to the state building code.

Note: The division is not obligated to examine a proposed code amendment submitted after the end of the timetable.

Code Amendment Proposal Application

Department of Consumer & Business Services
Building Codes Division
1535 Edgewater NW, Salem, Oregon
Mailing address: P.O. Box 14470, Salem, OR 97309-0404
Phone: (503) 378-4133, Fax: (503) 378-2322
Web: bcd.oregon.gov

STAFF USE ONLY
Application no.:
☐ Approved ☐ Denied

Instructions: Fill in all the following information, attach any supplementary information you relied on, and mail to the address listed above. For more information, please refer to the Building Codes Division Web site, bcd.oregon.gov.

APPLICANT INFORMATION		
Name: **Robert Rice**		Date:
Representing: **Oregon Building Officials Association**		Phone: **(541)474-5109 x2410**
Address (street or P.O. Box): **700 NW Dimmick St., Suite A**		Fax:
City: **Grants Pass**	State: **OR**	ZIP: **97526**
E-mail address: **RRice@co.josephine.or.us**		

PROPOSED CODE LANGUAGE
This proposed code amendment (check one):
☒ **Amends** (code, edition, section): **2009 International Residential Code, Sections R302.2 & R302.2.4**
☐ **Adopts a new section** (code, edition):
☐ **Repeals** (code, edition, section):

You must provide language for review by the division. Failure to provide language will invalidate the application.

Please use the following format to show additions and deletions from the code — strike through ~~deleted text~~, underline and bold **new text**.

Use arrow keys to advance to the next text box.

Proposed language:

R302.2 Townhouses.
Each townhouse shall be considered a separate building and shall be separated by fire-resistance-rated wall assemblies meeting the requirements of Section R302.1 for exterior walls.

Exception: A common ~~1~~2-hour fire-resistance-rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R302.4. The fire-resistance rated wall assembly shall be allowed to be reduced to 1-hour when an automatic fire sprinkler system is installed in accordance with NFPA 13D or an approved multi-purpose system is installed.

R302.2.4 Structural independence. Each individual townhouse shall be structurally independent.

Exceptions:

1. Foundations supporting exterior walls or common walls.
2. Structural roof and wall sheathing from each unit may fasten to the common wall framing.
3. Nonstructural wall and roof coverings.
4. Flashing at termination of roof covering over common wall.

Continued

5. Townhouses separated by a common ~~1~~ 2-hour fire-resistance-rated wall as provided in Section The fire-resistance rated wall assembly shall be allowed to be reduced to 1-hour when an automatic fire sprinkler system is installed in accordance with NFPA 13D or an approved multi-purpose system is installed.

APPLICATION CRITERIA

Attach to this application written responses to the following questions. If needed, include in the response an explanation as to why a question does not apply to your proposed code amendment. The division may reject an incomplete application.

Questions:

1. Is your proposed code amendment necessary to correct any unforeseen or probable outcomes resulting from the application of a code section, and if so, why? **Yes. The fire resistance rating was reduced to 1 hour in the model code because mandatory fire sprinkler systems were included in section 313. The mandatory requirement for sprinklers is often removed or reduced when the model code is adopted. Therefore, the tradeoff is not appropriate when the fire sprinkler systems are not installed.**
2. Is your proposed code amendment needed to protect the health, safety, welfare, comfort, and security of occupants and the public, and if so, why? **Yes. See above.**
3. Does your proposed code amendment correct inadequate application by a code section to a method, material, or design, and if so, how? **Yes. See above**
4. Is your proposed code amendment necessary to correct unique geographic or climatic conditions within Oregon, and if so, why? **N/A**
5. Is your proposed code amendment needed to eliminate conflicting, obsolete, or duplicative code provisions or standards among Oregon-adopted codes, statutes, or regulations, and if so, why? **N/A**
6. Does your proposed code amendment work to conserve scarce resources, and if so, how? **N/A**
7. Does your proposed code amendment provide for the use of unique or emerging technologies or promote advances in construction methods, devices, materials, and techniques, and if so, how? **N/A**
8. Does your proposed code amendment meet any energy conservation or indoor air quality requirements, and if so, how? **N/A**
9. Does your proposed code amendment involve the adoption of an electrical or plumbing building product? If an electrical or plumbing building product is involved, note if the appropriate board approved the product. **N/A**
10. Does your proposed code amendment create any adverse fiscal impact or cost savings for the general public, the construction industry, local and state governments, or small businesses? If so, please describe the added or reduced cost of the proposed code amendment, the adverse fiscal impact or cost savings in relation to the current Oregon specialty code, and any standards of measure used to arrive at the result given. **N/A**
11. If your proposed code amendment relates to the development of a 6,000-square-foot parcel and the construction of a 1,200-square-foot detached single-family dwelling on that parcel, please provide information to assist the division in preparing a housing cost impact statement. **N/A**

APPLICANT SIGNATURE

Signature: Date: 6/8/2010

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STAFF USE ONLY
Application no.:
☐ Approved ☐ Denied

Instructions: Fill in all the following information, attach any supplementary information you relied on, and mail to the address listed above. For more information, please refer to the Building Codes Division Web site, bcd.oregon.gov.

APPLICANT INFORMATION		
Name: **Johnathan Balkema**		Date: **6/8/10**
Representing: **Oregon Home Builders Association**		Phone: **503-378-9066**
Address (street or P.O. Box): **375 Taylor St NE**		Fax: **503-362-5120**
City: **Salem**	State: **OR**	ZIP: **97301**
E-mail address: **jbalkema@oregonhba.com**		

PROPOSED CODE LANGUAGE
This proposed code amendment (check one):
☐ **Amends** (code, edition, section):
☐ **Adopts a new section** (code, edition):
☒ **Repeals** (code, edition, section): 2009 IRC/2011 ORSC SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS

You must provide language for review by the division. Failure to provide language will invalidate the application.

Please use the following format to show additions and deletions from the code — strike through ~~deleted text~~, underline and bold **new text**.

Use arrow keys to advance to the next text box.

Proposed language:

~~**SECTION R313 AUTOMATIC FIRE SPRINKLER SYSTEMS**~~

~~**R313.1 Townhouse automatic fire sprinkler systems.** An automatic residential fire sprinkler system shall be installed in *townhouses.*~~

~~**Exception:** An automatic residential fire sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have an automatic residentialfire sprinkler system installed.~~

~~**R313.1.1 Design and installation.** Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P2904.~~

~~**R313.2 One- and two-family dwellings automatic fire systems.** Effective January 1, 2011, an automatic residential fire sprinkler system shall be installed in one- and two- family *dwellings*.~~

Reason:

The increased cost of the sprinkler system and associated system development charges will have a negative effect on the housing market and related industries. Whereas the fire services has had the ability to seek local adoption of fire sprinklers and none has, it seems hard to believe that this requirement and the increased costs are in the best interest of the public. Additionally as this provision will significantly increase the cost of a new construction, this requirement will direct more buyers to existing homes that do not tain some of the life and safety measures imposed in recent codes, thus reducing the effects of those life and safety provisions.

Continued

APPLICATION CRITERIA

Attach to this application written responses to the following questions. If needed, include in the response an explanation as to why a question does not apply to your proposed code amendment. The division may reject an incomplete application.

Questions:

1. Is your proposed code amendment necessary to correct any unforeseen or probable outcomes resulting from the application of a code section, and if so, why? **Yes, see previous page.**
2. Is your proposed code amendment needed to protect the health, safety, welfare, comfort, and security of occupants and the public, and if so, why? **Yes, additional costs may direct owners to remain in existing situations.**
3. Does your proposed code amendment correct inadequate application by a code section to a method, material, or design, and if so, how? **No**
4. Is your proposed code amendment necessary to correct unique geographic or climatic conditions within Oregon, and if so, why? **No**
5. Is your proposed code amendment needed to eliminate conflicting, obsolete, or duplicative code provisions or standards among Oregon-adopted codes, statutes, or regulations, and if so, why? **No**
6. Does your proposed code amendment work to conserve scarce resources, and if so, how? **Yes, reduction in pipe.**
7. Does your proposed code amendment provide for the use of unique or emerging technologies or promote advances in construction methods, devices, materials, and techniques, and if so, how? **No**
8. Does your proposed code amendment meet any energy conservation or indoor air quality requirements, and if so, how? **No**
9. Does your proposed code amendment involve the adoption of an electrical or plumbing building product? If an electrical or plumbing building product is involved, note if the appropriate board approved the product. **No**
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11. If your proposed code amendment relates to the development of a 6,000-square-foot parcel and the construction of a 1,200-square-foot detached single-family dwelling on that parcel, please provide information to assist the division in preparing a housing cost impact statement. **Cost Savings that varies in the thousands.**

APPLICANT SIGNATURE

Signature: Date: 6/19/10

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Note: The division is not obligated to examine a proposed code amendment submitted after the end of the timetable.

STATE OF OREGON **INTEROFFICE MEMO**

BUILDING CODES DIVISION **JULY 2, 2010**

To: Residential Specialty Code Review Committee

From: Chris S. Huntington
Manager Policy and Technical Services Section

Subject: Residential Fire Sprinkler Systems

As you are already aware, the 2009 International Residential Code (IRC) contains model code provisions that require fire sprinkler systems in one- and two-family dwellings and townhouses. This committee will be considering this model code change and associated code change proposals as part of the overall recommendation to the Residential and Manufactured Structures Board. Because this issue is of particular interest to a variety of stakeholders, the division requested that the committee set aside a specified time to discuss this issue. This discussion is scheduled for the July 14, 2010 committee meeting.

In addition to the new model code provision and the associated code change proposals, the committee should also consider the attached report which details the current approach to residential fire sprinkler requirements in Oregon. It is the result of an extended period of discussion during the previous code cycle and establishes substantive guidelines for a jurisdiction wanting to request a local amendment related to fire sprinklers.

Background

During the last code change cycle for the Oregon Residential Specialty Code the division received two code change proposals for residential fire sprinklers specific to Appendix P, residential fire sprinklers.

That code review committee and the board were unable to resolve the technical and policy issues in Appendix P. The board asked the division to try to resolve these issues. The division attempted, over several months, to work through Appendix P to gain consensus on the policy issues surrounding residential fire sprinklers. Because the division was unable to gain consensus on the issues, it ended the process without adopting a statewide residential fire sprinkler requirement.

The division prepared a report, which was approved by the residential structures board, summarizing the discussions surrounding residential fire sprinklers. The information in the report is intended to provide municipalities the benefit of the information provided to the division.

Part I - Background and overview of the process.
Part II - In depth discussion of the key issues that resurfaced throughout the process.
Part III - Summarizes what the division's position would have been had fire sprinklers been adopted as a statewide requirement.
Part IV - Discusses the local amendment process and issues that municipalities submitting a local amendment request for residential fire sprinklers must address.

As a result of the report, the current process for municipalities wishing to include mandatory residential fire sprinklers as part of an overall community fire protection plan may do so through the local amendment process. As part of the local amendment application, municipalities will need to address particular policy considerations.

The division wanted the committee to have this additional information in advance of the discussion at the next meeting.

If you have questions or need further information, please contact Richard Rogers, Structural Program Chief, at **richard.rogers@state.or.us** or at 503-378-4472.

Oregon
Theodore R. Kulongoski, Governor

Department of Consumer and Business Services
Building Codes Division
1535 Edgewater Street NW
PO Box 14470
Salem, OR 97309-0404
(503) 378-4133
FAX (503) 378-2322
http://bcd.oregon.gov

July 7, 2010

PUBLIC MEETING NOTICE
2011 Oregon Residential Specialty Code Committee

Building Codes Division
Conference Room A
1535 Edgewater St NW
Salem, OR 97304

Wednesday, July 14, 2010
9:00 a.m. to 4:00 p.m.

Agenda:

1. Discussion of model code change for residential fire sprinklers and associated proposals:
   A. R313 Automatic Fire Sprinkler Systems;
      - ORSC11-06 (code proposal);
      - ORSC11-50 (code proposal);
      - *BCD memo Residential Fire Sprinkler Systems*;
      - ORSC1-05 (code proposal);
      - ORSC11-14 (code proposal)- R302.2 Townhouses; and
      - R302.2.4 Structural Independence Exception #5
2. Discuss tabled items:
   A. Chapter 2 Definitions:
      - High-Efficacy Lamps
      - Thermal Isolation
      - Vapor Retarder/Vapor Retarder Class
3. Chapter 3 Building Planning:
   A. R301.3 Story Height – Discuss with Chapter 6
   B. R302.11 (code proposal ORSC11-47) – (Relates to R703.1)
   C. R315 Carbon Monoxide Alarms, code proposals;
      - ORSC11-11 (code proposal);
      - ORSC11-51 (code proposal); and
      - *BCD memo Carbon Monoxide Alarms*

4. Finish discussion on Chapter 3 Building and Planning, beginning with Section R317.1. Review will include model code changes, Oregon amendments, and any proposed code changes.

5. Continue review and discussion of Chapters 4, 5 and 6 as time allows.

Video-recorded live meetings and further committee information/documents can be viewed on the 2011 Oregon Residential Specialty Code Committee webpage at **http://www.bcd.oregon.gov/committees/11orsc.html.**

For more information, please contact Micheal D Ewert, Residential and Mechanical Code Programs at 503-373-7529 or mike.d.ewert@state.or.us.

All meetings will be held in Conference Room A from 9:00 a.m. to 4:00 p.m.
Meetings are currently scheduled for: Wednesday, July 28th and Wednesday, August 11th.

Auxiliary aids for people with disabilities are available upon advance request.
Vehicles with "E" plates should not park in customer only spaces.

Oregon
Theodore R. Kulongoski, Governor

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PO Box 14470
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(503) 378-4133
FAX (503) 378-2322
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July 22, 2010

2011 Oregon Residential Specialty Code Committee
July 14, 2010
Meeting Summary

****NOTE:** ***The following is a* summary *of the committee's discussion. To review the meeting in its entirety, the archived video of the meeting is available on the committee's Web site at the following link*** http://www.bcd.oregon.gov/committees/11orsc.html

Members Present: Johnathan Balkema, Oregon Home Builders Association
Mike Goodrich, Legend Homes Corporation
Tracy Hankin, Hankins Construction
Gary Lampella, City of Redmond
Eric McMullen, Oregon State Fire Marshal

Members Absent: Alan Seymour, Oregon Department of Energy
Ravi Mahajan, Clackamas County

Guests Present: John Caul, Oregon State Fire Marshal
Dick Honey, Portland Fire & Rescue
Mike Hansen, OFCA
Crosby Grindle, NFPA
LonJean Fobert, Habitat For Humanity
Stephanie Stafford, Oregon Fire Fatality Renew Committee (OSFM)
Don Miner, Oregon Manufactured Housing Association (OMHA)
Joe Andre, NEMA
Buzz Moubiel, Housebuilders Northwest
John Patterson, City of Medford Fire & Rescue
Jason Cane, Polk County Fire Department
Claire McGrew, Oregon Fire Fatality Renew Committee (OSFM)
Norm Nomie, City of Gresham
James Bela, Oregon Earthquake Awareness
Anthony Rocco, Chemeketa CWE Student
Thomas Phillips, City of Salem
Stacy Warner, Office of State Fire Marshal
Debbie McDermott, City of McMinnville Fire Department

Guests Present: *(continued)*

Larry Thornton, City of Monmouth
Rod Albin, Albin's Pluming
Phil Sample, Lake Oswego Fire Department
Donna Disch, Oregon Office of State Fire Marshal
Cave Kamrath, Habitat For Humanity
Robert Rice, Oregon Building Officials Association

Staff Present:

Chris Huntington, Policy and Technical Services Manager
Richard Rogers, Structural Chief
Rich Baumann, Policy Analyst
Dana Fischer, Building Code Para-Technical
Ernie Hopkins, Structural/Mechanical Inspector
Chad Brooks, Structural/Mechanical Inspector

Introductions

Gary Lampella, Chair, called the meeting to order at 9:30 a.m. The meeting began late due to technical difficulties. Chair Lampella explained that due to the amount of public testimony, testimony will be limited to 3 minutes.

*The committee began their discussion with items **tabled** at the last meeting.*

Chapter 3, Building Planning
Tabled items

Section R313 Automatic Fire Sprinkler Systems

Chair Lampella explained the language in the model code. Eric McMullen provided testimony for the National Sprinkler Coalition. He testified in support of keeping the model code language.

Public Testimony

John Caul, Deputy Oregon State Fire Marshal and representing the National Sprinkler Coalition, testified in support of *residential fire sprinklers*.

Dick Haney, Portland Fire Department testified *in favor of residential fire sprinklers*. He shared with the committee statistics on residential fires and loss of life for both the public and fire fighters.

Mike Hanson, Douglas County Fire Department testified *in favor of residential fire sprinklers*.

Crosby Grindle, representing National Fire Protection Agency (NFPA) testified that *residential fire sprinklers* reduce water use and greenhouse gases during a fire.

Stephanie Stattford and Claire McGrew both representing Oregon Fire Fatality Review Committee (OSFM), shared information about an advisory group of fire industry individuals. The purpose of the group is to review the different causes of fire fatalities. Ms. Stratford shared

the statistics on how many people die in a fire per nationality, disability and smoke alarm failure data. She stated that her organization is *in support of residential fire sprinklers*.

Don Miner representing Oregon Manufactured Housing Association testified that his organization is *not opposing residential fire sprinklers*, but shared concerns associated with cost of installation.

Stacy Warner, Assistant Chief Oregon State Fire Marshal, testified *in support of residential fire sprinklers*.

Rod Albin, a member of the general public testified *in support of residential fire sprinklers*. He did express concern and his wishes that the general public should not have access to any water supply shut off.

James Bela representing Oregon Earthquake Awareness testified *in support of protecting emergency workers*.

Debbie McDermott representing McMinnville Fire Department and Donna Disch representing Oregon State Fire Marshal testified that although they are both *in favor of residential fire sprinkler requirements*, they are concerned that insurance rates could increase if sprinkler requirements are not adopted.

Dave Kamrath representing Habitat for Humanity testified that because the families he represents are low-income, the costs associated with installation of residential fire sprinklers could be too costly. He stated that although saving lives is very important, he would like to ensure that the voice of low-income families will be heard.

Robert Rice representing Oregon Building Officials Association and Josephine County testified *in support of sprinklers* but not that they become mandatory for every residence. He stated that many rural communities do not have the availability of installing sprinklers due to lack of a water source.

Code Change Proposal ORSC11-05, ORSC11-06 and ORSC11-14
Robert Rice, OBOA explained each proposal.

Code Change Proposal ORSC11-50
Johnathan Balkema, OHBA explained the proposal.

BCD Memo on Residential Fire Sprinkler Systems
Chris Huntington, Manager Policy and Technical Services, explained the memo given to the committee. The committee members asked questions and provided comment.

Motion to approve code change proposal ORSC11-06 to delete Section R313 in its entirety.
Chair Lampella provided comment. Mike Goodrich asked if the proposal passes, would the division look at the existing fire sprinkler report. Mr. Balkema agreed.
Vote: 4-yes to 1-no
Motion approved.

Motion to disapprove code change proposal ORSC11-05 since code change ORSC11-06 accomplishes the same thing.
Motion approved unanimously.

Code change ORSC11-50 withdrawn by proponent.

Motion to approve ORSC11-14.
Motion withdrawn.

Motion to table for further discussion.
Motion approved unanimously.
Chair Lampella asked Mr. Balkema and Mr. McMullen to work with the division on drafting language in the form of a proposal that looks at possible trade-offs for sprinklered structures. The review would include Sections R302.2, R302.2.4, R317.2 (2008 ORSC language dealing with townhouses) and ORSC11-14. He asked that they bring the proposal back to a future meeting.

Break
The committee took a break

Section 315 Carbon Monoxide Alarms
Code Proposal ORSC11-11
Joe Andre representing National Electrical Manufacturers Association (NEMA) spoke to the committee sharing information on carbon monoxide alarms and the intent behind the proposal. The committee asked questions and provided comment. He expressed concerns about existing alarms that are not hard wired into an existing system.

The committee discussed at length, Mr. Andre's document compared with the division's draft document, and the proposal and issues on carbon monoxide alarms in general. On the division's proposed document, Exception 2, the *last sentence was deleted* due to an Oregon Amendment being previously approved that deleted the same language. Modifications to the division's document and code proposal BCD-6 were discussed.

Motion to approve code proposal BCD-06 draft for Carbon Monoxide Alarms including today's modifications.
Motion approved unanimously.

Break
The committee took a lunch break.

Section R302.13 Combustible Insulation Clearance
The committee discussed the language. Mr. Andre representing NEMA provided comment pertaining to electrical issues associated with combustible insulation clearance.
TABLED: *The committee agreed to table the discussion until Alan S. could be here.*

Chapter 2, Definitions
Tabled items

High-Efficacy Lamps
TABLED: *The committee agreed to table the discussion until Alan S. could be in attendance.*

Thermal Isolation
TABLED: *The committee agreed to table the discussion until Alan S. could be in attendance.*

Vapor Retarder
TABLED*: The committee agreed to table the discussion until Alan S. could be in attendance.*

Vapor Retarder Class
TABLED *The committee agreed to table the discussion until Alan S. could be in attendance.*

Chapter 3, Building Planning
Remainder of tabled items

Motion to disapprove code proposals ORSC11-11 and ORSC11-51 due to the approval of code proposal BCD-06.
Motion approved unanimously.

Section R301.3 Story height
TABLED: *for further discussion along with Chapter 6.*

Code change proposal ORSC11-47
The committee discussed the proposal. Mr. Balkema provided additional modified language to the Exception.
Motion to approve as modified code proposal ORSC11-47.
Motion approved unanimously.

Chapter 4, Foundations

Section R401.2 Requirements
Richard Rogers, Structural Chief explained the existing Oregon Amendment.

Section R401.3 Drainage
Chief Rogers explained the change to the model code language as well as the existing Oregon Amendment. The committee discussed the language.

Code Change Proposal ORSC11-44, Section R401.4 Soil Tests
Mr. Balkema explained the proposal and the committee discussed it.
Motion to approve code change proposal ORSC11-44 on the basis that the model code language is not clear.
Vote: 3-yes to 2-no
Motion approved.

Motion to approve all existing and new amendments in Section 401, including modification made by ORSC11-44.
Motion approve unanimously.

Break
The committee took a short break.

Chair Lampella explained that the committee needs clarification on the Motion for R313. As clarification, Mr. Balkema stated that the original language as written could potentially increase costs which would affect industry.

Section R402.3 Precast Concrete Foundation Materials
Chief Rogers explained the model code language.

Motion to approve new model code changes in Section 402.
Motion approve unanimously.

Table R403.1 Minimum Width of Concrete, Precast or Masonry Footings
Chief Rogers explained the language.

Section R403.3 Continuous Footing in Seismic Design Categories D_0, D_1 and D_2
TABLED: *the last sentence in Section R403.3 was tabled for discussion along with Chapter 6.*

The committee continued their review of Chapter 4.

Section R403.1.5.2 Seismic Condition
TABLED: *for further discussion along with Chapter 6.*

Section R403.1.8 Foundation Anchorage
TABLED: *for further discussion along with Chapter 6.*

Section R403.1.8.1 Foundation Anchorage in Seismic Design Categories C, D_1 and D_2
The committee discussed *item 3* and whether the language should be deleted or not.

Motion to disapprove model code change language.
Motion approved unanimously.

Motion to retain existing Oregon Amendments in Section 403.1.8.1.
Motion approve unanimously.

Section 403.4 Footings for Precast concrete Foundations and R403.4.1 Crushed Stone Footings
Chair Lampella explained the model code change language.

Motion to approve all existing and new amendments in Section 402, including modifications made to specific code sections.
Motion approved unanimously.

Section R404 Foundation and Retaining Walls
The committee reviewed the changes to Section R404.

Adjourn
The meeting adjourned at 4:00 p.m.

State of Oregon
Draft

Agenda Item I.D

Residential and Manufactured Structures Board

Re-scheduled board meeting minutes

December 8 2010

Members present: Ray Miller, Chairman
David DeHarpport, Vice-chair
Peter Bride
Scott Caufield
Bruce Dobbs
Mike Goodrich
Kathryn Gray
Larry Hultberg
Douglas Lethin
John Mills

Members absent: None

Staff present: Patrick Allen, administrator
Chris Huntington, manager, policy and technical services
Richard Rogers, structural program chief
Celina Paterson, manager, statewide services
Aeron Teverbaugh, green building policy analyst
Brent Griffiths, lead enforcement officer
Tim Lindsey, central region coordinator
Jim Hanson, policy analyst
Richard Baumann, policy analyst
Debi Barnes-Woods, boards coordinator

Guests present: Don Miner, Oregon Manufactured Housing Association
James Bela, president, Oregon Earthquake Awareness
John Caul, Oregon State Fire Marshal's office
Randy Simpson, representing fire industry
Chris Vick, League of Oregon Cities
Don Denton, consultant for the Air conditioning
Sue Walker, Vent-Free Gas Products Alliance
Don Leonard, Pacific Propane Gas Associate
Johnathan Balkema, Oregon Homebuilders Association
Sherry Patterson, Lakefield Fire District
Kirk Kirchner

app: _____

Lana Butterfield, Pacific Propane Gas Association
Carl Tracy, Mega Distribution
Gary Lampella
Andrew Krauss, Western Outdoor Wholesale

I. Board business

A. Call to order

Chairman Ray Miller called the Residential and Manufactured Structures Board meeting to order at 9:40 a.m. The meeting was held at the Building Codes Division, Conference Room A, 1535 Edgewater Street NW, Salem, Oregon.

B. Roll call

No members were absent.

C. Approval of agenda and order of business

Chair Miller **RULED** the agenda and order of business approved.

D. Approval of the board meeting minutes of July 7, 2010

Chair Miller **RULED** the regular meeting minutes of July 7, 2010 approved.

E. Date of the next regularly scheduled meeting

January 5, 2011

F. Review 2011 board meeting dates. January 5, April 6, July 6 and October 5, 2011

G. Election of member of the Construction Industry Energy Board

Chris Huntington, Manager of Policy and Technical Services, explained the election process and noted that Mike Goodrich fills one of the two positions that represent the Residential and Manufactured Structures Board.

Chair Miller opened the vote for nominations.
Vice-chair David DeHarpport nominated Bruce Dobbs for membership.

There being no other nominations, Bruce Dobbs was unanimously voted member of the Construction Industry Energy Board representing the Residential and Manufactured Structures Board.

II. Public comment

James Bela, President and founder of Earthquake Awareness, said that per the *Attorney General's Public Records and Meetings Manual* all public meetings need to be noticed.

III. Reports

A. Building Codes Division report

Manager Huntington announced BCD staff changes: Shane Sumption, formerly Fire & Life Safety Code Technician, accepted the newly combined position in the Policy and Technical Services and Green Building Services of the division as Assistant Manager. Manager Huntington also announced that when the new Governor takes office, the current director of the Department of Consumer and Business Services Cory Streisinger will be resigning to allow for the new governor-elect to appoint a new director.

SB 79/Reach Code: The committee was formed in April, which continues to meet. The committee finished with the commercial standards of the reach code and is preparing to start the residential side of the reach code. Notice for code proposals will post today for residential code amendment proposals for the residential provisions of the reach code with a 45-day window closing January 24, 2011.

B. Program update

There was no program update to report other than what is listed on the agenda under new business.

IV. Communications - None

V. Appeals – None

VI. Unfinished business - None

VII. New business

Manager Huntington explained that due to individuals wanting to testify that have come from out-of-state, the issues under this agenda item were re-arranged to meet their air flight needs.

(submitted testimony documents)

G 2445.8 Unvented Room Heaters, code proposal No. 30 for moisture control submitted by Homebuilders Association. (Written testimony received by Oregon Homebuilders Association, Indoor Concentrations, Northern Energy, HPVA, Propane Gas Industry, Northwest Consulting, NPGA, Leader Equipment Co. Amerigas, Alliance)

Mike Ewert explained that the committee reviewed and approved the code change proposal No. 30 that created a new Chapter G 2445.8 submitted by the Homebuilders Association.

Public testimony

Don Denton, consultant for the Air conditioning, Heating and Refrigerator submitted written testimony opposing the submittal.

Sue Walker, Chairperson, Vent-Free Gas Products Alliance, was also opposing the code submittal. She noted that the Consumer Product Safety Commission has data that clearly states that vent free gas products are among the safest gas product on the market.

James Bela, President and founder earthquake awareness, noted that combustion appliances should not be put in a conditioned space.

Don Leonard, Pacific Propane Gas Associate, noted that the association is opposed to the code submittal. He noted that the proponent states that there is no cost impact. A heating controlled system would require a heating exhaust fan and a dehumidifier.

Johnathan Balkema, Oregon Homebuilders Association, submitted a late submittal to explain some of the further work of the code change committee. The new submittal clarifies the minimal cost of using a separate fan within the space actively being heated by the vent-free appliance. The original submittal was intended to use the existing bath fan required for spa and bathing facilities by only requiring those automated controls be a humidistat the original proposal was to be little to no additional cost as automated control is already required.

Board member and staff discussion

Mike Goodrich spoke as a member of the code committee and as a homebuilder in supportive of the code proposal. He said that the Construction Claims Task Force worked hard in the past to insure that Oregon's homes were properly vented from moisture in kitchens and bathrooms. Mr. Goodrich said that this potentially large source of interior moisture should not ignored.

Bruce Dobbs noted that there is merit to the proposal but felt more work needs to be done before approval. He noted that there would not be heat recovery ventilation in most older homes. Outside air would be either be brought in by leaky windows and under doors that would cause other condensation issues. He added that there is no interlock within the system, which would cause the system to constantly run or not to run at all.

Vice-chair David DeHarpport said that he was a member of the Construction Claims Task Force and said that this issue with moisture control appliances did not get reviewed or approved. He also stated that at the National level the

International Code Council did not look at any moisture proposals related to appliances.

Manager Huntington advised the board of options of further working with the proponent for preparation of this upcoming adoption or for the mid-cycle code amendment process.

Motion by Vice-chair DeHarpport to disapprove Section G 2445.8 Moisture Control ORSC 11-30.

Roll call vote taken
Aye: Jon Mills, Douglas Lethin, Larry Hultberg, Bruce Dobbs, Peter Bride, VC DeHarpport and Chair Miller
Nay: Kathryn Gray, Mike Goodrich and Scott Caufield
Motion carried

VII.A.5. and 6.
Manager Huntington explained that the discussion will be related to the code committee's recommendation to delete from Model Code Section R 313 and to adopt Appendix S and T. (submitted testimony documents)

5. **Board review and provide recommendations for proposed BCD-11, revisions to 2011 Oregon Residential Specialty Code Appendix S, Local Residential Sprinkler Ordinance**
6. **Board review and provide recommendations for proposed change BCD-12, revisions to 2011 Oregon Residential Specialty Code Appendix T, Alternate Standard for the Installation of Dwelling Unit Fire Sprinkler**

Administrator Patrick Allen reviewed the history of the fire sprinkler appendix during the last code cycle. Instead of the Appendix being put into Oregon code, a report was issued by the division for local jurisdictions to adopt a Fire Sprinkler Ordinance. At the National level the Appendix was moved into the body of the code.

Public testimony
John Caul, Oregon State Fire Marshal's office, read a letter into the record from Eric McMullen, Building Codes Structures Board member, not supporting the recommendation from the committee to delete Section R 313.

Randy Simpson, Oregon State Fire Marshal, agrees with Eric McMullen's testimony letter and urges the board to strike the proposed limitation on System Development Charge's (SDC) from Appendix S.

Chris Vick, League of Oregon Cities, opposes the SDC provision found in Appendix S. He said the particular provision would restrict the SDC's that water purveyors may assess for use of the larger water meters required to service the residential fire sprinkler systems in one and two-family dwellings and townhouses.

James Bela, President and founder of Earthquake Awareness, said that in the best interest of the consumer he is in favor of the proposed code changes.

Johnathan Balkema, Oregon Homebuilders Association, was in favor of the code committee's recommendations.

Sherry Patterson, Lakefield Fire District, is supporting the request for mandatory fire sprinklers in homes.

Mike Goodrich was a member of the code committee and reviewed there recommendation. The committee did not vote in favor of accepting the model code language that required mandatory statewide fire sprinklers in residential homes but did agree to a trade-off. The agreement was that the additional SDC from having a larger water meter was not to be charged to the homebuilder or to the buyer.

Lunch break (Peter Bride and Douglas Lethin was not present at 1:07 pm when the board reconvened from lunch break)

(Douglas Lethin and Peter Bride returned from lunch break prior to the vote)

Motion by Mike Goodrich to disapprove Section R 313.

Roll call vote taken
Yea: Jon Mills, Douglas Lethin, Larry Hultberg, Kathryn Gray, Mike Goodrich, Bruce Dobbs, Scott Caufield, Peter Bride, VC DeHarpport and Chair Miller
Nay: None
Motion carried unanimously

Motion by Scott Caufield to approve Appendix S as recommended by the code committee and further modified by BCD code change proposal 11 with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Yea: Douglas Lethin, Kathryn Gray, Bruce Dobbs, Scott Caufield and Chair Miller

Nay: Jon Mills, Larry Hultberg, Mike Goodrich, Peter Bride and VC DeHarpport
Due to the vote being tied, motion fails

Motion by Mike Goodrich to approve Appendix T as recommended by the code committee and further modified by BCD code change proposal 12 with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Roll call vote taken
Yea: Jon Mills, Douglas Lethin, Larry Hultberg, Kathryn Gray, Mike Goodrich, Bruce Dobbs, Scott Caufield, Peter Bride, VC DeHarpport and Chair Miller
Nay: None
Motion carried unanimously

VII.A. Board review and provide recommendations for adoption of the 2011 Oregon Residential Specialty Code
It was decided to review the code chapter by chapter.

Chapter 1 Scope and Administration
Motion by Mike Goodrich to approve Chapter 1 as recommended by the code change committee.
Motion carried unanimously

Chapter 2 Definitions
Motion by Scott Caufield to approve Chapter 2 as recommended by the code change committee.
Motion carried unanimously

A.1. Board review and provide recommendations for proposed code change BCD-6, additional amendments adoption Section 315.1 of the 2011 Oregon Residential Specialty Code – Carbon Monoxide Alarms
Richard Rogers, structural program chief, explained that due to the passage of House Bill 3450 carbon monoxide alarms will now be required in all newly constructed Group R Occupancies as identified in Section 315 of the Oregon Structural Specialty Code.

Kathryn Gray left the meeting at 1:45 p.m.

Motion by Scott Caufield to approve Section 315.1 as recommended by the code committee and further modified by BCD code change proposal BCD-06 with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Motion carried unanimously

VII.B. Board review and provide recommendations for proposed supplemental code change for new Section R326 in the 2008 Oregon Residential Specialty Code – Carbon Monoxide Alarms

Motion by Scott Caufield to approve R326 in the 2008 Oregon Residential Specialty Code as recommended by the code committee and further modified by BCD with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

VII.A. *Chapter 3 Building Planning*
Motion by Mike Goodrich to approve Chapter 3 as recommended by the code change committee and further modified by BCD code change proposal BCD-06 with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.

Douglas Lethin said that under R317.3 Fasteners, z-max hangers, zinc-coated hangers may be creating failure and a committee should look into it.

Roll call vote taken
Yea: Jon Mills, Larry Hultberg, Mike Goodrich, Bruce Dobbs, Scott Caufield, Peter Bride, VC DeHarpport and Chair Miller
Nay: Douglas Lethin
Motion carried

Chapter 4 Foundations
Motion by Scott Caufield to approve Chapter 4 as recommended by the code change committee
Motion carried unanimously

Chapter 5 Floors
Motion by Mike Goodrich to approve Chapter 5 as recommended by the code change committee.
Motion carried unanimously

Chapter 6 Wall Construction
Motion by Bruce Dobbs to approve Chapter 1 as recommended by the code change committee.

Chapter 7 Wall Covering
Motion by Mike Goodrich to approve Chapter 7 as recommended by the code change committee.
Motion carried unanimously

Chapter 8 Roof-Ceiling Construction
Motion by VC DeHarpport to approve Chapter 8 as recommended by the code change committee.
Motion carried unanimously

Chapter 9 Roof Assemblies
Motion by Scott Caufield to approve Chapter 9 as recommended by the code change committee.
Motion carried unanimously

Chapter 10 Chimneys and Fireplaces
Motion by Mike Goodrich to approve Chapter 10 as recommended by the code change committee.
Motion carried unanimously

A.2. Board review and provide recommendations for proposed code change BCD-19, revisions to 2011 Oregon Residential Specialty Code Chapter 11 Energy Efficiency
Assistant Manager Shane Sumption distributed a memo that provides necessary clarification for the application of Table N1101.1(2)

Motion by Scott Caufield to approve Chapter 11 Energy Efficiency as recommended by the code change committee and further modified by BCD code change proposal BCD-19 and modifications to N1101.1 General with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

VII.A. *Chapter 12-24 Mechanical Chapters* (Action previous taken on unvented room heaters in Chapter 24)

Motion by Mike Goodrich to approve Chapters 12-24 as recommended by the code change committee and to approve the further modifications to Chapter 24 with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

app: _____

A.3. Board review and provide recommendations for Oregon amendment relative to radon gas mitigation standards required by SB 1025 (2010), for inclusion in the 2011 Oregon Residential Specialty Code and amending the 2008 Residential Specialty Code *(submitted testimony documents)*

Richard Rogers, structural program chief, explained that 2 separate actions are required:

1. Approve a code change adopting radon mitigation standards amending the 2011 edition of the ORSC for public hearing with an effective date of July 1, 2011
2. Approve a code change adopting radon mitigation standards amending the 2008 edition of the ORSC for public hearing with an effective date of April 1, 2011

Mr. Rogers further explained that the board must choose between the 2 exhibits, Exhibit A (submitted by the Building Codes) or Exhibit B (submitted by Oregon Home Builders Association, submitted housekeeping modifications) (document showing differences between Exhibit A and Exhibit B prepared by Oregon Home Builders Association)

Motion by Mike Goodrich to approve Exhibit B as modified to the 2011 ORSC adopting a standard for the mitigation of radon and send to public hearing, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

Motion by Mike Goodrich to approve Exhibit B as modified to the 2008 ORSC adopting a standard for the mitigation of radon with applicability to initial building permits issued on or after April 1, 2011 and send to public hearing, with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

VII.A. *Appendix E, G, H, K, R*

Motion by Scott Caufield to approve the continuous use of Appendix E, G, H, K and R.
Motion carried unanimously

Motion by Scott Caufield to approve the committee's code change recommendations as modified to adopt the residential structural and mechanical provisions of the proposed 2011 ORSC for public hearing and

subsequent adoption with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

A.4. Board review and provide recommendations for proposed code change to Appendix N new Section AN115 Radon (Late submission submitted)
Amended item distributed with additions.

Motion by Peter Bride approve the proposed code change Appendix N new Section AN115 as recommended by the code change committee and to approve the further modifications adding new Section AN103.6 to Appendix N addressing carbon monoxide alarms with an effective date of April 1, 2011 and approving Radon Control Methods R-2 and R-3 Occupancies as proposed and send to public hearing with the finding that the added cost, if any, is necessary to the health and safety of the occupants or the public or necessary to conserve scarce resources.
Motion carried unanimously

VIII. Announcements – None

IX. Adjournment

Chair Miller adjourned the board meeting at
Respectfully submitted by,
Debi Barnes, Division Boards Coordinator

VERMONT

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2012

FIRE & BUILDING SAFETY CODE

STATE OF VERMONT
FIRE
MARSHAL
ACADEMY
HAZ-MAT
DIVISION OF FIRE SAFETY

VERMONT DEPARTMENT OF PUBLIC SAFETY

DIVISION OF FIRE SAFETY

OFFICE OF THE STATE FIRE MARSHAL, STATE FIRE ACADEMY and THE STATE HAZ-MAT TEAM

www.firesafety.vermont.gov

EFFECTIVE DATE ~ November 5, 2012

2012 Vermont Fire & Building Safety Code
Introduction

Since 1972 the State of Vermont has adopted nationally recognized safety standards to protect the public from fire and explosion hazards and establish standards for fire safety. Standards for boiler safety have been in place even longer. Vermont is able to benefit from the research and fire safety experience from experts across the nation in every area of expertise by using nationally recognized safety standards in this *Code*. The national standards are amended only when necessary to address conditions specific to Vermont, stay within the limits set by law or to clarify interpretations of certain sections.

The *2012 Vermont Fire & Building Safety Code* establishes the process to obtain a construction or operating permit lists the codes and standards that are adopted and describes the process used to evaluate and grant a variance or exemption from the *Code.* The annexes to this *Code* are designed to help people understand the state laws related to fire, explosion, hazardous materials, structural safety and carbon monoxide, and enable people to understand and take advantage of the flexibility built into this *Code* for historic buildings.

This *Code* establishes separate minimum standards for new and existing buildings, and existing buildings that are used for a new purpose. This *Code* recognizes the need to protect the public when the use of a building changes putting more people at risk or introducing new hazards to a building. But, this *Code* is also written to facilitate the adaptive reuse of buildings recognizing certain limitations of existing buildings. This *Code* has less restrictive requirements for low risk occupancies and promotes the use of alternative solutions for safety.

The *Life Safety Code (NFPA 101)* is the most widely used standard adopted under this *Code* and applies to all buildings and premises regulated under this *Code.* The *Life Safety Code* regulates construction, fire protection and occupancy features necessary to minimize danger to life from fire and to allow escape from fire and non-fire emergencies.

The *Fire Code (NFPA 1)* applies to new and existing conditions including general fire safety provisions, fire protection including sprinkler systems, fire department access to buildings and special material and process fire hazards. The *Fire Code* functions as a guide to determine what other specialty codes and state amendments apply to a building, premise, or condition.

The *International Building Code (IBC)* applies to new construction and structural requirements. It is used to determine the allowable size of new construction, structural design features such as the snow load, and to ensure compliance with the performance requirements of other adopted standards.

The *National Board Inspection Code (NBIC)* is focused on the installation, maintenance and inspection of boilers and pressure vessels. The American Society of Mechanical Engineers (ASME) standards referenced in section 6 (c) regulates the design and manufacture of boilers and pressure vessels. Prior to the 2005 Vermont Fire & Building Safety Code there had been a separate set of rules for boilers and pressure vessels. By combining the boiler rules with the fire prevention rules there will be a simplified administrative process and better coordination for inspections regarding heating systems.

Information on how to contact the Division of Fire Safety and obtain copies of the adopted codes is in Annex V at the end of this *Code.*

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Section 1 — Title, Intent and Authority

(a) These rules are adopted under 20 V.S.A. Chapter 173, Subchapter 2 "Fire Safety Division", Subchapter 3 "Fire Hazards and Dangerous Substances", Subchapter 5 "Boilers and Pressure Vessels" and Chapter 177 "Explosives and Fireworks", and shall be known and cited as the Vermont Fire & Building Safety Code - 2012. It is the intent of these rules to provide for the public safety as directed by these sections of the law. (see Annex I for Public Building definition)

(b) This *Code* shall be administered and enforced by the Commissioner of Public Safety and staff members of the Division of Fire Safety that are hereby designated to enforce this *Code* and utilize discretionary authority regarding the details of the application of this *Code.* Hereafter the Commissioner, or designated representative, or in the case of a cooperative municipal inspection agreement, the approved inspector(s), are designated as the **Authority Having Jurisdiction** (AHJ). For the purpose of NFPA sections 1:1.13, Certificates of Fitness, and 1:20.12.3 & 101:37.7.5, Smoke Alarm & Carbon Monoxide Alarm – Consumer Information, the Commissioner and staff members of the Division of Fire Safety are designated as the AHJ.

(c) The AHJ may establish priorities for enforcing these rules and standards based on the relative risk to people and property.

(d) These rules apply to "public buildings" as defined by 20 V.S.A Chapter 173.

(Note: See Annex 1 for the definition of "public buildings" from 20 V.S.A. Chapter 173. Note that most owner-occupied single family residences are exempt from the definition of public buildings and are thus not included in the scope of this code; see definition of "public buildings" for exceptions).

Section 2 — Adoption of Nationally Recognized Standards

The following nationally recognized safety standards, as amended herein, are adopted for the purpose of making rules regarding the safeguarding of people and property in case of fire, explosion, hazardous materials, dangerous structural conditions and the generation of carbon monoxide.

LIFE SAFETY CODE – NFPA 101 – 2012
FIRE CODE – NFPA 1 – 2012
INTERNATIONAL BUILDING CODE – IBC - 2012
NATIONAL BOARD OF INSPECTION CODE (NBIC) 2004

This *Code* has been designed to minimize any conflict or difference between adopted codes and standards. Where there is a conflict between the codes or codes & standards the Life Safety Code (NFPA 101) or Fire Code (NFPA 1) shall apply. Where one code or standard has a requirement and another code or standard does not have a requirement the code or standard with a requirement shall apply.

The provisions of this code shall apply to the construction, alteration, relocation, enlargement, replacement, repair, equipment, use and occupancy, location, maintenance, removal and demolition of every public building or structure or any appurtenances connected or attached to such buildings or structures regulated under this code.

Matrix on next page shall be used to assist in designing construction projects.

Matrix of Vermont Fire and Building Codes by Project Type

New Construction	Major Rehabilitation, Modification, Reconstruction No Additions	Building Addition	Existing Building With Change of Use/Renovation
IBC & NFPA 1 & 101 apply. All IBC Chapters apply except Chapters; 8, 10, 11, 13, 27, 28, 29, 33 & 34 NFPA 101 Chapter 1 thru 11 and New Occupancy chapter apply, and all chapters of NFPA 1 as applicable • Purpose of IBC is to safeguard public health, safety and general welfare • Purpose of NFPA 1 & 101 is to provide an environment reasonably safe from fire	IBC used for structural requirements only Refer to NFPA 101 Chapter 43 for Building rehabilitation NFPA 1 applies Refer to NFPA 220 for type of construction (NFPA 101 page 386)	IBC applies to new construction and 3401.1 height & area Refer to NFPA 101 Chapter 43 for Building rehabilitation NFPA 1 applies Refer to NFPA 220 for type of construction (NFPA 101 page 386)	IBC used for structural requirements only Refer to NFPA 101 Chapter 43 for Building rehabilitation NFPA 1 applies Existing NFPA 101 chapter applies to existing building section not being altered 1- Determine occupancy use 2- Refer to NFPA 220 for type of construction

1- Always determine occupancy type first
2- Include a code analysis with plan submittal for all new or large renovation projects
3- Vermont Fire & Building Code Amendments apply to all categories above
4- Vermont Access Rules and 2010 ADA Standards for Accessible Design applies to all categories
5- Vermont Electrical, Plumbing, Elevator and Energy Rules applies to all categories
6- NFPA 1 applies to all categories, in addition to referenced standards in IBC, NFPA 1 & 101
7- When a conflict between codes is identified, NFPA governs for all categories, or where one code or standard has a requirement and another code or standard does not have a requirement the code or standard with a requirement shall apply.

[Updated October 2, 2012]

-delete & replace in part- section 101:2.2 **National Electrical Code & Residential Electrical Safety Code**: Any reference to NFPA 70 and 73 in this *Code* shall be to the edition adopted by the Vermont Electricians Licensing Board. The temperature and flame exposure ratings, resistance to the spread of fire, or flame spread, and the fire-resistant characteristics preventing the carrying of fire from floor to floor, shall be in accordance with the National Electrical Code as published.

-delete & replace in part - section 101:2.2 Reference Publications: Any reference to NFPA 5000, Building Construction and Safety Code, 2012 Edition, shall be to the **International Building Code**, 2012 edition, as amended in this *code.*

-delete & replace in part- section 101:2.3.4 Safety Code for **Elevators**: Any reference to ASME 17.1 or 17.3 in this *Code* shall be to the edition adopted by Vermont Elevator Safety Review Board.

-delete & replace- section 101:3.3.188.7 Definition of **Health Care Occupancy**: An occupancy used for purposes of medical or other treatment or care of three or more persons where such occupants are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupant's control.

-delete & replace- section 101:3.3.188.12 Definition of **Residential Board & Care Occupancy**: A building or portion thereof that is used for lodging or boarding of three or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services.

-add- section 101:4.6.4.2.1 **Historic Buildings**: NFPA 914, Code for Fire Protection of Historic Structures, 2010 edition, provides guidance to the AHJ in exercising the discretionary authority granted in section 4.6.2.2.

-add- section 101:7.1.10.1.1 Clearance for **Inclined Lifts on Stairways**: Where a platform or chair lift is installed on an exit stair in an existing building the minimum clear width on the stair when the inclined lift is in the down position shall be

- 18" when the stair serves fewer than 10 people
- 22" where the stair serves fewer than 50 people
- as required by this *Code* when the stair serves 50 or more people

Where a platform or chair lift is installed on an exit stair in a new building the minimum clear width on the stair when the inclined lift is in the down position shall be as required by this *Code.*

-delete & replace- section 101:7.2.2.4.4.5 **Handrail Clearance:** New handrails shall be installed to provide a clearance of not less than 1 ½" nor more than 2 ¼" between the handrail and the wall to which it is fastened.

-delete- section 7.2.2.5.5.4 Perimeter Demarcation Marking

-delete & replace- section 101:7.2.2.6.5 **Outside Stairs, Accumulation of Snow, Ice or Water**: New outside stairs and landings, other than the primary entrance, shall be designed to minimize the accumulation of snow, ice and water by a roof or other approved means. [*cross reference to 1:14.4.1.*]

-add- section 101:7.12.3 **Boiler Room Exits**: Two means of egress shall be provided for boiler rooms exceeding 500 sq. ft. floor area and containing one or more boilers having a fuel capacity of 1,000,000 BTU/HR or more. Each elevation shall be provided with at least two means of egress, each to be remotely located from the other. A platform at the top of a single boiler is not considered an elevation. [*reference NBIC I-2341*]

[Commentary: *Vermont amendments to NFPA 54, Fuel Gas Code, and NFPA 58, LP Gas Code, are found in NFPA 1:11.5 and 1:69*]

-delete & replace- section 101:9.1.2 **Electrical Systems**: All electrical wiring and equipment shall installed and maintained in accordance with NFPA 70, National Electrical Code and NFPA 73, Residential Safety Code, as adopted by the Electricians' Licensing Board. The temperature and flame exposure ratings, resistance to the spread of fire, or flame spread, and the fire-resistant characteristics preventing the carrying of fire from floor to floor, shall be in accordance with the National Electrical Code as published.

-add- section 101:9.2.3.1 **Isolated Cooking Operations**: The requirements for the hood, grease removal devices, duct and fixed fire extinguishing system may be modified by the AHJ for cooking operations in free standing tents, mobile units or other small buildings located greater than 30' from grandstands or other public buildings and occupied by employees only, when the clearance to combustibles, safety controls, portable fire extinguishers, staff training, fuel use, storage and shut-off of fuel, and electrical shut off for equipment are in compliance with this *Code.*

-add- section 101:9.6.1.9 **Fire Alarm Circuit Classification:** All newly installed fire alarm systems in healthcare, detention & correctional, residential board & care occupancies, assembly occupancies with more than 300 people, and all high rise buildings, shall be electrically wired as a Class A system.

-delete & replace- section 101:9.6.2.10.2.1 **Power for Smoke Alarms**: All newly installed (including replacement) smoke alarms in one & two family dwellings, multiple unit dwellings, lodging or rooming houses, hotels and dormitories shall be directly wired to a non-dedicated electrical branch circuit for the building and by battery.

-add- section 101:9.6.2.12 **Photoelectric Smoke Alarms:** All newly installed smoke alarms in dwelling units, lodging or rooming houses, hotels and dormitories, shall be the photoelectric-only-type.

-add- section 101:9.6.4.2.1 **Telecommunication Marking**: Where Emergency Force Notification is provided the fire alarm control panel and the demarcation point for all fire alarm systems shall be marked as to the method of emergency forces to assist in the periodic inspection of the fire alarm. The sticker/tag shall be adhered or tie rapped at the demarcation point, and shall include the following; Plain Old Telephone Service (POTS Numbers), Internet Protocol (IP), Radio/Master Box Number, Private Radio, Cellular Units or Managed Facilities Voice Network (MFVN).

-add- section 101:9.6.4.4 Single Line DACT: A **Digital Alarm Communicator Transmitter (DACT)** utilizing a single line, without a secondary transmission means as required by NFPA 72:26.6.3.2.1.4, shall be permitted where a fire alarm system is not required to provide emergency forces notification under this *Code when no other means is available. A secondary transmission means, ONLY when available, to be provided by any means available 72:29.6.3.2.1.4(A).*

[Commentary: *Vermont amendments to NFPA 13, 13D, 13R and 25 are found in NFPA 1:13.3*]

-add- section 101:9.7.2.2.1 **Outside Bell and an Inside Bell in Apartment and Condo Occupancies,** All buildings shall be protected throughout by an approved, supervised automatic sprinkler system installed in accordance with Section 30.3.5.2. In buildings with 11 or fewer dwelling units, an interior and exterior bell shall be accepted as supervision.

-delete & replace- section 101:9.7.4.1 **Portable Fire Extinguishers**: Portable fire extinguishers shall be located, installed, inspected and maintained in accordance with NFPA 1 section 13.6.

-delete & replace 9.8 **Carbon Monoxide Detection**: Where required by another section of this *Code* carbon monoxide alarms (detectors) shall be installed in accordance with NFPA 720, Standard for the Installation of Carbon Monoxide Warning (CO) Equipment in Dwelling Units, 2012 edition. NFPA 720 covers the selection, application, installation, location, testing and maintenance of carbon monoxide warning equipment in all buildings in which people sleep.

-add- section 101:9.8.1 **Power for Carbon Monoxide Alarms**: All newly installed carbon monoxide alarms (detectors) in multiple unit dwellings, lodging or rooming houses, hotels and dormitories, or other buildings in which people sleep, shall be directly wired to a non-dedicated electrical branch circuit for the building and by battery. Carbon monoxide detectors in one-two family dwellings that existed on October 22, 2005, shall be permitted to be powered by any approved source. (9 VSA Chapter 77)

-add- section 101:9.8.2 **Testing for Carbon Monoxide Alarms** (Detectors): All carbon monoxide alarms (detectors) shall have functional tests conducted in accordance with the manufacturer's instructions initially when installed and annually thereafter. The requirements for monthly testing in accordance with NFPA 720 shall also apply and may be accomplished by the owner or tenant.

-add- section 101:9.8.3 **Carbon Monoxide Alarms for Through the Wall Vent Termination:** In buildings other than where people sleep, carbon monoxide alarms shall be installed in areas adjacent to, but not outside of the distance established in the manufacturer's instructions, for all fuel fired heating appliances vented through the wall and terminating less than 7 feet above ground level.

[Commentary: *Carbon Monoxide alarms (detectors) installed in accordance with the manufacturer's instructions in one-two family dwellings are considered in compliance with the requirements for audibility under NFPA 72 and 720. Carbon Monoxide alarms (detectors) installed in accordance with the manufacturer's instructions are also considered in compliance with the requirements for audibility under NFPA 72 and 720 for apartments when the design of the apartment unit is consistent with a single family dwelling unit, however, where Carbon Monoxide alarms (detectors) are located remote from the bedroom area, or where doors have been designed to keep out noise, the audibility of Carbon Monoxide alarms (detectors) may not meet the requirements established under section 6.4.4 & 6.5.1 of NFPA 720.] The audibility standard may also be difficult to meet in lodging & rooming facility or a hotel or dormitory where doors are designed to keep out noise. Where additional sound is needed the sound level can be increased by decreasing the spacing of Carbon Monoxide alarms (detectors) or by placing Carbon*

Monoxide alarms (detectors) in each bedroom. Where Carbon Monoxide alarms (detectors) are installed in each bedroom Carbon Monoxide alarms (detectors) are not required in the corridor or common area.]

-add- 101:9.8.4 **Carbon Monoxide/Fire Alarm Interconnection**). Where desired carbon monoxide alarms may be integrated into the fire alarm system control panel. Notification appliances installed as part of the fire alarm system may be used for CO alarm detection notification of the building occupants when the notification appliances have been installed in compliance with the appropriate sections of NFPA-72. Requirements do not apply to single-station or multi-station Carbon Monoxide Alarm devices.

-add- section 101:13.1.1.4.1 Change of Ownership: A **place of assembly that changes ownership,** or increases the occupant load, shall not be occupied or used until a permit for use and occupancy has been issued by the authority having jurisdiction.

-delete & replace- section 101:14.7.2.3(1) **Emergency Egress and Relocation Drills**: Not less than one emergency egress and relocation drill, in accordance with the school's emergency preparedness plan, shall be conducted every month the facility is in session.

-delete & replace- section 101:15.2.1.2 **Student Occupied Space**: Rooms normally occupied by preschool, kindergarten or first grade students shall be located on a level of exit discharge, unless otherwise permitted by 15.2.1.4. Rooms with 4 or fewer students, where the ratio of students to teachers or aides does not exceed 2:1 at any time, are not considered normally occupied by students in regards to this section.

-delete & replace- section 101:15.7.2.3(1) **Emergency Egress and Relocation Drills**: Not less than one emergency egress and relocation drill, in accordance with the school's emergency preparedness plan, shall be conducted every month the facility is in session.

-delete & replace – section 101:16.6.3.4.4 **Carbon Monoxide Detection in New Daycare**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in the immediate vicinity of each separate sleeping area.

-delete & replace – section 101:17.6.3.4.5 **Carbon Monoxide Detection in Existing Daycare**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in the immediate vicinity of each separate sleeping area.

-delete- sections 101:18.1.1.4.3.3 and 101:18.1.1.4.3.4 Alternative Provisions for Fire Sprinkler System during Rehabilitation Work in new Health Care Occupancies.

-add – section 101:18.3.4.6 **Carbon Monoxide Detection in New Health Care**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in each nursing station. [*Location of Carbon Monoxide alarms (detectors) at each nursing station enables staff to monitor any level of Carbon Monoxide and to take appropriate action prior to an alarm condition*]

-add – section 101:19.3.4.6 **Carbon Monoxide Detection in Existing Health Care**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in each nursing station. [*Location of Carbon Monoxide alarms (detectors) at each nursing station enables staff to monitor any level of Carbon Monoxide and to take appropriate action prior to an alarm condition*]

-delete & replace- sections 101:19.3.5.1 & 19.3.5.3 **Existing Health Care**: Existing health care facilities shall be protected throughout by an approved supervised automatic fire sprinkler system installed in accordance with section 9.7.

-add – section 101:22.3.4.5 **Carbon Monoxide Detection in New Detention and Correctional Facilities**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in control rooms used by the facility.
-delete- section 101:22.4.4 Renovations for Existing Non-sprinklered Detention and Correctional Facilities

-delete & replace- section 101:22.4.5.1.1 **Capacity of New Lockups**: Lockups in occupancies, other than detention and correctional and health care occupancies, where the holding area has capacity for more than 3 detainees shall be classified as detention and correctional occupancies and shall comply with chapter 22.

-delete & replace- section 101:22.4.5.1.3 **Requirements for New Lockups**: Lockups in occupancies, other than detention and correctional and health care occupancies, where the holding area has capacity for not more than 3 detainees, and where no individual is detained for 24 hours or more, shall comply with 22.4.5.1.4 and 22.4.5.2.

-add – section 101:23.3.4.5 **Carbon Monoxide Detection in Existing Detention and Correctional Facilities**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in control rooms used by the facility.

-delete and replace- section 101:23.3.5.2 **Existing Detention & Correctional**: Existing detention & correctional facilities classified as Use Condition II, III, IV or V shall be protected throughout by an approved supervised automatic fire sprinkler system installed in accordance with section 9.7.

-delete & replace- section 101:23.4.5.1.1 **Capacity of Existing Lockups**: Lockups in occupancies, other than detection and correctional and health care occupancies, where the holding area has capacity for more than 3 detainees shall be classified as detention and correctional occupancies and shall comply with chapter 23.

-delete & replace- section 101:23.4.5.1.3 **Requirements for Existing Lockups**: Lockups in occupancies, other than detention and correctional and health care occupancies, where the holding area has capacity for not more than 3 detainees, and where no individual is detained for 24 hours or more, shall comply with 23.4.5.1.4 and 23.4.5.2.

-add- section 101:24.1.1.1.1 **One & Two Family Dwellings used for Transient Lodging:** A building that provides sleeping accommodations for a total of more than 6 people on a transient basis shall be classified as a lodging or rooming house or a hotel or dormitory under this code.

-add- section 101:24.2.2.3.3.1 **Existing Means of Escape**: The clear opening of an existing means of escape (***escape window***) under 24.2.2.3.3 shall be permitted to be not less than 5.0 square feet.

-add- section 101:24.2.5.7 **Stair riser heights and tread depths**: Maximum riser heights of 7 ¾ in. and minimum tread depths of 10 in. shall be permitted in new construction.

-delete- 101:24.3.4.1.3 smoke alarms powered by batteries

-add – section 101:24.3.4.4 **Carbon Monoxide Detection, One-Two Family Dwellings**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 outside of each separate sleeping area in the immediate vicinity of the bedrooms. An additional carbon monoxide alarm (detector) shall be installed in any sleeping room that contains a fuel-burning appliance.

-delete- section 101:24.3.5.1 **Fire Sprinkler Protection for One and Two Family Dwellings**.

[Commentary: ***Manufactured housing*** *that is built on a chassis to conform to the Housing and Urban Development (HUD) Standard is preempted by that federal standard and not subject to additional requirements under this Code except for smoke alarm and carbon monoxide alarm requirements. Manufactured housing built to the HUD standard has an identification plate.*

Smoke alarms installed in accordance with NFPA 501:5.9 are required to be photoelectric only in accordance with Title 9 V.S.A. Chapter 77 and this code. An owner may contact the U.S. Department of Housing and Urban Development (HUD) in Washington, D.C. at 1-800-927-2891 or the Consumer Assistance Program of the Vermont Office of Attorney General at 1-800-649-2424 for additional information regarding construction requirements.]

-delete & replace- section 101:24.5.1.2 **Unvented Fuel-fired Heaters**: Unvented room heaters and unvented fireplaces shall not be used.

-add- section 101:24.6 **Subdivision of Building Spaces in One-Two Family Dwellings**: New one-two family dwellings shall be provided with dwelling unit separation in accordance with 30.3.7.

-add- section 101:26.1.1.1.1 **Small Lodging & Rooming Houses**: A building that provides sleeping accommodations for a total of 6 or fewer persons, and is occupied by the proprietor, may be classified as a one and two family dwelling by the AHJ.

-delete & replace -add – section 101:26.3.4.6 **Carbon Monoxide Detection, Lodging & Rooming**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 outside of each separate sleeping area in the immediate vicinity of the bedrooms. An additional carbon monoxide alarm (detector) shall be installed in any bedroom that contains a fuel-burning appliance.

-delete- section 101:26.3.6.2 **Exception for Automatic Sprinkler**: Protection for New Lodging & Rooming Houses with Direct Access.

-delete & replace- section 101:26.5.2.2 **Unvented Fuel-fired Heaters**: Unvented room heaters and unvented fireplaces shall not be used.

-delete & replace-add – section 101:28.3.4.6 **Carbon Monoxide Detection in New Hotels & Dormitories**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in any section of corridor or common area that is in the immediate vicinity of sleeping rooms, or where there is no corridor, in each sleeping room. An additional carbon monoxide alarm (detector) shall be installed in any sleeping room that contains a fuel-burning appliance.

-delete - section 101:28.3.5.2 **Exception for Automatic Sprinkler:** Protection for New Hotels & Dormitories with Direct Access.

add- section 101:29.3.4.4 **Detection for Existing Hotels & Dormitories**: A corridor smoke detection system in accordance with section 9.6 shall be installed in existing hotels & dormitories other than those protected throughout by an approved supervised automatic sprinkler system in accordance with section 9.7.

-add – section 101:29.3.4.6 **Carbon Monoxide Detection in Existing Hotels & Dormitories**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in any section of corridor or common area that is in the immediate vicinity of sleeping rooms, or where there is no corridor, in each sleeping room. An additional carbon monoxide alarm (detector) shall be installed in any sleeping room that contains a fuel-burning appliance.

.-delete & replace– section 101:30.3.4.6 **Carbon Monoxide Detection, New Apartment Buildings**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 outside of each separate sleeping area in the immediate vicinity of the bedrooms. An additional carbon monoxide alarm (detector) shall be installed in any bedroom that contains a fuel-burning appliance.

-delete and replace – section 30.3.5.1 **Sprinkler Protection New Apartment Buildings**: Sprinkler systems shall not be required where every dwelling unit provides one of the following: 1) Exit door opening directly to the street or yard at ground level; 2) Direct access to an outside stair that complies with 7.2.2 and serves a maximum of two units, both located on the same floor; 3) Direct access to an interior stair serving only that unit and separated from all other portions of the building by fire barriers having a 1-hour fire resistance rating with no openings therein.

-delete & replace- section 101:30.5.2.2 **Unvented Fuel-fired Heaters:** Unvented room heaters and unvented fireplaces shall not be used.

-delete & replace – section 101:31.3.4.5.2 **Smoke Alarms Existing Apartment Buildings**: All electrically wired smoke alarms shall be required to be provided with secondary power supply source. Interconnection of smoke alarms shall apply only to new construction. 9.6.2.10.1.3

-delete & replace- section 101:31.3.4.5.4 **Smoke Alarms Existing Apartment Buildings**: Smoke alarms required by 31.3.4.5.3 shall be installed in all sleeping rooms by 11/1/2015 at which time all smoke alarms must be electrically wired.

-add – section 101:31.3.4.6 **Carbon Monoxide Detection, Existing Apartment Buildings**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 outside of each separate sleeping area in the immediate vicinity of the bedrooms. An additional carbon monoxide alarm (detector) shall be installed in any bedroom that contains a fuel-burning appliance.

-delete & replace- section 101:31.5.2.2 **Unvented Fuel-fired Heaters:** Unvented room heaters and unvented fireplaces shall not be used.

-add- section 101:32.1.1.4 **Assisted Living Facilities**: In addition to the requirements of this chapter a facility licensed under the Department of Aging & Disabilities Rules for Assisted Living Residences shall comply with the following:

(1) All facilities shall be fully sheathed (15 min. fire rating) in addition to having complete automatic fire sprinkler protection.

(2) Emergency lighting shall be provided for the means of egress and in the vicinity of doors equipped with delayed egress locks.

(3) Small facilities shall have the minimum of 30-minute fire rated exit stair enclosures.

(4) Smoke detection must be provided in addition to the complete automatic fire sprinkler protection.

(5) The fire alarm system shall provide emergency forces notification.

(6) All automatic fire sprinkler systems shall be electronically supervised.

(7)Large assisted living facilities and assisted living residences located in apartment buildings shall meet the minimum construction requirements for existing health care occupancies in section 19.1.6.

(8) Corridors for large facilities shall not be less than 48".

(9) Subdivision of building spaces in accordance with 101:18.2.2.5 shall be provided in common areas of large facilities using the same criteria as used for limited care facilities (15 square feet per resident).

-add – section 101:32.1.1.4.1 **Carbon Monoxide Detection in New Residential Care**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in any section of a corridor or common area that is in the immediate vicinity of sleeping rooms.

-delete & replace- section 101:32.2.3.5.1 **New Residential Board & Care**: All new residential board & care facilities with 3 or more residents shall be protected throughout by an approved supervised automatic fire sprinkler system installed in accordance with section 9.7.

-delete- section 101:32.2.3.5.2 Exception for Sprinkler Protection for New Small Board and Care Facilities.

-add – section 101:33.1.1.4.1 **Carbon Monoxide Detection in Existing Residential Care**: Carbon Monoxide alarms (detectors) shall be installed in accordance with section 9.8.1 and 9.8.2 in any section of corridor or common area that is in the immediate vicinity of sleeping rooms.

-delete & replace- section 101:33.2.3.4.3.1 **Smoke Alarms in Sleeping Rooms in Existing Residential Care**: Approved smoke alarms shall be provided in each sleeping room in accordance with 9.6.2.9.

-delete- section 101:33.2.3.4.3.6 Exception for Smoke Alarms in Residential Care with Sprinkler Protection.

-delete- section 101:33.2.3.4.3.7 Exception for Smoke Alarms in Residential Care with Sprinkler Protection – Battery Operated.

-add- section 101:37.7.7 **Smoke Alarm & Carbon Monoxide Alarm – Consumer Information:** Information provided by the AHJ, on the type, placement and installation of smoke alarms and carbon monoxide alarms, shall be posted in the retail sales area where the alarms are sold.

-add- section 101:38.3.1.1(3) **Protection of Vertical Opening in New Small Business**: Unenclosed vertical openings shall be permitted to be unenclosed in two-story buildings when the travel distance does not exceed 75' and all areas opening to the exit access stairs are provided with smoke alarms in accordance with 9.6.2.9.

-add- section 101:39.3.1.1(4) **Exception for Protection of Vertical Openings for Existing Small Business**: Exit access stairs shall be permitted to be unenclosed in two-story buildings when the travel distance does not exceed 75' and all areas opening to the exit access stairs are provided with smoke alarms in accordance with 9.6.2.9.

-add- section 43.10.1.1 Existing Code Violations: **Historic buildings** not otherwise undergoing rehabilitation work shall be permitted to use alternative solutions to correct existing code violations based on sections 43.10.4.3 through 43.10.4.10.

-*delete*- section 1:1.8 Duties and Powers of the Incident Commander

-*delete & replace*- section 1:1.10 **Appeals**: Requests for variances, exemptions and reconsideration of the interpretation of this *Code*, shall be made and processed in accordance with Section 8 of this *Code*.

-*delete & replace*- section 1:1.13.1 **Certificate of Fitness**: A certificate of fitness is required for all individuals performing activities related to fire or life safety based on the qualifications as follows:

(1) Inspection, servicing or recharging of **Portable Fire Extinguishers** (Reserved)

(2) Design, installation, inspection, servicing or recharging of **Fixed Fire Extinguishing Systems –** A current certificate from the National Institute for Certificate in Engineering Technologies (NICET) for fire suppression; or from the National Association of Fire Equipment Distributors (NAFED) for Pre-Engineered Kitchen Fire Extinguishing System or Industrial Pre-Engineered Fire Extinguishing System. [*see section 8 for transition effective date*]

(3) **Inspection, and testing of fire alarm** and detection systems and equipment – A current master electrician, journeyman electrician or type S journeyman commercial fire alarm license, issued in accordance with Title 26 V.S.A. chapter 15. Eight hours of related instruction is required for certificate renewal for master and journeyman electricians, but not for type S journeyman commercial fire alarm license. [*72:10.4.2 is deleted and replace by this section*]

(4)(a) **Delivery of Liquid Propane (LP):** successful completion of the LP Gas Certified Employee Training Program (CETP) Book 1 (Basic Principles and Practices of Propane); Book 2.1/2.4 (Propane Delivery Operations and Cylinder Delivery) and Book 2.2 (Bobtail Delivery Operations).

4(b) **Plant Operations:** successful completion of CETP Book 1; 3.1 (Maintaining ASME Tanks); 3.2 (Maintaining DOT cylinders); 3.3 (Operating Dispensing Equipment to Fill Containers) and 3.4 Maintaining Bulk Equipment.

4(c) (reserved)
4(d) (reserved)
4(e) (reserved)

4(f)- **Installation, Inspection and Service of LP Gas Appliances:** successful completion of CETP books 1.0; 4.1; 4.2; 4.3; and either 4.4 or 7.0; or other approved course of instruction. Eight hours of related instruction is required for certificate renewal every three years, including at least two hours regarding the prevention of CO leakage and the procedure for safety inspection of an existing appliance (see NFPA 54- Annex G).

(Commentary: *The National Propane Gas Association is expected to update CETP Book 7 in 2013 and re-number as CETP Book 4.4.*)

4(g)- **Installation, Inspection and Service of both Natural Gas and LP Gas systems and equipment:** successful completion of the American Gas Association(AGA) course of study including "The Fundamentals of Combustion, Gas Appliance Venting, Electricity, Gas Controls, and Gas Appliances" and CETP Books 1.0, 4.1, 4.2. Eight hours of related instruction is required for certificate renewal every three years, including at least two hours regarding the prevention of CO leakage and the procedure for safety inspection of an existing appliance.(see NFPA 54- Annex G).

4(h)- **Installation, Inspection and Service of Natural Gas systems and equipment:** successful completion of the AGA course of study including "Fundamentals of Combustion, Gas Appliance Venting, Electricity, Gas Controls, and Gas Appliances; or other approved course of study. Eight hours of related instruction is required for certificate renewal every three years, including at least two hours regarding the prevention of CO leakage and the procedure for safety inspection of an existing appliance. (see NFPA 54- Annex G).

(4)(i) Installation, inspection and service of **Oil Burning Equipment** – A Silver or Gold certificate from the National Oil heat Research Alliance (NORA). Eight hours of related instruction is required for certificate renewal including at least two hours regarding the prevention of CO leakage and the procedure for inspection, or a current NORA Silver or Gold certificate.

(4)(j) LIMITED installation, inspection and service of **Oil Burning Equipment** not including placing a new unit in service – A Bronze certificate from the National Oil heat Research Alliance (NORA). Eight hours of related instruction is required for certificate renewal including at least two hours regarding the prevention of CO leakage and the procedure for inspection, or a current bronze certificate from NORA.

(5) Cleaning, maintenance and evaluation of **Chimneys and Solid Fuel Burning Appliances** – A current certificate from the Chimney Safety Institute of America.

(6) Installation, inspection or servicing of range hood systems - (Reserved)

(7) Installation or servicing of private fire service mains and their appurtenances – Reserved

(8) Crowd management required by the code – Reserved

(9) Utilization of pyrotechnics before a proximate audience – Reserved

(10) Installation, modification, or maintenance of liquefied petroleum gas or liquefied natural gas tanks or systems – See number 4 above

(11) Installation or modification of medical gas systems where a permit is required by Table 1.12.8(a) – Reserved

(12) Installation, modification, or maintenance of standpipe systems – See number 13 below

(13) **Installation, maintenance, repair and testing for water based fire protection systems** including but not limited to **fire sprinkler** systems regulated under NFPA 13, 13D and 13R, multipurpose piping systems, standpipe systems, aboveground fire mains and fire pumps – Completion of an approved fire sprinkler apprentice program or four years of documented supervised installation, maintenance, repair and testing experience and meeting the testing requirements established by the AHJ. Fifteen hours of related instruction is required for certificate renewal. **Calculations and design,** for water based fire protection systems including but not limited to **fire sprinkler** systems regulated under NFPA 13, 13D and 13R, multipurpose piping systems, standpipe systems, aboveground fire mains and fire pumps - A current level III certificate, or higher, for automatic fire sprinkler systems from NICET or a fire protection engineer license issued in accordance with Title 26 V.S.A. chapter 20. A person with a certificate of fitness under this section shall also be permitted to install, maintain, repair and test fire sprinkler and standpipe systems under section 1.13.1

(14) Installation, modification, or maintenance of **fire pumps** – See number 13 above

(15) Installation, modification, or maintenance of tanks, wells, or drafting points used for fire protection water supplies – Reserved

(16) LIMITED installation, maintenance, inspection and testing for **domestic fire sprinkler systems** with not more than 6 sprinklers for any isolated hazard area in accordance with 101:9.7.1.2 or an automatic fire sprinkler system in accordance with NFPA 13D, Standard for the Installation of Sprinkler Systems in One and Two Family Dwellings and Manufactured Homes, including multipurpose piping systems – Documented competency and experience acceptable to the AHJ. Eight hours of related instruction is required for certificate renewal. [*Information on the periodic inspection & tests of fire protection systems is found in NFPA 1 amended section 4.5.8 7*]

(17) Installation, maintenance, repair and testing for **emergency generators** – Documented competency and experience through training by the manufacturer or acceptable by the AHJ is required. Eight hours of related instruction is required for certificate renewal.

-delete & replace section 1:1.13.2 (1) Use of **Explosive materials** – A current explosive license issued in accordance with Title 20 V.S.A. 3072 by the Vermont State Police is required for the use of explosive materials in Vermont. [*For license applications or additional information contact the Department of Public Safety at (802) 244-8781 or* http://vsp.vermont.gov/about_us/divisions/bci/explosives_permit

(2) **Fireworks** displays – (Reserved)

-add- section 1:1.13.4.1 **Experience & Training**: The AHJ may accept successful completion of appropriate examination or certification other than those listed in this section when the examination or certification demonstrates an equivalent level of experience and training.

-add- section 1:1.13.8.1 Documentation for **Renewal**: An application for renewal shall include:

(1) Documentation of having completed the required hours of approved related instruction regarding this *Code* during the previous certificate period, or maintaining the required level of certification, and

(2) A completed and signed tax certification form in accordance with Title 32 V.S.A. 3113, and

(3) A completed and signed child support certification form in accordance with Title15 V.S.A. section 795, and

(4) A completed and signed unemployment compensation certification form in accordance with Title 21 V.S.A. 1378, and

(5) A completed and signed fine or penalty certification form in accordance with Title 4 V.S.A. 1110.

-add- section 1:1.13.8.2 **Approval of Related Instruction**: An individual or organization providing related instruction, as required for renewal of a certificate of fitness, shall provide information on the training provided as requested by the AHJ prior to approval of the related instruction. Individuals providing the instruction shall demonstrate competency to the AHJ in the codes and standards for which the certificate of fitness is issued and shall attend such training as required by the AHJ.

-add- section 1:1.13.12.4 **Due Process**: A person who has a certificate of fitness revoked or suspended shall be given written notification and the opportunity for a hearing following due process.

-add referenced standards- section 1:2.2 **Referenced Publications**: the following standards are added to section 2.2;

-delete- section 1:16.4.2 Penalty Schedule

NFPA 53, Recommended Practice on Materials, Equipment, and Systems in Oxygen-Enriched Atmospheres, 2011 Edition.
NFPA 73, Residential Safety Code, as adopted by the Vermont Electrician's Licensing Board.
NFPA 92A, Recommended Practice for Smoke Control Systems, 2009 edition.
NFPA 92B, Guide for Smoke Management Systems in Malls, Atria and Large Areas, 2009 edition.
NFPA 101A, A guide on Alternative Approaches to Life Safety, 2010 edition.
NFPA 291, Recommended Practice for Fire Flow Testing and Marking of Hydrants, 2010 Edition.
NFPA 720, Standard for the Installation of Carbon Monoxide Warning (CO) Equipment in Dwelling Units, 2012 edition.
NFPA 820 Standard for Fire Protection in Wastewater Treatment and Collection Facilities, 2012 edition.

-add- NFPA 1221, Standard for the Installation, Maintenance and Use of Emergency Services Communication Systems, 2010 edition.

-delete & replace in part - section 1:2.2 **Reference Publications**: Any reference to NFPA 5000, Building Construction and Safety Code, 2012 Edition, shall be to the International Building Code, 2012 edition, as amended in this *code*.

-delete & replace- section 1:3.3.182.11 Definition of **Health Care Occupancy**: An occupancy used for purposes of medical or other treatment or care of three or more persons where such occupants are mostly incapable of self-preservation due to age, physical or mental disability, or because of security measures not under the occupant's control.

-delete & replace- section 3.3.182.25.22 Definition of **Residential Board & Care Occupancy**: A building or portion thereof that is used for lodging or boarding of three (3) or more residents, not related by blood or marriage to the owners or operators, for the purpose of providing personal care services.

-add- section 1:4.5.2.1 **Historic Buildings**: NFPA 914, Code for Fire Protection of Historic Structures, 2010 edition, provides guidance to the AHJ in exercising the discretionary authority granted in section 4.5.2.

-add- section 1:4.5.7.3 Place of Assembly: A **place of assembly that changes ownership,** or increases the occupant load, shall not be occupied or used until a permit for use and occupancy has been issued by the authority having jurisdiction.

-delete & replace- section 1:4.5.8.7 **Periodic Inspection and Test of Fire Protection Systems:** Inspections and tests of fire sprinkler (other than multipurpose piping systems), suppression, emergency electrical generation, alarm, detection and any other fire protection systems, devices and equipment shall be conducted for the owner by a technically qualified person who has obtained the required certificate of fitness according to section 1.13. Inspections and tests shall be conducted at least annually and cover all intervals of testing frequency for the system. Annual testing by a technically qualified person does not relieve the owner of the responsibility of maintenance, inspection and testing at more frequent intervals as required by this code. A technically qualified person shall file a written inspection report with the AHJ within 14 days of completion of each inspection.

-add- section 1:4.5.8.8 **Identification of fire protection systems**: A fire protection system identification number, provided by the AHJ, shall be affixed to the control panel, control valve or riser of the fire protection system to provide a unique identification number for the fire protection system.

-add- section 1:4.5.8.9 **Proof of Inspection**: Proof of inspection, approved by the AHJ shall be affixed by a technically qualified person to the control panel, control

valve or riser of the fire protection system after any required inspection has been completed as evidence of that inspection.

The proof of inspection fee for fire suppression, alarm, detection and any other fire protection systems shall be as currently adopted.

-add- section 1:10.10.1.2 No Smoking label for small-size **Oxygen Cylinders**: All small-size oxygen cylinders shall be provided with a conspicuous no smoking precautionary label in the form of the international "no smoking" symbol, not less than 2" by 2" in size.

-delete & replace- Section 1:10.11.1 **Permits for Open Fires & Burning:** A permit is not required for an open fire where a permit has been obtained from the Town Forest Fire Warden in accordance with Title 10 V.S.A. chapter 83; 2645.

-add- section 1:10.12.4 **Truss Construction**: All buildings containing truss construction assemblies shall be provided with signage permanently affixed at a height 4 feet above the ground located at the left side of the main entrance door on the address side of the building, at the location of the remote fire alarm annunciation panel or at the fire department connection for the fire sprinkler system. The sign shall be triangular in shape measuring 12 inches horizontally and 6 inches vertically and of contrasting color to the background containing the letter "F" for the truss floor assemblies, the letter "R" for truss roof assemblies and "FR" for truss floor and roof assemblies.

-add- section 1:10.12.5 **Heating Vent Termination**: All through the wall vents for fuel fired heating appliances, located less than 7 feet above ground level, shall be provided with signage permanently affixed at a height of 7 feet above ground level directly above the through the wall vent. The sign shall be a "V" shape, not less than 4 ½ inches in height, with the principal stroke of the letter "V" not less than ¾ inch in width, colored black on a white background. The sign shall contain the wording "Heating Vent" using plainly legible letters.

-add- section 1:10.14.1.2 **Combustible Vegetation**: In other than Health Care, Detention and Correctional occupancies, combustible vegetation, including natural cut Christmas trees otherwise prohibited under table 10.14.1.1 shall be permitted when located in areas protected by an approved automatic fire sprinkler system.

-delete- section 1:10.15.11.1 Permits for Crop Mazes

-delete- section 1:10.17.1 Permits for Parade Floats

-delete & replace- section 1:11.1.2 **Electrical Systems**: All electrical wiring and equipment shall be installed and maintained in accordance with NFPA 70, National Electrical Code and NFPA 73, Residential Safety Code, as adopted by the Electricians' Licensing Board. The temperature and flame exposure ratings, resistance to the spread of fire, or flame spread, and the fire-resistant characteristics preventing the carrying of fire from floor to floor, shall be in accordance with the National Electrical Code as published.

[Commentary: *Information regarding natural fuel gas-section 11.4: The Department of Public Service regulates the transportation of natural and other* ***gas by pipeline.*** *For additional information contact the Vermont Department of Public Service at (802) 828-2811*]

-add- section 1:11.2.3 **Ash Disposal**: Where wood-burning stoves or fireplaces are installed, a metal receptacle with lid for disposal of ashes shall be provided. Written instructions shall be provided to instruct occupants on the importance of proper disposal of fireplace or woodstove ashes.

-add- section 1:11.4.3 **Application of NFPA 54**: Coverage of piping systems shall extend from the point of delivery to the appliance connections. For other than undiluted liquefied petroleum gas systems, the point of delivery shall be considered to be the outlet of the service meter assembly or the outlet of the service regulator or service shutoff valve where no meter is provided. For undiluted liquefied petroleum gas systems, the point of delivery shall be considered to be the outlet of the first stage pressure regulator.

-add- section 1:11.5.1.6.1 Interruption or **Discontinuance of Gas Service**: Whenever service to a customer is discontinued one of the following must be complied with:

(a) The valve that is closed to prevent the flow of gas to the customer must be provided with a locking device or other means designated to prevent the opening of the valve by persons other than those authorized by the operator.
(b) A mechanical device or fitting that will prevent the flow of gas must be installed in the service line or in the meter assembly.
(c) The customer's piping must be physically disconnected from the gas supply and the open pipe ends sealed. [*reference 54:4.2.1 & 4.2.2*]

-add- section 1:11.5.1.4.5 **Water Heater Installations:** Water heaters installed in bedrooms or bathrooms shall be of the direct vent type. [*54:10.28.1.1 is deleted & replaced by this subsection*]

-add- section 1:11.5.1.6.2 **Change in LP Gas Delivery Service:** The building owner, tenant, or responsible party shall obtain a safety inspection that meets or exceeds NFPA 54 annex H, for gas utilization equipment by person(s) certified in accordance with section 1.13, when new fuel delivery service is provided. [*reference 54:8.1.*]

-add- section 1:11.5.1.6.3 Room Heater Installations: **Unvented room heaters and unvented fireplaces** shall not be used in any building or structure regulated under this code. [*54:10.23.1 is deleted & replaced by this subsection. It is not the intent of this section to prohibit heaters defined under NFPA 54 section, 3.3.57.1, Industrial Air Heaters, Direct Gas-Fired Non-Recirculating, or 3.3.57.2, Industrial Air Heaters, Direct Gas-Fired Recirculating, used for large well ventilated areas.*]

-add- section 1:11.5.1.7.1 **Periodic Inspection of Heating Appliances**: All fuel fired heating appliances shall be cleaned and maintained in accordance with the manufacturer's instructions, and shall be inspected at least once during any 2 year period by person(s) certified in accordance with section 1.13. Inspections shall be in accordance with the standards and recommended procedures for inspection of existing appliances established under NFPA 31, 54 and 211, including the measurement of carbon monoxide in the flue gas. At the time of inspection the appliance shall be marked with the date of the inspection and the name and certificate number of the person who performed the inspection. When the inspection determines the existing situation involves a distinct hazard to life or property and requires immediate action, the violation(s) shall be immediately corrected or the certified inspector conducting the inspection shall contact the AHJ and disconnect the heating appliance from operation.

-delete- section 1:11.5.1.11.2 **Clothes Dryers in Dwelling Units**:

-add- section 1:11.5.4.1 Carbon Monoxide Alarms for **Through the Wall Vent Termination**: In buildings other than where people sleep, carbon monoxide alarms shall be installed in areas adjacent to, but outside of the distance established in the manufacturer's instructions, for all fuel fired heating appliances vented through the wall and terminating less than 7 feet above ground level.

-add- section 1:13.3.1.2.1 **Approval of NFPA 13D Sprinkler Systems**: For all sprinkler systems designed in accordance with 13D, the technically qualified person certified under section 1.13 shall perform all required acceptance tests as required for NFPA 13R sprinkler systems, perform a water flow test for the most remote area, complete the Contractor's Material and Test Certificate(s), and forward the certificate(s) to the AHJ prior to asking for approval of the installation. Where the AHJ desires to be present during the conducting of acceptance tests, the installer shall provide the AHJ 15 day notification of the time and date of the testing. [*13D:4.3 is deleted & replaced by this subsection*]

-add- section 1:13.3.1.2.2 **Arrangement of Fire Department Connections**: All new & existing fire department connections shall be arranged so that water from the fire department connection shall reach the sprinkler system regardless of any manually closed control valve. This section does not apply to remote electrically supervised zone / floor control valves on existing systems installed in accordance with NFPA 13. [*NFPA 13:8.16.2.4.3 and 8.16.2.4.4 are amended by this section*]

-add- section 1:13.3.1.2.3 **Underground Private Fire Service Mains supplying Automatic Fire Sprinkler Systems:** As defined in NFPA 24, standard for the Installation of Private Fire Service Mains and their Appurtenances, and in regards to this section, an underground private fire service main is the pipe and its appurtenances on private property between a source of water and the base of the system riser for a water based fire protection system. A contractor installing an underground private fire service main shall install, flush and test the piping, including completion of the "Contractor's Material and Test Certificate for Underground Piping", in accordance with NFPA 24.

A licensed professional engineer, or a person exempted under 26 V.S.A. 1163, shall design an underground private fire service main in accordance with NFPA 24 and witness the acceptance flushing and testing. The person designing and/or installing a fire sprinkler system under 1:1.13.1(10) or (11) shall verify the testing and flushing of the underground private fire service main and obtain a copy of the "Contractor's Material and Test Certificate for Underground Piping" prior to connecting to the piping.

Working plans for an underground private fire service main including the items specified under NFPA 24: 4 shall be submitted in accordance with section 4 of *this code* for a construction permit.

-add- section 1:13.3.1.2.4 **Backflow Prevention for New Fire Protection Systems**: A backflow prevention device, dedicated to a water based fire protection system, shall be sized, installed and tested by a TQP certified for design, installation and maintenance of water based fire protection systems. Annual testing shall be in accordance with NFPA 25 Section 13.6. On new installations a valved connection shall be provided

to conduct the "forward Flow" test. Test forms can be found at www.nfpa.org, wwwnfsa.org, and wwwsprinklernet.org

-add- section 1:13.3.1.3.1 **Fire Department Connections for Existing Sprinkler Systems**: Where there is no fire department connection for an existing NFPA 13 or 13R sprinkler system, or the threads do not meet NFPA 13 section 6.8, it shall be listed as a deficiency under NFPA 25: 5.1.1 by the technically qualified person conducting the annual inspection and corrected by the owner or occupant in accordance with NFPA 25: 4.1.4.

-add- section 1:13.3.1.3.2 **Backflow Prevention for Existing Sprinkler Systems**: A backflow prevention device shall not be added to an existing fire sprinkler system that reduces the water supply or water pressure to a point lower than the minimum sprinkler system design. Sprinkler calculations verifying the modified sprinkler design shall be submitted to the AHJ.

-delete- section 1:13.3.2.20.1 Fire Sprinkler Protection for One and Two Family Dwellings

-add- section 1:13.3.3.1.2.5 **Seismic Protection of Fire Protection Systems**: Earthquake protection of building systems shall be limited to those buildings or structures that are categorized as essential. For purposes of this paragraph IBC Table 1604.5 IV shall be limited to hospitals; fire, rescue, & police stations; emergency vehicle garages, water storage & pumping structures and Emergency Operation Centers.

-delete & replace- section 1:13.5.1 **Water Supply**: Water supply for fire suppression systems shall be evaluated by an individual certified under section 1:1.13.1 for proper supply and pressure prior to plan review submittal in accordance with NFPA 13 and 24.

-add- section 1:13.5.3.1.1 **Backflow Testing**: The sprinkler system TQP (Technically Qualified Person) shall be certified to conduct annual forward flow test through the sprinkler system backflow device to ensure proper water flow rate.

-delete & replace- section 1:13.6.8.3.1.1 **Portable Fire Extinguishers**: Portable fire extinguishers inside individual apartment or condo units shall be permitted to be 2-1/2 pound dry chemical capacity. All other occupancy types or locations shall be provided with fire extinguishers in accordance with NFPA 1:13.6.

-add- section 1:13.7.1.5 **Carbon Monoxide Alarms**: Carbon Monoxide alarms shall be installed in accordance with NFPA 70, National Electrical Code, NFPA 720, Standard for the Installation of Carbon Monoxide Warning Equipment, and section 1:13.7, as amended under this code.

[Commentary: *Refer to page 42 in the index for carbon monoxide detector locations.]*

-add- section 1:13.7.1.4.5.1 **Fire Alarm Circuit Classification**: All newly installed fire alarm systems in healthcare, detention & correctional, residential board & care occupancies, assembly occupancies with more than 300 people, and all high rise buildings, shall be electrically wired as a Class A system.

-delete & replace- section 1:13.7.1.4.9.2 **Power for Smoke Alarms**: All newly installed (including replacement) smoke alarms in one & two family dwellings, multiple unit dwellings, lodging or rooming houses, hotels and dormitories shall be directly wired to a non-dedicated electrical branch circuit for the building and by battery, except where additional smoke alarms are added in sleeping rooms of existing apartment buildings 101:31.3.4.5.4 as amended.

-add- section 1:13.7.1.4.9.6 **Photoelectric Smoke Alarms**: All newly installed smoke alarms in dwelling units, lodging or rooming houses, hotels and dormitories, shall be the photoelectric-only-type.

-add- section 1:13.7.1.4.11.4 **Single Line DACT**: A digital alarm communicator transmitter (DACT) utilizing a single line, without a secondary transmission means as required by NFPA 72:26.6.3.2.1.4, shall be permitted where a fire alarm system is not required to provide emergency forces notification under this *Code when no other means is available.* A secondary transmission means, ONLY when available, shall be employed as listed in 72:26.6.3.2.1.4(A).

-add- 1:13.7.1.5.1 **Carbon Monoxide/Fire Alarm Interconnection**). Where desired, carbon monoxide alarms may be integrated into the fire alarm system control panel. Notification appliances installed as part of the fire alarm system may be used for CO alarm detection notification of the building occupants when the notification appliances have been installed in compliance with the appropriate sections of NFPA-72. The above requirements do not apply to single-station or multi-station Carbon Monoxide Alarm devices.

-add- section 1:14.10.2.3 **Snow Removal**: All portions of the means of egress, including outside stairs and fire escapes, shall be kept clear of any accumulation of snow and ice at all times that the building is occupied. For multi-family dwellings with direct exit access to the outside and one and two family dwellings snow and ice shall be removed as soon as practicable.

-add- section 1:14.10.2.4 Clearance for **Inclined Lifts on Stairways**: Where a platform or chair lift is installed on an exit stair in an existing building the minimum clear width on the stair when the inclined lift is in the down position shall be:

- 18" when the stair serves fewer than 10 people
- 22" where the stair serves fewer than 50 people
- as required by this *Code* when the stair serves 50 or more people.

Where a platform or chair lift is installed on an exit stair in a new building the minimum clear width on the stair when the inclined lift is in the down position shall be as required by this *Code.*

-delete- section 1:16.6.1 Permits for Torch Applied Roofing Systems

-delete- section 1:16.7.1.2 Permits for the Placement of Tar Kettles

-delete- section 1:16.8 Asbestos Removal: [*The Vermont Department of Health regulates the removal of asbestos containing materials, as well as the training for persons who remove asbestos containing materials. For additional information, contact the Vermont Department of Health, Health Protection Division (1-800-439-8550)*]

-delete- Chapter 17 Wildland Urban Interface

-delete- section 1:19.1.1 Commercial Rubbish-Handling Operations Permit

-delete & replace- section 1:20.2.4.2.3(1) **Emergency Egress and Relocation Drills**: Not less than one emergency egress and relocation drill, in accordance with the school's emergency preparedness plan, shall be conducted every month the facility is in session.

-delete & replace- sections 1:20.9.2.2, 1:20.10.2 & 1:20.11.2 **Unvented Fuel-fired Heaters**: Unvented fuel-fired heaters shall not be used. [*101: 30.5.2.2; 101:31.5.2.2; 101:26.5.2.2 and 101:24.5.1.2 are deleted and replaced by this section*]

-add- section 1:20.12.2.2.3 **Smoke Alarm & Carbon Monoxide Alarm – Consumer Information**: Information provided by the AHJ, on the type, placement and installation of smoke alarms and carbon monoxide alarms, shall be posted in the retail sales area where the alarms are sold.

-delete- section 1:22.2 Automobile Wrecking Yard Permit

-delete & replace- section 1:25.1.2 Permits for **Membrane Structures, Tents and Canopies**: Permits for an air-supported membrane structure, tent or canopy in excess of 1200 sq. ft. shall comply with 1.12.8.

-add- section 1:29.1.4 **Ventilation for Occupied Spaces Adjacent or Accessory to Parking Structures**: In addition to ventilation requirements under 88A:6.3 for enclosed parking structures, all connecting spaces or contained spaces such as offices, waiting areas, ticket booths and similar areas shall be maintained at a positive pressure.

-delete- section 1:41.1.5 Permits for **Welding, Cutting & other Hot Work**

-add- section 1:42.3.2.1.1 **Lighting**: Adequate lighting shall be provided for all fuel dispensing locations.

-delete & replace- section 1:42.3.3.2 **Aboveground Storage Tanks for Fuel Dispensing**: All aboveground storage tanks involved with fuel dispensing shall meet all applicable requirements of Chapter 22 and 27 of NFPA 30, Flammable and Combustible Liquids Code. All aboveground tanks storing Class I liquids shall be **fire resistant tanks** in accordance with Section 42.3.3.4. [*30A:4.3.2 is deleted & replaced by this section*]

-delete & replace- section 1:42.3.3.2.4 **Location of Aboveground Tanks for Fuel Dispensing**: Tanks involved with fuel dispensing storing Class I liquids shall be located in accordance with Table 42.3.3.2.4. Tanks containing other liquids regulated under this chapter shall be permitted to be located with minimum separation requirements ½ of the distances in Table 42.3.3.2.4. [*30A:4.3.2.4 is deleted & replaced by this section*]

-delete & replace - section 1:42.6.1.4.1 **Fire Suppression Systems**: Approved automatic fire suppression systems shall be required at all **unattended self-service fuel dispensing** facilities including **card-lock, key-lock and fleet-refueling facilities** where non-employee third parties are allowed to dispense Class 1 flammable liquids.

Approved automatic fire suppression systems shall also be required where unique and special circumstances constituting a serious risk to public safety require the use of such systems in order to adequately protect users, as determined by the authority having jurisdiction.

Approved automatic fire suppression systems shall not be required at any full-service or self-service fuel dispensing facility where an employee is on duty during all hours of operation, and where such employee is able

to view and supervise all fuel dispensing operations, in accordance with 42.7.4.

-add- section 1:42.6.1.4.3 **Fire Suppression Systems – Alternative Design**: Where otherwise exempted under this code a fire suppression system shall be permitted to be installed in accordance with the appropriate NFPA standard and the manufacturers' instructions that do not meet the listing requirements of UL 1254.

-add- section 1:42.6.1.4.4 **Existing Fire Suppression Systems:** Systems currently in use that were installed prior to May 31, 2002, shall be inspected and certified annually and shall continue to meet the standards for installation and operation incorporated into the Vermont Fire & Building Safety Code. A system installed prior to May 31, 2002, that is no longer operable shall be removed and:

(a) be replaced with a system that meets the listing requirement of UL 1254, or

(b) be replaced by a previously listed system that does not meet the listing requirements of UL 1254, or.

(c) Be removed from service and not replaced after notification, inspection and approval from the AHJ.

-add- section 1:42.6.1.4.5 **Extinguishing Agent**: A copy of the Material Safety Data Sheet (MSDS) for the extinguishing agent shall be kept at all locations where automatic fire suppression systems are installed.

-add- section 1:42.7.4.3.2 **Training for Attendants**: All attendants for self-service fuel dispensing facilities shall receive initial and periodic training regarding the requirements of the Fire Code including preventing the dispensing of gasoline into unapproved portable containers, making sure that the portable container is on the ground while filling, controlling sources of ignition such as smoking and requiring the motor of the vehicle to be shut off, activating emergency controls and notifying the fire department of any fire, and handling accidental spills and fire extinguishers as needed. A poster listing the duties of this section and section 42.7.4.5, approved by the AHJ, shall be posted at the normal workstation of the attendant.

-add- section 1:42.7.4.5 **Power Disconnect:** An attendant for a self-service fuel dispensing facility shall disconnect the power to any pump when the attendant observes the dispensing of gasoline into an unapproved portable container, filling of a portable container that is not on the ground, the motor of the vehicle had not been stopped, smoking materials are being used within 20 ft. of the fuel dispensing, a person has blocked open the hose nozzle valve or a person has left the pump unattended, and the power shall not be restored until the violation is abated.

-add- section 1:50.2.1.10 **Isolated Cooking Operations**: The requirements for the hood, grease removal devices, duct and fixed fire extinguishing system may be modified by the AHJ for cooking operations in free standing tents, mobile units or other small buildings located greater than 30' from grandstands or other public buildings and occupied by employees only, when the clearance to combustibles, safety controls, portable fire extinguishers, staff training, fuel use, storage and shut-off, and electrical shut off for equipment are in compliance with this *Code*.

-add- Section 1:50.4.1.1 **Cooking Operations - Acceptance Testing Of a Suppression System**: An acceptance test shall be conducted by person(s) holding Vermont TQP status to ensure the system functions as designed. This test shall include of a "puff test" discharging nitrogen or other approved inert gas through the system's agent distribution piping to allow verification of piping continuity including verification of gas discharge to each of the discharge nozzle(s). In addition this test shall also include a demonstration of all critical functions of the system including but not limited to any required gas or electric shut down, any required make-up air shut down, any required building fire alarm connection, and visually provide confirmation of nozzle size and placement per the design plans when completed.

-delete & replace Section1:50.4.11.2.1 **Qualifications**: Only persons properly trained and certified (to include holding current Vermont TQP(1:1.13.1.(2)) status and meeting manufacturers training requirements if part of the system listings) shall be considered competent to design, install, inspect, and service pre-engineered wet chemical systems.

-delete & replace- section 1:51.1.2.1 **Permits for Industrial Ovens and Furnaces:** Permits for new installations, alterations or extensions to existing equipment shall comply with 1.12.

-add- section 1:53.1.3.1 **Permits for Mechanical Refrigeration:** A permit is not required for an existing facility that is in compliance with reporting requirements under the Vermont Community Right to Know Law, Title 20 V.S.A. Chapter 1.

-delete- Chapter 54 Ozone Gas–Generating Equipment

-add- section 1:60.1.2.3 **Permits for Hazardous Materials:** A permit is not required for an existing facility that is in compliance with reporting requirements under the Vermont Community Right to Know Law, Title 20 V.S.A. Chapter 1.

[*Information regarding chapter 65,* ***Explosives and Fireworks****- A license is required to possess, purchase, store, use, transport, give, transfer or sell explosives. For license applications or additional information contact the Division of State Police at (802) 244-8781.*

The Division of Fire Safety regulates the safekeeping, storage, use, manufacturing, sale, handling, and other disposition of explosive material under this Code.

The Division of Fire Safety also regulates the construction, manufacturing, storage, handling and use of fireworks for supervised public displays and pyrotechnic special effects under this Code.
It is unlawful for any person to offer for sale, sell at retail or wholesale, possess, use or explode any fireworks except as permitted for a supervised public display of fireworks.

A permit for a supervised public display of fireworks may be obtained from the Chief of the Fire Department, or in towns where there is no Fire Department from the board of selectman, where it is determined the display would not be hazardous to property or endanger the public. Application for a permit must be made at least 15 days in advance of the public fireworks display.

Sparklers *less than 14 inches long with no more than 20 grams of pyrotechnic mixture and novelty sparkling items limited to snakes, party poppers, glow worms, smoke devices, string poppers, snappers, or drop pops with no more than 0.25 grains of explosive mixture, that are in compliance with United States Consumer Product Safety Commission regulations, are legal for sale and use in Vermont.*]

-delete & replace - section 1:65.2.3 **Permits for Public Fireworks Displays**: A permit for a supervised public display of fireworks shall be obtained from the chief of the fire department, or in towns where there is no fire department the board of selectmen, after determining the display would not be hazardous to property or endanger the public.

-delete & replace- section 1:65.10.1.1 **Consumer Fireworks**: The sale, handling and storage of consumer fireworks, including sparklers permitted for sale in Vermont, in both new and existing buildings, structures and facilities shall comply with NFPA 1124 and section 65.11.

-delete & replace- section 1:65.10.3.1 Exempt Amounts of **Consumer Fireworks**: Consumer fireworks retail sales facilities or stores where the fireworks and sparklers are in packages in accordance with the U. S. Consumer Product Safety Commission and where the total quantity of consumer fireworks and sparklers in the building does not exceed 125 lb (net) of pyrotechnic composition shall be exempt from the following sections:
-65.10.3.2[*1124:7.3.2*] Permits
-65.10.3.5[*1124:7.3.5*] Construction
-65.10.3.6[*1124:7.3.6*] Automatic Sprinkler System
-65.10.3.9[*1124:7.3.9*] Fire Alarms
-65.10.3.10[*1124:7.3.10*] Smoke Control
-65.10.3.12[*1124:7.3.12*] Separation distances

-delete & replace section 1:66.1.5 **Permits for Flammable & Combustible Liquids**: A permit is not required for an **underground storage tank** regulated by the Agency of Natural Resources, Department of Environmental Conservation, according to NFPA 30. [*The Agency of Natural Resources, Department of Environmental Conservation (DEC) regulates petroleum and chemical Underground Storage Tanks (USTs) that are 10 percent or more beneath the surface of the ground.*

All USTs are required to be registered with the Agency except for: (a) Tanks less than 1100 gallons containing fuel oil (#2-#6) which is used for on premises heating and domestic hot water, and (b) farm and residential tanks less than 1100 gallons containing motor fuel which is used for noncommercial purposes.

In addition, certain registered USTs are required to have permits for their operation and are subject to other operational standards. All USTs are subject to closure (removal) requirements upon being taken permanently out of service. For additional information contact the Vermont DEC at (802) 241-3888.]

-add- section 1:69.1.1.4 **Record of Installation for LP Gas Containers**: Installers shall maintain a record of all installations for which a permit is not required by section 69.1.1.3, but not including replacing of portable cylinders, available for inspection by the AHJ.

-delete & replace- section 1:69.3.6.1.2 **LP Gas Systems, Protection from Damage**: LP Gas containers or systems of which they are a part, shall be protected by physical protective barriers from damage from vehicles. [*58:6.6.1.2 is deleted & replaced by this section*]

-add- section 1:69.3.6.1.2.1 **Underground LP Gas Systems, Protection from Damage:** Where containers are installed underground within 10' of where vehicular traffic can be expected, physical protective barriers shall be provided for the fitting housing, housing cover, tank connections, and piping, to protect against vehicular damage.

All other underground containers shall be provided with a reflective marker or other readily visible marker acceptable to the authority having jurisdiction, at 4' in height to mark the location of the location of the housing cover. [*58:6.6.6.1(D) is deleted & replaced by this subsection*]

-delete & replace- Section 1:70.1.2. **Permits for Oxidizers and Organic Peroxides**: A permit is not required for an existing facility that is in compliance with reporting requirements under the Vermont Community Right to Know Law, Title 20 V.S.A. Chapter 1

Section 5

ICC, International Building Code (IBC)

2012 edition, including those standards referenced in Chapter 35 to the prescribed extent of each reference by adopted sections of the IBC.

The IBC is adopted to the extent necessary to ensure compliance with the performance requirements of this *Code* and the intent of this *Code* regarding safeguarding of people and property in case of fire, explosion, dangerous structural conditions and the generation of carbon monoxide.

-delete- chapter 1 Administration except for section 107 (Submittal Documents) & 110 (Inspections) as appropriate and the following sections:

-delete & replace- section 101.4 Referenced Codes: Where referenced under the IBC any reference to the:
* **ICC Electrical Code**, shall be to the National Electrical Code, NFPA 70, as adopted by the Electricians Licensing Board. The temperature and flame exposure ratings, resistance to the spread of fire, or flame spread, and the fire-resistant characteristics preventing the carrying of fire from floor to floor, shall be in accordance with the National Electrical Code as published.

* **International Fuel Gas Code**, shall be to the National Fuel Gas Code, NFPA 54, 2012 edition, as adopted under this *Code*
* **International Mechanical Code**, shall be to the Fire Code, NFPA 1, 2012 edition, including NFPA 90A, as adopted under this *Code*
* **International Plumbing Code** shall be as adopted by the Plumbers Examining Board
* **International Property Maintenance Code**, shall be to the Fire Code, NFPA 1, 2012 edition and the Life Safety Code, NFPA 101, 2012 edition, as adopted under this *Code*
* **International Fire Code**, shall be to the Fire Code, NFPA 1, 2012 edition, as adopted under this *Code*
* **International Energy Conservation Code**, shall be to the Vermont Building Energy Standards, as published by the Vermont Department of Public Service (802-828-3183).
http://publicservice.vermont.gov/energy/ee_commstandards.html, (Commercial)
http://publicservice.vermont.gov/energy/ee_resbuildingstandards.html, (Residential)
http://publicservice.vermont.gov/energy/ee_energyefficiency.html (Energy Code Information)

* **International Residential Code**, or to R-3 Occupancy Classification for one & two family dwellings, shall be to the Life Safety Code, NFPA 101, 2012 edition as adopted under this *Code*.

-delete & replace- section 105 **Construction Permits**: Permits shall be obtained in accordance with section 7 of the Vermont Fire & Building Safety Code.

-add- section 117 **Structural Failure or Collapse**: A building owner shall immediately report any structural failure or collapse that involves personal injury to the AHJ.

Where the structural failure or collapse does not involve personal injury the report shall be made within 48 hours. A registered design professional investigating an incident on behalf of the owner shall advise the owner of the requirement to report the incident.

[F*or AHJ emergency contact during normal business hours call 1-800-640-2106. Outside of normal business hours call The State Emergency Operations Center at 1-800-347-0488*]

delete & replace- section 308.3 Group I-1, **Residential Board & Care Facilities:** Assisted Living Facilities and similar use: Residential care facilities, assisted living facilities and similar use in which three or more clients receive care shall be classified and regulated in accordance with the Life Safety Code, NFPA 101, and the IBC for structural design.

-delete & replace- section 308.5 **Day Care Facilities:** Day care facilities in which four or more clients receive care shall be classified and regulated in accordance with the Life Safety Code, NFPA 101, and the IBC for structural design.

-delete & replace- section 310.5 R-3 Detached **One & Two Family Dwellings**: Detached one & two family dwellings shall be classified and regulated in accordance with the Life Safety Code, NFPA 101.

-delete & replace- section 415.10 Protection of **Semiconductor Fabrication Facilities**: In addition to requirements set elsewhere in this code semiconductor fabrication facilities shall be in accordance with NFPA 1, and NFPA 318.

-delete & replace- section 506.2.2 **Open Space for Area Increase**: Such open space shall be either on the same lot or dedicated for public use, clear and unobstructed at all times, usable for fire department operations and accessed from a street or fire department access road in accordance with NFPA 1: chapter 18.

-add- section 507.13 **Open Space for Unlimited Area Buildings**: Open space required under section 507 shall be either on the same lot or dedicated for public use, clear and unobstructed at all times, usable for fire department operations and accessed from a street or fire department access road in accordance with NFPA 1: chapter 18.

-delete & replace- IBC Section 706 **Fire Walls**: The design and construction of new Fire Walls and High Challenge Fire Walls shall be in accordance with NFPA 1 Section 12.3.1 and NFPA 221 and the following:

The minimum fire resistance rating for Fire Walls and High Challenge Fire Walls shall be three hours; for buildings with complete supervised automatic sprinkler systems on both sides of the fire wall, the minimum fire resistance rating shall be two hours.

High Challenge Fire Walls shall be utilized for buildings containing an occupancy in categories "III" or "IV" listed on Table 1604.5 IBC.

-delete & replace- chapter 8 **Interior Finishes**: Interior finishes shall be in accordance with the Life Safety Code, NFPA 101, as adopted under this *Code.*

.-delete & replace- chapter 10 **Means of Egress**: Means of Egress shall be in accordance with the Life Safety Code, NFPA 101, as adopted under this *Code.*

-delete & replace- chapter 11 **Accessibility**: All new construction and alterations shall be in accordance with the 2012 "Vermont Access Rules" as adopted by the Vermont Access Board.

-delete- chapter 12 **Interior Environment** except for section 1209.1 Crawl Spaces & 1209.2 Attic Spaces Access to Unoccupied Spaces.

-delete- & replace- chapter 13 **Energy Efficiency**: Certification, approved by the Department of Public Service, indicating compliance with the Vermont Guidelines for Energy Efficient Commercial Construction, for the design and construction of any public building, other than one & two family dwellings and multi-family dwellings three stories or less in height, shall be affixed in a visible location inside the building, in the vicinity of the heating or cooling equipment or the electrical service panel, as a condition for a final occupancy permit,

[Note: *The Department of Public Service provides technical assistance and expert advice regarding the energy standard requirements for new construction. This includes criteria that builders may use in lieu of computer or systems analysis of the building. For additional information contact the Vermont Department of Public Service at 1-888-373-2255.*]

-delete & replace- IBC 1403.5 **Vertical and lateral flame propagation**: Exterior walls on buildings of Type I, II, III or IV construction that are greater than 40 feet (12 192 mm) in height above grade plane and contain a combustible water-resistive barrier shall have an evaluation report which provides details of the assemblies tested, in accordance with NFPA 285 and/or NFPA 285 test results extended via a third-party engineering analysis.

-add- section 1608.2 Local **Ground Snow Load**: The Minimum Ground Snow Load Map shall be used in determining the ground snow load. [*The snow load map and the Average Yearly Snowfall Map are located in the Annex to this Code and on the division website.*

-add- section 1608.2.1 **Minimum Roof Snow Load**: The total roof snow load, including additional loading effects due to drifting snow, sliding snow, unbalanced loading conditions and partial loading conditions, shall not be less than 40 psf for roofs with a slope less than or equal to 5 degrees, and shall not be less than the slope factor (C_s) times 40 psf for roofs with a slope greater than 5 degrees.

This minimum roof snow load shall not apply to the windward side for unbalanced loading conditions, or to the partially loaded spans for partial loading conditions. Note: Our Division web page has an "Average Yearly Snowfall Map" provided for informational purposes only.

-delete & replace- section 1612.3 Establishment of **Flood Hazard Area**: Where established by a municipality by ordinance or zoning standard the flood hazard area shall be identified by one of the following:

(1) Special flood hazard area designated by the Federal Emergency Management Agency (FEMA), or
(2) Most recent flood insurance rate map (FIRM), or
(3) Area subject to flooding during the design flood and shown on a municipal flood hazard map, or
(4) Most recent maps and studies adopted by a municipality for a flood with less than a 1 % chance of being equaled or exceeded in any given year.

-delete & replace- sections 2111 through 2113: **Masonry Fireplaces, Heaters and Chimneys**: Masonry fireplaces, heaters and chimneys shall be in accordance with the Standard for Chimneys, Fireplaces, Vents and Solid Fuel-Burning Appliances, NFPA 211, as adopted under this *Code.*

-delete & replace- IBC 2603.5.5 **Vertical and lateral fire propagation**: The exterior wall assembly shall have an evaluation report which provides details of the assemblies tested, in accordance with NFPA 285 and/or NFPA 285 test results extended via a third-party engineering analysis. Exception: One-story buildings complying with Section 2603.4.1.4.

-delete & replace- chapter 27 **Electrical**: Electrical components, equipment and systems shall be in accordance with the National Electrical Code, NFPA 70, as adopted by the Electricians' Licensing Board

-delete & replace- chapter 28 **Mechanical Systems**: Mechanical equipment and systems shall be installed in accordance with the Fire Code, NFPA 1, including NFPA 90A as adopted under this *Code.*

-delete & replace- chapter 29 **Plumbing Systems**: Plumbing work is regulated under the Vermont Plumbing Rules as adopted by the Plumbers Examining Board.

-delete & replace- section 3001 **Elevators** and Conveying Systems: Elevator and conveyance work is regulated under the Elevator Safety Rules as adopted by the Elevator Safety Review Board.

-delete & replace- section 3002.4. Required Locations: An elevator car of such a size and arrangement to accommodate an **ambulance stretcher** (24" X 84") as specified in section 3002.4 shall be provided where a passenger elevator is newly installed in a building three or more stories in height above or below grade plane/grade level. This section shall not apply to the installation of a Limited-Use / Limited-Application elevator approved by the Vermont Access Board.

-delete & replace- section 3005.4 **Personnel and Material Hoists:** Personnel and Material Hoist work is regulated under the rules of the Vermont Occupational and Safety Administration.

-delete & replace- section 3006.5 **Shunt Trip:** The method to automatically disconnect electrical power for elevators prior to fire sprinkler activation in the elevator shaft or elevator mechanical room is regulated under the Elevator Safety Rules.

delete- section 3108 Telecommunication and Broadcast Towers

delete- section 3109 Swimming Pool Enclosures and Safety Devices

-delete- section 3110 Automatic Vehicular Gates

-delete- chapter 32 Encroachments into the Public Right-of-Way

-delete & replace – chapter 33 **Safeguards During Construction**: Safety during construction shall be in accordance with the Standard for Safeguarding Construction, Alteration and Demolition Operations, NFPA 241, as adopted under this *Code.*

-delete & replace- chapter 3401.1 **Scope**: Scope of application of *this code* for Existing Buildings and Structures is as follows:

-add- 3401.1.1 Existing buildings and structures shall be in maintained in accordance with the Life Safety Code and the Fire Code as amended under this *Code.*

-add- 3401.1.2 Rehabilitation work, classified as repair, alteration (further classified as renovation, modification or reconstruction), change of use or occupancy, or addition, for existing buildings and structures, shall be in accordance with the Life Safety Code, chapter 43, and the structural requirements of Chapter 34 of the International Building Code.

-add- 3401.1.3 An addition to any existing building or structure shall be in accordance with the Life Safety Code, the Fire Code and the International Building Code for new construction, as indicated in the matrix on page 5. An existing building plus additions shall comply with the height and area provisions of chapter 5 of the International Building Code and the structural requirements of Chapter 34 of the International Building Code.

-add- 3401.1.4 The remainder of chapter 34 is adopted only for purposes of structural provisions.

National Board of Boiler and Pressure Vessel Inspectors, National Board Inspection Code, Part RA – RE, Appendix 1-9 and A-K

(a) A boiler is defined as a closed vessel in which water is heated, steam is generated, steam is super- heated, or any combination thereof, under pressure or vacuum by the direct application of heat from the combustion of fuel or from electricity. The term includes a fired unit for the heating or vaporizing of liquids other than water where the unit is separate from a processing system and is complete within itself. An unfired pressure vessel is defined as a container of pressure obtained from an external source that exceeds 15 psi. This section shall apply to all boilers, and pressure vessels identified in the National Board Inspection Code (NBIC) except:

(1) A boiler or pressure vessel located on a common carrier subject to regulations under the Surface Transportation Board, Department of Transportation, Federal Railroad Administration or Nuclear Regulatory Commission.

(2) Pressure containers that are integral parts or components of rotating or reciprocating mechanical devices such as pumps, compressors, turbines, generators, engines and hydraulic or pneumatic cylinders where the primary design consideration and /or stress is derived from the functional requirements of the device.

(3) **Hot water heaters** and potable water storage tanks with a heat input of less than 200,000 BTU/HR, water temperature less than 210 degrees (F) and less than 120 gallons aggregate water capacity. Units otherwise exempted under this section shall be equipped with approved pressure/temperature safety relief devices in accordance with NBIC I 3837.

(4) Steam cleaners or coil type boilers without steam space where water flashes into steam when manually released through a nozzle for cleaning machinery, equipment, etc.; when the water capacity is less than 6 gallons and the water temperature less than 350 degrees

(F). Units otherwise exempted under this section shall be equipped with approved pressure/temperature safety relief devices in accordance with NBIC.

[*A system for heating a building or other processes using an open vessel (characterized by a continuously open vent or vents of adequate size designed so that the vessel will not operate above atmospheric pressure) are not regulated under the NBIC, but are subject to other requirements of this code and other rules and standards adopted by the Division, including obtaining all required permits and inspections.*]

(b) All boilers and pressure vessels shall be designed, manufactured, constructed and assembled in accordance with the relevant standards published by the:

(1) American Society of Mechanical Engineers,

(2) Canadian Standards Association, or

(3) European Committee for Standardization, for boilers with a maximum water jacket size of 60 gallons, a maximum input of 250,000 BTU, and a maximum relief valve setting of 30 PSIG.

(4) European Committee for Standardization, for boilers or pressure vessels with an input of greater than 250,000 BTU or a water jacket size of greater than 60 gallons as approved per Section 5 of these rules.

(c) All boilers and pressure vessels shall be installed in accordance with the National Board Inspection Code, as amended, including control, safety, and pressure relief devices in accordance with the relevant standards published by the American Society of Mechanical Engineers. **(ASME)**

(d) The manufacturer's design information, instructions, data plates and warning labels for all boilers and pressure vessels shall be in English.

(e) The owner or person installing a boiler or pressure vessel shall report to the AHJ the location, type, capacity, age and date of installation of any boiler or pressure vessel.

(f) Prior to being placed in service **any boiler or pressure vessel shall be inspected** by a commissioned inspector. When the boiler or pressure vessel is found to be in compliance with this *Code* the commissioned inspector shall attach an **identification number**, approved by the AHJ, and an **initial inspection certificate** in a format approved by the AHJ. The inspection certificate shall be posted at the site of operation. The identification number, initial inspection by a commissioned inspector and operating certificate shall not be required for boilers designed to heat individual dwelling units in buildings containing less than 6 dwelling units.

(g) The **periodic inspection of boilers and pressure vessels** shall be performed by a commissioned inspector at intervals listed in this section. A commissioned inspector may require additional external (an inspection made when a boiler or pressure vessel is fully intact so all safety features can be inspected) or internal (an inspection made when a boiler or pressure vessel is shut down and hand-holes, manholes or other inspection openings are opened for inspection of the interior) inspections when unsafe conditions or operations are

observed or suspected. The AHJ may order the owner or user to stop operation of a boiler or pressure vessel operating in violation of this *Code.*

(1) Each high pressure power boiler in which steam is generated at a pressure of more than 15 pounds per square inch shall be inspected both internally and externally while not under pressure on an annual basis, and externally, while under pressure, approximately six months from the internal inspection.

(2) Each low-pressure hot water heating boiler installed to operate at pressures not to exceed 160 pounds per square inch and/or temperatures not exceeding 250 degrees (F), and each steam heating boiler operating at a pressure not exceeding 15 pounds per square inch, shall be inspected externally, and internally where construction permits, every two years. An inspection shall not be required for boilers designed to heat individual dwelling units in buildings containing less than 6 dwelling units.

(3) Each pressure vessel greater than 5 cubic feet and operating with a relieving pressure greater than 125 pounds per square inch shall be inspected externally, and internally where construction permits, every three years. An internal inspection is not required for a rubber lined pressure vessel.

(h) An employee of an insurance company, licensed to insure boilers and pressure vessels in Vermont, shall obtain a current Vermont commission to inspect boilers and pressure vessels prior to conducting any inspections. A current certification from the National Board of Boiler and Pressure Vessel Inspectors is required to obtain a Vermont commission.

A Vermont commission may be revoked or suspended for violation or misrepresentation of responsibilities established under this *Code.* A person who has a Vermont commission revoked or suspended shall be given written notification and the opportunity for a hearing following due process.

(i) An employee of an insurance company, licensed to insure boilers and pressure vessels in Vermont, who has obtained a Vermont commission, and/or the insurance company, licensed to insure boilers and pressure vessels in Vermont shall:

(1) Inspect all boilers and pressure vessels insured by the insurance company in accordance with this *Code* and at time frames established under this *Code.*

(2) Report the results of all inspections to the AHJ within 30 days of the inspection in a format approved by the AHJ.

(3) Notify the AHJ of new boilers or pressure vessels insured, insurance cancelled or not renewed or refused within 30 days.

(4) Participate in training as may be directed by the AHJ.

(5) Not engage in the sale of, or have any interest in, any appliance or device related in any way to the construction, operation or maintenance of boilers and pressure vessels covered under this *Code.*

(j) The owner, user or commissioned inspector shall immediately **report any accident, incident or explosion** involving a boiler or pressure vessel that involves personal injury to the AHJ at 1-800-347-0488 and secure the scene to prevent any change that would hamper the investigation of the incident. Where the accident, incident or explosion does not involve personal injury the report shall be made within 48 hours.

(k) The insurance company of record shall pay a fee of $30.00 to the Division of Fire Safety for each **inspection certificate** or periodic inspection sticker.

see NFPA 101 section 101:7.12.3 **Boiler Room Exit Requirements** (page 6)

-delete & replace- section I-3724(a) **Low Water Cutoff**: Each automatically fired low pressure hot water boiler shall have an automatic low-water fuel cutoff which has been designed for hot water service, and it shall be so located as to automatically cut off the fuel supply when the surface of the water falls to the level established in I-3724(b).

Section 7 Application for a Construction Permit

(a) The owner, or a designated representative, of a building or premises shall obtain a construction permit before beginning any construction, addition, alteration, demolition or installation of fixed building equipment at the building site unless specifically waived by the AHJ.

(b) To obtain a construction permit the applicant shall:

(1). Complete a Construction Permit Application form and submit it along with the required construction permit fee to the Division of Fire Safety regional office.

(2) Provide construction documents relating to the construction work and equipment under consideration unless specifically waived by the AHJ based on the size, use, occupancy or complexity of the work.

(3) For buildings where the applicant is requesting special consideration for a **historic building, documentation** shall be included on the historic designation of the building, including identification and evaluation of historic adjacent structures and site elements such as sheds, walkways, and fencing; historic construction features such as sheathing, facade or roofing materials, chimneys, skylights, cornices or molding, windows or doors, wainscoting, cabinets and finishes; and historic spaces such as archways, lobbies or rooms which are important to the understanding and application of the building.

(c) The **construction documents** shall be prepared by a registered designed professional, stamped and signed, where required by 26 V.S.A. chapters 3 & 20. [*Excerpts from the Architects & Professional Engineering Licensing and Registration Statutes are included in Annex II of this code*]

(d) Plans required under this *Code* shall be drawn to scale, using customary inch-pound units and English language, and shall be sufficiently clear, comprehensive, detailed and legible when submitted to the AHJ so that, together with any accompanying specifications and data, the AHJ can readily determine whether or not the proposed building, addition, or alteration, and all proposed building equipment will conform to this *Code*.

(e) The AHJ shall review the application for a construction permit and the construction documents where applicable and shall issue a permit, a conditional permit with specific terms and conditions, or deny the application. The AHJ may require additional information before issuing, or denying the application for a construction permit. Any conditions of the permit or reasons for denial of the permit shall be transmitted to the applicant in writing.

(f) The AHJ may provide consultation or preliminary plan review for proposed construction to identify high priority code issues when deemed warranted by the significance or complexity of the project.

(g) A **construction permit shall expire** if the work authorized under the permit is not commenced, or is suspended or abandoned, for a time period of **12 months**. When a project is resubmitted for review beyond the 12 months and where no extension was granted, and no major building design change has occurred a 50% plan review fee will be assessed.

(h) Construction permit fees are established by the Vermont Legislature under Title 20 V.S.A. section 2731. The current construction permit fees are available on the Division's website or by contacting any office of the Division.

(1) The Commissioner or designated representative may **rebate up to $2,000** of the construction permit fee paid the department toward the cost of a qualified fire sprinkler system installed in an existing building in a designated downtown area.

(2) In the case of **abandonment or discontinuance of a building project** involving a construction permit fee greater than $150 the construction permit fee may be refunded, upon written request to the AHJ, prorated on construction work, services, reviews and inspections conducted prior to such abandonment. Such request shall be received within 12 months of the date that the construction permit was issued.

(3) The AHJ may refuse to issue a construction or occupancy permit if the owner or a designated representative owes the Department fees or penalties.

(j) The AHJ shall be authorized to require the owner to engage, and designate on the construction permit application, a registered design professional who shall act as the **design professional in responsible charge** in accordance IBC 106.3.4, who shall be responsible for reviewing and coordinating submittal documents prepared by others for compatibility with the approved design of the building.

(k) The AHJ shall be authorized to order all, or part of, work regulated under this *Code* to stop when the work is unsafe or being performed contrary to the provisions of this *Code.*

PERMIT & LICENSING REQUIREMENTS

When do you need a state permit or license?

	DFS State Construction Permit	DFS Electrical		DFS Plumbing		Notes
		State Permit	License	State Permit	License	
Projects within a **Single Family Owner- Occupied home** that includes: new construction, alterations, renovations or the installation of fixtures.	NO	NO	NO	Yes	Yes	Only if connected to a public water or sewer system
Projects within a **Rental Property or Apartment Buildings** having more than two units that includes: new construction, alterations, renovations or the installation of fixtures.	Yes	Yes	Yes	Yes	Yes	
Projects within a **Duplex or a Rental single family home** that includes: new construction, alterations, renovations or the installation of fixtures.	Yes	Yes	NO	Yes	Yes	
Maintenance projects with in a public building such as painting, replacement of broken fixtures with fixture that is an exact match.	NO	NO	Yes	NO	Yes	
Public Building Renovations, Additions, Alterations, Modifications and New Building Projects. See Annex I for definition of Public Building	Yes	Yes	Yes	Yes	Yes	Includes Fire protection systems, Fire alarm system, Fire sprinkler, Kitchen hood & suppression, Elevators Ect.
The erection of temporary tents greater than 1,200 square feet in a public location	Yes	Yes	Yes	x	x	

To obtain a construction permit the applicant shall:

(1) Complete a Construction Permit Application form and submit it to the DFS regional office.

(2) Provide construction documents relating to the construction work and equipment under consideration unless specifically waived by the Commissioner or designated representative based on the size, use, occupancy or complexity of the work.

(3) Submit the required construction permit fee.

(4) Installation of fire or sprinkler system, kitchen hood system or elevator requires an electrical permit in addition to a construction permit.

[Updated October 2, 2012]

Section 8 Variance, Exemption and Reconsideration

(a) The Commissioner may grant a variance approving a different solution to compliance that meets the intent of this code, or may exempt a portion of a building, or equipment including non-standard boilers and pressure vessels, from the requirements of this Code. It is the policy of the Commissioner that whenever possible the determination of a variance or exemption request be made by the Regional Managers.

(b) In order for a variance or exemption request to be reviewed the owner or designated representative shall submit:

1. Evidence that the proposed or existing building or premises is not in compliance with this Code.

2. Evidence, letters, statements, test results, construction documents, computations, chemical and physical properties or other supporting information as prepared by licensed or certified professionals that is required to justify the request.

3. Evidence that strict compliance with the Code would entail practical difficulty, unnecessary hardship or otherwise found unwarranted.

4. Evidence that any such variance or exemption secures the public safety and health and that the methods, means or practices proposed provide equal protection of the public safety and health.

(c) Review of the variance or exemption request shall consider evidence that the code or standard from which the variance or exemption is sought has not been promulgated as a rule or standard under the Vermont Occupational Safety and Health Act.

(d) The determination on the variance or exemption request shall be made in writing to the applicant and shall advise the applicant of the reconsideration process as contained in Section (e).

(e) The Director may reconsider an interpretation or decision made by a designated representative pursuant to this Section. To request reconsideration the owner or designated representative shall submit a written request including:

1. Evidence the proposed or existing building or premises is not in compliance with this Code.

2. Evidence, letters, statements, test results, construction documents or other supporting information as required for justifying the request.

3. Evidence that the true intent of the Code has been incorrectly interpreted, or the provisions of the Code do not fully apply; or the decision is unreasonable or arbitrary as it applies to alternatives or new materials.

(f) The request for reconsideration shall be submitted to the deputy director no later than 30 days after receiving the decision.

(g) A request for a **variance relating to access** to a public building for people with disabilities shall be referred for decision to the **Access Board** established under Title 20 V.S.A. chapter 174.

(h) A request for a variance from this *Code* for historical buildings that is not resolved under section 8(a) shall be determined by the **Historic Variance Appeals Board** as established by 20 V.S.A. 2732.

Section 9 Duty to Observe Rules

A request for variance, exemption, or reconsideration, or request for an appeal pursuant to the rules for Administrative Citations and Penalties, or request for an appeal of orders issued pursuant to 20 V.S.A. 2733, or request for an appeal of any finding of violation of this *Code* shall not relieve a person from complying with this *Code*, permit or occupancy requirements, unless the Commissioner expressly authorizes an extension of compliance period pending review of the request.

Section 10 Municipal Enforcement and Coordination

(a) Each municipality shall provide information regarding building permits issued by the municipality to the AHJ upon request.

(b) The Commissioner may assign the responsibility for the enforcement of all or part of these rules to municipalities that meet the qualifications established in 20 V.S.A. sections 2736 and 2884.

(c) Any fire, building or similar code standards adopted by any municipality shall be consistent with the standards adopted under this *Code*.

Section 11 Effective Dates and Severability

(a) These rules shall take effect **November 5, 2012** and shall be known as the Vermont Fire & Building Safety Code - 2012.

(b) This *Code* shall not require changes in the construction documents or construction of a building or portions of a building for which a construction permit has been issued and construction has started within **90 days** of the effective date of this *Code*, or as otherwise approved by the AHJ prior to submission of plans. Existing buildings or portions of shall meet or exceed requirements for the existing buildings under this *Code* to allow a 90 day grace period.

(c) In the event any part or provision of these rules is held to be illegal, this shall not have the effect of making void or illegal any of the other parts or provisions of these rules. Under Sections 3-6 of this *code* certain Vermont amendments have been cross-referenced for clarity and ease of use. Failure to cross-reference an amendment does not affect the enforcement of that amendment.

Annex I — Excerpts from Vermont Law Pertaining to the Vermont Fire & Building Safety Code

Title 20 Chapter 173: PREVENTION AND INVESTIGATION OF FIRES

§ 2729. General provisions

(a) A person shall not build or cause to be built any structure that is unsafe or likely to be unsafe to other persons or property in case of fire or generation and leakage of carbon monoxide.

(b) A person shall not maintain, keep or operate any premises or any part thereof, or cause or permit to be maintained, kept, or operated, any premises or part thereof, under his or her control or ownership in a manner that causes or is likely to cause harm to other persons or property in case of fire or generation and leakage of carbon monoxide.

(c) On premises under a person's control, excluding single family owner-occupied houses and premises, that person shall observe rules adopted under this subchapter for the prevention of fires and carbon monoxide leakage that may cause harm to other persons or property.

(d) Any condominium or multiple unit dwelling using a common roof, or row houses so-called, or other residential buildings in which people sleep, including hotels, motels, and tourist homes, excluding single family owner-occupied houses and premises, whether the units are owned or leased or rented, shall be subject to the rules adopted under this subchapter and shall be provided with one or more carbon monoxide detectors, as defined in 9 V.S.A. section 2881(3), properly installed according to the manufacturer's requirements..

§ 2730. Definitions

(a) As used in this subchapter, "**public building**" means:

(1)(A) a building owned or occupied by a public utility; hospital; school; house of worship; convalescent center or home for the aged, infirm, or disabled; nursery; kindergarten; or day care;

(B) a building in which two or more persons is employed, or occasionally enter as part of their employment or are entertained, including private clubs and societies;

(C) a cooperative or condominium; [*A condominium is described as a building or complex in which units of property, such as apartments, are owned by individuals and common parts of the property, such as the grounds and building structure, are owned jointly by the unit owners. A unit in such a complex.*]

(D) a building in which people rent accommodations, whether overnight or for a longer term;

(E) a restaurant, retail outlet, office or office building, hotel, tent, or other structure for public assembly, including outdoor assembly, such as a grandstand;

(F) a building owned or occupied by the state of Vermont, a county, a municipality, a village, or any public entity, including a school or fire district.

(2) Use of any portion of a building in a manner described in this subsection shall make the entire building a "public building" for purposes of this subsection. For purposes of this subsection, a "person" does not include an individual who is directly related to the employer and who resides in the employment-related building.

(b) The term "public building" does not include:

(1) an owner-occupied single family residence, unless used for a purpose described in subsection (a) of this section;

(2) a family residence registered as a day care home under chapter 35 of Title 33, or specifically exempted from registration by subdivision 3502(b)(1) of Title 33;

(3) farm buildings on a working farm or farms. For purposes of this subchapter and subchapter 3 of this chapter, the term "working farm or farms" means farms with fewer than the equivalent of 10 full-time employees who are not family members and who do not work more than 26 weeks a year. In addition, the term means a farm or farms:

(A) whose owner is actively engaged in farming; or

(B) if the farm or farms are owned by a partnership or a corporation, one which includes at least one partner or principal of the corporation who is actively engaged in farming;

(C) where the farm or farms are leased, the lessee is actively engaged in farming. The term "farming" means:

(i) the cultivation or other use of land for growing food, fiber, Christmas trees, maple sap, or horticultural and orchard crops;

(ii) the raising, feeding, or management of livestock, poultry, equines, fish, or bees;

(iii) the production of maple syrup;

(iv) the operation of greenhouses;

(v) the on-site storage, preparation, and sale of agricultural products principally produced on the farm. Notwithstanding this definition of farming, housing provided to farm employees other than family members shall be treated as rental housing and shall be subject to the provisions of this chapter. In addition, any farm building which is open for public tours and for which a fee is charged for those tours shall be considered a public building.

(4) a single family residence with an **accessory dwelling unit** as permitted under subdivision 4406(4)(D) of Title 24. [*reference 24 VSA 4412(E) An accessory dwelling unit is an efficiency or one-bedroom apartment that is clearly subordinate to a single-family dwelling, and has facilities and provisions for independent living, including sleeping, food preparation, and sanitation, and does not exceed 30 percent of the total habitable floor area of the single-family dwelling. An accessory dwelling may be contained within the single-family dwelling, or detached, but cannot be located across a public way. A common driveway, shared water and waste water systems, and a common electrical service entrance are examples of an accessory dwelling unit being clearly subordinate to a single-family dwelling.*]

(c) For the purpose of this subchapter, subchapter 3 of this chapter, and chapter 174 of Title 20, the words "premises," "building," and "structure," or any part thereof shall mean "public building" as defined in this section.

[*Buildings classified as public buildings and owned by* ***a federal agency*** *are not exempt from state and municipal codes but there are limitations on how this Code is applied. 40 U.S.C.A, section 3312 requires that a federal agency consult with local code officials, submit plans for review and permit inspection of the construction project. The federal agency is required to give due consideration to any recommendations made by the local code official and build in compliance with nationally recognized building, electrical, fire, life safety and plumbing codes. A federal agency is exempt from any fees and no enforcement action can be brought against the federal agency for failure to comply with the law.*]

(d) "**Historic building**" or "historic structure" means any structure which has been listed in the National Register of Historic Places or the state register of historic properties or which has been determined to be historically significant by the Vermont advisory council on historic preservation or which meets the standards adopted by the division for historic preservation pursuant to subsection 723(a) of Title 22.

(e) The phrase "damage or destroy the historic architectural integrity of the historic building or structure" means to have an undue adverse impact on historically significant features of the historic architectural integrity of the building.

§ 2731. Rules; inspections; variances

(a) The commissioner is authorized to adopt rules regarding the construction of buildings, maintenance, and operation of premises, and prevention of fires and removal of fire hazards, and to prescribe standards necessary to protect the public, employees, and property against harm arising out of or likely to arise out of fire.

(b) The commissioner shall conduct inspections of premises to assure that the rules adopted under this subchapter are being observed and may establish priorities for enforcing these rules and standards based on the relative risks to persons and property from fire of particular types of premises. The commissioner may also conduct inspections to assure that buildings are constructed in accordance with approved plans and drawings.

(c) The following fire prevention and building code fees are established:

(1) The permit application fee for a construction plan approval shall be:

(A) The **permit application fee** for a construction plan approval shall be based on $5.50 per each $1,000.00 of the total valuation of the construction work proposed to be done for all buildings, but in no event shall the permit application fee exceed $185,000.00 nor be less than $50.00. (2) When an inspection is required due to the **change in use** of a public building, the fee shall be $125.00.

(3) The **proof of inspection fee** for fire suppression, alarm, detection, and any other fire protection systems shall be $30.00.

(d) The commissioner shall make all practical efforts to process permits in a prompt manner. The commissioner shall establish time limits for permit processing as well as procedures and time periods within which to notify applicants whether an application is complete.

(e) The commissioner may grant **variances or exemptions** from rules adopted under this subchapter where strict compliance would entail practical difficulty, unnecessary hardship, or is otherwise found unwarranted, provided that:

(1) Any such variance or exemption secures the public

safety and health; and

(2) any petitioner for such a variance or exemption can demonstrate that the methods, means, or practices proposed to be taken in lieu of compliance with the rule or rules provide, in the opinion of the commissioner, equal protection of the public safety and health as provided by the rule or rules; and

(3) the rule or rules from which the variance or exemption is sought has not also been adopted as a rule or standard under subchapters 4 and 5 of chapter 3 of Title 21; and

(4) any such variance or exemption does not violate any of the provisions of chapters 3 and 20 of Title 26 or any rules adopted thereunder.

(f) The commissioner shall, in state-funded buildings or new additions to state-funded buildings on which construction is begun after June 30, 2001, meet the standards contained in "**The Vermont Guidelines for Energy Efficient Commercial Construction**" as published in its most recent edition by the department of public service.

(h) A building owner or contractor engaged in an older and historic renovation project may propose innovative, performance-based alternatives in lieu of strict fire and building code compliance. The commissioner shall consider such alternatives and shall accept those that provide equivalent protection of the public safety and health. A decision to accept or deny a proposed alternative shall be in writing and explain the reasons for accepting or denying the alternative.

(i)(1) The department approves stamped architectural plans by issuing a plan review letter. If, upon final inspection, the department requires structural changes, additional life safety modifications, or state-mandated accessibility modifications, and the modifications or changes are not the result of design or construction changes by the owner, the owner or architect:

(A) May apply for a variance or exemption as provided in subsection (e) of this section, section 2732 of this title, and section 2902 of this title; and

(B) If the variance or exemption request is denied, upon the completion of the structural changes or additional life safety, or state-mandated accessibility modifications, as the case may be, may apply to the commissioner for a reimbursement of some or all of the plan review fee paid for the project.

(2) The decisions of the commissioner, pursuant to this subsection, shall be final. The commissioner shall adopt rules to carry out the provisions of this subsection. This subsection shall not apply to design or construction changes necessary to comply with an alternative method of life safety code or state-mandated accessibility compliance requested by the owner after the plan review.

(j) Rules adopted under this section shall require that information, written, approved, and distributed by the commissioner, on the type, placement, and installation of photoelectric smoke detectors and carbon monoxide detectors be conspicuously posted in the retail sales area where the detectors are sold.

§ 2732. Historic variance appeals board; variances; exemptions

(a) An historic variance appeals board is created. The board shall consist of the following three members: the commissioner of public safety or designee, who shall be chair; the state historic preservation officer or designee; and a representative of the Vermont historic preservation community appointed by the governor. A board member who is not a state employee shall be entitled to compensation and expenses as provided by section 1010 of Title 32.

(b) The board shall hear and determine all requests for variances or exemptions from the rules adopted by the commissioner under this subchapter for historic buildings and structures. A request for a variance or exemption may be granted where an applicant has demonstrated that strict compliance would entail practical difficulty, or unnecessary hardship, or would damage or destroy the historic architectural integrity of the historic building or structure, or is otherwise found unwarranted, provided that:

(1) Any such variance or exemption secures the public safety and health;

(2) Any petitioner for such a variance or exemption can demonstrate that the methods, means, or practices proposed to be taken in lieu of compliance with the rule or rules provide, in the opinion of the board, equal protection of the public safety and health as provided by rule or rules;

(3) The rule or rules from which the variance or exemption is sought have not also been adopted as a rule or standard under subchapters 4 and 5 of chapter 3 of Title 21; and

(4) Any such variance or exemption does not violate any of the provisions of chapters 3 and 20 of Title 26 or any rules adopted thereunder.

(c) The board may permit a person seeking a variance or exemption to phase in compliance with the rules adopted under this subchapter in lieu of or in addition to granting the variance or exemption requested. The period of phased in compliance shall be reasonable but shall state a date by which compliance shall be achieved.

(d) Any person seeking a variance or exemption for work involving an historic building shall file a written request with the commissioner. The request shall describe the rule or rules from which the variance or exemption is sought, the reasons why a variance or exemption is sought, and a description as to how any alternative means of protecting the public safety and health is to be provided. The board shall meet and consider such requests within 15 working days of the request being filed with the commissioner. In deciding whether to grant or deny the request, the board shall take testimony or receive information from the applicant or his or her representatives, and from fire safety division staff. A decision of the board based on a majority vote of those members present shall be binding. The board shall issue a written determination granting or denying, in whole or in part, any variance or exemption request, or permission to phase in compliance, within 60 days of hearing the request. If a grant is conditional, the condition shall be clearly stated in writing. Failure to act on a request within 60 days shall be deemed approval of the request, provided that the public safety and health is not imminently threatened.

(e) The board may adopt, amend, or repeal procedural rules to carry out the provisions of this section.

(f) The board is attached to the department of public safety for administrative purposes.

(g) The board shall be subject to the requirements of subchapters 2 and 3 of chapter 5 of Title 1.

§ 2733. Orders to repair, rehabilitate, or remove structure

(a) Whenever the commissioner finds that premises or any part of them does not meet the standards adopted under this subchapter, the commissioner may order it repaired or rehabilitated. If it is not repaired or rehabilitated within a reasonable time as specified by the commissioner in his or her order, the commissioner may order the premises or part of them closed, if by doing so the public safety will not be imperiled; otherwise he or she shall order demolition and removal of the structure, or fencing of the premises. Whenever a violation of the rules is deemed to be imminently hazardous to persons or property, the commissioner shall order the violation corrected immediately. If the violation is not corrected, the commissioner may then order the premises or part of them immediately closed and to remain closed until the violation is corrected.

(b) Whenever a structure, by reason of age, neglect, want of repair, action of the elements, destruction, either partial or total by fire or other casualty or other cause, is so dilapidated, ruinous, decayed, filthy, unstable, or dangerous as to constitute a material menace or damage in any way to adjacent property, or to the public, and has so remained for a period of not less than one week, the commissioner may order such structure demolished and removed.

(c) Orders issued under this section shall be served by certified mail with return receipt requested or in the discretion of the commissioner, shall be served in the same manner as summonses are served under the Vermont Rules of Civil Procedure promulgated by the supreme court, to all persons who have a recorded interest in the property recorded in the place where land records for the property are recorded, including owners, tenants, mortgagees, attaching creditors, lien holders, and public utilities or water companies serving the premises.

§ 2734. Penalties

(a) A person who violates any provision of this subchapter or any order or rule issued pursuant thereto shall be fined not more than $10,000.00. The state's attorney of the county in which such violation occurs shall prosecute the violation and may commence a proceeding in the superior court to compel compliance with such order or rule, and such court may make orders and decrees therein by way of writ of injunction or otherwise.

(b) A person who fails to comply with a lawful order issued under authority of this subchapter in case of sudden emergency shall be fined not more than $20,000.00. A person who fails to comply with an order requiring notice shall be fined $200.00 for each day's neglect commencing with the effective date of such order or the date such order is finally determined if an appeal has been filed.

(c) The commissioner may, after notice and opportunity for hearing, assess an administrative penalty of not more than $1,000.00 for each violation of this subchapter or any rule adopted under this subchapter. Penalties assessed pursuant to this subsection shall be based on the severity of the violation. An election by the commissioner to proceed under this subsection shall not limit or restrict the commissioner's authority under subsection (a) of this section.

(d) Violation of any rule adopted under this subchapter shall be prima facie evidence of negligence in any civil action for damage or injury which is the result of the violation.

§ 2736. Municipal enforcement

(a) The legislative body of a municipality may appoint one or more trained and qualified officials and may establish procedures to enforce rules and standards adopted under subsection 2731(a) of this title. After considering the type of buildings within the municipality, if the commissioner determines that the training, qualifications and procedures are sufficient, he or she may assign responsibility to the municipality for enforcement of some or all of these rules and standards. The commissioner may also assign responsibility for enforcement of the rules of the access board adopted under section 2902 of this title. The commissioner shall provide continuing review, consultation, and assistance as may be necessary. The assignment of responsibility may be revoked by the commissioner after notice and an opportunity for hearing if the commissioner determines that the training, qualifications, or procedures are insufficient. The assignment of responsibility shall not affect the commissioner's authority under this subchapter.

(b) If a municipality assumes responsibility under subsection (a) of this section for performing any functions that would be subject to a fee established under subsection 2731(a) of this title, the municipality may establish and collect reasonable fees for its own use, and no fee shall be charged for the benefit of the state.

(c) Subject to rules adopted under section 2731 of this title, municipal officials appointed under this section may enter any premises in order to carry out the responsibilities of this section. The officials may order the repair, rehabilitation, closing, demolition, or removal of any premises to the same extent as the commissioner may under section 2732 of this title.

(d) Upon a determination by the commissioner that a municipality has established sufficient procedures for granting variances and exemptions, such variances and exemptions may be granted to the same extent authorized under subsection 2731(b) of this title.

(e) The results of all activities conducted by municipal officials under this section shall be reported to the commissioner periodically upon request.

(f) Nothing in this section shall be interpreted to decrease the authority of municipal officials under other laws, including laws concerning building codes and laws concerning housing codes.

Current cooperative municipal inspection agreements include:

Barre *- Responsibility for the enforcement of the Code for all existing public buildings except federally certified health care facilities, high-rise buildings, state owned buildings, and the testing and reporting of fire protection systems by technically qualified people.*
Bellows Falls *- Responsibility for the enforcement of the Code for all existing public buildings except federally certified health care facilities, high-rise buildings, state owned buildings, and the testing and reporting of fire protection systems by technically qualified people.*
Bennington *- Responsibility for the enforcement of the Code for all new & existing public buildings except federally certified health care facilities, high-rise buildings, state owned buildings, and the testing and reporting of fire protection systems by technically qualified people.*
Brattleboro *- Responsibility for the enforcement of the Code for all existing public buildings except federally certified health care facilities, high-rise buildings, state owned buildings, and the testing and reporting of fire protection systems by technically qualified people.*
Burlington *- Responsibility for the enforcement of the Code for all new and existing public buildings except federally certified health care facilities, state owned buildings, and the testing and reporting of fire protection systems by technically qualified people.*
Hartford *- Responsibility for the enforcement of the Code for all new and existing public buildings except day-care, health care, detention and correctional and residential board and care facilities, state owned buildings, high-rise buildings and the testing and reporting of fire protection systems by technically qualified people.*
Montpelier *- Responsibility for the enforcement of the Code for all new and existing public buildings except day-care, health care, detention and correctional and residential board and care facilities, state owned buildings, high-rise buildings and the testing and reporting of fire protection systems by technically qualified people*
Putney *- Responsibility for the enforcement of the Code for all existing public buildings except federally certified health care facilities, state owned building, and the testing and reporting of fire protection systems by technically qualified people.*
St. Albans *- Responsibility for the enforcement of the Code for all existing public buildings except assembly, business, educational, day-care, health care, detention and correctional, mercantile, and residential board and care facilities, state owned buildings, high-rise buildings and the testing and reporting of fire protection systems by technically qualified people.*
Winooski *- Responsibility for the enforcement of the Code for all existing public buildings except educational, day-care, health care, detention and correctional and residential board and care facilities, state owned buildings, high-rise buildings and the testing and reporting of fire protection systems by technically qualified people.*

§ 2737. Building permits

Each municipality shall provide to the commissioner upon request information regarding building permits issued by the municipality.

§ 2799. Definitions

As used in this subchapter:

(1) "Explosive material" includes "explosives," "explosive material," "blasting agents," and "detonators," as defined in section 841 of Title 18 of the United States Code, as amended at any time, and regulations promulgated thereunder.

(2) "Flammable material" means, in addition to its ordinary meaning, motion picture film.

(3) "Hazardous material" means any substance having such properties that it may spontaneously or acting under the influence of anything contiguous or of any chemical or physical agency ignite or generate flammable or explosive vapors or gases to a dangerous extent.

(4) "Petroleum product" includes without limitation liquid petroleum gas, explosive flammable gases, and flammable fluids, compounds, or tablets, derived in whole or in part from petroleum.

§ 2800. Rules and standards

The commissioner may adopt rules and standards for explosion prevention, fire prevention, and public safety with respect to the safekeeping, storage, use, manufacturing, sale, handling, transportation, and other disposition of explosive materials, flammable materials, hazardous materials, petroleum, and petroleum products. The commissioner may prescribe the location, materials, and construction of buildings and other facilities to be used for these purposes.

§ 2801. Seizure of materials

Without warrant, the commissioner, a member of the state police, a sheriff, a deputy sheriff, a police officer, or a constable may seize materials held by a person in violation of rules adopted under this subchapter and hold the same subject to the order of the court taking jurisdiction of the offense.

§ 2802. Orders

After an inspection, the commissioner may issue an appropriate order to remove or abate a condition dangerous to persons or property involving explosive materials, flammable materials, or hazardous materials. This order shall be served on the owner or occupant of the premises on which the condition exists.

§ 2685. Record of fires

The fire marshal shall keep in his office a record of every fire occurring in this state which causes serious injury to any person or loss or damage to property in excess of $200.00. He shall record all the facts concerning these fires, including statistics as to their extent and the damage caused thereby, and whether the losses were covered by insurance and, if so, in what amount. The record shall be made daily from the reports made to him under the provisions of this chapter. All such records shall be public, except information and testimony taken where arson is suspected.

§ 2833. Reports to fire marshal

(a) The chief of a volunteer or paid fire department or, if there is no fire department, the first selectman of a town, shall within five days of the occurrence of a fire within his jurisdiction which causes serious injury to any person or loss or damage to property which exceeds $200.00, forward a report of the fire to the state fire marshal on forms to be furnished by him. If the reporting officer has reason to believe that a fire is of suspicious origin, he shall report that fact to the state fire marshal immediately. No fee shall be paid or allowed any officer for rendering the report required by this subsection.

(b) An officer referred to in subsection (a) of this section who willfully neglects to comply with any of the requirements of this subchapter shall be fined not more than $100.00.

§ 2881. General provisions

(a) A person shall not install or maintain a boiler or pressure vessel which is unsafe or likely to be unsafe to other persons or property.

(b) A person shall not operate, cause to be operated, or permit to be operated any boiler or pressure vessel under his or her control or ownership, in a manner which causes or is likely to cause harm to other persons or property.

§ 2882. Rules

The commissioner may adopt rules pertaining to boilers and pressure vessels, and standards to be observed, necessary for the safety and protection of the public, employees and property. All standards adopted by the commissioner shall conform to the codes of the American Society of Mechanical Engineers and the National Board of Boiler and Pressure Vessel Inspectors. The commissioner may provide for operating certificates to be issued before a boiler or pressure vessel may be used.

§ 2883. Boiler inspections

The commissioner has authority to obtain specific information from boiler inspectors on forms which shall first be approved by the commissioner. The commissioner may authorize qualified inspectors to conduct inspections under such rules as the commissioner may prescribe. If a boiler or pressure vessel is insured, the inspection may be conducted by a qualified inspector who is employed, or contractually authorized, by the insurer. If a boiler or pressure vessel is not insured, the inspection may be conducted by any qualified inspector authorized by the commissioner. In case the inspection is made by such an inspector, no fee shall be charged by the division, except a process fee of $30.00 for issuance of an operating certificate. The fee for a person requesting a three-year authorization to conduct inspections shall be $150.00. A licensed boiler inspector shall carry liability insurance in an amount determined by the department. (Added 2003, No. 141 (Adj. Sess.), § 4a, eff. April 1, 2005; amended 2009, No. 134 (Adj. Sess.), § 4.)

§ 2884. Qualifications of inspectors

All boiler inspectors, employed by the state and insurance companies, shall have passed the examination required by the National Board of Boiler and Pressure Vessel Inspectors, and hold annual certification from such board.

§ 2885. Penalties

The commissioner may assess penalties pursuant to section 2734 of this title against a person who violates this subchapter or any rule adopted under this subchapter.

Chapter 177 § 3131. Definitions

The term **"fireworks"** means any combustible or explosive composition, or any substance or combination of substances, or article prepared for the purpose of producing a visible or an audible effect by combustion, explosion, deflagration or detonation, including blank cartridges, toy pistols, toy cannons, toy canes, or toy guns in which explosives are used, balloons that are propelled by explosives, firecrackers, torpedoes, sky rockets, Roman candles, cherry bombs, or other fireworks of like construction and any fireworks containing any explosive or flammable compound, or any tablets or other device containing any explosive substance, except sparklers. The term "fireworks" does not include toy pistols, toy canes, toy guns, or other devices in which paper caps containing 0.25 grains or less of explosive compound are used, providing they are so constructed that the hand cannot come in contact with the cap when in place for use, and toy pistol paper caps that contain less than 0.2 grains of explosive mixture. The term "fireworks" does not include fixed ammunition for firearms, or primers for firearms. The term "sparkler" means a sparkling item that is in compliance with the United States Consumer Product Safety Commission regulations and is one of the following:

3132. Prohibitions; permits

(a) Except as provided in this section, it shall be unlawful for any person, firm, co-partnership, or corporation to do any of the following:

(1) Offer for sale, expose for sale, sell at retail or wholesale, or possess fireworks unless the person has been issued a permit by both the U.S. Bureau of Alcohol, Tobacco, and Firearms and the municipality in which the person offers for sale and stores the fireworks.

(2) Use, possess, or explode any fireworks unless the person has been issued a permit to display fireworks pursuant to subsection (c) of this section.

(3) Transport fireworks except in interstate commerce.

(4) Offer for sale or sell hand-held sparklers as described in subdivision 3131(1) of this title to a minor.

(5) Offer for sale or sell sparklers that are not in compliance with the United States Consumer Product Safety Commission regulations.

(b) The state fire marshal shall have power to adopt reasonable rules and regulations for granting permits for supervised public displays of fireworks by municipalities, fair associations, amusement parks, and other organizations or groups of individuals.

(c) Any display for which a permit is issued shall be handled by a competent operator to be approved by the chiefs of police and fire departments of the municipality in which the display is to be held and shall be of a character, and so located, discharged or fired as, in the opinion of the chief of the fire department, or in a municipality with no fire department, the selectboard, after proper inspection, shall not be hazardous to property or endanger any person or persons.

(d) Application for permits shall be made to the chief of the fire department, or in municipalities with no fire department, the selectboard, in writing, at least **15 days in advance** of the date of the display. After the permit has been granted, sales, possessions, use and distribution of fireworks for the display shall be lawful for that purpose only. No permit granted under this section shall be transferable.

§ 3136. Construction

Being in the interest of public safety the provisions of this subchapter shall be liberally construed.

Title 20 CHAPTER 201. PUBLIC ASSEMBLIES

*A **commercial public assembly permit** issued by the Vermont State Police is required for an **outdoor gathering of two thousand or more people** in a public place when payment is required for admission. A permanent stadium used for sporting events, or a fairground having permanent seats for patrons, does not require a commercial public assembly permit. An application for a commercial public assembly permit must be filed with Vermont State Police Headquarters, 103 South Main St., Waterbury, VT 05671-2101, at least 30 days prior to the event.*

For additional information contact (802) 241-5270, or online at
http://vsp.vermont.gov/about_us/divisions/field_force/assembly_permits

Annex II — *Excerpts from the Architects and Professional Engineering Licensing and Registration Laws*

Title 26 Professions and Occupations *Chapter 3: ARCHITECTS*

§ 121. Definitions

(5) The "practice of architecture" means providing professional services such as consultation, investigation, evaluation, planning, designing (including structural design), or responsible supervision of construction in connection with any building or structure which has as its principal purpose human occupancy or habitation.

§ 124. Construction; exemptions

(a) This chapter shall not be construed to affect or prevent:

(1) The practice of engineering by a professional engineer licensed under the laws of this state;

(2) The preparation of working drawings, details and shop drawings by persons other than architects for use in connection with the execution of their work;

(3) Employees of those lawfully practicing as architects under the provisions of this chapter from acting under the instruction, control, or supervision of their employers;

(4) Supervision by builders or superintendents employed by such builders, of the construction or structural alteration of buildings or structures;

(5) Design and construction, and the provision of services related thereto, of the following if the structure is:

(A) A detached single, two-family, three-family, or four-family dwelling, or a shed, storage building or garage incidental to that dwelling;

(B) A farm building, including barns, silos, sheds or housing for farm equipment and machinery, livestock, poultry or storage; or

(C) A pre-engineered building, or a building, plans for which have been stamped or sealed by a licensed professional in the appropriate field.

(b) The provisions of this section shall not be construed to permit any person not licensed as provided in this chapter to use the title architect, or any title, sign, card, or device to indicate that such person is an architect.

(c) This chapter shall not be construed to limit or restrict in any manner the right of a practitioner of another profession or occupation from carrying on in the usual manner any of the functions incidental to that profession or occupation.

§ 208. Seal

Each licensee shall obtain a seal of such design as the board shall authorize and direct. Plans and specifications prepared by, or under the direct supervision of, a licensed architect shall be stamped with the licensee's seal.

Chapter 20 § 1161. Definitions

(2) **"Professional engineering services"** means any service or creative work, the adequate performance of which requires engineering education, training and experience in the application of special knowledge of the mathematical, physical and engineering sciences. This includes consultation, investigation, evaluation, planning and design of engineering works and systems, planning the use of land and water and accomplishing engineering surveys. Such services or work may be either for public or private purposes, and may be performed in connection with any utilities, structures, buildings, machines, equipment, processes, work systems, projects, and equipment systems of a mechanical, electrical, hydraulic, pneumatic or thermal nature, insofar as they involve safeguarding life, health or property.

(6) "Professional engineer" means a person licensed under this chapter.

§ 1163. Exemptions

(a) Persons exempt. Section 1162 of this title does not prohibit acts constituting the practice of engineering performed as a necessary part of the duties of:

(1) An officer or employee of the federal government.

(2) An officer or a full-time employee of the state.

(3) An officer or full-time employee of a municipality.

(4) Certain classes of licensed potable water supply and wastewater system designers, as designated by rule of the secretary of the agency of natural resources, who design supplies or systems with a design flow of up to 1,350 gallons per day and who are licensed under chapter 64 of Title 10.

(5) An officer or employee of a corporation engaged in interstate commerce as defined in the act of Congress entitled "An Act to Regulate Commerce" approved February 4, 1887, as amended.

(6) An officer or employee of a corporation in interstate communications as defined in the act of Congress entitled "Communications Act of 1934" or of a telephone company under the supervision and regulation of the department of public service.

(7) An employee of a professional engineer.

(8) Students of engineering acting under the supervision of a professional engineer.

(b) Other professions. Section 1162 of this title does not prohibit acts constituting the practice of any other legally recognized profession or occupation.

(c) Purposes exempt. Section 1162 does not prohibit any person from performing acts constituting the practice of engineering for the purpose of:

(1) Designing or fabricating a manufactured product.

(2) Designing or constructing a building which is not a public building as defined in Title 18.

(3) Designing or constructing a building which contains only one, two or three dwelling units, or accessory outbuildings.

(4) Construction of public works by a municipality.

(5) Designing or constructing recreational trails and trail-related structures by a not-for-profit organization whose trails have been recognized by the agency of natural resources as part of the Vermont trails system; provided such organization purchases and maintains liability insurance in the amount required by law or under a contract with the state of Vermont, but in no event in an amount that is less than $100,000.00.

(e) Temporary practice. Section 1162 does not prohibit a person who has become a resident of this state within the preceding six months from performing acts constituting the practice of engineering, provided that:

(1) the person has filed an application for a license under this chapter; and

(2) the person is licensed or registered as a professional engineer in another state which, in the opinion of the board, has licensing standards substantially equivalent to those applicable under this chapter.

§ 1188. Seal

(a) Each licensee shall obtain a seal of a design authorized or approved by the board. The seal shall bear the licensee's name and the title "professional engineer."

(b) Plans, specifications, plats and reports issued by a licensee shall be stamped with his seal and shall also be signed by the licensee.

Title 9: Commerce and Trade

Chapter 77 SMOKE DETECTORS AND CARBON MONOXIDE DETECTORS

§ 2881. Definitions

For the purpose of this chapter:

(1) "Single-family dwelling" means any building or structure in which a family, families or households reside that contains sleeping facilities and is not otherwise classified as a "public building" as defined in section 20 V.S.A. section 2730 or as a "condominium" or "multiple unit dwelling" as defined in section 20 V.S.A. section 2729(d).

(2) "Smoke detector" means a device that detects visible or invisible particles of combustion and sounds a warning alarm, is operated from a power supply, within the unit or wired to it from an outside source, and is approved or listed for the purpose by Underwriters Laboratory or by another nationally recognized independent testing laboratory.

(3) "Carbon monoxide detector" means a device with an assembly that incorporates a sensor control component and an alarm notification that detects elevations in carbon monoxide levels and sounds a warning alarm, is operated from a power supply within the unit or wired to it from an outside source, and is approved or listed for the purpose by Underwriters Laboratory or by another nationally recognized independent testing laboratory.

§ 2882. Installation

(a) A person who constructs a single-family dwelling shall install photoelectric-only-type smoke detectors in the vicinity of any bedrooms and on each level of the dwelling, and one or more carbon monoxide detectors in the vicinity of any bedrooms in the dwelling in accordance with the manufacturer's instructions. In a dwelling provided with electrical power, the detectors shall be powered by the electrical service in the building and by battery.

(b) Any single-family dwelling when transferred by sale or exchange shall contain photoelectric-only-type smoke detectors in the vicinity of any bedrooms and on each level of the dwelling installed in accordance with the manufacturer's instructions and one or more carbon monoxide detectors installed in accordance with the manufacturer's instructions. A single-family dwelling constructed before January 1, 1994 may contain smoke detectors powered by the electrical service in the building or by battery, or by a combination of both. In a single-family dwelling newly constructed after January 1, 1994 that is provided with electrical power, smoke detectors shall be powered by the electrical service in the building and by battery. In a single-family dwelling newly constructed after July 1, 2005 that is provided with electrical power, carbon monoxide detectors shall be powered by the electrical service in the building and by battery.

(c) Nothing in this section shall require an owner or occupant of a single-family dwelling to maintain or use a smoke detector or a carbon monoxide detector after installation.

§ 2883. Requirements for transfer of dwelling

(a) The seller of a single-family dwelling, including one constructed for first occupancy, whether the transfer is by sale or exchange, shall certify to the buyer at the closing of the transaction that the dwelling is provided with photoelectric-only-type smoke detectors and carbon monoxide detectors in accordance with this chapter. This certification shall be signed and dated by the seller.

(b) If the buyer notifies the seller within ten days by certified mail from the date of conveyance of the dwelling that the dwelling lacks any photoelectric-only-type smoke detectors or any carbon monoxide detectors or that any detector is not operable, the seller shall comply with this chapter within ten days after notification.

(c) Violation of this section or of the installation requirements of section 2882 shall not create a defect in title.

Residential Single Station Smoke Alarm (Detector) Installation Guidelines

		Occupancy	Type	Required Power Supply	Required Locations	Reference	Notes
1	NEW Building	**OWNER – OCCUPIED Single Free Standing Dwelling**	Photoelectric only alarms required to be installed	Hardwired into the building electric system with battery backup.	In the immediate vicinity of sleeping rooms and on all floor levels including the basement.	VSA Title 9 Chapter 77	
		ALL OTHER DWELLING UNITS	Photoelectric only alarms required to be installed	Hardwired into the building electric system with battery backup.	In the immediate vicinity of sleeping rooms, inside each sleeping room and on all floor levels including the basement.	NFPA 101 Section 24.3.4.1 Section 30.3.4.5	All smoke alarms within the dwelling unit must be interconnected.
2	EXISTING Building	**OWNER – OCCUPIED Single Free Standing Dwelling**	Photoelectric only alarms required to be installed at time of transfer by sale or exchange	Built before **01/01/1994:** Hardwired into the building electric system <u>OR</u> by Battery. Built after **01/01/1994:** Hardwired into the building electric system with battery backup.	In the immediate vicinity of sleeping rooms and on all floor levels including the basement.	VSA Title 9 Chapter 77	The seller of a single-family dwelling shall certify to the buyer that smoke and CO alarms are installed using the DFS form. See General Note # 3
		1 & 2 DWELLING UNITS IN THE SAME BUILDING	All alarms newly installed or replaced alarms are required to be Photoelectric	All Newly installed and Replacement smoke alarms must be Hardwired into the building electric system with battery backup. By a battery when existing smoke alarm/s is less then ten (10) years from the date of manufacture and is installed in approved locations.	In the immediate vicinity of sleeping rooms and on all floor levels including the basement. Alarms shall be installed in side of all sleeping rooms by 11/1/15	NFPA 101 Section 24.3.4.1.1 Section 9.6.2 And VT Code Amendments Section 9.6.2.12 Section 9.6.2.10.2.1	Hardwired into the building electric system with battery backup will be required if alarms are not being maintained.
		3 OR MORE DWELLING UNITS IN THE SAME BUILDING	All alarms newly installed or replaced alarms are required to be Photoelectric	Hardwired into the building electric system with battery backup.	In the immediate vicinity of sleeping rooms, on all floor levels including the basement. Alarms shall be installed in side of all sleeping rooms by 11/1/15	NFPA 101 Section 31.3.4 Section 31.3.4.5.3 NFPA 72 Section 11.5.4 Section 31.3.4.5.3	See General Note # 5

3 General Smoke Alarm Notes:

1. Combination photoelectric smoke and CO alarms are acceptable for new installations or replacements. Combination smoke alarms that include Ionization and photoelectric sensors in the same alarm are not permitted to be used for new installations or replacements.

2. Lodging and Rooming Houses or Bed & Breakfast establishments that provide sleeping accommodations for 6 - 16 persons on a transient or permanent basis shall have smoke alarms installed in every sleeping room. Existing battery-powered smoke alarms, shall be permitted where the facility demonstrates that the testing, maintenance, and battery replacement programs will ensure reliability of the smoke alarms. Smoke alarms shall not remain in service longer than 10 years from the date of manufacture. All Newly installed and Replacement smoke alarms must be Hardwired into the building electric system with battery backup.

Bed and Breakfast establishments that provide sleeping accommodations for less than 6 people and is occupied by the proprietor may be classified as a single free standing dwelling.

3. Smoke alarms shall not remain in service longer than 10 years from the date of manufacture.

4. One and Two family dwellings used as a licensed family day care home (3-12 clients) shall also include single station smoke alarms in each room used for sleeping.

5. All smoke alarms within the dwelling unit must be interconnected in new buildings or existing buildings undergoing reconstruction or extensive modification. Smoke alarms required by 31.3.4.5.3 shall be installed in all sleeping rooms by 11/1/2015 at which time all smoke alarms must be electrically wired.

6. For stairways leading up from a basement, smoke alarms shall be located on the basement ceiling near the entry to the stairs.

7. Existing smoke alarms installed within 20 ft of a cooking appliance shall be photoelectric type.

8. Smoke alarms shall not be installed within 36 in. of a door to a bathroom containing a shower or tub.

9. Smoke alarms shall not be installed within 36 in of forced air heating or cooling system registers or smoke alarms may not be installed within 36 in. from the tip of the blade of a ceiling-suspended (paddle) fan.

[Updated November, 2012]

CARBON MONOXIDE ALARM REQUIREMENTS

	Occupancy	Power Supply	Code Reference	Location	** Notes
1.	Existing 1&2 family dwellings	Battery, directly hardwired into the building's electrical circuit, or plug in type. **No transition period to require upgrade to electric power**	(VFBSC) Vermont Fire & Building Safety Code Page 9 – add section 24.3.4.4 to NFPA 101, 2012	Outside each sleeping area in the immediate vicinity of the bedrooms. An additional detector shall be installed in each sleeping room that contains a fuel- burning appliance. ** See Note	** Detectors required only on floor levels where sleeping rooms are provided. ** Have your heating appliance serviced by a certified fuel service technician.
2.	*New 1 & 2 Family Dwelling constructed after October 22, 2005*	Directly hardwired into the building's electrical circuit with battery back up. Plug in type not considered direct wired	(VFBSC) Page 9 – add section 24.3.4.4 to NFPA 101, 2012	Outside each sleeping area in the immediate vicinity of the bedrooms. An additional detector shall be installed in each sleeping room that contains a fuel- burning appliance. ** See Note	** Detectors required only on floor levels where sleeping rooms are provided. ** Have your heating appliance serviced by a certified fuel service technician.
3.	Existing Apartment Buildings/Condos (3 or more units)	Effective Oct. 22, 2005 - Battery, directly hardwired into the building's electrical circuit, or plug in type. ** See Note	(VFBSC) Page 10 –Add section 31.3.4.6 to NFPA 101, 2012	Outside each sleeping area in the immediate vicinity of the bedrooms. An additional detector shall be installed in each sleeping room that contains a fuel- burning appliance. ** See Note	** Effective October 1, 2007 the detectors are required to be directly hardwired with battery back up. ** Detectors required only on floor levels where sleeping rooms are provided.
4.	New Apartment Buildings/Condos (3 or more units)	Effective Oct. 22, 2005- Directly hardwired into the building's electrical circuit with battery back up.	(VFBSC) Page 10 –Add section 30.3.4.6 to NFPA 101, 2012	Outside each sleeping area in the immediate vicinity of the bedrooms. An additional detector shall be installed in each sleeping room that contains a fuel- burning appliance. ** See Note	** Detectors required only on floor levels where sleeping rooms are provided. ** Have your heating appliance serviced by a certified fuel service technician.
5.	Existing Hotels, Motels, Dormitories, and Rooming and Lodging	Effective Oct. 22, 2005 the power may originate from battery, direct wire, or plug in type. ** See Note	(VFBSC) Page 9–Add section 29.3.4.6 to NFPA 101, 2012	Outside the guest rooms in the corridor spaced in accordance with the manufacturer's installation instructions. Inside each bedroom where there is no corridor, and in each sleeping room provided with a fuel-burning appliance. ** See Note	** Detectors must be installed in accordance with the manufacturer's installation instructions. Effective October 1,07 battery detectors shall be up - graded to direct wire with battery back up.
6.	New Hotels, Motels, Dormitories, and Rooming and Lodging built after Oct. 22, 2005	Effective Oct. 22, 2005- Directly hardwired into the building's electrical circuit with battery back up. ** See Note	(VFBSC) Hotels & Dorms- Page 9 (28.3.4.6) Rooming & Lodging Page 9 (26.3.3.5.4)	Outside the guest rooms in the corridor spaced in accordance with the manufacturer. Inside each bedroom where there is no corridor, and in each sleeping room provided with a fuel - burning appliance.	** Detectors must be installed in accordance with the manufacturer's installation instructions.
7.	Single-family owner occupied home	Effective 7-01-05, new homes directly wired into the house electrical circuit. Existing homes battery, directly wired into house circuit, or plug-in.	9 VSA Chapter 77 VFBSC – page 39	Outside each sleeping area in the immediate vicinity of the bedrooms. An additional detector is recommended in any sleeping room that contains a fuel-burning appliance. **See Note	** Detectors required only on floor levels where sleeping rooms are provided. ** Have your heating appliance serviced by a certified fuel service technician.

"Install and maintain detectors in accordance with the manufacturer's installation instructions and NFPA 720"

[Updated October 1, 2012]

Annex IV Information for Historic Buildings

Vermont has an unusually high proportion of older buildings. These buildings contribute substantially to the sense of community and place that makes Vermont unique. At the same time, these buildings may be particularly challenging to adaptively reuse. Owners of older and historic buildings should seek the assistance of experienced designers specializing in the preservation of these structures. Division for Historic Preservation and Division of Fire Safety staff will assist in using the features of this *Code* to preserve and enhance historic buildings. Clear and comprehensive information on the significant historic features needs to be provided to the Division to facilitate review.

There are a number of codes that are part of this *Code* specifically written for existing and historic buildings;

* NFPA 1, Fire Prevention Code, primarily addresses maintenance and the operation of buildings with performance guidelines for historic buildings.

* NFPA 73, Residential Electrical Code, addresses electrical code requirements in existing residential units.

* NFPA 101, Life Safety Code, principally addresses life safety issues and has specific chapters for existing buildings.

* NFPA 909, Protection of Cultural Resources including Museums, Libraries and places of worship, brings together the design and implementation of fire protection plans designed to protect both people and property.

*NFPA 914, Code for Fire Protection of Historic Structures, addresses the identification of existing conditions, planning and fire protection practices for historic buildings.

The regional offices of the Division of Fire Safety are staffed with safety professionals who have training and experience in developing solutions to meet both safety and historic preservation concerns.

If a solution to a problem has not been developed after plan review or inspection, the owner or designated representative should contact the regional manager for assistance. With more experience and resources to draw on the regional manager often will develop a solution without requesting a formal variance.

For many buildings there are alternatives for certain code requirements that will provide an equivalent level of safety for the people using the building. To facilitate the review process for historic buildings, a fire safety plan should be developed. Guidance for that plan is found in Section 10.3 of NFPA 914 and Section 2.2 of NFPA 909. Additional flexibility is provided for historic buildings having the option to use the Alternative Approaches to Life Safety contained in NFPA 101A.

Fire Alarm and Detection Systems

Fire alarm and detection systems provide early warning of a fire allowing for safe evacuation of the building and a prompt response of fire suppression activities. There are numerous types, styles and designs of fire alarm and detection equipment that provide options and flexibility for sympathetic installation in historic buildings.

(See NFPA 914, Appendix F or NFPA 909, Appendix C for a general discussion of fire alarm systems and NFPA 101 Section 9.6)

Fire Extinguishing Systems

Automatic fire sprinkler systems and other types of automatic fire extinguishing systems provide early warning of a fire allowing for safe evacuation of the building and provide prompt suppression of the fire using a minimal amount of water.

Each sprinkler head has to be heated to a certain temperature by a fire before water is released. Most fires are extinguished by the operation of just one or two sprinkler heads due to the prompt response by the sprinkler system. The amount of water applied to a fire is much less than what would need to be applied by a fire hose line.

(See NFPA 914, Appendix D or NFPA 909 Appendix C for a general discussion of fire extinguishing systems and NFPA 101 Section 9.7)

Automatic fire sprinkler systems have an excellent record of success in saving both people and property. Because of the excellent experience of automatic fire sprinkler systems the Codes have fewer requirements for buildings that have automatic fire sprinkler systems. For example, the Codes would drop or "trade off" certain requirements for historic buildings that have an automatic fire sprinkler system.

To promote the installation of fire sprinkler systems in existing buildings in designated downtown areas, a **rebate of up to $2,000** of the construction permit fee is available to applicants where a complete fire sprinkler system is installed.

The process for receiving the rebate includes providing documentation from the City or Town Clerk that the building is in a designated downtown area; completion of the fire sprinkler system in accordance with appropriate codes and final acceptance testing and approval of the fire sprinkler system.

Vermont tax credits are also available for the installation of sprinkler systems and elevators in designated downtown areas, contact the Agency of Commerce & Community Development at 800-622-4553.

Maintenance and Testing of Fire Protection Systems

To help assure that fire protection systems will function properly when needed, all fire protection systems such as a fire alarm, sprinkler or kitchen hood exhaust systems are required to be tested periodically by a technically qualified person who is certified by the Division of Fire Safety. Upon completion of the test, the technically qualified person will affix an inspection sticker and notify the Division of Fire Safety of the results of the inspection.

Use of Archaic Building Materials

Building materials used within buildings are evaluated for "interior finish ratings" and "fire resistance ratings."

1) Interior finish ratings include evaluations for flame spread, fuel contribution and smoke development. Interior finish ratings are classified as A, B or C. Common archaic finish material such as plaster, tile flooring, wood flooring and metal ceilings will normally meet the standards for interior finish.

Wood trim and incidental finish which is less than 10% of the aggregate wall and ceiling areas will also meet the standards for interior finish. Wood paneling which consists of more than 10% of the aggregate wall and ceiling areas will also meet the standards for interior finish in a number of historic buildings such as a bed and breakfast with 16 or fewer guests. However, in some buildings such as schools, the wood paneling would need to be treated with a fire retardant finish. The fire retardant finishes are available in both clear and solid color. The application of a fire retardant finish would not be required for wood paneling in a building provided with an automatic fire sprinkler system.

2) Fire resistance ratings evaluate building walls, ceilings or doors for the amount of time that it would resist the passage of fire. Construction assemblies can be evaluated by standard tests, rating guidelines published by nationally recognized authorities or by engineering analysis. Many common archaic construction assemblies have substantial resistance ratings while other assemblies may need to be enhanced to meet fire resistance requirements.

Fire resistance requirements are commonly found in the code for separation walls that separate a more hazardous area from the rest of the building, such as a boiler room or stairway walls which protect the means of egress from a building.

The requirements for construction or wall assemblies with fire resistance ratings in a building are reduced or totally eliminated for existing buildings with an automatic fire sprinkler system.

Field Guide for Historic Buildings

The Field Guide is designed to be used by those involved at all levels in the alteration process of historic and older buildings, including: trades persons, planners, architects, engineers, and property owners.

The purpose of the Field Guide is to illustrate and describe successful examples of code compliance that reconcile safety considerations with preservation goals. In addition to explaining the code requirements and listing sources for further referencing, this guide also encourages and outlines the early and continued cooperation between those directly involved in the project with local code and preservation officials.

For a downloadable copy go to:

http://accd.vermont.gov/strong_communities/preservation/education/accessibility

Annex V — Contact Information:

The Division of Fire Safety's four Regional Offices are located in:

Barre	Rutland
1311 U. S. Route 302 – Suite 500 Barre, VT 05641 802.479.4434 Toll free: 888.870.7888 Fax: 802.479.4446	56 Howe Street Building A – Suite 200 Rutland, VT 05701 802.786.5867 Toll free: 888.370.4834 Fax: 802.786.5872
Springfield	**Williston**
100 Mineral Street, Suite 307 Springfield, VT 05156 802.885.8883 Toll free: 866.404.8883 Fax: 802.885.8885	372 Hurricane Lane, Suite 102 Williston, VT 05495 802.879.2300 Toll free: 800.366.8325 Fax: 802.879.2312
The Vermont Fire Academy	**The Division of Fire Safety Main Office**
93 Davison Drive Pittsford, VT 05763 802.483.2755 Toll Free 800.615.3473 Fax: 802.483.2464	1311 U. S. Route 302 – Suite 600 Barre, Vermont 05641-2351 802.479.7561 Toll Free 800.640.2106 Fax: 802.479.7562

Codes and Standards Adopted and referenced under this ***Code*** are available at:

National Fire Protection Association

1 Batterymarch Park
Quincy Mass 02169-9101
1-800-344-3555

www.nfpa.org/

International Code Council, Publications

4051 West Flossmoor Road
Country Club Hills
Illinois, 60478-5795
888-422-7233 800-786-4452

www.iccsafe.org

American Society for Testing and Materials

100 Barr Harbor Drive
West Conshohocken PA 19428-2959
610-832-9585

www.astm.org/

American Society of Heating Refrigeration and Air Condition Engineers

1791 Tullie Circle N.E.
Atlanta, GA 30329
404-636-8400

www.ashrae.org/

American Welding Society, Inc.

550 N.W. Lejunne Road
P.O. Box 351040
Miami FL 33135
1-800-443-9353

www.aws.com

Compressed Gas Association, Inc.

4221 Walney Road, 5th Floor
Chantilly, VA 20151-2923
703-788-2700

www.cganet.com/default.html

American Society of Mechanical Engineers

22 Law Drive, Box 2900
Fairfield, NJ 07007
1-800-843-2763

www.asme.org/

National Board of Boiler & Pressure Vessel Inspectors

1055 Crupper Ave.
Columbus, Ohio 43229-1183
614-888-8320

www.nationalboard.org

Annex VI

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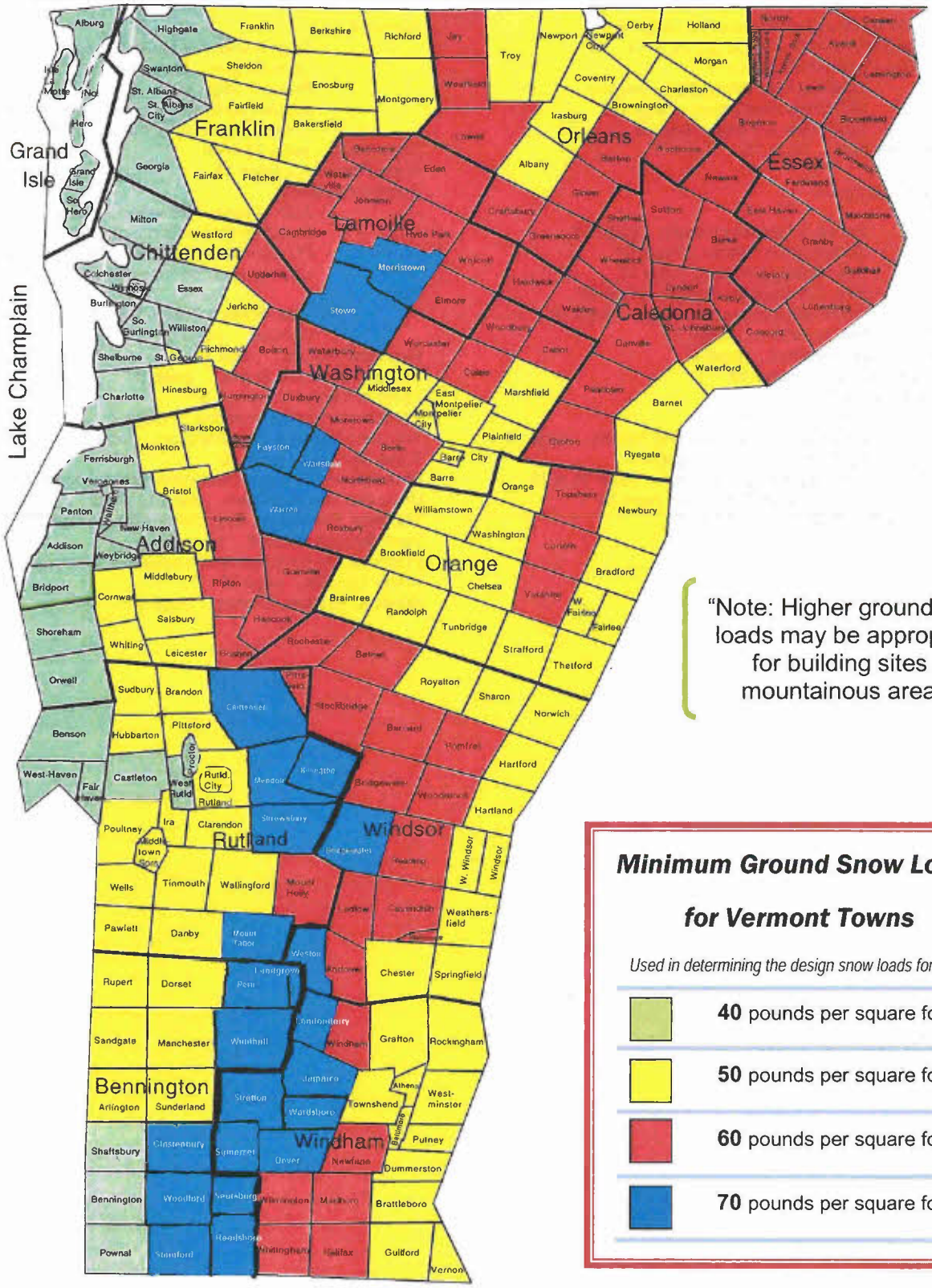
Annex VII

Ground Snow Loads, Pg, for Vermont by Town or City



"Note: Higher ground snow loads may be appropriate for building sites in mountainous areas."

Minimum Ground Snow Loads for Vermont Towns

Used in determining the design snow loads for roofs

- **40** pounds per square foot
- **50** pounds per square foot
- **60** pounds per square foot
- **70** pounds per square foot

VIRGINIA

CODES AND STANDARDS COMMITTEE
2009 CODE CHANGE CYCLE – BOOK 5
June 7, 2010

OPENING STATEMENT

TAB 1 ----- Summary of April 23 and April 29, 2010 Workgroup Meetings.

TAB 2 ----- Residential Sprinkler Related Proposals.

Proposal Number	Description of Change	Page No.
C-310.6(R313.1)	Residential Sprinkler Coalition	6
C-310.6(R329)	Fire Extinguishers Kitchens	170

TAB 3 ----- Carry-over Proposals from the May 10, 2010 Codes and Standards Committee Meeting

Proposal Number	Description of Change	Page No.
C-310.6(E3802.4)	Wiring in Crawlspaces	173
C-1301(402.1.1)	Log Home Walls	175
C-3001.2.1	Elevator Performance Standard	177
C-3102.5	Separation Distance Property Lines	179
F-2205.4	Distance from Dispensers	181

TAB 4 ----- Code Changes Considered through the Workgroup Process and Recommended for Approval as Submitted or As Modified.

USBC, Part I, Virginia Construction Code

Proposal Number	Description of Change	Page No.
C-101.2(b) (one proposal substituted)	VCC – Multiple Changes	184
C-102.3(7)	Federal Exemption	187
C-410.2 (clarify proposed regulation)	Stages	190
C-422(a) and (b) (one proposal substituted)	Ambulatory Health Care Facilities	194
C-424(a)-(d) (one proposal substituted)	Fertilizer Tanks	200
C-705.2(a) and (b)	Separation of Porches and Decks	204
C-1018.2	Corridor Width Group I-2	211
C-1301(402.4.2)(b) and (c)	Duct and Blower Door Testing (who may do test)	214

USBC, Part III, Virginia Maintenance Code

Proposal Number	Description of Change	Page No.
M-105.1.1	Unsafe Structures Rewrite	219

Virginia Statewide Fire Prevention Code

Proposal Number	Description of Chauge	Page No.
F-506.1	Key Boxes	223
F-3301.2.3.1	Fireworks Display Personnel	226
F-3308.4	Separation Distance – Fireworks	239

TAB 5 ----- Code Changes Considered Through Workgroup Process and Recommended for Disapproval.

USBC, Part I, Virginia Construction Code

Proposal Number	Description of Change	Page No.
C-1301	Delete IRC Energy Provisions	242

TAB 6 ----- Code Changes Considered Through Workgroup Process as Non-consensus.

USBC, Part I, Virginia Construction Code

Proposal Number	Description of Change	Page No.
C-109.3.1(a) and (b)	Construction Documents	280
C-307.1	Group H Fireworks	292
C-308.1	Assisted Living Facilities	296
C-403.3.5	Fire Command Rooms	307
C-907.2.3	Voice Alarm and Corridors Group E	309
C-908.1	Carbon Monoxide Groups R and I	318
C-1301(402.4.2)(a)	Duct and Blower Door Testing (random sampling)	325

Virginia Statewide Fire Prevention Code

Proposal Number	Description of Change	Page No.
F-106.3	Hazards to Life or Health	328
F-106.6	Use of Other Standards	333
F-107.14	SRCF Inspection Fees	338
F-506.3	Elevator Service Keys	343
F-2209.2.1	Hydrogen Dispensing	348
F-3301.2.2	Permissible Fireworks Sale	352

TAB 7 ----- Proposals to Implement Legislation (exempt from regulatory process since no agency discretion is necessary).

Proposal Number	Description of Change	Page No.
C-104.1	Legislative Changes	356

DHCD, DBFR 2009 Code Change Process

April 23, 2010 Meeting Summary

IRC – Residential Sprinkler Meeting

(4th meeting of the workgroup)

1. Discussed insurance impacts. No definitive conclusions. Heard anecdotal testimony on some savings, but not an overall industry savings. It was noted that probably over time where there is more data and trends developed, then rates may have evolved to find an industry saving rate on premiums for sprinklers.

2. Reviewed code changes. The sprinkler coalition summarized their positions on the townhome code change with the incentives being offered. The builders also commented and on their code change amended the fire extinguisher to be a 2A10BC type. The placement of the fire extinguisher was an issue for the fire officials believing the placement must be within the kitchen and not in a closet or cabinet. Discussed stovetop fire suppression canisters. Fire officials noted need to be listed.

3. IRC sprinklers to be on June 7th Codes and Standards Committee.

DHCD, DBFR 2009 Code Change Process

April 29, 2010 Meeting Agenda Package

Combined Workgroup – Remaining Code Changes

CODE CHANGE NUMBER

1. C-101.2 (b) VCC – Multiple Changes: Consensus to approve. This will be on the June 7th CSC Agenda.
2. C-102.3(7) Federal Exemption: Consensus to approve. This will be on the June 7th CSC Agenda.
3. C-103.5 (a) and (b) Alterations and Repair: Withdrawn by proponent.
4. C-109.3.1 (a) and (b) Construction Documents: Non-consensus. AIA would withdraw their code change if Dave Thomas' code change is denied. DHCD submitted a compromise for the 109.3 engineering data that allows requiring more MOE occupant data and provides flexibility for the policy of each building official. 109.5.1.1 needs review on public way. This will be on the June 7th CSC Agenda.
5. C-307.1 Group H Fireworks: Non-consensus. Industry is opposed and it is on the 2012 ICC agenda for consumer fireworks. This will not impact permissible fireworks. This will be on the June 7th CSC Agenda.
6. C-308.1 Assisted Living Facilities: Non-consensus. A revised code change will be reviewed with stakeholders prior to the CSC meeting. This will be on the June 7th CSC Agenda.
7. C-403.3.5 Fire Command Rooms: Non-consensus. One suggestion was to revise to state that the building official could allow up to 200 square feet where there is a demonstrated need for a larger room. AOBA may submit a revision prior to the CSC meeting. This will be on the June 7th CSC Agenda.
8. C-422 (a) and (b) Ambulatory Health Care Facilities: Consensus to approve as amended with new definition to ensure building official do not misapply B occupancy requirements for medical offices. This will be on the June 7th CSC Agenda.
9. C-424 (a) through (d) Fertilizer Tanks: Consensus to approve. SFPC will likely need legislation for maintenance and operational inspections for liquid fertilizer. This will be on the June 7th CSC Agenda.
10. C-705.2 (a) and (b) Separation of Porches and Decks: Consensus to deny both (a) and (b). Consensus to approve revised change allowing decks and unenclosed porches. This will be on the June 7th CSC Agenda.
11. C-907.2.3 Voice Alarm and Corridors Group E: Non-consensus. Private school representatives stated going from 50 to 30 is too stringent and they do not feel all small schools need these systems. This is a 2012 IBC code change that is not in the 2009 IBC. This will be on the June 7th CSC Agenda.
12. C-908.1 Carbon Monoxide Groups R and I: Non-consensus. The issue will be reviewed by stakeholders prior to the CSC meeting. This will be on the June 7th CSC Agenda.
13. C-1018.2 Corridor Width Group I-2: Consensus to amend #8 with I-2. This will be on the June 7th CSC Agenda.
14. C-1301(402.4.2) (a), (b) and (c) Duct and Blower Door Testing: Non-consensus for (a). Builders support testing one out of seven. There was discussion as to whether this would mean one of every seven permits applied for by each builder or one of every seven permits overall to capture permits applied for by owners. VBCOA opposes sampling. Consensus to approve (b) allowing any qualified person/company to perform the actual tests. This will be on the June 7th CSC Agenda.
15. C-1301 Delete IRC Energy Provisions: Consensus to deny. This will be on the June 7th CSC Agenda.
16. M-105.1.1 Unsafe Structures Rewrite: Consensus to approve the revised change from VBCOA VMC committee. The revised change would delete the new unsafe provisions in the IPMC for now while the committee works on correlating them with the VMC for the next code change cycle. Lynn Underwood preferred the withdrawal of the proposal in lieu of deleting the IPMC provisions and did not think the revised proposal was in order.

17. F-106.3 Hazards to Life or Health: Non-consensus. It was noted that the change is too broad. Revisions are needed, such as deleting "opinion of the fire official". Possible unintended consequences were discussed. Fire officials felt there might be a need with new technology. This will be on the June 7th CSC Agenda.
18. F-106.6 Use of Other Standards: Non-consensus. Staff noted that in a meeting with legal counsel, DHCD staff and VDFP staff, legal counsel gave verbal opinion that the code change was beyond the scope and could allow fire officials to use standards not approved by the BHCD. This will be on the June 7th CSC Agenda.
19. F-107.14 SRCF Inspection Fees: Non-consensus. Opposed by private school representatives and one ALF group. Fiscal data has not been provided. There was discussion as to why this would be done by number of occupants allowed rather than actual number or square footage. Questions were raised about a possible need for legislation, but the Code of Virginia does allow fees to cover expenses. Some revisions are needed with regard to the facilities covered, such as removing SRCF. This will be on the June 7th CSC Agenda.
20. F-506.1 Key Boxes: Consensus to approve. Questions were raised about whether current non-UL key boxes would have to be replaced, but that could be required now and this code change doesn't change the current language. A suggestion was made to link this to the USBC but this has not been submitted as a code change. This will be on the June 7th CSC Agenda.
21. F-506.3 Elevator Service Keys: Non-consensus. The revised code change does not address concerns from building owners and there were questions as to the enforcement of 506.3.1 #3. This will be on the June 7th CSC Agenda.
22. F-2209.2.1 Hydrogen Dispensing: Non-consensus. This is a 2012 ICC code change that has not been reviewed by VBCOA, VPMIA and the industry for USBC sections and correlation with other model codes. This will be on the June 7th CSC Agenda.
23. F-3301.2.2 Permissible Fireworks Sale: Non-consensus. Not allowable as written per legal counsel. No amendment has been submitted. This will be on the June 7th CSC Agenda.
24. F-3301.2.3.1 Fireworks Display Personnel: Consensus to approve with amendment to include volunteer language. This will be on the June 7th CSC Agenda.
25. F-3308.4 Separation Distance – Fireworks: Consensus to approve. This will be on the June 7th CSC Agenda.
26. Staff presented revisions to the USBC and IBSR from 2010 legislation. It includes appeals for aggrieved parties, allowance for IBSR to be appealed to the TRB, local fire ordinances decisions being appealed to the local boards, VADR permits subject to the 2% fee, and the allowance of temporary units without foundations and connections to the home (this one would require meeting with local zoning and building officials and the industry – HB1307). Consensus to approve. This will be on the June 7th CSC Agenda.
27. Staff presented a log home energy code change that allows approval for prescriptive path. VBCOA energy committee will review. This is supported by the industry. This will be on the May 10th CSC Agenda.
28. Staff presented IRC energy 3802.4 to delete crawl spaces that have become more stringent. The 2011 NEC has done a modification to only require over 4 ½ feet. The CSC will determine if it would like for staff to move forward with this change. If so, this will be on the June 7th CSC Agenda.
29. IBC 3008 – Occupant elevators. Proponent gave more reasons why this should be used in 420 feet buildings at this time. This was non-consensus at the March 25th meeting. If used in other buildings, the heat shunt trip is not used for self-evacuation. It needs to be submitted to the IBC and elevator representatives. There was a consensus to limit to 420 feet buildings for now until this issue is reviewed at ICC and industry standards for 2015. This will be on the May 10th CSC Agenda.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-310.6(R313.1)

Nature of Change:

A series of proposals for requiring sprinkler systems to be installed in new townhouses and to provide incentives for such systems to be installed more economically.

Proponent: James R. Dawson, Chesterfield County Fire Marshal, representing the Virginia Residential Sprinkler Coalition

Staff Comments:

These proposals are offered as a compromise to requiring all single family dwellings to be sprinklered. The townhouse proposal would permit a one-hour fire wall between units rather than the two-hour fire wall which is currently required for unsprinklered townhouses. An additional proposal would permit exterior walls of such sprinklered townhouses (end units) to be located as close as three feet to property lines without requiring the exterior wall to be rated. Other additional proposals address lessening the requirements for fire apparatus access roads, fire flow requirements and the number and distribution of fire hydrants in the Virginia Statewide Fire Prevention Code. While a sub-workgroup was established for the overall issue of residential sprinklers, no consensus has been achieved concerning these proposals or the proposal from the Home Builders of Virginia (Code Change No. C-310.6(R329)).

COMMENT RECEIVED

Beginning on Page No. 21

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

Code Change Number: C-310.6(R313.1)

Virginia Residential Sprinkler Coalition
A Partnership for Public Safety

September 7, 2009

Mr. Tom Fleury, Chairman
Board of Housing and Community Development
c/o Mr. Emory Rodgers, Deputy Director of Building and Fire Regulations
Main Street Centre
600 East Main Street, Suite 300
Richmond, Virginia 23219

RE: Virginia Residential Construction Code Amendment Proposals

Dear Mr. Fleury:

On behalf of the Virginia Residential Sprinkler Coalition (VARSC), an organization representing over 3000 building safety and fire safety professionals throughout the Commonwealth of Virginia, I submit the attached code change proposals as a package in an effort to enhance public safety for the citizens in our state.

We believe these changes represent a common sense approach to fire protection while offering cost saving reductions in building construction and infrastructure that will assist with off-setting the costs of these systems for the new home buyer. These changes have been fully vetted within the member organizations which make up the Coalition and the representative members of our Board of Directors unanimously support these changes as we present them here.

We have discussed this package with the Home Builders Association of Virginia and have asked for their suggestions on how these changes may be improved upon. They have not had the opportunity to present this information to their membership at the present time, therefore they have not offered any suggested changes to this comprehensive package. We have however received positive feedback from NAHB's leadership on our efforts to reach a common middle ground consensus.

We anticipate this code change package will be used in the upcoming discussions for the workgroups slated for later this year, and look forward to working with you and the other interest groups to move these changes forward as a complete comprehensive package.

Sincerely,

Submitted via e-mail
James R. Dawson, VARSC Chairman
Fire Marshal
CHESTERFIELD FIRE AND EMS
cc: HBAV, VBCOA, VPMIA, VFCA, IAFF, VFPA, VSFA

www.varsc.org

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual X Government Entity ☐Company

Name: Guy Tomberlin, Vice Chair Representing: VA Residential Sprinkler Coalition (VRSC)

Mailing Address: 12055 Government Center Parkway, Suite 630
Fairfax, VA 22035

Email Address: guy.tomberlin@fairfaxcounty.gov Telephone Number: 703–324–1611

Proposal Information Require mandatory sprinkler installation in all Townhouse construction with trade–off incentives, not including detached 1 and 2 family dwellings.

Code(s) and Section(s): 2009 IRC Section R313

Proposed Change (including all relevant section numbers, if multiple sections):

Retain, and implement provisions with adoption of the next USBC, current text exactly as it appears in the published International Code Council (ICC) International Residential Code (IRC) 2009 edition, Sections R 313.1, R 313.1.1, and R 302.2.

R 313.1 Townhouse automatic fire sprinkler systems. An automatic residential fire sprinkler system shall be installed in *townhouses*.

Exception: An automatic residential sprinkler system shall not be required when *additions* or *alterations* are made to existing *townhouses* that do not have automatic residential fire sprinkler system installed.

And

R 313.1.1 Design and installation. Automatic residential fire sprinkler systems for *townhouses* shall be designed and installed in accordance with Section P 2904.

And

R 302.2 Townhouses. Each *townhouse* shall be considered a separate building and shall be separated by fire–resistant–rated wall assemblies meeting the requirements of Section R 302.1 for exterior walls.

Exception: A common 1–hour fire–resistance–rated wall assembly tested in accordance with ASTM E 119 or UL 263 is permitted for townhouses if such walls do not contain plumbing or mechanical equipment, ducts or vents in the cavity of the common wall. The wall shall be rated for fire exposure from both sides and shall extend to and be tight against exterior walls and the underside of the roof sheathing. Electrical installations shall be installed in accordance with Chapters 34 through 43. Penetrations of electrical outlet boxes shall be in accordance with Section R 302.4

Supporting Statement (including intent, need, and impact of the proposal):
During the Public Hearings the BHCD encouraged communication between all interested parties with a underlying emphasis on compromise. This proposal is a result of the Boards direction. We would like to take this opportunity to elaborate on many of the issues that have been raised to date. We hope to dispel many of the misconceptions that have been put forward during public testimony by providing the applicable factual information. Our goal is to promote the installation of residential sprinklers while recognizing all sides of the issues by incorporating the concept of compromise and trade–off incentives in hopes the Board will view this recommendation favorably.

1. This proposal still maintains the optional (non–mandatory) installation of residential sprinklers in detached 1 and 2 family dwellings, just as industry has indicated the need for during this current economic environment. One philosophy for this proposal could be explained as this will "assist in the protection from others, outside the control of ones own family."
2. Sprinkler system installation has been required for 4 story townhouses since back in the Legacy code era (pre year 2000). So, we should be able to capture real life, actual added cost of the sprinkler system to the construction of a townhouse. We need to disregard the numbers of cost that have been brought forward because they are not based on the current economic environment or actual typical installations. This proposal is not a huge departure from current business operation, in fact a sprinkler system for a townhouse 3 stories or less should considerably less than a system install for a 4 story structure. The VRSC will attempt obtain real estimates for the average size 3 story or less townhouse, approximately (2,000 sq. ft?) form various contractors across the state and submit these estimates to the BHCD. This method will provide hard numbers, from contractors that have already been doing this type work and not arbitrary numbers that can be skewed one way or another. Hopefully some other industry groups will step up and provide actual documentation as to the cost for the installation of sprinklers in the average 4 story townhouses from existing projects. It appears that currently, 4 story townhouses are selling as well as any other type dwelling in this economy, they are not out of the market because they have a sprinkler system and therefore the cost is just too excessive.
3. There is not a maintenance issue to be concerned with, and no added cost throughout the life of the home. The Fire Official will not be visiting residential homes on a routine basis just as they do not visit the 4 story townhomes, or any residences that currently have sprinkler systems installed today. This is one vast misconception, unfortunately residential sprinkler systems are being confused with the only other systems people are familiar with..."commercial" systems. The residential system is not a separate independent system as in a commercial building. They are an active part of the homes water distribution system that supplies the water closets, kitchen sinks, and every other fixture that utilizes potable water. Therefore, these are nothing more than future water lines, not any different than the future water line installed in thousands of houses for future bathrooms such as in a basement location. There simply is no maintenance required for a future water line. The only other component of the system is the sprinkler head itself. Keep in mind, recessed heads are available on the market today and would probably be the most desirable. However, if someone elects to utilize a protruding type sprinkler head, there is still no maintenance required. It is no different than an outside hose bib that never gets used. Yes, there is a risk of physical damage but no more than any other plumbing fixture in the home.
4. Monitoring systems are not part of the required installation and design provisions. There really is not anything to monitor. However, if someone wanted to exceed the code requirements and install this type technology it should not be a problem.
5. There is not a marked increase chance for leaks and flooding damage. Plumbing water piping systems today are quite reliable. You just don't have pipes bursting as a routine typical occurrence, this situation has actually never been an issue unless it was related to a particular product failure. Residential sprinkler systems are nothing more than extensions of the typical house domestic piping. A guess would be, probably no more than an additional 10% of pipe and fittings would be required beyond what the system would have without a sprinkler system. Please note this is nothing more than a guesstimate and this does not increase the chance for leakage by 10%, just look at the statistics for pipe burst and you will see it is not a common occurrence.
6. Plumbing system design in VA inherently has always had another element to deal with, and that is the potential for pipes freezing. The front end design will have to take climatic conditions into consideration.

Sprinkler piping systems will ultimately end up using wall locations whenever possible of the top floors of dwelling units, just as for any other plumbing fixture. But when a room is to large for wall mounted sprinkler heads, provisions will have to be incorporated into the design and installation to prevent freezing conditions.

7. A Registered Design Professional (RDP) will not be required to design these systems and a licensed sprinkler contractor will not be required to install them. The current USBC Section 108.3 authorizes the owner of a property to apply for permitting and through the USBC and the Department of Occupation and Regulation (DPOR) an owner/occupant can perform the actual system installation. Therefore no contractor or RDP is required to be involved in the process. DPOR has said that since these provisions are located within the IRC and specifically in Chapter 29 (which is a plumbing chapter) that a licensed plumbing contractor will be able to obtain the permitting and perform the installation. So, a typical plumbing permit will be required and an owner can certainly use a specialty contractor or RDP if they elect but it is not required and should not be a problem if someone chooses to utilize any professional services.

8. Water tap fees are not going to increase drastically. For example, in Fairfax County the water authority has indicated that if a larger meter is required for the purpose of installing a residential sprinkler system (as opposed to more plumbing fixtures) than an increased meter size will cost an additional $150.00. In Chesterfield the water purveyor indicated that the larger meter would cost $45.00.

9. Residential sprinklers located in homes in rural areas do in fact have other things to take into consideration. Storage and water availability are issues that must be dealt with. However, well systems must have some type storage as well as a pump included in their initial installation. So yes the flow capacity of a pump may need to be increased as well as the tank capacity for water storage but keep in mind there is already the initial cost of the original installation components that must be accounted for before you factor in the increased size cost adjustments. The VRSC intends to obtain real cost estimates from plumbing supply wholesalers from across the state based on the estimates obtained from the contractors as outlined in item # 2 and will forward these cost estimates to the BHCD.

10. Finally there are several elements to the cost benefit analysis. Some which are just near impossible to place any type number on and claim accuracy. For example, we cant even look at 4 story town house statistics to see how well sprinklers are working, because there are so many 4 story units that predate the sprinkler mandate. It will take years before we can accurately get some numbers attached to the cost savings in the event of a fire happening in a dwelling unit with sprinklers. Another fallacy is to say that over X number of years that the cost will be recovered. From the VRSC perspective one life saved trumps all the cost incurred, others view this philosophy different. Savings can be recovered from things like fire rating reductions (as we have put forward), hydrant location, fire department staffing levels, fire department response time. smaller water mains due to reduction of hydrants, more narrow streets, etc.. All these things are continuously moving targets that no fixed savings number is going to satisfy. Anyone can do the math in order to gain their particular intended outcome. The bottom line, real facts are,

"residential sprinkler systems will increase the cost of construction and residential sprinkler systems will save lives." For further information on the Coalition please visit http://www.varsc.org/

Submittal Information

Date Submitted: September 8, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☒Individual ☐Government Entity ☐Company

Name: Shahriar Amiri Representing: VRSC

Mailing Address: 2100 Clarendon Blvd., Suite 1000, Arlington, VA 22201

Email Address: samiri@arlingtonva.us Telephone Number: 703-228-3848

Proposal Information

Code(s) and Section(s):

Proposed Change (including all relevant section numbers, if multiple sections): Change Exception 1 to current USBC Section R310.1 to read:

Exceptions:

1. Dwelling units equipped throughout with an approved automatic sprinkler system installed in accordance with NFPA 13, 13R ~~or~~ ,13D or Section P2904.

Supporting Statement (including intent, need, and impact of the proposal): This is an editorial change to add the reference to Section P 2904 as an acceptable method to sprinkler one and two-family dwellings.

Submittal Information

Date Submitted: September 7, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
Main Street Centre
600 E. Main St., Ste. 300
Richmond, VA 23219

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☒Individual ☐Government Entity ☐Company

Name: Shahriar Amiri Representing: VRSC

Mailing Address: 2100 Clarendon Blvd., Suite 1000, Arlington, VA 22201

Email Address: samiri@arlingtonva.us Telephone Number: 703-228-3848

Proposal Information

Code(s) and Section(s): Change Table R302.1 as follows:

Proposed Change (including all relevant section numbers, if multiple sections): **TABLE R302.1 EXTERIOR WALLS**

EXTERIOR WALL ELEMENT		MINIMUM FIRE-RESISTANCE RATING	MINIMUM FIRE SEPARATION DISTANCE
Walls	(Fire-resistance rated)	1 hour with exposure from both sides	< 5 feet [1]
	(Not fire-resistance rated)	0 hours	≥5 feet [1]
Projections	(Fire-resistance rated)	1 hour on the underside	≥ 2 feet to 5 feet [1]
	(Not fire-resistance rated)	0 hours	5 feet [1]
Openings	Not allowed	N/A	< 3 feet
	25% Maximum of Wall Area	0 hours	3 feet
	Unlimited	0 hours	5 feet [1]
Penetrations	All	Comply with Section R317.3	< 5 feet [1]
		None required	5 feet [1]

[1] 3 feet when dwelling units are equipped throughout with an approved automatic sprinkler system installed in

accordance with NFPA 13, 13R ,13D or Section P2904.

Supporting Statement (including intent, need, and impact of the proposal): 2003 IRC required that exterior walls of dwellings with fire separation distance of less than 3 feet to have a fire-resistance rating. USBC amended this requirement to 5 feet based on the IRC supplement. This proposal is to allow zero rated exterior walls from 3 to 5 feet provided that the dwelling unit is equipped throughout with an approved automatic sprinkler system established by the code. This reduction will provide a degree of protection for exterior walls permitted by 2003 IRC with the additional requirement that the dwelling be sprinklered.

Submittal Information

Date Submitted: September 7, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
Main Street Centre
600 E. Main St., Ste. 300
Richmond, VA 23219

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐ Individual ☐ Government Entity ☐ Company

Name: Robby Dawson, Chairman Representing: Virginia Residential Sprinkler Coalition

Mailing Address: 9800 Government Center Parkway, Chesterfield, VA 23832

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): IFC 503.2.1

Proposed Change (including all relevant section numbers, if multiple sections):
Change the following code sections as noted: Add exception as noted

503.2.1 Dimensions. Fire apparatus access roads shall have an unobstructed width of not less than 20 feet (6096mm), exclusive of shoulders, except for approved security gates in accordance with Section 503.6, and an unobstructed vertical clearance of not less than 13 feet 6 inches (4115mm)

Exception: Fire apparatus access roads exclusively serving fully sprinklered residential developments in accordance with IRC Section 313.1 or 313.2 shall have an unobstructed width of not less than 18 feet (5486mm), exclusive of shoulders.

Supporting Statement (including intent, need, and impact of the proposal):

With the improved fire safety of residential sprinklers, the need for apparatus access to combat large scale fires is reduced. This reduction in residential street width takes advantage of the inclusion of sprinklers in new construction. This reduction is limited to single family dwellings where the all dwelling units in the development are electively sprinklered and townhouse developments only.

This approach has been used in localities in Virginia already without fire service operational issues. This is also the standard used by a number of other communities where residential sprinklers are used as a community fire protection strategy. The reduction in impervious surface in addition to the infrastructure cost savings will offset the additional costs associated with fire sprinkler systems.

While no specific cost savings have been identified, this change would result in as much as a 10% reduction in certain required fire apparatus access roads and the resulting savings in materials and impervious surfaces will have a positive impact on the infrastructure costs and environmental impacts.

Submittal Information

Date Submitted: September 7, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: taso@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual ☐Government Entity ☐Company

Name: Robby Dawson, Chairman Representing: Virginia Residential Sprinkler Coalition

Mailing Address: 9800 Government Center Parkway, Chesterfield, VA 23832

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): IFC Appendix B Table B105.1

Proposed Change (including all relevant section numbers, if multiple sections):

See attached table

Supporting Statement (including intent, need, and impact of the proposal):

The reduction of required fire suppression water in structures protected with water based fire protection systems has been a long-standing trade-off in the International Building Code. With the addition of the residential sprinkler requirement in town home developments, and selected detached single family homes, the inclusion of these guidelines in the SFPC Appendix will allow local fire officials to base their decision for required fire flow on a consistent basis across the commonwealth.

The basis of the flows noted here are based on the fire ground formula of

$$\frac{\text{fire area square footage}}{3} = \text{required gpm}$$

These requirements also take into account the long-standing allowance of fire flow reductions when structures are equipped with a sprinkler system.

Cost savings associated with this change are difficult to estimate due to the variability between local water authorities. An estimate was prepared for a number of developments in Chesterfield County. The following is submitted as a comparison:

Small subdivision of 25 single family dwellings-
Cost as proposed - $172,353
Cost with reduced fire flow (smaller water lines) - $142,547
Savings - $29,806 ($1192 per unit)

Small townhouse project of 42 dwelling units-
Cost as proposed - $176,389
Cost with reduced fire flow (smaller water lines) - $143,556
Savings - $32,833 ($782 per unit)

Large subdivision of 103 single family dwellings –
Cost as proposed - $524,781
Cost with reduced fire flow (smaller water lines) - $433,381
Savings - $91,400 ($887 per unit)

These estimates are based on 3 planned developments currently in the approval process.

Submittal Information

Date Submitted: September 7, 2009 _____

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
taso@dhcd.virginia.gov
501 N. 2nd Street
Richmond, VA 23219-1321
or (804) 371-7150

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Phone Numbers: (804) 371-7140

TABLE B105.1
MINIMUM REQUIRED FIRE-FLOW AND FLOW DURATION FOR BUILDINGS[a]

FIRE-FLOW CALCULATION AREA (square feet)					FIRE-FLOW (gallons per minute)[c]	FLOW DURATION (hours)
Type IA and IB[b]	Type IIA and IIIA[b]	Type IV and V-A[b]	Type IIB and IIIB[b]	Type V-B[b]		
0-22,700	0-12,700	0-8,200	0-5,900	0-3,600 0-5,000[d]	1,500 1,000[d]	2
22,701-30,200	12,701-17,000	8,201-10,900	5,901-7,900	3,601-4,800 5,001-7,200[d]	1,750 1,250[d]	
30,201-38,700	17,001-21,800	10,901-12,900	7,901-9,800	4,801-6,200 7,201-8,200[d]	2,000 1,500[d]	
38,701-48,300	21,801-24,200	12,901-17,400	9,801-12,600	6,201-7,700 8,201-9,500[d]	2,250 1,750[d]	
48,301-59,000	24,201-33,200	17,401-21,300	12,601-15,400	7,701-9,400 9,501-11,000[d]	2,500 2,000[d]	
59,001-70,900	33,201-39,700	21,301-25,500	15,401-18,400	9,401-11,300 11,301-13,000[d]	2,750 2,250[d]	
70,901-83,700	39,701-47,100	25,501-30,100	18,401-21,800	11,301-13,400	3,000	3
83,701-97,700	47,101-54,900	30,101-35,200	21,801-25,900	13,401-15,600	3,250	
97,701-112,700	54,901-63,400	35,201-40,600	25,901-29,300	15,601-18,000	3,500	
112,701-128,700	63,401-72,400	40,601-46,400	29,301-33,500	18,001-20,600	3,750	
128,701-145,900	72,401-82,100	46,401-52,500	33,501-37,900	20,601-23,300	4,000	4
145,901-164,200	82,101-92,400	52,501-59,100	37,901-42,700	23,301-26,300	4,250	
164,201-183,400	92,401-103,100	59,101-66,000	42,701-47,700	26,301-29,300	4,500	
183,401-203,700	103,101-114,600	66,001-73,300	47,701-53,000	29,301-32,600	4,750	
203,701-225,200	114,601-126,700	73,301-81,100	53,001-58,600	32,601-36,000	5,000	
225,201-247,700	126,701-139,400	81,101-89,200	58,601-65,400	36,001-39,600	5,250	
247,701-271,200	139,401-152,600	89,201-97,700	65,401-70,600	39,601-43,400	5,500	
271,201-295,900	152,601-166,500	97,701-106,500	70,601-77,000	43,401-47,400	5,750	
295,901-Greater	166,501-Greater	106,501-115,800	77,001-83,700	47,401-51,500	6,000	
--	--	115,801-125,500	83,701-90,600	51,501-55,700	6,250	
--	--	125,501-135,500	90,601-97,900	55,701-60,200	6,500	
--	--	135,501-145,800	97,901-106,800	60,201-64,800	6,750	
--	--	145,801-156,700	106,801-113,200	64,801-69,600	7,000	
--	--	156,701-167,900	113,201-121,300	69,601-74,600	7,250	
--	--	167,901-179,400	121,301-129,600	74,601-79,800	7,500	
--	--	179,401-191,400	129,601-138,300	79,801-85,100	7,750	
--	--	191,401-Greater	138,301-Greater	85,101-Greater	8,000	

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895kPa.

a. The minimum required fire flow shall be allowed to be reduced by 25 percent for Group R.

b. Types of construction are based on the *International Building Code*.

c. Measured for 20 psi.

d. For use with town homes equipped with a residential sprinkler systems in accordance with R313.1 or when all detached single family homes in developments are equipped with sprinklers in accordance with NFPA13D, NFPA 13R or P2409.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual ☐Government Entity ☐Company

Name: Robby Dawson Representing: Virginia Residential Sprinkler Coalition

Mailing Address: 9800 Government Center Pky, Chesterfield, VA 23832

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): IFC Appendix C Table C105.1

Proposed Change (including all relevant section numbers, if multiple sections):

TABLE C105.1
NUMBER AND DISTRIBUTION OF FIRE HYDRANTS

FIRE –FLOW REQUIREMENT (GPM)	MINIMUM NUMBER OF HYDRANTS	AVERAGE SPACING BETWEEN HYDRANTS[a,b,c,f] (feet)	MAXIMUM DISTANCE FROM ANY POINT ON STREET OR ROAD FRONTAGE TO A HYDRANT[d,f]
1,750 or less	1	500	250
2,000 – 2,250	2	450	225
2,500	3	450	225
3,000	3	450	225
3,500 – 4,000	4	350	210
4,500 – 5,000	5	300	180
5,500	6	300	180
6,000	6	250	150
6,500 – 7,000	7	250	150
7,500 or more	8 or more[e]	200	150

For SI: 1 square foot = 0.0929 m^2, 1 gallon per minute = 3.785 L/m, 1 pound per square inch = 6.895kPa.
a. Reduce by 100 feet for dead-end streets or roads.
b. Where streets are provided with median dividers which can be crossed by fire fighters puling hose lines, or where arterial streets are provided with four or more traffic lanes and have a traffic count of more than 30,000 vehicles per day, hydrant spacing shall average 500 feet on each side of the street and be arranged on an alternating basis up to a fire-flow requirement of 7,000 gallons per minute and 400 feet for higher fire-flow requirements.
c. Where new water mains are extended along streets where hydrants are not needed for protection of structures or similar fire problems, fire hydrants shall be provided at spacing not to exceed 1,000 feet to provide for transportation hazards.
d. Reduce by 50 feet for dead-end streets or roads.
e. One hydrant for each 1,000 gallons per minute or fraction thereof.
f. The fire code official shall be permitted to increase spacing and distances by 100% for residential use group developments when all dwellings are protected with fire sprinklers in accordance with NFPA 13, 13R, 13D or P2409 standards.

Supporting Statement (including intent, need, and impact of the proposal):

This change to Appendix C provides for a reduction in the number of hydrants required in developments that utilize residential sprinklers. The language in footnote f indicates "shall be permitted" to account for individual fire service equipment standards. For those departments that carry greater than 1000 feet of supply hose, it would be logical to extend the distance by 100%. For those that carry 1000 feet or less, the distance between hydrants may be extended to a reasonable distance based on the local operational capabilities.

Submittal Information

Date Submitted: September 7, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: taso@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

Construction

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July 21, 2008

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

Dear Chairman Fleury:

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Nearly 80 percent of all fire deaths occur at home. Each year, approximately 3,000 people die in home fires, and sprinklers would have saved the vast majority of them. If you have a reported home fire, the risk of death is reduced by 80 percent with sprinklers. Home fire sprinklers save lives.

Careful consideration of this most important issue is necessary. The safety of Virginia residents must be the guideline for the Virginia Uniform Statewide Building Code (USBC). The BHCD should fully adopt the ICC mandate for residential fire sprinklers in the Virginia USBC.

Sincerely,

Heather Mason

Heather Mason
Manager, Organizational Development
REHAU Inc.

REHAU Incorporated·1501 Edwards Ferry Road, NE·Leesburg, VA 20176·Phone: (703) 777-5255·Fax: (703) 777-3053·www.rehau.com

Sibylle Behrens
43835 Eagle Bend Square 404
20176 Leesburg

Sibylle.behrens@gmx.de

07-21-2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

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Sincerely,

Sibylle Behrens

July 20, 2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

Dear Chairman Fleury:

A recent decision by the International Code Council (ICC) has resulted in a residential sprinkler requirement for all new one- and two-family homes and townhouses. As you are aware, in Virginia these requirements are subject to review and adoption by the BHCD. Currently, there is legislation in Virginia that, if passed, would prohibit this latest safety requirement for new home construction.

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Sincerely,

David E. Slye, Jr. Nancy L. Slye

David E. Slye Jr.
Nancy L. Slye

David E. Slye Jr. / Nancy L. Slye·403 River Park Lane, Bluemont, VA 20135·Phone: (540) 955-3483 · nlslye1@wmconnect.com

GUILBAUD ENTERPRISES

Architecture • Design • Build • Real Estate

July 20, 2009

Board for Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, Virginia, 23219

Dear Board Member,

As you know, one of the many important decisions you will make in conjunction with the 2009 Update of the Virginia Uniform Statewide Building Code (USBC) is the proposal to Mandate Fire Sprinkler Systems in all New One (1) and Two (2) Family Homes in Virginia. On behalf of the Tidewater Builders Association, we suggest that sprinklers should be an option that potential home buyers may request should they choose to install a system but not mandate for all new construction. As one of the business members of the Home Builders Association of Virginia (HBAV), I would strongly urge you to reject that proposal.

Thank you in advance for your review and again I would urge you to vote "NO" on the proposed to "MANDATE" sprinklers in new homes in Virginia.

Best Regards,

GUILBAUD ENTERPRISES INC.

Jean-Claude Guilbaud
President

924 Professional Place, Suite A • Chesapeake, Virginia 23320 • Office: 757.410.2940 • Fax 757.410.2074
e-mail info@guilbaudenterprises.com • www.GuilbaudEnterprises.com

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804.354.8830 Office • 804.358.6976 Fax

July 17, 2009

Board for Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, Virginia, 23219

Members of the Board:

The purpose of this letter is to express our strong opposition to the sprinkler mandate being considered by the BHCD. We are a builder in the Commonwealth with over 30 years of experience building quality, affordable homes.

The reasons behind our opposition are many. The attached editorial from The Roanoke Times describes the primary reason for our objection: lack of independent study confirming the benefits claimed by the sprinkler industry.

Other reasons include:

- Effectiveness of smoke alarms, working in much less time than it takes a sprinkler system to activate.
- Unintended damage from malfunction or sprinkler being activated in an entire home for a fire isolated to one room.
- Susceptibility to water damage from freezing.
- Another impediment to affordable housing.

We stand in opposition to this mandate with our trade association, the Home Builders Association of Virginia (HBAV). Please listen to the well reasoned arguments put forth by HBAV and vote "NO" to the sprinkler mandate.

Sincerely,
Keystone Builders Resource Group

V. Earl Dickinson, Jr.
President

Cc: Michael Toalson, HBAV

Construction

Automotive

Industry

July 28, 2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

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Careful consideration of this most important issue is necessary. The safety of Virginia residents must be the guideline for the Virginia Uniform Statewide Building Code (USBC). The BHCD should fully adopt the ICC mandate for residential fire sprinklers in the Virginia USBC.

Sincerely,

Joe Pinto
Manager – Supply Chain Management

REHAU Incorporated·1501 Edwards Ferry Road, NE·Leesburg, VA 20176·Phone: (703) 777-5255·Fax: (703) 777-3053·www.rehau.com

July 21, 2009

Simon Koenig
700 Somerset Park Dr. Apt. 204
Leesburg, VA 20175

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

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Sincerely,

Simon Koenig

Construction

Automotive

Industry

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Unlimited Polymer Solutions

07/21/2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

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Sincerely,

Dr. Alessandra Barelli
Chemistry Department Manager
REHAU Inc.

REHAU Incorporated·1501 Edwards Ferry Road, NE·Leesburg, VA 20176·Phone: (703) 777-5255·Fax: (703) 777-3053·www.rehau.com

Construction

Automotive

Industry

July 20, 2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
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Sincerely,

Gerard Shi

Gerard Shi
Technical Manager
REHAU Inc.

REHAU Incorporated·1501 Edwards Ferry Road, NE·Leesburg, VA 20176·Phone: (703) 777-5255·Fax: (703) 777-3053·www.rehau.com

Construction

Automotive

Industry

20 July, 2009

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Sincerely,

Thomas Moore
Engineer
REHAU Inc.

REHAU Incorporated 1501 Edwards Ferry Road, NE Leesburg, VA 20176 Phone: (703) 777-5255 Fax: (703) 777-3053 www.rehau.com

Construction

Automotive

Industry

REHAU

Unlimited Polymer Solutions

20 July 2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
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Sincerely,

Randy C. Hoover

Randy C. Hoover
Business Team Manager-Design, windows & Doors
REHAU Construction LLC

REHAU Incorporated 1501 Edwards Ferry Road, NE Leesburg, VA 20176 Phone: (703) 777-5255 Fax: (703) 777-3053 www.rehau.com

Fredericksburg Area Builders Association

3006 Lafayette Boulevard • Fredericksburg, VA 22408 • (540) 898-2730 • Fax (540) 898-2974 • www.fabava.com

July 17, 2009

Board for Housing and Community Development
Main Street Center
600 East Main Street
Suite 300
Richmond, Virginia 23219

Dear Members of the Board:

The International Code Commission (ICC), at its September 2008 meeting, voted to mandate the installation of fire sprinklers in all newly-constructed one and two-family homes. Because states have the option of removing some or all of the ICC codes when they adopt their building codes, Virginia may choose not to mandate installation of fire sprinklers. The Fredericksburg Area Builders Association respectfully requests the Board not to mandate installation of fire sprinklers in newly-constructed one and two-family homes.

The home building industry believes that mandating fire sprinklers is not a good idea. Sprinklers should be an option that potential home buyers may request should they choose to install a system. There are 10 persuasive reasons that back up our conclusion.

Statistics show today's better built homes are saving lives. From 1979-2003 the death rate per million persons from house fires dropped 58 percent, according to the U.S. Centers for Disease Control. That trend will continue as more new housing stock is built, stronger building codes are enacted and especially as smoke alarm maintenance by homeowners improves.

Sprinklers are rarely needed for house fires. Sprinkler proponents claim that a residential system is reliable in 96-99 percent of all reported structure fires where the fire was large enough to activate the system. But reports from the National Fire Prevention Association (NFPA) show that the number of fires that occur in one- and two-family dwellings equipped with sprinklers are so few that they are not shown in studies done by the organization.

Home insurance rates do not decrease with their use. Sprinkler proponents claim the cost of home insurance decreases when you install fire sprinklers. It's true that some states offer insurance credits for having fire sprinklers in the home. Using a conservative sprinkler cost estimate of $1.50 per square foot in a 2,300-square-foot home with an annual property insurance rate of $1,000, it would take approximately 35 years for a 10 percent credit to pay for the system. Insurance agents in the Richmond area say credits rarely are given above 3.5 percent. Throw in maintenance costs and it would take even longer for the credit to pay its due for the system.

However, that does not offset the increased costs charged for potential water damage and flooding. In most cases sprinklers go off in areas of the home where fire is not occurring, causing more claims for water damage than fire damage. Virginia insurance agents say this drives the cost of insurance higher for people who have sprinkler systems.

Smoke alarms potentially save more lives than sprinklers. A 2006 study by the U.S. Fire Association (USFA) on the presence of working smoke alarms in residential fires from 2001-2004 showed that 88 percent of the fatal fires in single-family homes occurred where there were no working smoke alarms. USFA and NFPA data continue to show that the vast majority of home fire fatalities occur when there are no operational smoke alarms. The most recent NFPA report on smoke alarms estimates that more than 890 lives could be saved annually if every home had a working smoke alarm. From 2000-2004, 65 percent of the fire fatalities reported occurred in homes where smoke alarms were not present or were present and did not operate.

Sprinklers will harm efforts at providing affordable housing statewide. According to an August 2006 survey of home builders done by the National Association of Home Builders' Research Center, the average sprinkler system costs $2.66 per square foot to install in a new home. For the average home size considered to be affordable housing in Virginia – 1,800 to 2,200 square feet – the maximum cost would be approximately $5,850. In the Richmond area, about 710 families lose the ability to qualify for a new home mortgage with each $1,000 increase in the price of a new home. Mandating fire sprinklers would keep more than 4,100 families from being able to buy affordable housing in the Richmond area.

In rural areas of Virginia not served by public water supply systems, the cost to install a sprinkler system would DOUBLE to nearly $10,000. Larger pumps would have to be installed water wells, a minimum 300 gallon storage blatter would have to be installed and it is likely that a back up generator would be required for required sprinkler systems to function during times when the homeowners electricity had been interrupted.

The Sprinkler Mandate will force more Virginians to seek less safe older housing. The anticipated cost of the Sprinkler Mandate ($2.66 per square foot) will force many Virginians to abandon their hope for a new home and force them to seek older less safe housing. Today's Building Codes already include many provisions and technology innovations designed to provide safety from fire. They include fire blocking, draft stopping, emergency escape and rescue openings, outlet spacing and capacity, fire walls and fire separation, modern heating systems and energy efficient housing and most importantly interconnected hard wired smoke detection systems. Don't force Virginians to choose less safe, less costly older housing.

Sprinklers are much more difficult and time consuming to maintain than smoke alarms. Homeowners have a difficult time remembering to change the batteries in their smoke alarms once every six months. A sprinkler system requires much more maintenance than simply replacing batteries. Based on the problems with maintaining smoke detectors, it is easy to deduce that homeowners will not maintain sprinkler systems at the level required for them to be at maximum efficiency. More lives can be saved by educating the public to the importance of maintaining hard-wired, interconnected smoke alarms in proper operating condition than through mandating fire sprinklers.

Sprinklers can be damaged by extreme cold, causing water damage. Should a home lose power for several days, as occurred in some parts of the Richmond area during the early March snowstorm, the basins that hold water for sprinkler use can freeze and burst. Homeowners most likely would have to take measures to keep heat in the water basins, further increasing the cost that many rural Virginians can't afford.

Annual sprinkler installation costs will greatly exceed property losses nationwide and in any jurisdiction where they are mandated. For example, had this mandate been in place in 2005 the installation cost to builders would have been almost $10.2 billion based on an average square-foot home with a cost of $2.66 per square foot. The NFPA reported that the total home property loss – new and existing homes – due to fire in 2005 was less than $5.8 billion. The installation cost would have been nearly double the loss. As new homes continue to be better built, the difference between installation cost and property loss will continue to increase, and statistics show most people forced to have these installed will never use them in their home.

For these reasons, the Fredericksburg Area Builders Association respectfully requests the Board for Housing and Community Development not to mandate installation of fire sprinklers in newly-constructed one and two-family homes.

Sincerely,

Bea Phelps

Bea Phelps
Executive Vice President

Virginia Fire Chiefs Association, Inc.
P.O. Box 70907, Richmond, Va. 23255-0907
Phone: 888-818-0983
Web Site: www.vfca.us

PRESS RELEASE

RELEASE DATE:
July 21, 2009

Contact Person:
J.W. "Jimmy" Carter jcarter@vfca.us

VIRGINIA FIRE CHIEFS SAY RESIDENTIAL SPRINKLER SYSTEMS SAVE LIVES

Since 2004, there have been 467 civilian deaths and more than $1.8 billion in property damage resulting from structure fires in the Commonwealth of Virginia. **The Virginia Fire Chiefs Association** believes that the most effective way to attack this problem is to adopt building code regulations that require sprinklers in one and two-family dwellings.

Sprinklers are a proven method of detecting and extinguishing fires in the incipient stage, thereby reducing the risk of death and unnecessary property damage, says James Gray, President of the Virginia Fire Chiefs Association The fire loss in residential occupancies in this country is alarming, and manual firefighting methods are not the answer. The way to attack the problem is to limit the fire growth where it occurs in dwellings, and we have the technology to do it. Studies by the U.S. Fire Administration indicate that the installation of residential fire sprinkler systems can save thousands of lives, prevent a large portion of injuries, and eliminate hundreds of millions of dollars in property loss. The cost effectiveness of these systems has been proven to positively impact fire safety for the citizens of the community and the firefighters who respond to the calls.

The effectiveness of residential sprinkler systems has been well documented since the first community required their use in 1969. The three decades of history in San Clemente, California, as well as decades of experience in other localities, has proven these systems are a reliable and cost effective strategy which has a profound impact on fire injuries and deaths. The unintended consequence has also been a considerable reduction in property loss due to fires as well. With today's light weight construction and given the high heat release rates of today's furnishings and decorations, it is imperative to have active fire safety features in new homes. Based on a National Institute of Standards and Technology study, the occupants of today's modern homes have only three minutes to evacuate.

Unfortunately, the arguments made by opponents against these systems are not based upon established fact, rather supposition and fear tactics which were the same arguments used to oppose residential smoke detectors. If they would thoroughly educate themselves on residential sprinkler technology, they would surely understand that developers and builders can achieve reduced construction costs while providing higher value homes for their customers and, at the

same time, enhance public safety in the Commonwealth of Virginia. This point was reinforced in a study released July 15th, 2009 by the National Fire Protection Association.

The Virginia Department of Housing and Community Development will hold a public hearing on July 27th to determine if Virginia will follow model code requirements and require sprinklers in one and two-family dwelling units. The **Virginia Fire Chiefs Association** recommends the DHCD Board remove the one and two family requirement from the 27th agenda to allow for an opportunity to have dialog and draft a compromise solution.

340E Shanks Hall
Department of English
Virginia Tech
Blacksburg, VA 24061

Phone: 540-231-6442
URL: http://www.rhetoric.english.vt.edu

Center for the Study of Rhetoric in Society

12 July 2009

To Whom It May Concern:

Paul Whitney has asked me to write a letter supporting his continued efforts to equip residences with life-saving technologies and to educate high-risk populations with pertinent fire prevention and safety materials. It is my pleasure to write such a letter.

During the spring semester of 2009, I worked with Mr. Whitney as part of Virginia Tech's Citizen Scholar graduate student certificate program. The partnership was quite natural, as I serve as the Assistant Director of Virginia Tech's Center for the Study of Rhetoric in Society—a departmental center that researches, among other things, risk communication. Together, Mr. Whitney and I discussed recent research on fire and risk, identified the needs for new fire safety and prevention approaches for the college population, and established contacts throughout the university.

While Mr. Whitney's knowledge about fire safety and prevention proves impressive, his desire to affect a positive change in society proves even more so.

I encourage you to partner with Mr. Whitney on future fire prevention and safety initiatives.

Sincerely,

Brian Gogan
Assistant Director
Brian.Gogan@vt.edu

Construction
Automotive
Industry

REHAU®
Unlimited Polymer Solutions

30-July-2009

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

Dear Chairman Fleury:

A recent decision by the International Code Council (ICC) has resulted in a residential sprinkler requirement for all new one- and two-family homes and townhouses. As you are aware, in Virginia these requirements are subject to review and adoption by the BHCD. Currently, there is legislation in Virginia that, if passed, would prohibit this latest safety requirement for new home construction.

I am writing to you to encourage the BHCD to adopt the new residential sprinkler mandate when it updates the 2009 IRC for Virginia. Nearby Montgomery County, MD has long since created such a mandate along with most other US states that will adopt the ICC requirement. By prohibiting the mandate of fire sprinkler systems in new one- and two-family homes, Virginia residents would be placed at unnecessary risk.

Many of our places of employment, education and civic buildings are already protected by sprinklers. The place where families are most vulnerable - their homes - should be protected by sprinklers, as well.

Nearly 80 percent of all fire deaths occur at home. Each year, approximately 3,000 people die in home fires, and sprinklers would have saved the vast majority of them. If you have a reported home fire, the risk of death is reduced by 80 percent with sprinklers. Home fire sprinklers save lives.

Careful consideration of this most important issue is necessary. The safety of Virginia residents must be the guideline for the Virginia Uniform Statewide Building Code (USBC). The BHCD should fully adopt the ICC mandate for residential fire sprinklers in the Virginia USBC.

Sincerely,

Jonathan Bittenbender
Engineering Manager

(also Technical Committee Member – National Fire Protection Association NFPA 13D Standard for residential sprinkler systems)

REHAU Construction LLC· 1501 Edwards Ferry Road, NE· Leesburg, VA 20176· Phone: (703) 777-5255· Fax: (703) 777-3053· www.rehau.com

NVR

Dwight C. Schar
Chairman

July 14, 2009

Board for Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219

Dear Board Members:

On behalf NVR Ryan Homes and NV Homes I would take this opportunity to urge the Board to accept the recommendation of your Codes and Standards Committee to make the installation of Sprinkler systems an option in Virginia. NVR has been constructing homes since 1948 and is one of the largest builders on the East Coast of the nation.

NVR prides itself on its' ability to construct a high-quality affordable home for its customers, including many Virginians. Our company can only achieve that goal through our high volume production, high volume purchasing and a building system whose efficiency we believe is second to none.

I believe that mandating a requirement that all new single family homes we construct will NOT allow NVR to continue to construct affordable new homes in Virginia. The Sprinkler Mandate will increase our core cost and disrupt the efficiency of our building systems.

Having reviewed the many statistics surrounding this issue, I also fail to see the need for this Sprinkler Mandate. NVR already includes fire blocking, draft stopping, emergency escape and rescue openings, outlet spacing and capacity, fire walls and fire separation, modern heating systems and energy efficient housing and most importantly interconnected hard-wired smoke detection systems in every new home we construct.

Once again, I would urge the Board to accept the earlier recommendation of your Codes and Standards Committee to make the installation of Sprinkler systems an option in Virginia, and to resist the unproven need to Mandate Sprinklers in all new 1 & 2 family dwelling units.

Best regards,

Dwight C. Schar
Chairman of the Board
NVR, Inc.

11700 Plaza America Drive
Suite 500
Reston, VA 20190
(703) 956-4200

** TOTAL PAGE.02 **

Hodge, Vernon (DHCD)

From: Eubank, Paula (DHCD)
Sent: Thursday, July 30, 2009 9:58 AM
To: Hodge, Vernon (DHCD)
Subject: FW: NFPA Testimony

As mentioned.

Paula N. Eubank
Associate Director of TASO
Division of Building and Fire Regulation
Virginia Department of Housing and Community Development
804.371.7172
paula.eubank@dhcd.virginia.gov

The Virginia Department of Housing and Community Development (DHCD) recently relocated its offices to The Main Street Centre at 600 East Main Street, Suite 300, Richmond, Virginia 23219. All staff telephone numbers, facsimile numbers, and email addresses will remain unchanged.

From: Figueroa, Maria [mailto:mfigueroa@NFPA.org]
Sent: Thursday, July 30, 2009 7:44 AM
To: Eubank, Paula (DHCD)
Cc: Roy, Ben; Dawson, Robby; Altizer, Ed (VDFP)
Subject: RE: NFPA Testimony

Paula:

It was brought to my attention that there was testimony offered by the opposition offering NFPA survivability data. Taken out of context this data may provide the wrong impression and I wanted to provide clarification, for the record, as follows:

Beware misleading percentages on survival and death

Fire sprinkler opponents have been using a statistic of 99.45 percent to illustrate the effectiveness of smoke alarms in reducing home fire deaths. This NFPA statistic estimates the likelihood of surviving a home fire when a working smoke alarm is present. Taken completely out of context, a number like 99.45% sounds very high. But consider this:

- The total home fire death toll of roughly 3,000 deaths a year occurs in roughly 400,000 reported home fires a year. Therefore, the likelihood of surviving a home fire is over 99% without regard to the presence of smoke alarms or any other fire safety provisions. Does that mean 3,000 deaths are acceptable? Most people would say no.

Important comparisons to the above

- Each year, there are an estimated 12,000 deaths due to falls in homes and an estimated 11 million fall injuries in the home. The likelihood of surviving a fall is 99.9%. Does that mean 12,000 deaths are acceptable? Most people would say no.

- Each year, there are an estimated 37,000 deaths due to motor vehicle crashes and an estimated 6 million reported motor vehicle crashes. The likelihood of surviving a motor vehicle crash is 99.4%. Does that mean 37,000 deaths are acceptable? Most people would say no.

- Each year, 2.4 million people die of any cause in the country compared to a total U.S. resident population of 300 million. The likelihood of surviving every hazard, threat and illness for a year is

99.2%. Does that mean 2.4 million deaths are acceptable to the sprinkler opponents – that nothing at all should be done to protect Americans from anything, especially when technology exists that could save lives? Most people would say no.

Please feel free to contact me with any questions or if you require additional information.
Have a safe day,

Maria Figueroa, Regional Manager
NFPA Fire Prevention Field Office
8518 N.W. 163rd Terrace
Miami Lakes, FL 33016
Office: 617-984-7015
Office: 305- 364-0396
Fax: 305-364-0795
Cell: 305-812-3051

FIRE SPRINKLER INITIATIVE
Bringing Safety Home

Fire Prevention Week is October 4 – 10, 2009.
Visit www.firepreventionweek.org or call 800-344-3555 for more information.

From: Eubank, Paula (DHCD) [mailto:Paula.Eubank@dhcd.virginia.gov]
Sent: Monday, July 27, 2009 8:49 AM
To: Figueroa, Maria
Subject: Re: NFPA Testimony

Maria, thank you and we will do so. Paula Eubank

From: Figueroa, Maria <mfigueroa@NFPA.org>
To: Eubank, Paula (DHCD)
Cc: Roy, Ben <BRoy@NFPA.org>; Dawson, Robby <DawsonJ@chesterfield.gov>
Sent: Mon Jul 27 08:21:19 2009
Subject: NFPA Testimony
Ms. Eubank:
NPFA's representative at today's hearing has informed me he's being held up at his connecting airport and will probably not make it to this morning's hearing. I am attaching NFPA's testimony to this e-mail and respectfully present it to the record via this e-mail. Please let me know if you have any questions or concerns
Have a safe day,

Maria Figueroa, Regional Manager
NFPA Fire Prevention Field Office
8518 N.W. 163rd Terrace

7/30/2009

Miami Lakes, FL 33016
Office: 617-984-7015
Office: 305- 364-0396
Fax: 305-364-0795
Cell: 305-812-3051

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7/30/2009

NFPA

Commentary on the "10 Reasons Why Mandating Fire Sprinklers Makes No Sense for Virginia"

July 27, 2009

Maria Figueroa
Regional Manager
Fire Prevention Field Office
[May 8, 2009]

[This document provides commentary on the referenced homebuilder document. It is intended to update information, examine analyses for validity, and express NFPA's position with regards to the inclusion of residential fire sprinklers in the State of Virginia]

The mission of the international nonprofit NFPA, established in 1896, is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training, and education. This document provides commentary on the referenced homebuilder document. It is intended to update information, examine analyses for validity, and express NFPA's position with regards to the inclusion of residential fire sprinklers in the State of Virginia, and to encourage the adoption of fire sprinkler requirements in new homes.

The home building industry has submitted "10 Reasons Why Mandating Fire Sprinklers Makes No Sense for Virginia." This document will present those ten persuasive reasons, in quotes, followed by NFPA commentary in red.

Reason #1- Statistics show today's better built homes are saving lives.
"From 1979-2003 the death rate per million persons from house fires dropped 58 percent, according to the U.S. Centers for Disease Control. That trend will continue as more new housing stock is built, stronger building codes are enacted and especially as smoke alarm maintenance by homeowners improves."

Home fire is a major problem in Virginia and the U.S.
Fire in the home poses one of the biggest threats to the people of your community. Nearly 400,000 home fires occur every year in the United States and, nearly 3,000 people, on average, die in fires that started at home. As in most states, the majority of fire deaths in Virginia in 2007 and 2008 occurred in residential properties, specifically one and two-family homes; according to Virginia State Fire Marshal's statistics. From 2004 to the present, one person was killed or injured by a fire every two days. Home fire sprinklers are a proven way to protect lives and property against fires at home. Congressional hearings have been scheduled and pandemics have been declared on the basis of much smaller death tolls than the home fire death toll in one year in Virginia. Clearly, most people do not believe that we are safe enough or that current death tolls from home fires are acceptable.

Opponents of residential fire sprinkler systems like to boast that newer homes are safer homes and that the fire and death problem is limited to older homes. This statistical claim evaporates if you adjust for the higher risk characteristics (e.g., lower income, less education) found on average in the occupants of older homes. But in fact, newer homes are also more likely to include a threat to firefighters in the form of lightweight construction. Lightweight construction has been variously estimated to be used in a half to two-thirds of all new wood one- and two-family homes. ***Sprinklers can offset the increased dangers posed by lightweight construction and create a safer fire environment for firefighters to operate.***

Reason #2 - Sprinklers are rarely needed for house fires.
"Sprinkler proponents claim that a residential system is reliable in 96-99 percent of all reported structure fires where the fire was large enough to activate the system. But reports from the National Fire Prevention Association (NFPA) show that the number of fires that occur in one- and two-family dwellings equipped with sprinklers are so few that they are not shown in studies done by the organization."

NFPA's *"U.S. Experience With Sprinklers and Other Automatic Fire Extinguishing Equipment"* by John Hall, Jr., published in January 2009 does include data on sprinkler effectiveness in homes; ***"the fire death rate per 1,000 reported structure fires is lower by 80% for home fires, where most structure fire deaths occur."***

Reason #3 - Sprinklers cause unintended damage.
Statistics from the Virginia Fire Incident Reporting System show that 76.8 percent of all fires in Virginia from 2000 through 2008 either did not spread or were confined to an object or a room and contained. But when sprinklers detect smoke they set off every sprinkler in the house, not just in the room where the fire is occurring. In many homes that suffer a fire where working sprinklers exist there is more water damage to the home than fire damage.

Sprinklers do more than save lives; they also protect property from destruction by fire. In many situations, that means a family that survived a fire will also have a place to live and enough resources to continue living their lives as they did before. "Saving lives" means more than just preventing deaths. Just as there is no other fire safety technology or program that produces as great a reduction in risk of death as sprinklers, there also is no other fire safety technology or program that produces as great a reduction in property loss per fire as sprinklers.
It is important to recognize that home fire sprinkler systems are designed to activate to the heat of a fire that grows large enough for the temperature to rise to 135°-160° F. ***They are not activated by smoke, nor should they be.***

- People in homes with sprinklers are protected against significant property loss— sprinklers reduce the average property loss by 71% per home fire.
- Each individual sprinkler is designed and calibrated to go off when it senses a significant heat change.
- ***Roughly 90% of the time, fires are contained by the operation of just one sprinkler.***
- Only the sprinkler closest to the fire will activate, spraying water directly on the fire.

Reason #4 - Home insurance rates do not decrease with their use.
"Sprinkler proponents claim the cost of home insurance decreases when you install fire sprinklers. It's true that some states offer insurance credits for having fire sprinklers in the home. Using a conservative sprinkler cost estimate of $1.50 per square foot in a 2,300-square-foot home with an annual property insurance rate of $1,000, it would take approximately 35 years for a 10 percent credit to pay for the system. Insurance agents in the Richmond area say credits rarely are given above 3.5 percent. Throw in maintenance costs and it would take even longer for the credit to pay its due for the system."

"However, that does not offset the increased costs charged for potential water damage and flooding. In most cases sprinklers go off in areas of the home where fire is not occurring, causing more claims for water damage than fire damage. Virginia insurance agents say this drives the cost of insurance higher for people who have sprinkler systems."

The following information is quoted directly from the Insurance Services Organizations' (ISO) fact sheet is offered to dispute the above:

"ISO is an independent statistical, rating, and advisory organization that serves the property/casualty insurance industry. ISO is the leading supplier of underwriting information, advisory loss costs, supplementary rating information and standardized policy language to insurers in all 50 states and the District of Columbia. ISO offers the following regarding how residential sprinklers are reflected in ISO's advisory residential property programs:

The standard ISO Dwelling Fire and Homeowners Programs contain available premium credits for installation of fire sprinkler protection up to a maximum of:

- 13% for full sprinkler protection that includes all areas of a home, including attics, bathrooms, closets, and attached structures;
- 8% for fire sprinkler protection of all areas of a home excluding the attic, bathrooms, closets, and attached structures as long as fire detection equipment is installed in those areas where sprinklers are omitted;
- The presence of a residential sprinkler system may raise concern about the risk of accidental water leakage from the system. ISO's standard Homeowners policy forms provide coverage for "...accidental discharge or overflow of water...from within a...fire protective sprinkler system...".
- This coverage is included in the basic policy. There is no extra charge for this coverage.
- Also, coverage is provided for water damage related to the suppression or extinguishment of a covered fire.

"The ISO Building Code Effectiveness Grading Schedule (BCEGS®) is used to review public building code enforcement agencies and to develop a classification that is provided as advisory information to insurers who may use it for insurance underwriting and rating. If the requirement of the International Residential Code (2009) for automatic fire sprinkler protection of residential dwellings was removed by legislation or local ordinance, BCEGS would not provide full recognition for adoption of code without amendments. ***A building code enforcement agency which adopted a code with amendments that weaken hazard mitigation issues as defined in the model codes and referenced standards would not receive maximum recognition for code adoption."***

<u>Reason #5 - Smoke alarms potentially save more lives than sprinklers</u>.
"A 2006 study by the U.S. Fire Association (USFA) on the presence of working smoke alarms in residential fires from 2001-2004 showed that 88 percent of the fatal fires in single-family homes occurred where there were no working smoke alarms. USFA and NFPA data continue to show that the vast majority of home fire fatalities occur when there are no operational smoke alarms. The most recent NFPA report on smoke alarms estimates that more than 890 lives could be saved annually if every home had a working smoke alarm. From 2000-2004, 65 percent of the fire fatalities reported occurred in homes where smoke alarms were not present or were present and did not operate."

MYTH
"A smoke alarm provides enough protection."

FACT
Home fire sprinklers are a proven way to protect lives and property against fires at home.

These life-saving systems respond quickly and effectively to the presence of a nearby fire. When sprinklers are present, they save lives. Sprinkler systems provide additional benefits, on top of the benefits already provided by smoke alarms.

- ***Working smoke alarms cut the risk of dying in a home fire by 50 percent.***
- ***If you have a reported fire in your home, the risk of dying decreases by about 80 percent when sprinklers are present.***

Reason # 6 - Sprinklers will harm efforts at providing affordable housing statewide.
According to an August 2006 survey of home builders done by the National Association of Home Builders' Research Center, the average sprinkler system costs $2.66 per square foot to install in a new home. For the average home size considered to be affordable housing in Virginia – 1,800 to 2,200 square feet – the maximum cost would be approximately $5,850. In the Richmond area, about 710 families lose the ability to qualify for a new home mortgage with each $1,000 increase in the price of a new home. Mandating fire sprinklers would keep more than 4,100 families from being able to buy affordable housing in the Richmond area.

A hard-wired, interconnected smoke alarm system installed through the whole house costs about $50 per alarm. You may have heard of the "Scottsdale study," which sprinkler proponents are using to claim sprinklers do not harm affordable housing. They claim sprinklers can be installed for as little as $1 per square foot. In Scottsdale, AZ, where the Scottsdale study was done,these units can be installed for $1 per square foot. But Scottsdale has some of the least expensive building costs in America. Therefore, the Scottsdale study is not reflective of the average cost for installation nationwide.

Home fire sprinklers are cost effective.
A national perspective on the cost of installing residential fire sprinklers is examined in the report, "*Home Fire Sprinkler Cost Assessment*", released by the Fire Protection Research Foundation, an affiliate of NFPA. According to the report, the cost of installing sprinkler systems averaged $1.61 per sprinklered square foot. This cost includes all costs to the builder associated with the system including design, installation, and other costs such as; permits, additional equipment, increased tap and water meter fees – to the extent that they apply.

Additionally, in a recent study, "*Comparative Analysis of Housing Cost and Supply Impacts of Sprinkler Ordinances at the Community Level*", conducted by Newport Partners for NFPA and just released, it is reported that: "the following analysis did not reveal that the enactment of sprinkler ordinances caused any detrimental effects on housing supply and costs." This report clearly indicates there is no merit to the claim that a residential sprinkler requirement significantly increases the cost of housing or creates an unfair market advantage for an area that does not have a requirement, as claimed by sprinkler opponents.

When incentives are added to sprinkler requirements they may help to offset some of the cost to developers and builders. ***In areas where sprinkler systems have been required for years, the cost is substantially lowered by market competition and achievement of economies of scale***

Reason # 7 - Sprinklers are much more difficult and time consuming to maintain than smoke alarms.
Homeowners have a difficult time remembering to change the batteries in their smoke alarms once every six months. A sprinkler system requires much more maintenance than simply replacing batteries. Based on the problems with maintaining smoke detectors, it is easy to deduce that homeowners will not maintain sprinkler systems at the level required for them to be at maximum efficiency. More lives can be saved by educating the public to the importance of maintaining hard-wired, interconnected smoke alarms in proper operating condition than through mandating fire sprinklers.

Because of their simplicity, residential sprinklers systems generally need no more maintenance than residential plumbing systems, NFPA 13D prescribes the following simple maintenance procedure for home sprinklers:

- Visual inspections of all sprinklers
- Inspection of valves to ensure that they are open
- Opening flow valve to ensure that water flows
- Testing of the alarm system, where installed

Reasons # 8 - Sprinklers can be damaged by extreme cold, causing water damage.
Should a home lose power for several days, as occurred in some parts of the Richmond area during the early March snowstorm, the basins that hold water for sprinkler use can freeze and burst. Homeowners most likely would have to take measures to keep heat in the water basins, further increasing the cost that many rural Virginians can't afford.

With proper installation, home fire sprinkler systems will not freeze in cold settings. NFPA 13D sets forth guidelines for proper insulation to avoid pipes freezing. Antifreeze systems are also prescribed to protect against freezing. The Chicago area is a great example of a cold weather region where many jurisdictions have passed sprinkler mandates for new homes with limited to no problems with systems freezing.

Reason # 9 - Sprinklers in homes on well water have additional problems.
Owners will have to calculate how the system will work if power goes out, or if the well's water level is low enough to cause pressure problems. Extra water tanks, pumps and generators could be purchased to help with pressure, but that adds more cost to the system – cost many owners in rural Virginia could not afford.

A well and pump of sufficient capacity and pressure to meet the sprinkler demand is prescribed by NFPA 13D. This fact will not be disputed. This may only require an upgrade of the pump. If the system is augments by a tank, a 300 gallon tank is considered sufficient to supply the home fire sprinkler system. These systems are consistently being streamlined in order to reduce costs.

Reason #10 - Annual sprinkler installation costs will greatly exceed property losses nationwide and in any jurisdiction where they are mandated.
For example, had this mandate been in place in 2005 the installation cost to builders would have been almost $10.2 billion based on an average square-foot home with a cost of $2.66 per square foot. The NFPA reported that the total home property loss – new and existing homes – due to fire in 2005 was less than $5.8 billion. The installation cost would have been nearly double the loss. As new homes continue to be better built, the difference

between installation cost and property loss will continue to increase, and statistics show most people forced to have these installed will never use them in their home.

The national consensus is in favor of sprinklers
All model safety codes now require the use of home fire sprinklers in new one- and two-family homes. Model codes are the specific expression of the shared values of Americans. No one interest is allowed to dominate all model codes, and no one interest should be allowed to dictate to the people of Virginia what constitutes acceptable safety for them and their families.

MYTH
We don't need sprinkler mandates; they can be installed in homes voluntarily.

FACT
Mandating sprinklers in new one- and two-family homes provides a greater overall level of safety in communities. By requiring these life-saving devices in new homes you are ensuring that a large number of residents can enjoy the same level of safety found in many offices, schools, apartments, and public buildings.

Beyond the life safety benefits of home sprinklers, there are other incentives for jurisdictions that mandate sprinklers in new homes. By mandating sprinkler requirements, cities and towns can reduce the strain on fire service personnel, limit damage to property, and help conserve municipal water resources by reducing the amount of water needed to fight fires (fire-fighting hoses use more than eight times the amount of water used by automatic fire sprinklers).

HBA VIRGINIA

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HOME BUILDERS ASSOCIATION OF VIRGINIA

Comments to

Board for Housing and Community Development
Commonwealth of Virginia

July 27, 2009

Richmond, Virginia

Good Morning, and thank you for this opportunity to comment on the 2009 Proposed Changes to the Virginia Uniform Statewide Building Code. I am Rand Sompayrac, 2009 President of the Home Builders Association of Virginia (HBAV). As you may know, HBAV is one of the largest business organizations in the state, with nearly 5,000 business members. This year, HBAV celebrated its 53rd anniversary.

You will consider many proposed changes to the USBC over the next year that relate to the method of construction and materials that are required to be used in the construction of new housing and new buildings. This is an important responsibility that HBAV has been a partner in developing since the USBC was first adopted in 1972.

I would begin by respectfully reminding you that the Code of Virginia empowers you to adopt the USBC, and directs you "to protect the health, safety and welfare of residents of the Commonwealth, at the least possible cost." The Code of Virginia also directs you to adopt regulations that are "reasonable and appropriate".

In that spirit, I would take a few minutes this morning to urge you to ACCEPT the recommendation of your experienced and qualified Codes and Standards Committee to make the installation of sprinkler systems an OPTION in Virginia, and to resist the unproven need to Mandate Sprinklers in all new 1 & 2 family dwelling units in Virginia.

As I speak, it is my understanding that not a single state in this nation has adopted the Sprinkler Mandate, and only one may be considering it. Only One.

I would also remind you that the Housing Industry in Virginia is in the midst of an historic downturn. Housing starts are anticipated to decline to less than 15,000 statewide this year, down from almost 46,000 in 2005. And, those few new homes that are selling fall into one category.... the lower cost, first time homebuyer category.

This is not the time to dictate, by state regulation, the addition of a new $5,000 cost onto the price of every new home served by public water systems in Virginia and nearly $10,000 for new homes that will have to depend on water wells for their water supply.
I would remind you that the USBC already includes many provisions and technology innovations designed to provide safety from fire. They include fire blocking, draft stopping, emergency escape and rescue openings, outlet spacing and capacity, fire walls and fire separation, modern heating systems and energy efficient housing and most importantly interconnected hard-wired smoke detection systems. Most older homes do not include this full list of current fire safety provisions. Many don't even include a working smoke detector. We sincerely fear the additional and undeniable new cost of the Sprinkler Mandate will force Virginians to choose less safe, less costly older housing.

Finally, HBAV would urge you to reject any notion or suggestion that modern housing is less safe, or less appropriate to be constructed in Virginia. Modern housing, not light weight housing, is Green Built Housing, some of the most popular and energy efficient housing in America. It is the future of housing today and should be embraced and encouraged by All. It will keep housing more affordable and help make the nation less dependent on foreign oil and foreign products.

This is the wrong proposal at the wrong time, and will result in very little benefit compared to the significant cost of installation and future maintenance needs. Remember, from 1979 to 2003, the death rate from house fires dropped 58%!

Once again, HBAV urges the Board to accept the recommendation of your experienced and qualified Codes and Standards Committee to make the installation of Sprinkler systems an option in Virginia, and to resist the unproven need to Mandate Sprinklers in all new 1 & 2 family dwelling units. We would also urge the Board to urge fire officials to better educate all Virginians of the need for working smoke alarms in existing housing.

Thank you for your time this morning.

Rand Sompayrac
2009 President
Home Builders Association of Virginia
July 27, 2009

Comments Submitted to the Board of Housing and Community Development
James Dawson
Fire Marshal
Chesterfield County Fire and EMS
1st Vice President, Virginia Fire Prevention Association
Chairman, Virginia Fire Chiefs Association Fire and Life Safety Committee
July 27, 2009

Good morning Mr. Chairman and members of the board. My name is James Dawson. I am the Fire Marshal for Chesterfield County and today I am asking for you to pull the code change submitted by the Home Builders Association of Virginia concerning residential sprinklers from the Proposed Regulations you will be approving later today.

I have previously submitted written comments outlining my concerns about the process the Codes and Standards Committee used to approve the change. In addition to not following the process as advertised, I believe the committee is very short sighted to remove a provision of a nationally recognized model code with only 30 minutes of discussion when the issue was debated for more than eight hours at the International Code Council hearings. In addition, the committee's discussion included more questions about sprinklers and no discussion on the merits these systems.

I would also like to point out something about the supporting statement presented by the Home Builders Association of Virginia in their proposed change. In that statement there is only one sentence that has any resemblance of a supporting statement. In fact their supporting statement asks even more questions, a total of seven questions without answers are presented in their support for removal of this code provision.

One aspect of this change the home builders continue to press is economics. Since I've become involved in this issue, I've been trying to gain an understanding of the economics of new home construction. I've recently discovered a paper by Mr. Buddy Dewer who holds an economics degree and a Master's degree in Business Administration. His explanation of new home economics is enlightening, and I have included his report with my written statement for your review. Even more enlightening in his report is this – residential sprinklers have no impact on the affordability of new homes. In fact the more important factors involved with affordability are mortgage and loan rate, not the cost of required safety systems in new homes. The issue of economics is far to complicated to discuss here, so I urge you to review his paper in order to become more informed on this specific issue.

Mr. Chairman, I look forward to working with all interested parties to develop the code change proposals the Virginia Residential Sprinkler Coalition will bring forward in the coming months. And it is my sincere hope that home builders will finally step up to the table and toward compromise as the fire service in Virginia has to develop these code changes. and I hope this board has all of their questions answered before they make a decision on accepting a code change that will decrease the safety of new homes built under our Uniform Statewide Building Code.

Mr. Chairman, for the sake of time, I will leave you printed copies of my full remarks and in closing I submit this for your consideration. The one supporting statement in the Home Builders Association of Virginia code change proposal found on page 212 of the Codes and Standards Committee package, the one sentence that does not use qualifying words like, "maybe", and "seems to", the one sentence that is not a question but rather makes a statement regarding residential sprinklers is this – "NFPA data and reports confirm that sprinklers do reduce deaths, injuries and property damage losses." Mr. Chairman, I believe they have that supporting statement right, it is the code change they have gotten wrong.

I thank you for your time.

HBAV Assertion #9
Sprinklers in homes on well water have additional problems. Owners will have to calculate how the system will work if power goes out, or if the well's water level is low enough to cause pressure problems. Extra water tanks, pumps and generators could be purchased to help with pressure, but that adds more cost to the system, cost many owners in rural Virginia could not afford.

Response
Residential sprinklers supplied via wells indeed have additional costs, just as the basic water supply for those homes does. Systems are designed for a maximum of 2 heads flowing. Some homeowners have installed larger pressure tanks to supply their sprinkler systems or larger pumps to provide the pressure and volume needed.

The HBAV claims of hundreds of gallons of water stored in holding tanks in attics is flatly not accurate.

Back-up generators or emergency power are not required. Additionally, tanks and pumps are not required to be listed for sprinkler service, saving the homeowner additional expense.

6905 Rockledge Drive, Suite 800
Bethesda, Maryland 20817
Tel (301) 803-4800
Toll Free (800) 527-8558
Fax (301) 803-4900

Winchester Homes, Inc.
Testimony Before the Virginia State Board for Housing and Community Development in Support of Voluntary Residential Fire Sprinklers

July 21, 2009

By: Randall K. Melvin
Director Research and Standards

Winchester Homes, Inc. appreciates the opportunity to testify before the Virginia State Board for Housing and Community Development today and urges that they retain the option of Voluntary Residential Fire Sprinklers in the 2009 Uniform Statewide Building Code of Virginia (USBC).

For those who may not be familiar with our company, Winchester is a long time, reputable builder and developer of new single family and town home communities in Virginia and Maryland. Many or our homes in Maryland, as well as some of our model homes in Virginia, contain fire sprinklers.

As the USBC, even in the absents of any mandatory residential sprinkler requirements, still provides a very reasonable, cost effective, level of fire protection for new homes, we support a voluntary, not mandatory, residential sprinkler provision. We believe the limited additional protection fire sprinklers offer one and two family dwellings is generally not a cost effective means of saving lives and their selection is best left to the voluntary discretion of the consumer and builder. Examples of fire protection related requirements already contained within the code include; interconnected, battery backed-up, smoke detectors in each sleeping room and outside of each sleeping area, means of egress (including the recently added mandatory basement egress), recently increased fire separation distances between single family detached dwellings units, fire/party walls between adjoining town homes, drywall barrier protection between attached garages and the main living spaces, the recent incorporation of arc fault circuit protection in bedrooms. As several of the fire protection related code enhancements listed have just recently gone into widespread practice, with the adoption of the more recent versions of the USBC, and the vast majority of one and two family dwellings in Virginia were constructed prior to the adoption of these more stringent codes, the state has not yet been able to measure the full effectiveness/benefits of the fire protection related codes already in place.

It is also interesting to note that when a fire does occur, the National Fire Protection Association reports that; "The chances of surviving a reported home fire when working smoke alarms are present are 99.45% (100 minus 0.55%) vs. 98.87% (100 minus 1.13) in home fires with no working smoke alarms.[1]"

[1] *Ahrens, Marty, Home Smoke Alarms-The Data as Context for Decision. Fire Analysis and Research Division National Fire Protection Association. January 2008.*

Our experience with residential sprinklers has taught us they are not without numerous drawbacks and costly unintended consequences. Attachment #1 is an example of a $55,733.57 subrogation claim from an insurance company for a damaged sprinkler head that accidently went off in one of our homes, three (3) months after the homeowners had moved in. (Note: Names of companies, homeowners, public officials and employees involved have been "struck" from the letters for privacy purposes.) Attachment #2 and #3 are correspondence regarding this same home that provide a flavor of the amount of time and resources that go into resolving this type of issue and the impact they can have on peoples lives when personal belonging are damaged and they need to temporarily be moved out of their home during repairs. While for the purposes of this testimony it is not important who was ultimately responsible for this issue, or how it was ultimately resolved, it is important to understand the amount of disruption and resources required, from all parties, which go into resolving these types of issues. If every home had fire sprinklers in them, incidents such as this one would be far form isolated. Whether it be moving a mattress into a home, a child throwing a ball glove in the air after a team victory or jumping on a bed with arms in the air, sprinkler heads are going to get damaged or broken and significant water damage, disruption and other costs are going to result form it.

Yet another reality of residential sprinklers is the significant number of sprinkler heads which have had to be recalled by the Consumer Products Safety Commission. Because of the magnitude of these recalls they can cause considerable confusion and inconvenience for homeowners even if the sprinkler head manufacturers are willing and able to pay for the replacements. In addition, the likelihood of many of the sprinkler heads of questionable performance not getting replaced remains. Attachment # 4 a recall of 8.4 million sprinkler heads, many of which were use in single family homes, was originally issued in 1998 and was still under way in 2007. The nine year time period of the recall helps to frame the magnitude and complexity of these issues. Attachment #5 involves the recall of 35 million sprinkler heads and just within the past couple of months Fairfax County sent out a "Notice to Industry" regarding potential issues with specific dry sprinkler heads.

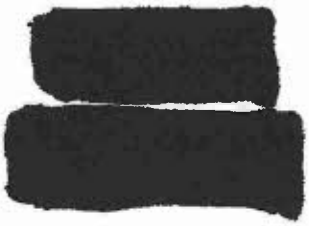
Service issues with sprinklers are not uncommon and our records show items such as leaking sprinkler heads, leaking water storage tanks, sprinkler trim rings needing adjustments, and frozen sprinklers and the resulting broken pipes. (Note: some homeowners have closed off their solariums in the winter time and the independent heating ventilating and air condition units that serve them, forgetting that wet sprinklers in ceiling above will be left subject to freezing.)

In conclusion, we believe requiring mandatory sprinklers in one and two family dwellings is not a cost effective means of saving lives. In fact, attachment #6, a table from page 14 of a 2005 Canadian Home Builder Association Research paper entitled, "Mandatory Sprinkler Proposals Still Don't Make Sense," clearly demonstrates many more lives can be saved by deploying far less capital elsewhere and that the cost per life saved by mandating residential sprinklers will be thirty eight million (38,000,000.00). dollars each, a cost the citizen of Virginia cannot afford. We also believe what is in an individual family's overall best interest and how they can most effectively deploy their limited capital resources is generally best determined by that family. This should include their ability to decide on whether or not the added expense, increased interior flooding risk and added fire protection residential sprinklers may offer are appropriate for their particular family's needs. For example, one family may find procuring an emergency escape ladder for each bedroom, placing fire extinguishers at critical locations within the home, maintaining their smoke detectors, keeping their dryer vent duct clean and practicing emergency evacuation plans with the family are the preferred

means of providing themselves some additional fire protection. The money the family saved by not mandatorily having to pay for the installation of a sprinkler system in their new home, might be redeployed to help pay for their child's education, medical care, a car repair which is critical for them to be able to get to work or to give it to a charity that can save lives far more cost effectively than will adding mandatory residential sprinklers to homes.

In what we believe is in the overall best interest of the citizen of Virginia, we urge the board to retain voluntary residential sprinklers.

ATTACHMENT 1



Tuesday, June 20, 2006

WINCHESTER HOMES INC
6905 ROCKLEDGE DR, SUITE 800
BETHESDA, MD, 20817

DATE OF LOSS: 08/06/2005
Our Claim #:
Our Insured:
Loss Location:
TOTAL SUBRO AMT $55,733.57
EVIDENCE: DRAFTS, ESTIMATES, PROPERTY SUBROGATION REPORT, RECORDED STATEMENT, AND PHOTOS

WINCHESTER HOMES, INC:

After an investigation of the loss sustained by our insured, it is our opinion that you are legally responsible for the damages. We have made a settlement with our insured and our insured's claim against you has been forwarded to us.

CAUSE OF LOSS: SPRINKLER SYSTEM FAILED ON 3 MONTH-OLD HOME / NEW CONSTRUCTION.BUILDER TOOK THE EVIDENCE FOR TESTING?
THEORY OF LIABILITY: NEGLIGENCE-BREECH OF IMPLIED WARRANTY AND/OR IMPROPER INSTALLATION

WINCHESTER HOMES, INC.: if you are insured for this loss, please forward all paperwork to your **insurance company** representative so that they may investigate on your behalf. Please forward to us your insurance carrier information; including your insurance company name, adjuster's name and phone number, and the claim number. If you are not insured, please forward full payment to us at this time or contact this office to discuss alternate payment arrangements.

Thank you,

ATTACHMENT 2

WINCHESTER HOMES®

6905 Rockledge Drive, Suite 800
Bethesda, Maryland 20817
Tel (301) 803-4800
Toll (800) 527-8558
Fax (301) 803-4900

August 12, 2005

[redacted]

Dear [redacted]

Thank you for meeting with [redacted] and me at your home today, to discuss recent events around the fire sprinkler in your second floor hallway, which activated during the weekend of August 6, 2005.

Winchester Homes' representatives came to your home on the morning of August 8, 2005, in response to a warranty call, regarding a broken sprinkler head and damaged flooring. You said that your wife and children were home when the sprinkler head discharged.

We contracted [redacted] to extract water from the second floor, first floor and basement, remove all of the wet carpet and hardwood, then set up dehumidifiers and fans, to help with the evaporation process. If a warranty repair, we agreed to reimburse you for lodging and up to [redacted] a day for meals, while the warranty work was taking place.

The preliminary inspection conducted by [redacted] Plumbing, revealed a bent frame arm. To the best of my knowledge and belief, the arm was not bent at the time the house was completed, in February, 2005. I gave you a copy of the letter from [redacted] Plumbing, stating that a bent frame arm typically indicates that the head was struck by an object, after it was installed.

Since the preliminary inspection does not indicate a defect in material or workmanship, as originally believed, the corrective efforts do not appear to be covered under warranty. We suggest that you contact your homeowner's insurance company. Our investigation is ongoing, if the investigation reveals a deficiency, we will honor the warranty, and proceed with the repairs.

As a service to you, we will leave the dehumidifiers and fans, until replaced by a contractor of your choice.

If you should have any questions or comments regarding this letter, please contact me at 301-343-7752.

Sincerely,

[redacted]

WINCHESTER HOMES

6905 Rockledge Drive, Suite 800
Bethesda, Maryland 20817
Tel (301) 803-4800
Toll (800) 527-8558
Fax (301) 803-4900

ATTACHMENT 3

August 26, 2005

[redacted]
Gaithersburg, MD 20879

Dear [redacted]

I spoke to Captain [redacted] of the [redacted] County Fire Marshall's office. He inspected the sprinkler head that activated in your home, during the weekend of August 6, 2005.

He concluded that the arms are bent, which is an indication that the head was struck by something. He stated that a sprinkler head in this condition would not have passed the Fire Marshall's final inspection, performed on January 5, 2005, by [redacted] It is my understanding that Captain [redacted] communicated the results of his inspection to you.

Captain [redacted] suggested that the head be sent to the manufacturer for a formal evaluation. This evaluation would completely destroy the head. If you wish for us to proceed with this option, please communicate your position to me. Otherwise, it will remain in the possession of [redacted] Inc.

Sincerely,

[redacted]

Cc: [redacted]

ATTACHMENT 4

NEWS from CPSC

U.S. Consumer Product Safety Commission

Office of Information and Public Affairs Washington, DC 20207

Note: Telephone Number Change

FOR IMMEDIATE RELEASE
Originally October 14, 1998
Revised June 15, 2007
Release # 99-008

Company Phone Number: (800) 927-5291
CPSC Consumer Hotline: (800) 638-2772
CPSC Media Contact: Ken Giles, (301) 504-7052
Central Contact: Anne Buchanan, (800) 775-8718

CPSC, Central Sprinkler Recall Omega Fire Sprinklers; Settle Lawsuit

WASHINGTON, D.C. - The U.S. Consumer Product Safety Commission (CPSC) and Central Sprinkler announced today the nationwide recall of approximately 8.4 million Omega brand fire sprinklers manufactured since 1982 by Central Sprinkler Corp. and its subsidiary, Central Sprinkler Co., of Lansdale, Pa. CPSC alleges that Omegas are defective and could likely fail in a fire. This recall announcement follows the resolution of the lawsuit filed by the Commission staff against these companies on March 3, 1998.

CPSC alleges that, on average, between 30 and 40 percent of Omegas removed from various locations across the country for testing failed to activate as they should. In some buildings, all Omegas tested failed to activate. CPSC is warning consumers that they are at risk of bodily injury or death and should have Omegas replaced as soon as possible. CPSC is urging consumers to take immediate action to determine whether the buildings where they live and work are equipped with Omegas, and if so, to call the Omega Sprinkler Recall Hotline to participate in the recall. Properly functioning fire sprinklers save lives when a fire occurs. With the Omega sprinklers, this line of defense may not be there when it is needed most.

CPSC has received reports of Omega sprinklers not functioning in 17 fires. At least four persons suffered injuries, including burns and smoke inhalation. Over $4.3 million in property damage has been reported. The fires occurred between 1990 and the present in Arizona, California, Florida, Georgia, Indiana, Maryland, Massachusetts, Michigan, New York, Pennsylvania and Texas. In some cases, the sprinkler directly above the fire failed to operate.

Omega fire sprinklers are installed in homes, schools, hospitals, dormitories, nursing homes, prisons, offices, hotels and other buildings as well as federal buildings, including the Smithsonian Museums and the U.S. Capitol, which house many of the country's historical artifacts. Omegas have been or are being removed from many state and federal buildings, including the White House. As part of the settlement agreement, Central has asked Underwriters Laboratories to withdraw its listing of approval for all Omega brand fire sprinklers.

Consumers themselves should be able to determine whether their homes or other buildings are equipped with Omega fire sprinklers. On most models, consumers will be able to see three flat round metal disks stacked one above the other with a small space between each disk. Consumers should not attempt to unscrew the sprinkler or shut down their sprinkler system to determine if they have Omegas. Central will send consumers a packet of information to help them identify the sprinklers involved.

The recall of the Omega sprinklers includes models referred to or marked as follows:

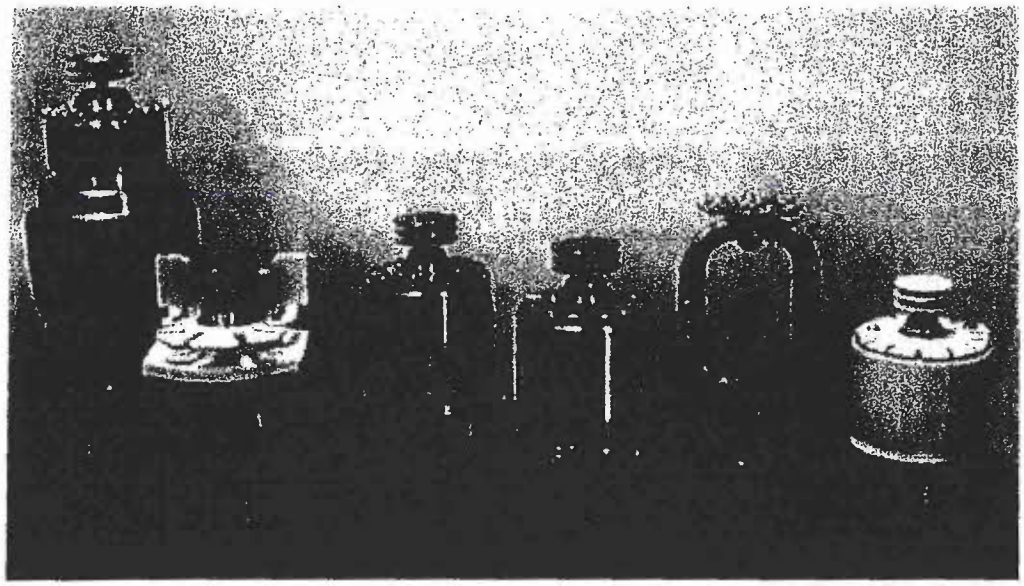
- C1 (or C-1)
- C1A (or C-1A)

- C-1A PRO (or C1-A PRO)
- C1-A PRO QR
- EC-20
- EC-20A
- R-1
- R-1A
- R-1M
- Flow Control (FC, Flow Control-FC)
- Protector-M or M Protector (Upright, Pendent, Sidewall, Sidewall EC)
- HEC-12
- EC-12 RES
- HEC-12 EC
- HEC-12 EC PRO
- HEC-12 ID
- HEC-12 PRO
- HEC-12 PRO QR
- HEC-20
- Prohibitor QR and AC.

Central is offering consumers free replacement glass bulb fire sprinklers and reimbursement toward the cost of having Omega sprinklers removed and replaced. CPSC routinely requires companies to pay the full costs associated with recalls. In this case, Central's reported financial condition reveals that its ability to pay the cost of replacing the Omega sprinklers is limited. Consumers are urged to call the Omega Sprinkler Recall Hotline, available 24 hours a day, at (800) 927-5291 or to access the Omega recall website at omegarecall.com to participate in the recall. For consumers to get any monetary reimbursement for installation costs, they must submit a proof of claim and release to Central postmarked by August 1, 1999. Consumers are urged to take immediate action and call today.

Since Omegas may not operate in a fire, it is particularly important that consumers have at least one fully operational smoke detector on every floor of their home, especially near bedrooms. To ensure that the detector's batteries are working, test the detector every month. Consumers also should have a well-defined and rehearsed escape plan and an alternate escape plan in the event of a fire. "Your Home Fire Safety Checklist" is available here in pdf format or text format, or you can obtain a free copy by writing to CPSC, Washington, D.C. 20207.

Consumers can also view a video clip about this recall (Transcript). It is about 10 megabytes long and the download time depends upon the speed of your Internet connection.



CPSC is still interested in receiving incident or injury reports that are either directly related to this product recall or involve a different hazard with the same product. Please tell us about it by visiting https://www.cpsc.gov/cgibin/incident.aspx

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Send the link for this page to a friend! The U.S. Consumer Product Safety Commission is charged with protecting the public from unreasonable risks of serious injury or death from thousands of types of consumer products under the agency's jurisdiction. The CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. The CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed significantly to the decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

To report a dangerous product or a product-related injury, call CPSC's Hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270. To join a CPSC e-mail subscription list, please go to https://www.cpsc.gov/cpsclist.aspx. Consumers can obtain recall and general safety information by logging on to CPSC's Web site at www.cpsc.gov.

NEWS from CPSC

U.S. Consumer Product Safety Commission

Office of Information and Public Affairs — Washington, DC 20207

FOR IMMEDIATE RELEASE
Originally issued July 19, 2001
Revised May 28, 2003
Release # 01-201

Notice Packet Request Hotline: (800) 871-3492
CPSC Consumer Hotline: (800) 638-2772
CPSC Media Contact: Ken Giles, (301) 504-7052
Central Media Hotline: (866) 836-3929

Note: there is an update to this voluntary recall
Also note: replacement program ends August 31, 2007

CPSC, Central Sprinkler Company Announce Voluntary Recall To Replace O-Ring Fire Sprinklers

WASHINGTON, D.C.- The U.S. Consumer Product Safety Commission (CPSC), and Central Sprinkler Company, an affiliate of Tyco Fire Products LP, of Lansdale, Pa., are announcing a voluntary replacement program. The company will provide free parts and labor to replace 35 million Central fire sprinklers with O-ring seals. The program also includes a limited number of O-ring models sold by Gem Sprinkler Company and Star Sprinkler, Inc. totaling about 167,000 sprinkler heads.

Central initiated this action because it discovered the performance of these O-ring sprinklers can degrade over time. These sprinkler heads can corrode or minerals, salts and other contaminants in water can affect the rubber O-ring seals. These factors could cause the sprinkler heads not to activate in a fire. Central is providing newer fire sprinklers that do not use O-ring seals, and is voluntarily launching this program to provide enhanced protection to its sprinkler customers. This is the third largest replacement program in CPSC history.

"I am pleased that Central is voluntarily undertaking this major program proactively to replace sprinklers nationwide and protect consumers from the risk of fire," said CPSC Chairman Ann Brown.

Central will provide free of charge replacement sprinkler heads and the labor needed to replace the sprinklers. Central will arrange for the installation by using either its own Central Field Service crews or by contracting with professional sprinkler contractors.

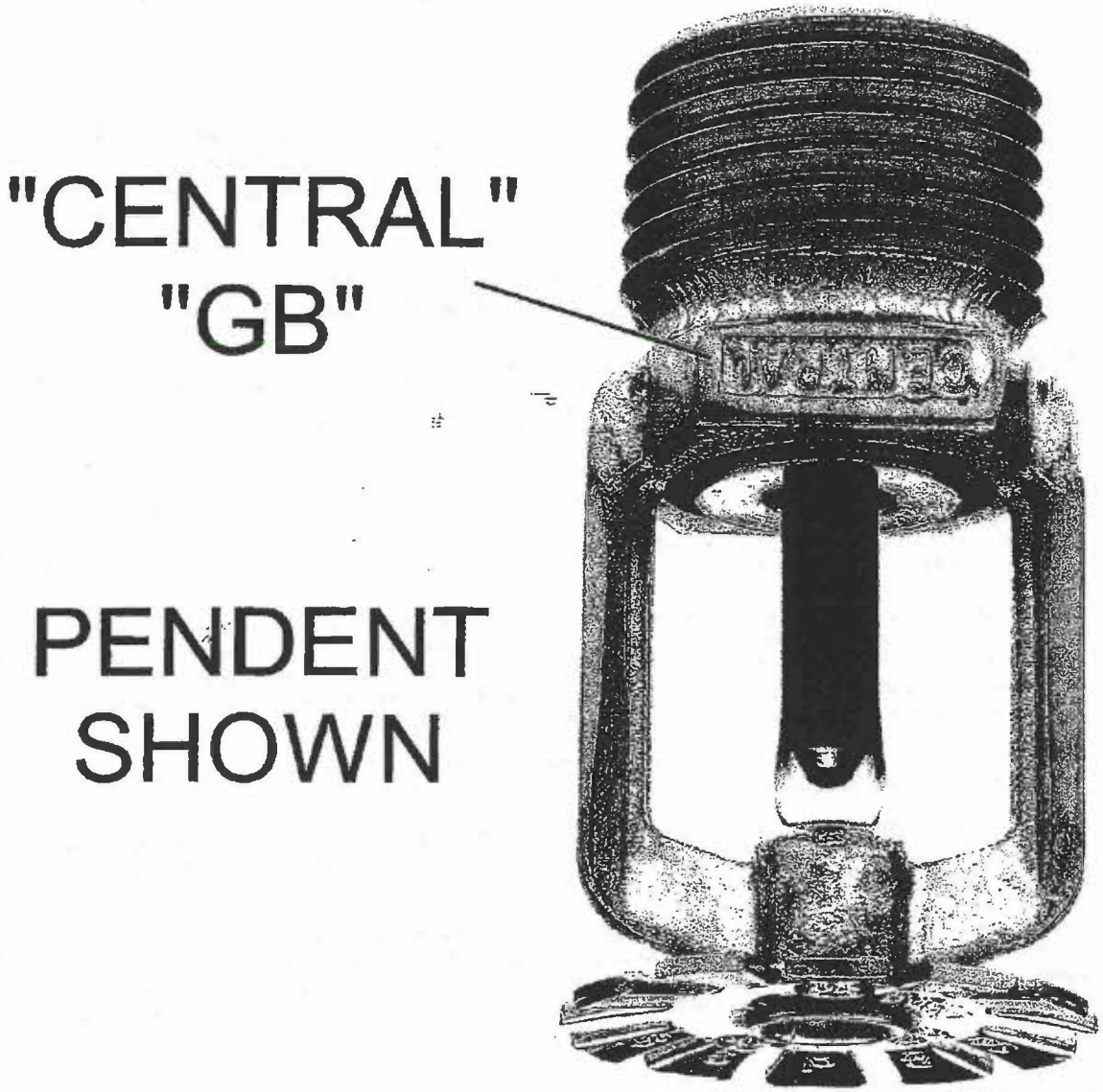
This replacement program includes two kinds of sprinklers, "wet" and "dry." "Wet" sprinklers are installed in piping that is filled with water. "Dry" sprinklers are used in areas that may be exposed to very cold temperatures and the exposed piping does not contain water. Central has received 4 reports of "wet" sprinklers failing to activate during a fire and 9 similar reports on "dry" sprinklers. These incidents resulted in two property damage claims against Central.

The sprinklers were installed nationwide in a wide variety of buildings, including houses, apartments, hospitals, day care facilities, schools, dormitories, nursing homes, supermarkets, parking garages, warehouses, and office buildings.

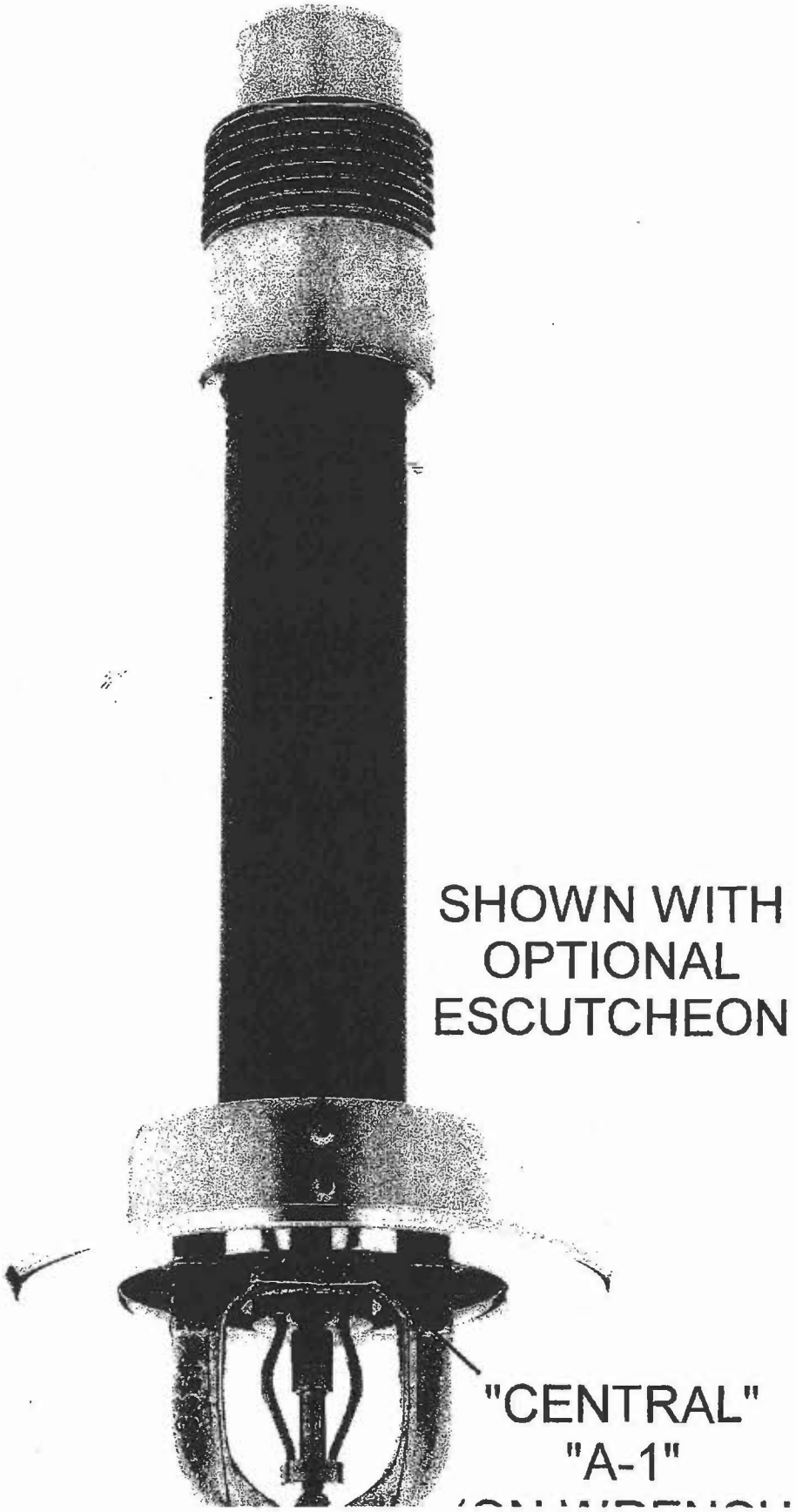
Central manufactured 33 million "wet" sprinklers with O-rings from 1989 until 2000 that are covered by this program. Central also manufactured 2 million "dry" sprinklers with O-rings from the mid-1970's to June 2001 that are covered by this program. The program also covers 167,000 sprinklers with O-rings manufactured by Gem Sprinkler Co. and Star Sprinkler Inc. from 1995 to 2001. A listing of all the models covered under this voluntary replacement program is attached to the end of this release.

The fire sprinkler heads have the words "CENTRAL" or "STAR", the letters "CSC", the letter "G" in triangle, or a star-shaped symbol stamped on either the metal sprinkler frame or on the deflector. The model designation and

date may also be stamped on the frame or deflector. The deflector is the flower, or gear-shaped metal piece at one end of the sprinkler head.



Typical "Wet" Sprinkler


SHOWN WITH
OPTIONAL
ESCUTCHEON
"CENTRAL"
"A-1"

Typical "Dry" Sprinkler

Laboratory testing has indicated that most of the heads would operate in a fire situation, but certain tested heads required higher water pressure to activate than may be available in particular buildings. Due to the number of sprinklers involved, this program will be phased in, with priority based on the age of the sprinklers, the population affected (e.g., buildings such as nursing homes and hospitals will be given priority), and whether the sprinklers show signs of corrosion or leakage. This program puts in place an orderly process that serves the public interest.

Building and home owners should check their fire sprinklers immediately to see if they are part of this voluntary replacement program. For more information on how to identify sprinklers subject to this program and to learn how to participate in this program, call the Notice Packet Request Line at 1-800-871-3492 24 hours a day, 7 days a week or access the program's web site at www.SprinklerReplacement.com.

The Commission is currently working with the sprinkler industry to improve sprinkler reliability and upgrade existing standards and codes.

The Commission and Central emphasize that for sprinkler systems to be effective, they must be regularly inspected, and maintained like a building's heating, cooling, electrical and elevator systems. In addition, the most recent industry standards state that dry sprinkler heads should be tested, and replaced if necessary, at least every 10 years. Central believes all fire sprinkler heads should be tested no later than 10 years after installation, and depending on water quality and other factors, more frequent testing may be appropriate.

Central is also contacting foreign governments to facilitate the replacement of these O-ring sprinklers that may be installed in their countries.

Consumers should always take precautions to make sure they are fully protected from a fire, even if they have fire sprinklers in their homes. There should be at least one fully operational smoke detector on every floor of a home, especially near bedrooms. To ensure that the detector's batteries are working, test the detector every month. Consumers also should have a well defined and rehearsed escape plan and an alternate escape plan in the event of a fire. A free copy of "Your Home Fire Safety Checklist" is available from CPSC by calling (800) 638- 2772, or by writing to CPSC, Washington, D.C. 20207.

AFFECTED MODELS CENTRAL "WET" SPRINKLERS (Manufactured from 1989-2000)					
GB	GB4-FR	GB-R1	BB2	ELOC	ELO-GB QR
GB-J	GB4-EC	GB-RS	BB3	ESLO	LD
GB-1	GB4-QREC	GB-R	SD1	ELO SW-20	K17-231
GB-ALPHA	GB-20	ROC	SD2	ELO SW-24	Ultra K17
GB4	GB-20 QR	BB1 17/32	SD3	ESLO-20 GB	ELO-16 GB
GB-QR	GB-LO	BB2 17/32	HIP	ELO-231 GB	GB MULTI-LEVEL
GBR-2	LF	BB3 17/32	WS	ELO-GB	GB-QR MULTI-LEVEL
GB-EC	GBR	BB1	ELO-LH	ELO-231 GBQR	ELO-16 GB FR

CENTRAL "DRY" SPRINKLERS (Manufactured from Mid-1970s-2001)			
A-1	GB	GB4-EC	ELO-16 GB
H-1	GB-QR	GB4-QREC	ELO-16 GB FR
J	GB4	ELO-231 GB	
K	GB4-FR	ELO-GB QR	

GEM "WET" SPRINKLERS (Sold under Gem name from 1995-2001)	
F927	
STAR "DRY" SPRINKLERS (Manufactured from 1996-1998)	
ME-1	SG
SG-QR	Q
Q-QR	

Consumers can also view a video clip (transcript) about this recall. This is in "streaming video" format.

CPSC is still interested in receiving incident or injury reports that are either directly related to this product recall or involve a different hazard with the same product. Please tell us about it by visiting https://www.cpsc.gov/cgibin/incident.aspx

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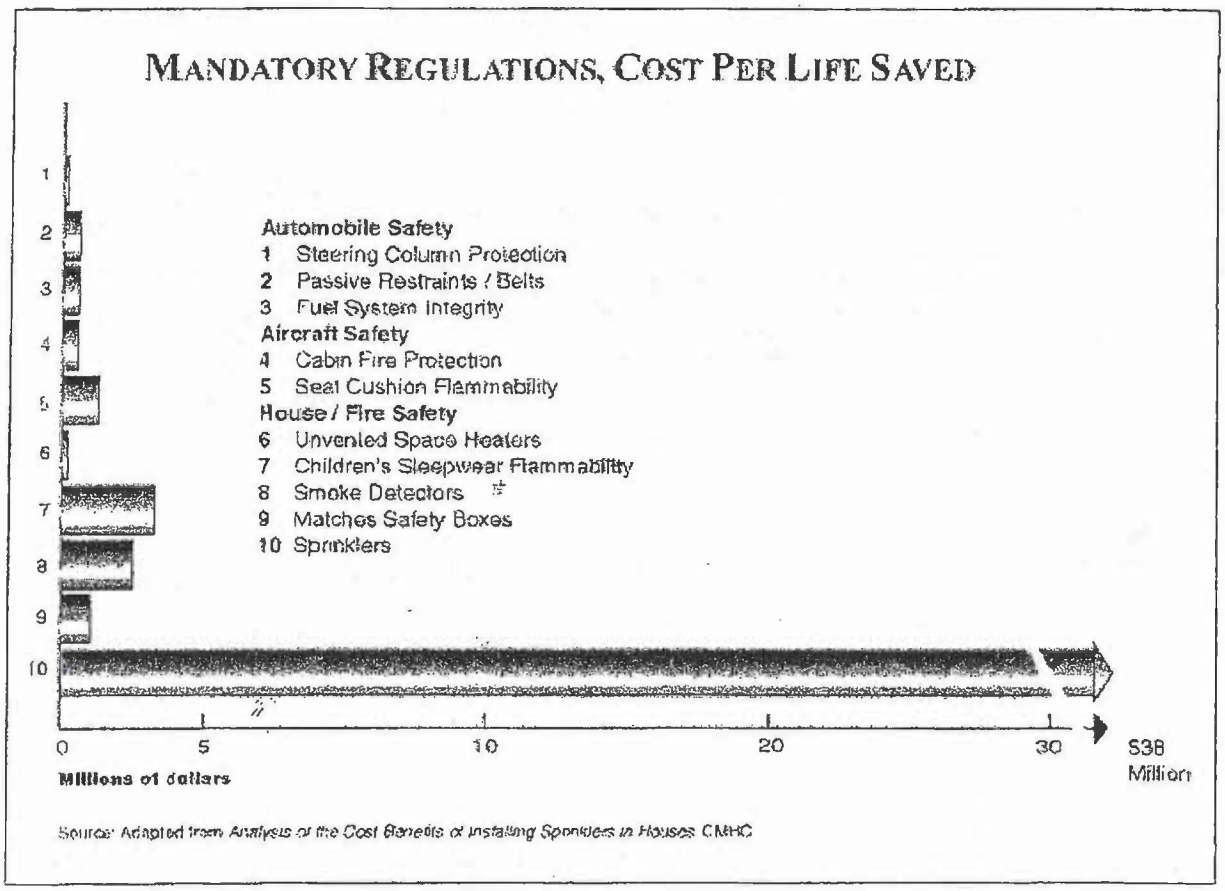
Send the link for this page to a friend! The U.S. Consumer Product Safety Commission is charged with protecting the public from unreasonable risks of serious injury or death from thousands of types of consumer products under the agency's jurisdiction. The CPSC is committed to protecting consumers and families from products that pose a fire, electrical, chemical, or mechanical hazard. The CPSC's work to ensure the safety of consumer products - such as toys, cribs, power tools, cigarette lighters, and household chemicals - contributed significantly to the decline in the rate of deaths and injuries associated with consumer products over the past 30 years.

To report a dangerous product or a product-related injury, call CPSC's Hotline at (800) 638-2772 or CPSC's teletypewriter at (800) 638-8270. To join a CPSC e-mail subscription list, please go to https://www.cpsc.gov/cpsclist.aspx. Consumers can obtain recall and general safety information by logging on to CPSC's Web site at www.cpsc.gov.



Fire Service Costs

In 1998, an unanswered question was the net impact on fire service costs if municipalities required sprinklers in all new residential developments. Proponents argued that, if sprinklers were made mandatory, the demand for fire services would drop and the municipality could reduce costs. CMHC commissioned the report *Costs and Benefits to Municipalities of Mandatory Residential Fire Sprinklers* to provide an impartial assessment, technically justified on economic grounds. It looked at changes in costs in five municipalities and one First Nation.

The study found some potential for cost savings to municipalities – if people were willing to accept longer response times from their fire fighting services, and to rely primarily on other services for response to other emergencies. These include fighting fires in all other building types, in vehicles, and "outside@ (grass fires, etc.), as well as rescue operations, emergency medical treatments, and dealing with hazardous materials.

HBAR TESTIMONY ON FIRE SPRINKLER MANDATE TO THE VIRGINIA BOARD FOR HOUSING AND COMMUNITY DEVELOPMENT
January 25, 2010

Good morning. My name is Warren Wakeland and I represent the Home Building Association of Richmond.

This Board has held one public hearing about the fire sprinkler issue, this past July. It voted at that time that keeping sprinklers as an option for homeowners was the best policy for Virginia. I would submit that nothing since July has changed that would suggest keeping sprinklers optional is not still the best policy.

You have seen the statistics gathered by the fire industry concerning how many lives smoke alarms save. You have also seen the 10 reasons why a fire sprinkler mandate is wrong for Virginia. We now have data from the Virginia Fire Incident Reporting System (VFIRS) that show from 2006 to 2009 the number of fires reported has dropped by one-third, from 31,538 to 21,152, the number of civilian fire deaths has dropped by 46 percent, from 96 to 52, and the amount of property lost has dropped by 14 percent, from more than $253 million to more than $220 million. The Richmond-Petersburg area has seen an even larger decline, with the number of fire deaths declining by 50 percent since 2007.

Homeowners are detecting fires and putting them out more quickly, saving lives and property, thanks to smoke alarms. Why should we require sprinklers when smoke alarms are clearly doing the job?

We all know the devastating effect the economy is having on the home building industry. This sprinkler mandate would create an even more devastating effect. It would add a minimum of $5,000 to $6,000 to the average cost of every new home including townhomes, the only truly affordable new homes being constructed in the Richmond market and many markets across Virginia, and drive homebuyers to older, less costly, less safe homes.

We can do better, though. VFIRS data show that in 2009, 32.5 percent of all residential fires in Virginia were attributed to "cooking." Cooking fires have increased each of the last three years, according to VFIRS. Fire officials have stated that if a small fire, like what starts in a kitchen, is detected early, a fire extinguisher is the most effective tool to control the fire. So let's employ a worthy, cost effective mandate -- kitchen fire extinguishers. A 10 BC extinguisher is effective at putting out fires and costs less than $25 per extinguisher.

All the statistics available show that smoke alarms are saving lives and property. Fire extinguishers in the kitchen will lead to more property saved. HBAR is willing to support requiring a 10 BC fire extinguisher in the kitchen. HBAR cannot support a minimum $5,000 to $6,000 expense when all the available data show the expense is not necessary.

Mr. Chairman, members of the Board, my name is Robert Martinko and I am a local builder here in the Richmond-Metro area. I am also the Legislative Committee Chair for the Home Builders Association of Southside Virginia. Many of our association members are here with me today. The adoption of a code requirement for sprinklers in single family dwellings will significantly impact the home building industry and the buying public. It will have a disproportionate impact on the segment of the market I service, which are buyers of affordable housing.

For my firm, and my homebuyers, that means housing with starting prices in the low 100,00's. I have circulated a picture of an 1100 square foot home, which sells for $130,000, that is representative of the affordable housing that I build here in Richmond. The other pictures are of homes in the same neighborhood, which were built in the 1950's without many of today's building code provisions and other technological innovations, which provide fire safety.

The demographic that I build houses for is 75% single mothers with incomes that generally allows them to qualify for affordable housing only. For every $1,000 increase in the price of a new home in the Richmond area, 710 families lose the ability to qualify for a new home mortgage. I often cannot serve potential buyers because their income only allows them to qualify for homes that sell for less than $130,000. The additional cost associated with a mandatory sprinkler system would force me to turn even more buyers away, leaving them to remain in, or purchase older housing, which lacks many fire prevention features.

I urge the Board to reject mandatory sprinklers for single-family homes and keep sprinklers as an option. The fire fighting community should put their energy towards providing fire protection devices in older homes where statistics have shown the need is much greater.

HOME BUILDERS ASSOCIATION OF VIRGINIA

Comments to

Board for Housing and Community Development
Commonwealth of Virginia

January 25, 2010
Richmond, Virginia

Chairman Fleury and Board Members:

Good Morning, and thank you for this opportunity to comment on the 2009 Proposed Changes to the Virginia Uniform Statewide Building Code. I am Mike Newsome, President of the Home Builders Association of Virginia (HBAV). As you may know, HBAV is one of the largest business organizations in the state, with nearly 5,000 business members. This year, HBAV will celebrate its 54rd anniversary.

As you continue your consideration of many proposed changes to the USBC this year, I would urge you to REJECT every Code Change in this Code Cycle that would increase the cost of new housing in Virginia. Across this Commonwealth, the housing industry continues to be experiencing an historic downturn. Since your last Public Hearing on this matter last July, conditions for the new housing industry have not improved. The

industry and thousands of companies and jobs that depend on it, continues to sit idle.

I would remind you that the Code of Virginia empowers you to adopt the USBC, and directs you "to protect the health, safety and welfare of residents of the Commonwealth, at the least possible cost." The Code of Virginia also directs you to adopt regulations that are "reasonable and appropriate".

In that spirit, I would take a few minutes this morning to urge you to RE-AFFIRM the position you took last July to make the installation of sprinkler systems an OPTION in Virginia, and to resist the unproven need to Mandate Sprinklers in all new 1 & 2 family dwelling units in Virginia.

I would also strongly urge you to REJECT the proposal that would impose the Sprinkler MANDATE on all new townhomes. There are no statistics, whatsoever, that display the occupants of townhomes to be at any higher risk of fire danger than the occupants of single family detached housing...None! Furthermore, and this is very important, the Sprinkler Cost Offsets outlined in that proposal, CANNOT be delivered by fire officials. Local Planning and Zoning

Departments and Local Public Utility Departments determine street widths and the quantity of public water supplies. That proposal is seriously flawed and should not be adopted.

Please also consider the fact that the USBC already includes many provisions and technology innovations designed to provide safety from fire. They include fire blocking, draft stopping, emergency escape and rescue openings, outlet spacing and capacity, fire walls and fire separation, modern heating systems and energy efficient housing and most importantly interconnected hard-wired smoke detection systems. Most older homes do not include this full list of current fire safety provisions. Many don't even include a working smoke detector. We sincerely fear the additional and undeniable new cost of the Sprinkler Mandate will force Virginians to choose less safe, less costly older housing, where the real risk of fire danger resides. There are currently over 3 million dwellings units in Virginia, and the proposed Mandate will not impact one (1) of them.

Finally, HBAV would strongly urge you to ADOPT the HBAV proposal to require all new homes to be equipped with a 2A:10B:C Fire

Extinguisher in the kitchen area of all new homes. Kitchens, by far, are the leading area for the origination of home fires. And, according the National Association of Fire Marshalls, fire extinguishers are the most effective means of protecting life and preventing property loss with the occurrence of a small and controllable fire. They cost less than $25.00. That should be next step for fire safety in Virginia.

Once again, HBAV urges the Board to reaffirm your July 27th decision, and to resist the unproven need to Mandate Sprinklers in all new 1 & 2 family dwelling units. We would also urge the Board to urge fire officials to better educate all Virginians of the need for working smoke alarms in existing housing.

Thank you for your time this morning.

Michael Newsome
2010 President
Home Builders Association of Virginia
January 25, 2010.

HOME BUILDING
ASSOCIATION OF RICHMOND

www.hbar.org

January 12, 2010

Board of Housing and Community Development
Virginia Department of Housing and Community Development
600 E. Main St., Suite 300
Richmond, VA 23219

Re: mandatory fire sprinklers

Dear Board Members:

The Home Building Association of Richmond (HBAR) appreciates the opportunity to comment concerning the proposal before you during your January 25 meeting to consider including the Interstate Code Commission (ICC) mandate on installation of fire sprinklers in all one and two-family homes in the Virginia Uniform Statewide Building Code.

HBAR stands as unified and strongly as possible against this mandate. There are many, many reasons why sprinkler systems should not be required in new homes.

1) ***Statistics show today's better-built homes are saving lives.*** Between 1979 and 2003 the death rate per million persons from house fires dropped 58 percent, according to statistics from the U.S. Centers for Disease Control and Prevention. New codes in most states, including Virginia, mean many homes today are built much stronger and with many more fire-prevention safeguards than even five years ago.
2) ***The fire industry itself says smoke alarms are extraordinarily effective.*** A January 2008 study done by the National Fire Protection Association (NFPA) shows that the chances of surviving a reported home fire when working smoke alarms are present is 99.45 percent. All new homes in Virginia are already required to be equipped with hard-wired, interconnected smoke alarms with battery back-up on every level of the home and adjacent to every sleeping area in the home. The NFPA figure proves conclusively that fire sprinklers are not necessary to save lives.
3) ***Smoke alarms potentially save more lives than fire sprinklers.*** A 2006 study from the U.S. Fire Association (USFA) showed that 88 percent of the fatal fires in single-family homes occurred where there were no working smoke alarms present. The most recent NFPA report shows that more than 890 lives could have been saved annually if every home had a working smoke alarm. The data show it to be more prudent to require smoke alarms, which is already done.
4) ***Sprinklers are much more difficult and time consuming to maintain than smoke alarms.*** Homeowners have a difficult time trying to remember to replace the batteries in their smoke alarms every six months. A sprinkler system requires much more maintenance than simply changing batteries. Based on the difficulty

400 N. Ridge Road, Richmond, Virginia 23229 • (804) 282-0400 • Fax (804) 282-9866

with maintaining fire sprinklers, it is reasonable to deduce that homeowners will not maintain sprinkler systems at the level required for them to be at maximum efficiency. The data show more lives can be saved by educating the public to the importance of maintaining hard-wired, interconnected smoke alarms in proper operating condition than through mandating fire sprinklers.

5) ***Sprinklers are rarely needed for house fires.*** Sprinkler proponents claim that a residential sprinkler system is reliable in 96-99 percent of all reported structure fires where the fire was large enough to activate the system. But NFPA reports show that the number of fires large enough to activate the system that occur in one and two-family dwellings are so few that they do not appear in studies done by the organization.
6) ***Sprinklers can be damaged by extreme cold, causing water damage.*** Should a home lose power for several days, as occurred throughout Virginia during the recent December 2009 snowstorm, the basins that hold water for sprinkler use and the pipes that carry the water can freeze and burst. Homeowners in Virginia most likely would have to take measures to keep the system from suffering cold damage, increasing the cost of the system.
7) ***Sprinklers will harm efforts at providing affordable housing statewide.*** The Virginia Housing Development Agency (VHDA) released a report in November that says the state's housing stock is not adequate to meet emerging needs, and that housing affordability is becoming a key issue in retaining and attracting an adequate workforce. Mandating sprinklers when it is clearly not necessary will lead to further deterioration of affordable housing stock across the state and potential loss of economic development opportunities.
8) ***The cost of a mandate for sprinklers will push many potential homebuyers toward buying older homes, which are less safe.*** According to studies done by the National Association of Home Builders Research Center, the average sprinkler system nationwide costs about $2.66 per square foot, or more than $5,300 for a 2,000-square-foot new home. In rural areas served by well water, which includes many areas of Virginia, the cost for sprinklers can be as much as double, as homeowners would need special pumps installed along with a minimum 300-gallon water bladder and a back-up generator for times when electric supply is interrupted. A hard-wired, interconnected smoke alarm costs about $50 per alarm. Building codes today already provide many provisions and technological innovations designed to protect residents from fire. A mandate would force families into buying older homes that are less expensive and not as safe.
9) ***Home insurance rates do not decrease in cold weather states with their use.*** Sprinkler proponents claim the cost of home insurance decreases when sprinklers are installed. It is true that some warm-weather states offer insurance credits for sprinklers. Using a conservative cost estimate of $1.50 per square foot, a system in a 2,300-square-foot home with an annual property insurance rate of $1,000 would need approximately 35 years for a 10 percent credit to pay for the system. Throw in maintenance costs and it will take even longer for the credit to pay its due. Insurance agents in the Richmond area, however, say credits are rarely given about 3.5 percent. In cold weather states, credits are rarely given because of losses arising from systems freezing.

10) ***Annual sprinkler installation costs will greatly exceed property losses nationwide and in any jurisdiction where they are mandated.*** Had this mandate been in place in 2005 the installation cost to builders would have been almost $10.2 billion, based on an average square-foot home with a cost of $2.66 per square foot. The NFPA reported that the total home property loss – for new and existing homes – due to fire in 2005 was less than $5.8 billion. The installation cost would have been nearly double the property loss. As new homes continue to be better built, the difference between installation cost and property loss will continue to increase, and statistics show most people forced to have these installed in their homes will never use them.

HBAR understands there are at least two compromise proposals being offered. One, by the fire industry coalition, would limit this mandate to townhomes. HBAR does not support this compromise proposal. Townhomes are the most affordable new home product available in Virginia. In most urban areas, including Richmond, it is the only affordable new home product. HBAR has seen no statistics that show townhomes are a greater fire hazard than one and two-family homes. Mandating sprinklers for townhomes would simply drive an affordable housing product out of an affordable price range – something VHDA has clearly pointed out would not be good for Virginia.

The second, by the Home Builders Association of Virginia, would require fire extinguishers in the kitchen area of each new home. HBAR supports this compromise proposal. NFPA statistics show that more than one in four home fires begins in the kitchen area. Many are small and can be easily controlled if discovered early. Fire extinguishers are the first method used to put these fires out in most cases, according to the National Fire Marshal Association (NFMA). If a fire is discovered in its early stages, NFMA says the most effective means of protecting life or preventing property loss is to use a portable fire extinguisher. Extinguishers can be used by untrained persons and can be purchased at a reasonable price. HBAR believes this requirement would be reasonable and worthwhile.

This Board has voted to reject the fire sprinkler mandate once, last July, because it recognized the reasons a mandate was unnecessary. These reasons are still as pertinent and true today as they were then. There still is no reason whatsoever to include the ICC mandate in the Virginia Uniform Statewide Building Code. HBAR strongly recommends that you vote to exclude the mandate from the code. Homeowners deserve to have the option of whether to include sprinklers in their own new homes. Forcing sprinklers onto the public when all the statistics show they clearly are not necessary is bad public policy.

Thank you for taking the time to consider our position, and for your service to the Commonwealth.

Sincerely,

C. Warren Wakeland
Director of Government Affairs

Thomas L. Herman, CFPS
10719 River Road
Chesterfield, VA 23838
804-590-1239

January 4, 2010

Mr. Thomas Fleury
Board of Housing and Community Development
600 East Main Street
Suite 300
Richmond, VA 23219

Dear Mr. Fleury,

I am writing in regards to the upcoming hearing and vote pertaining to Virginia retaining the residential fire sprinkler requirements as now adopted by the International Residential Building Code. The Commonwealth of Virginia has always been way behind many other states when it comes to issues of fire safety. It is now time to align Virginia and bring us into modern times!

I have been a local firefighter now for 44 years: For 13 years I worked as a career fire fighter in the City of Richmond. I have served as a volunteer firefighter in Henrico and also in Chesterfield County where I still actively serve. I left my career in Richmond because I grew weary of removing the bodies of victims from burned out houses. I knew that most of the fatalities I witnessed were preventable, but no one seemed to make residential fire protection a priority. I left the Richmond Fire Department to take a job as a fire protection system technician, inspecting, testing, and maintaining commercial built-in fire protection systems. I felt then and still feel today that I am saving more lives by ensuring that fire sprinkler systems installed within commercial buildings work properly, if and when needed, than I was as a firefighter.

I personally witnessed the agonizing screams of a mother as we removed the bodies of her three children from their destroyed home. The home was only three blocks from our fire station and the total fire department response time was under two minutes! As usual, the victims died before the fire department ever received the call.

Thanksgiving morning of 1976, another house fire happened with devastating results. We found a deceased mother and father together in their second floor bedroom with their six-year-old daughter lying across them. The daughter had been outside of the home with a neighbor across the street, when the daughter darted back into the home to find her parents.

Another great injustice occurred on August 18th, 1970, when one of the firefighters assigned to my station died while fighting a typical house fire, when what we call a "flashover" enveloped him. Fire sprinklers would have prevented the flashover from occurring.

The one common thread is that all of these fatalities were PREVENTABLE! I could go on about these experiences, as there are many more I could tell you about, and I am just one firefighter. Imagine hearing these types of experiences from all the firefighters in Virginia.

Please take the time to read the enclosed articles. Also please realize that the systems we are talking about are very different from the commercial building type fire sprinkler systems. *Most residential installations can be performed by the plumbing contractor who is already onsite, adding a relatively small amount of additional work as an add on to the existing plumbing system.* Separate water supplies are generally NOT required and there is NO requirement in the code for outside contractor inspections or maintenance. The Habitat for Humanity Texas chapter has installed fire sprinklers in the last 100 homes they constructed. That potentially life-saving addition cost only .60 cents per square foot—proof that the cost comes down once the trade acclimates to the work.

The technology is now available, the cost is minimal and will go even lower, but the process needs to start now. This is not for the benefit of ourselves—it is for our children, grand children, and great grandchildren, as it will take years for the majority of houses to become protected. The process needs to start and the sooner the better for all of us.

Please, please, join forces with America's firefighters and help us begin the process of saving 3,000 lives annually.

Sincerely,

Thomas L. Herman

Thomas L. Herman, CFPS
Certified Fire Protection Specialist
Fire Protection Consultant

1970 8/18

Fire at Annex Area Home

Young Fireman Killed Fighting Blaze

By BILL McDOWELL

A young Richmond fire fighter was killed early today while battling a blaze on the second floor of a home in the newly annexed area of the city, fire authorities said.

John D. Barlow, acting fire chief, identified the dead fireman as James W. Buckner, 20, of 1007 W. Cary St.

Buckner was a member of a five-man team from Engine Co. 20, the first firemen to enter a smoke-filled home at 1201 Acorn Ave. at 12:59 a.m., Barlow said. Firemen had received the alarm three minutes earlier, he said.

DETAILS GIVEN

Barlow gave these details of the mishap:

Buckner and three of the team, all wearing gas masks, entered the home, occupied by a Mrs. J. Semp and her two children. Buckner and a fellow fireman, Jerry Wayne Hall, went immediately to the second floor carrying the first line of hose to locate the source of the fire.

The other two men returned to get supporting hose, while a fifth fireman stood by his truck to operate its water pumps.

Barlow said the home is a "Cape Cod-style" structure, with a stairway in the center leading to a remodeled attic. There are two rooms, one at each end of a hallway at the top of the stairs, he said.

GAS MASK

Hall told Buckner his gas mask was beginning to malfunction because of the intense heat in the area, and twice told Buckner they should retreat to the first floor, Barlow said. By then, about 1:10 a.m., a call for extra equipment was made for assistance in fighting the fire, Barlow said.

The men began to feel their way along the smoky hallway. Hall found the stairs, but Buckner, "in my opinion, became confused and lost his sense of direction," and instead groped

JAMES W. BUCKNER

his way into the bedroom where the fire began, Barlow said.

When Buckner entered the room, oxygen rushing into the room caused "a burst of flames," said Barlow. The door to the room then closed behind the fireman, he said.

Barlow said Buckner was found behind the door to the burning room. Fellow firemen, members of the Forest View Volunteer Rescue Squad and Allied Ambulance rescue squadsmen administered oxygen to the fallen firemen on the front lawn of the house.

CARBON MONOXIDE

Officials at MCV-West hospital said Buckner was dead on arrival there at 1:50 a.m. Dr. R. C. Henry, a state medical examiner, said today Buckner died of massive inhalation of carbon monoxide gas.

The young firemen also was burned on his hands and face, but Dr. Henry said Buckner was overcome by the smoke before he was burned, based on autopsy reports.

No other injuries were reported in the blaze. Mrs. Semp and her two children were reported staying with relatives.

Damage to the home was estimated at $2,200. Barlow said faulty wiring in the bedroom caused the blaze.

Buckner joined the Richmond Fire Bureau in December, 1968, Barlow said.

NATIVE OF CITY

A native of Richmond, Buckner was a 1967 graduate of Maggie Walker High School.

He was a member of Fifth Baptist Church.

He is survived by his parents, Mr. and Mrs. Arthur B. Buckner; a sister, Mrs. Sandra Nutall of Richmond and a brother, Authur B. Buckner of Owensboro, Ky.

Funeral arrangements were incomplete.

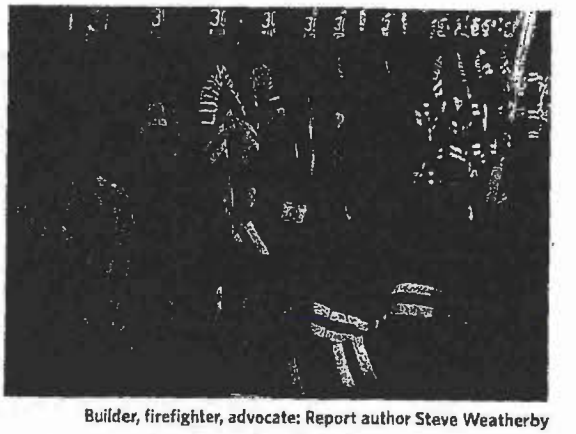
Fire officials said it has been seven years since a Richmond fireman had been killed in the line of duty.

Capt. Harvey Hicks and Douglas Evans were overcome on June 14, 1963 by gas fumes when they attempted to rescue a contractor who had fallen in a huge hole at 1001 N. Fifth St.

HOME FIRE SPRINKLERS

Direct Impact

A detailed study of one Maryland community is good news for home fire sprinkler advocates



Builder, firefighter, advocate: Report author Steve Weatherby

HOME FIRE SPRINKLERS SAVE LIVES, cut property loss from fire, and cost less than $2 a square foot to install.

That's the bottom line in Prince George's County, Maryland, according to "Benefits of Residential Fire Sprinklers," a report released in August that analyzes the county's experience with the single-family-dwelling fire sprinkler ordinance it enacted in 1992. The report, which covers a 15-year period, was a joint effort of the nonprofit Home Fire Sprinkler Coalition; the Prince George's County, Maryland, Fire/EMS Department; the Maryland Fire and Rescue Institute; and the Maryland State Fire Marshal's Office.

The study, prepared by Steve Weatherby, vice-president of construction for The Holladay Corporation in Washington, D.C., concludes that the "most obvious benefit of the ordinance is the direct impact that home fire sprinkler systems have made in saving lives and reducing fire-related injuries." During the period studied, Prince George's County had fires in 13,494 single-family homes or townhouses. Fires in unsprinklered homes killed 101 civilians and injured 328. No civilians died and only six were injured in fires in sprinklered homes. In addition, sprinklers cut property loss in such fires almost in half.

To determine whether sprinklers added significantly to the cost of a home, Weatherby also interviewed several Prince George's County sprinkler contractors, who told him that the per-square-foot cost to install sprinklers in single-family homes in the county had dropped to less than $2 per square foot. This is consistent with a recent Fire Protection Research Foundation study that found the average cost of residential sprinkler installation in the United States is $1.61 per sprinklered square foot.

These findings appear to refute two arguments the nation's home builders have made in an effort to persuade members of the International Code Council to rescind the sprinkler requirement included in the 2009 edition of the *International Residential Code®* (IRC) at the ICC's annual meeting and code development hearings, held recently in Baltimore, Maryland. According to a policy statement published by the National Association of Home Builders on its website, www.nahb.org, residential sprinklers would significantly increase the cost of building a home, and the need for residential sprinklers in one- and two-family homes is "unsubstantiated."

To demonstrate the efficacy of residential sprinklers, the Maryland Fire & Rescue Institute conducted a live burn to coincide with the release of the report. Two 8-by-8-foot (2-by-2-meter) rooms were built and furnished, and one was equipped with a single sprinkler. Nine seconds after a fire was started in the unprotected room, the smoke alarm activated. In three minutes, flashover occurred. A fire started in the sprinklered room activated its smoke alarm at eight seconds. Once the temperature near the sprinkler reached approximately 150°F (66°C), the sprinkler activated and controlled the fire.

Home builders also argue that smoke alarms alone provide enough fire protection in homes. While there can be no doubt that smoke alarms have played a major role in reducing the number of fire deaths over the past two decades, approximately 3,000 people still die in home fires every year, even though about 95 percent of U.S. homes have smoke alarms.

"As a builder and fire officer, I still can't understand why there is continued objection to mandatory residential fire sprinklers," says Weatherby, who is also a captain in his local volunteer fire department. "I hope that the study I produced will help reinforce the life-saving benefits of fire sprinklers, and make an impact with the individuals who are working against mandatory fire sprinkler requirements."

NFPA President James Shannon hopes so, too. "There is no magic bullet solution to the problem of fire deaths," notes Shannon in this issue's "First Word." "But it would be illogical and indefensible for us not to work hard for the application of a technology that is available, affordable, and proven to be extraordinarily effective in protecting lives from fire."

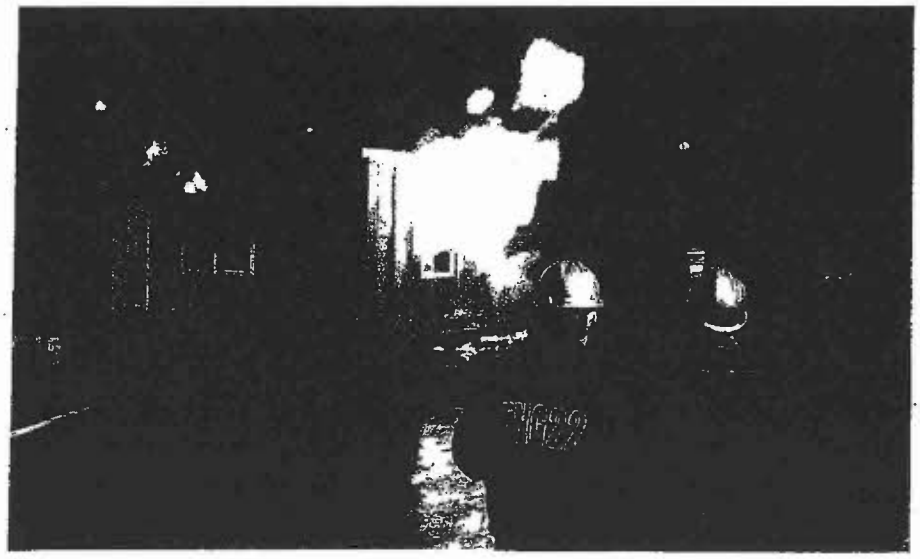
For a copy of the Prince George's report, visit www.HomeFireSprinkler.org.

—*Kathleen Robinson*

"The Tree Burn"

Christmas tree fires aren't common, but when they happen they tend to be severe. Consider this: From 2003 to 2007, on average, one of every 14 home structure Christmas tree fires resulted in a death, compared to an average of one death per 74 non-confined home structure fires overall. That's one of the findings in the new "Home Christmas Tree and Holiday Light Fires" report, recently released by NFPA's Fire Analysis and Research Division. For the full report, as well as a video of an NFPA side-by-side Christmas tree burn test, visit www.nfpa.org/treeburn.

Photograph: Katherine Lambert



RESEARCH

'The ultimate side-by-side'

Measuring the soup-to-nuts environmental impact of fire

Attendees at the FM Global burn demonstration in early October were sworn to secrecy on the preliminary results of the burn, which measured the overall environmental impact of sprinklered versus non-sprinklered home fires.

Here's a hint, though: A home with sprinklers is a lot kinder to the environment than one without, especially in the event of a fire.

While that probably comes as no surprise, the real eye-opener promises to be the quantitative data gathered from each burn—the first time such information has been scientifically evaluated in terms of environmental impact. The burn, co-sponsored by commercial property insurer FM Global and the Home Fire Sprinkler Coalition, was described by Gary Keith, HFSC chair, as "the ultimate side-by-side burn."

The research intends to establish the types, quantity, and duration of air and water pollutants released from a home fire, as well as the water usage from fire sprinklers and firefighters' hoses. It also plans to measure the environmental impact resulting from burning household furnishings and finish material, as well as disposing the fire-damaged contents of a home. The research also hopes to quantify the carbon footprint associated with rebuilding a burnt home. FM Global officials say they hope to make the findings available sometime early in 2010.

About 50 observers, including a delegation from NFPA, attended the Oct. 1 event, held at FM Global's research campus in West Glocester, Rhode Island. Each burn test was conducted on a fully furnished living room, and ran for 10 minutes before firefighters extinguished the remaining fire. The fire in the sprinklered room was controlled by the sprinkler and resulted in minimal damage; the unsprinklered room was destroyed.

If one definition of "green" is any technology that has the effect of minimizing environmental impact, then sprinklers are decidedly green—the research results will tell us just how green. "We want to make the point that sprinklers are an important environmental consideration for the green movement," Keith says, "and can be considered a positive aspect of green construction."

—*Scott Sutherland*

For video, photos, and interviews from the FM Global burn, visit nfpa.typepad.com/firesprinklerinitiative/

Americans Recognize Risk of Fire, But Don't Worry About It

A nationwide survey conducted by the Society for Fire Protection Engineers (SFPE) revealed that more Americans believe fire is the event that will most likely cause harm to them or their family when compared to lighting strikes, hurricanes, earthquakes and floods. Forty-five percent of the survey respondents selected fire.

At the same time, only 18 percent of the respondents said they worry about the dangers of fire more than once a year.

"As a nation, there are widespread misconceptions about fire safety, and that's worrisome," said Chris Jelenewicz, Engineering Program Manager at SFPE. "Everyone should recognize that thousands of people die each year in fires, and be aware that fire safety features in a building play a critical role in protecting people, property and the environment from fire."

Americans are more likely to be harmed by fire when compared to natural disasters. For example, although natural disasters such as hurricanes and earthquakes are covered widely in the national news media, many more people die each year as a result of fire.

For more information, go to *www.sfpe.org*.

FEMA's U.S. Fire Administration Endorses Residential Fire Sprinklers

The U.S. Fire Administration Announces its Support of a New Building Code Calling for the Use of Fire Sprinklers in New Homes

After 30 years of testing, research and development, the Federal Emergency Management Agency's (FEMA) U.S. Fire Administration (USFA) has announced its support of the 2009 International Residential Code (IRC), which mandates the installation of fire sprinklers in all new homes beginning in 2011.

"Every day firefighters bravely enter homes to rescue people from fire and risk their lives under collapsing roofs and floors, because of the lightweight construction that's so prevalent these days in home building. This endorsement by the USFA comes as great news to fire service professionals across the country, who are supporting the IRC to include residential fire sprinklers as a critical component in fire protection in the home," said John Viniello, president of the National Fire Sprinkler Association, the longest-tenured fire sprinkler advocacy organization in the U.S.

The new IRC mandate, a response to the growing fire problem in the U.S., is an initiative that could prevent more than 3,000 fire-related deaths and 60,000 serious fire-related injuries across the nation each year. About 90 percent of all fires occur in the home, fueled by new lightweight construction and more flammable home contents. In fact, the new sprinkler regulations are being endorsed by fire service professionals across the country, such as the U.S. Fire Administration, the International Association of Fire Chiefs, the National Fallen Firefighters Foundation, and the International Association of Firefighters. Groups including these agree smoke detectors are no longer enough in residential fire protection, as lightweight construction has become more prevalent, house contents are more flammable than ever, and the time available to escape a house fire has reduced from 17 minutes 20 years ago to three minutes today, according to a cost-benefit analysis by FEMA.

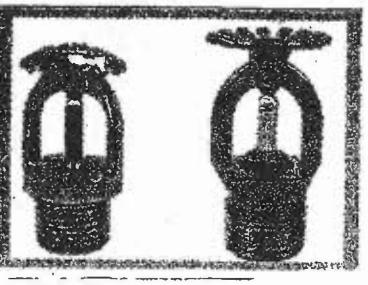
"It is the position of the U.S. Fire Administration that all Americans should be protected from death, injury and property loss resulting from fire in their residences. All homes should be equipped with both smoke alarms and residential fire sprinklers, and all families should have and practice an emergency escape plan. The U.S. Fire Administration supports all efforts to reduce the tragic toll of fire losses in this nation, including the recently adopted changes to the International Residential Code that require residential fire sprinklers in all new residential construction. The time has come to use this affordable, simple and effective technology to save lives and property where it matters most – in our homes," said Glenn A. Gaines, Acting Assistant Administrator for the U.S. Fire Administration.

USFA's research regarding residential fire sprinkler systems has indisputably demonstrated that residential fire sprinklers can save the lives of civilians and firefighters and can reduce property loss as well as offset the risk of premature building collapse by lightweight construction when involved in a fire.

FIRE SPRINKLERS

The Good Thing Can Save

LIVES - Property - Money



New Report Finds Sprinkler Ordinances Don't Hurt Housing Construction or Prices

County-wide mandates for life-saving sprinklers do not result in reduced housing supplies, compared to counties without sprinkler requirements

July 15, 2009 — The results of a new study conducted for the National Fire Protection Association (NFPA) concluded that the presence of sprinkler ordinances has no negative impact on the number of homes being built.

Conducted by Newport Partners, Comparative Analysis of Housing Cost and Supply Impacts of Sprinkler Ordinances at the Community Level compared residential construction in four counties; Montgomery County, Maryland, was paired with Fairfax County, Virginia, and Prince George's County was paired with Anne Arundel County, both located in Maryland. Montgomery County and Prince George's County have sprinkler requirements; Fairfax County and Anne Arundel County do not. The selected areas, all developmentally mature, cover a wide geographic area and contain a variety of housing stock and income levels, making them prime for comparing municipalities with and without sprinkler ordinances in place.

"This study clearly demonstrates that home fire sprinkler requirements do not impede housing development starts," says Jim Shannon, NFPA president. "This report is another point to make the case for enacting life-saving sprinkler requirements in local communities."

Sprinkler ordinances were enacted in Montgomery and Prince George's Counties in several stages, beginning in the late 1980s, but never in Fairfax County. Anne Arundel County adopted a requirement for single-family detached residences this year; this study looked at Anne Arundel County

Continued on Page 54

SPRINKLER REPORT *from Page 52*

housing starts prior to the ordinance. No reduction in the number of single-family homes built in either Montgomery County or Prince George's County accompanied the enactment of ordinances, compared to the other two counties in the study that do not have sprinkler ordinances. Rather, both Montgomery and Prince George' counties saw larger relative increases in construction in the year after the ordinances went into effect, compared to the other two counties.

Data for the analysis included annual single-family building permits, surveys of housing and households, local documents and news reports released before and after adoption of residential sprinkler requirements, as well as reviews of other housing regulations. Interviews with key builders, trade association staff and local government officials were also conducted.

In interviews, builders and staff of the Maryland-National Capital Building Industry Association (MNCBIA) all indicated that the sprinkler requirements did not significantly affect the volume, character or price of the construction of new homes. According to the report, "None of the statistical or interview information demonstrated that the requirements led to reduced housing supply."

All model safety codes now require the use of fire sprinklers in new one- and two-family homes. These requirements offer the highest level of safety to protect people and property. To review the complete finding from this report, please visit the Fire Sprinkler Initiative's Website at www.firesprinklerinitiative.org. The report can be found under "Research and Reports."

About the Fire Sprinkler Initiative:

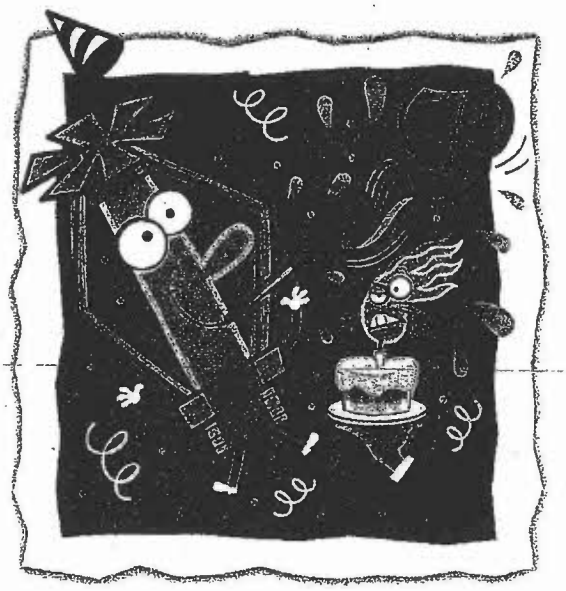
Bringing Safety Home

The Fire Sprinkler Initiative, a project of the National Fire Protection Association, is a nationwide effort to encourage the use of home fire sprinklers and the adoption of fire sprinkler requirements for new construction.

About the National Fire Protection Association NFPA has been a worldwide leader in providing fire, electrical, building and life safety to the public since 1896. The mission of the international, nonprofit organization is to reduce the worldwide burden of fire and other hazards on the quality of life by providing and advocating consensus codes and standards, research, training and education. Visit NFPA's Web ite at www.nfpa.org

Anniversary Time

Recalling three big years in the development of automatic sprinklers.



Anniversaries provide a special opportunity to look back at milestones in the development and recognition of automatic sprinklers. It was 10 years ago, in 1999, that the Federal Emergency Management Agency recommissioned *America Burning*, leading to the publication of an updated report on the fire problem in the United States. One of the principal findings was this: "The most effective fire loss prevention and reduction measure with respect to both life and property is the installation and maintenance of fire sprinklers."

Fifteen years ago, in 1994, the U. S. General Services Administration (GSA) addressed the issue of how effective sprinklers are, under an obligation imposed by the Federal Fire Safety Act of 1992. After studying the issue, the GSA determined that an automatic sprinkler system could provide life safety from fires by preventing flames from leaving the room of origin, limiting the fire size to no more than 1 megawatt, and preventing flashover in the room of fire origin.

Preventing flames from leaving the room of origin ensures that the fire does not continue to grow and spread. Limiting the size of the fire to no more than 1 megawatt ensures that the total impact of the fire will be manageable. Without sprinklers, a fire in even a single upholstered chair can grow to 2 megawatts, while a sofa fire can reach 4 megawatts. Fires in small rooms can quickly grow to flashover, when heated gases at the ceiling ignite all combustible items in an enclosure simultaneously. Preventing flashover in the room of fire origin limits the production of toxic gases that can spread to adjacent areas even in cases where the fire itself is contained.

Even the 1-megawatt fire is a maximum based on conservative assumptions relative to ceiling height and sprinkler response. In typical rooms, sprinklers are expected to respond when then fire is considerably smaller, on the order of a tenth to a quarter of a megawatt, or the range from a small to large wastebasket fire. This is because of the significant technological advancement that took place 30 years ago: the development of a new generation of fast-response sprinklers.

The Los Angeles residential sprinkler test series, in which fast-response prototype residential sprinklers were field-tested for the first time, took place in the summer and fall of 1979, and included 60 full-scale fire tests that demonstrated the ability of the new sprinklers to provide life safety even in small residential compartments.

The residential sprinklers were the first in the family of fast-response sprinklers, a family that grew to include ESFR (early suppression fast response) sprinklers for storage applications, as well as QR (quick response) and QREC (quick response extended coverage) sprinklers for light and ordinary hazard applications. These sprinklers all employ fusible links or bulbs that are more thermally sensitive than those of traditional sprinklers, allowing them to react faster to the heat of a fire. This is done by reducing mass in the sensing element, using a thinner link or smaller-diameter bulb, while maintaining the strength of the sprinkler assembly needed to hold back the water pressure in the absence of a fire. Faster sprinkler response leads to more rapid control of the fire, which means that, in many cases, only one or two sprinklers closest to the fire will need to operate to provide control or suppression.

Today, NFPA's sprinkler system installation standards mandate the use of these fast-response sprinklers in almost all areas in which people live, work, and play. On the 30th anniversary of the Los Angeles residential fire tests, the level of protection fire sprinklers provide is higher than ever.

RUSS FLEMING, P.E., *is executive vice-president of the National Fire Sprinkler Association and a member of the NFPA Technical Correlating Committee on Automatic Sprinklers.*

Illustration by Jack Desrocher

Lt. Pete Hypes is with Chesterfield County Fire & EMS

Living Safe

When Will We Learn?

With the holidays upon us, the smell of delicious food cooking will quickly turn into food burning if we do not pay attention to the task at hand. You have heard me say over and over again that cooking is a full-time job. We had a day recently where no fewer than twelve cooking-related incidents occurred in our county. Some ranged from food on the stove that got burnt and smoked up the house or apartment, to fires that did some level of damage to the kitchen and home.

Pete Hypes

It has been shown that, since people continue to do things that cause cooking related fires, smoke alarms and residential sprinklers are needed to offer the greatest level of protection. In other words, these protective measures are absolutely needed because the chances are so great that most people will experience a cooking-related fire in their home or apartment.

It takes three things to have a fire – heat, fuel and oxygen. All three are present every time you cook, and, in the case of a gas stove, you even have the fire. If cooking is something that we all do and cooking results in 3.5 out of every 10 residential fires, then we must keep our head in the cooking game.

I know that you may get tired of hearing me say the same things over and over, but until you get it, I am going to keep saying it. You have heard me say before that most firefighters love to fight fires. It does not matter whether the fire is at your house or mine. If you are not home and your nice new front door is locked, don't worry, we carry a universal key. The only problem is that you may need a new front door. Also, if your kitchen is burning, that nice bay window that you like to look out while drinking your coffee will be broken out to allow the heat and smoke to be removed. As far as the 150 to 200 gallons per minute of water that we will flow to extinguish the fire, it may cause some collateral damage that cannot be avoided.

You may say I am being too harsh, but these fires are happening every single day! I leave you with this – unexpected guests will come to your home at meal time if your cooking gets out of hand. Be safe and enjoy the holidays.

Sprinklers Save Lives, Property AND MONEY!

Limiting Fire Department Costs

Sprinkler ordinances are especially considered in communities where homes are built in areas that are not easily served by the fire department, or where the fire department would have to be expanded to serve the growth of the community. Homes can be built farther from a fire department, and the fire department would not have to be expanded - saving tax dollars.

Construction Cost Savings

The Uniform Building Code provides design and construction options for sprinklered buildings which are not available to non-sprinklered structures. Design flexibility provided by some communities to sprinklered developments includes narrower street widths, steeper street grades, more space between fire hydrants, more distance from houses to the road, etc.

A study done in Scottsdale, Ariz., in 1986 found that residential sprinkler systems were costing $157.24 for a typical 2000 sq.ft. home. "The initial cost was $2053, but after the trade-offs, both on- and off-site, the system actually cost $157.24," said Assistant Fire Chief Frank Hodges of the Rural Metro Fire Department in Scottsdale, Ariz.[15]

Insurance Rate Reductions

The effectiveness of automatic fire sprinklers in reducing fire losses has been recognized by the insurance industry for nearly a hundred years. Check with your insurance agent for information on insurance credit for residential sprinklers.

Sprinklers Are Effective

The U.S. Fire Administration reports the following information about Residential Sprinkler Systems:

- U.S. Department of Energy reports no loss of life and greatly reduced property loss in fires from 1952-1980 in sprinkler-protected facilities of all types.

- Sprinklers are extremely effective. Excluding deaths caused by explosion or flash fire, there has been no known occurrence of multiple loss of life in a fully sprinklered building, where the sprinkler system was properly operating, due to smoke or fire.
- In most cases, a single sprinkler head is sufficient to control a fire while it is still small.

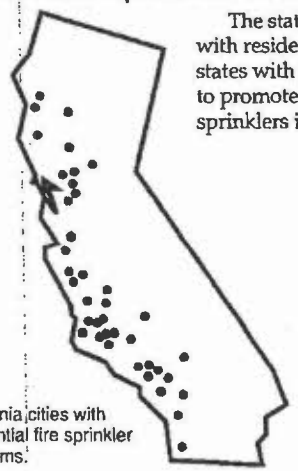
Fire Sprinkler Performance

Approximately 100,000 fire incidents have been recorded in studies conducted by six organizations from 1886-1978. The results indicate outstanding performance by fire sprinkler systems over a period of 92 years.

Area of Study	Time-Span	# of Fires	Success
Australia and New Zealand	1886-1968	5,734	99.8%
New York City High-Rise	1969-1978	1,648	98.4%
New York City Low-Rise	1969-1978	4,061	95.8%
Nat. Fire Protection Assoc.	1925-1969	81,425	96.2%
U.S. Navy (shore facilities)	1964-1977	724	95.7%
Factory Mutual Research	1973-1977	3,292	86.1%

Residential Sprinkler Ordinances

The state of California contains the most cities with residential fire sprinkler programs. Other states with cities that have established a program to promote or require the use of residential sprinklers include:



California cities with residential fire sprinkler programs.

Alaska
Arizona
Colorado
Connecticut
Florida
Georgia
Illinois
Indiana
Maine
Maryland
Massachusetts
Michigan
Montana
Nevada
New Hampshire
New York
North Carolina
Oklahoma
Pennsylvania
South Carolina
Texas
Utah
Virginia
Washington
Wisconsin

Commercial Example

A comprehensive automatic sprinkler requirement was instigated in 1964 in Fresno, California, and more than 5.7 million sq. ft. of commercial buildings were equipped with sprinklers. A study done in 1984 compared the fire losses before and after the city adopted a sprinkler ordinance. They found a 93.8 percent reduction in property loss after the sprinklers were installed.

Years	Total Fire Loss	Loss/per year	Number of fires
1954-1969	$1.3 million	$90,080	62
1970-1984	$82,573	$5,504	67

The Facts About Fire Sprinklers

Automatic sprinkler systems have enjoyed an enviable record of protecting life and property for over 100 years. Yet, there are still common misunderstandings about the operation and effectiveness of automatic fire sprinkler systems:

Myth: "Water damage from a sprinkler system will be more extensive than fire damage."

Fact:
- Water damage from a home sprinkler system will be much less severe than the damage caused by water from fire-fighting hose lines or smoke and fire damage if the fire goes unabated.
- Quick response residential sprinklers release 13-18 gallons of water per minute compared to 125 gallons per minute released by a single fire hose.

Myth: "When a fire occurs, every sprinkler head goes off."

Fact:
- Sprinkler heads are individually activated by heat.
- Residential fires are usually controlled with one sprinkler head.
- 90% of all fires, including those in commercial structures, are controlled with six or fewer heads.

- A study conducted in Australia and New Zealand covering 82 years of automatic sprinkler use found that 82% of the fires that occurred were controlled by two or fewer sprinklers.

Myth: "A smoke detector is enough protection."

Fact:
- Smoke detectors save lives by providing a warning system but can do nothing to extinguish a growing fire or protect those physically unable to escape on their own, such as the elderly or small children.
- Too often, battery operated smoke detectors fail to function because the batteries are dead or have been removed.
- According to NFPA, the combined protection of a smoke detector and a fire sprinkler system could reduce the fire death rate per thousand fires by 82%.[16]

Myth: "Sprinklers are designed to protect property, but are not effective for life safety."

Fact:
- Sprinklers provide a high level of life safety.
- NFPA has no record of a fire killing more than two people in a completely sprinklered public assembly, educational, institutional or residential building where the system was properly operating.[17]
- Property losses are 85% less in residences with fire sprinklers compared to those without sprinklers. The combination of automatic sprinklers and early warning systems in all buildings and residences could reduce overall injuries, loss of life and property damage by at least 50%.

Tom Herman

From: "Jack Sullivan" <jacksull@mindspring.com>
To: <tom-herman@worldnet.att.net>
Sent: Sunday, January 30, 2005 1:11 PM
Subject: Report: firefighters taking longer to get to

This page has been printed from the following URL:
http://www.seacoastonline.com/news/01302005/south_of/61971.htm

1-30-2005

Report: firefighters taking longer to get to fires

By Associated Press

BOSTON - Firefighters from departments across the country are arriving at fires later each year, giving fires longer head starts, and barely over a third of calls nationwide meet national standards for response time, according to an analysis by The Boston Globe.

In Massachusetts, only 54 percent of local fire departments were able to get to 90 percent of building fires within six minutes, a standard set in 2001 by the National Fire Protection Association.

People waited 10 minutes or more for firefighters at 214 building fires in 2002, the last year that data was available, and there have been 2,786 such fires since 1990.

Nationwide, only 35 percent of departments were able to meet the six-minute goal in 2002, compared to 75 percent in 1986, when alarm times first began to be collected.

"Fire protection in America is a myth," said Vincent Dunn, a retired New York City Deputy fire chief and author of books on fire safety.

"These two subjects are the dirty little secrets of the fire service: The response times outside the center cities are too great, and the personnel responding, inside and outside the center cities, are too few. No one wants to talk about that."

1/30/2005

The Globe reviewed public records of 3.3 million building fires collected by the National Fire Incident Reporting System by 20,000 fire departments nationwide. The paper published the findings Sunday in the first of a two-part series.

The paper's review may be the first systematic effort to measure fire department performance using the response time data, which has been collected since 1986 under the reporting system, which is kept by the U.S. Fire Administration.

The Globe found that more than 4,000 people died in fires _ or about five per week _ in which the firefighters took more than six minutes to respond. The true number is probably higher, because fewer than half of structure fires are reported to the database, and reporting is voluntary.

The six-minute standard is a guideline, not law, based on the NFPA's estimation that a 911 call takes a minute to field, and firefighters take another minute to gear up and four to arrive at a fire. The NFPA does not seek perfection; the association recommends meeting that standard in 90 percent of calls.

It's difficult to tell how many deaths would have been prevented had firefighters arrived sooner, given that every fire is unique and occupants are sometimes dead even before 911 was dialed.

But there's little doubt that probability of death increases as minutes pass, according to Elaine Allen, a statistics professor at Babson College who reviewed the Globe's findings.

"Every minute counts," Allen said.

The standard has not been embraced. The National League of Cities and many

small fire departments have opposed the NFPA standard, arguing that the benchmark cannot be made to fit every community. The International Association of Fire Chiefs has endorsed it.

"The key is getting water on the fire. We've got get enough people in there

quickly," said Chief Billy Goldfeder, who heads the fire department in Loveland-Symmes, Ohio, a Cincinnati suburb. "It all ties to money, what people are willing to pay for."

The problem is also exacerbated by newer, fuel efficient homes, which burn hotter because the construction holds in the heat. New roofs also collapse faster because prefabricated trusses go up faster, and modern furnishings tend to burn faster.

In the 1970s, scientists at the National Institute of Standards and Technology found that at that time, people had about 17 minutes to escape before being overcome by heat and smoke. Today, the estimate is three minutes.

The Globe found that slow-responding departments are found in a wide-range of communities: wealthy communities like Bellevue, Wash., poor urban areas like East St. Louis, Ill., and fast-growing suburbs, like the counties around Atlanta.

Some communities touted as attractive "cheap towns" to live in because of low taxes also have low response times. Bend, Ore., cited by Forbes magazine as a top "cheap town," had an on-time response rate of 18 percent.

Fire chiefs say firefighters are taking longer to get to fires because of more work and fewer staff.

Though the number of fires nationwide has declined with fire prevention efforts, the number of calls to departments has doubled over the last 20 years, in part because fire departments began handling ambulance calls in the 1970s and 1980s, but also because people routinely call over perceived emergencies, such as bats in the attic, flooding, and strange noises.

And fire department budgets are shrinking. The Globe calculated, using U.S. Census data, that fire spending went from an average of 6.1 percent of municipal spending in 1987 to 5.7 percent in 2003.

In Massachusetts, 800 paid firefighters have been lost since Sept. 2001 through layoffs and attrition.

1/30/2005

Residents may not see the need to increase spending. In Ipswich, a seaside town north of Boston, residents voted down plan to hire eight firefighters at $786,800 per year.

The request was made after a mother and her two young children died in a house fire broke out in 2001 and there was no one in the firehouse a few blocks away, because all three firefighters on duty were on emergency calls and couldn't arrive at the home on time.

"It would have passed," said Ipswich Fire Chief Henry Michaelski, "if we'd had the vote at the funeral."

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NOTE: The City of Richmond, Va. Has eliminated 40% of it's fire companies over the past 30 years and has reduced staffing by almost 50% !

Thomas L. Herman
RFD Historian

1/30/2005

ALL PREVENTABLE !!!!!!!!

12-2-99

Disabled vet dies in fire in S. Richmond

Five injured in Henrico fatal to two half brothers

11-16-99

Richmond apartment [illegible] fire to hospital, 2 [illegible]

THE STATE

12-5-99

Henrico fire kills mother and 2 children

9/3/99

Woman is killed in Caroline house fire

Body is found after Surry home fire

Henrico investigating three

Scenes from a tragedy

4-21-98

Dinwiddie

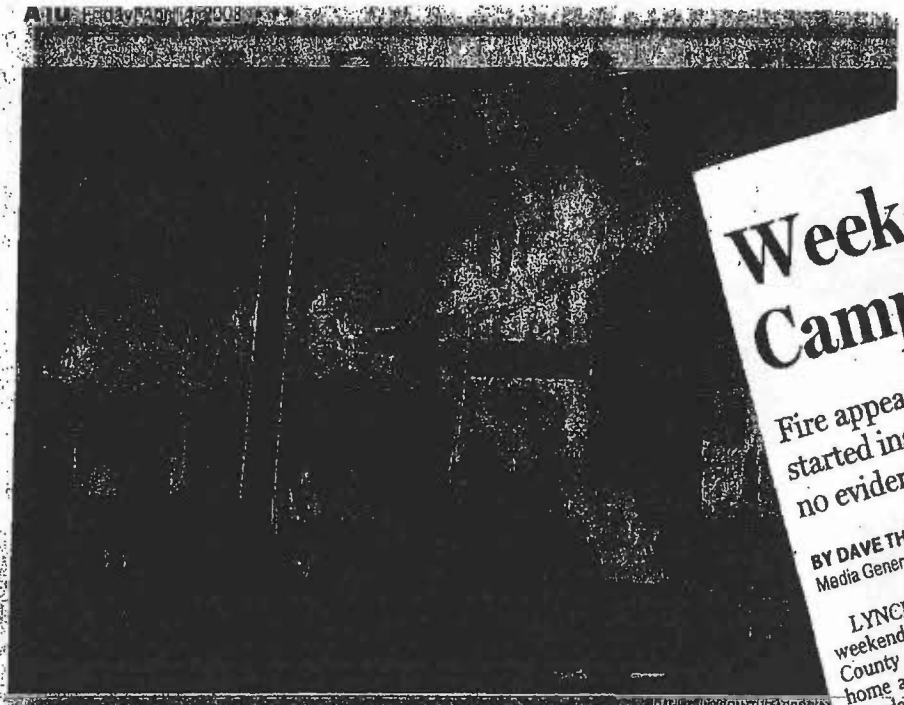
Officials await ID of fire victim

A person died in an early morning blaze

6-08

Woman became disoriented in fatal

Investigators identify victim in Petersburg, say blaze was [illegible]



The fire chief said the blaze in Brockway, Pa., early yesterday had a good head start that time firefighters arrived. It melted the siding of a neighboring house.

Weekend fire kills Campbell couple

Fire appears to have started inside house; no evidence of arson

BY DAVE THOMPSON
Media General News Service

LYNCH STATION — A weekend fire killed a Campbell County couple inside their home and left nothing but the foundation and a deck standing.

Daughter says the victim was 43 and a longtime n...

3-21-08

Body discovered in Henrico house fire

10 die in Pa. house fire

Woman, 9 others under 20 are victims; most were related

Wis. house fire kills 3 kids left home alone

Five children die in Arkansas house fire

1-6-07

Two fires in Danville area kill four people, injure one

Among the victims: a couple who'd just had their 62nd anniversary

SATURDAY, JANUARY 5, 2008

• VIRGINIA'S NEWS LEADER • INRICH.COM • A MEDIA GENERAL NEWSPAP

2-29-08

Central Va. fires killed 20 in 2007

R. EDWARD (ED) RHODES
POST OFFICE BOX 29647
RICHMOND, VIRGINIA 23242
TELEPHONE: 804.360.8922 • FACSIMILE: 804.360.8502
E-MAIL: RH007@COMCAST.NET

By Electronic Mail

July 5, 2009

Mr. Steve Calhoun
Department of Housing and Community Development
501 North Second Street
Richmond, Virginia 23219-1221

Mr. Calhoun:

I write this letter as public comment concerning the proposed Uniform Statewide Building Code as an individual. These regulations are now under consideration by the Board of Housing and Community Development.

My apprehension is that the inclusion of residential sprinklers will not be retained in the model code. All of the arguments being exploited by the opponents are not defensible with facts. The HBAV website even has misleading information posted to scare the public. The same tactics being used now are the same as twenty years ago with smoke alarms.

But now, occupants only have three minutes to vacate a single family dwelling that is on fire, with the time beginning when the smoke alarm sounds! What happens to those who are too young or are physically challenged? New technologies are normal in construction (light-weight construction) and furnishings are more flammable and produce more toxic smoke causing a faster burn and less time to evacuate.

Last month, the Codes and Standards Committee passed a proposal on residential sprinklers submitted by the Virginia Homebuilders Association. The Notice of Intended Regulatory Action (NOIRA) states that the proposed regulations "*have been vetted through the client groups affected by the USBC and have met no opposition.*" This could not be further from reality. This proposal has opposition and has yet to be discussed by any of the stakeholder groups. All of the arguments presented by the homebuilders have been heard at the national level and without success. This proposal needs to be withdrawn and allow it to go through the same process as all the other proposals without preferential treatment.

In closing, after retiring from the fire service with thirty years of service, I know that residential sprinklers save lives and reduce property damage. I would ask that the Board of Housing and Community Development remove the Virginia Homebuilders Association's submission from the proposed regulations and let the system work, as best as it can, for the betterment of our citizens and firefighters. What is the price of a loved one's life when it could have been saved by residential sprinklers?

Sincerely,

R. Edward Rhodes

R. Edward Rhodes

Construction

Automotive

Industry

3 rd August

Board of Housing and Community Development
Main Street Centre
600 East Main Street, Suite 300
Richmond, VA 23219
Attention: Mr. Tom Fleury, Chairman

Dear Chairman Fleury:

A recent decision by the International Code Council (ICC) has resulted in a residential sprinkler requirement for all new one- and two-family homes and townhouses. As you are aware, in Virginia these requirements are subject to review and adoption by the BHCD. Currently, there is legislation in Virginia that, if passed, would prohibit this latest safety requirement for new home construction.

I am writing to you to encourage the BHCD to adopt the new residential sprinkler mandate when it updates the 2009 IRC for Virginia. Nearby Montgomery County, MD has long since created such a mandate along with most other US states that will adopt the ICC requirement. By prohibiting the mandate of fire sprinkler systems in new one- and two-family homes, Virginia residents would be placed at unnecessary risk.

Many of our places of employment, education and civic buildings are already protected by sprinklers. The place where families are most vulnerable - their homes - should be protected by sprinklers, as well.

Nearly 80 percent of all fire deaths occur at home. Each year, approximately 3,000 people die in home fires, and sprinklers would have saved the vast majority of them. If you have a reported home fire, the risk of death is reduced by 80 percent with sprinklers. Home fire sprinklers save lives.

Careful consideration of this most important issue is necessary. The safety of Virginia residents must be the guideline for the Virginia Uniform Statewide Building Code (USBC). The BHCD should fully adopt the ICC mandate for residential fire sprinklers in the Virginia USBC.

Sincerely,

Peter Wallace
Head of Key Account management
REHAU Automotive LLC.

REHAU Automotive LLC·1501 Edwards Ferry Road, NE·Leesburg, VA 20176·Phone: (703) 777-5255·Fax: (703) 777-3053·www.rehau.com

March 27, 2009

Virginia Board of Housing and Community Development,
The Jackson Center
501 N. Second St.
Richmond, VA23219

Dear Sirs:

I am writing to ask you not to adopt the requirement to install fire sprinkler systems into all new one and two family dwellings.

- Data shows that smoke alarms have provided a substantial drop in fire fatalities. The rate of fatalities is exceptionally low in new construction where each bedroom and level is required to have a hard wired smoke detector with battery backup.
- Sprinklers will actually increase insurance rates due to potential for property damage.
- Sprinklers will increase the cost of new housing and thus increase the cost of all housing. This said, taxes will be increased unnecessarily on most new and existing residences due to higher property assessments.

For these reasons, please do not vote to require fire sprinklers in all new homes.

Sincerely,

Robert Lanphear
3709 Wakefield Road
Richmond, VA 23235

Shelton, Bill (DHCD)

From: David Larimer [dlarimer@netscope.net]
Sent: Monday, September 14, 2009 3:32 PM
To: Shelton, Bill (DHCD)
Subject: FW: I Strongly Oppose the Residential (Fire) Sprinkler Systems Proposal (Forwarded E-Mail from Senator Puckett)

Bill:
FYI-
Please see below e-mail.

Thank you very much!!
David

David T. Larimer, II
Office of Senator Phillip Puckett
38th District
Senate of Virginia
(276) 979-8181
-----Original Message-----
From: Bill Smith [mailto:smithwythe2@yahoo.com]
Sent: Thursday, September 10, 2009 3:14 PM
To: Phillip Puckett; Roscoe Reynolds
Subject: I Strongly Oppose the Residential (Fire) Sprinkler Systems Proposal

The Virginia Board of Housing and Community Development is considering requiring home-sprinkler systems in new all new residential construction.

Please receive this for the record as my strong oppostion to the proposed requirement for residential sprinkler systems for fire protection.
I have been involved in the residential construction industry for 32 years.

William J. Smith
395 Chapman Rd.
Wytheville, VA 24382
smithwythe2@yahoo.com
276-228-4888
276-228-5985
276-228-5987 Fax

9/15/2009

SENATE OF VIRGINIA

WM. ROSCOE REYNOLDS
20TH SENATORIAL DISTRICT
ALL OF CARROLL, FLOYD, HENRY AND PATRICK COUNTIES;
ALL OF THE CITIES OF GALAX AND MARTINSVILLE
AND PART OF GRAYSON AND WYTHE COUNTIES
POST OFFICE BOX 404
MARTINSVILLE, VIRGINIA 24114-0404
EMAIL: DISTRICT20@SENATE.VIRGINIA.GOV

COMMITTEE ASSIGNMENTS:
AGRICULTURE, CONSERVATION AND NATURAL RESOURCES
COURTS OF JUSTICE
FINANCE
LOCAL GOVERNMENT

September 10, 2009

William C. Shelton, Director
Department of Housing and Community
Development
Jackson Center
501 N. 2nd Street, 4th Floor
Richmond, VA 23219-1321

VIA: Fax Transmittal – 804-371-7090

Dear Director Shelton:

Enclosed herewith, please find a copy of an email to me from William J. Smith indicating his strong opposition to adopting regulations requiring home sprinkler systems in all new residential construction.

I wanted to make sure that Mr. Smith's concern was called to your attention.

I would be grateful if you could have someone from staff contact Mr. Smith and discuss with him in detail why he believes this is a bad idea.

Thank you very much.

Sincerely,

Wm. Roscoe Reynolds

WRR:ew

Enclosure

From: Bill Smith (smithwythe2@yahoo.com)
To: Phillip Puckett; Roscoe Reynolds
Date: Thursday, September 10, 2009 3:14:11 PM
Subject: I Strongly Oppose the Residential (Fire) Sprinkler Systems Proposal

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Please receive this for the record as my strong oppostion to the proposed requirement for residential sprinkler systems for fire protection.
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July 21, 2009
BHCD Public Hearing

Good morning. My name is Keith Brower. I am the Chief Fire Marshal for Loudoun County, Virginia. I am here today representing the position of the Loudoun County Board of Supervisors who have asked you to enact residential sprinkler requirements as part of the 2009 code cycle.

In 1986, knowing that unparalleled residential growth was imminent, the Loudoun County Board of Supervisors approved the creation of a consortium to study residential sprinklers. That study was completed in 1987 and contained recommendations to pursue residential sprinklers in the code process as well as through legislation, as needed, and to encourage homebuilders to voluntarily install residential sprinklers. Dissapointingly, some 23 years later, Loudoun County and Virginia are still at the starting line for the most part. State building codes and laws have not resulted in residential sprinklers for 1 and 2 family dwellings and townhouses and voluntary compliance has simply not worked. How will the new voluntary code change alter things?

We need residential sprinklers as today's fires are rapid energy release fires. Fed by synthetics and plastics, and in combination with unprotected engineered construction components, fires are quickly flashing over and causing structural collapsing with unprecedented speed. Occupant escape time has been reduced and firefighter danger has increased. You may have heard of Loudoun's near miss, fully involved house fire on Meadowood Court on May 25, 2008 where we almost lost 4 firefighters who became

trapped in a collapse while conducting a search on the second floor. I can give you the web site with the video that tells all.

By contrast, on June 8, 2009 a fire occurred in a 4-story sprinklered townhome in Sterling when an occupant of the home placed a pizza box on the kitchen stove and left. Within moments, the box caught fire. The smoke alarm inside the residence activated. It did not set off the sprinklers, as they don't activate on smoke. Then the fire was extinguised by a single residential sprinkler head that activated due to the heat. All the sprinklers did not go off, just the 1 exposed to the heat. Fire damage was confined to a 3' x 3' area above the stove, there was no heat or smoke damage and there was no danger posed to occupants or firefighters. There was water damage, probably about 250 gallons from the sprinkler head. Far less, however, had the home required 10-15 minutes of water from our fire hoses which flow at 150-200 gallons per minute.

Ladies and gentlemen, residential sprinklers work. The need is there and it is time for Virginia to become a leader as opposed to continuing to resist the ever improving and ever affordable advances of residential sprinklers. Continuing to rely on voluntary efforts amounts to putting one's head in the sand if the last 23 years of Loudoun County's experience is the indictor. I encourage you today to reject the code change for voluntary residential sprinklers, as this is not what the national model code requires. Instead, require the fire service, the home building industry and the allied professions to develop and submit a truly consensus and meaningful proposal that works and will save the lives of future Virginians.

Comments by R. Edward Rhodes
Rhodes Consulting Group
Richmond, Virginia

Good morning Mr. Chairman and members of the board. I am Ed Rhodes and I represent a number of organizations that you will hear from today.

I want to briefly discuss residential sprinklers and to tell you that you will hear conflicting testimony from both the fire service and those who oppose residential sprinklers. You will hear how modern technology and better construction practices have made new homes safer for the consumer. But technology and construction has changed our profession immensely from when I first started over 35 years ago. No, I was not around when the horses pulled the fire equipment as some of my colleagues would have you believe. Today, the residential structures that we respond to are more dangerous, constructed of light weight components that are prone to early collapse. We face fires daily that can double in size every 30 to 60 seconds.

Keeping that last statement in mind, let us add this to the equation. In 2008, there was $325 million in property and contents loss in the Commonwealth of Virginia due to fire; the fire service saved over $6.0 billion in property and contents; and there were 544 civilian causalities and 336 fire service causalities. Through April of this year alone, there have been 26 civilian fire deaths in Virginia.

Now, again remembering the previous fact about fire doubling in size, the average time for evacuation from a residence is approximately 3 minutes. Let me repeat that – 3 minutes to get out of the house! This is before the structure becomes uninhabitable. Now, add in the fact that the average fire department response time is 6.9 minutes. That is an overall, statewide average that includes both career and volunteer departments.

Let me repeat this information so that each of you fully understands what we in the fire service are faced with on a daily basis with the current building practices.

1st – the fire doubles in size every 30 to 60 seconds

2nd – Escape time is 3 minutes, if you are not physically challenged or an infant.

3rd – Average fire department response time is 6.9 minutes

Yet, we in the fire service must understand the dynamics of the fire environment and the critical lines that we operate in. We are forced to make stressful decisions based on imperfect information and come up with a plan. All of this is time sensitive. When it is your house or your life or your family's life that is in peril, would you not want all of the protections afforded to you no matter the cost? What is the cost of someone's life? Given these facts, residential sprinklers are proven to be cost effective, affordable and they save lives.

We do not get the chance to do it over, we get one try and it better be right or we get to live with it.

In closing, Mr. Chairman, the opponents to residential sprinklers will use tactics that were used for over 20 years – it will increase the cost. It was used for smoke alarms, carbon monoxide alarms, now sprinklers and the DCR water quality regulations. Even to using wrong information on their website – smoke does not and never has set off a sprinkler.

Which would you rather have – a single head putting out 10 to 12 gpm in a room or a firefighter with a hose putting out 100 gpm or a nozzle in the bedroom window, putting out 250 gpm for a single room and draining it out the front door? Their arguments are old news!

Mr. Chairman and members of the board I implore you to reverse the decision of the Codes and Standards Committee on residential sprinklers and let this proposal be properly vetted by all of the stakeholders that are in this room. Remember, every argument, both for and against, has already been heard at the ICC meetings.

Thank you and I will glad to answer questions.

1 APSP-7. We would like for this Board to reject the
2 implementation of the APSP-7 at least until the meeting in
3 September comes to a conclusion in regard to what the
4 ICC ruling. We look forward to working with the Board
5 and other stakeholders regarding this process.
6 MR. CALHOUN: Ed Rhodes followed by David
7 Thomas.
8 MR. RHODES: Mr. Chairman and Board
9 members, good morning. My name is Ed Rhodes and I
10 represent a number of fire service organizations
11 throughout the state and you'll be hearing from them
12 today also. I want to briefly discuss residential sprinklers
13 and tell you that you'll hear probably conflicting testimony
14 from both fire services and from the opponents of this
15 proposal. You'll hear how modern technology and better
16 construction practices make new homes safer for the
17 consumers. Technology and construction has changed
18 our profession and fire services from when I first started
19 35 years ago. Now, I was not around when horses pulled
20 the fire wagons and equipment some of my colleagues
21 would have you believe. Today residential structures that
22 we respond to are more dangerous, construction of
23 lightweight components that are prone to early collapse.
24 We've faced daily challenges with fires that can double in
25 size every 30 to 60 seconds. Keeping that last statement

1 in mind, let us add to this equation. In 2008, there was
2 $325 million in property damage and contents loss in the
3 Commonwealth of Virginia due to fire. The fire service on
4 the other hand, saved over $6 billion in property and
5 contents. There was 544 civilian casualties and 336 fire
6 service casualties. In April of this year alone there were
7 26 civilian fire deaths in the state. Now, remembering the
8 previous facts about doubling in time, the average time for
9 evacuation from a residence is three minutes. Let me
10 repeat that, three minutes to get out of the house. This is
11 before the structure becomes uninhabitable. Now, add
12 the fact that the average fire response time 6.9 minutes
13 and that's an overall statewide average through both
14 career and volunteer departments. I want to reiterate that
15 fact so each of you can fully understand what we in the
16 fire service are faced with on a daily basis with the current
17 building practices. First the fire doubles in size every 30
18 to 60 seconds. Two, the escape time is three minutes if
19 you're not physically challenged or an invalid. Third, the
20 average fire department response time is 6.9 minutes, yet
21 we in the fire service most understand the dynamics of the
22 fire environment and the critical line we operate in. We're
23 forced to make special decisions based on imperfect
24 information and come up with a plan. All of this is time
25 sensitive. When it's your house or your life or your

1 family's lives is in peril, do you want, would you not want
2 all the protection afforded you no matter what the cost?
3 What's the cost of someone's life? Given the fact that
4 residential sprinklers have proven to be cost effective and
5 affordable. We do not get the chance to do it over in the
6 fire service. We get one try and it better be right or we get
7 to live with it. In closing Mr. Chairman, the opponents
8 use the same tactics they have used for 20 years. It will
9 increase the costs, use a smoke alarm, carbon monoxide,
10 sprinkler head problems, the DCR water quality
11 regulations, even using wrong information on the website,
12 smoke does not and never has set off a sprinkler. Which
13 would you rather have, sprinkler head putting out 10 to
14 12 gallons per minutes or a fire fighter with a hose putting
15 out a 100 gallons per minute or a nozzle in your bedroom
16 window putting out 250 gallons per minute for a single
17 room draining out the front door. Their arguments are old
18 news.
19 Mr. Chairman and members of the Board, I
20 implore you to reverse the decision of the Code and
21 Standards Committee on residential sprinklers and let
22 this proposal be properly vented by all stakeholders that
23 are in this room. Remember, every argument, both for
24 and against it have already been heard in the ICC hearing.
25 Thank you.

1 MR. CALHOUN: David Thomas followed by
2 Rand Sompayrac.
3 MR. THOMAS: My name is David Thomas and
4 I'm a licensed fire protection engineer in the
5 Commonwealth and have been for 20 years. I'm speaking
6 for myself as a fire protection engineer. I'm going to
7 request that Mr. Calhoun give each of you copies to the
8 Board members to follow me because my data is in factual
9 form. I apologize for that because engineers are pinheads.
10 My subject is the consequences of the codes and
11 standards committee June 22 action on residential
12 sprinklers. In order that the members of the board are
13 apprised of the consequences of the June 22nd decision to
14 delete the mandatory IRC code requirement for sprinklers
15 in single family and townhouse structures, I am enclosing
16 information on actual fire tests of engineer wood floors, in
17 basement fire scenarios. Lacking sprinkler protection, the
18 time to failure of engineered wood floors and basement
19 fire scenarios is as follows: Solid wood, regular old
20 dimensional lumber, 740 seconds. Wood I-joist
21 engineered wood, 490 seconds; steel channel joist, 462
22 seconds; metal plate wood truss, 469 seconds; wood I-
23 joist, 382 seconds; wood I_joist 380 seconds; wood I-
24 joists, 414 seconds; and metal web wood truss, 325
25 seconds. For engineered wood, time to collapse is from 5

1 minutes to 8 minutes. Fire department best case arrival
2 is of the order of 5 to 6 minutes on scene. By the time fire
3 departments set up occurs, the floor may well have
4 collapsed. I enclose the original data table from the
5 National Research Council of Canada, where the research
6 was conducted. I urge that the Board reconsider the
7 codes and standards committee decision, and the
8 published initial document of the USBC 2009 Edition, the
9 Board remain with the IRC mandate as it stands. The
10 consequences of the codes and standards committee June
11 22nd action are shown in the table above, and they are
12 very grievous for the safety of citizens and firefighters.
13 Thank you.
14 MR. CALHOUN: Rand Sompayrac.
15 MR. SOMPAYRAC: Good morning ladies and
16 gentlemen. My name is Rand Sompayrac and I am the
17 President of the Home Builders Association of Virginia. I
18 want to thank you for the opportunity to comment to the
19 2009 proposed changes to the Virginia Uniform Statewide
20 Building Code. As many of you know, the Homebuilders
21 Association is one of the largest business associations in
22 the state, with nearly 5,000 business member firms and
23 this year, HBAV celebrated its 53rd anniversary. Today we
24 brought several builders and associates with us. I would
25 like to ask all of those builder associates in the room

1 today who are opposed to this mandate please stand.
2 (Members standing). Over the next year this Board will
3 consider many proposed changes to the USBC that relates
4 to the method of construction and materials that are
5 required to be used in the construction of new housing
6 and new buildings in Virginia. This is a very important
7 responsibility. Since the USBC was first adopted in 1972
8 HBAV has been an active participant in the process. In
9 the most respectful manner possible, I would remind the
10 Board that the Code of Virginia empowers you to adopt
11 the USBC and directs you to protect the health, safety and
12 welfare of residents of the Commonwealth, at the least
13 possible cost. The Code of Virginia also directs you to
14 adopt regulations that are reasonable and appropriate.
15 In that spirit, I would like to urge you to accept
16 the recommendation of this Board's experienced and most
17 qualified Codes and Standards Committee to make the
18 installation of sprinkler systems an option in Virginia and
19 to resist the unproven need to mandate sprinklers in all
20 new one and two family dwelling units in Virginia. It's my
21 understanding that currently not a single state in this
22 nation has adopted a sprinkler mandate, and only one
23 may be considering it. Only one. I would also remind you
24 that the housing industry in Virginia is in the midst of a
25 historic downturn. Housing starts are anticipated to

1 decline to less than 15,000 units statewide this year,
2 down from almost 46,000 in 2005 and, those few new
3 homes that are selling, fall into one category, lower cost,
4 first time homebuyer category. In Virginia it's estimated
5 that the proposed mandate will add an additional $5,000
6 of cost to the price of every new home that is served by
7 public water systems and nearly $10,000 in cost for new
8 homes that will depend on wells for the water supply.
9 This is not a time to dictate by state regulations additional
10 new costs to meet this mandate because the USBC
11 already includes many provisions and technology
12 innovations designed to provide safety from fire. That
13 includes fire blocking, draft stopping, emergency escape
14 and rescue openings, outlet spacing and capacity, fire
15 walls and fire suppression, fire separation, modern
16 heating systems and energy efficient housing and most
17 importantly interconnected hard-wired smoke detection
18 systems. Most older homes do not include this full list of
19 current fire safety provisions. Many don't even include a
20 working smoke detector. We sincerely fear that the
21 additional and undeniable increase in costs of these
22 proposed sprinkler mandates will force many Virginian's
23 to chose less safe, less costly older housing.
24 Finally, HBAV would urge you to reject any
25 notion or suggestion that modern housing is less safe, or

1 less appropriate to be constructed in Virginia. That is just
2 false. Modern housing is trending toward Green Built
3 Housing, some of the most popular and energy efficient
4 housing in America. It is the future of housing today and
5 should be embraced and encouraged by all. It will keep
6 housing more efficient and safer. This proposed mandate
7 is the wrong proposal at the wrong time, and will result in
8 very little benefit compared to the significant cost and
9 installation and future maintenance needs. Remember,
10 from 1979 to 2003, the death rate from house fires
11 dropped 58 percent.
12 MR. FLEURY: Would you wrap up please?
13 MR. SOMPAYRAC: Yes, sir. Once again, HBAV
14 expressly urges this Board to accept the recommendation
15 of this Board's own Codes and Standards Committee to
16 make the installation of sprinkler systems an option in
17 Virginia. Thank you for your time and consideration.
18 MR. CALHOUN: J. R. Tolbert.
19 MR. TOLBERT: Good morning Mr. Chairman.
20 Thank you very much for having us here today to talk
21 about this very important issue. My name is J. R. Tolbert
22 and I'm the advocate for Environment Virginia.
23 Environment Virginia is a statewide citizens funded
24 advocacy organization working for clean air and clean
25 water and preservation of open spaces. Today I stand

1 through having more energy efficient homes makes us a
2 win win for all of Virginia. I urge you strongly to adopt the
3 2009 IECC Code. Thank you.
4 MR. CALHOUN: Mr. Schweiger.
5 MR. SCHWEIGER: Mr. Chairman and
6 members of the Board, my name is Christian Schweiger.
7 I'm Executive Vice President of the Top of Virginia
8 Building Association and a former investigator with the
9 Commonwealth Attorney's Office for the City of
10 Winchester, Virginia. I'd like to speak on behalf of the
11 150 member firms in the Winchester, Frederick, Warren
12 County area. We are opposed to mandatory fire sprinklers
13 and we'd like it to be an option. It always has been an
14 option and I wonder how many people here have used
15 that option and believing in fire sprinklers have actually
16 gone out and done that. We have a devastating economy
17 in our area and the Virginia Employment Commission is
18 getting ready to open 15 temporary offices. It's a tough
19 time for builders and a tough time for our economy and
20 adding the extra cost and extra burden will not help
21 what's happened in our area. We ask that you would
22 reject that and make it an option. Thank you.
23 MR. CALHOUN: Dale White.
24 MR. WHITE: My name is Dale White and I am
25 with Top of Virginia Building Association and I'd like to

1 say that everyone appreciates the work that the fire
2 departments do in our lives and has done for decades in
3 the Commonwealth of Virginia and the United States. I'd
4 like to say that we as builders build the safest houses
5 possible. We try everyday from the day we start
6 construction we build as safe a house as possible to keep
7 our employees safe and the clients that buy our houses.
8 In conversations with many builders in our area, we are
9 confused why it just cannot be an option. We are in the
10 service industry and we sell homes to people that want to
11 buy them. We put in what the people want to buy. So
12 we're asking that this be an option and we'd be opposed to
13 the sprinklers. Thank you.
14 MR. CALHOUN: Paul Whitney.
15 MR. WHITNEY: Good morning. My name is
16 Paul Whitney and I spent 25 years doing fire restoration
17 and rebuilding buildings after fires. Some years ago I
18 started a research project and I've written a book on
19 household fires. That book is listed on the FEMA book list
20 and there's only two in the country that speak to this. As
21 a result of doing all these autopsies on burned buildings, I
22 started noticing a pattern in fire construction and one of
23 them is that we are ventilating these fires in the early
24 stages. Some have more ventilation than others but as a
25 result of that, there's been some projects that have been

1 developed that connects and working towards filling these
2 gaps in the technology that we have now. We have the
3 sprinkler on one hand and we have very little on the
4 other. This technology is very simple and when you use
5 the existing circuit for the smoke detector in your home
6 and will connect to your thermostat, go out on a phone
7 line and make an email or a text message. For mass
8 housing or for single family, you now have a way to
9 respond. This little device costs .30 cents a square foot.
10 It does an enormous job for a very small cost. I have not
11 had anyone argue with the logic of slowing down
12 ventilation during a fire. What I'm hoping is that we get
13 some consideration to use the technology and there's
14 going to be many people show up in the marketplace to do
15 this. If we can start interrupting the early ventilation
16 cycle in these fires, it will allow the fire fighters more time.
17 This is easily programmed to oscillate in two minutes
18 depending on what the owner wants to do with the
19 notification. They now have the ability to understand
20 what's going on in these houses in the earliest fire stages.
21 There's a reset button on it for the convenience of the
22 homeowner and there's a number of ways this thing can
23 be utilized to have an enormous option here. In this case,
24 in 25 years doing autopsies on these fired homes. We can
25 use carbon monoxide detectors, this little signal devise

1 can be used and it's UL approved to use the signal to use
2 the existing smoke and existing thermostat and existing
3 communication and we can give these fire fighters a jump
4 on these fires. Thank you.
5 MR. CALHOUN: John Conrad.
6 MR. CONRAD: Good morning, I'm John
7 Conrad. I'm with Miller and Smith in McClean, Virginia
8 builder and developer. I'm speaking to you this morning
9 in hopes that I can be one small voice of reason that will
10 allow you to reject the notion that residential sprinkler
11 systems can be a mandatory component in new homes.
12 During my career, I've seen any number of code revisions
13 that have been enacted in order to make a home more
14 safe. Smoke detectors in the home, some now have them
15 in every bedroom. Bathrooms and exterior building and
16 now we have them in kitchens, basements and garages.
17 We have firewalls between units, fire protection stairs, and
18 fire stopping petitions. Multi-family units and
19 townhouses have fire retardant plywood on the roof and
20 every type of residential construction we are obligated to
21 plug every little hole to stop drafts from spreading the fire.
22 My point is not to brief you on the aspects of building
23 code but to demonstrate that there are many fire and
24 safety measures that the home builders already have
25 embraced, not necessarily because it's mandated but

1 because it makes sense. What does not make sense is the
2 use of domestic sprinkler systems. All the things I just
3 mentioned are rather inert, the homeowner doesn't need
4 to do anything and the system will work. Yes, the battery
5 backup on the smoke detector needs to be changed but if
6 you don't make the change, the penalty will only be an
7 irritating noise. Sprinkler systems on the other hand, if
8 not maintained properly, will cause problems in the
9 house. Look at where fire start, in the kitchens,
10 bedrooms, furnace rooms. All areas that are protected by
11 smoke detectors. You may ask what happens if the
12 smoke detector goes off and no one is home, who will
13 extinguish the fire. Is the sprinkler system, well, isn't the
14 sprinkler program alleged to protect the lives, if no one is
15 home, there's no need to protect. If someone is at home,
16 they'll either extinguish the fire or vacate the dwelling and
17 the smoke detector has done its job. On the other hand,
18 when a sprinkler malfunctions when no one is home, the
19 house will flood or if the sprinkler has a malfunction and
20 someone is home, it causes a disaster. One of the basic
21 axioms that I learned in my early career of homebuilding
22 is not to introduce water pipes into an unheated attic; a
23 recipe for disaster. A small pin hole can freeze and burst
24 a pipe. Sprinkler systems must be checked yearly on the
25 other hand and the way to check the system is to

1 introduce water pressure. I have seen sprinkler heads
2 malfunction during the system checks and discharge
3 filthy water all over the building. Many homes in Virginia
4 are served by private wells and their well capacity is rated
5 for domestic water use. What good would the sprinkler
6 provide if the capacity of the well or pump could not keep
7 up with the sprinkler system? Please ladies and
8 gentlemen, don't allow the fear factor spread by others to
9 cloud your judgment. Let's be satisfied with all the safety
10 features that are now provided in a house and do not
11 burden the homeowner with the constant threat that the
12 sprinkler head or the power system will not function.
13 Thank you.
14 MR. CALHOUN: Jayme Hill. Is Jayme Hill
15 here?
16 MR. HILL: (No response)
17 MR. CALHOUN: Lynn Underwood.
18 MS. UNDERWOOD: I'm a building official for
19 the City of Norfolk and also President of the VBCOA. I'm
20 here this morning to assure you that Virginian's remain
21 active in code development both at the national and state
22 level. Before I do that, let me congratulate Governor
23 Kaine and this Board for the achievement earned this
24 week. CNBC has named Virginia its top state for
25 business. One factor cited is a streamline regulatory

1 process. That includes the work we're doing here, you, to
2 adopt the best building codes in the nation and us in local
3 jurisdictions to enforce them, providing quality building
4 safety to seven million Virginians while supporting a
5 business climate that helps the economy. VBCOA has
6 several dozen members who serve on code committees
7 and councils with ICC. We are 75 percent effective in
8 gaining approval of changes into these codes. At the state
9 level, VBCOA has four code committees that review new
10 provisions in the IBC, IRC, the IECC and the IPMC and we
11 will suggest changes reflecting Virginia's values and
12 interests. We have a committee to recommend improved
13 administrative provisions of the USBC. We participate in
14 four workgroups established by DHCD and several groups
15 for residential sprinkler and assisted living facilities.
16 These workgroups achieve results with all the
17 stakeholders present. My sincere compliments to DHCD
18 staff for their leadership in hosting these workgroups.
19 While it takes staff time and money to do this, the result
20 has been better code, acceptable to all. It has been an
21 effective instrument to streamline the process and achieve
22 consensus on these tough issues.
23 VBCOA has established positions on a few
24 significant proposals. We support sprinkler provisions for
25 town homes as written in the IRC and incentives or

1 tradeoffs. In addition, we support the idea of sprinklers
2 for one and two family homes and believe that these
3 should be voluntary while encouraging their use by
4 providing reasonable, cost effective incentives or tradeoffs.
5 Energy efficiency is increasingly essential with 70 percent
6 of all electricity and 40 percent of all energy consumed in
7 buildings. Our members have worked for changes that
8 improve the energy code with the objective of reducing the
9 energy demand caused by the construction of buildings.
10 The federal cap in trade bill may have a significant affect
11 on us. While that bill establishes a national energy code,
12 we believe the IECC will serve that purpose, having
13 increased energy efficiency requirements by 15 percent
14 with an aim of an additional 15 percent in the 2012
15 edition. We will bring you firm positions on significant
16 proposed code changes. These include CO alarms, ARC
17 fault devices and child proof receptacle covers required in
18 one and two family dwellings. Required sprinklers for
19 physician offices, schools and furniture stores, CSST
20 Bonding, exit floor markings for high rise buildings,
21 limitations on healthcare and assisted living facilities, pool
22 entrapment safety, gray water, reclaimed water, rainwater
23 harvesting, maintenance code provisions, maintenance of
24 grease traps and cross connection devices, proposed
25 limitations on third party inspector qualifications.

1 VBCOA values the relationship that we have
2 with this Board and looks forward to working with each of
3 you during the code change cycle. Thank you for your
4 hard work and your dedicated service, your friendship
5 and your continued support for the profession of building
6 safety. Thank you.
7 MR. CALHOUN: Bill Long.
8 MR. LONG: Thank you Mr. Chairman and
9 Board members, I'm Bill Long and I'm with Toll Brothers,
10 a major national builder. We think the sprinkler provision
11 should be an option, mainly because I've been a builder
12 for over 40 years in the Commonwealth. I've been a
13 member of the VBCOA 23 years. I've placed my concerns
14 with all the other homebuilders and concerned about
15 different factors in the homebuilding industry.
16 Homebuilders try to build the most efficient and safe
17 housing that we can on a limited amount of funds. We
18 have to operate within those funding limitations. As has
19 been mentioned before, the building code has changed
20 and we have many things in new buildings now. We see a
21 lot of deserted houses now. We have various components
22 built into new buildings now and we've seen a lot of
23 deserted houses now especially some of these town homes
24 and you have to worry about protecting people on each
25 side of that unit. Like we had storms through the area

1 last night and if their sprinkler systems, what do they do
2 when no power and no water is available. What will
3 protect the other homes? We're building homes with the
4 best fireproof materials available but you have to be very
5 concerned on these sprinkler systems. As I say, if there's
6 a power problem or if it malfunctions. We make units as
7 fireproof as best we can. It looks like we're trying to
8 encroach the commercial code with the single family code,
9 even though we have sprinkler systems proposed for
10 single family dwellings. Whose going to inspect and
11 maintain them down the road. How are they going to be
12 inspected yearly? The average homeowner will have to let
13 the fire marshal into the home. These are just some of the
14 things that the Board needs to consider when you make
15 this mandated. Thank you.
16 MR. CALHOUN: Keith Brower.
17 MR. BROWER: My name is Keith Brower. I'm
18 the Chief Fire Marshal for Loudoun County. I'm here
19 today representing the position of the Loudoun County
20 Board of Supervisors who have asked you to enact
21 residential sprinkler requirements as part of the 2009
22 code cycle.
23 In 1986 knowing the unparallel residential
24 growth was eminent, the Loudoun County Board of
25 Supervisor approved the creation of a consortium to study

1 residential sprinklers. That study was completed in 1987
2 and contained recommendations to pursue residential
3 sprinklers in the code process as well as through
4 legislation, as needed, and to encourage homebuilders to
5 voluntarily install residential sprinklers. This
6 proportionately some 23 years later, Loudoun County and
7 Virginia are still at the starting line for the most part.
8 State building codes and laws have not resulted in
9 residential sprinklers for one and two family dwellings and
10 townhouses and voluntary compliance has simply not
11 worked. How will the new voluntary code change or alter
12 things?
13 We need residential sprinklers as todays fires
14 are rapid energy release fires. Fed by synthetics and
15 plastics, and in combination with unprotected engineered
16 construction components, fires are quickly flashing over
17 and causing structural collapsing with unprecedented
18 speed. Occupant escape time has been reduced and
19 firefighter danger has increased. You may have heard of
20 Loudoun's near miss, fully involved house fire on Meadow
21 Wood Court on May 25, 2008 where we almost lost four
22 firefighters who became trapped in a collapse while
23 conducting a search on the second floor. I can give you
24 the website with the video that tells all.
25 By contrast, on June 8, 2009 a fire occurred in

1 a four story sprinklered town home in Sterling when an
2 occupant of the home placed a pizza box on the kitchen
3 stove and left. Within moments, the box caught fire. The
4 smoke alarm inside the residence activated. It did not set
5 off the sprinklers, as they don't activate on smoke. Then
6 the fire was extinguished by a single residential sprinkler
7 head that activated due to the heat. All the sprinklers did
8 not go off, just the one exposed to the heat. Fire damage
9 was confined to a three by three foot area above the stove.
10 There was no heat or smoke damage and there was no
11 danger posed to occupants or firefighters. There was
12 water damage, probably about 250 gallons from the
13 sprinkler head. Far less, however, had the home required
14 10 to 15 minutes of water from our fire hoses, which flow
15 at 150 to 200 gallons per minute.
16 Ladies and gentlemen, residential sprinklers
17 work. The need is there and it is time for Virginia to
18 become a leader as opposed to continuing to resist the
19 ever improving and ever affordable advances of residential
20 sprinklers. Continuing to rely on voluntary efforts
21 amounts to putting ones head in the sand if the last 23
22 years of Loudoun County experience is an indicator. I
23 encourage you today to reject the code change for
24 voluntary residential sprinklers, as this is not what the
25 national model code requires. Instead, it requires the fire

1 service, the homebuilding industry and the allied
2 professions to develop and submit a truly consensus and
3 meaningful proposal that works and will save the lives of
4 future Virginians. Thank you.
5 MR. CALHOUN: Randy Melvin.
6 MR. MELVIN: Good morning, my name is
7 Randy Melvin and I'm with Winchester Homes and I'm
8 here on behalf of Winchester Homes. We appreciate the
9 opportunity to testify before the Virginia State Board for
10 Housing and Community Development pertaining to
11 residential sprinklers. For those of you who might not be
12 familiar with Winchester, we are a long time over 30 years
13 builder and developer of single family and town home
14 communities in Virginia and Maryland. Many of the
15 homes we have built today and we have a lot of experience
16 with sprinklers so we're speaking from a practical and
17 factual aspect here today. Our position on the issue is
18 that we urge the board to retain the option of voluntary
19 residential fire sprinklers. The rationale and
20 substantiation for our position or four fold. The first is
21 that even in the absence of sprinklers, new homes provide
22 a very reasonable and cost effective level of fire protection.
23 Many of the other speakers have already listed many of
24 the protections that are already built into the homes. One
25 thing I would like to add is that many of these protections

1 have just been added in the last couple of years. Egress
2 from the basement of every home, the fire separation
3 distance between single family detached dwelling units
4 and the distance on the lot line used to be three feet so
5 there'd be six feet between units and that's been increased
6 to ten. We haven't even seen the effects of all of those
7 changes that have already taken place. I think you'll find
8 the newer houses and the new codes with a lot less
9 incidents to begin with. We do reach a point of
10 cumulative and reach a point of diminishing returns. The
11 second reason that we support optional sprinklers is that
12 our experience told us that residential fire sprinklers have
13 numerous drawbacks of unintended consequences.
14 Heads are going to get damaged and when its in every
15 home, it's going to be far from isolated incidences whether
16 its kids coming in throwing balls after the game or
17 jumping in bed or a homeowner moving a bed into the
18 house on the edge. If you look at the attachment to my
19 comments, you'll see that there was attachment one,
20 $55,733 subrogation claim for damage sprinkler heads
21 that went off three months after occupancy. You can read
22 more about these in our written testimony. That's just an
23 example of the magnitude and not counting the disruption
24 of people's lives, the personal effects they have like
25 artwork, the damage for moving out of their house so

1 there are consequences. The third reason we support
2 voluntary sprinklers, let me back up a second. We've
3 done these in certain jurisdictions in Maryland. Service
4 issues, we've done these in certain jurisdictions in
5 Maryland. Leaking heads are not uncommon. Leaking
6 heads on the sprinkler heads, some have independent
7 heating units and some people have closed off their
8 solariums in the winter time and next thing you know the
9 pipes are breaking and freezing and there's damage.
10 Leaks, water tanks and, service issues are not
11 uncommon. One more reason is that if you look at the
12 reliability of the sprinkler heads in your package, you'll
13 see a recall of 35 million heads and you'll see another
14 recall for 8.4 million heads. Some of this has been going
15 on for nine years. It impacted us. You'll look in there and
16 see the sprinkler company had questionable financial
17 means to address these issues. If you'll look at the very
18 last item in your packet and that indicates that sprinklers
19 are still not an effective means of saving lives; $48 million
20 per life saved and there's a lot more effective ways we can
21 save lives with a lot less money. Finally, we believe the
22 individual family should have the choice of what's best for
23 them and their family whether they would like sprinkler
24 heads in their home or not. Thank you.
25 MR. CALHOUN: James Barber.

1 MR. BARBER: Good morning Mr. Chairman
2 and members of the Board. My name is James Barber
3 and I'm the fire official in Albemarle County and Fire
4 Marshal. Our county is not unlike some throughout the
5 state in that we have 750 square miles and roughly 80
6 percent of that is rural. We have a combination
7 department so we have paid firefighters and volunteers.
8 We have volunteer firefighters that run out of ten stations.
9 In our rural district our response time goal is to be on the
10 scene within 8 minutes, that's our urban goal. In our
11 rural the response time is 13 minutes. You've already
12 heard that a fire grows and doubles in size every minute
13 that it is in a free burning state. This means in the 10 to
14 13 minutes that it takes the fire department to arrive in
15 Albemarle County, the fire has already had a chance to
16 grow substantially. What I'd ask you to do is reverse the
17 action before you today and to adopt the ICC
18 recommendation. One of the assertions about sprinklers
19 on homes with well water is that it would be unaffordable
20 and too costly to try. The truth is that the 13D System
21 that's for residential sprinklers calculates the water flow
22 from two minutes. That's roughly 13 gallons per head per
23 minute. If you extrapolate that out, you're talking about a
24 water tank that holds 300 gallons and a pump that will
25 pump the water through the system. The cost is going to

1 be held down on that because the pump and the tank
2 don't have to be rated. It's not like the sprinkler system
3 you have here where all the components must be rated.
4 There's already a standard out there that's a compromised
5 standard. I would ask you to make the residential
6 sprinklers mandatory. Thank you.
7 MR. CALHOUN: Dave Bailey.
8 MR. BAILEY: Mr. Chairman and the Board,
9 thank you for allowing us to speak and participate here.
10 I'm speaking today as a resident of Powhatan County. In
11 1992 my wife and I built a home in Powhatan with no
12 public water in my area we are on a well. In the contract I
13 worked with my builder to set aside one week to have a
14 residential sprinkler system installed. The Virginia
15 Sprinkler Company installed the full 13-D System in 3
16 days. The full system costs me $3,020. My house has
17 2,100 square feet of floor area. So, the cost for the system
18 was less than $1.50 per square foot. Obviously the
19 insurance industry knows the benefit of sprinkler systems
20 in buildings therefore, my insurance premiums have been
21 reduced with a 13 percent sprinkler credit. Initially that
22 equals to $86 a year in savings. So, to date my premium
23 savings have paid half the cost of the system. Over the
24 life of the house, the system will more than pay for itself.
25 I've heard some discussion about maintenance of the

1 system. We've had no leaks or any problems with any
2 piping, sprinkler heads or any system components. The
3 only maintenance I perform is to drain the system once
4 each year but I don't have to but I do it throughout the
5 year. I do it as well as to flush out any sediment that may
6 have accumulated over the past year from the water in the
7 pipes. This process is so easy, that my 11 year old son
8 conducted the entire flushing procedure this year. Often
9 people ask why I've done this and why I spent $3,000 to
10 put the system in. Like many here, since 1976 I been
11 involved and served with the Chesterfield Fire and EMS
12 Department. Over those years, I have run thousands of
13 fires and seen many fire deaths. That has included men,
14 women and children. In 1992, when we built our home
15 and we knew that we were going to have children and we
16 weren't satisfied with the fact of about a 50 percent safety
17 factor. With the residential sprinkler system, our chances
18 jump up to 97 percent to help my family to survive a fire
19 should we have one if I'm not there. So I'm going to urge
20 you to protect future generations of children by voting to
21 install these sprinkler systems. Thank you.
22 MR. CALHOUN: Mark Granville-Smith
23 MR. GRANVILLE-SMITH: Good morning, my
24 name is Mark Granville-Smith. I'm currently vice
25 president of the Northern Virginia Building Industry

1 Association. No one from our building industry would
2 discount the value of human life. Arguing that sprinklers
3 won't reduce the chance of death or injury is nonsense.
4 In fact, there is any number of ways to reduce the chance
5 of death of injury due to fire. What criteria should be
6 used? Clearly, the code requires the consideration of
7 costs as well as health and safety for the homebuyers.
8 There are two issues that strike me most interesting
9 through these discussions were; cost is truly an issue
10 when confronted with fire prevention and safety on both
11 sides. Our fire officials have ranked their highest priority
12 in most effective fire prevention method as public
13 education and awareness. However, our current Board of
14 Supervisors recently has cut the budget of the fire
15 department so they have an urgent awareness. They have
16 to focus on public awareness and education programs.
17 Given these facts, there are better more cost effective ways
18 to deal with this issue than mandating sprinklers in every
19 home. Builders are being unfairly characterized as
20 putting the dollar ahead of safety. Did our local
21 government officials cut the education funding because
22 they weren't concerned about fire safety, of course not.
23 Smoke detectors were a home run in terms of saving lives
24 as well as being cost effective. Sprinklers are not. It
25 should be optional. An interesting fact is I'm a boater and

1 I enjoy it and the Coast Guard requires boats 17 feet or
2 longer to have a fire extinguisher on the boat even if it's
3 made out of aluminum. We've never offered fire
4 extinguishers in the kitchens and garages might be a
5 solution or partial solution to this issue. There are a
6 number of other options or solutions and I'll give them to
7 you in my written comments. Thank you.
8 MR. CALHOUN: James Dawson.
9 MR. DAWSON: Mr. Chairman and members of
10 the Board, good morning. I'm James Dawson and I'm the
11 fire marshal for Chesterfield County. I'm asking you to
12 pull the code changes submitted by the Homebuilders
13 Association concerning residential sprinklers. I submitted
14 a previous written statement outlining my concerns about
15 the process, the Codes and Standards Committee used to
16 approve the change. I believe the Committee is very short
17 sighted to remove a provision of a nationally recognized
18 model code with only 30 minutes of discussion when the
19 issue was debated for more than 8 hours at the
20 International Code Council Hearing. In addition, the
21 Committee's discussion included more questions about
22 sprinklers and no discussion on the merits of these
23 systems. I'd also like to point out something about this
24 supporting statement presented by the Homebuilders
25 Association in their proposed changes. In that statement,

1 there's only one sentence that really has any resemblance
2 of a supporting statement. In fact, their supporting
3 statement ask even more questions, a total of seven
4 questions without answers are presented in their support
5 for removal of this code provision. One aspect of this
6 change the homebuilders continue to press is economics.
7 Since I've become involved in this issue, I been trying to
8 gain an understanding of the economic aspects of new
9 home construction. I recently discovered a paper by Mr.
10 Buddy Doer who holds an economic degree and Master's
11 degree in business administration. His explanation, new
12 home economics is enlightening, and I have included a
13 copy of his report with my written statement for your
14 review. Even more enlightening in his report is that
15 residential sprinklers have a one percent increase in home
16 costs and do not impact the affordability of new homes.
17 I'll leave that document with you so that you can research
18 it. Mr. Chairman, I look forward to working with all
19 interested parties to develop the code change proposals
20 the Virginia Residential Sprinkler Coalition will bring
21 forward in the coming months. I hope this Board will
22 have all its questions answered before they make a
23 decision on accepting a code change that will decrease the
24 safety of new homes built under our uniform statewide
25 building code. Mr. Chairman, for the sake of time, I'll

1 leave you with a full copy of my remarks. One supporting
2 statement in the Homebuilders Association of Virginia
3 code change proposal found on page 212 of the codes and
4 standards committee packet. The one sentence that does
5 not use qualifying words like maybe and seems to, the one
6 sentence that doesn't ask a question but rather makes a
7 statement regarding residential sprinklers. The NFPA
8 data and reports confirm that sprinklers do reduce
9 deaths, injuries and property damage losses. Mr.
10 Chairman, I believe they have that supporting statement
11 right. It is the code change they have gotten wrong.
12 Thank you for your time.
13 MR. CALHOUN: Mark Viani.
14 MR. VIANI: Mr. Chairman and members of the
15 Board, I'm Mark Viani. I'm with the Northern Virginia
16 Builders Association. A lot of what I was going to say has
17 already been said. I'll try to keep my comments brief. I
18 urge the Board not to make the fire sprinklers mandatory
19 and leave it as an option. From my own personal
20 experience, I have purchased two homes in Virginia in the
21 last 10 years. Both of my purchases were not expensive
22 homes. In both cases, we have done everything we could
23 do to buy a house. Some didn't have an option. Where
24 we had the option, we would ask about safety features.
25 The townhouses we had internet and those systems work.

1 From a practical experience point of view, the smoke
2 detectors were great. Two hundred town homes had
3 sprinkler systems and I'm sure they worked when their
4 needed but our experience with them wasn't too good. We
5 had a Christmas tree fire and that wasn't too good. We
6 had sprinkler head problems. There are some practical
7 rules that can be more effective. I heard a question about
8 education. These things are good and they're effective and
9 probably the best way to do it. Finding out and getting
10 information on prior history and why they would work
11 well. By contrast, the house I live in now is built in 1959
12 and has no sprinkler system but does have a smoke
13 alarm. The smoke alarm went off Christmas Eve and we
14 got it put out. It's all about choice. I think a choice
15 should be available. I think this should be a choice. I
16 know people have talked about the cost benefit ratio and
17 the free market. I would ask you to support this.
18 MR. CALHOUN: Sean Horne.
19 MR. HORNE: Good morning, my name is Sean
20 Horne here representing the Roanoke Regional
21 Homebuilders Association. We represent a membership of
22 nearly 400 local members and firms to come here and
23 share with you our concern about the significance and the
24 negative impact of mandated fire sprinklers. To cut it
25 short, I understand that you have received all of the

1 literature that the National Homebuilding Association and
2 the Virginia Homebuilders Association has provided which
3 shows the decline in home fires over the past 30 years
4 despite the tremendous population growth in America.
5 Many of the homes have become a lot safer through the
6 cost effective code provisions that affect a lot of
7 organizations. Our homebuilders association located in
8 Southwest Virginia. We are mostly rural and rely heavily
9 on well water. It is anticipated that new home costs, as
10 stated earlier, for homes served by well water, would be
11 $10,000 or more. Homeownership is out of reach for
12 many people in Southwest Virginia. It's our belief that
13 such a mandate will have a significant negative impact on
14 the affordability of housing in Virginia. Additionally,
15 homeowners with well water will have to deal with the
16 issues for adequate storage, providing adequate flow and
17 making sure the wells are capable of providing required
18 flows. During dry years, such as 2008, water level at the
19 wells could easily be too low to provide effective sprinkler
20 system. Water tanks, pumps and generators would need
21 to be purchased to help with these problems and that
22 would double the cost of the sprinkler system yet again.
23 We're asking that you not mandate fire sprinklers in
24 Virginia and mandating it would be another hardship on
25 homeowners and create a difficult time. Thank you.

1 MR. CALHOUN: Meredith Ward.

2 MS. WARD: Members of the Board, my name is
3 Meredith Ward. I'm here representing the Shenandoah
4 Valley Builders Association. I'd like to quote the Uniform
5 Statewide Building Code and say that they are to provide
6 a safeguard for the public welfare. We as the National
7 Association of Homebuilders, we found numerous reasons
8 why fire sprinkler systems are not necessary to continue
9 fire deaths. However, I wish to bring you one further
10 point before you today. Statistics show that the current
11 methods of fire suppression are very effective and they
12 continue to save lives despite the growth in housing. In
13 fact the rates at which all these fire deaths follows the
14 same aggression line as house fires. Alone this trend
15 continues dating back to 1979. It can be determined from
16 information that building sprinklers provide no significant
17 decrease in fire deaths. This common trend can be
18 attributed to fire prevention materials along with fire
19 prevention education. Therefore, it is the opinion of the
20 Shenandoah Valley Builders Association that these
21 current practices are working to exceed the goals under
22 the statewide building code. We urge you today to
23 approve the recommendations to allow the option to
24 install fire sprinklers in one and two family residential
25 homes. Thank you.

1 MR. CALHOUN: Vince Butler.

2 MR. BUTLER: Good morning, I'm Vince Butler,
3 second generation homebuilder and a third generation
4 firefighter. I'm here today representing Northern Virginia
5 Building Industry Association and president this year. On
6 behalf of our board of 530 member companies agree and
7 uphold the decision of you Code Standards Committee. I
8 would add to the litany of statistics and personal stories
9 because they play on both sides. None of us are here to
10 argue that anything to help put out fires is a good idea.
11 However, there is a cost benefit analysis that we have to
12 take into account as far as any public safety decision. As
13 has been said, you make that decision unfortunately on a
14 daily basis. You can't put a figure on human life but
15 trying to find the best way is the answer to protect that life
16 within the realm of our capabilities. We have over 130
17 million existing homes in the United States right now and
18 this will only address new homes built; in a good year, we
19 build maybe over a million. Similar to our energy
20 standards, to affect an issue like this we have to address
21 our housing stock and we have a number of ways we can
22 do that through public education primarily. I'm sure our
23 industry will reach out to the fire service protection people
24 that are here throughout the state to help in
25 accomplishing that goal. One thing I think that is

1 important to understand is just as an example of how the
2 education works. I think both sides have talked a lot
3 about smoke detectors and we agree they do save lives.
4 Smoke detectors have a finite life. I believe you have to
5 replace them after 10 years. I deal with hundreds and
6 hundreds of homeowners every year in my business and
7 I've yet to find one that goes bad. We bring that to their
8 attention all the time. So I would urge you to uphold the
9 decision of the Code Standards Committee and to extend
10 a hand of cooperation to my fellow firefighters to work
11 together and dedicated to fire safety. Thank you.
12 MR. CALHOUN: Hadden Culp.
13 MR. CULP: Good morning Mr. Chairman and
14 members of the Board, my name is Hadden Culp, Chief
15 Firefighter from Prince William County, Virginia. I have
16 many years of experience, that includes over 35 years
17 here in the Commonwealth. I've had the unfortunate
18 experience of participating in many, many hundreds of
19 fires. I've stood in the front yard of people's homes who
20 have lost everything. I've had the unfortunate experience
21 of citizens who have passed away out of their houses were
22 on fire and on one occasion, I carried one of my
23 firefighters out of a house that was on fire. Many of these
24 fires could have been prevented through the use of
25 sprinklers. I can tell you a quick story about a fire that

1 occurred less than 24 hours ago in Prince William County;
2 2:30 yesterday afternoon an apartment, a mother turned
3 the burner on on her stove and a few minutes later
4 noticed some smoke and there was a fire and the smoke
5 alarm went off and the mother took action to deal with
6 that. The sprinkler head over top of that but she turned
7 the wrong button on. But they escaped unharmed but the
8 sprinkler went off in time to put that fire out. Sprinklers
9 are not anything new and many houses and apartments
10 already have them and people have installed them. We've
11 been dealing with this issue associated with sprinklers
12 and education is part of it and the maintenance that
13 you've heard about, some people have been living with
14 these sprinklers for many, many years. Last year in
15 Prince William County we had 8 fires. The value of that is
16 immeasurable. That amounted to $14.5 million because
17 sprinklers were activated and the damage was $156,000.
18 So I urge you to look at the value of the sprinklers and
19 support the legislation that's come before you to keep
20 sprinklers in the code and this will help support lives and
21 property damage. Thank you very much.
22 MR. CALHOUN: Ernie Little.
23 MR. LITTLE: Good morning, I thank you for the
24 opportunity to speak to you. I have a fact sheet having to
25 do with this subject. I've been involved with the code

1 development process at the ICC level since 2006. I've
2 seen all the discussions at the ICC and state level here
3 now and hearing a lot of the same things over and over
4 again and the same issues but these issues coming to you
5 this morning are the same issues that have been in front
6 of the ICC. The main thing I want you to think about is
7 back in the 50s and 60s, the auto industry. We had a
8 situation where we knew we were losing a lot of folks
9 through auto crashes because of seatbelts or the lack of
10 seatbelts. Seatbelts were put out there and reduced the
11 number of deaths due to automobile accidents drastically.
12 A little bit later on the auto industry realized that they
13 needed the airbag and the airbags have reduced the
14 number of deaths significantly. Now we come to the issue
15 we're talking about today, are smoke detectors the 1970
16 version of seatbelts. It has had a significant impact. At
17 that time I believe the figure was around 12,000 people a
18 year. We cut that down significantly. I offer you that the
19 sprinkler systems are the airbags for homes. One speaker
20 talked about somebody that built a house. People who
21 have committed to purchasing a home because the
22 purchase of a home is a very important thing and a
23 significant fire can put you out of your house that's
24 something to think about. There are relief agencies out
25 there but the sprinkler system may decrease the amount

1 of time you're out of your house and consisting of repairs
2 and having it rebuilt. People that have the sprinkler
3 system if they're put out of their house by fire, they'll
4 certainly be back in sooner than they would be without it.
5 I'll stop there, thank you.
6 MR. CALHOUN: Kevin McNulty.
7 MR. MCNULTY: My name is Kevin McNulty and
8 I'm Vice President of the Home Building Association of
9 Richmond. I'm concerned about the proposal to add fire
10 sprinklers. I do not believe that adding this equipment to
11 your home, will make people significantly safer. Statistics
12 can and have been presented which will show today's new
13 houses are better built and produce fewer fire deaths than
14 our nations older housing stock. This proposal will make
15 new homes more expensive and place Virginia families
16 into older homes which do not meet today's fire
17 standards. Why not use our resources to address the real
18 problem which is the lack of updated smoke detectors and
19 have them in every bedroom of every home. Most
20 statistics show 88 percent of fires in single family homes
21 occur where there's no working smoke alarm. A recent
22 report about smoke alarms estimates that 1 in 890 lives
23 could be save annually if everyone had a working smoke
24 alarm. From 2000 to 2004, 65 percent of the fire fatalities
25 were reported in homes where smoke alarms were not

1 present or did not operate property. The cost does not
2 outweigh the benefits. We can have a much greater
3 impact for safety by using our resources to promote and
4 educate the public on the maintenance of working smoke
5 detectors. I urge you to make fire sprinkler systems an
6 option in new home construction.
7 MR. CALHOUN: Warren Wakeland.
8 MR. WAKELAND: Good morning, I'm Warren
9 Wakeland with the Home Building Association of
10 Richmond with its 500 members. Much of what has been
11 said is included in my written comments. I won't go into
12 that specifically. There's a couple of details that I'd like to
13 mention. The National Fire Prevention Association in
14 January, 2008 showed that the survival rate of people of
15 home fires is 99.45 percent where no sprinklers are
16 present, but smoke alarms are. The same 2008 study
17 stated and I'll quote, "Because there is evidence that
18 working smoke alarms acts so early that they convert
19 what would have been a reported fire into a very small,
20 unreported fire, the potential savings from universal
21 working smoke alarms could be even larger." Safety is a
22 big issue on this subject but the cost is also a big issue for
23 homebuyers. An August 2006 study of more than 2,500
24 homebuilders nationwide and the association of
25 homebuilders research center showed that the average

1 sprinkler system in a new home cost $2.66 per square
2 foot to install against almost $5,800 in the average size
3 new home built in 2008. That's for installation.
4 Maintenance is going to cost a little more. On the other
5 hand, a hard-wired, interconnected smoke alarm system
6 in a home, run by the home's electrical system, cost about
7 $50 per alarm. The only maintenance you're going to find
8 is changing the backup batteries. It's been mentioned
9 that getting people to change the batteries is a tough
10 thing. That's where education comes in and something
11 this Board should look at, educating more people about
12 changing the batteries while maintaining their system.
13 When you talk about affordable housing, an 1800 square
14 foot, single family detached home will cost about
15 $215,000 in the Richmond area without sprinklers. A
16 fully installed sprinkler system in that home will cost
17 about $4,800 by today's terms, not in 1992. That will
18 drive the cost almost to $220,000. A $5,000 increase
19 doesn't sound like much to some people but it's a lot to
20 consider because of every thousand dollars an additional
21 cost to a new home in this area, you put more than 700
22 families out of the market for that home. A sprinkler
23 mandate would mean a lot of people won't be able to buy
24 a new home. We've heard that many older homes are not
25 built as safely as today's homes. Our association has no

1 problem with this Board deciding that a sprinkler should
2 be an option a homebuyer may chose to have installed.
3 Homebuyers should always have as much choice as
4 possible as to what goes into their home. The government
5 should not require something in a home that has not been
6 proven to save more lives and more property than a less
7 costly, just as effective alternative and will not be used by
8 a great majority of the homes in which they're installed.
9 The Home Builders Association of Richmond would urge
10 you to follow the recommendation of your Code and
11 Standards Committee and make sprinklers an option for
12 homeowners. Thank you.
13 MR. CALHOUN: Ray Pylant.
14 MR. PYLANT: I'm Ray Pylant, a building official
15 for Fairfax County. I'm here to talk about a couple of
16 ambiguities in Section 103.5 of the building code.
17 Strangely this section talks about the, it doesn't say the
18 code applies for new construction. The current code talks
19 in the negative. It says the portions not being
20 constructed, altered or repaired does not have to meet
21 standards of new construction. Another portion of the
22 section and it says that the materials may be replaced
23 with material or equivalent with similar capacity. This
24 refers to repairs that makes sense. If you have a rotten
25 board, particularly in the back of your house, you can

1 replace that board. Strangely, some people have
2 determined this to mean however. If you have a house
3 that burns down, you can replace it board by board to
4 conform to whatever code or lack thereof may have existed
5 at the time the house was originally built and call it
6 repair. You cannot repair something that does not exist.
7 Unless the house burns down and no longer exists, and
8 you replace it, I can't call that anything other than
9 construction. I would like to make this purely an
10 administrative clean up of the language in the code. You
11 may find some opposition to that. Thank you.
12 MR. CALHOUN: Charles Werner.
13 MR. WERNER: Mr. Chairman and members of
14 the Board, thank you for the opportunity of allowing me to
15 come here and speak today. There's many different
16 statistics that have come before you today which would
17 make your job very tough in trying to weight through this
18 and try to figure out what's the best way to go. My name
19 is Charles Werner and I'm with the City of Charlottesville,
20 I'm the Fire chief in Charlottesville and here on behalf of
21 the Virginia Fire Chief's Association. I'd like to take a
22 little bit of a different stance that I think is different from
23 most of the conversations that you heard. One of the
24 things I'd like to say is that there are statistics that are
25 very compelling on both sides of the isle. My suggestion is

1 that we don't move forward with the proposed amendment
2 as it is today, the option. I say sit down and actually have
3 a dialogue and conversation with some cooler heads and
4 sit down and try to agree with what statistics we can agree
5 on and really dive into this matter. I believe that
6 sprinklers do save lives and will save lives and there's
7 enough statistics that show that. At the same time, I also
8 understand the expense and the issue to the housing
9 people that have brought that information to you today. I
10 think we have seen through the years and if you look back
11 at all these issues, and these concern me and we've heard
12 from Loudoun County, the volunteer aspect doesn't work.
13 The same thing can be true if you look at smoke detectors.
14 If you say smoke detectors are optional today, there
15 wouldn't be smoke detectors in homes. The problems we
16 have in the fire service and the nation as a whole, the big
17 thing about complacency. We quickly forget the issues
18 that happen and in many cases, we always believe fires
19 are going to happen to someone else and that's the
20 mentality that we're in. We hear about fire deaths but I
21 would urge the Committee to deny the proposal and say
22 let's put this back on the table and have a discussion and
23 come back with a proposal that, and even though there
24 may be some compromises and look at what are the
25 outcomes we're trying to achieve and see if we can find

1 some middle ground. I thank you again for the
2 opportunity to be here today and for the great, great work
3 you are doing. Thank you.
4 MR. CALHOUN: Tyler Craddock.
5 MR. CRADDOCK: Good morning, I'm Tyler
6 Craddock representing the Virginia Chamber of
7 Commerce. I urge you to support the recommendations of
8 the Codes and Standards Committee for the sprinkler
9 system's adoption and again mandating this in the family
10 dwellings. Our greatest concern on imposing this
11 mandatory provision on homeowners, how that will
12 damage efforts to make more affordable housing and how
13 that will effect economic development in Virginia. As you
14 may know, the state supply of affordable housing, that
15 choice is close to job centers and are a necessary
16 component of economic development. Houses after all are
17 where the employees and the job centers go at night.
18 Unfortunately, if this proposal would increase the cost of
19 housing in Virginia and it will. The National Association
20 of Homebuilders estimate the cost of these systems adds
21 about $2.66 per square foot and translate that into
22 $4,500 for a 1,800 square foot home. Simply imposing a
23 mandate would add $4,500 to the cost of a basic 1,800
24 square foot home and that has a definite effect on home
25 affordability and its effect on the Commonwealth.

1 Housing starts in Virginia declined by 50,000 in 2005 to
2 less than the anticipated 15,000 in 2009. The only part of
3 housing that shows any signs of life are homes
4 constructed in the price range typically known as
5 workforce houses. Housing typically designed or
6 marketed to first time homebuyers. This mandate at this
7 time can decimate a sector of Virginia's housing industry.
8 It's important to remember there are over 50,000
9 businesses typically involved in the acquisition and
10 construction of new homes. I strongly encourage you to
11 resist any mandate that would in anyway further affect
12 the housing industry and endanger local development.
13 Moreover, Virginia was ranked as the best state in the
14 nation to do business with. The Commonwealth's weakest
15 performance is in the cost of living and for consumers
16 costs of housing. We're doing everything we can to make
17 Virginia more competitive in respect to the cost of living
18 and cost of doing business and other factors that would
19 affect business. Please do not mandate this requirement
20 and effect homeowners.
21 MR. CALHOUN: David Seay.
22 MR. SEAY: I'm David Seay the Henrico County
23 Fire Marshal and a member of the Virginia Fire Prevention
24 Association Fire Services. Some people believe that the
25 reduction in fire fatalities in the United States is due to

1 better building codes. Where better codes have
2 contributed to this reduction is not the only reason we
3 have seen the number of fire fatalities in the United States
4 reduced by over 50 percent in the last 20 years. The
5 information on smoke detectors in new and existing
6 homes has been one effective tool. Fire safety and
7 prevention and education to the public plays a major role
8 in this reduction. With the increase in fire service
9 capabilities and emergency medical services and critical
10 care facilities and the ability to care for the number of
11 burn injury patients has to also be considered. Even with
12 the improvements in building codes, occupants still
13 continue to die even in newer homes that were subject to
14 the new and improved code. It is important to know that
15 even with such a dramatic decrease in civilian fire
16 fatalities, the number of injuries has not decreased by the
17 same percent nor has the number of fire fighter fatality
18 injuries. This would again support the idea that codes
19 have not had as much to do with the overall number in
20 intensity of fires in the United States. Additionally,
21 residents with smoke detectors are passive fire protection
22 devices. Their purpose is to alert building occupants of
23 fires while they're small enough to combat or to exit for
24 safety. Residential smoke detectors do nothing to aid in
25 terms of distinguishing a fire. If the building is

1 unoccupied, the fire will continue to grow until it is
2 noticed by someone from the outside. Smoke detectors
3 alone do nothing to protect those that are unable to
4 escape by themselves. The very young, the elderly, the
5 mentally or physically impaired have a decreased chance
6 of survival without some form of active fire protection or
7 rescue. Firefighters must still respond to and extinguish
8 fires that are merely detected by the smoke detector. Fire
9 sprinklers decrease the size of the fire or have a positive
10 reduction in the cost of extinguishing the fire. The cost is
11 not always calculated in the direct cost. While additional
12 units may be requested for fires in non-sprinkler
13 buildings, the same units could remain in service to cover
14 other emergencies if the building had been equipped with
15 automatic sprinklers. The reduction in service demands
16 will equate to a decrease service delivery cost to the
17 locality and ultimately to the taxpayer. The very same
18 options that apply in homes today. Like the old saying
19 goes, it takes a community to raise a child. The
20 protection of life and property is the responsibility of
21 everyone including building officials, contractors, fire
22 officials, fire emergency responders and to you to develop
23 and adopt appropriate codes.
24 MR. FLUERY: Can you wrap it up please?
25 MR. SEAY: Yes, sir. The code process has

1 included residential sprinklers as an additional step to
2 insure that life and property is protected. There are
3 others around that want to take this out of the Virginia
4 Code. In my opinion, we must have an overall compelling
5 reason to overturn that process. What if your family or a
6 family of someone you know that would be counted as a
7 statistic in order to prove a particular point. The
8 resources –
9 MR. FLEURY: Thank you very much.
10 MR. CALHOUN: Jeff Ainslie.
11 MR. AINSLIE: Good morning ladies and
12 gentlemen of the Board, I'm Jeff Ainslie. I been a builder
13 for 25 or 30 years and I've built about 4,000 homes and
14 I'd like the folks that are here today that would like to see
15 the regulations include the sprinklers as being mandatory
16 to stand up please. I'd now like to see a show of hands
17 now from all the folks that have a sprinkler system
18 installed in their home. Does anybody here have a
19 sprinkler system installed in your home, in one or two
20 family residents? Thank you. These sprinkler systems
21 have been an option for a number of years in Virginia and
22 if everybody thought they were so wonderful, I think you
23 would have seen at least one or two people indicate that
24 out of the 200 or 250 people in this room. We're not there
25 yet. Both of them require constant maintenance to

1 remain operational. We install these systems and many of
2 our commercial buildings and multifamily buildings.
3 There's a great benefit analysis to be there because if
4 they're maintained properly and tested on a regular basis,
5 they do save lives. The cost to install is just the beginning
6 of the system, it is still less than a, it's still affordable to
7 less than three percent of the folks in the Commonwealth
8 of Virginia. The cost to monitor it for a lifetime.
9 Additional costs are enhanced water supplies, backup
10 power supply, monitoring contract, maintenance contract
11 will easily persuade homeowners to have these systems to
12 either cancel the contract and abandon and then falsely
13 have a sense of security and their system won't operate in
14 time of need. One of the speakers mentioned the
15 basement rate. Simply covering those exposed structural
16 designs would eliminate that. The building code has been
17 effective in saving lives over the last years and you have to
18 compliment the State of Virginia, this Board for years.
19 People that go onto other states, we're still fortunate here
20 in Virginia to have a Board that reviews these codes
21 through an analysis to make the right decisions in order
22 to keep localities affordable and safe. Don't be persuaded
23 by the NFDA test and safety results you've heard some of
24 the speakers come up here and talk about today because
25 in those test results none of the, the single family homes

1 are being measured because the system is so small.
2 When you look at safety performance rates, sprinkler
3 systems in commercial and multifamily structures is
4 different. What I learned recently is that if you have a
5 system in your house and it's not monitored properly and
6 you don't have a maintenance contract and it's not
7 maintained properly and you do have a fire, the
8 homeowners insurance will not cover it all. Thank you.
9 MR. CALHOUN: Dan Zacharias.
10 MR. ZACHARIAS: Thank you members of the
11 Board, my name is Dan Zacharias and I'm the Executive
12 Director of the Old Dominion Association of Church
13 Schools. I too am not here to talk about residential
14 sprinklers. I have opinions but I won't share that with
15 you. My purpose is just to address the concerns that we
16 have. ODAC is an association of private Christian schools
17 and we are a relatively small association. Last year 43
18 schools around the state and we been in operation since
19 1976 providing a variety of services and activities for our
20 members. Our understanding is that proposed in the new
21 code is the potential of reducing the threshold for these
22 facility sprinklers in Group E buildings from 20,000
23 square feet down to 12,000 square feet. Given the size of
24 our schools, we probably would be one of the principal
25 groups that would be affected by such a change. We'd

1 innovation of giving drugs and shocking people in the field
2 had the same argument. Now it's time for sprinklers in
3 the home. Time has come that will help save lives and it'll
4 take bold action on your part to do that. I would echo the
5 request of Chief Werner to send us back to the workroom
6 and have them come back with a concession so that
7 everybody will work together; you'd have a good product.
8 Thank you.
9 MR. CALHOUN: John Broadway.
10 MR. BROADWAY: Good morning, I'm John
11 Broadway, Virginia Association of Realtors. You've
12 already heard many comments about the building
13 industry. I'll simply say on behalf of our 33,000 members
14 around the state that we're fully supportive of the position
15 of our colleagues in the homebuilding industry. We've
16 certainly seen a little pickup and we think that the sale of
17 new homes around the State, sales of course, are related
18 to price certainly in this market. We're very concerned
19 about anything that would create an increase or decrease
20 in housing. So we would urge you to retain the option
21 concerning new housing. We will submit written
22 comments later.
23 MR. CALHOUN: Anthony Shultz.
24 MR. SHULTZ: Good morning Mr. Chairman
25 and Board members. My name is Anthony Shultz and I

1 represent the Virginia Chapter of the American Fire
2 Sprinkler Association. We are in favor of the residential
3 fire sprinkler code adoption. That's not surprising. We
4 have submitted written comments which I'd ask you to
5 read. I don't want to belabor a lot of points that have
6 already been made. I'd like to point out that there's only
7 one device that you can put in a home that will extinguish
8 or contain a fire and that's a fire sprinkler. That's very
9 important. There's a lot of things that are out there and
10 I'd ask the board to examine the facts and make an
11 important decision. We're available for any questions that
12 you may have. Thank you.
13 MR. CALHOUN: Kathy Renn.
14 MS. RENN: Good morning Mr. Chairman and
15 members of the Board. I'm Kathy Renn and I'm president
16 of the Peninsula Housing and Builders Association, been
17 a building in Hampton Roads. Thank you for this
18 opportunity to speak to you today. Our members wish to
19 convey our opposition to any change in the Uniform
20 Statewide Building Code that would mandate fire
21 sprinklers in single family residential construction. We
22 urge the Board to accept the recommendations of the
23 Code and Standards Committee to have fire sprinklers as
24 an option to homeowners. Insurance rates do not
25 decrease because of sprinklers. Virginia insurance agents

1 say homeowners rates will increase because of water
2 damage, mold and other related issues. We urge the
3 board to let new customers decide for themselves. It is
4 important that nothing prevents a homebuyer today from
5 installing a sprinkler system in their home and as a
6 builder, I can assure you that if the client wants a
7 sprinkler system installed in their house, I'll have it
8 installed in their house but it's their choice. Fire officials
9 contribute to a lobbying effort. Fire officials have shown
10 today that they can look forward to an impressive lobbying
11 effort. They suggest they have an educational campaign
12 to the homeowners and convince the customer that their
13 fire officials are right and that their builders will be happy
14 to install a lot of new things. If there's one thing I've
15 learned in many years as a builder, the customers are
16 smart. Homebuyers can figure out on their own if the
17 increased cost in insurance will provide enough added
18 safety features that would be worth the cost. They can
19 also decide whether a fire has been addressed sufficiently
20 through smoke detectors and other technology. We ask
21 that the VHCD Board continue to allow homebuyers to
22 make those choices for themselves. Thank you for your
23 time.
24 MR. CALHOUN: Doug Kingma.
25 MR. KINGMA: Good morning. I'm Doug

1 Kingma. I'm from the Charlottesville Albemarle area. I'm
2 very uncomfortable and I'm sure everyone else standing
3 before you arguing about saving lives. I'm sure no one
4 opposes that. I would like to suggest to you that we as a
5 community have a finite number of resources and that
6 deploying those resources in other ways will produce a
7 better savings of lives than mandating fire sprinklers in
8 new construction. We saw a few moments ago a
9 demonstration of how many people had these sprinkler
10 systems in their homes. If we put them in all new
11 construction next year or the year after, we would still
12 have a very small percentage of the population. I'd like to
13 suggest that the finite resources we have be used more
14 efficiently. Thank you.
15 MR. CALHOUN: Ed Altizer.
16 MR. ALTIZER: Good morning, I'm Ed Altizer
17 and I'm the Virginia State Fire Marshal. I'm here speaking
18 on behalf of residential sprinklers. A lot of what I would
19 say has already been said. I'll give you a copy of my entire
20 comments and I will have that information sent in. I got a
21 couple of statistics and comments that have not been
22 given I think and those are very important. In 2008, as
23 has been reported, there were 85 related deaths, 59
24 percent or 47 were one or two family dwellings; 674
25 civilian and firefighter injuries; 51.5 percent – 348 were

1 involved in one or two family dwellings. More than 5,600
2 fires in single family dwellings representing more than
3 $125 million of property and content damage. This
4 doesn't include local government cost, healthcare costs or
5 any of those things. For years Virginia has been a leader
6 in this country providing fire protection to citizens and
7 visitors in buildings that are occupied by the public. We
8 were one of the first, if not the first in the country to
9 require equipment in homes and hospitals and nursing
10 homes and buildings over six stories and hotels and
11 motels over three stories in height. In addition to being a
12 leader in providing sprinkler protection for all these
13 buildings and other buildings. In about 1993, I did a
14 survey for the Department of Housing and Community
15 Development Board and Virginia was second in providing
16 sprinkler protection at that time. New Jersey was a close
17 second and I'm not sure if that's still good but at that
18 time, we were the leader. The Board's Code and
19 Standards Committee has voted to relieve the current
20 requirement from the option proposed in 2009 of the
21 residential code even though the Committees work group
22 has not reached a consensus. However, the Committee
23 did confirm in addition to fire service, their own
24 organization supported residential sprinkler. At national
25 hearings in Rochester, Palm Springs and Minneapolis, any

1 concerns that had been addressed about sprinklers in one
2 or two family dwellings had been addressed. This
3 included provisions for installation and ICC plumbing
4 codes. We're also seeing actual cost figures which are
5 substantially less than what some groups are indicating
6 with improvements, the cost should fall. Also taking into
7 consideration not only the cost of the sprinkler but the
8 savings cost. I would encourage this board to help lead
9 this country in helping to solve this significant fire
10 problem by reconsidering the code and standards and not
11 removing automatic sprinklers from the base document
12 and leaving it in the 2009 IRC. We have properly vented
13 our issue and hoping to provide a solution that I believe
14 will be is a major unresolved fire safety problem still
15 facing our citizens.
16 MR. CALHOUN: Richard Napier.
17 MR. NAPIER: Thank you very much. I
18 appreciate all the work you folks do taking your time to
19 work on issues like this. I'm a homebuilder and my name
20 is Rich Napier in Powhatan County which is a rural
21 county. We heard a few minutes ago from a gentleman
22 from my same county in Powhatan that shows they had a
23 sprinkler system installed in 1992 and has a house about
24 2,000 square feet and I think he said the bill was $3,000.
25 I had an issue last year in Powhatan County where it was

1 a much larger home but the way we had a drain issue and
2 created a four level home which we were dealing with a
3 different code. The building official indicated we may have
4 to have the sprinkler system installed. The multiple
5 storage tanks, the well, and the pump system and
6 everything else wasn't $3,000 but it was over $15,000.
7 My customer did not chose to do that because of the
8 affordability issue. We were able to work with our
9 building official by making changes to the structure of the
10 home. We removed closets that were called bedrooms and
11 rename it. We put in some different things like fire
12 extinguishers on each level and built different things. We
13 were able to accomplish the goal of the customer for about
14 $2,500 instead of $15,000. The gentleman from
15 Powhatan that spoke earlier chose to have the system in
16 his house. So I would ask you folks to make this
17 voluntary and not mandatory. We've heard talk about
18 when the seatbelts came in in the 70s and airbags and
19 you name it. Smoke detectors are effective and we have
20 them in every room on every level and they do save lives.
21 None of us are here to talk about or have no argument
22 about saving lives. When you get into a cost in excess of
23 $15,000, it's a major affordability issue. Let the citizens of
24 Virginia chose and they know that these systems are
25 available. People are aware of all the safety features when

1 building their homes so let them decide what to do. Just
2 like we might quote you a thermal system or solar
3 systems and you name it and when we give the customers
4 the cost, they change their minds quickly because they
5 are thinking about having to pay that. We need to stop all
6 this mandating in our state and let's work from a practical
7 issue. Let the market decide and dictate where we go.
8 Thank you very much.
9 MR. CALHOUN: Jack Knapp.
10 MR. KNAPP: (No response).
11 MR. CALHOUN: Alan Givens.
12 MR. GIVENS: (No response)
13 MR. CALHOUN: Guy Tomberlin.
14 MR. TOMBERLIN: Good morning or afternoon,
15 Mr. Chairman and distinguished board members. I'm
16 Guy Tomberlin from Fairfax County and I'm here
17 representing myself and I'm speaking first on the Virginia
18 Plumbing and Mechanical Inspector's Association along
19 with the Virginia Building Code Officials Association and
20 VRSC. We submitted nine proposals to the Board this
21 year for the USBC amendment and I just want to highlight
22 a couple of them. First related to the carbon monoxide
23 detectors, the mandated carbon monoxide detectors,
24 anytime anyone pulls a permit for anything and we cause
25 that to be a retroactive provision and probably prohibited

1 buildings which are four stories or less.
2 MR. CALHOUN: Tom Schwartz.
3 MR. SCHWARTZ: (No response)
4 MR. CALHOUN: John Ruffin.
5 MR. RUFFIN: (No response)
6 MR. CALHOUN: Bobby Tyler.
7 MR. TYLER: Thank you for the opportunity to
8 speak to you today. I had no intention of coming up here
9 and speaking and I heard a lot of information and I didn't
10 hear the statistics I was looking for. I build houses for
11 firefighters and I build houses for teachers, I build houses
12 for public workers and police officers and I can tell you
13 our business is decimated. When Mr. Ainslie asked these
14 people to stand up and tell you how many of them
15 supported this, and then he turned around and asked
16 how many actually have them in their homes, I think that
17 probably was one of the most compelling statistics I heard
18 all day long. I live in one of the houses that I built and I'll
19 tell you that I guess I should put a sprinkler system in it
20 but I wouldn't. I deliver every house that I build
21 personally. The one thing that I talk about that's very
22 important and the one thing that will destroy your house I
23 tell them is water. It's quiet and doesn't make a whole lot
24 of noise and importantly it does it when you're not home
25 most of the time. Unless we have a system that would

1 detect all those things, I'm opposed to it. I'll tell you that
2 right now. I do love my family and love my home and I do
3 protect my house. I install Ruffin Alarm Systems for every
4 house we build and I allow the customer to decide
5 whether they want it. I have weighted rise detectors that
6 will detect heat. That's the protection that I have. I have
7 clients that want it and I have clients that do not want it.
8 I ask you not to make it mandatory. Thank you.
9 MR. FLEURY: That appears to be the last
10 speaker that has signed up to speak from the sign in
11 sheet. Are there any persons that have not spoken today
12 on the issues for which this public hearing was convened?
13 Any other speakers? Then the hearing is now concluded.
14 All comments will be taken under advisement by the
15 Board. I'd like to re-emphasize any written statements
16 received will be considered by the Board. For members of
17 the Board we'll now go over to our meeting room and the
18 Board meeting and we'll see you all later. Have a good
19 day.
20
21
22 PROCEEDINGS CONCLUDED
23
24
25

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-310.6(R329)

Nature of Change:

To require a fire extinguisher to be installed in the kitchen area of new dwelling units in lieu of a sprinkler system.

Proponent: Mike Toalson, Home Builders Association of Virginia

Staff Comments:

The proposal was considered at one of the later sub-workgroup for residential sprinklers meetings but was not agreed upon by the fire service representatives as a substitute for requiring sprinklers, but there was no objection to the requirement in addition to sprinklers.

COMMENT RECEIVED

Beginning on Page No. 172

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number: C-310.6(R329)

Proponent Information (Check one): ☐ Individual ☐ Government Entity X Company

Name: Mike Toalson Representing: Home Builders Association of Virginia

Mailing Address: 707 East Franklin Street, Richmond, VA 23219

Email Address: mltoalson@hbav.com Telephone Number: 804-643-2797

Proposal Information

Code(s) and Section(s): 2009 USBC IRC R 329 and add new section on Fire Extinguishers

Proposed Change (including all relevant section numbers, if multiple sections):

R329.1 Kitchen Areas. Other than where the dwelling unit is equipped with an approved sprinkler system in accordance with R 313 or P 2904, a 10 BC fire extinguisher or an approved equivalent type of fire extinguisher shall be installed in the kitchen area.

Supporting Statement (including intent, need, and impact of the proposal): Kitchens are the top location for home fires. Many are small and controllable if discovered early, and according to the National Association of State Fire Marshall's, fire extinguishers have historically been the first line of defense for the same. According to the same professional group, if a fire is discovered in its early stages, the most effective means of protecting life and preventing property loss is to sound an alarm and then control and/or extinguish the incipient stage fire with a portable fire extinguisher. Fire extinguishers are manufactured with instructions and can be operated by untrained persons. They would provide a cost effective and enhanced active fire suppression measure to new homes. The typical 10 BC fire extinguisher would cost less than $50.00.

According to the National Association of State Fire Marshall's, fire extinguishers provide a very good first line of defense.

Submittal Information

Date Submitted: December 4, 2009

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
Main Street Centre
600 E. Main St., Ste. 300
Richmond, VA 23219

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual ☐Government Entity ☐Company

Name: Mike Toalson Representing: HBA of Virginia

Mailing Address: 707 East Franklin Street, Richmond, VA 23219

Email Address: mltoalson@hbav.com Telephone Number: 804-643-0317

Proposal Information

Code(s) and Section(s): 2009 USBC IRC R 329 and add a new section on Fire Extinguishers

Proposed Change (including all relevant section numbers, if multiple sections): R329.1 Kitchen Areas. Other than where the dwelling is equipped with an approved sprinkler system in accordance with R 313 or P 2904, a UL Rated 2-A: 10-B:C fire extinguisher or an approved equivalent type fire extinguisher shall be installed in the kitchen area.

Supporting Statement (including intent, need, and impact of the proposal): Kitchens are the top location for home fires. Many are small and controllable if discovered early and according to the National Association of Fire Marshall's fire extinguishers have historically been the first and most effective line of defense of the same. According to the same organization, if a fire is discovered in its early stages, fire extinguishers are the most effective means of protecting life and preventing damage to property. Fire extinguishers are manufactured with the instructions and can be operated untrained persons. Fire extinguishers would be a cost effective, and would enhance the fire suppression system in every new home.

Submittal Information

Date Submitted: Date First Submitted: December 4, 2009/Amended May 12, 2010

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
Main Street Centre
600 E. Main St., Ste. 300
Richmond, VA 23219

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-310.6(E3802.4)

Nature of Change:

To delete the requirements in the 2009 IRC for having to install electrical wiring on running boards in crawlspaces of homes.

Proponent: DHCD Staff (at the direction of the Codes and Standards Committee)

Staff Comments:

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual ☐Government Entity ☐Company

Name: DHCD Staff (at the direction of the Codes and Standards Committee) _____ Representing: _____

Mailing Address: _____

Email Address: _____ Telephone Number: _____

Proposal Information

Code(s) and Section(s): VCC, IRC Section E3802.4

Proposed Change (including all relevant section numbers, if multiple sections):

Change Section E3804.2 of the 2009 IRC as follows:

E3802.4 In unfinished basements ~~and crawlspaces~~. Where type SE or NM cable is run at angles with joists in unfinished basements ~~and crawlspaces~~, cable assemblies containing two or more conductors of sizes 6 AWG and larger... (remainder of section unchanged).

Supporting Statement (including intent, need, and impact of the proposal):

The 2008 NEC and the 2009 IRC electrical provisions added a new requirement for supporting electrical cables in a crawlspace either by running them through holes in the floor joists or by installing running boards. Both of these processes require much additional work and are very difficult to do in a typical crawlspace due to the limitations in working space. Crawlspaces are not typically accessible to the extent that protection of these conductors is necessary as they would be in a basement; therefore, this new requirement, which could add a substantial installation cost, is not warranted. This proposal simply keeps the 2006 IRC provisions intact. There is debate over the new requirement in the NEC adoption process and it appears that the 2011 NEC will have an exception for crawlspaces less than four and one-half feet in height. If that exception passes for the NEC, then it could be considered for the 2012 IRC and the 2012 USBC; however, for the 2009 USBC, it is best to just delete the new requirement and keep the 2006 requirements while the issue continues to be debated at the national level.

Submittal Information

Date Submitted: _____

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: taso@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-1301(402.1.1)

Nature of Change:

To reference an alternative standard for log wall construction and to specify greater window energy requirements for such installations.

Proponent: Michael E. Loy, representing the Log Homes Council

Staff Comments:

The proposal was not received in time to be fully vetted through the workgroup process; however, it was discussed at several client group meetings. The proposal references an ICC standard for log homes. Staff does have a copy of the standard. Staff notes that the proposal is from the Log Homes Council, yet the proposal is for the IECC and not the energy provisions of the IRC. Most log homes would be constructed to comply with the IRC.

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number: C-1301(402.1.1)

Proponent Information (Check one): ☐ Individual ☐ Government Entity ☒ Company

Name: Michael E. Loy Representing: Log Homes Council

Mailing Address: PO Box 1668, Irmo, SC 29063

Email Address: mloy@southlandloghomes.com Telephone Number: 803-407-4601

Proposal Information

Code(s) and Section(s): IECC Table 402.1.1 Insulation and Fenestration Requirements by Component

Proposed Change (including all relevant section numbers, if multiple sections):
Add footnote "k" to the Mass Wall R-value column of IECC Table 402.1.1 "Insulation and Fenestration Requirements by Component"

Footnote "k" to read as follows : k Log walls complying with ICC400 and with a minimum average wall thickness of 5" or greater shall be permitted in Zone 4 when overall window glazing is .32 U-factor or lower and all other component requirements are met.

Supporting Statement (including intent, need, and impact of the proposal):

To direct users to the consensus standard on log construction, the footnote references ICC400. This amendment would provide a prescriptive method that code officials and design professionals can apply to log homes. It simplifies administration of the codes for log construction for all parties involved. Log construction would be held to a higher requirement for window glazing.

Submittal Information

Date Submitted: 11/3/09

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-3001.2.1

Nature of Change:

To reference the newest addendum to the traditional elevator standard and to add a new standard for the evaluation of newer design or non-traditional elevators to the USBC.

Proponent: James D. Lawrence, representing the International Association of Elevator Consultants

Staff Comments:

The proposal was not received in time to be vetted through the workgroup process; however, it was discussed at one meeting of DHCD staff with the Virginia Building and Code Officials Association. It was recognized that the standard has merit for facilitating the acceptance of newer or non-traditional elevators for which the normal ASME A17.1 standard does not provide complete coverage for. It was also noted that the '08 addendum to ASME A17.1 authorizes the use of the new A17.7 standard, which might be sufficient rather than actually referencing the new standard. The proponent did not provide a copy of either the '08 addendum to the ASME A17.1 standard or the new A17.7 standard and was informed that copies needed to be provided.

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number: C - 3001.1.2.1

Proponent Information (Check one): ☐ Individual ☐ Government Entity X Company

Name: James D. Lawrence Representing: IAEC (Int'l Assoc. of Elevator Consultants)

Mailing Address: 4214 Coles Point Way, Glen Allen, VA 23060

Email Address: jlawrence9@aol.com Telephone Number: 804-747-0971

Proposal Information

Code(s) and Section IBC – Chapter 35 Referenced Standards (s):

Proposed Change (including all relevant section numbers, if multiple sections): Revised

Changed the referenced standards in Chapter 35 of the IBC as follows:
ASME
Add A17.1a-2008/CSA B44a-08 Addenda to ASME A17.1- 2007/CSA B44-07
Add A17,1b-2009/CSA B44b-09 Addenda to ASME A17.1- 2007/CSA B44-07

The next edition of ASME A17.1 will be on a three-year cycle without Addenda, which are being phased out. These Addenda will incorporate most of the upcoming changes in the next edition of the code.

Supporting Statement (including intent, need, and impact of the proposal):
A17.1a and 1b Addenda cover clarifications, corrections, deletions, additions and updates to elevator code referenced standards to the most recent available version of A17.1. A17.1a was issued December 5, 2008 and became effective June 5, 2009. A17.1b was issued December 30, 2009 and becomes effective June 30, 2010.

Submittal Information Copies of A17.1a and A17.1b submitted to VDHCD

Date Submitted: May 10, 2010 (Supersedes 12/1/09 submittal)

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: tsu@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

USBC – Virginia Construction Code
Code Change No. C-3102.5

Nature of Change:

To add a provision specifically dealing with construction not extending over a lot line.

Proponent: John Catlett, Building Official, representing the City of Alexandria Building Department

Staff Comments:

The proponent offers language from the BOCA Code with some modifications. The BOCA Code was the model code used as the basis for the USBC prior to the merger of the three nationally recognized model code organizations to form the International Code Council. Staff notes that the language suggested may be administrative in nature and if necessary, should be placed in Chapter 1 of the USBC. Section 108.1 of the USBC already requires a permit if a lot line is moved. To only put the language in Chapter 32 of the IBC (which is only for encroachments into the public right of way) would raise issues of whether it was applicable on adjacent private lots. In addition, if a building was constructed under the IRC (USBC Group R-5), it was also be questionable whether a provision in Chapter 32 of the IBC would be applicable. Staff further notes that the definition of "building line" in both the IBC and the IRC specifically prohibits building across a lot line. This change was not fully vetted through the workgroup process as the proposal came in after the first round of workgroup meetings; however it was considered by a DHCD-sponsored meeting with VBCOA and a number of similar issues were raised.

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐ Individual X Government Entity ☐ Company

Name: John Catlett Representing: City of Alexandria

Mailing Address: 301 King Street, Room 4200, Alexandria, va 22314

Email Address: john.catlett@alexandriava.gov Telephone Number: 703.746.4200

Proposal Information

Code(s) and Section(s): USBC Construction Code (New) IBC 3201.5

Proposed Change (including all relevant section numbers, if multiple sections):

3201.5 Encroachments of buildings and structures to building line.

Except as provided herein, a part of any building hereinafter erected and additions to an existing building heretofore erected shall not project beyond the lot lines or building line where such lines are established by zoning laws or any other statute controlling building construction. This shall not affect an existing building or structure that may have been constructed over one or more lot or building lines unless being added to and the addition will be placed over one or more lot lines.

Supporting Statement (including intent, need, and impact of the proposal):

It appears to be the intent of the building code to generally not allow buildings and structures to be built over property lines. The ICC has several terms, code provisions and definitions that indicate this position.

First the ICC defines building line as the following:

BUILDING LINE. The line established by law, beyond which a building shall not extend, except as specifically provided by law.

However, the term is only used in one other section of the code pertaining to fire escapes.

The ICC defines Fire Separation Distance as the following:

FIRE SEPARATION DISTANCE. The distance measured from the building face to one of the following:
1. The closest interior lot line;
2. To the centerline of a street, an alley or public way; or
3. To an imaginary line between two buildings on the property.

The application of Fire Separation Distance is found in 406.3.7

406.3.7 Fire separation distance. Exterior walls and openings in exterior walls shall comply with Tables 601 and 602. The distance to an adjacent lot line shall be determined in accordance with Table 602 and Section 704.

The ICC defines Lot Lines as the following:

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

2009 Code Change Cycle – Code Change Evaluation Form

SFPC – Virginia Statewide Fire Prevention Code
Code Change No. F-2205.4

Nature of Change:

To specify a distance from gas pumps where smoking is prohibited.

Proponent: Robby Dawson, representing the Virginia Fire Services Board

Staff Comments:

The proposal was not received in time to be considered by the workgroups. The only staff suggestion is that to facilitate a greater distance is necessary, the proposal could be modified to read as follows:

2205.4 Sources of ignition. Smoking and open flames shall be prohibited in areas where fuel is dispensed. <u>If not marked otherwise, the area shall extend at least 25 feet (7620 mm) away from any dispensing device.</u> (Remainder unchanged)

Codes and Standards Committee Action:

_____ Approve as presented. _____ Disapprove.

_____ Approve as modified (specify):

_____ Carry over to next cycle. _____ Other (specify):

VIRGINIA DEPARTMENT OF HOUSING AND COMMUNITY DEVELOPMENT
DIVISION OF BUILDING AND FIRE REGULATION

Code Change Form for the 2009 Code Change Cycle

Code Change Number:_____

Proponent Information (Check one): ☐Individual X Government Entity ☐Company

Name: Robby Dawson Representing: Virginia Fire Services Board

Mailing Address: 1005 Technology Park Drive, Glen Allen, VA 23059

Email Address: dawsonj@chesterfield.gov Telephone Number: 804-717-6838

Proposal Information

Code(s) and Section(s): USBC 903.2.8 – **Substitute based on Work Group Comments**

Proposed Change (including all relevant section numbers, if multiple sections):

Proposed Change (including all relevant section numbers, if multiple sections):
Change Section 2205.4 to read:

2205.4 Sources of ignition. Smoking and open flames shall be prohibited within 25 feet (7,620mm) ~~in areas where fuel is dispensed and shall not be allowed within 25 feet~~ of a fuel dispensing device. The engines of vehicles being fueled

Supporting Statement (including intent, need, and impact of the proposal):

This language change is in response to feedback received at the Work Group Meeting March 25, 2010. The balance of the supporting statement is listed here for reference:

The current language is subjective and is not quantifiable. Since this section applies to a variety of fueling operations that involve gasoline, LPG, CNG or hydrogen, the proposed change is to provide a measurable distance but still retain the subjective language aspect for the various circumstances based on the particular fuel to be dispensed.

As it may apply to smoking, open flames and the selected 25-foot distance, the common distances expressed in the firecode are 10, 25 and 50-foot separation from flammables and combustibles with 25-feet viewed as the most reasonable
minimum distance from dispensers.

In recognition of the various circumstances that a 25-foot may be an insufficient distance, no attempt is being made to coordinate a change on how the proposed 25-foot distance would be conveyed to those using the fuel dispensers. Section 2205.6 currently requires signage to be "conspicuously posted with sight of each dispenser". It is up to the
operator of the fueling facility on how to best comply with that requirement and can range from the most common scheme at public retail sites of posting signage on the dispensing unit itself or, very large free standing signs on the perimeter of a private fleet fueling area.

Submittal Information

Date Submitted: 12/16/09 Substitute submitted 3/30/2010

The proposal may be submitted by email as an attachment, by fax, by mail, or by hand delivery.

Please submit the proposal to:

DHCD DBFR TASO (Technical Assistance and Services Office)
The Jackson Center
501 N. 2nd Street
Richmond, VA 23219-1321

Email Address: taso@dhcd.virginia.gov
Fax Number: (804) 371-7092
Phone Numbers: (804) 371-7140 or (804) 371-7150

CODES AND STANDARDS COMMITTEE
2009 CODE CHANGE CYCLE – BOOK 6

BOARD OF HOUSING AND COMMUNITY DEVELOPMENT
FINAL REGULATION PACKAGE – 2009 CODE CHANGE CYCLE

SUMMARY OF CSC & BOARD ACTIONS – July 26, 2010

AS – Approve as submitted
AM – Approve as modified
D – Disapprove

OPENING STATEMENT

TAB 1 ----- Carry-over Proposals from the June 7, 2010 Codes and Standards Committee Meeting

Proposal Number	Description of Change	Committee Action
C-308.1	Assisted Living Facilities	AS
C-908.1	Carbon Monoxide Groups R and I	AS
C-1103.2.7	Accessibility Churches	AS
C-1301(IECC 402.4.2 & IRC N1103.2.2.1)	Duct Testing	AS
C-310.6(R313.1)(1)	Common Wall in Townhouses	AS
C-310.6(R313.1)(2)	Exterior Walls	AS
C-310.6(R313.1)(3)	Fire Apparatus Access Roads	AS
C-310.6(R313.1)(4)(a)	Fire Flow – Chapter 5	D
C-310.6(R313.1)(4)(b)	Fire Flow – Appendix B	AS
C-310.6(R313.1)(5)(a)	Fire Hydrants – Chapter 5	D
C-310.6(R313.1)(5)(b)	Fire Hydrants – Appendix C	AS
F-506.3	Elevator Service Keys	AM

TAB 2 ----- Final Regulations - USBC, Part I, Virginia Construction Code AS

HANDOUT – Final Regulations – USBC, Part II, Virginia Rehabilitation Code AS

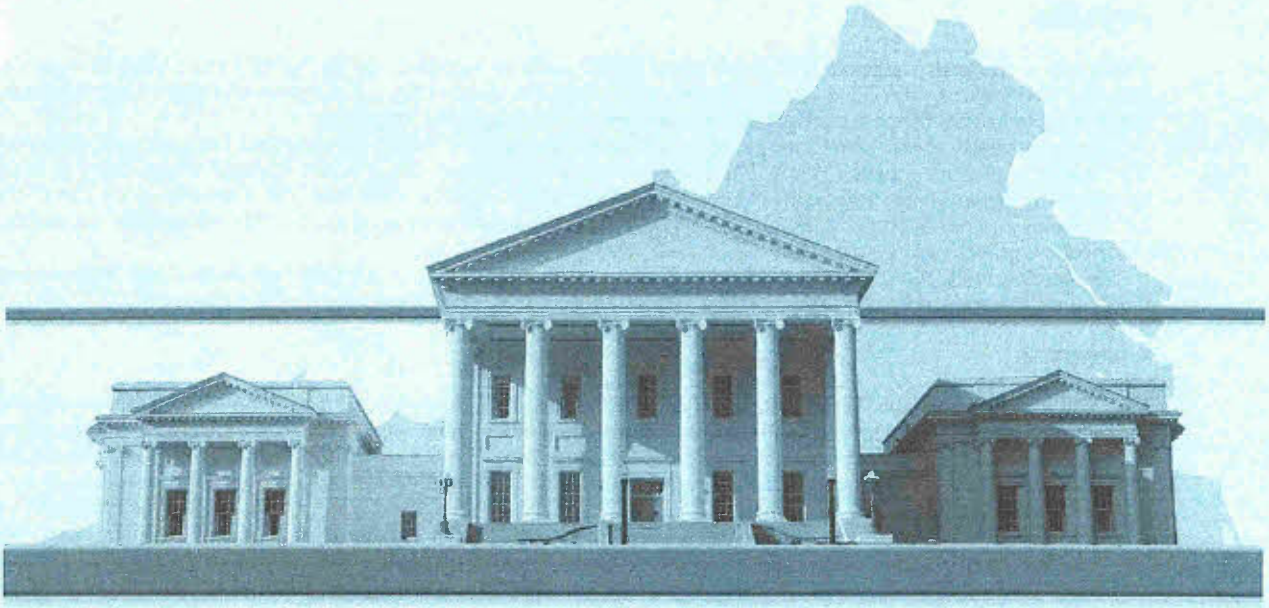
TAB 3 ----- Final Regulations - USBC, Part III, Virginia Maintenance Code AS

TAB 4 ----- Final Regulations - Virginia Statewide Fire Prevention Code AS

TAB 5 ----- Final Regulations – Virginia Industrialized Building Safety Regulations AS

TAB 6 ----- Final Regulations – Virginia Amusement Device Regulations AS

NOTE: All actions taken by the CSC were subsequently approved by the full Board of Housing.



Virginia Construction Code

Part I of the Virginia Uniform Statewide Building Code

2009

Effective March 1, 2011

PREFACE

Introduction

The Virginia Uniform Statewide Building Code (USBC) is a state regulation promulgated by the Virginia Board of Housing and Community Development, a Governor-appointed board, for the purpose of establishing minimum regulations to govern the construction and maintenance of buildings and structures.

The provisions of the USBC are based on nationally recognized model building and fire codes published by the International Code Council, Inc.. The model codes are made part of the USBC through a regulatory process known as incorporation by reference. The USBC also contains administrative provisions governing the use of the model codes and establishing requirements for the enforcement of the code by the local building departments and other code enforcement agencies.

In keeping with the designations of the USBC used previously, since the 2009 editions of the International Codes are incorporated by reference into this version of the USBC, it is known as the 2009 edition of the USBC.

Arrangement

The USBC is part of the Virginia Administrative Code (VAC), the official compilation of state regulations published under the authority and guidance of the Virginia Code Commission. Due to the difference in the section numbering system between the VAC and the model codes incorporated by reference into the USBC, the UBSC utilizes a dual section numbering system. In the USBC, the VAC section numbers are listed first, followed by a section number matching the model code system. In this printing of the USBC, the VAC section numbers are omitted and only the model code numbering system is utilized. The version of the USBC containing both the VAC section numbers and the model code numbering is available from the Virginia Department of Housing and Community Development (DHCD) and may also be accessed through the website of the Virginia Code Commission or by subscription to the VAC.

Overview

The USBC is divided into three stand-alone parts. Part I contains regulations specific to the construction of new buildings and structures and alterations, additions and change of occupancy in existing buildings and structures and is known as the Virginia Construction Code. Part II contains optional regulations specific to the rehabilitation of existing buildings that may be used as an acceptable alternative to the Virginia Construction Code. Part II is known as the Virginia Rehabilitation Code. Part III of the USBC contains the regulations for the maintenance of existing structures which is enforced at the option of the local governments. It is known as the Virginia Maintenance Code.

Codes Purchased from ICC

The 2009 edition of the USBC is being made available in pamphlet form as in past editions of the USBC. In addition to the pamphlet form of the USBC published by DHCD, the International Code Council (ICC) publishes versions of the Virginia Construction Code, Virginia Rehabilitation Code, Virginia Maintenance Code and a series of Virginia specific trade codes. In the ICC published versions, marginal markings are provided to distinguish between text which is part of the International Codes and text which is part of the state regulations. Double vertical lines in the margins within the body of the codes indicate state amendments to the International Codes. As in the standard printings of the International Codes, a single vertical line in the margins within the body of the code indicates a technical change from the previous edition of the International Codes. Deletions from the previous editions of the International Codes are indicated in the form of an arrow (→) in the margin where an entire section, paragraph, exception or table has been deleted or an item in a list of items or a table has been deleted.

Technical Assistance

The local building departments and enforcing agencies may be contacted for further information concerning the USBC. Contact information for DHCD is below.

DHCD, Division of Building and Fire Regulation
Technical Assistance Services Office
600 East Main Street, Suite 300
Richmond, Virginia 23219-2430
Phone: (804) 371-7150 – Email: taso@dhcd.virginia.gov
Website: www.dhcd.virginia.gov

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CHAPTER 1

ADMINISTRATION

SECTION 101
GENERAL

101.1 Short title. The Virginia Uniform Statewide Building Code, Part I, Construction, may be cited as the Virginia Construction Code. The term "USBC" shall mean the Virginia Construction Code unless the context in which the term is used clearly indicates it to be an abbreviation for the entire Virginia Uniform Statewide Building Code or for a different part of the Virginia Uniform Statewide Building Code.

Note: This code is also known as the 2009 edition of the USBC due to the use of the 2009 editions of the model codes.

101.2 Incorporation by reference. Chapters 2–35 of the 2009 International Building Code, published by the International Code Council, Inc., are adopted and incorporated by reference to be an enforceable part of the USBC. The term "IBC" means the 2009 International Building Code, published by the International Code Council, Inc. Any codes and standards referenced in the IBC are also considered to be part of the incorporation by reference, except that such codes and standards are used only to the prescribed extent of each such reference. In addition, any provisions of the appendices of the IBC specifically identified to be part of the USBC are also considered to be part of the incorporation by reference.

Note 1: The IBC references the whole family of International Codes including the following major codes:

2009 International Plumbing Code
2009 International Mechanical Code
2008 NFPA 70
2009 International Fuel Gas Code
2009 International Energy Conservation Code
2009 International Residential Code

Note 2: The International Residential Code is applicable to the construction of detached one- and two-family dwellings and townhouses as set out in Section 310.

101.3 Numbering system. A dual numbering system is used in the USBC to correlate the numbering system of the Virginia Administrative Code with the numbering system of the IBC. IBC numbering system designations are provided in the catchlines of the Virginia Administrative Code sections. Cross references between sections or chapters of the USBC use only the IBC numbering system designations. The term "chapter" is used in the context of the numbering system of the IBC and may mean a chapter in the USBC, a chapter in the IBC or a chapter in a referenced code or standard, depending on the context of the use of the term. The term "chapter" is not used to designate a chapter of the Virginia Administrative Code, unless clearly indicated.

101.4 Arrangement of code provisions. The USBC is comprised of the combination of (i) the provisions of Chapter 1, Administration, which are established herein, (ii) Chapters 2–35 of the IBC, which are incorporated by reference in Section 101.2, and (iii) the changes to the text of the incorporated chapters of the IBC that are specifically identified. The terminology "changes to the text of the incorporated chapters of the IBC that are specifically identified" shall also be referred to as the "state amendments to the IBC." Such state amendments to the IBC are set out using corresponding chapter and section numbers of the IBC numbering system. In addition, since Chapter 1 of the IBC is not incorporated as part of the USBC, any reference to a provision of Chapter 1 of the IBC in the provisions of Chapters 2 - 35 of the IBC is generally invalid. However, where the purpose of such a reference would clearly correspond to a provision of Chapter 1 established herein, then the reference may be construed to be a valid reference to such corresponding Chapter 1 provision.

101.5 Use of terminology and notes. The term "this code," or "the code," where used in the provisions of Chapter 1, in Chapters 2–35 of the IBC or in the state amendments to the IBC means the USBC, unless the context clearly indicates otherwise. The term "this code" or "the code" where used in a code or standard referenced in the IBC means that code or standard, unless the context clearly indicates otherwise. The use of notes in Chapter 1 is to provide information only and shall not be construed as changing the meaning of any code provision. Notes in the IBC, in the codes and standards

referenced in the IBC and in the state amendments to the IBC may modify the content of a related provision and shall be considered to be a valid part of the provision, unless the context clearly indicates otherwise.

101.6 Order of precedence. The provisions of Chapter 1 of this code supersede any conflicting provisions of Chapters 2–35 of the IBC and any conflicting provisions of the codes and standards referenced in the IBC. In addition, the state amendments to the IBC supersede any conflicting provisions of Chapters 2–35 of the IBC and any conflicting provisions of the codes and standards referenced in the IBC. Further, the provisions of Chapters 2–35 of the IBC supersede any conflicting provisions of the codes and standards referenced in the IBC.

101.7 Administrative provisions. The provisions of Chapter 1 establish administrative requirements, which include but are not limited to provisions relating to the scope of the code, enforcement, fees, permits, inspections and disputes. Any provisions of Chapters 2–35 of the IBC or any provisions of the codes and standards referenced in the IBC that address the same subject matter and impose differing requirements are deleted and replaced by the provisions of Chapter 1. Further, any administrative requirements contained in the state amendments to the IBC shall be given the same precedence as the provisions of Chapter 1. Notwithstanding the above, where administrative requirements of Chapters 2–35 of the IBC or of the codes and standards referenced in the IBC are specifically identified as valid administrative requirements in Chapter 1 of this code or in the state amendments to the IBC, then such requirements are not deleted and replaced.

Note: The purpose of this provision is to eliminate overlap, conflicts and duplication by providing a single standard for administrative, procedural and enforcement requirements of this code.

101.8 Definitions. The definitions of terms used in this code are contained in Chapter 2 along with specific provisions addressing the use of definitions. Terms may be defined in other chapters or provisions of the code and such definitions are also valid.

Note: The order of precedence outlined in Section 101.6 may be determinative in establishing how to apply the definitions in the IBC and in the referenced codes and standards.

SECTION 102
PURPOSE AND SCOPE

102.1 Purpose. In accordance with Section 36-99 of the Code of Virginia, the purpose of the USBC is to protect the health, safety and welfare of the residents of the Commonwealth of Virginia, provided that buildings and structures should be permitted to be constructed at the least possible cost consistent with recognized standards of health, safety, energy conservation and water conservation, including provisions necessary to prevent overcrowding, rodent or insect infestation, and garbage accumulation; and barrier-free provisions for the physically handicapped and aged.

102.2 Scope. This section establishes the scope of the USBC in accordance with Section 36-98 of the Code of Virginia. The USBC shall supersede the building codes and regulations of the counties, municipalities and other political subdivisions and state agencies. This code also shall supersede the provisions of local ordinances applicable to single-family residential construction that (i) regulate dwelling foundations or crawl spaces, (ii) require the use of specific building materials or finishes in construction, or (iii) require minimum surface area or numbers of windows; however, this code shall not supersede proffered conditions accepted as a part of a rezoning application, conditions imposed upon the grant of special exceptions, special or conditional use permits or variances, conditions imposed upon a clustering of single-family homes and preservation of open space development through standards, conditions, and criteria established by a locality pursuant to subdivision 8 of Section 15.2-2242 of the Code of Virginia or subdivision A 12 of Section 15.2-2286 of the Code of Virginia, or land use requirements in airport or highway overlay districts, or historic districts created pursuant to Section 15.2-2306 of the Code of Virginia, or local flood plain regulations adopted as a condition of participation in the National Flood Insurance Program.

Note: Requirements relating to functional design are contained in Section 103.11 of this code.

102.2.1 Invalidity of provisions. To the extent that any provisions of this code are in conflict with Chapter 6 (Section 36-97 et seq.) of Title 36 of the Code of Virginia or in conflict with the scope of the USBC, those provisions are considered to be invalid to the extent of such conflict.

102.3 Exemptions. The following are exempt from this code:

1. Equipment, related wiring, and poles and towers supporting the related wiring installed by a provider of publicly regulated utility service or a franchised cable television operator and electrical equipment and related wiring used for radio, broadcast or cable television, telecommunications or information service transmission. The exemption shall apply only if under applicable federal and state law the ownership and control of the equipment and wiring is by the service provider or its affiliates. Such exempt equipment and wiring shall be located on either rights-of-way or property for which the service provider has rights of occupancy and entry; however, the structures, including their service equipment, housing or supporting such exempt equipment and wiring shall be subject to the USBC. The installation of equipment and wiring exempted by this section shall not create an unsafe condition prohibited by the USBC.

2. Manufacturing and processing machines that do not produce or process hazardous materials regulated by this code, including all of the following service equipment associated with the manufacturing or processing machines.

   2.1. Electrical equipment connected after the last disconnecting means.

   2.2. Plumbing piping and equipment connected after the last shutoff valve or backflow device and before the equipment drain trap.

   2.3. Gas piping and equipment connected after the outlet shutoff valve.

   Manufacturing and processing machines that produce or process hazardous materials regulated by this code are only required to comply with the code provisions regulating the hazardous materials.

3. Parking lots and sidewalks, which are not part of an accessible route.

4. Nonmechanized playground or recreational equipment such as swing sets, sliding boards, climbing bars, jungle gyms, skateboard ramps, and similar equipment where no admission fee is charged for its use or for admittance to areas where the equipment is located.

5. Industrialized buildings subject to the Virginia Industrialized Building Safety Regulations (13 VAC 5-91) and manufactured homes subject to the Virginia Manufactured Home Safety Regulations (13 VAC 5-95); except as provided for in Section 424.

6. Farm buildings and structures, except for a building or a portion of a building located on a farm that is operated as a restaurant as defined in Section 35.1-1 of the Code of Virginia and licensed as such by the Virginia Board of Health pursuant to Chapter 2 (Section 35.1-11 et seq.) of Title 35.1 of the Code of Virginia. However, farm buildings and structures lying within a flood plain or in a mudslide-prone area shall be subject to flood-proofing regulations or mudslide regulations, as applicable.

7. Federally owned buildings and structures unless federal law specifically requires a permit from the locality. Underground storage tank installations, modifications and removals shall comply with this code in accordance with federal law.

SECTION 103
APPLICATION OF CODE

103.1 General. In accordance with Section 36-99 of the Code of Virginia, the USBC shall prescribe building regulations to be complied with in the construction and rehabilitation of buildings and structures, and the equipment therein.

103.2 When applicable to new construction. Construction for which a permit application is submitted to the local building department after the effective date of the 2009 edition of the code shall comply with the provisions of this code, except for permit applications submitted during a one-year period after the effective date of the 2009 edition of the code. The applicant for a permit during such one-year period shall be permitted to choose whether to comply with the provisions of this code or the provisions of the edition of the code in effect immediately prior to the 2009 edition. This provision shall also apply to subsequent amendments to this code based on the effective date of such amendments. In addition, when a permit has been properly issued under a previous edition of this code, this code shall not require changes to the approved construction documents, design or construction of such a building or structure, provided the permit has not been suspended or revoked.

103.3 Change of occupancy. No change of occupancy shall be made in any structure when the current USBC requires a greater degree of accessibility, structural strength, fire protection, means of egress, ventilation or sanitation. When such a greater degree is required, the owner or the owner's agent shall make written application to the local building department for a new certificate of occupancy and shall obtain the new certificate of occupancy prior to the new use of the structure. When impractical to achieve compliance with this code for the new occupancy classification, the building official shall consider modifications upon application and as provided for in Section 106.3.

Exception: This section shall not be construed to permit noncompliance with any applicable flood load or flood-resistant construction requirements of this code.

103.4 Additions. Additions to buildings and structures shall comply with the requirements of this code for new construction and an existing building or structure plus additions shall comply with the height and area provisions of Chapter 5. Further, this code shall not require changes to the design or construction of any portions of the building or structure not altered or affected by an addition, unless the addition has the effect of lowering the current level of safety.

Exception: This section shall not be construed to permit noncompliance with any applicable flood load or flood-resistant construction requirements of this code.

103.5 Reconstruction, alteration or repair. The following criteria is applicable to reconstruction, alteration or repair of buildings or structures:

1. Any reconstruction, alteration or repair shall not adversely affect the performance of the building or structure, or cause the building or structure to become unsafe or lower existing levels of health and safety.

2. Parts of the building or structure not being reconstructed, altered or repaired shall not be required to comply with the requirements of this code applicable to newly constructed buildings or structures.

3. The installation of material or equipment, or both, that is neither required nor prohibited shall only be required to comply with the provisions of this code relating to the safe installation of such material or equipment.

4. Material or equipment, or both, may be replaced in the same location with material or equipment of a similar kind or capacity.

Exceptions:

1. This section shall not be construed to permit noncompliance with any applicable flood load or flood-resistant construction requirements of this code.

2. Reconstructed decks, balconies, porches and similar structures located 30 inches (762 mm) or more above grade shall meet the current code provisions for structural loading capacity, connections and structural attachment. This requirement excludes the configuration and height of handrails and guardrails.

103.6 Use of rehabilitation code. Compliance with Part II of the Virginia Uniform Statewide Building Code, also known as the "Virginia Rehabilitation Code," shall be an acceptable alternative to compliance with this code for the rehabilitation of such existing buildings and structures within the scope of that code. For the purposes of this section, the term "rehabilitation" shall be as defined in the Virginia Rehabilitation Code.

103.7 Retrofit requirements. The local building department shall enforce the provisions of Section 3413, which require certain existing buildings to be retrofitted with fire protection systems and other safety equipment. Retroactive fire protection system requirements contained in the International Fire Code shall not be applicable unless required for compliance with the provisions of Section 3413.

103.8 Nonrequired equipment. The following criteria for nonrequired equipment is in accordance with Section 36-103 of the Code of Virginia. Building owners may elect to install partial or full fire alarms or other safety equipment that was not required by the edition of the USBC in effect at the time a building was constructed without meeting current requirements of the code, provided the installation does not create a hazardous condition. Permits for installation shall be obtained in

accordance with this code. In addition, as a requirement of this code, when such nonrequired equipment is to be installed, the building official shall notify the appropriate fire official or fire chief.

103.8.1 Reduction in function or discontinuance of nonrequired fire protection systems. When a nonrequired fire protection system is to be reduced in function or discontinued, it shall be done in such a manner so as not to create a false sense of protection. Generally, in such cases, any features visible from interior areas shall be removed, such as sprinkler heads, smoke detectors or alarm panels or devices, but any wiring or piping hidden within the construction of the building may remain. Approval of the proposed method of reduction or discontinuance shall be obtained from the building official.

103.9 Equipment changes. Upon the replacement or new installation of any fuel-burning appliances or equipment in existing buildings, an inspection or inspections shall be conducted to ensure that the connected vent or chimney systems comply with the following:

1. Vent or chimney systems are sized in accordance with either the International Residential Code, the International Mechanical Code or the International Fuel Gas Code, depending on which is applicable based on the fuel source and the occupancy classification of the structure.

2. Vent or chimney systems are clean, free of any obstruction or blockages, defects or deterioration and are in operable condition.

Where not inspected by the local building department, persons performing such changes or installations shall certify to the building official that the requirements of Items 1 and 2 of this section are met.

103.10 Use of certain provisions of referenced codes. The following provisions of the IBC and of other indicated codes or standards are to be considered valid provisions of this code. Where any such provisions have been modified by the state amendments to the IBC, then the modified provisions apply.

1. Special inspection requirements in Chapters 2–35.

2. Chapter 34, Existing Structures, except that Section 3412, Compliance Alternatives, shall not be used to comply with the retrofit requirements identified in Section 103.7 and shall not be construed to permit noncompliance with any applicable flood load or flood-resistant construction requirements of this code.

3. Testing requirements and requirements for the submittal of construction documents in any of the ICC codes referenced in Chapter 35 and in the IRC.

4. Section R301.2 of the International Residential Code authorizing localities to determine climatic and geographic design criteria.

5. Flood load or flood-resistant construction requirements in the IBC or the International Residential Code, including, but not limited to, any such provisions pertaining to flood elevation certificates that are located in Chapter 1 of those codes. Any required flood elevation certificate pursuant to such provisions shall be prepared by a land surveyor licensed in Virginia or an RDP.

6. Section R101.2 of the IRC.

103.11 Functional design. The following criteria for functional design is in accordance with Section 36-98 of the Code of Virginia. The USBC shall not supersede the regulations of other state agencies that require and govern the functional design and operation of building related activities not covered by the USBC, including but not limited to (i) public water supply systems, (ii) waste water treatment and disposal systems, (iii) solid waste facilities, nor shall state agencies be prohibited from requiring, pursuant to other state law, that buildings and equipment be maintained in accordance with provisions of this code. In addition, as established by this code, the building official may refuse to issue a permit until the applicant has supplied certificates of functional design approval from the appropriate state agency or agencies. For purposes of coordination, the locality may require reports to the building official by other departments or agencies indicating compliance with their regulations applicable to the functional design of a building or structure as a condition for issuance of a building permit or certificate of occupancy. Such reports shall be based upon review of the plans or inspection of the

project as determined by the locality. All enforcement of these conditions shall not be the responsibility of the building official, but rather the agency imposing the condition.

Note: Identified state agencies with functional design approval are listed in the "Related Laws Package," which is available from DHCD.

103.12 Amusement devices and inspections. In accordance with Section 36-98.3 of the Code of Virginia, to the extent they are not superseded by the provisions of Section 36-98.3 of the Code of Virginia and the VADR, the provisions of the USBC shall apply to amusement devices. In addition, as a requirement of this code, inspections for compliance with the VADR shall be conducted either by local building department personnel or private inspectors provided such persons are certified as amusement device inspectors under the VCS.

103.13 State buildings and structures. This section establishes the application of the USBC to state-owned buildings and structures in accordance with Section 36-98.1 of the Code of Virginia. The USBC shall be applicable to all state-owned buildings and structures, with the exception that Sections 2.2-1159, 2.2-1160 and 2.2-1161 of the Code of Virginia shall provide the standards for ready access to and use of state-owned buildings by the physically handicapped.

Any state-owned building or structure for which preliminary plans were prepared or on which construction commenced after the initial effective date of the USBC, shall remain subject to the provisions of the USBC that were in effect at the time such plans were completed or such construction commenced. Subsequent reconstruction, renovation or demolition of such building or structure shall be subject to the pertinent provisions of this code.

Acting through the Division of Engineering and Buildings, the Virginia Department of General Services shall function as the building official for state-owned buildings. The department shall review and approve plans and specifications, grant modifications, and establish such rules and regulations as may be necessary to implement this section. It shall provide for the inspection of state-owned buildings and enforcement of the USBC and standards for access by the physically handicapped by delegating inspection and USBC enforcement duties to the State Fire Marshal's Office, to other appropriate state agencies having needed expertise, and to local building departments, all of which shall provide such assistance within a reasonable time and in the manner requested. State agencies and institutions occupying buildings shall pay to the local building department the same fees as would be paid by a private citizen for the services rendered when such services are requested by the department. The department may alter or overrule any decision of the local building department after having first considered the local building department's report or other rationale given for its decision. When altering or overruling any decision of a local building department, the department shall provide the local building department with a written summary of its reasons for doing so.

Notwithstanding any provision of this code to the contrary, roadway tunnels and bridges owned by the Virginia Department of Transportation shall be exempt from this code. The Virginia Department of General Services shall not have jurisdiction over such roadway tunnels, bridges and other limited access highways; provided, however, that the Department of General Services shall have jurisdiction over any occupied buildings within any Department of Transportation rights-of-way that are subject to this code.

Except as provided in Section 23-38.109 D of the Code of Virginia, and notwithstanding any provision of this code to the contrary, at the request of a public institution of higher education, the Virginia Department of General Services, as further set forth in this provision, shall authorize that institution of higher education to contract with a building official of the locality in which the construction is taking place to perform any inspection and certifications required for the purpose of complying with this code. The department shall publish administrative procedures that shall be followed in contracting with a building official of the locality. The authority granted to a public institution of higher education under this provision to contract with a building official of the locality shall be subject to the institution meeting the conditions prescribed in Section 23-38.88 B of the Code of Virginia.

Note: In accordance with Section 36-98.1 of the Code of Virginia, roadway tunnels and bridges shall be designed, constructed and operated to comply with fire safety standards based on nationally recognized model codes and standards to be developed by the Virginia Department of Transportation in consultation with the State Fire Marshal and approved by the Virginia Commonwealth Transportation Board. Emergency response planning and activities related to the standards approved by the Commonwealth Transportation Board shall be developed by the Department of Transportation and coordinated with the appropriate local officials and emergency service providers. On an annual basis, the Department of Transportation shall provide a report on the maintenance and operability of installed fire protection and detection systems in roadway tunnels and bridges to the State Fire Marshal.

103.13.1 Certification of state enforcement personnel. State enforcement personnel shall comply with the applicable requirements of Section 105 for certification, periodic maintenance training, and continuing education.

SECTION 104
ENFORCEMENT, GENERALLY

104.1 Scope of enforcement. This section establishes the requirements for enforcement of the USBC in accordance with Section 36-105 of the Code of Virginia. Enforcement of the provisions of the USBC for construction and rehabilitation shall be the responsibility of the local building department. Whenever a county or municipality does not have such a building department, the local governing body shall enter into an agreement with the local governing body of another county or municipality or with some other agency, or a state agency approved by DHCD for such enforcement. For the purposes of this section, towns with a population of less than 3,500 may elect to administer and enforce the USBC; however, where the town does not elect to administer and enforce the code, the county in which the town is situated shall administer and enforce the code for the town. In the event such town is situated in two or more counties, those counties shall administer and enforce the USBC for that portion of the town situated within their respective boundaries.

Upon a finding by the local building department, following a complaint by a tenant of a residential rental unit that is the subject of such complaint, that there may be a violation of the unsafe structures provisions of Part III of the Virginia Uniform Statewide Building Code, also known as the "Virginia Maintenance Code," the local building department shall enforce such provisions.

If the local building department receives a complaint that a violation of the Virginia Maintenance Code exists that is an immediate and imminent threat to the health or safety of the owner or tenant of a residential dwelling unit or a nearby residential dwelling unit, and the owner or tenant of the residential dwelling unit that is the subject of the complaint has refused to allow the local building official or his agent to have access to the subject dwelling, the local building official or his agent may present sworn testimony to a court of competent jurisdiction and request that the court grant the local building official or his agent an inspection warrant to enable the building official or his agent to enter the subject dwelling for the purpose of determining whether violations of the Virginia Maintenance Code exist. The local building official or his agent shall make a reasonable effort to obtain consent from the owner or tenant of the subject dwelling prior to seeking the issuance of an inspection warrant under this section.

The local governing body shall inspect and enforce the provisions of the Virginia Maintenance Code for elevators except for elevators in single and two-family homes and townhouses. Such inspection and enforcement shall be carried out by an agency or department designated by the local governing body.

104.2 Interagency coordination. When any inspection functions under this code are assigned to a local agency other than the local building department, such agency shall coordinate its reports of inspection with the local building department.

104.3 Transfer of ownership. If the local building department has initiated an enforcement action against the owner of a building or structure and such owner subsequently transfers the ownership of the building or structure to an entity in which the owner holds an ownership interest greater than 50%, the pending enforcement action shall continue to be enforced against the owner.

SECTION 105
LOCAL BUILDING DEPARTMENT

105.1 Appointment of building official. Every local building department shall have a building official as the executive official in charge of the department. The building official shall be appointed in a manner selected by the local governing body. After permanent appointment, the building official shall not be removed from office except for cause after having been afforded a full opportunity to be heard on specific and relevant charges by and before the appointing authority. DHCD shall be notified by the appointing authority within 30 days of the appointment or release of a permanent or acting building official.

Note: Building officials are subject to sanctions in accordance with the VCS.

105.1.1 Qualifications of building official. The building official shall have at least five years of building experience as a licensed professional engineer or architect, building, fire or trade inspector, contractor, housing inspector or

superintendent of building, fire or trade construction or at least five years of building experience after obtaining a degree in architecture or engineering, with at least three years in responsible charge of work. Any combination of education and experience that would confer equivalent knowledge and ability shall be deemed to satisfy this requirement. The building official shall have general knowledge of sound engineering practice in respect to the design and construction of structures, the basic principles of fire prevention, the accepted requirements for means of egress and the installation of elevators and other service equipment necessary for the health, safety and general welfare of the occupants and the public. The local governing body may establish additional qualification requirements.

105.1.2 Certification of building official. An acting or permanent building official shall be certified as a building official in accordance with the VCS within one year after being appointed as acting or permanent building official.

Exception: A building official in place prior to April 1, 1983, shall not be required to meet the certification requirements in this section while continuing to serve in the same capacity in the same locality.

105.1.3 Noncertified building official. Except for a building official exempt from certification under the exception to Section 105.1.2, any acting or permanent building official who is not certified as a building official in accordance with the VCS shall attend the core module of the Virginia Building Code Academy or an equivalent course in an individual or regional code academy accredited by DHCD within 180 days of appointment. This requirement is in addition to meeting the certification requirement in Section 105.1.2.

105.1.4 Requirements for periodic maintenance and continuing education. Building officials shall attend periodic maintenance training as designated by DHCD. In addition to the periodic maintenance training required above, building officials shall attend 16 hours of continuing education every two years as approved by DHCD. If a building official possesses more than one BHCD certificate, the 16 hours shall satisfy the continuing education requirement for all BHCD certificates.

105.2 Technical assistants. The building official, subject to any limitations imposed by the locality, shall be permitted to utilize technical assistants to assist the building official in the enforcement of the USBC. DHCD shall be notified by the building official within 60 days of the employment of, contracting with or termination of all technical assistants.

Note: Technical assistants are subject to sanctions in accordance with the VCS.

105.2.1 Qualifications of technical assistants. A technical assistant shall have at least three years of experience and general knowledge in at least one of the following areas: building construction; building, fire or housing inspections; plumbing, electrical or mechanical trades; or fire protection, elevator or property maintenance work. Any combination of education and experience that would confer equivalent knowledge and ability shall be deemed to satisfy this requirement. The locality may establish additional qualification requirements.

105.2.2 Certification of technical assistants. A technical assistant shall be certified in the appropriate subject area within 18 months after becoming a technical assistant. When required by local policy to have two or more certifications, a technical assistant shall obtain the additional certifications within three years from the date of such requirement.

Exception: A technical assistant in place prior to March 1, 1988, shall not be required to meet the certification requirements in this section while continuing to serve in the same capacity in the same locality.

105.2.3 Requirements for periodic maintenance and continuing education. Technical assistants shall attend periodic maintenance training as designated by DHCD. In addition to the periodic maintenance training required above, technical assistants shall attend 16 hours of continuing education every two years as approved by DHCD. If a technical assistant possesses more than one BHCD certificate, the 16 hours shall satisfy the continuing education requirement for all BHCD certificates.

105.3 Conflict of interest. The standards of conduct for building officials and technical assistants shall be in accordance with the provisions of the State and Local Government Conflict of Interests Act, Chapter 31 (Section 2.2-3100 et seq.) of Title 2.2 of the Code of Virginia.

105.4 Records. The local building department shall retain a record of applications received, permits, certificates, notices and orders issued, fees collected and reports of inspection in accordance with The Library of Virginia's General Schedule Number Six.

SECTION 106
POWERS AND DUTIES OF THE BUILDING OFFICIAL

106.1 Powers and duties, generally. The building official shall enforce this code as set out herein and as interpreted by the State Review Board.

106.2 Delegation of authority. The building official may delegate powers and duties except where such authority is limited by the local government. However, such limitations of authority by the local government are not applicable to the third-party inspector policy required by Section 113.7.1 nor shall such limitations of authority by the local government have the effect of altering the provisions of this code or creating building regulations. When such delegations are made, the building official shall be responsible for assuring that they are carried out in accordance with the provisions of this code.

106.3 Issuance of modifications. Upon written application by an owner or an owner's agent, the building official may approve a modification of any provision of the USBC provided the spirit and functional intent of the code are observed and public health, welfare and safety are assured. The decision of the building official concerning a modification shall be made in writing and the application for a modification and the decision of the building official concerning such modification shall be retained in the permanent records of the local building department.

Note: The USBC references nationally recognized model codes and standards. Future amendments to such codes and standards are not automatically included in the USBC; however the building official should give them due consideration in deciding whether to approve a modification.

106.3.1 Substantiation of modification. The building official may require or may consider a statement from an RDP or other person competent in the subject area of the application as to the equivalency of the proposed modification. In addition, the building official may require the application to include construction documents sealed by an RDP.

106.3.2 Use of performance code. Compliance with the provisions of a nationally recognized performance code when approved as a modification shall be considered to constitute compliance with this code. All documents submitted as part of such consideration shall be retained in the permanent records of the local building department.

SECTION 107
FEES

107.1 Authority for charging fees. In accordance with Section 36-105 of the Code of Virginia, fees may be levied by the local governing body in order to defray the cost of enforcement of the USBC.

107.1.1 Fee schedule. The local governing body shall establish a fee schedule incorporating unit rates, which may be based on square footage, cubic footage, estimated cost of construction or other appropriate criteria. A permit or any amendments to an existing permit shall not be issued until the designated fees have been paid, except that the building official may authorize the delayed payment of fees.

107.1.2 Refunds. When requested in writing by a permit holder, the locality shall provide a fee refund in the case of the revocation of a permit or the abandonment or discontinuance of a building project. The refund shall not be required to exceed an amount which correlates to work not completed.

107.2 Code academy fee levy. In accordance with subdivision 7 of Section 36-137 of the Code of Virginia, the local building department shall collect a 2.0% levy of fees charged for permits issued under this code and transmit it quarterly to DHCD to support training programs of the Virginia Building Code Academy. Localities that maintain individual or regional training academies accredited by DHCD shall retain such levy.

SECTION 108
APPLICATION FOR PERMIT

108.1 When applications are required. Application for a permit shall be made to the building official and a permit shall be obtained prior to the commencement of any of the following activities, except that applications for emergency construction, alterations or equipment replacement shall be submitted by the end of the first working day that follows the day such work commences. In addition, the building official may authorize work to commence pending the receipt of an application or the issuance of a permit.

1. Construction or demolition of a building or structure. Installations or alterations involving (i) the removal or addition of any wall, partition or portion thereof, (ii) any structural component, (iii) the repair or replacement of any required component of a fire or smoke rated assembly, (iv) the alteration of any required means of egress system, (v) water supply and distribution system, sanitary drainage system or vent system, (vi) electric wiring, (vii) fire protection system, mechanical systems, or fuel supply systems, or (viii) any equipment regulated by the USBC.

2. For change of occupancy, application for a permit shall be made when a new certificate of occupancy is required under Section 103.3.

3. Movement of a lot line that increases the hazard to or decreases the level of safety of an existing building or structure in comparison to the building code under which such building or structure was constructed.

4. Removal or disturbing of any asbestos containing materials during the construction or demolition of a building or structure, including additions.

108.2 Exemptions from application for permit. Notwithstanding the requirements of Section 108.1, application for a permit and any related inspections shall not be required for the following; however, this section shall not be construed to exempt such activities from other applicable requirements of this code. In addition, when an owner or an owner's agent requests that a permit be issued for any of the following, then a permit shall be issued and any related inspections shall be required.

1. Installation of wiring and equipment that (i) operates at less than 50 volts, (ii) is for network powered broadband communications systems, or (iii) is exempt under Section 102.3(1), except when any such installations are located in a plenum, penetrate fire rated or smoke protected construction or are a component of any of the following:

   1.1. Fire alarm system.

   1.2. Fire detection system.

   1.3. Fire suppression system.

   1.4. Smoke control system.

   1.5. Fire protection supervisory system.

   1.6. Elevator fire safety control system.

   1.7. Access or egress control system or delayed egress locking or latching system.

   1.8. Fire damper.

   1.9. Door control system.

2. One story detached accessory structures used as tool and storage sheds, playhouses or similar uses, provided the floor area does not exceed 200 square feet (18 m^2) and the structures are not classified as a Group F-1 or H occupancy.

3. Detached prefabricated buildings housing the equipment of a publicly regulated utility service, provided the floor area does not exceed 150 square feet (14 m^2).

4. Tents or air-supported structures, or both, that cover an area of 900 square feet (84 m^2) or less, including within that area all connecting areas or spaces with a common means of egress or entrance, provided such tents or structures have an occupant load of 50 or less persons.

5. Fences and privacy walls not part of a building, structure or of the barrier for a swimming pool, provided such fences and privacy walls do not exceed six feet in height above the finished grade. Ornamental post caps shall not be considered to contribute to the height of the fence or privacy wall and shall be permitted to extend above the six feet height measurement.

6. Retaining walls supporting less than two feet of unbalanced fill. This exemption shall not apply to any wall impounding Class I, II or III-A liquids or supporting a surcharge other than ordinary unbalanced fill.

7. Swimming pools that have a surface area not greater than 150 square feet (13.95 m^2), do not exceed 5,000 gallons (19 000 L) and are less than 24 inches (610 mm) deep.

8. Signs under the conditions in Section H101.2 of Appendix H.

9. Replacement of above-ground existing LP-gas containers of the same capacity in the same location and associated regulators when installed by the serving gas supplier.

10. Ordinary repairs that include the following:

    10.1. Replacement of windows and doors with windows and doors of similar operation and opening dimensions that do not require changes to the existing framed opening and that are not required to be fire rated in Group R-2 where serving a single dwelling unit and in Groups R-3, R-4 and R-5.

    10.2. Replacement of plumbing fixtures in all groups without alteration of the water supply and distribution systems, sanitary drainage systems or vent systems.

    10.3. Replacement of general use snap switches, dimmer and control switches, 125 volt-15 or 20 ampere receptacles, luminaries (lighting fixtures) and ceiling (paddle) fans in Group R-2 where serving a single dwelling unit and in Groups R-3, R-4 and R-5.

    10.4. Replacement of mechanical appliances provided such equipment is not fueled by gas or oil in Group R-2 where serving a single family dwelling and in Groups R-3, R-4 and R-5.

    10.5. Replacement of an unlimited amount of roof covering or siding in Groups R-3, R-4 or R-5 provided the building or structure is not in an area where the design (3 second gust) wind speed is greater than 100 miles per hour (160 km/hr) and replacement of 100 square feet (9.29 m^2) or less of roof covering in all groups and all wind zones.

    10.6. Replacement of 100 square feet (9.29 m^2) or less of roof decking in Groups R-3, R-4 or R-5 unless the decking to be replaced was required at the time or original construction to be fire-retardant-treated or protected in some other way to form a fire-rated wall termination.

    10.7. Installation or replacement of floor finishes in all occupancies.

    10.8. Replacement of Class C interior wall or ceiling finishes installed in Groups A, E and I and replacement of all classes of interior wall or ceiling finishes in other groups.

    10.9. Installation of replacement cabinetry or trim.

    10.10. Application of paint or wallpaper.

    10.11. Other repair work deemed by the building official to be minor and ordinary which does not adversely affect public health or general safety.

Exception: Application for a permit may be required by the building official for the installation of replacement siding, roofing and windows in buildings within a historic district designated by a locality pursuant to Section 15.2-2306 of the Code of Virginia.

108.3 Applicant information, processing by mail. Application for a permit shall be made by the owner or lessee of the relevant property or the agent of either or by the RDP, contractor or subcontractor associated with the work or any of their agents. The full name and address of the owner, lessee and applicant shall be provided in the application. If the owner or lessee is a corporate body, when and to the extent determined necessary by the building official, the full name and address of the responsible officers shall also be provided.

A permit application may be submitted by mail and such permit applications shall be processed by mail, unless the permit applicant voluntarily chooses otherwise. In no case shall an applicant be required to appear in person.

The building official may accept applications for a permit through electronic submissions provided the information required by this section is obtained.

108.4 Prerequisites to obtaining permit. In accordance with Section 54.1-1111 of the Code of Virginia, any person applying to the building department for the construction, removal or improvement of any structure shall furnish prior to the issuance of the permit either (i) satisfactory proof to the building official that he is duly licensed or certified under the terms or Chapter 11 (Section 54.1-1000 et seq.) of Title 54.1 of the Code of Virginia to carry out or superintend the same or (ii) file a written statement, supported by an affidavit, that he is not subject to licensure or certification as a contractor or subcontractor pursuant to Chapter 11 of Title 54.1 of the Code of Virginia. The applicant shall also furnish satisfactory proof that the taxes or license fees required by any county, city, or town have been paid so as to be qualified to bid upon or contract for the work for which the permit has been applied.

108.5 Mechanics' lien agent designation. In accordance with Section 36-98.01 of the Code of Virginia, a building permit issued for any one- or two-family residential dwelling shall at the time of issuance contain, at the request of the applicant, the name, mailing address, and telephone number of the mechanics' lien agent as defined in Section 43-1 of the Code of Virginia. If the designation of a mechanics' lien agent is not so requested by the applicant, the building permit shall at the time of issuance state that none has been designated with the words "None Designated."

Note: In accordance with Section 43-4.01A of the Code of Virginia, a permit may be amended after it has been initially issued to name a mechanics' lien agent or a new mechanics' lien agent.

108.6 Application form, description of work. The application for a permit shall be submitted on a form or forms supplied by the local building department. The application shall contain a general description and location of the proposed work and such other information as determined necessary by the building official.

108.7 Amendments to application. An application for a permit may be amended at any time prior to the completion of the work governed by the permit. Additional construction documents or other records may also be submitted in a like manner. All such submittals shall have the same effect as if filed with the original application for a permit and shall be retained in a like manner as the original filings.

108.8 Time limitation of application. An application for a permit for any proposed work shall be deemed to have been abandoned six months after the date of filing unless such application has been pursued in good faith or a permit has been issued, except that the building official is authorized to grant one or more extensions of time if a justifiable cause is demonstrated.

SECTION 109
CONSTRUCTION DOCUMENTS

109.1 Submittal of documents. Construction documents shall be submitted with the application for a permit. The number of sets of such documents to be submitted shall be determined by the locality. Construction documents for one- and two-family dwellings may have floor plans reversed provided an accompanying site plan is approved.

Exception: Construction documents do not need to be submitted when the building official determines the proposed work is of a minor nature.

Note: Information on the types of construction required to be designed by an RDP is included in the "Related Laws Package" available from DHCD.

109.2 Site plan. When determined necessary by the building official, a site plan shall be submitted with the application for a permit. The site plan shall show to scale the size and location of all proposed construction, including any associated wells, septic tanks or drain fields. The site plan shall also show to scale the size and location of all existing structures on the site, the distances from lot lines to all proposed construction, the established street grades and the proposed finished grades. When determined necessary by the building official, the site plan shall contain the elevation of the lowest floor of any proposed buildings. The site plan shall also be drawn in accordance with an accurate boundary line survey. When the application for a permit is for demolition, the site plan shall show all construction to be demolished and the location and size of all existing structures that are to remain on the site.

Note: Site plans are generally not necessary for alterations, renovations, repairs or the installation of equipment.

109.3 Engineering details. When determined necessary by the building official, construction documents shall include adequate detail of the structural, mechanical, plumbing or electrical components. Adequate detail may include computations, stress diagrams or other essential technical data and when proposed buildings are more than two stories in height, adequate detail may specifically be required to include where floor penetrations will be made for pipes, wires, conduits, and other components of the electrical, mechanical and plumbing systems and how such floor penetrations will be protected to maintain the required structural integrity or fire-resistance rating, or both. All engineered documents, including relevant computations, shall be sealed by the RDP responsible for the design.

109.4 Examination of documents. The building official shall examine or cause to be examined all construction documents or site plans, or both, within a reasonable time after filing. If such documents or plans do not comply with the provisions of this code, the permit applicant shall be notified in writing of the reasons, which shall include any adverse construction document review comments or determinations that additional information or engineering details need to be submitted. The review of construction documents for new one- and two-family dwellings for determining compliance with the technical provisions of this code not relating to the site, location or soil conditions associated with the dwellings shall not be required when identical construction documents for identical dwellings have been previously approved in the same locality under the same edition of the code and such construction documents are on file with the local building department.

109.4.1 Expedited construction document review. The building official may accept reports from an approved person or agency that the construction documents have been examined and conform to the requirements of the USBC and may establish requirements for the person or agency submitting such reports. In addition, where such reports have been submitted, the building official may expedite the issuance of the permit.

109.5 Approval of construction documents. The approval of construction documents shall be limited to only those items within the scope of the USBC. Either the word "Approved" shall be stamped on all required sets of approved construction documents or an equivalent endorsement in writing shall be provided. One set of the approved construction documents shall be retained for the records of the local building department and one set shall be kept at the building site and shall be available to the building official at all reasonable times.

109.6 Phased approval. The building official is authorized to issue a permit for the construction of foundations or any other part of a building or structure before the construction documents for the whole building or structure have been submitted, provided that adequate information and detailed statements have been filed complying with pertinent requirements of this code. The holder of such permit for the foundation or other parts of a building or structure shall proceed at the holder's own risk with the building operation and without assurance that a permit for the entire structure will be granted.

SECTION 110
PERMITS

110.1 Approval and issuance of permits. The building official shall examine or cause to be examined all applications for permits or amendments to such applications within a reasonable time after filing. If the applications or amendments do not comply with the provisions of this code or all pertinent laws and ordinances, the permit shall not be issued and the permit applicant shall be notified in writing of the reasons for not issuing the permit. If the application complies with the applicable requirements of this code, a permit shall be issued as soon as practicable. The issuance of permits shall not be delayed in an effort to control the pace of construction of new detached one- or two-family dwellings.

110.2 Types of permits. Separate or combined permits may be required for different areas of construction such as building construction, plumbing, electrical, and mechanical work, or for special construction as determined appropriate by the locality. In addition, permits for two or more buildings or structures on the same lot may be combined. Annual permits may also be issued for any construction regulated by this code. The annual permit holder shall maintain a detailed record of all alterations made under the annual permit. Such record shall be available to the building official and shall be submitted to the local building department if requested by the building official.

110.3 Asbestos inspection in buildings to be renovated or demolished; exceptions. In accordance with Section 36-99.7 of the Code of Virginia, the local building department shall not issue a building permit allowing a building for which an initial building permit was issued before January 1, 1985, to be renovated or demolished until the local building department receives certification from the owner or his agent that the affected portions of the building have been inspected for the presence of asbestos by an individual licensed to perform such inspections pursuant to Section 54.1-503 of the Code of Virginia and that no asbestos-containing materials were found or that appropriate response actions will be undertaken in accordance with the requirements of the Clean Air Act National Emission Standard for the Hazardous Air Pollutant (NESHAPS) (40 CFR Part 61, Subpart M), and the asbestos worker protection requirements established by the U.S. Occupational Safety and Health Administration for construction workers (29 CFR 1926.1101). Local educational agencies that are subject to the requirements established by the Environmental Protection Agency under the Asbestos Hazard Emergency Response Act (AHERA) shall also certify compliance with 40 CFR Part 763 and subsequent amendments thereto.

To meet the inspection requirements above, except with respect to schools, asbestos inspection of renovation projects consisting only of repair or replacement of roofing, floorcovering, or siding materials may be satisfied by a statement that the materials to be repaired or replaced are assumed to contain friable asbestos and that asbestos installation, removal, or encapsulation will be accomplished by a licensed asbestos contractor.

The provisions of this section shall not apply to single-family dwellings or residential housing with four or fewer units unless the renovation or demolition of such buildings is for commercial or public development purposes. The provisions of this section shall not apply if the combined amount of regulated asbestos-containing material involved in the renovation or demolition is less than 260 linear feet on pipes or less than 160 square feet on other facility components or less than 35 cubic feet off facility components where the length or area could not be measured previously.

An abatement area shall not be reoccupied until the building official receives certification from the owner that the response actions have been completed and final clearances have been measured. The final clearance levels for reoccupancy of the abatement area shall be 0.01 or fewer asbestos fibers per cubic centimeter if determined by Phase Contrast Microscopy analysis (PCM) or 70 or fewer structures per square millimeter if determined by Transmission Electron Microscopy analysis (TEM).

110.4 Fire apparatus access road requirements. The permit applicant shall be informed of any requirements for providing or maintaining fire apparatus access roads prior to the issuance of a building permit.

110.5 Signature on and posting of permits; limitation of approval. The signature of the building official or authorized representative shall be on or affixed to every permit. A copy of the permit shall be posted on the construction site for public inspection until the work is completed. Such posting shall include the street or lot number, if one has been assigned, to be readable from a public way. In addition, each building or structure to which a street number has been assigned shall, upon completion, have the number displayed so as to be readable from the public way.

A permit shall be considered authority to proceed with construction in accordance with this code, the approved construction documents, the permit application and any approved amendments or modifications. The permit shall not be construed to otherwise authorize the omission or amendment of any provision of this code.

110.6 Abandonment of work. A building official shall be permitted to revoke a permit if work on the site authorized by the permit is not commenced within six months after issuance of the permit, or if the authorized work on the site is suspended or abandoned for a period of six months after the permit is issued; however, permits issued for plumbing, electrical and mechanical work shall not be revoked if the building permit is still in effect. It shall be the responsibility of the permit applicant to prove to the building official that authorized work includes substantive progress, characterized by approved inspections as specified in Section 113.3 of at least one inspection within a period of six months or other evidence

that would indicate substantial work has been performed. Upon written request, the building official may grant one or more extensions of time, not to exceed one year per extension.

110.7 Single-family dwelling permits. The building official shall be permitted to require a three year time limit to complete construction of new detached single-family dwellings, additions to detached single-family dwellings and residential accessory structures. The time limit shall begin from the issuance date of the permit. The building official may grant extensions of time if the applicant can demonstrate substantive progress, characterized by approved inspections as specified in Section 113.3 of at least one inspection within a period of six months or other evidence that would indicate substantial work has been performed.

110.8 Revocation of a permit. The building official may revoke a permit or approval issued under this code in the case of any false statement, misrepresentation of fact, abandonment of work, failure to complete construction as required by Section 110.7 or incorrect information supplied by the applicant in the application or construction documents on which the permit or approval was based.

SECTION 111
RDP SERVICES

111.1 When required. In accordance with Section 54.1-410 of the Code of Virginia and under the general authority of this code, the local building department shall establish a procedure to ensure that construction documents under Section 109 are prepared by an RDP in any case in which the exemptions contained in Sections 54.1-401, 54.1-402 or 54.1-402.1 of the Code of Virginia are not applicable or in any case where the building official determines it necessary. When required under Section 54.1-402 of the Code of Virginia or when required by the building official, or both, construction documents shall bear the name and address of the author and his occupation.

Note: Information on the types of construction required to be designed by an RDP is included in the "Related Laws Package" available from DHCD.

111.2 Special inspection requirements. Special inspections shall be conducted when required by Section 1704. Individuals or agencies, or both, conducting special inspections shall meet the qualification requirements of Sections 1703 and 1704.1. The permit applicant shall submit a completed statement of special inspections with the permit application. The building official shall review, and if satisfied that the requirements have been met, approve the statement of special inspections as required in Sections 1704.1.1 and 1705 as a requisite to the issuance of a building permit. The building official may require interim inspection reports. The building official shall receive, and if satisfied that the requirements have been met, approve a final report of special inspections as specified in Section 1704.1.2. All fees and costs related to the special inspections shall be the responsibility of the building owner.

SECTION 112
WORKMANSHIP, MATERIALS AND EQUIPMENT

112.1 General. It shall be the duty of any person performing work covered by this code to comply with all applicable provisions of this code and to perform and complete such work so as to secure the results intended by the USBC.

112.2 Alternative methods or materials. In accordance with Section 36-99 of the Code of Virginia, where practical, the provisions of this code are stated in terms of required level of performance so as to facilitate the prompt acceptance of new building materials and methods. When generally recognized standards of performance are not available, this section and other applicable requirements of this code provide for acceptance of materials and methods whose performance is substantially equal in safety to those specified on the basis of reliable test and evaluation data presented by the proponent. In addition, as a requirement of this code, the building official shall require that sufficient technical data be submitted to substantiate the proposed use of any material, equipment, device, assembly or method of construction.

112.3 Documentation and approval. In determining whether any material, equipment, device, assembly or method of construction complies with this code, the building official shall approve items listed by nationally recognized testing laboratories (NRTL), when such items are listed for the intended use and application, and in addition, may consider the recommendations of RDPs. Approval shall be issued when the building official finds that the proposed design is satisfactory and complies with the intent of the provisions of this code and that the material, equipment, device, assembly or method of construction offered is, for the purpose intended, at least the equivalent of that prescribed by the code. Such approval is subject to all applicable requirements of this code and the material, equipment, device, assembly or method of

construction shall be installed in accordance with the conditions of the approval and their listings. In addition, the building official may revoke such approval whenever it is discovered that such approval was issued in error or on the basis of incorrect information, or where there are repeated violations of the USBC.

112.3.1 Conditions of listings. Where conflicts between this code and conditions of the listing or the manufacturer's installation instructions occur, the provisions of this code shall apply.

Exception: Where a code provision is less restrictive than the conditions of the listing of the equipment or appliance or the manufacturer's installation instructions, the conditions of the listing and the manufacturers installation instructions shall apply.

112.4 Used material and equipment. Used materials, equipment and devices may be approved provided they have been reconditioned, tested or examined and found to be in good and proper working condition and acceptable for use by the building official.

SECTION 113
INSPECTIONS

113.1 General. In accordance with Section 36-105 of the Code of Virginia, any building or structure may be inspected at any time before completion, and shall not be deemed in compliance until approved by the inspecting authority. Where the construction cost is less than $2,500, however, the inspection may, in the discretion of the inspecting authority, be waived. The building official shall coordinate all reports of inspections for compliance with the USBC, with inspections of fire and health officials delegated such authority, prior to the issuance of an occupancy permit.

113.1.1 Equipment required. Any ladder, scaffolding or test equipment necessary to conduct or witness a requested inspection shall be provided by the permit holder.

113.1.2 Duty to notify. When construction reaches a stage of completion that requires an inspection, the permit holder shall notify the building official.

113.1.3 Duty to inspect. Except as provided for in Section 113.7, the building official shall perform the requested inspection in accordance with Section 113.6 when notified in accordance with Section 113.1.2.

113.2 Prerequisites. The building official may conduct a site inspection prior to issuing a permit. When conducting inspections pursuant to this code, all personnel shall carry proper credentials.

113.3 Minimum inspections. The following minimum inspections shall be conducted by the building official when applicable to the construction or permit:

1. Inspection of footing excavations and reinforcement material for concrete footings prior to the placement of concrete.
2. Inspection of foundation systems during phases of construction necessary to assure compliance with this code.
3. Inspection of preparatory work prior to the placement of concrete.
4. Inspection of structural members and fasteners prior to concealment.
5. Inspection of electrical, mechanical and plumbing materials, equipment and systems prior to concealment.
6. Inspection of energy conservation material prior to concealment.
7. Final inspection.

113.4 Additional inspections. The building official may designate additional inspections and tests to be conducted during the construction of a building or structure and shall so notify the permit holder.

113.5 In-plant and factory inspections. When required by the provisions of this code, materials, equipment or assemblies shall be inspected at the point of manufacture or fabrication. The building official shall require the submittal of an evaluation report of such materials, equipment or assemblies. The evaluation report shall indicate the complete details of the assembly including a description of the assembly and its components, and describe the basis upon which the assembly is being evaluated. In addition, test results and other data as necessary for the building official to determine conformance with the USBC shall be submitted. For factory inspections, an identifying label or stamp permanently affixed to materials, equipment or assemblies indicating that a factory inspection has been made shall be acceptable instead of a written inspection report, provided the intent or meaning of such identifying label or stamp is properly substantiated.

113.6 Approval or notice of defective work. The building official shall either approve the work in writing or give written notice of defective work to the permit holder. Upon request of the permit holder, the notice shall reference the USBC section that serves as the basis for the defects and such defects shall be corrected and reinspected before any work proceeds that would conceal such defects. A record of all reports of inspections, tests, examinations, discrepancies and approvals issued shall be maintained by the building official and shall be communicated promptly in writing to the permit holder. Approval issued under this section may be revoked whenever it is discovered that such approval was issued in error or on the basis of incorrect information, or where there are repeated violations of the USBC.

113.7 Approved inspection agencies. The building official may accept reports of inspections and tests from individuals or inspection agencies approved in accordance with the building official's written policy required by Section 113.7.1. The individual or inspection agency shall meet the qualifications and reliability requirements established by the written policy. Under circumstances where the building official is unable to make the inspection or test required by Section 113.3 or 113.4 within two working days of a request or an agreed upon date or if authorized for other circumstances in the building official's written policy, the building official shall accept reports for review. The building official shall approve the report from such approved individuals or agencies unless there is cause to reject it. Failure to approve a report shall be in writing within two working days of receiving it stating the reason for the rejection. Reports of inspections conducted by approved third-party inspectors or agencies shall be in writing, shall indicate if compliance with the applicable provisions of the USBC have been met and shall be certified by the individual inspector or by the responsible officer when the report is from an agency.

Note: Photographs, videotapes or other sources of pertinent data or information may be considered as constituting such reports and tests.

113.7.1 Third-party inspectors. Each building official charged with the enforcement of the USBC shall have a written policy establishing the minimum acceptable qualifications for third-party inspectors. The policy shall include the format and time frame required for submission of reports, any prequalification or preapproval requirements before conducting a third-party inspection and any other requirements and procedures established by the building official.

113.7.2 Qualifications. In determining third-party inspector qualifications, the building official may consider such items as DHCD inspector certification, other state or national certifications, state professional registrations, related experience, education and any other factors that would demonstrate competency and reliability to conduct inspections.

113.8 Final inspection. Upon completion of a building or structure and before the issuance of a certificate of occupancy, a final inspection shall be conducted to ensure that any defective work has been corrected and that all work complies with the USBC and has been approved, including any work associated with modifications under Section 106.3. The approval of a final inspection shall be permitted to serve as the new certificate of occupancy required by Section 116.1 in the case of additions or alterations to existing buildings or structures that already have a certificate of occupancy.

SECTION 114
STOP WORK ORDERS

114.1 Issuance of order. When the building official finds that work on any building or structure is being executed contrary to the provisions of this code or any pertinent laws or ordinances, or in a manner endangering the general public, a written stop work order may be issued. The order shall identify the nature of the work to be stopped and be given either to the owner of the property involved, to the owner's agent or to the person performing the work. Following the issuance of such an order, the affected work shall cease immediately. The order shall state the conditions under which such work may be resumed.

114.2 Limitation of order. A stop work order shall apply only to the work identified in the order, provided that other work on the building or structure may be continued if not concealing the work covered by the order.

SECTION 115
VIOLATIONS

115.1 Violation a misdemeanor; civil penalty. In accordance with Section 36-106 of the Code of Virginia, it shall be unlawful for any owner or any other person, firm or corporation, on or after the effective date of any code provisions, to violate any such provisions. Any locality may adopt an ordinance that establishes a uniform schedule of civil penalties for violations of specified provisions of the code that are not abated or remedied promptly after receipt of a notice of violation from the local enforcement officer.

Note: See the full text of Section 36-106 of the Code of Virginia for additional requirements and criteria pertaining to legal action relative to violations of the code.

115.2 Notice of violation. The building official shall issue a written notice of violation to the responsible party if any violations of this code or any directives or orders of the building official have not been corrected or complied with in a reasonable time. The notice shall reference the code section upon which the notice is based and direct the discontinuance and abatement of the violation or the compliance with such directive or order. The notice shall be issued by either delivering a copy to the responsible party by mail to the last known address or delivering the notice in person or by leaving it in the possession of any person in charge of the premises, or by posting the notice in a conspicuous place if the person in charge of the premises cannot be found. The notice of violation shall indicate the right of appeal by referencing the appeals section. When the owner of the building or structure, or the permit holder for the construction in question, or the tenants of such building or structure, are not the responsible party to whom the notice of violation is issued, then a copy of the notice shall also be delivered to the such owner, permit holder or tenants.

115.2.1 Notice not to be issued under certain circumstances. When violations are discovered more than two years after the certificate of occupancy is issued or the date of initial occupancy, whichever occurred later, or more than two years after the approved final inspection for an alteration or renovation, a notice of violation shall only be issued upon advice from the legal counsel of the locality that action may be taken to compel correction of the violation. When compliance can no longer be compelled by prosecution under Section 36-106 of the Code of Virginia, the building official, when requested by the building owner, shall document in writing the existence of the violation noting the edition of the USBC the violation is under.

115.3 Further action when violation not corrected. If the responsible party has not complied with the notice of violation, the building official shall submit a written request to the legal counsel of the locality to institute the appropriate legal proceedings to restrain, correct or abate the violation or to require the removal or termination of the use of the building or structure involved. In cases where the locality so authorizes, the building official may issue or obtain a summons or warrant. Compliance with a notice of violation notwithstanding, the building official may request legal proceedings be instituted for prosecution when a person, firm or corporation is served with three or more notices of violation within one calendar year for failure to obtain a required construction permit prior to commencement of work subject to this code.

Note: See Section 19.2-8 of the Code of Virginia concerning the statute of limitations for building code prosecutions.

115.4 Penalties and abatement. Penalties for violations of the USBC shall be as set out in Section 36-106 of the Code of Virginia. The successful prosecution of a violation of the USBC shall not preclude the institution of appropriate legal action to require correction or abatement of a violation.

115.5 Transfer of ownership. In accordance with Section 36-105 of the Code of Virginia, if the local building department has initiated an enforcement action against the owner of a building or structure and such owner subsequently transfers the ownership of the building or structure to an entity in which the owner holds an ownership interest greater than 50%, the pending enforcement action shall continue to be enforced against the owner.

SECTION 116
CERTIFICATES OF OCCUPANCY

116.1 General; when to be issued. A certificate of occupancy indicating completion of the work for which a permit was issued shall be obtained prior to the occupancy of any building or structure, except as provided for in this section generally

and as specifically provided for in Section 113.8 for additions or alterations. The certificate shall be issued after completion of the final inspection and when the building or structure is in compliance with this code and any pertinent laws or ordinances, or when otherwise entitled. The building official shall, however, issue a certificate of occupancy within five working days after being requested to do so, provided the building or structure meets all of the requirements for a certificate.

Exception: A certificate of occupancy is not required for an accessory structure as defined in the International Residential Code.

116.1.1 Temporary certificate of occupancy. Upon the request of a permit holder, a temporary certificate of occupancy may be issued before the completion of the work covered by a permit, provided that such portion or portions of a building of structure may be occupied safely prior to full completion of the building or structure without endangering life or public safety.

116.2 Contents of certificate. A certificate of occupancy shall specify the following:

1. The edition of the USBC under which the permit is issued.
2. The group classification and occupancy in accordance with the provisions of Chapter 3.
3. The type of construction as defined in Chapter 6.
4. If an automatic sprinkler system is provided and whether or not such system was required.
5. Any special stipulations and conditions of the building permit and if any modifications were issued under the permit, there shall be a notation on the certificate that modifications were issued.

116.3 Suspension or revocation of certificate. A certificate of occupancy may be revoked or suspended whenever the building official discovers that such certificate was issued in error or on the basis of incorrect information, or where there are repeated violations of the USBC after the certificate has been issued or when requested by the code official under Section 105.7 of the Virginia Maintenance Code. The revocation or suspension shall be in writing and shall state the necessary corrections or conditions for the certificate to be reissued or reinstated in accordance with Section 116.3.1.

116.3.1 Reissuance of reinstatement of certificate of occupancy. When a certificate of occupancy has been revoked or suspended, it shall be reissued or reinstated upon correction of the specific condition or conditions cited as the cause of the revocation or suspension and the revocation or suspension of a certificate of occupancy shall not be used as justification for requiring a building or structure to be subject to a later edition of the code than that under which such building or structure was initially constructed.

116.4 Issuance of certificate for pre-USBC buildings or structures. When a building or structure was constructed prior to being subject to the initial edition of the USBC and the local building department does not have a certificate of occupancy for the building or structure, the owner or owner's agent may submit a written request for a certificate to be created. The building official, after receipt of the request, shall issue a certificate provided a determination is made that there are no current violations of the Virginia Maintenance Code or the Virginia Statewide Fire Prevention Code (13 VAC 5-51) and the occupancy classification of the building or structure has not changed. Such buildings and structures shall not be prevented from continued use.

Exception: When no certificate exists, but the local building department has records indicating that a certificate did exist, then the building official may either verify in writing that a certificate did exist, or issue a certificate based upon the records.

SECTION 117
TEMPORARY AND MOVED BUILDINGS AND STRUCTURES; DEMOLITION

117.1 Temporary building and structures. The building official is authorized to issue a permit for temporary buildings or structures. Such permits shall be limited as to time of service, but shall not be permitted for more than one year, except that upon the permit holder's written request, the building official may grant one or more extensions of time, not to exceed one

year per extension. The building official is authorized to terminate the approval and order the demolition or removal of temporary buildings or structures during the period authorized by the permit when determined necessary.

117.2 Moved buildings and structures. Any building or structure moved into a locality or moved to a new location within a locality shall not be occupied or used until a certification of occupancy is issued for the new location. Such moved buildings or structures shall be required to comply with the requirements of this code for a newly constructed building or structure unless meeting all of the following requirements relative to the new location:

1. There is no change in the occupancy classification from its previous location.

2. The building or structure was in compliance with all state and local requirements applicable to it in its previous location and is in compliance with all state and local requirements applicable if originally constructed in the new location.

3. The building or structure did not become unsafe during the moving process due to structural damage or for other reasons.

4. Any alterations, reconstruction, renovations or repairs made pursuant to the move are in compliance with applicable requirements of this code.

117.3 Demolition of buildings and structures. Prior to the issuance of a permit for the demolition of any building or structure, the owner or the owner's agent shall provide certification to the building official that all service connections of utilities have been removed, sealed or plugged satisfactorily and a release has been obtained from the associated utility company. The certification shall further provide that written notice has been given to the owners of adjoining lots and any other lots that may be affected by the temporary removal of utility wires or the temporary disconnection or termination of other services or facilities relative to the demolition. In addition, the requirements of Chapter 33 of the IBC for any necessary retaining walls or fences during demolition shall be applicable and when a building or structure is demolished or removed, the established grades shall be restored.

SECTION 118
BUILDINGS AND STRUCTURES BECOMING UNSAFE DURING CONSTRUCTION

118.1 Applicability. This section applies to buildings and structures for which a construction permit has been issued under this code and construction has not been completed or a certificate of occupancy has not been issued, or both. In addition, this section applies to any building or structure that is under construction or that was constructed without obtaining the required permits under this edition or any edition of the USBC.

Note: Existing buildings and structures other than those under construction or subject to this section are subject to the Virginia Maintenance Code that also has requirements for unsafe conditions.

118.2 Repair or removal of unsafe buildings or structures. Any building or structure subject to this section that is either deteriorated, improperly maintained, of faulty construction, deficient in adequate exit facilities, a fire hazard or dangerous to life or the public welfare, or both, or any combination of the foregoing, is an unsafe building or structure and shall be made safe through compliance with this code or shall be taken down and removed if determined necessary by the building official.

118.3 Inspection report and notice of unsafe building or structure. The building official shall inspect any building or structure reported to be unsafe and shall prepare a report to be filed in the records of the local building department. In addition to a description of any unsafe conditions found, the report shall include the occupancy classification of the building or structure and the nature and extent of any damages caused by collapse or failure of any building components. If the building or structure is determined by the building official to be unsafe, a notice of unsafe building or structure shall be issued in person to the owner and any permit holder. The notice shall describe any unsafe conditions and specify any repairs or improvements necessary to make the building or structure safe, or alternatively, when determined necessary by the building official, require the unsafe building or structure, or any portion of it, to be taken down and removed. The notice shall stipulate a time period for the repair or demolition of the unsafe building or structure and contain a statement requiring the person receiving the notice to determine whether to accept or reject the terms of the notice. If any persons to which the notice of unsafe building or structure is to be issued cannot be found after diligent search, as equivalent service, the notice

shall be sent by registered or certified mail to the last known address of such persons and a copy of the notice posted in a conspicuous place on the premises.

118.4 Vacating the unsafe building or structure. If any portion of an unsafe building or structure has collapsed or fallen, or if the building official determines there is actual and immediate danger of any portion collapsing or falling, and when life is endangered by the occupancy of the unsafe building or structure, the building official shall be authorized to order the occupants to immediately vacate the unsafe building or structure. When an unsafe building or structure is ordered to be vacated, the building official shall post a notice at each entrance that reads as follows:

"This Building (or Structure) is Unsafe and its Occupancy (or Use) is Prohibited by the Building Official."

After posting, occupancy or use of the unsafe structure shall be prohibited except when authorized to enter to conduct inspections, make required repairs or as necessary to demolish the building or structure.

118.5 Emergency repairs and demolition. To the extent permitted by the locality, the building official may authorize emergency repairs to unsafe buildings or structures when it is determined that there is an immediate danger of any portion of the unsafe building or structure collapsing or falling and when life is endangered. Emergency repairs may also be authorized when there is a code violation resulting in the immediate, serious and imminent threat to the life and safety of the occupants. The building official shall be permitted to authorize the necessary work to make the building or structure temporarily safe whether or not legal action to compel compliance has been instituted.

In addition, whenever an owner of an unsafe building or structure fails to comply with a notice to demolish issued under Section 118.3 in the time period stipulated, the building official shall be permitted to cause the unsafe building or structure to be demolished. In accordance with Sections 15.2-906 and 15.2-1115 of the Code of Virginia, the legal counsel of the locality may be requested to institute appropriate action against the property owner to recover the costs associated with any such emergency repairs or demolition and every such charge that remains unpaid shall constitute a lien against the property on which the emergency repairs or demolition were made and shall be enforceable in the same manner as provided in Articles 3 (Section 58.1-3940 et seq.) and 4 (Section 58.1-3965 et seq.) of Chapter 39 of Title 58.1 of the Code of Virginia.

Note: Building officials and local governing bodies should be aware that other statutes and court decisions may impact on matters relating to demolition, in particular whether newspaper publication is required if the owner cannot be located and whether the demolition order must be delayed until the owner has been given the opportunity for a hearing.

SECTION 119
APPEALS

119.1 Establishment of appeals board. In accordance with Section 36-105 of the Code of Virginia, there shall be established within each local building department a LBBCA. Whenever a county or a municipality does not have such a LBBCA, the local governing body shall enter into an agreement with the local governing body of another county or municipality or with some other agency, or a state agency approved by DHCD for such appeals resulting therefrom. Fees may be levied by the local governing body in order to defray the cost of such appeals. In addition, as an authorization in this code, separate LBBCAs may be established to hear appeals of different enforcement areas such as electrical, plumbing or mechanical requirements. Each such LBBCA shall comply with the requirements of this section.

119.2 Membership of board. The LBBCA shall consist of at least five members appointed by the locality for a specific term of office established by written policy. Alternate members may be appointed to serve in the absence of any regular members and as such, shall have the full power and authority of the regular members. Regular and alternate members may be reappointed. Written records of current membership, including a record of the current chairman and secretary shall be maintained in the office of the locality. In order to provide continuity, the terms of the members may be of different length so that less than half will expire in any one-year period. The LBBCA shall meet at least once annually to assure a duly constituted board, appoint officers as necessary, and receive such training on the code as may be appropriate or necessary from staff of the locality.

119.3 Officers and qualifications of members. The LBBCA shall annually select one of its regular members to serve as chairman. When the chairman is not present at an appeal hearing, the members present shall select an acting chairman. The locality or the chief executive officer of the locality shall appoint a secretary to the LBBCA to maintain a detailed record of all proceedings. Members of the LBBCA shall be selected by the locality on the basis of their ability to render fair and

competent decisions regarding application of the USBC and shall to the extent possible, represent different occupational or professional fields relating to the construction industry. At least one member should be an experienced builder; at least one member should be an RDP, and at least one member should be an experienced property manager. Employees or officials of the locality shall not serve as members of the LBBCA.

119.4 Conduct of members. No member shall hear an appeal in which that member has a conflict of interest in accordance with the State and Local Government Conflict of Interests Act (Section 2.2-3100 et seq. of the Code of Virginia). Members shall not discuss the substance of an appeal with any other party or their representatives prior to any hearings.

119.5 Right of appeal; filing of appeal application. Any person aggrieved by the local building department's application of the USBC or the refusal by to grant a modification to the provisions of the USBC may appeal to the LBBCA. The applicant shall submit a written request for appeal to the LBBCA within 30 calendar days of the receipt of the decision being appealed. The application shall contain the name and address of the owner of the building or structure and in addition, the name and address of the person appealing, when the applicant is not the owner. A copy of the building official's decision shall be submitted along with the application for appeal and maintained as part of the record. The application shall be marked by the LBBCA to indicate the date received. Failure to submit an application for appeal within the time limit established by this section shall constitute acceptance of a building official's decision.

Note: To the extent that a decision of a building official pertains to amusement devices there may be a right of appeal under the VADR.

119.6 Meetings and postponements. The LBBCA shall meet within 30 calendar days after the date of receipt of the application for appeal, except that a longer time period shall be permitted if agreed to by all the parties involved in the appeal. A notice indicating the time and place of the hearing shall be sent to the parties in writing to the addresses listed on the application at least 14 calendar days prior to the date of the hearing, except that a lesser time period shall be permitted if agreed to by all the parties involved in the appeal. When a quorum of the LBBCA is not present at a hearing to hear an appeal, any party involved in the appeal shall have the right to request a postponement of the hearing. The LBBCA shall reschedule the appeal within 30 calendar days of the postponement, except that a longer time period shall be permitted if agreed to by all the parties involved in the appeal.

119.7 Hearings and decision. All hearings before the LBBCA shall be open meetings and the appellant, the appellant's representative, the locality's representative and any person whose interests are affected by the building official's decision in question shall be given an opportunity to be heard. The chairman shall have the power and duty to direct the hearing, rule upon the acceptance of evidence and oversee the record of all proceedings. The LBBCA shall have the power to uphold, reverse or modify the decision of the official by a concurring vote of a majority of those present. Decisions of the LBBCA shall be final if no further appeal is made. The decision of the LBBCA shall be by resolution signed by the chairman and retained as part of the record of the appeal. Copies of the resolution shall be sent to all parties by certified mail. In addition, the resolution shall contain the following wording:

"Any person who was a party to the appeal may appeal to the State Review Board by submitting an application to such Board within 21 calendar days upon receipt by certified mail of this resolution. Application forms are available from the Office of the State Review Board, 600 East Main Street, Richmond, Virginia 23219, (804) 371-7150."

119.8 Appeals to the State Review Board. After final determination by the LBBCA in an appeal, any person who was a party to the appeal may further appeal to the State Review Board. In accordance with Section 36-98.2 of the Code of Virginia for state-owned buildings and structures, appeals by an involved state agency from the decision of the building official for state-owned buildings or structures shall be made directly to the State Review Board. The application for appeal shall be made to the State Review Board within 21 calendar days of the receipt of the decision to be appealed. Failure to submit an application within that time limit shall constitute an acceptance of the building official's decision. For appeals from a LBBCA, a copy of the building official's decision and the resolution of the LBBCA shall be submitted with the application for appeal to the State Review Board. Upon request by the office of the State Review Board, the LBBCA shall submit a copy of all pertinent information from the record of the appeal. In the case of appeals involving state-owned buildings or structures, the involved state agency shall submit a copy of the building official's decision and other relevant information with the application for appeal to the State Review Board. Procedures of the State Review Board are in accordance with Article 2 (Section 36-108 et seq.) of Chapter 6 of Title 36 of the Code of Virginia. Decisions of the State Review Board shall be final if no further appeal is made.

CHAPTER 2

DEFINITIONS

Add the following definitions to Section 202 of the IBC to read:

ABOVEGROUND LIQUID FERTILIZER STORAGE TANK (ALFST). A device that contains an accumulation of liquid fertilizer (i) constructed of nonearthen materials, such as concrete, steel or plastic, that provide structural support, (ii) having a capacity of 100,000 gallons (378 500 L) or greater, and (iii) the volume of which is more than 90 percent above the surface of the ground. The term does not include any wastewater treatment or wastewater storage tank, utility or industry pollution control equipment.

BUILDING REGULATIONS. Any law, rule, resolution, regulation, ordinance or code, general or special, or compilation thereof, heretofore or hereafter enacted or adopted by the Commonwealth or any county or municipality, including departments, boards, bureaus, commissions, or other agencies thereof, relating to construction, reconstruction, alteration, conversion, repair, maintenance, or use of structures and buildings and installation of equipment therein. The term does not include zoning ordinances or other land use controls that do not affect the manner of construction or materials to be used in the erection, alteration or repair of a building or structure.

CHANGE OF OCCUPANCY. A change in the use or occupancy of any building or structure which would place the building or structure in a different division of the same group of occupancies or in a different group of occupancies; or a change in the purpose or level of activity within a building or structure that involves a change in application of the requirements of this code.

CONSTRUCTION. The construction, reconstruction, alteration, repair, or conversion of buildings and structures.

DAY-NIGHT AVERAGE SOUND LEVEL (LDN). See Section 1202.1.

DHCD. The Virginia Department of Housing and Community Development.

EMERGENCY COMMUNICATION EQUIPMENT. See Section 902.1.

EMERGENCY PUBLIC SAFETY PERSONNEL. See Section 902.1.

EQUIPMENT. Plumbing, heating, electrical, ventilating, air-conditioning and refrigeration equipment, elevators, dumbwaiters, escalators, and other mechanical additions or installations.

FARM BUILDING OR STRUCTURE. A building or structure not used for residential purposes, located on property where farming operations take place, and used primarily for any of the following uses or combination thereof:

1. Storage, handling, production, display, sampling or sale of agricultural, horticultural, floricultural or silvicultural products produced in the farm.

2. Sheltering, raising, handling, processing or sale of agricultural animals or agricultural animal products.

3. Business or office uses relating to the farm operations.

4. Use of farm machinery or equipment or maintenance or storage of vehicles, machinery or equipment on the farm.

5. Storage or use of supplies and materials used on the farm.

6. Implementation of best management practices associated with farm operations.

INDUSTRIALIZED BUILDING. A combination of one or more sections or modules, subject to state regulations and including the necessary electrical, plumbing, heating, ventilating and other service systems, manufactured off-site and transported to the point of use for installation or erection, with or without other specified components, to comprise a finished building. Manufactured homes shall not be considered industrialized buildings for the purpose of this code.

HOSPICE FACILITY. See Section 308.3.1.

LBBCA. Local board of building code appeals.

LIQUID FERTILIZER. A fluid in which a fertilizer is in true solution. This term does not include anhydrous ammonia or a solution used in pollution control.

LOCAL BUILDING DEPARTMENT. The agency or agencies of any local governing body charged with the administration, supervision, or enforcement of this code, approval of construction documents, inspection of buildings or structures, or issuance of permits, licenses, certificates or similar documents.

LOCAL GOVERNING BODY. The governing body of any city, county or town in this Commonwealth.

LOCALITY. A city, county or town in this Commonwealth.

MANUFACTURED HOME. A structure subject to federal regulation, which is transportable in one or more sections; is eight body feet or more in width and 40 body feet or more in length in the traveling mode, or is 320 or more square feet when erected on site; is built on a permanent chassis; is designed to be used as a single-family dwelling, with or without a permanent foundation, when connected to the required utilities; and includes the plumbing, heating, air-conditioning, and electrical systems contained in the structure.

NIGHT CLUB. Any building in which the main use is a place of public assembly that provides exhibition, performance or other forms of entertainment; serves alcoholic beverages; and provides music and space for dancing.

SKIRTING. A weather-resistant material used to enclose the space from the bottom of the manufactured home to grade.

SOUND TRANSMISSION CLASS (STC) RATING. See Section 1202.1.

STATE REGULATED CARE FACILITY (SRCF). A building with an occupancy in Group R-2, R-3, R-4 or R-5 occupied by persons in the care of others where program oversight is provided by the Virginia Department of Social Services, the Virginia Department of Behavioral Health and Developmental Services, the Virginia Department of Education or the Virginia Department of Juvenile Justice.

STATE REVIEW BOARD. The Virginia State Building Code Technical Review Board as established under Section 36-108 of the Code of Virginia.

TECHNICAL ASSISTANT. Any person employed by or under an extended contract to a local building department or local enforcing agency for enforcing the USBC, including but not limited to inspectors and plans reviewers. For the purpose of this definition, an extended contract shall be a contract with an aggregate term of 18 months or longer.

TECHNICAL PRODUCTION AREA. See Section 410.2.

VADR. The Virginia Amusement Device Regulations (13 VAC 5-31).

VCS. The Virginia Certification Standards (13 VAC 5-21).

WORKING DAY. A day other than Saturday, Sunday or a legal local, state or national holiday.

Change the following definitions in Section 202 of the IBC to read:

AMBULATORY HEALTH CARE FACILITY. Buildings or portions thereof that are licensed by the Virginia Department of Health as outpatient surgical hospitals.

BUILDING. A combination of materials, whether portable or fixed, having a roof to form a structure for the use or occupancy by persons, or property. The word "building" shall be construed as though followed by the words "or part or parts thereof" unless the context clearly requires a different meaning. "Building" shall not include roadway tunnels and

bridges owned by the Virginia Department of Transportation, which shall be governed by construction and design standards approved by the Virginia Commonwealth Transportation Board.

For application of this code, each portion of a building that is completely separated from other portions by fire walls complying with Section 706 shall be considered as a separate building (see Section 503.1).

OWNER. The owner or owners of the freehold of the premises or lesser estate therein, a mortgagee or vendee in possession, assignee of rents, receiver, executor, trustee or lessee in control of a building or structure.

REGISTERED DESIGN PROFESSIONAL (RDP). An architect or professional engineer, licensed to practice architecture or engineering, as defined under § 54.1-400 of the Code of Virginia.

STRUCTURE. An assembly of materials forming a construction for occupancy or use including stadiums, gospel and circus tents, reviewing stands, platforms, stagings, observation towers, radio towers, water tanks, storage tanks (underground and aboveground), trestles, piers, wharves, swimming pools, amusement devices, storage bins, and other structures of this general nature but excluding water wells. The word "structure" shall be construed as though followed by the words "or part or parts thereof" unless the context clearly requires a different meaning. "Structure" shall not include roadway tunnels and bridges owned by the Virginia Department of Transportation, which shall be governed by construction and design standards approved by the Virginia Commonwealth Transportation Board.

Delete the following definitions from Section 202 of the IBC:

AGRICULTURAL, BUILDING.

EXISTING STRUCTURE.

FLY GALLERY.

GRIDIRON.

CHAPTER 3

USE AND OCCUPANCY CLASSIFICATION

Change exception 13 of Section 307.1 of the IBC to read:

13. The storage of black powder, smokeless propellant and small arms primers in Groups M, R-3 and R-5 and special industrial explosive devices in Groups B, F, M and S, provided such storage conforms to the quantity limits and requirements prescribed in the International Fire Code, as amended in Section 307.9.

Add Section 307.9 to the IBC to read:

307.9 Amendments. The following changes shall be made to the International Fire Code for the use of Exception 13 in Section 307.1:

1. Change Section 314.1 of the IFC to read as follows:

   314.1 General. Indoor displays constructed within any building or structure shall comply with Sections 314.2 through 314.5.

2. Add new Section 314.5 to the IFC to read as follows:

   314.5 Smokeless powder and small arms primers. Vendors shall not store, display or sell smokeless powder or small arms primers during trade shows inside exhibition halls except as follows:

   1. The amount of smokeless powder each vender may store is limited to the storage arrangements and storage amounts established in Section 3306.5.2.1.

2. Smokeless powder shall remain in the manufacturer's original sealed container and the container shall remain sealed while inside the building. The repackaging of smokeless powder shall not be performed inside the building. Damaged containers shall not be repackaged inside the building and shall be immediately removed from the building in such manner to avoid spilling any powder.

3. There shall be at least 50 feet separation between vendors and 20 feet from any exit.

4. Small arms primers shall be displayed and stored in the manufacturer's original packaging and in accordance with the requirements of Section 3306.5.2.3.

3. Change Exception 4 and add Exceptions 10 and 11 to Section 3301.1 of the IFC as follows:

4. The possession, storage and use of not more than 15 pounds (6.75 kg) of commercially manufactured sporting black powder, 20 pounds (9 kg) of smokeless powder and any amount of small arms primers for hand loading of small arms ammunition for personal consumption.

10. The display of small arms primers in Group M when in the original manufacturer's packaging.

11. The possession, storage and use of not more than 50 pounds (23 kg) of commercially manufactured sporting black powder, 100 pounds (45 kg) of smokeless powder, and small arms primers for hand loading of small arms ammunition for personal consumption in Group R-3 or R-5, or 200 pounds (91 kg) of smokeless powder when stored in the manufacturer's original containers in detached Group U structures at least 10 feet (3048 mm) from inhabited buildings and are accessory to Group R-3 or R-5.

4. Change the definition of Smokeless Propellants in Section 3302.1 of the IFC as follows:

SMOKELESS PROPELLANTS. Solid propellants, commonly referred to as smokeless powders, or any propellants classified by DOTn as smokeless propellants in accordance with NA3178 (Smokeless Powder for Small Arms), used in small arms ammunition, firearms, cannons, rockets, propellant-actuated devices and similar articles.

5. Change Section 3306.4 of the IFC to read as follows:

3306.4 Storage in residences. Propellants for personal use in quantities not exceeding 50 pounds (23 kg) of black powder or 100 pounds (45 kg) of smokeless powder shall be stored in original containers in occupancies limited to Group R-3 and R-5 or 200 pounds (91 kg) of smokeless powder when stored in the manufacturer's original containers in detached Group U structures at least 10 feet (3048 mm) from inhabited buildings and are accessory to Group R-3 or R-5. In other than Group R-3 or R-5, smokeless powder in quantities exceeding 20 pounds (9 kg) but not exceeding 50 pounds (23 kg) shall be kept in a wooden box or cabinet having walls of at least one inch (25 mm) nominal thickness or equivalent.

6. Delete Sections 3306.4.1 and 3306.4.2 of the IFC.

7. Change Section 3306.5.1.1 of the IFC to read as follows:

3306.5.1.1 Smokeless propellant. No more than 100 pounds (45 kg) of smokeless propellants in containers of eight pounds (3.6 kg) or less capacity shall be displayed in Group M occupancies.

8. Delete Section 3306.5.1.3 of the IFC.

9. Change Section 3306.5.2.1 of the IFC as follows:

3306.5.2.1 Smokeless propellant. Commercial stocks of smokeless propellants shall be stored as follows:

1. Quantities exceeding 20 pounds (9 kg), but not exceeding 100 pounds (45 kg) shall be stored in portable wooden boxes having walls of at least one inch (25 mm) nominal thickness or equivalent.

2. Quantities exceeding 100 pounds (45 kg), but not exceeding 800 pounds (363 kg), shall be stored in storage cabinets having walls at least one inch (25 mm) nominal thickness or equivalent. Not more than 400 pounds (182 kg) shall be stored in any one cabinet, and cabinets shall be separated by a distance of at least 25 feet (7620 mm) or by a fire partition having a fire-resistance rating of at least one hour.

3. Storage of quantities exceeding 800 pounds (363 kg), but not exceeding 5,000 pounds (2270 kg) in a building shall comply with all of the following:

   3.1. The storage is inaccessible to unauthorized personnel.

   3.2. Smokeless propellant shall be stored in nonportable storage cabinets having wood walls at least one inch (25 mm) nominal thickness or equivalent and having shelves with no more than 3 feet (914 mm) of vertical separation between shelves.

   3.3. No more than 400 pounds (182 kg) is stored in any one cabinet.

   3.4. Cabinets shall be located against walls with at least 40 feet (12 192 mm) between cabinets. The minimum required separation between cabinets may be reduced to 20 feet (6096 mm) provided that barricades twice the height of the cabinets are attached to the wall, midway between each cabinet. The barricades must extend a minimum of 10 feet (3048 mm) outward, be firmly attached to the wall, and be constructed of steel not less than 0.25 inch thick (6.4 mm), 2-inch (51 mm) nominal thickness wood, brick, or concrete block.

   3.5. Smokeless propellant shall be separated from materials classified as combustible liquids, flammable liquids, flammable solids, or oxidizing materials by a distance of 25 feet (7620 mm) or by a fire partition having a fire-resistance rating of 1 hour.

   3.6. The building shall be equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1.

4. Smokeless propellants not stored according to Item 1, 2, or 3 above shall be stored in a Type 2 or 4 magazine in accordance with Section 3304 and NFPA 495.

Change Section 308.2 of the IBC to read:

308.2 Group I-1. This occupancy shall include buildings, structures or parts thereof housing more than 16 persons, on a 24-hour basis, who because of age, mental disability or other reasons, live in a supervised residential environment that provides personal care services. The occupants are capable of responding to an emergency situation without physical assistance from staff. This group shall include, but not be limited to, the following:

Alcohol and drug centers
Assisted living facilities
Congregate care facilities
Group homes
Halfway houses
Residential board and care facilities
Social rehabilitation facilities

Exception: In Group I-1 occupancies, not more than five of the residents may require physical assistance from staff to respond to an emergency situation when all residents that may require the physical assistance reside on a single level of exit discharge.

A facility such as the above with five or fewer persons shall be classified as a Group R-3 or shall comply with the International Residential Code in accordance with Section 101.2. A facility such as above, housing at least six and not more than 16 persons, shall be classified as Group R-4.

Change Section 308.3 of the IBC to read:

308.3 Group I-2. This occupancy shall include buildings and structures used for medical, surgical, psychiatric, nursing or custodial care for persons who are not capable of self-preservation. This group shall include, but not be limited to, the following:

Child care facilities
Convalescent facilities
Detoxification facilities
Hospice facilities
Hospitals
Mental hospitals
Nursing homes

Exception: Hospice facilities occupied by 16 or less occupants, excluding staff, are permitted to be classified as Group R-4.

Add the following definition to Section 308.3.1 of the IBC:

HOSPICE FACILITY. An institution, place, or building owned or operated by a hospice provider and licensed by the Virginia Department of Health as a hospice facility to provide room, board, and palliative and supportive medical and other health services to terminally ill patients and their families, including respite and symptom management, on a 24-hour basis to individuals requiring such care pursuant to the orders of a physician.

Change Section 308.5.2 of the IBC to read:

308.5.2 Child care facility. A facility other than family day homes under Section 310.4 that provides supervision and personal care on less than a 24-hour basis for more than five children 2-1/2 years of age or less shall be classified as Group I-4.

Exception: A child day care facility that provides care for more than five but no more than 100 children 2-1/2 years or less of age, where the rooms in which the children are cared for are located on a level of exit discharge serving such rooms and each of these child care rooms has an exit door directly to the exterior, shall be classified as Group E.

Change occupancy classifications "R-1" and "R-4" and add new occupancy classification "R-5" to Section 310 of the IBC to read:

R-1 Residential occupancies containing sleeping units where the occupants are primarily transient in nature, including:

Boarding houses (transient)
Hotels (transient)
Motels (transient)

Congregate living facilities (transient) with 10 or fewer occupants are permitted to comply with the construction requirements for Group R-3.

Exceptions:

1. Nonproprietor occupied bed and breakfast and other transient boarding facilities not more than three stories above grade plane in height with a maximum of 10 occupants total are permitted to be classified as either Group R-3 or Group R-5 provided that smoke alarms are installed in compliance with Section 907.2.10.1.2 for Group R-3 or Section 313.1 of the International Residential Code for Group R-5.

2. Proprietor occupied bed and breakfast and other transient boarding facilities not more than three stories above grade plane in height, that are also occupied as the residence of the proprietor, with a maximum of five guest room sleeping units provided for the transient occupants are permitted to be classified as either Group R-3 or R-5 provided that smoke alarms are installed in compliance with Section 907.2.10.1.2 for Group R-3 or Section 313.1 of the International Residential Code for Group R-5.

R-4 Residential occupancies shall include buildings arranged for occupancy as residential care/assisted living facilities including more than five but not more than 16 occupants, excluding staff and buildings arranged for occupancy as hospice facilities with not more than 16 occupants, excluding staff.

Group R-4 occupancies shall meet the requirements for construction as defined for Group R-3, except as otherwise provided for in this code, or shall comply with the IRC provided the building is protected by an automatic sprinkler system installed in accordance with Section 903.2.7.

Exceptions:

1. Group homes licensed by the Virginia Department of Behavioral Health and Developmental Services that house no more than eight persons with one or more resident counselors shall be classified as Group R-2, R-3, R-4 or R-5. Not more than five of the persons may require physical assistance from staff to respond to an emergency situation.

2. In Group R-4 occupancies, not more than five of the residents may require physical assistance from staff to respond to an emergency situation when all residents that may require the physical assistance from staff reside on a single level of exit discharge of exit discharge and other than using a ramp, a change of elevation using steps or stairs is not within the path of egress to an exit door.

3. Assisted living facilities licensed by the Virginia Department of Social Services that house no more than eight persons, with one or more resident counselors, and all of the residents are capable of responding to an emergency situation without physical assistance from staff, may be classified as Group R-2, R-3 or R-5.

4. Assisted living facilities licensed by the Virginia Department of Social Services that house no more than eight persons, with one or more resident counselors, may be classified as Group R-5 when in compliance with all of the following:

   4.1. The building is protected by an automatic sprinkler system installed in accordance with Section 903.3 or Section P2904 of the IRC.

   4.2. Not more than five of the residents may require physical assistance from staff to respond to an emergency situation.

   4.3. All residents that may require physical assistance from staff to respond to an emergency situation reside on a single level of exit discharge and other than using a ramp, a change in elevation using steps or stairs is not within the path of egress to an exit door.

5. Hospice facilities with five or fewer occupants are permitted to comply with the IRC provided the building is protected by an automatic sprinkler system in accordance with IRC Section P2904 or IBC Section 903.3.

R-5 Residential occupancies in detached one- and two-family dwellings, townhouses and accessory structures within the scope of the International Residential Code, also referred to as the "IRC."

Change the definition of "Residential care/assisted living facilities" in Section 310.2 of the IBC to read:

RESIDENTIAL CARE/ASSISTED LIVING FACILITIES. Any congregate residential setting that provides or coordinates personal and health care services, 24-hour supervision and assistance for the maintenance or care of four or more adults who are aged, infirm or disabled and who are cared for in a primarily residential setting, and provides for the protection, general supervision and oversight of the physical and mental well-being of aged, infirmed or disabled individuals. Residents are capable of self-evacuation.

Add Section 310.3 to the IBC to read:

310.3 Group R-5. The construction of Group R-5 structures shall comply with the IRC. The amendments to the IRC set out in Section 310.6 shall be made to the IRC for its use as part of this code. In addition, all references to Section 101.2 in the IBC relating to the construction of such structures subject to the IRC shall be considered to be references to this section.

Add Section 310.3.1 to the IBC to read:

310.3.1 Additional requirements. Methods of construction, materials, systems, equipment or components for Group R-5 structures not addressed by prescriptive or performance provisions of the IRC shall comply with applicable IBC requirements.

Add Section 310.4 to the IBC to read:

310.4 Family day homes. Family day homes where program oversight is provided by the Virginia Department of Social Services shall be classified as Group R-2, R-3 or R-5.

Note: Family day homes may generally care for up to 12 children. See the DHCD Related Laws Package for additional information.

Add Section 310.5 to the IBC to read:

310.5 Radon-resistant construction in Group R-3 and R-4 structures. Group R-3 and R-4 structures shall be subject to the radon-resistant construction requirements in Appendix F in localities enforcing such requirements pursuant to Section R325 of the IRC.

Add Section 310.6 to the IBC to read:

310.6 Amendments to the IRC. The following changes shall be made to the IRC for its use as part of this code:

1. Change Section R301.2.1 to read:

   R301.2.1 Wind limitations. Buildings and portions thereof shall be limited by wind speed, as defined in Table R301.2(1), and construction methods in accordance with this code. Basic wind speeds shall be determined from Figure R301.2(4). Where different construction methods and structural materials are used for various portions of a building, the applicable requirements of this section for each portion shall apply. Where loads for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors are not otherwise specified, the loads listed in Table R301.2(2) adjusted for height and exposure using Table R301.2(3) shall be used to determine design load performance requirements for wall coverings, curtain walls, roof coverings, exterior windows, skylights, garage doors and exterior doors. Asphalt shingles shall be designed for wind speeds in accordance with Section R905.2.6. Wind speeds for localities in special wind regions, near mountainous terrain, and near gorges shall be based on elevation. Areas at 4,000 feet in elevation or higher shall use 110 V mph (48.4 m/s) and areas under 4,000 feet in elevation shall use 90 V mph (39.6 m/s). Gorge areas shall be based on the highest recorded speed per locality or in accordance with local jurisdiction requirements determined in accordance with Section 6.5.4 of ASCE 7.

2. Change Section R301.2.1.1 to read:

   R301.2.1.1 Design criteria. Construction in regions where the basic wind speeds from Figure R301.2(4) equal or exceed 110 miles per hour (49 m/s) shall be designed in accordance with one of the following methods. The elements of design not addressed by those documents in Items 1 through 4 shall be in accordance with this code.

   1. American Forest and Paper Association (AF&PA) Wood Frame Construction Manual for One- and Two-Family Dwellings (WFCM); or

   2. International Code Council (ICC) Standard for Residential Construction in High Wind Regions (ICC-600); or

3. Minimum Design Loads for Buildings and Other Structures (ASCE-7); or

4. American Iron and Steel Institute (AISI), Standard for Cold-Formed Steel Framing-Prescriptive Method for One- and Two-Family Dwellings (AISI S230).

5. Concrete construction shall be designed in accordance with the provisions of this code.

6. Structural insulated panel (SIP) walls shall be designed in accordance with the provisions of this code.

3. Change Section R301.2.2.1.1 to read:

R301.2.2.1.1 Alternate determination of seismic design category. The Seismic Design Categories and corresponding Short Period Design Spectral Response Accelerations, S_{DS} shown in Figure R301.2(2) are based on soil Site Class D, as defined in Section 1613.5.2 of the International Building Code. If soil conditions are other than Site Class D, the Short Period Design Spectral Response Accelerations, S_{DS}, for a site can be determined according to Section 1613.5 of the International Building Code. The value of S_{DS} determined according to Section 1613.5 of the International Building Code is permitted to be used to set the seismic design category according to Table R301.2.2.1.1, and to interpolate between values in Tables R602.10.3(3), R603.7 and other seismic design requirements of this code.

4. Delete Section R301.2.2.3 and all subsections.

5. Delete Section R301.2.2.4.

6. Change the exception to Item 1 of Section R301.3 to read:

Exception: For wood framed wall buildings with bracing in accordance with Section R602.10, the wall stud clear height used to determine the maximum permitted story height may be increased to 12 feet (3658 mm) without requiring an engineered design for the building wind and seismic force resisting systems.

7. Add Exception 6 to Section R302.1 to read:

6. Decks and open porches.

8. Change the last column and add footnote "a" to Table R302.1 as shown:

MINIMUM FIRE SEPARATION DISTANCE
<5 feet[a]
≥5 feet[a]
≥2 feet to 5 feet[a]
5 feet[a]
<3 feet
3 feet
5 feet[a]
<5 feet[a]
5 feet[a]

a. The minimum fire separation distance shall be reduced to 3 feet in developments which are fully sprinklered as provided for in Sections R313.1 or R313.2.

9. Change the exception in Section R302.2 to require a common two-hour fire-resistance-rated wall instead of a one-hour fire-resistance-rated wall, unless the townhouse development is fully sprinklered as provided for in Section R313.1, in which case a common one-hour fire-resistive-rated wall shall be permitted between townhouses.

10. Add the following sentence to the end of Section R302.3 to read:

Dwelling unit separation wall assemblies that are constructed on a lot line shall be constructed as required in Section R302.2 for townhouses.

11. Add an exception to Section R303.8 to read:

Exception: Seasonal structures not used as a primary residence for more than 90 days per year, unless rented, leased or let on terms expressed or implied to furnish heat, shall not be required to comply with this section.

12. Add Section R303.8.1 to read:

R303.8.1 Nonowner occupied required heating. Every dwelling unit or portion thereof which is to be rented, leased or let on terms either expressed or implied to furnish heat to the occupants thereof shall be provided with facilities in accordance with Section R303.8 during the period from October 15 to May 1.

13. Add Section R303.9 to read:

R303.9 Insect screens. Every door, window and other outside opening required for ventilation purposes shall be supplied with approved tightly fitted screens of not less than 16 mesh per inch (16 mesh per 25 mm) and every screen door used for insect control shall have a self-closing device.

14. Add Section R306.5 to read:

R306.5 Water supply sources and sewage disposal systems. The water and drainage system of any building or premises where plumbing fixtures are installed shall be connected to a public or private water supply and a public or private sewer system. As provided for in Section 103.11 for functional design, water supply sources and sewage disposal systems are regulated and approved by the Virginia Department of Health and the Virginia Department of Environmental Quality.

Note: See also the Memorandums of Agreement in the "Related Laws Package," which is available from the Virginia Department of Housing and Community Development.

15. Change Section R310.1 to read:

R310.1 Emergency escape and rescue required. Basements and each sleeping room designated on the construction documents shall have at least one openable emergency escape and rescue opening. Such opening shall be directly to the exterior of the building or to a deck, screen porch or egress court, all of which shall provide access to a public street, public alley or yard. Where emergency escape and rescue openings are provided, they shall have a sill height of not more than 44 inches (1118 mm) above the floor. Where a door opening having a threshold below the adjacent ground elevation serves as an emergency escape and rescue opening and is provided with a bulkhead enclosure, the bulkhead enclosure shall comply with Section R310.3. The net clear opening dimensions required by this section shall be obtained by the normal operation of the emergency escape and rescue opening from the inside, except that tilt-out or removable sash designed windows shall be permitted to be used. Emergency escape and rescue openings with a finished height below the adjacent ground elevation shall be provided with a window well in accordance with Section R310.2.

Exceptions:

1. Dwelling units equipped throughout with an approved automatic sprinkler system installed in accordance with NFPA 13, 13R , 13D or Section P2904.

2. Basements used only to house mechanical equipment and not exceeding total floor area of 200 square feet (18.58 m^2).

16. Change Section R310.1.1 to read:

R310.1.1 Minimum opening area. All emergency escape and rescue openings shall have a minimum net clear opening of 5.7 square feet (0.530 m^2), including the tilting or removal of the sash as the normal operation to comply with Sections R310.1.2 and R310.1.3.

Exception: Grade floor openings shall have a minimum net clear opening of 5 square feet (0.465 m^2).

17. Change Section R311.7.4.1 to read:

R311.7.4.1 Riser height. The maximum riser height shall be 8-1/4 inches (210 mm). The riser shall be measured vertically between the leading edges of the adjacent treads. The greatest riser height within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm).

18. Change Section R311.7.4.2 to read:

R311.7.4.2 Tread depth. The minimum tread depth shall be 9 inches (229 mm). The tread depth shall be measured horizontally between the vertical planes of the foremost projection of adjacent treads and at a right angle to the tread's leading edge. The greatest tread depth within any flight of stairs shall not exceed the smallest by more than 3/8 inch (9.5 mm). Consistently shaped winders at the walkline shall be allowed within the same flight of stairs as rectangular treads and do not have to be within 3/8 inch (9.5 mm) of the rectangular tread depth. Winder treads shall have a minimum tread depth of 10 inches (254 mm) measured between the vertical planes of the foremost projection of adjacent treads at the intersection with the walkline. Winder treads shall have a minimum tread depth of 6 inches (152 mm) at any point within the clear width of the stair. Within any flight of stairs, the largest winder tread depth at the walkline shall not exceed the smallest winder tread by more than 3/8 inch (9.5 mm).

19. Change Section R311.7.6 to read:

R311.7.6 Stairway walking surface. The walking surface of treads and landings of stairways shall be level or sloped no steeper than one unit vertical in 48 inches horizontal (two-percent slope).

20. Replace Section R313 with the following:

SECTION R313
AUTOMATIC FIRE SPRINKLER SYSTEMS

R313.1 Townhouse automatic fire sprinkler systems. Notwithstanding the requirements of Section 103.8, where installed, an automatic residential fire sprinkler system for townhouses shall be designed and installed in accordance with NFPA 13D or Section P2904.

Exception: An automatic residential fire sprinkler system shall not be required when additions or alterations are made to existing townhouses that do not have an automatic residential fire sprinkler system installed.

R313.2 One- and two-family dwellings automatic fire sprinkler systems. Notwithstanding the requirements of Section 103.8, where installed, an automatic residential fire sprinkler system shall be designed and installed in accordance with NFPA 13D or Section P2904.

Exception: An automatic residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with an automatic residential fire sprinkler system.

21. Change Section R314.2 to read:

R314.2 Smoke detection systems. Household fire alarm systems installed in accordance with NFPA 72 that include smoke alarms, or a combination of smoke detector and audible notification device installed as required by this section for smoke alarms, shall be permitted. The household fire alarm system shall provide the same level of smoke detection and alarm as required by this section for smoke alarms. Where a household fire warning system is installed using a combination of smoke detector and audible notification device(s), the system shall become a permanent fixture of the dwelling unit.

Exception: Where smoke alarms are provided meeting the requirements of Section R314.4.

22. Delete Section R314.3.1.

23. Delete Section R315.2.

24. Change Section R315.3 to read:

    R315.3 Alarm requirements. Single station carbon monoxide alarms shall be hard wired, plug-in or battery type, listed as complying with UL 2034, and shall be installed in accordance with this code and the manufacturer's installation instructions.

25. Add Section R324 Radon-Resistant Construction.

26. Add Section R324.1 to read:

    R324.1 Local enforcement of radon requirements. Following official action under Article 7 (Section 15.2-2280 et seq.) of Chapter 22 of Title 15.2 of the Code of Virginia by a locality in areas of high radon potential, as indicated by Zone 1 on the U.S. EPA Map of Radon Zones (IRC Figure AF101), such locality shall enforce the provisions contained in Appendix F.

    Exception: Buildings or portions thereof with crawl space foundations which are ventilated to the exterior, shall not be required to provide radon-resistant construction.

27. Add Section R325 Swimming Pools, Spas and Hot Tubs.

28. Add Section R325.1 to read:

    R325.1 Use of Appendix G for swimming pools, spas and hot tubs. In addition to other applicable provisions of this code, swimming pools, spas and hot tubs shall comply with the provisions in Appendix G.

29. Add Section R326 Patio Covers.

30. Add Section R326.1 to read:

    R326.1 Use of Appendix H for patio covers. Patio covers shall comply with the provisions in Appendix H.

31. Add Section R327 Sound Transmission.

32. Add Section R327.1 to read:

    R327.1 Sound transmission between dwelling units. Construction assemblies separating dwelling units shall provide airborne sound insulation as required in Appendix K.

33. Add Section R327.2 to read:

    R327.2 Airport noise attenuation. This section applies to the construction of the exterior envelope of detached one- and two-family dwellings and multiple single-family dwellings (townhouses) not more than three stories high with separate means or egress within airport noise zones when enforced by a locality pursuant to Section 15.2-2295 of the Code of Virginia. The exterior envelope of such structures shall comply with Section 1207.4 of the state amendments to the IBC.

34. Add Section R328 Gray Water and Rain Water Recycling Systems.

35. Add Section R328.1 to read:

    R328.1 Use of Appendix O for gray water and rain water recycling systems. In addition to other applicable provisions of this code, gray water recycling systems and rain water recycling systems shall comply with the provisions in Appendix O. In the use of Appendix O for rain water recycling systems, the term "rain water" shall be substituted for the term "gray water." Gray water recycling systems and rain water recycling systems shall be separate systems and shall not be interconnected.

36. Add Section R329 Fire Extinguishers.

37. Add Section R329.1 to read:

R329.1 Kitchen areas. Other than where the dwelling is equipped with an approved sprinkler system in accordance with Section R313, a fire extinguisher having a rating of 2-A:10-B:C or an approved equivalent type of fire extinguisher shall be installed in the kitchen area.

38. Change Section R401.3 to read:

R401.3 Drainage. Surface drainage shall be diverted to a storm sewer conveyance or other approved point of collection that does not create a hazard to the dwelling unit. Lots shall be graded to drain surface water away from foundation walls. The grade shall fall a minimum of 6 inches (152 mm)within the first 10 feet (3048 mm).

Exception: Where lot lines, walls, slopes or other physical barriers prohibit 6 inches (152 mm) of fall within 10 feet (3048 mm), drains or swales shall be constructed to ensure drainage away from the structure. Impervious surfaces within 10 feet (3048 mm) of the building foundation shall be sloped a minimum of 2 percent away from the building.

39. Change Section R403.1 to read:

R403.1 General. All exterior walls shall be supported on continuous solid or fully grouted masonry or concrete footings, wood foundations, or other approved structural systems which shall be of sufficient design to accommodate all loads according to Section R301 and to transmit the resulting loads to the soil within the limitations as determined from the character of the soil. Footings shall be supported on undisturbed natural soils or engineered fill.

Exception: One-story detached accessory structures used as tool and storage sheds, playhouses and similar uses, not exceeding 256 square feet (23.7824 m^2) of building area, provided all of the following conditions are met:

1. The building eave height is 10 feet or less.

2. The maximum height from the finished floor level to grade does not exceed 18 inches.

3. The supporting structural elements in direct contact with the ground shall be placed level on firm soil and when such elements are wood they shall be approved pressure preservative treated suitable for ground contact use.

4. The structure is anchored to withstand wind loads as required by this code.

5. The structure shall be of light-frame construction whose vertical and horizontal structural elements are primarily formed by a system of repetitive wood or light gauge steel framing members, with walls and roof of light weight material, not slate, tile, brick or masonry.

40. Change Exceptions 2 and 3 in Section R403.1.6 to read:

2. Walls 24 inches (610 mm) total length or shorter connecting offset braced wall panels shall be anchored to the foundation with a minimum of one anchor bolt located in the center third of the plate section.

3. Connection of walls 12 inches (305 mm) total length or shorter connecting offset braced wall panels to the foundation without anchor bolts shall be permitted.

41. Delete Item 5 of Section R403.1.6.1.

42. Add Section R408.3.1 to read:

R408.3.1 Termite inspection. Where an unvented crawl space is installed and meets the criteria in Section R408, the vertical face of the sill plate shall be clear and unobstructed and an inspection gap shall be provided below the sill plate along the top of any interior foundation wall covering. The gap shall be a minimum of one inch (25.4 mm) and a maximum of two inches (50.8 mm) in width and shall extend throughout all parts of any foundation that is enclosed. Joints between the sill plate and the top of any interior wall covering may be sealed.

Exceptions:

1. In areas not subject to damage by termites as indicated by Table R301.2(1).

2. Where other approved means are provided to inspect for potential damage.

Where pier and curtain foundations are installed as depicted in Figure R404.1.5(1), the inside face of the rim joist and sill plate shall be clear and unobstructed except for construction joints which may be sealed.

Exception: Fiberglass or similar insulation may be installed if easily removable.

43. Change Section R502.2.1 to read:

R502.2.1 Framing at braced wall panels. A load path for lateral forces shall be provided between floor framing and braced wall panels located above or below a floor, as specified in Sections R602.3.5 and R602.10.8.

44. Change Section R506.2.1 to read:

R506.2.1 Fill. Fill material shall be free of vegetation and foreign material and shall be natural nonorganic material that is not susceptible to swelling when exposed to moisture. The fill shall be compacted to assure uniform support of the slab, and except where approved, the fill depth shall not exceed 24 inches (610 mm) for clean sand or gravel and 8 inches (203 mm) for earth.

Exception: Material other than natural material may be used as fill material when accompanied by a certification from an RDP and approved by the building official.

45. Change Section R506.2.2 to read:

R506.2.2 Base. A 4-inch-thick (102 mm) base course consisting of clean graded sand, gravel or crushed stone passing a 2-inch (51 mm) sieve shall be placed on the prepared subgrade when the slab is below grade.

Exception: A base course is not required when the concrete slab is installed on well drained or sand-gravel mixture soils classified as Group I according to the United Soil Classification System in accordance with Table R405.1. Material other than natural material may be used as base course material when accompanied by a certification from an RDP and approved by the building official.

46. Modify Table R602.3(1) to change and add items as shown:

7	Built-up studs, face nail	10d (3" x 0.128")	24" o.c.
7a	Abutting studs at intersecting wall corners, face nail	16d (3½" x 0.135")	12" o.c.
26a	Rim joist or blocking to sill plate, toe nail	8d (2½" x 0.113")	6" o.c.

47. Add Section R602.3.5 to read:

R602.3.5 Braced wall panel uplift load path. Braced wall panels located at exterior walls that support roof rafters or trusses (including stories below top story) shall have the framing members connected in accordance with one of the following:

1. Fastening in accordance with Table R602.3(1) where:

1.1. The basic wind speed does not exceed 90 mph (40 m/s), the wind exposure category is B, the roof pitch is 5:12 or greater, and the roof span is 32 feet (9754 mm) or less, or

1.2. The net uplift value at the top of a wall does not exceed 100 plf (146 N/mm). The net uplift value shall be determined in accordance with Section R802.11 and shall be permitted to be reduced by 60 plf (57 N/mm) for each full wall above.

2. Where the net uplift value at the top of a wall exceeds 100 plf (146 N/mm), installing approved uplift framing connectors to provide a continuous load path from the top of the wall to the foundation or to a point where the uplift force is 100 plf (146 N/mm) or less. The net uplift value shall be as determined in Item 1.2 above.

3. Wall sheathing and fasteners designed in accordance with accepted engineering practice to resist combined uplift and shear forces.

48. Change Section R602.9 to read:

R602.9 Cripple walls. Foundation cripple walls shall be framed of studs not smaller than the studding above. When exceeding 4 feet (1219 mm) in height, such walls shall be framed of studs having the size required for an additional story.

Cripple walls with a stud height less than 14 inches (356 mm) shall be continuously sheathed on one side with wood structural panels fastened to both the top and bottom plates in accordance with Table R602.3(1), or the cripple walls shall be constructed of solid blocking. Cripple walls shall be supported on continuous foundations.

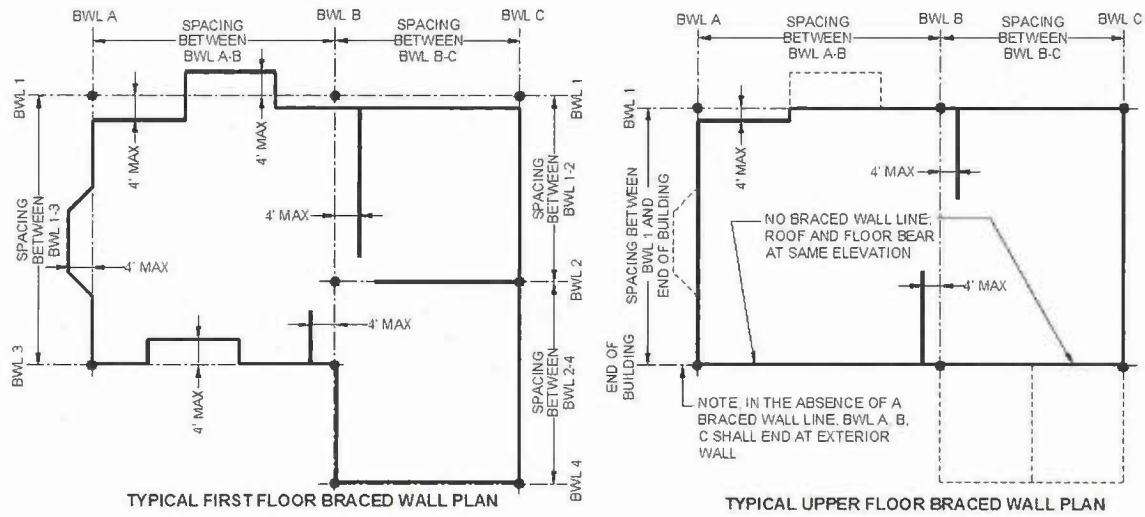
49. Replace Section R602.10, including all subsections, with the following:

R602.10 Wall bracing. Buildings shall be braced in accordance with this section, or, when applicable, Section R602.12. Where a building, or portion thereof, does not comply with one or more of the bracing requirements in this section, those portions shall be designed and constructed in accordance with Section R301.1.

The building official may require the permit applicant to identify and locate on the construction documents braced wall lines and braced wall panels as described herein.

R602.10.1 Braced wall lines. For the purpose of determining the amount and location of bracing required in each story level of a building, braced wall lines shall be designated as straight lines in the building plan placed in accordance with this section.

R602.10.1.1 Length of a braced wall line. The length of a braced wall line shall be the distance between its ends. The end of a braced wall line shall be the intersection with a perpendicular braced wall line, an angled braced wall line as permitted in Section R602.10.1.4 or an exterior wall as shown in Figure R602.10.1.1.



For SI: 1 foot = 304.8 mm.

FIGURE 602.10.1.1
BRACED WALL LINES

R602.10.1.2 Offsets along a braced wall line. All exterior walls parallel to a braced wall line shall be permitted to offset up to 4 feet (1219 mm) from the designated braced wall line location as shown Figure R602.10.1.1. Interior walls used as bracing shall be permitted to offset up to 4 feet (1219 mm) from a braced wall line through the interior of the building as shown in Figure R602.10.1.1.

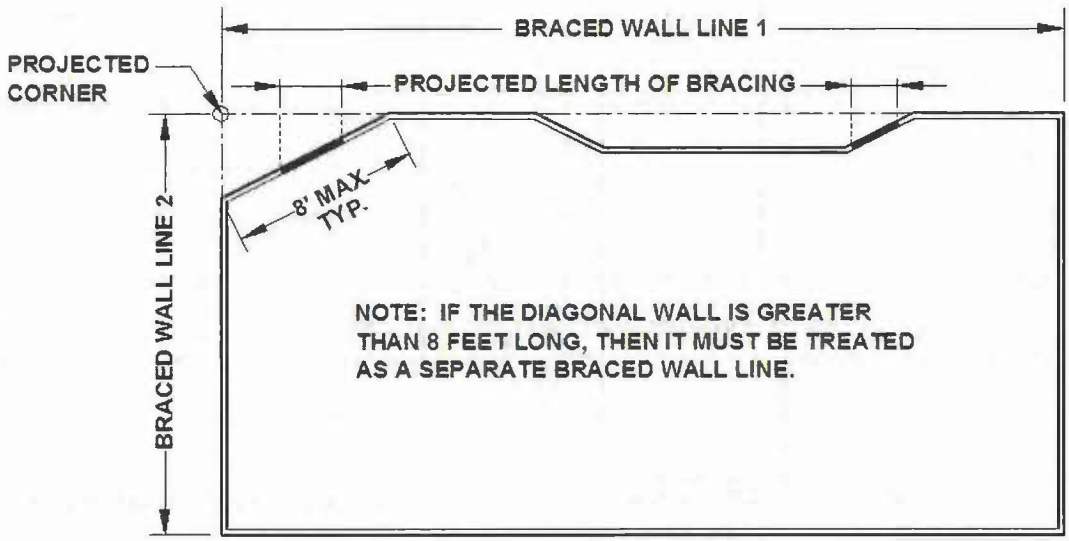
R602.10.1.3 Spacing of braced wall lines. There shall be a minimum of two braced wall lines in both the longitudinal and transverse direction as shown in Figure R602.10.1.1. Intermediate braced wall lines through the interior of the building shall be permitted. The spacing between parallel braced wall lines shall be in accordance with Table R602.10.1.3.

TABLE 602.10.1.3
BRACED WALL LINE SPACING

APPLICATION	CONDITION	BUILDING TYPE	BRACED WALL LINE SPACING CRITERIA	
			Maximum Spacing	Exception to Maximum Spacing
Wind bracing	85 mph to <110 mph	Detached, townhouse	60 feet	None
Seismic bracing	SDC A - C	Detached	Use wind bracing	
	SDC A – B	Townhouse	Use wind bracing	
	SDC C	Townhouse	35 feet	Up to 50 feet when length of required bracing per Table R602.10.3(3) is adjusted in accordance with Table R602.10.3(4)

For SI: 1 foot = 304.8 mm.

R602.10.1.4 Angled walls. Any portion of a wall along a braced wall line shall be permitted to angle out of plane for a maximum diagonal length of 8 feet (2438 mm). Where the angled wall occurs at a corner, the length of the braced wall line shall be measured from the projected corner as shown in Figure R602.10.1.4. Where the diagonal length is greater than 8 feet (2438 mm), it shall be considered a separate braced wall line and shall be braced in accordance with Section R602.10.1.



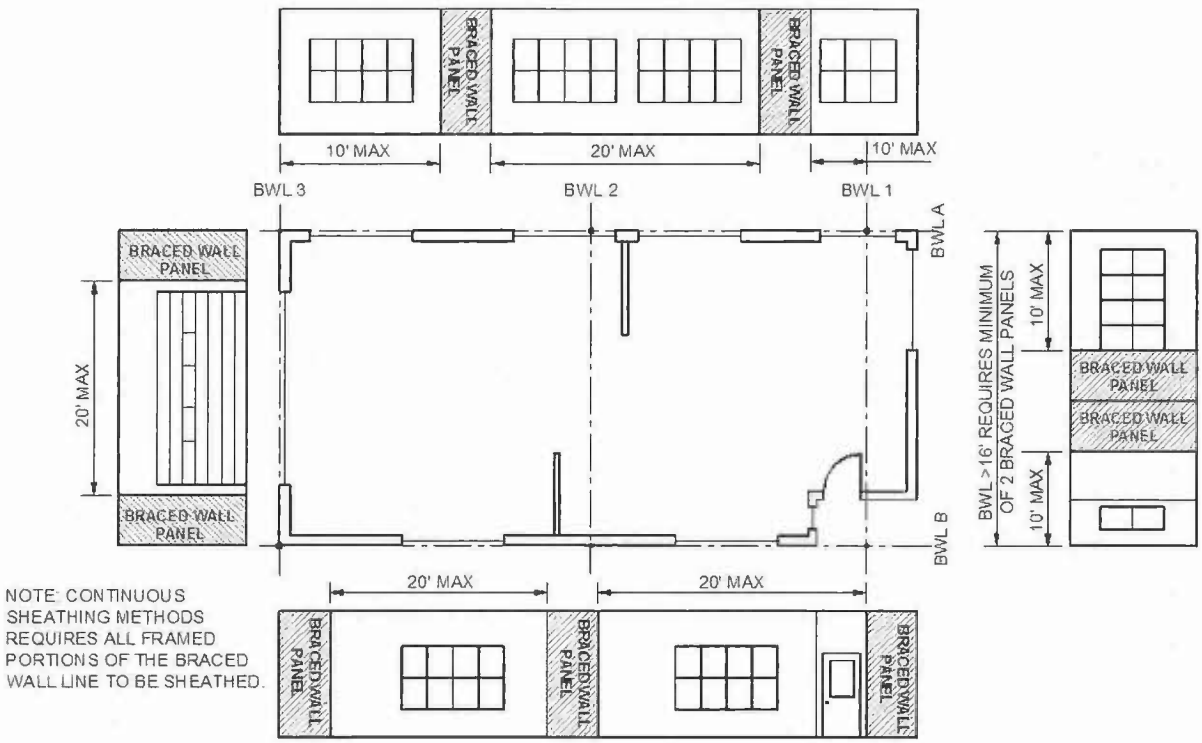
For SI: 1 foot = 304.8 mm.

FIGURE 602.10.1.4
ANGLED WALLS

R602.10.2 Braced wall panels. Braced wall panels shall be full-height sections of wall that shall have no vertical or horizontal offsets. Braced wall panels shall be constructed and placed along a braced wall line in accordance with this section and the bracing methods specified in Section R602.10.4.

R602.10.2.1 Braced wall panel uplift load path. The bracing lengths in Table R602.10.3(1) apply only when uplift loads are resisted per Section R602.3.5.

R602.10.2.2 Locations of braced wall panels. A braced wall panel shall begin within 10 feet (3810 mm) from each end of a braced wall line as determined in accordance with Section R602.10.1.1. The distance between adjacent edges of braced wall panels along a braced wall line shall be no greater than 20 feet (6096 mm) as shown in Figure R602.10.2.2.



For SI: 1 foot = 304.8 mm.

FIGURE 602.10.2.2
LOCATION OF BRACED WALL PANELS

R602.10.2.3 Minimum number of braced wall panels. Braced wall lines with a length of 16 feet (4877 mm) or less shall have a minimum of two braced wall panels of any length or one braced wall panel equal to 48 inches (1219 mm) or more. Braced wall lines greater than 16 feet (4877 mm) shall have a minimum of two braced wall panels.

R602.10.3 Required length of bracing. The required length of bracing along each braced wall line shall be determined as follows.

1. All buildings in Seismic Design Categories A and B shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

2. Detached buildings in Seismic Design Category C shall use Table R602.10.3(1) and the applicable adjustment factors in Table R602.10.3(2).

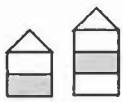
3. Townhouses in Seismic Design Category C shall use the greater value determined from Table R602.10.3(1) or R602.10.3(3) and the applicable adjustment factors in Table R602.10.3(2) or R602.10.3(4) respectively.

Only braced wall panels parallel to the braced wall line within the 4 foot (1219 mm) offset permitted by Section R602.10.1.2 shall contribute towards the required length of bracing of that braced wall line. If a braced wall panel is located along an angled wall and meets the minimum length requirements of Tables R602.10.5 or R602.10.5.2, it shall be permitted to contribute its projected length towards the minimum required length of bracing for the braced wall line as shown in Figure R602.10.1.4. If a braced wall panel is located along an angled wall at the end of a braced wall line, it shall contribute its projected length for only one of the braced wall lines at the projected corner.

TABLE R602.10.3(1)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 85		10	3.5	3.5	2.0	1.5
		20	6.0	6.0	3.5	3.0
		30	8.5	8.5	5.0	4.5
		40	11.5	11.5	6.5	5.5
		50	14.0	14.0	8.0	7.0
		60	16.5	16.5	9.5	8.0
		10	6.5	6.5	3.5	3.0
		20	11.5	11.5	6.5	5.5
		30	16.5	16.5	9.5	8.0
		40	21.5	21.5	12.5	10.5
		50	26.5	26.5	15.0	13.0
		60	31.5	31.5	18.0	15.5
		10	NP	9.0	5.5	4.5
		20	NP	17.0	10.0	8.5
		30	NP	24.5	14.0	12.0
		40	NP	32.0	18.0	15.5
		50	NP	39.0	22.5	19.0
		60	NP	46.5	26.5	22.5
≤ 90		10	3.5	3.5	2.0	2.0
		20	7.0	7.0	4.0	3.5
		30	9.5	9.5	5.5	5.0
		40	12.5	12.5	7.5	6.0
		50	15.5	15.5	9.0	7.5
		60	18.5	18.5	10.5	9.0
		10	7.0	7.0	4.0	3.5
		20	13.0	13.0	7.5	6.5
		30	18.5	18.5	10.5	9.0
		40	24.0	24.0	14.0	12.0
		50	29.5	29.5	17.0	14.5
		60	35.0	35.0	20.0	17.0
		10	NP	10.5	6.0	5.0
		20	NP	19.0	11.0	9.5
		30	NP	27.5	15.5	13.5
		40	NP	35.5	20.5	17.5
		50	NP	44.0	25.0	21.5
		60	NP	52.0	30.0	25.5

TABLE R602.10.3(1) (continued)
BRACING REQUIREMENTS BASED ON WIND SPEED

EXPOSURE CATEGORY B, 30 FT MEAN ROOF HEIGHT, 10 FT EAVE TO RIDGE HEIGHT, 2 BRACED WALL LINES			MINIMUM TOTAL LENGTH (feet) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]			
Basic Wind Speed (mph)	Story Location	Braced Wall Line Spacing (feet)	Method LIB[b]	Method GB	Methods DWB, WSP, SFB, PBS, PCP, HPS, CS-SFB[c]	Methods CS-WSP, CS-G, CS-PF
≤ 100		10	4.5	4.5	2.5	2.5
		20	8.5	8.5	5.0	4.0
		30	12.0	12.0	7.0	6.0
		40	15.5	15.5	9.0	7.5
		50	19.0	19.0	11.0	9.5
		60	22.5	22.5	13.0	11.0
		10	8.5	8.5	5.0	4.5
		20	16.0	16.0	9.0	8.0
		30	23.0	23.0	13.0	11.0
		40	29.5	29.5	17.0	14.5
		50	36.5	36.5	21.0	18.0
		60	43.5	43.5	25.0	21.0
		10	NP	12.5	7.5	6.0
		20	NP	23.5	13.5	11.5
		30	NP	34.0	19.5	16.5
		40	NP	44.0	25.0	21.5
		50	NP	54.0	31.0	26.5
		60	NP	64.0	36.5	31.0
< 110[c]		10	5.5	5.5	3.0	3.0
		20	10.0	10.0	6.0	5.0
		30	14.5	14.5	8.5	7.0
		40	18.5	18.5	11.0	9.0
		50	23.0	23.0	13.0	11.5
		60	27.5	27.5	15.5	13.5
		10	10.5	10.5	6.0	5.0
		20	19.0	19.0	11.0	9.5
		30	27.5	27.5	16.0	13.5
		40	36.0	36.0	20.5	17.5
		50	44.0	44.0	25.5	21.5
		60	52.5	52.5	30.0	25.5
		10	NP	15.5	9.0	7.5
		20	NP	28.5	16.5	14.0
		30	NP	41.0	23.5	20.0
		40	NP	53.0	30.5	26.0
		50	NP	65.5	37.5	32.0
		60	NP	77.5	44.5	37.5

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Linear interpolation shall be permitted.

b. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).

c. Method CS-SFB does not apply where the wind speed is greater than 100 mph.

TABLE R602.10.3(2)
WIND ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

ADJUSTMENT BASED ON	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR [a,b] (multiply length from Table R602.10.3(1) by this factor)	APPLICABLE METHODS
Exposure category	One story structure	B	1.00	All methods
		C	1.20	
		D	1.50	
	Two-story structure	B	1.00	
		C	1.30	
		D	1.60	
	Three-story structure	B	1.00	
		C	1.40	
		D	1.70	
Roof eave-to-ridge height	Roof only	≤5 ft	0.70	
		10 ft	1.00	
		15 ft	1.30	
		20 ft	1.60	
	Roof + 1 floor	≤5 ft	0.85	
		10 ft	1.00	
		15 ft	1.15	
		20 ft	1.30	
	Roof + 2 floors	≤5 ft	0.90	
		10 ft	1.00	
		15 ft	1.10	
		20 ft	Not permitted	
Wall height adjustment	Any story	8 ft	0.90	
		9 ft	0.95	
		10 ft	1.00	
		11 ft	1.05	
		12 ft	1.10	
Number of braced wall lines (per plan direction)[C]	Any story	2	1.00	
		3	1.30	
		4	1.45	
		≥5	1.60	
Additional 800 lb hold-down device	Top story only	Fastened to the end studs of each braced wall panel and to the foundation or framing below	0.80	DWB, WSP, SFB, PBS, PCP, HPS
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.40	DWB, WSP, SFB,PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB
Gypsum board fastening	Any story	4 in. o.c. at panel edges, including top and bottom plates, and all horizontal joints blocked	0.7	GB

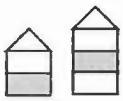
For SI: 1 foot = 305 mm, 1 pound force = 4.48 N.

a. Linear Interpolation shall be permitted.

b. The total adjustment factor is the product of all applicable adjustment factors.

c. The adjustment factor is permitted to be 1.0 when determing bracing amounts of intermediate braced wall lines provided the bracing amounts on adjacent braced wall lines are based on a spacing and number that neglects the intermediate braced wall line.

TABLE R602.10.3(3)
BRACING REQUIREMENTS BASED ON SEISMIC DESIGN CATEGORY

SOIL CLASS D[b] WALL HEIGHT = 10 FT 10 PSF FLOOR DEAD LOAD 15 PSF ROOF/CEILING DEAD LOAD BRACED WALL LINE SPACING ≤ 25 FT			MINIMUM TOTAL LENGTH (FEET) OF BRACED WALL PANELS REQUIRED ALONG EACH BRACED WALL LINE[a]				
Seismic Design Category (SDC)	Story Location	Braced Wall Line Length (ft)	Method LIB[c]	Method GB	Methods DWB, SFB, PBS, PCP, HPS, CS-SFB	Method WSP	Methods CS-WSP, CS-G
C (townhouses only)		10	2.5	2.5	2.5	1.6	1.4
		20	5.0	5.0	5.0	3.2	2.7
		30	7.5	7.5	7.5	4.8	4.1
		40	10.0	10.0	10.0	6.4	5.4
		50	12.5	12.5	12.5	8.0	6.8
		10	NP	4.5	4.5	3.0	2.6
		20	NP	9.0	9.0	6.0	5.1
		30	NP	13.5	13.5	9.0	7.7
		40	NP	18.0	18.0	12.0	10.2
		50	NP	22.5	22.5	15.0	12.8
		10	NP	6.0	6.0	4.5	3.8
		20	NP	12.0	12.0	9.0	7.7
		30	NP	18.0	18.0	13.5	11.5
		40	NP	24.0	24.0	18.0	15.3
		50	NP	30.0	30.0	22.5	19.1

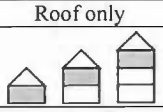
For SI: 1 foot 305 mm

a. Linear interpolation shall be permitted.

b. Wall bracing lengths are based on a soil site class "D." Interpolation of bracing length between the Sds values associated with the Seismic Design Categories shall be permitted when a site-specific Sds value is determined in accordance with Section 1613.5 of the International Building Code.

c. Method LIB shall have gypsum board fastened to at least one side with nails or screws per Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum board. Spacing of fasteners at panel edges shall not exceed 8 inches (203 mm).

TABLE R602.10.3(4)
SEISMIC ADJUSTMENT FACTORS TO THE REQUIRED LENGTH OF WALL BRACING

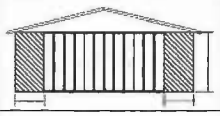
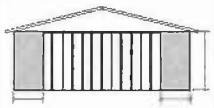
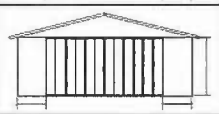
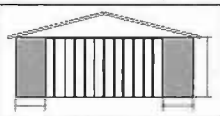
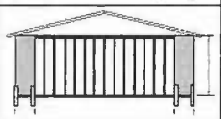
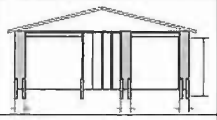
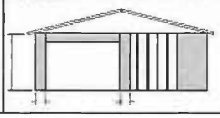
ADJUSTMENT BASED ON:	STORY/ SUPPORTING	CONDITION	ADJUSTMENT FACTOR[a,b] (multiply length from Table R602.10.3(3) by this factor)	APPLICABLE METHODS
Story height (Section 301.3)	Any story	≤10 ft >10 ft ≤ 12 ft	1.0 1.2	All methods
Braced wall line spacing	Any story	≤35 ft >35 ft ≤ 50 ft	1.0 1.43	
Wall dead load	Any story	> 8 psf < 15 psf <8 psf	1.0 0.85	
Roof/ceiling dead load for wall supporting	Any story	≤15 psf	1.0	
	Roof plus one or two stories	>15 psf ≤ 25 psf	1.1	
	Roof only	>15 psf ≤ 25 psf	1.2	
Walls with stone or masonry veneer		1.0		
		1.5		
		1.5		
Interior gypsum board finish (or equivalent)	Any story	Omitted from inside face of braced wall panels	1.5	DWB, WSP, SFB, PBS, PCP, HPS, CS-WSP, CS-G, CS-SFB

For SI: 1 psf = 47.8 N/m.

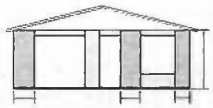
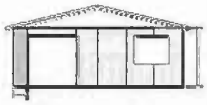
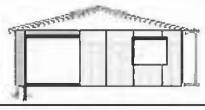
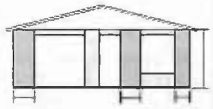
a. Linear interpolation shall be permitted.
b. The total length of bracing required for a given wall line is the product of all applicable adjustment factors.
c. The length-to-width ratio for the floor/roof diaphragm shall not exceed 3:1. The top plate lap splice nailing shall be a minimum of 12-16d nails on each side of the splice.
d. Applies to stone or masonry veneer exceeding the first story height.
e. The adjustment factor for stone or masonry veneer shall be applied to all exterior braced wall lines and all braced wall lines on the interior of the building.

R602.10.4 Bracing methods for braced wall panels. Braced wall panels shall be constructed in accordance with this section and the methods listed in Table R602.10.4.

TABLE R602.10.4
BRACING METHODS

METHODS, MATERIAL		MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA[a]	
				Fasteners	Spacing
Intermittent Bracing Methods	**LIB** Let-in-bracing	1x4 wood or approved metal straps at 45° to 60° angles for maximum 16" stud spacing		Wood: 2-8d common nails or 3-8d (2 ½" long x 0.113" dia.) nails	Wood: per stud and top and bottom plates
				Metal: per manufacturer	Metal: per manufacturer
	DWB Diagonal wood boards	¾" (1" nominal) for maximum 24" stud spacing		2-8d (2½" long x 0.113" dia.) nails or 2 - 1¾" long staples	Per stud
	WSP Wood structural panel (See Section R604)	$^3/_8$"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
	SFB Structural fiberboard sheathing	$^1/_2$" or $^{25}/_{32}$" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) $1^3/_4$" long x 0.12" dia. (for $^{25}/_{32}$" thick sheathing) galvanized roofing nails or 8d common (2½" long x 0.131" dia.) nails	3" edges 6" field
	GB Gypsum board	$^1/_2$"		Nails or screws per Table R602.3(1) for exterior locations	For all braced wall panel locations: 7" edges (including top and bottom plates) 7" field
				Nails or screws per Table R702.3.5 for interior locations	
	PBS Particleboard sheathing (See Section R605)	$^3/_8$" or $^1/_2$" for maximum16" stud spacing		For $^3/_8$", 6d common (2" long x 0.113" dia.) nails For ½", 8d common (2½" long x 0.131" dia.) nails	3" edges 6" field
	PCP Portland cement plaster	See Section R703.6 for maximum 16" stud spacing		1½" long, 11 gage, $^7/_{16}$" dia. head nails or $^7/_8$" long, 16 gage staples	6" o.c. on all framing members
	HPS Hardboard panel siding	$^7/_{16}$" for maximum 16" stud spacing		0.092" dia., 0.225" dia. head nails with length to accommodate 1½" penetration into studs	4" edges 8" field
	ABW Alternate braced wall	$^3/_8$"		See Section R602.10.6.1	See Section R602.10.6.1
	PFH Portal frame with hold-downs	$^3/_8$		See Section R602.10.6.2	See Section R602.10.6.2
	PFG Portal frame at garage	$^7/_{16}$"		See Section R602.10.6.3	See Section R602.10.6.3

BRACING METHODS (continued)

METHODS, MATERIAL		MINIMUM THICKNESS	FIGURE	CONNECTION CRITERIA[a]	
				Fasteners	Spacing
Continuous Sheathing Methods	**CS-WSP** Continuously sheathed wood structural panel	$^3/_8$"		Exterior sheathing per Table R602.3(3)	6" edges 12" field
				Interior sheathing per Table R602.3(1) or R602.3(2)	Varies by fastener
	CS-G[b, c] Continuously sheathed wood structural panel adjacent to garage openings	$^3/_8$"		See Method CS-WSP	See Method CS-WSP
	CS-PF Continuously sheathed portal frame	$^7/_{16}$"		See Section R602.10.6.4	See Section R602.10.6.4
	CS-SFB[d] Continuously sheathed structural fiberboard	$^1/_2$" or $^{25}/_{32}$" for maximum 16" stud spacing		1½" long x 0.12" dia. (for ½ " thick sheathing) $1^3/_4$" long x 0.12" dia. (for $^{25}/_{32}$" thick sheathing) galvanized roofing nails or 8d common (2½" long x 0.131 dia.) nails	3" edges 6" field

For SI: 1 inch = 25.4 mm, 1 foot = 305 mm.

a. Adhesive attachment of wall sheathing, including Method GB, shall not be permitted in townhouses in Seismic Design Category C.

b. Applies to panels next to garage door opening when supporting gable end wall or roof load only. May only be used on one wall of the garage.

c. Garage openings adjacent to a Method CS-G panel shall be provided with a header in accordance with Table R502.5(1). A full height clear opening shall not be permitted adjacent to a Method CS-G panel.

d. Method CS-SFB does not apply in areas where the wind speed exceeds 100 mph.

R602.10.4.1 Mixing methods. Mixing of bracing methods shall be permitted as follows:

1. Mixing intermittent bracing and continuous sheathing methods from story to story shall be permitted.

2. Mixing intermittent bracing methods from braced wall line to braced wall line within a story shall be permitted. In regions where the basic wind speed is less than or equal to 100 mph, mixing of intermittent bracing and continuous sheathing methods from braced wall line to braced wall line within a story shall be permitted.

3. Mixing intermittent bracing methods along a braced wall line shall be permitted in Seismic Design Categories A and B, and detached dwellings in Seismic Design Category C provided the length of required bracing in accordance with Table R602.10.3(1) or R602.10.3(3) is the highest value of all intermittent bracing methods used.

4. Mixing of continuous sheathing methods CS-WSP, CS-G and CS-PF along a braced wall line shall be permitted.

5. In Seismic Design Categories A and B, and for detached one- and two-family dwellings in Seismic Design Category C, mixing of intermittent bracing methods along the interior portion of a braced wall line with continuous sheathing methods CS-WSP, CS-G and CS-PF along the exterior portion of the same braced wall line shall be permitted. The length of required bracing shall be the highest value of all intermittent bracing methods used in accordance with Table R602.10.3(1) or R602.10.3(3) as adjusted by Tables R602.10.3(2) and R602.10.3(4), respectively. The requirements of Section R602.10.7 shall apply to each end of the continuously sheathed portion of the braced wall line.

R602.10.4.2 Continuous sheathing methods. Continuous sheathing methods require structural panel sheathing to be used on all sheathable surfaces on one side of a braced wall line including areas above and below openings and gable end walls and shall meet the requirements of Section R602.10.7.

R602.10.4.3 Braced wall panel interior finish material. Braced wall panels shall have gypsum wall board installed on the side of the wall opposite the bracing material. Gypsum wall board shall be not less than ½ inch (12.7 mm) in thickness and be fastened with nails or screws in accordance with Table R602.3(1) for exterior sheathing or Table R702.3.5 for interior gypsum wall board. Spacing of fasteners at panel edges for gypsum wall board opposite Method LIB bracing shall not exceed 8 inches (203 mm). Interior finish material shall not be glued in townhouses in Seismic Category C.

Exceptions:

1. Interior finish material is not required opposite wall panels that are braced in accordance with Method GB, ABW, PFH, PFG and CS-PF, unless otherwise required by Section R302.6.

2. An approved interior finish material with an in-plane shear resistance equivalent to gypsum board shall be permitted to be substituted, unless otherwise required by Section R302.6.

3. Except for Method LIB, gypsum wall board is permitted to be omitted provided the required length of bracing in Tables R602.10.3(1) and R602.10.3(3) is multiplied by the appropriate adjustment factor in Tables R602.10.3(2) and R602.10.3(4) respectively, unless otherwise required by Section R302.6.

R602.10.5 Minimum length of a braced wall panel. The minimum length of a braced wall panel shall comply with Table R602.10.5. For Methods CS-WSP and CS-SFB, the minimum panel length shall be based on the vertical dimension of the adjacent opening in accordance with Table R602.10.5 and Figure R602.10.5. When a panel has openings on either side of differing heights, the larger vertical dimension shall be used to determine the minimum braced wall panel length.

R602.10.5.1 Contributing length. For purposes of complying with the required length of bracing in Tables R602.10.3(1) and R602.10.3(3), the contributing length of each braced wall panel to the total length of bracing shall be as specified in Table R602.10.5.

TABLE R602.10.5
MINIMUM LENGTH OF BRACED WALL PANELS

METHOD (See Table R602.10.4)		MINIMUM LENGTH[a] (in) Wall Height 8 ft	9 ft	10 ft	11 ft	12 ft	CONTRIBUTING LENGTH (in)
DWG, WSP, SFB, PBS, PCP, HPS		48	48	48	53	58	Actual[b]
GB		48	48	48	53	58	Double sided = Actual Single sided = 0.5 x Actual
LIB		55	62	69	NP	NP	Actual[b]
ABW		28	32	34	38	42	48
PFH	Supporting roof only	16	16	16	18[c]	20[c]	48
	Supporting one story and roof	24	24	24	27[c]	29[c]	48
PFG		24	27	30	33[c]	36[c]	1.5 x Actual[b]
CS-G		24	27	30	33	36	Actual[b]
CS-PF		16	18	20	22[c]	24[c]	Actual[b]
CS-WSP, CS-SFB	Adjacent opening vertical dimension (in)						
	≤ 64	24	27	30	33	36	Actual[b]
	68	26	27	30	33	36	
	72	27	27	30	33	36	
	76	30	29	30	33	36	
	80	32	30	30	33	36	
	84	35	32	32	33	36	
	88	38	35	33	33	36	
	92	43	37	35	35	36	
	96	48	41	38	36	36	
	100		44	40	38	38	
	104		49	43	40	39	
	108		54	46	43	41	
	112			50	45	43	
	116			55	48	45	
	120			60	52	48	
	124				56	51	
	128				61	54	
	132				66	58	
	136					62	
	140					66	
	144					72	

For SI: 1 inch = 25.4 mm
NP = Not permitted
a. Linear interpolation shall be permitted.
b. Use the actual length provided it is greater than or equal to the minimum length.
c. Maximum header height is 10'; however, wall height may be increased to 12' with a pony wall per Table R602.10.6.4.

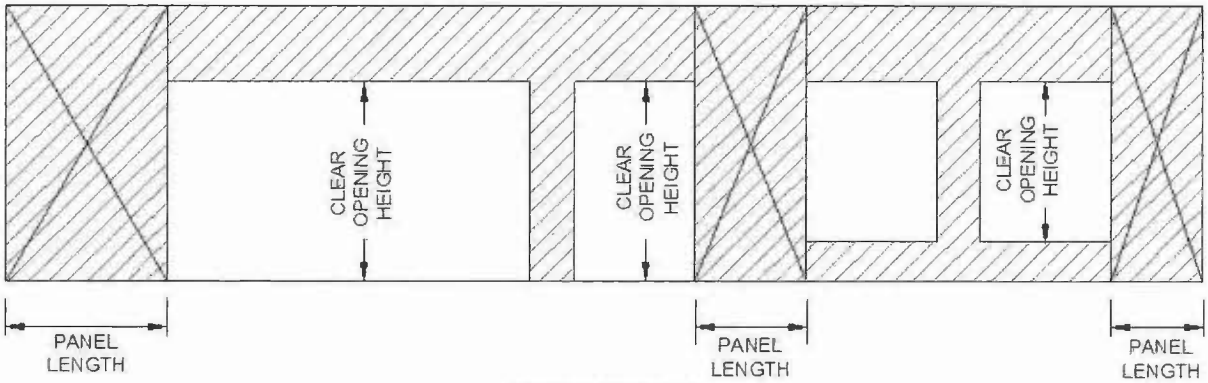


FIGURE R602.10.5
BRACED WALL PANELS WITH CONTINUOUS SHEATHING

R602.10.5.2 Partial credit. For Methods DWB, WSP, SFB, PBS, PCP and HPS panels between 36 inches and 48 inches in length shall be considered a braced wall panel and shall be permitted to partially contribute towards the required length of bracing in Table R602.10.3(1) and R602.10.3(3), and the contributing length shall be determined from Table R602.10.5.2.

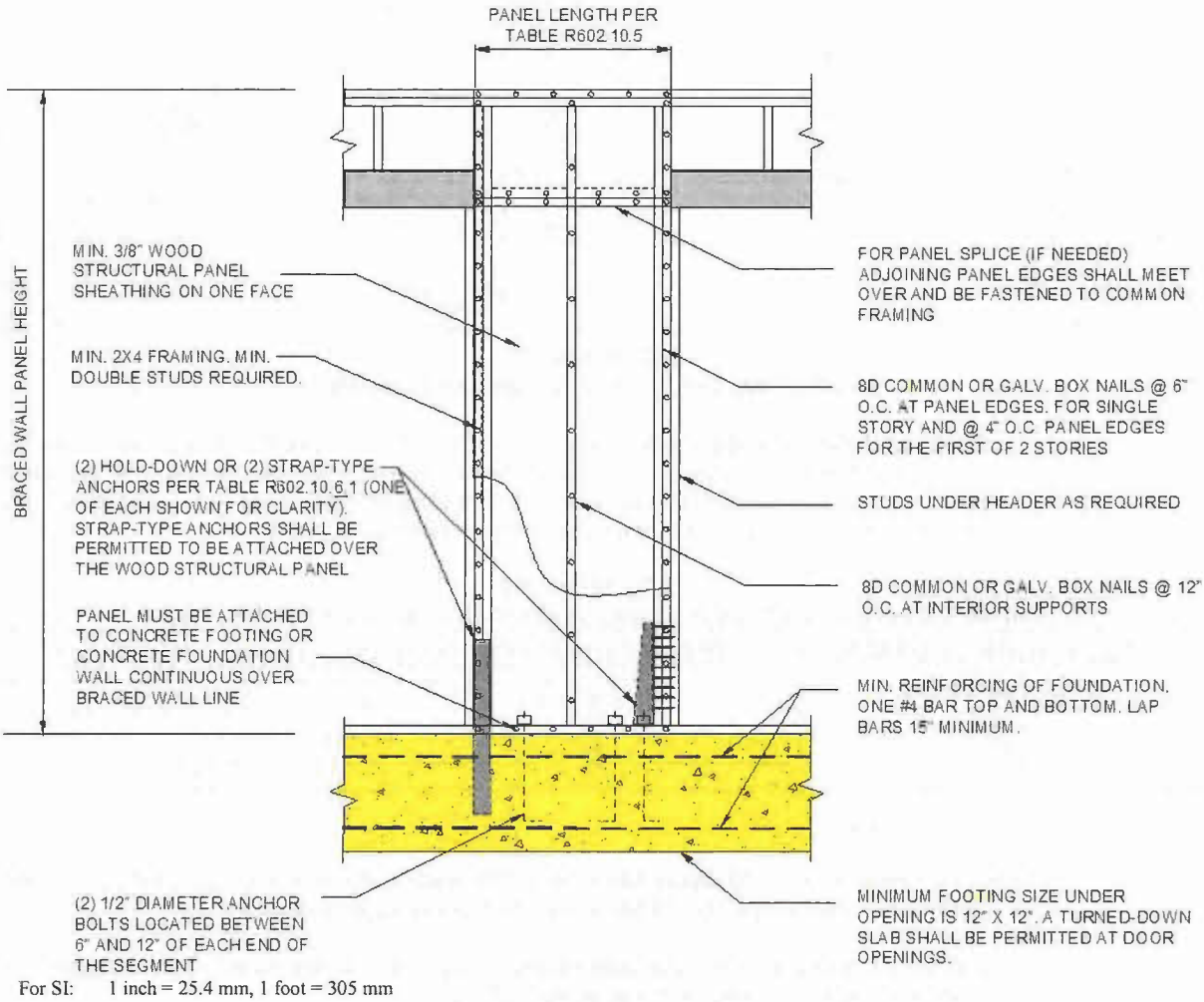
TABLE R602.10.5.2
PARTIAL CREDIT FOR BRACED WALL PANELS LESS THAN 48 INCHES IN ACTUAL LENGTH

ACTUAL LENGTH OF BRACED WALL PANEL (in)	CONTRIBUTING LENGTH OF BRACED WALL PANEL (in)[a]	
	8 ft Wall Height	9 ft Wall Height
48	48	48
42	36	36
36	27	N/A

For SI: 1 inch = 25.4mm
a. Linear interpolation shall be permitted.

R602.10.6 Construction of Methods ABW, PFH, PFG and CS-PF. Methods ABW, PFH, PFG and CS-PF shall be constructed as specified in Sections R602.10.6.1 through R602.10.6.4.

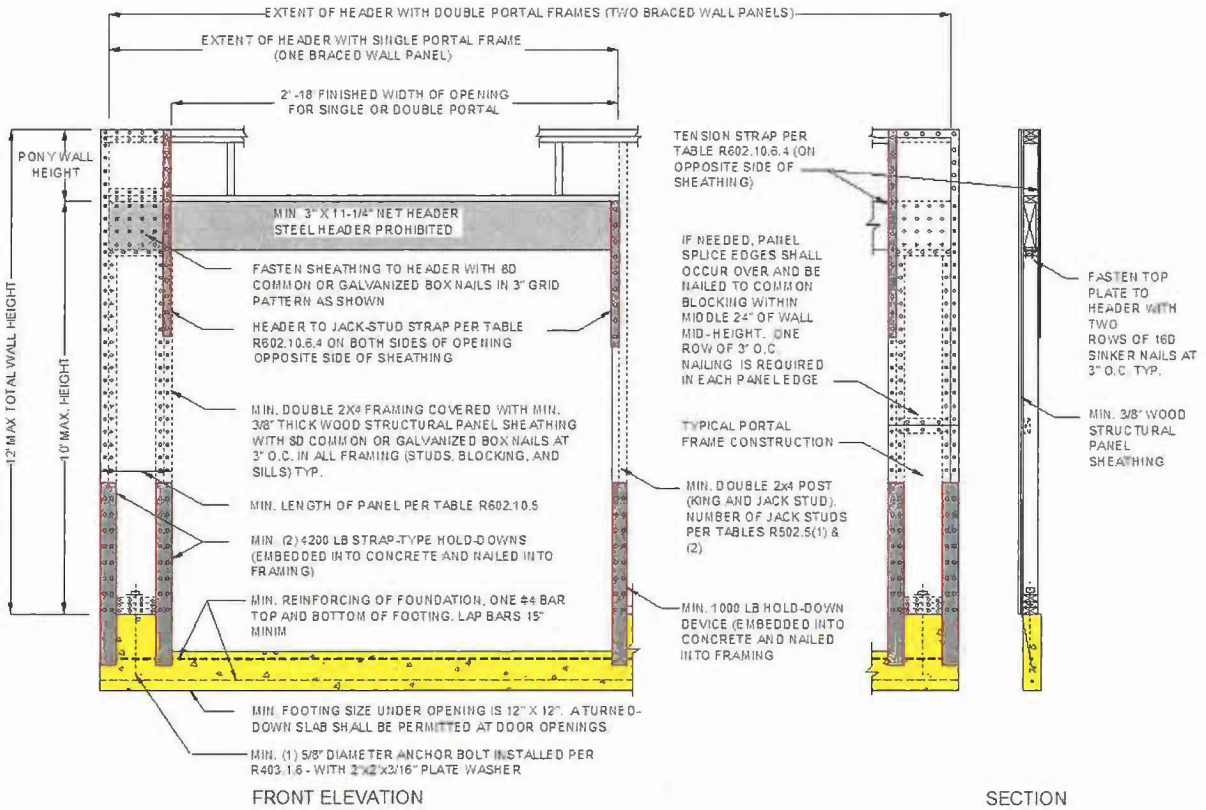
R602.10.6.1 Method ABW: Alternate braced wall panels. Method ABW braced wall panels shall be constructed in accordance with Figure R602.10.6.1.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

FIGURE R602.10.6.1
METHOD ABW: ALTERNATE BRACED WALL PANEL

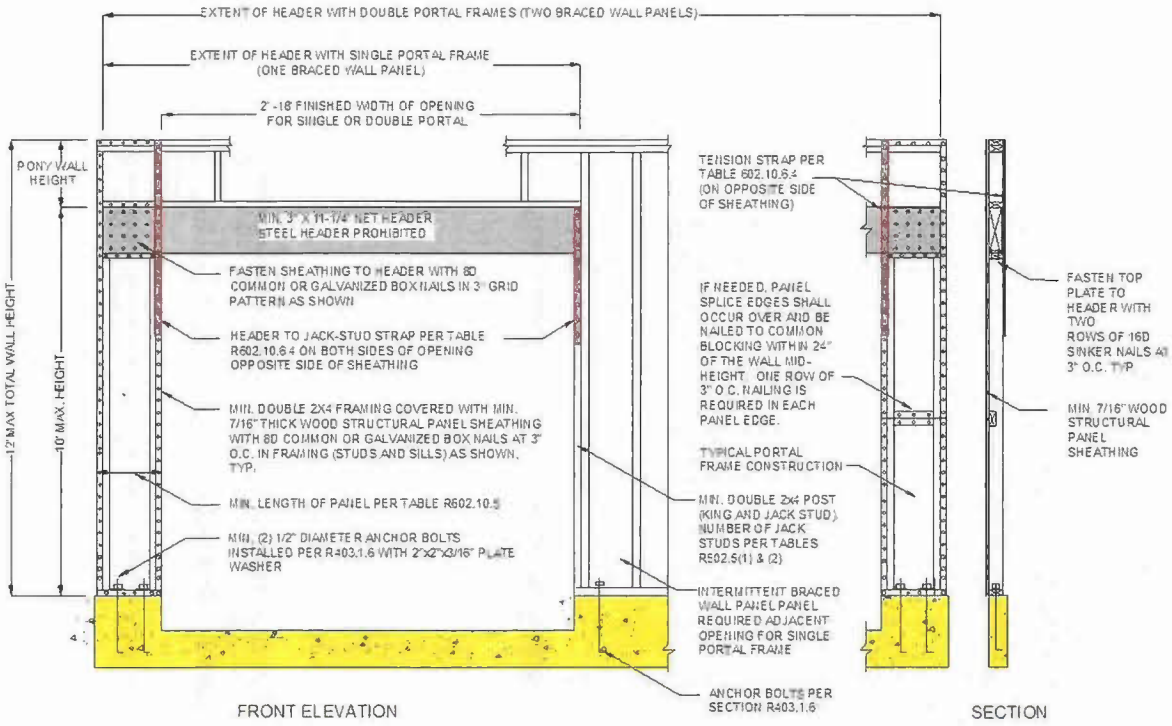
R602.10.6.2 Method PFH: Portal frame with hold-downs. Method PFH braced wall panels shall be constructed in accordance with Figure R602.10.6.2.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

FIGURE R602.10.6.2
METHOD PFH: PORTAL FRAME WITH HOLD-DOWNS

R602.10.6.3 Method PFG: Portal frame at garage door openings. Where supporting a roof or one story and a roof, a Method PFG braced wall panel constructed in accordance with Figure R602.10.6.3 shall be permitted on either side of garage door openings.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm

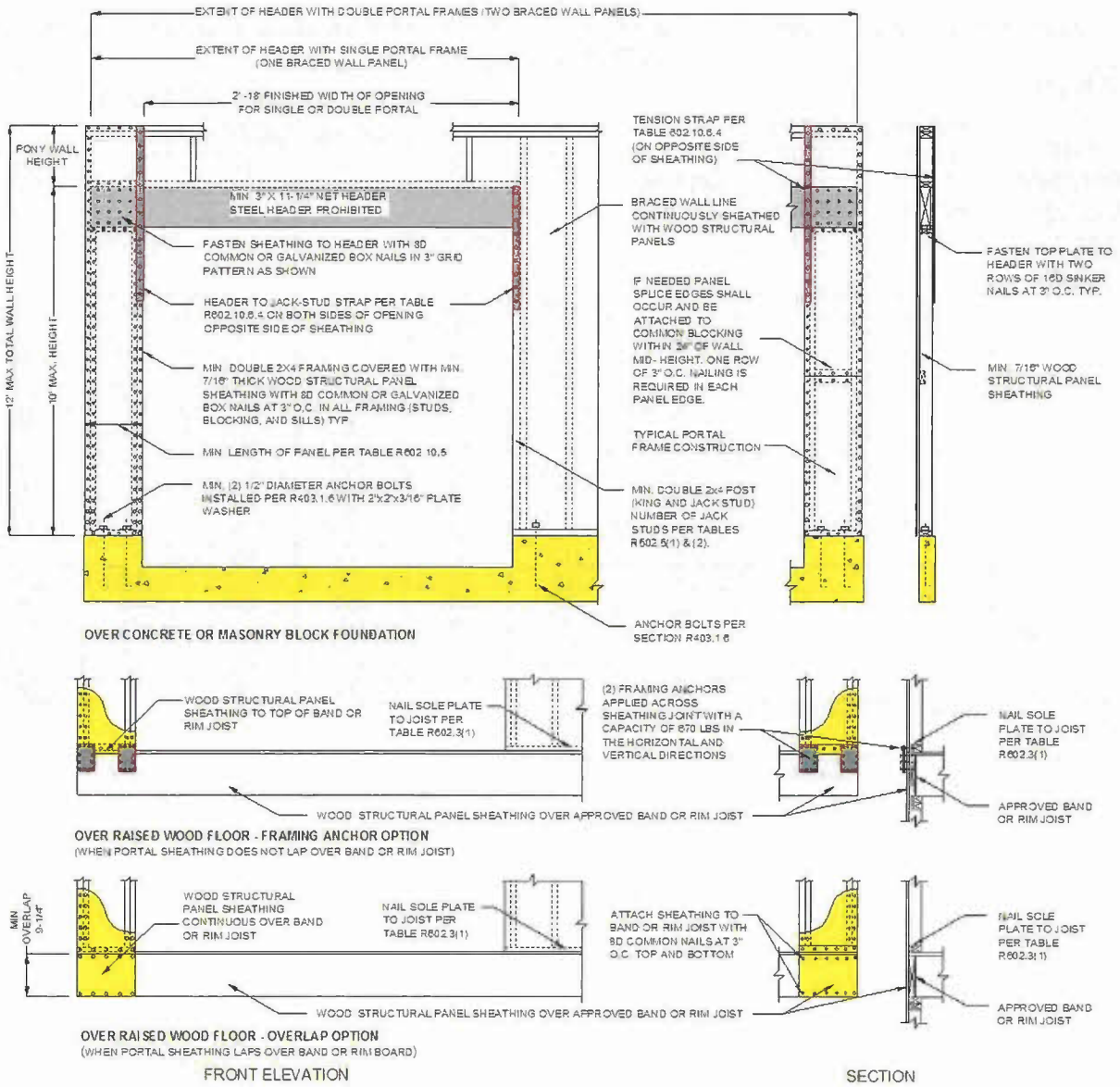
FIGURE R602.10.6.3
METHOD PFG: PORTAL FRAME AT GARAGE DOOR OPENINGS IN SEISMIC DESIGN CATEGORIES A, B AND C

R602.10.6.4 Method CS-PF: Continuously sheathed portal frame. Continuously sheathed portal frame braced wall panels shall be constructed in accordance with Figure R602.10.6.4 and Table R602.10.6.4. The number of continuously sheathed portal frame panels in a single braced wall line shall not exceed four.

TABLE R602.10.6.4
TENSION STRAP CAPACITY REQUIRED FOR RESISTING WIND PRESSURES PERPENDICULAR TO METHOD PFH, PFG AND CS-PF BRACED WALL PANELS

MINIMUM WALL STUD FRAMING NOMINAL SIZE AND GRADE	MAXIMUM PONY WALL HEIGHT (ft)	MAXIMUM TOTAL WALL HEIGHT (ft)	MAXIMUM OPENING WIDTH (ft)	TENSION STRAP CAPACITY REQUIRED (lb)[a]					
				BASIC WIND SPEED (mph)					
				85	90	100	85	90	100
				Exposure B			Exposure C		
2x4 No. 2 Grade	0	10	18	1000	1000	1000	1000	1000	1000
	1	10	9	1000	1000	1000	1000	1000	1275
			16	1000	1000	1750	1800	2325	3500
			18	1000	1200	2100	2175	2725	DR
	2	10	9	1000	1000	1025	1075	1550	2500
			16	1525	2025	3125	3200	3900	DR
			18	1875	2400	3575	3700	DR	DR
	2	12	9	1000	1200	2075	2125	2750	4000
			16	2600	3200	DR	DR	DR	DR
			18	3175	3850	DR	DR	DR	DR
	4	12	9	1775	2350	3500	3550	DR	DR
			16	4175	DR	DR	DR	DR	DR
2x6 Stud Grade	2	12	9	1000	1000	1325	1375	1750	2550
			16	1650	2050	2925	3000	3550	DR
			18	2025	2450	3425	3500	4100	DR
	4	12	9	1125	1500	2225	2275	2775	3800
			16	2650	3150	DR	DR	DR	DR
			18	3125	3675	DR	DR	DR	DR

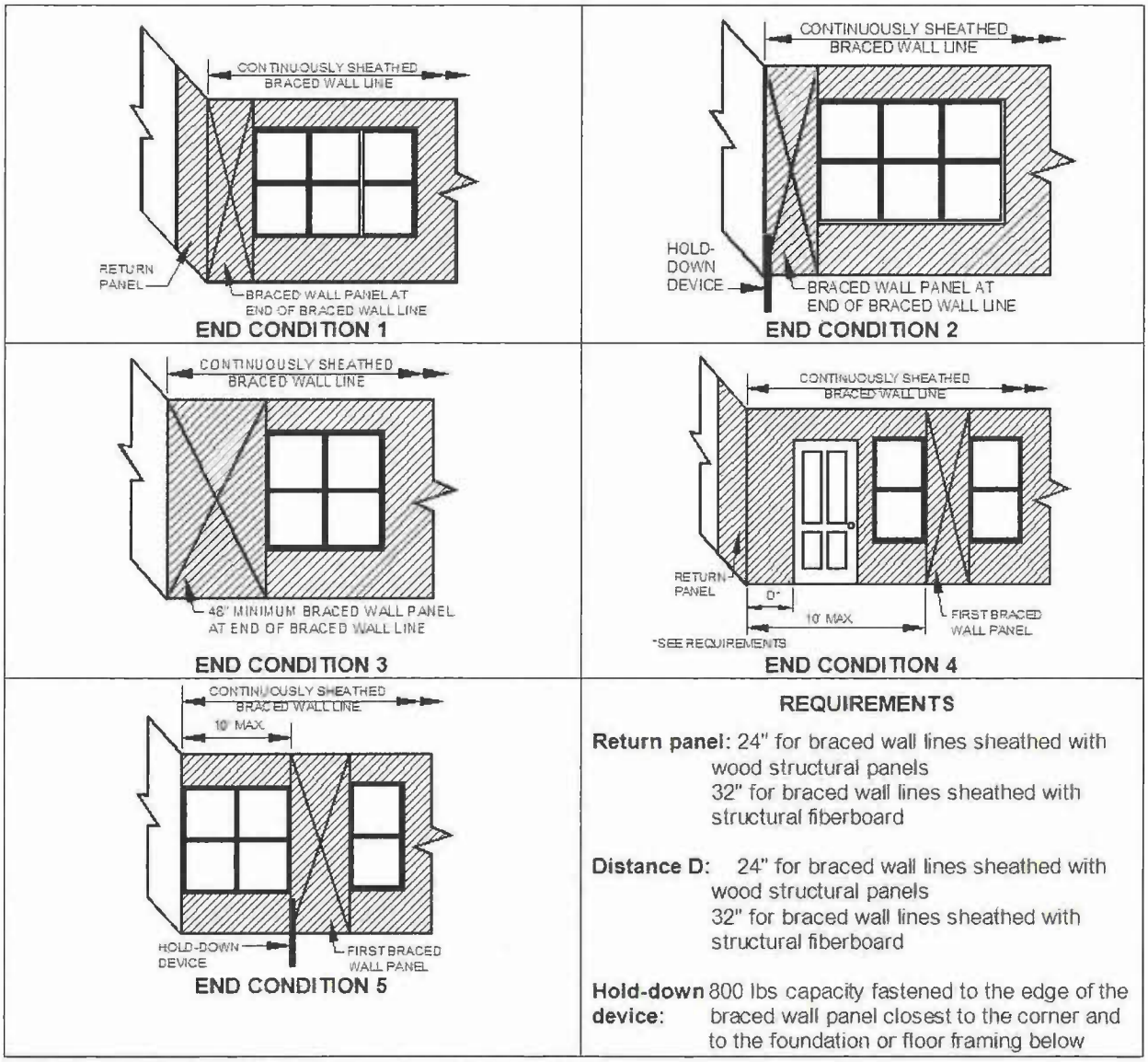
For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound force = 4.48 N
DR = design required
a. Strap shall be installed in accordance with manufacturer's recommendations.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound force = 4.48 N

FIGURE R602.10.6.4
METHOD CS-PF: CONTINUOUSLY SHEATHED PORTAL FRAME PANEL CONSTRUCTION

R602.10.7 Ends of braced wall lines with continuous sheathing. Each end of a braced wall line with continuous sheathing shall be in accordance with one of the end conditions shown in Figure R602.10.7.



For SI: 1 inch = 25.4 mm, 1 foot = 305 mm, 1 pound force = 4.48 N

FIGURE R602.10.7
END CONDITIONS FOR BRACED WALL LINES WITH CONTINUOUS SHEATHING

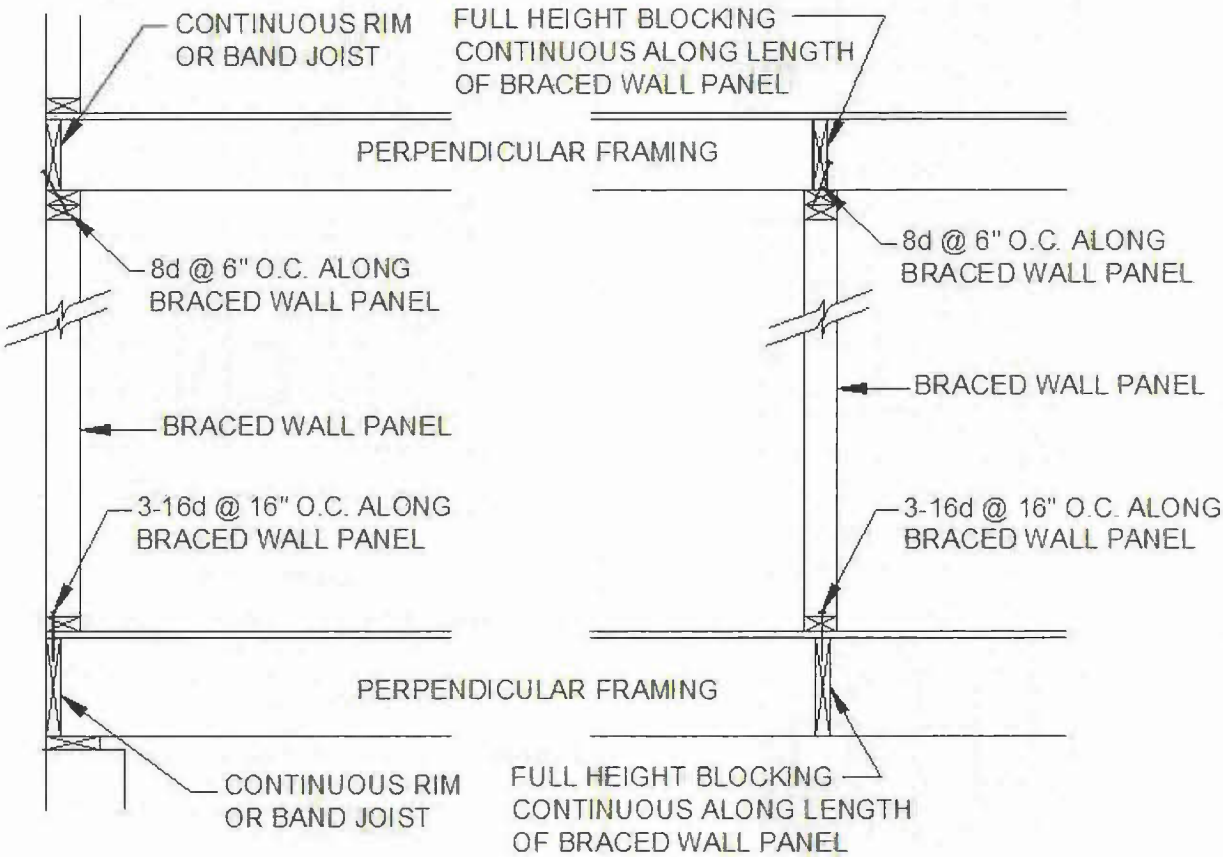
R602.10.8 Braced wall panel connections. Braced wall panels shall be connected to floor framing or foundations as follows:

1. Where joists are perpendicular to a braced wall panel above or below, a rim joist, band joist or blocking shall be provided along the entire length of the braced wall panel in accordance with Figure R602.10.8(1). Fastening of top and bottom wall plates to framing, rim joist, band joist and/or blocking shall be in accordance with Table R602.3(1).

2. Where joists are parallel to a braced wall panel above or below, a rim joist, end joist or other parallel framing member shall be provided directly above and below the braced wall panel in accordance with Figure R602.10.8(2). Where a parallel framing member cannot be located directly above and below the panel, full-depth blocking at 16 inch (406 mm) spacing shall be provided between the parallel framing members to each side of the braced wall panel in

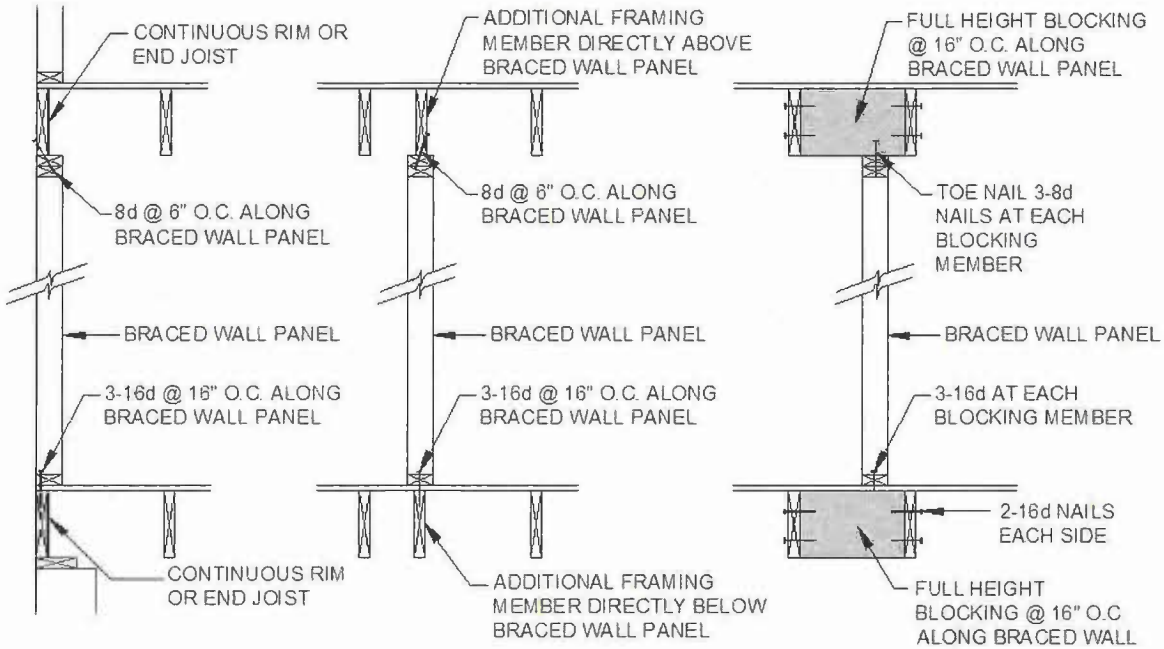
accordance with Figure R602.10.8(2). Fastening of blocking and wall plates shall be in accordance with Table R602.3(1) and Figure R602.10.8(2).

3. Connections of braced wall panels to concrete or masonry shall be in accordance with Section R403.1.6.



For SI: 1 inch = 25.4 mm

FIGURE R602.10.8(1)
BRACED WALL PANEL CONNECTION WHEN PERPENDICULAR TO FLOOR/CEILING FRAMING



For SI: 1 inch = 25.4 mm

FIGURE R602.10.8(2)
BRACED WALL PANEL CONNECTION WHEN PARALLEL TO FLOOR/CEILING FRAMING

R602.10.8.1 Connections to roof framing. Top plates of exterior braced wall panels shall be attached to rafters or roof trusses above in accordance with Table R602.3(1) and this section. Where required by this section, blocking between rafters or roof trusses shall be attached to top plates of braced wall panels and to rafters and roof trusses in accordance with Table R602.3(1). A continuous band, rim, or header joist or roof truss parallel to the braced wall panels shall be permitted to replace the blocking required by this section. Blocking shall not be required over openings in continuously-sheathed braced wall lines. In addition to the requirements of this section, lateral support shall be provided for rafters and ceiling joists in accordance with Section R802.8 and for trusses in accordance with Section R802.10.3. Roof ventilation shall be provided in accordance with Section R806.1.

1. For wind speeds less than 100 mph (45 m/s):

   1.1. Where the distance from the top of the braced wall panel to the top of the rafters or roof trusses above is 9.25 inches (235 mm) or less, blocking between rafters or roof trusses shall not be required.

   1.2. Where the distance from the top of the braced wall panel to the top of the rafters or roof trusses above is between 9.25 inches (235 mm) and 15.25 inches (387 mm) blocking between rafters or roof trusses shall be provided above the braced wall panel in accordance with Figure R602.10.8.1(1).

2. For wind speeds of 100 mph (45 m/s) or greater, where the distance from the top of the braced wall panel to the top of the rafters or roof trusses is 15.25 inches (387 mm) or less, blocking between rafters or roof trusses shall be provided above the braced wall panel in accordance with Figure R602.10.8.1(1).

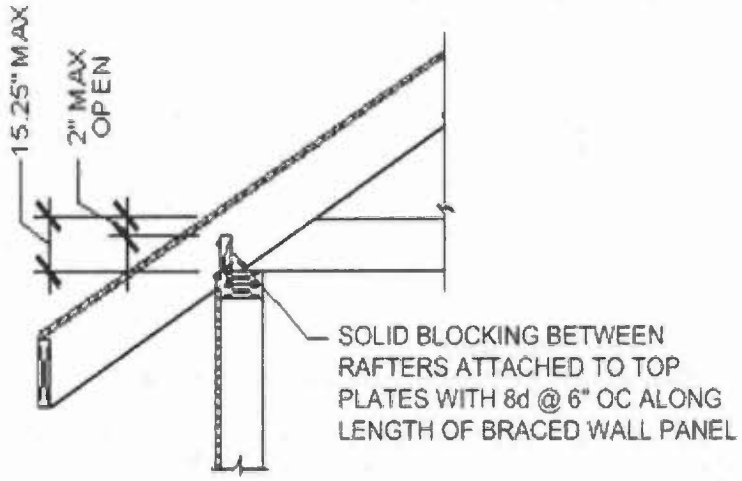
3. Where the distance from the top of the braced wall panel to the top of the rafters or roof trusses exceeds 15.25 inches (387 mm), the top plate of the braced wall panel shall be connected to perpendicular rafters or roof trusses above in accordance with one or more of the following methods:

   3.1. Soffit blocking panels constructed per Figure R602.10.8.1(2).

   3.2. Vertical blocking panels constructed per Figure R602.10.8.1(3).

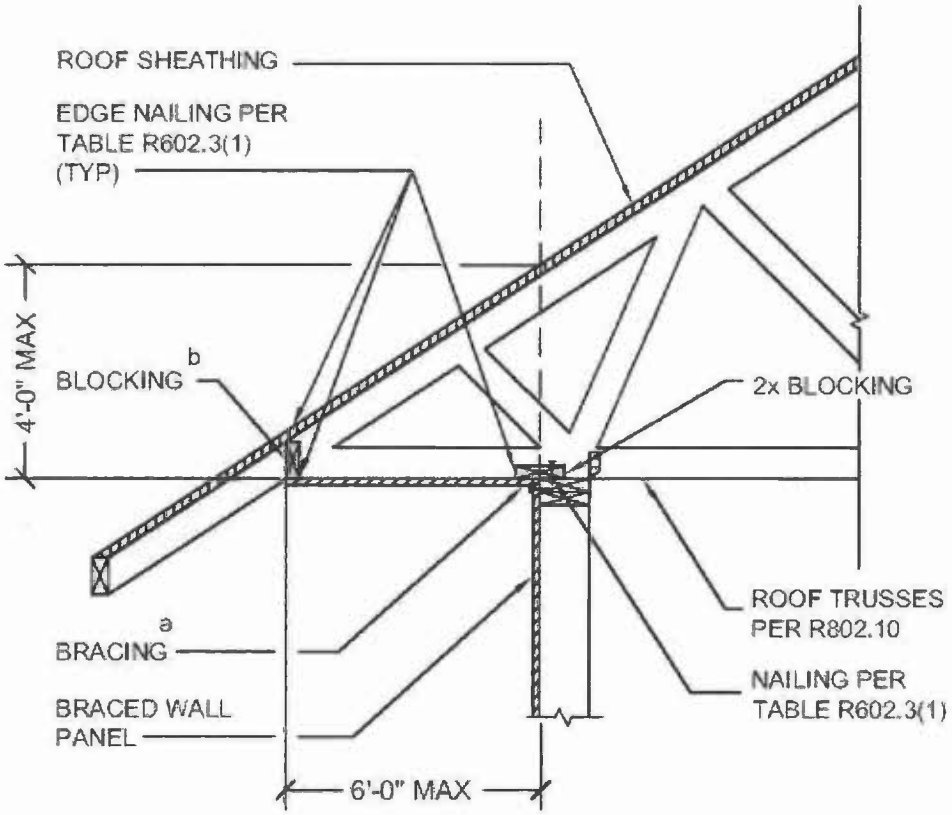
   3.3. Full-height engineered blocking panels designed per the AF&PA WFCM.

   3.4. Blocking, blocking panels, or other methods of lateral load transfer designed in accordance with accepted engineering practice.



For SI: 1 inch = 25.4 mm

FIGURE R602.10.8.1(1)
BRACED WALL PANEL CONNECTION TO PERPENDICULAR RAFTERS



For SI: 1 inch = 25.4 mm

a. Methods of bracing shall be as described in Section R602.10.4

b. Provide ventilation (not shown) per Section R806.

FIGURE R602.10.8.1(2)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

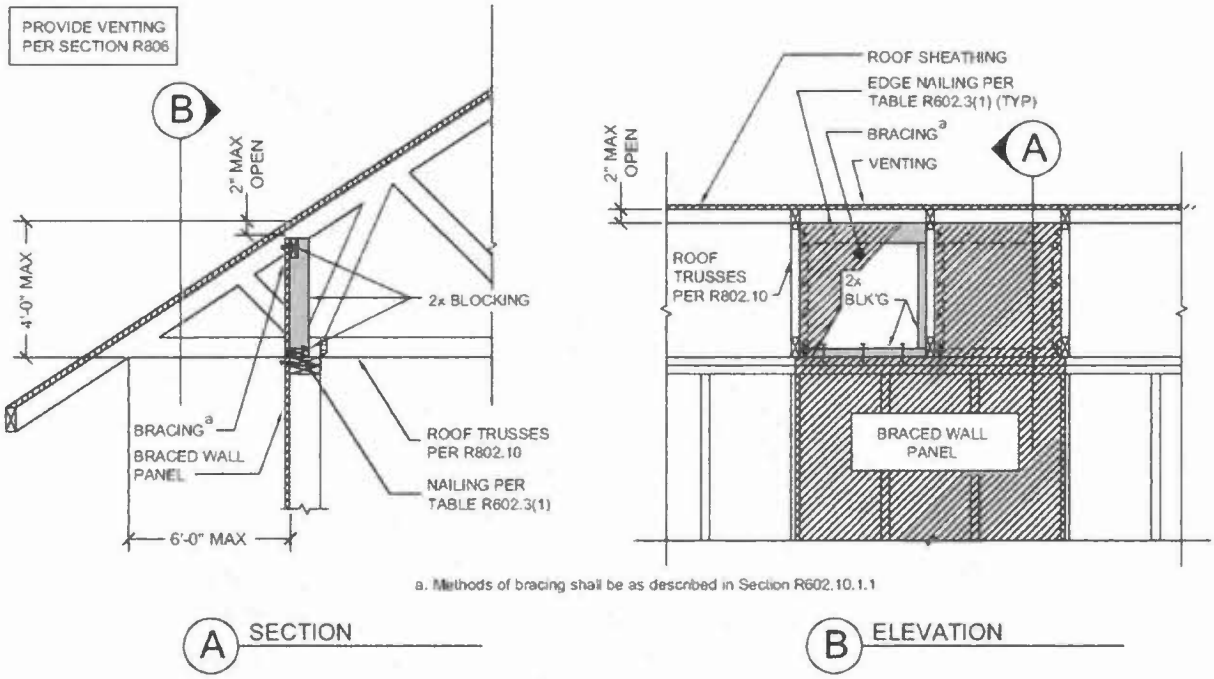


FIGURE R602.10.8.1(3)
BRACED WALL PANEL CONNECTION OPTION TO PERPENDICULAR RAFTERS OR ROOF TRUSSES

R602.10.9 Braced wall panel support. Braced wall panel support shall be provided as follows:

1. Cantilevered floor joists complying with Section R502.3.3 shall be permitted to support braced wall panels.

2. Elevated post or pier foundations supporting braced wall panels shall be designed in accordance with accepted engineering practice.

3. Masonry stem walls less than 48 inches (1220 mm) in length that support braced wall panels shall be reinforced in accordance with Figure R602.10.9. Masonry stem walls with a length greater than or equal to 48 inches (1220 mm) supporting braced wall panels shall be constructed in accordance with Section R403.1. Methods ABW and PFH shall not be permitted to attach to masonry stem walls.

4. Concrete stem walls less than 48 inches (1220 mm) in length, greater than 12 inches (305 mm) tall and less than 6 inches (152 mm) thick shall have reinforcement sized and located in accordance with Figure R602.10.9.

Exception: As an alternative to the Optional Stem Wall Reinforcement in Fig. R602.10.9, an approved post-installed adhesive anchoring system shall be permitted. A minimum of two anchors shall be installed as indicated in Figure R602.10.9. Anchors shall be located not more than 4 inches (102 mm) from each end of the stem wall. Anchors shall be installed into the concrete footing as follows:

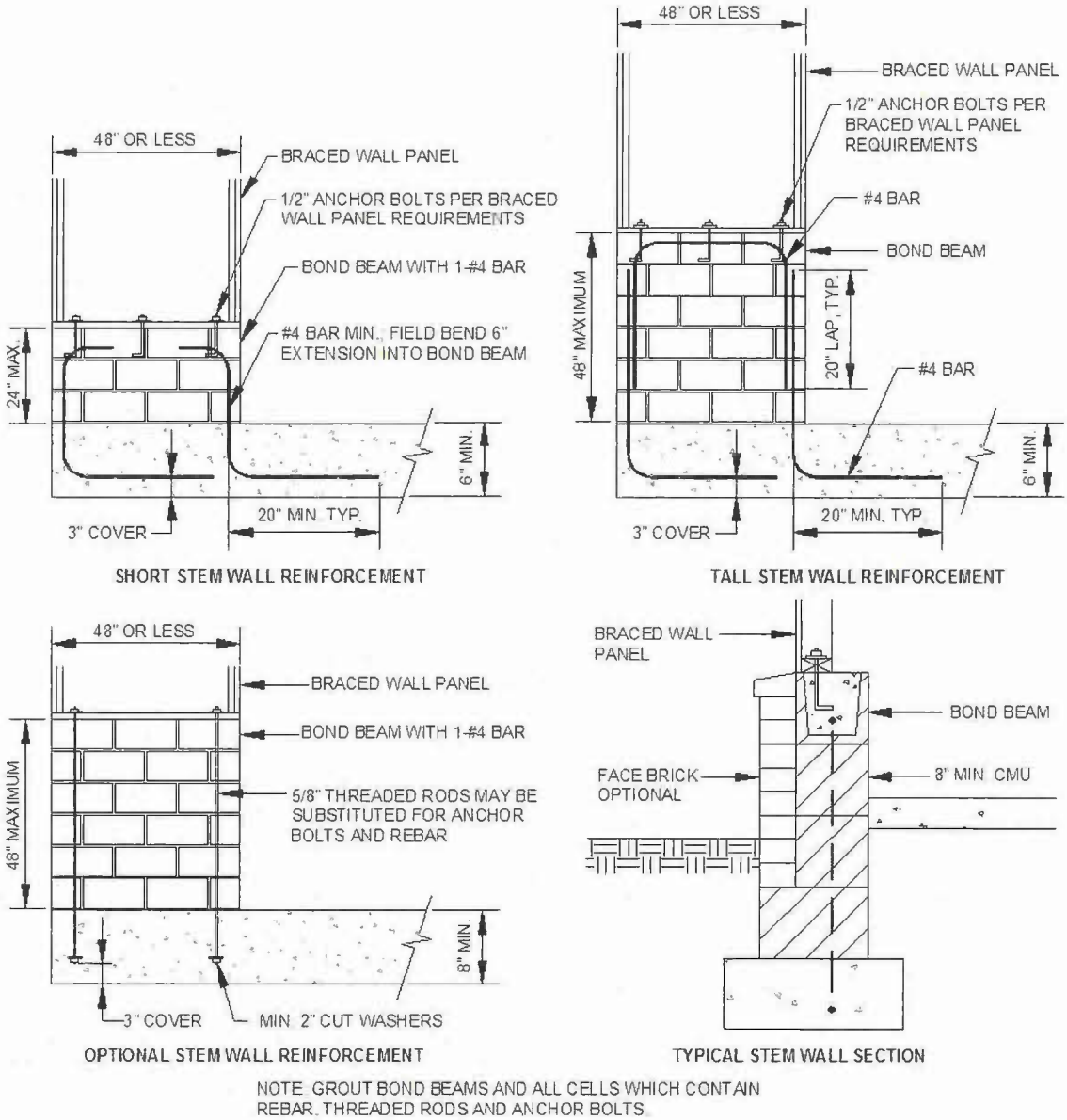
1. 5/8 inch (16 mm) threaded rod – 3/4 inch (19 mm) diameter hole with a minimum embedment of 6 inches (152 mm).

2. No. 4 reinforcing bar – 5/8 inch (16 mm) diameter hole with a minimum embedment of 4 1/2 inches (114 mm).

A minimum footing thickness of 8 inches (203 mm) is required and the minimum distance from each anchor to the edge of the footing shall be 3 3/4 (95 mm).

The anchoring adhesive and anchors shall be installed in accordance with the manufacturer's instructions and have a minimum tensile capacity of 5,000 lbs (22 kN).

The reinforcement of the masonry stem wall and attachment of the braced wall panel to the stem wall shall be as shown in Figure R602.10.9.



NOTE: GROUT BOND BEAMS AND ALL CELLS WHICH CONTAIN REBAR, THREADED RODS AND ANCHOR BOLTS.

For SI: 1 inch = 25.4 mm

FIGURE R602.10.9
MASONRY STEM WALLS SUPPORTING BRACED WALL PANELS

R602.10.10 Panel joints. All vertical joints of panel sheathing shall occur over, and be fastened to common studs. Horizontal joints in braced wall panels shall occur over, and be fastened to common blocking of a minimum 1-1/2 inch (38 mm) thickness.

Exceptions:

1. Vertical joints of panel sheathing shall be permitted to occur over double studs, where adjoining panel edges are attached to separate studs with the required panel edge fastening schedule, and the adjacent studs are attached together with 2 rows of 10d box nails (3 in. long x 0.128 in. dia.) at 10 inches (254 mm) o.c.

2. Blocking at horizontal joints shall not be required in wall segments that are not counted as braced wall panels.

3. Where the length of bracing provided is at least twice the required length of bracing from Tables R602.10.3(1) and R602.10.3(3) blocking at horizontal joints shall not be required in braced wall panels constructed using Methods WSP, SFB, GB, PBS or HPS.

4. When Method GB panels are installed horizontally, blocking of horizontal joints is not required.

R602.10.11 Cripple wall bracing. Cripple walls shall be constructed in accordance with Section R602.9 and braced in accordance with this section. Cripple walls shall be braced with the length and method of bracing used for the wall above in accordance with Tables R602.10.3(1) and R602.10.3(3), except that the length of cripple wall bracing shall be multiplied by a factor of 1.15.

R602.10.11.1 Cripple wall bracing for townhouses in Seismic Design Category C. In addition to the requirements in Section R602.10.11, the distance between adjacent edges of braced wall panels shall be 14 feet (4267 mm) maximum.

Where braced wall lines at interior walls are not supported on a continuous foundation below, the adjacent parallel cripple walls, where provided, shall be braced with Method WSP or CS-WSP per Section R602.10.4. The length of bracing required per Table R602.10.3(3) for the cripple walls shall be multiplied by 1.5. Where the cripple walls do not have sufficient length to provide the required bracing, the spacing of panel edge fasteners shall be reduced to 4 inches (102 mm) on center and the required bracing length adjusted by 0.7. If the required length can still not be provided, the cripple wall shall be designed in accordance with accepted engineering practice.

R602.10.11.2 Redesignation of cripple walls. Where all cripple wall segments along a braced wall line do not exceed 48 inches (1220 mm) in height, the cripple wall shall be permitted to be redesignated as a first story wall for purposes of determining wall bracing requirements. Where any cripple wall segment in a braced wall line exceeds 48 inches (1220 mm) in height, the entire cripple wall shall be counted as an additional story. If the cripple walls are redesignated, the stories above the redesignated story shall be counted as the second and third stories respectively.

50. Change Section R602.11.1 to read:

602.11.1 Wall anchorage for townhouses in Seismic Design Category C. Plate washers, a minimum of 0.229 inch by 3 inches by 3 inches (5.8 mm by 76 mm by 76 mm) in size, shall be provided between the foundation sill plate and the nut except where approved anchor straps are used. The hole in the plate washer is permitted to be diagonally slotted with a width of up to 3/16 inch (5 mm) larger than the bolt diameter and a slot length not to exceed 1¾ inches (44 mm), provided a standard cut washer is placed between the plate washer and the nut.

51. Delete Section R602.11.2.

52. Replace Section R602.12, including all subsections, with the following:

R602.12 Simplified wall bracing. Buildings meeting all of the conditions listed below shall be permitted to be braced in accordance with this section as an alternate to the requirements of Section R602.10. The entire building shall be braced in accordance with this section; the use of other bracing provisions of R602.10, except as specified herein, shall not be permitted.

1. There shall be no more than two stories above the top of a concrete or masonry foundation or basement wall. Permanent wood foundations shall not be permitted.

2. Floors shall not cantilever more than 24 inches (607 mm) beyond the foundation or bearing wall below.

3. Wall height shall not be greater than 10 feet (2743 mm).

4. The building shall have a roof eave-to-ridge height of 15 feet (4572 mm) or less.

5. All exterior walls shall have gypsum board with a minimum thickness of 1/2 inches (12.7 mm) installed on the interior side fastened in accordance with Table R702.3.5.

6. The structure shall be located where the basic wind speed is less than or equal to 90 mph (40 m/s), and the Exposure Category is A or B.

7. The structure shall be located in Seismic Design Category of A, B or C for detached one- and two-family dwellings or Seismic Design Category A or B for townhouses.

8. Cripple walls shall not be permitted in two-story buildings.

R602.12.1 Circumscribed rectangle. Required bracing shall be determined by circumscribing a rectangle around the entire building on each floor as shown in Figure R602.12.1. The rectangle shall surround all enclosed offsets and projections such as sunrooms and attached garages. Open structures, such as carports and decks shall be permitted to be excluded. The rectangle shall have no side greater than 60 feet (18 288 mm), and the ratio between the long side and short side shall be a maximum of 3:1.

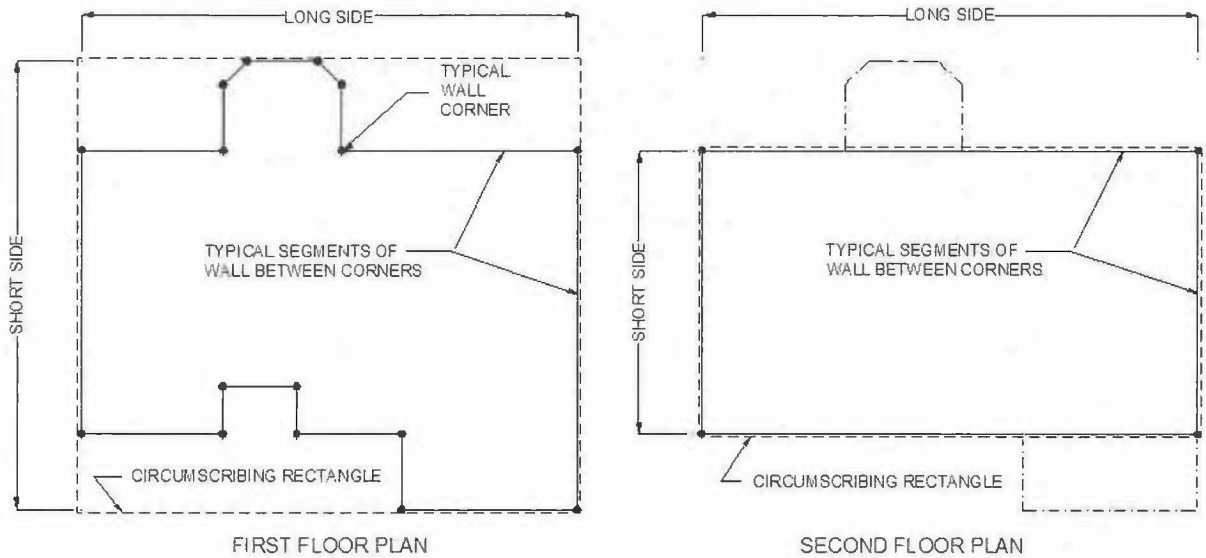


FIGURE R602.12.1
RECTANGLE CIRCUMSCRIBING AN ENCLOSED BUILDING

R602.12.2 Sheathing materials. The following sheathing materials installed on the exterior side of exterior walls shall be used to construct a bracing unit as defined in Section R602.12.3. Mixing materials is prohibited.

1. Wood structural panels with a minimum thickness of 3/8 inch (9.5 mm) fastened in accordance with Table R602.3(3).

2. Structural fiberboard sheathing with a minimum thickness of 1/2 inch (12.7 mm) fastened in accordance with Table R602.3(1).

R602.12.3 Bracing unit. A bracing unit shall be a full-height sheathed segment of the exterior wall with no openings or vertical or horizontal offsets and a minimum length as specified below. Interior walls shall not contribute toward the amount of required bracing. Mixing of Items 1 and 2 below is prohibited on the same story.

1. Where all framed portions of all exterior walls are sheathed in accordance with Section R602.12.2, including wall areas between bracing units, above and below openings and on gable end walls, the minimum length of a bracing unit shall be 3 feet (914 mm).

2. Where the exterior walls are braced with sheathing panels in accordance with Section R602.12.2 and areas between bracing units are covered with other materials, the minimum length of a bracing unit shall be 4 feet (1219 mm).

R602.12.3.1 Multiple bracing units. Segments of wall compliant with Section R602.12.3 and longer than the minimum bracing unit length shall be considered as multiple bracing units. The number of bracing units shall be determined by dividing the wall segment length by the minimum bracing unit length. Full-height sheathed segments of wall narrower than the minimum bracing unit length shall not contribute toward a bracing unit except as specified in Section R602.12.6.

R602.12.4 Number of bracing units. Each side of the circumscribed rectangle, as shown in Figure R602.12.1, shall have, at a minimum, the number of bracing units per Table R602.12.4 placed on the parallel exterior walls facing the side of the rectangle. Bracing units shall then be placed using the distribution requirements specified in Section R602.12.5.

TABLE R602.12.4
MINIMUM NUMBER OF BRACING UNITS ON EACH SIDE OF THE CIRCUMSCRIBED RECTANGLE

STORY LEVEL	EAVE-TO RIDGE HEIGHT (FEET)	MINIMUM NUMBER OF BRACING UNITS ON EACH LONG SIDE[a, b]						MINIMUM NUMBER OF BRACING UNITS ON EACH SHORT SIDE[a, b]					
		Length of short side (ft)[c]						Length of long side (ft)[c]					
		10	20	30	40	50	60	10	20	30	40	50	60
	10	1	2	2	2	3	3	1	2	2	2	3	3
		2	3	3	4	5	6	2	3	3	4	5	6
	15	1	2	3	3	4	4	1	2	3	3	4	4
		2	3	4	5	6	7	2	3	4	5	6	7

For SI: 1 ft = 304.8 mm

a. Interpolation shall not be permitted.

b. Cripple walls or wood-framed basement walls in a walk-out condition of a one-story structure shall be designed as the first floor of a two-story house.

c. Actual lengths of the sides of the circumscribed rectangle shall be rounded to the next highest unit of 10 when using this table.

R602.12.5 Distribution of bracing units. The placement of bracing units on exterior walls shall meet all of the following requirements as shown in Figure R602.12.5.

1. A bracing unit shall begin no more than 12 feet (3658 mm) from any wall corner.
2. The distance between adjacent edges of bracing units shall be no greater than 20 feet (6096 mm).
3. Segments of wall greater than 8 feet (2438 mm) in length shall have a minimum of one bracing unit.

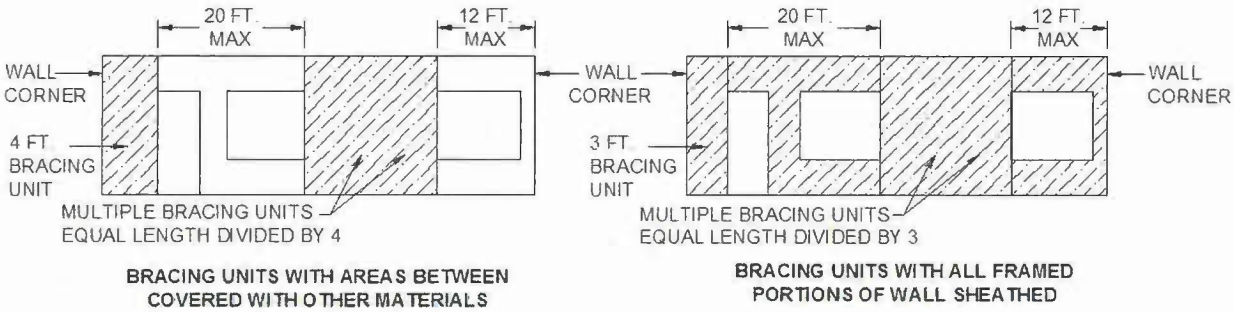


FIGURE R602.12.5
BRACING UNIT DISTRIBUTION

R602.12.6 Narrow panels. The bracing methods referenced in Section R602.10 and specified in Sections R602.12.6.1 through R602.12.6.3 shall be permitted when using simplified wall bracing.

R602.12.6.1 Method CS-G. Braced wall panels constructed as Method CS-G in accordance with Tables R602.10.4.1 and R602.10.5 shall be permitted for one-story garages when all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-G panel shall be equivalent to 0.5 bracing units.

R602.12.6.2 Method CS-PF. Braced wall panels constructed as Method CS-PF in accordance with Section R602.10.6.4 shall be permitted when all framed portions of all exterior walls are sheathed with wood structural panels. Each CS-PF panel shall equal 0.5 bracing units. A maximum of four CS-PF panels shall be permitted on all the segments of walls parallel to each side of the circumscribed rectangle.

R602.12.6.3 Methods PFH and PFG. Braced wall panels constructed as Method PFH, in accordance with Section R602.10.6.2, and PFG, in accordance with Section R602.10.6.3, shall be permitted when bracing units are constructed using wood structural panels. Each PFH panel shall equal one bracing unit, and each PFG shall equal 0.75 bracing units.

R602.12.7 Lateral support. For bracing units located along the eaves, the vertical distance from the outside edge of the top wall plate to the roof sheathing above shall not exceed 9.25 inches (235 mm) at the location of a bracing unit unless lateral support is provided in accordance with Section R602.10.8.1.

R602.12.8 Stem walls. Masonry stem walls with a height and length of 48 inches (1219 mm) or less supporting a bracing unit or a Method CS-G, CS-PF or PFG braced wall panel shall be constructed in accordance with Figure R602.10.9. Concrete stem walls greater than 12 inches (305 mm) tall and less than 6 inches (152 mm) thick shall have reinforcement sized and located in accordance with Figure R602.10.9.

53. Change Section R612.2 to read:

R612.2 Window sills. In dwelling units, where the opening of an operable window is located more than 72 inches (1829 mm) above the finished grade or surface below, the lowest part of the clear opening of the

window shall be a minimum of 18 inches (457 mm) above the finished floor of the room in which the window is located. Operable sections of windows shall not permit openings that allow passage of a 4-inch-diameter (102 mm) sphere where such openings are located within 18 inches (457 mm) of the finished floor.

Exceptions:

1. Windows whose openings will not allow a 4-inch-diameter (102 mm) sphere to pass through the opening when the opening is in its largest opened position.

2. Openings that are provided with window fall prevention devices that comply with Section R612.3.

3. Openings that are provided with fall protection devices that comply with ASTM F 2090.

4. Windows that are provided with opening limiting devices that comply with Section R612.4.

54. Change Section R703.7 to read:

R703.7 Stone and masonry veneer, general. Stone and masonry veneer shall be installed in accordance with this chapter, Table R703.4 and Figure R703.7. These veneers installed over a backing of wood or cold-formed steel shall be limited to the first story above-grade and shall not exceed 5 inches (127 mm) in thickness. See Tables R602.10.3(3) and R602.10.3(4) for wall bracing requirements for masonry veneer for wood framed construction and Section R603.9.5 for wall bracing requirements for masonry veneer for cold-formed steel construction.

Exceptions:

1. For all buildings in Seismic Design Categories A, B and C, exterior stone or masonry veneer, as specified in Table R703.7(1), with a backing of wood or steel framing shall be permitted to the height specified in Table R703.7(1) above a noncombustible foundation.

2. For detached one- or two-family dwellings in Seismic Design Categories D_0, D_1 and D_2, exterior stone or masonry veneer, as specified in Table R703.7(2), with a backing of wood framing shall be permitted to the height specified in Table R703.7(2) above a noncombustible foundation.

55. Delete the reference to footnote "f" and the footnote itself in Figure R802.11.

56. Delete Section N1101.9.

57. Change Section N1103.2.2 to read:

N1103.2.2 Sealing. All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. Verification of compliance with this section shall be in accordance with either Section N1103.2.2.1 or Section N1103.2.2.2.

58. Add Section N1103.2.2.1 to read:

N1103.2.2.1 Testing option. Duct tightness shall be verified by either of the following:

1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.

2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be

taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area.

Exception: Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

When this option is chosen, testing shall be performed by approved qualified individuals, testing agencies or contractors. Testing and results shall be as prescribed in Section N1103.2.2 and approved recognized industry standards.

59. Add Section N1103.2.2.2 to read:

N1103.2.2.2 Visual inspection option. In addition to the inspection of ducts otherwise required by this code, when the air handler and all ducts are not within conditioned space and this option is chosen to verify duct tightness, duct tightness shall be considered acceptable when the requirements of Section N1103.2.2 are field verified.

60. Change Section M1502.4.4.1 to read:

M1502.4.4.1 Specified length. The maximum length of the exhaust duct shall be 35 feet (10 668 mm) from the connection to the transition duct from the dryer to the outlet terminal. Where fittings are used the maximum length of the exhaust duct shall be reduced in accordance with Table M1502.4.4.1.

61. Add Section M1801.1.1 to read:

M1801.1.1 Equipment changes. Upon the replacement or new installation of any fuel-burning appliances or equipment in existing buildings, an inspection or inspections shall be conducted to ensure that the connected vent or chimney systems comply with the following:

1. Vent or chimney systems are sized in accordance with this code.

2. Vent or chimney systems are clean, free of any obstruction or blockages, defects or deterioration and are in operable condition.

Where not inspected by the local building department, persons performing such changes or installations shall certify to the building official that the requirements of Items 1 and 2 of this section are met.

62. Add Section G2425.1.1 to read:

G2425.1.1 Equipment changes. Upon the replacement or new installation of any fuel-burning appliances or equipment in existing buildings, an inspection or inspections shall be conducted to ensure that the connected vent or chimney systems comply with the following:

1. Vent or chimney systems are sized in accordance with this code.

2. Vent or chimney systems are clean, free of any obstruction or blockages, defects, or deterioration and are in operable condition.

Where not inspected by the local building department, persons performing such changes or installations shall certify to the building official that the requirements of Items 1 and 2 of this section are met.

63. Change Section P2601.2 to read:

P2601.2 Connections. Plumbing fixtures, drains and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems.

Exception: Bathtubs, showers, lavatories, clothes washers and laundry trays are not required to discharge to the sanitary drainage system where those fixtures discharge to an approved gray water or rain water recycling system.

64. Change Section P2602.1 to read:

P2602.1 General. The water and drainage system of any building or premises where plumbing fixtures are installed shall be connected to a public or private water supply and a public or private sewer system. As provided for in Section 103.11 of Part I of the Virginia Uniform Statewide Building Code (13 VAC 5-63) for functional design, water supply sources and sewage disposal systems are regulated and approved by the Virginia Department of Health and the Virginia Department of Environmental Quality.

Note: See also the Memorandums of Agreement in the "Related Laws Package," which is available from the Virginia Department of Housing and Community Development.

65. Change Section P2903.5 to read:

P2903.5 Water hammer. The flow velocity of the water distribution system shall be controlled to reduce the possibility of water hammer. A water-hammer arrestor shall be installed where quick-closing valves are utilized, unless otherwise approved. Water hammer arrestors shall be installed in accordance with manufacturer's specifications. Water hammer arrestors shall conform to ASSE 1010.

66. Add Section P3002.2.1 to read:

P3002.2.1 Tracer wire. Nonmetallic sanitary sewer piping that discharges to public systems shall be locatable. An insulated copper tracer wire, 18 AWG minimum in size and suitable for direct burial or an equivalent product, shall be utilized. The wire shall be installed in the same trench as the sewer within 12 inches (305 mm) of the pipe and shall be installed from within five feet of the building wall to the point where the building sewer intersects with the public system. At a minimum, one end of the wire shall terminate above grade in an accessible location that is resistant to physical damage, such as with a cleanout or at the building wall.

67. Add Section E3601.8 to read:

E3601.8 Energizing service equipment. The building official shall give permission to energize the electrical service equipment of a one- or two-family dwelling unit when all of the following requirements have been approved:

1. The service wiring and equipment, including the meter socket enclosure, shall be installed and the service wiring terminated.
2. The grounding electrode system shall be installed and terminated.
3. At least one receptacle outlet on a ground fault protected circuit shall be installed and the circuit wiring terminated.
4. Service equipment covers shall be installed.
5. The building roof covering shall be installed.
6. Temporary electrical service equipment shall be suitable for wet locations unless the interior is dry and protected from the weather.

68. Change Section E3802.4 to read:

E3802.4 In unfinished basements. Where type SE or NM cable is run at angles with joists in unfinished basements, cable assemblies containing two or more conductors of sizes 6 AWG and larger and assemblies containing three or more conductors of sizes 8 AWG and larger shall not require additional protection where

attached directly to the bottom of the joists. Smaller cables shall be run either through bored holes in joists or on running boards. NM cable installed on the wall of an unfinished basement shall be permitted to be installed in a listed conduit or tubing or shall be protected in accordance with Table E3802.1. Conduit or tubing shall be provided with a suitable insulating bushing or adapter at the point the where cable enters the raceway. The NM or SE cable sheath shall extend through the conduit or tubing and into the outlet or device box not less than 1/4 inch (6.4 mm). The cable shall be secured within 12 inches (305 mm) of the point where the cable enters the conduit or tubing. Metal conduit, tubing, and metal outlet boxes shall be connected to an equipment grounding conductor.

69. Change Section E3902.11 to read:

E3902.11 Arc-fault protection of bedroom outlets. All branch circuits that supply 120-volt, single phase, 15- and 20-ampere outlets installed in bedrooms shall be protected by a combination type arc-fault circuit interrupter installed to provide protection of the branch circuit.

Exceptions:

1. Where a combination AFCI is installed at the first outlet to provide protection for the remaining portion of the branch circuit, the portion of the branch circuit between the branch-circuit overcurrent device and such outlet shall be wired with metal outlet and junction boxes and RMC, IMC, EMT or steel armored cable, Type AC meeting the requirements of Section E3908.8.

2. AFCI protection is not required for a branch circuit supplying only a fire alarm system where the branch circuit is wired with metal outlet and junction boxes and RMC, IMC, EMT or steel armored cable Type AC meeting the requirements of Section E3908.8.

CHAPTER 4

SPECIAL DETAILED REQUIREMENTS BASED ON USE AND OCCUPANCY

Delete Section 403.4.4 of the IBC.

Add Section 407.10 to the IBC to read:

407.10 Special locking arrangement. Means of egress doors shall be permitted to contain locking devices restricting the means of egress in areas in which the clinical needs of the patients require restraint of movement, where all of the following conditions are met:

1. The locks release upon activation of the fire alarm system or the loss of power.

2. The building is equipped with an approved automatic sprinkler system in accordance with Section 903.3.1.1.

3. A manual release device is provided at a nursing station responsible for the area.

4. A key-operated switch or other manual device is provided adjacent to each door equipped with the locking device. Such switch or other device, when operated, shall result in direct interruption of power to the lock – independent of the control system electronics.

5. All staff shall have keys or other means to unlock the switch or other device or each door provided with the locking device.

Add Section 407.11 to the IBC to read:

407.11 Emergency power systems. Emergency power shall be provided for medical life support equipment, operating, recovery, intensive care, emergency rooms, fire detection and alarm systems in any Group I-2 occupancy licensed by the Virginia Department of Health as a hospital, nursing home or hospice facility.

Change the title of IBC Section 410 to read:

STAGES, PLATFORMS AND TECHNICAL PRODUCTION AREAS

Delete the following definitions in IBC Section 410.2:

FLY GALLERY.

GRIDIRON.

Add the following definition to IBC Section 410.2 to read:

TECHNICAL PRODUCTION AREA. Open elevated areas or spaces intended for entertainment technicians to walk on and occupy for servicing and operating entertainment technology systems and equipment. Galleries, including fly and lighting galleries, gridirons, catwalks and similar areas are designed for these purposes.

Delete Section 410.5.3 of the IBC, add new Section 410.6 to the IBC and renumber Sections 410.6 and 410.7 of the IBC to Sections 410.7 and 410.8 respectively.

410.6 Means of egress. Except as modified or as provided for in this section, the provisions of Chapter 10 shall apply.

410.6.1 Arrangement. Where two or more exits or exit access doorways are required per Section 1015.1 from the stage, at least one exit or exit access doorway shall be provided on each side of the stage.

410.6.2 Stairway and ramp enclosure. Stairways and ramps provided from stages, platforms and technical production areas are not required to be enclosed.

410.6.3 Technical production areas. Technical production areas shall be provided with means of egress and means or escape in accordance with Section 410.6.3.1 through 410.6.3.5.

410.6.3.1 Means of egress. At least one means of egress shall be provided from technical production areas.

410.6.3.2 Travel distance. The maximum length of exit access travel shall not exceed 300 feet (91 440 mm) for buildings without a sprinkler system and 400 feet (121 920 mm) for buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

410.6.3.3 Two means of egress. Where two means of egress are required, the common path of travel shall not exceed 100 feet (30 480 mm).

Exception: A means of egress to a roof in place of a second means of egress is permitted.

410.6.3.4 Path of egress travel. The following exit access components are permitted when serving technical production areas:

1. Stairways.
2. Ramps.
3. Spiral stairways.
4. Catwalks.
5. Alternating tread devices.
6. Permanent ladders.

410.6.3.5 Width. The path of egress travel within and from technical production areas shall be a minimum of 22 inches (559 mm).

Add Section 415.1.1 to the IBC to read:

415.1.1 Flammable and combustible liquids. Notwithstanding the provisions of this chapter, the storage, handling, processing, and transporting of flammable and combustible liquids shall be in accordance with the mechanical code and the fire code listed in Chapter 35 of this code. Regulations governing the installation, repair, upgrade, and closure of underground and aboveground storage tanks under the Virginia State Water Control Board regulations 9 VAC 25-91 and 9 VAC 25-580 are adopted and incorporated by reference to be an enforceable part of this code. Where differences occur between the provisions of this code and the incorporated provisions of the State Water Control Board regulations, the provisions of the State Water Control Board regulations shall apply.

Add IBC Section 424 Manufactured Homes and Industrialized Buildings.

Add Section 424.1 to the IBC to read:

424.1 General. The provisions of this section shall apply to the installation or erection of manufactured homes subject to the Virginia Manufactured Home Safety Regulations (13 VAC 5-95) and industrialized buildings subject to the Virginia Industrialized Building Safety Regulations (13 VAC 5-91).

Add Section 424.2 to the IBC to read:

424.2 Site work for manufactured homes. The aspects for the installation and set up of a new manufactured home covered by this code rather than the Virginia Manufactured Home Safety Regulations (13 VAC 5-95) include, but are not limited to, footings, foundations systems, anchoring of the home, exterior, interior close-up, and additions and alterations done during initial installation. Such aspects shall be subject to and shall comply with the manufacturer's installation instructions provided by the manufacturer of the home. To the extent that the manufacturer's installation instructions do not address any aspect enumerated above or when the manufacturer's installation instructions are not available, such aspects shall be subject to and comply with 24 CFR Part 3285 – Model Manufactured Home Installation Standards. To the extent that the manufacturer's installation instructions and 24 CFR Part 3285 do not address any aspect enumerated above, the installer must first attempt to obtain Design Approval Primary Inspection Agency (DAPIA) as defined in 24 CFR Part 3285.5, approved designs and instructions prepared by the manufacturer; or if designs and instructions are not available from the manufacturer, obtain an alternate design prepared and certified by an RDP that is consistent with the manufactured home design, conforms to the requirements of the Manufactured Housing Consensus Committee (MHCSS) as defined in 24 CFR Part 3285.5, and has been approved by the manufacturer and the DAPIA. Stoops, decks, porches and used manufactured homes shall comply with the provisions of this code, which shall include the option of using the IRC for the technical requirements for the installation and set up of the home and the use of Appendix E of the IRC for additions, alterations and repairs to the home. Additionally, all applicable provisions of Chapter 1 of this code, including but not limited to requirements for permits, inspections, certificates of occupancy and requiring compliance, are applicable to the installation and set up of a manufactured home. Where the installation or erection of a manufactured home utilizes components that are to be concealed, the installer shall notify the building official that an inspection is necessary and assure that an inspection is performed and approved prior to concealment of such components, unless the building official has agreed to an alternative method of verification.

Add Section 424.3 to the IBC to read:

424.3 Wind load requirements for manufactured homes. Manufactured homes shall be anchored to withstand the wind loads established by the federal regulation for the area in which the manufactured home is installed. For the purpose of this code, Wind Zone II of the federal regulation shall include the cities of Chesapeake, Norfolk, Portsmouth, and Virginia Beach.

Add Section 424.4 to the IBC to read:

424.4 Skirting requirements for manufactured homes. As used in this section, "skirting" means a weather-resistant material used to enclose the space from the bottom of the manufactured home to grade. In accordance with Section 36-99.8 of the Code of Virginia, manufactured homes installed or relocated shall have skirting installed within 60 days of occupancy of the home. Skirting materials shall be durable, suitable for exterior exposures and installed in accordance with the manufacturer's installation instructions. Skirting shall be secured as necessary to ensure stability, to minimize vibrations, to minimize susceptibility to wind damage and to compensate for possible frost heave. Each manufactured

home shall have a minimum of one opening in the skirting providing access to any water supply or sewer drain connections under the home. Such openings shall be a minimum of 18 inches (457 mm) in any dimension and not less than three square feet (.28 m^2) in area. The access panel or door shall not be fastened in a manner requiring the use of a special tool to open or remove the panel or door. On-site fabrication of the skirting by the owner or installer of the home shall be acceptable, provided that the material meets the requirements of this code. In addition, as a requirement of this code, skirting for the installation and set-up of a new manufactured home shall also comply with the requirements of 24 CFR Part 3285 – Model Manufactured Home Installation Standards.

Add Section 424.5 to the IBC to read:

424.5 Site work for industrialized buildings. Site work for the erection and installation of an industrialized building shall comply with the manufacturer's installation instructions. To the extent that any aspect of the erection or installation of an industrialized building is not covered by the manufacturer's installation instructions, this code shall be applicable, including the use of the IRC for any construction work where the industrialized building would be classified as a Group R-5 building. In addition, all administrative requirements of this code for permits, inspections, and certificates of occupancy are also applicable. Further, the building official may require the submission of plans and specifications for details of items needed to comprise the finished building that are not included or specified in the manufacturer's instructions, including, but not limited to, footings, foundations, supporting structures, proper anchorage, and the completion of the plumbing, mechanical, and electrical systems. Where the installation or erection of an industrialized building utilizes components that are to be concealed, the installer shall notify the building official that an inspection is necessary and assure that an inspection is performed and approved prior to concealment of such components, unless the building official has agreed to an alternative method of verification.

Exception: Temporary family health care structures installed pursuant to Section 15.2-2292.1 of the Code of Virginia shall not be required or permitted to be placed on a permanent foundation, but shall otherwise remain subject to all pertinent provisions of this section.

Add Section 424.6 to the IBC to read:

424.6 Relocated industrialized buildings; alterations and additions. Industrialized buildings constructed prior to January 1, 1972, shall be subject to Section 117 when relocated. Alterations and additions to any existing industrialized buildings shall be subject to pertinent provisions of this code. Building officials shall be permitted to require the submission of plans and specifications for the model to aid in the evaluation of the proposed alteration or addition. Such plans and specifications shall be permitted to be submitted in electronic or other available format acceptable to the building official.

Add IBC Section 425 Aboveground Liquid Fertilizer Tanks.

Add Sections 425.1 through 425.6 to the IBC to read:

425.1 General. This section shall apply to the construction of ALFSTs and shall supersede any conflicting requirements in other provisions of this code. ALFSTs shall also comply with any applicable non-conflicting requirements of this code.

425.1.1 When change of occupancy rules apply. A change of occupancy to use a tank as an ALFST occurs when there is a change in the use of a tank from storing liquids other than liquid fertilizers to use storing liquid fertilizer and when the type of liquid fertilizer being stored has a difference of at least 20 percent of the specific gravity or operating temperature, or both, or a significant change in the material's compatibility.

425.2 Standards. Newly constructed welded steel ALFSTs shall comply with API 650 and TFI RMIP, as applicable. Newly constructed ALFSTs constructed of materials other than welded steel shall be constructed in accordance with accepted engineering practice to prevent the discharge of liquid fertilizer and shall be constructed of materials that are resistant to corrosion, puncture or cracking. In addition, newly constructed ALFSTs constructed of materials other than welded steel shall comply with TFI RMIP, as applicable. For the purposes of this code, the use of TFI RMIP shall be construed as mandatory and any language in TFI RMIP, such as, but not limited to, the terms "should" or "may" which indicate that a provision is only a recommendation or a guideline shall be taken as a requirement. ALFSTs shall be placarded in accordance with NFPA 704.

Exception: Sections 4.1.4, 4.2.5, 5.1.2, 5.2.8, 5.3 and 8.1(d)(i) of TFI RMIP shall not be construed as mandatory.

425.3 Secondary containment. When ALFSTs are newly constructed and when there is a change of occupancy to use a tank as an ALFST, a secondary containment system designed and constructed to prevent any liquid fertilizer from reaching the surface water, groundwater or adjacent land before cleanup occurs shall be provided. The secondary containment system may include dikes, berms or retaining walls, curbing, diversion ponds, holding tanks, sumps, vaults, double-walled tanks, liners external to the tank, or other approved means and shall be capable of holding up to 110 percent of the capacity of the ALFST as certified by an RDP.

425.4 Repair, alteration and reconstruction of ALFSTs. Repair, alteration and reconstruction of ALFSTs shall comply with applicable provisions of API 653 and TFI RMIP.

425.5 Inspection. Applicable inspections as required by and in accordance with API 653 and TFI RMIP shall be performed for repairs and alterations to ALFSTS, the reconstruction of ALFSTs and when there is a change of occupancy to use a tank as an ALFST. When required by API 653 or TFI RMIP, such inspections shall occur prior to the use of the ALFST.

425.6 Abandoned ALFSTs. Abandoned ALFSTs shall comply with applicable provisions of Section 3404.2.13.2 of the IFC.

CHAPTER 7

FIRE AND SMOKE PROTECTION FEATURES

Change Section 703.6 of the IBC to read:

703.6 Fire-resistance assembly marking. Concealed fire walls, vertical fire separation assemblies, fire barriers, fire partitions and smoke barriers shall be designated above ceilings and on the inside of all ceiling access doors which provide access to such fire rated assemblies by signage having letters no smaller than one inch (25.4 mm) in height. Such signage shall indicate the fire-resistance rating of the assembly and the type of assembly and be provided at horizontal intervals of no more than eight feet (2438 mm).

Note: An example of suggested formatting for the signage would be "ONE HOUR FIRE PARTITION."

Change Section 705.2 of the IBC to read:

705.2 Projections. Except for decks and open porches of buildings in Groups R-3 and R-4, cornices, eave overhangs, exterior balconies and similar projections extending beyond the exterior wall shall conform to the requirements of this section and Section 1406. Exterior egress balconies and exterior exit stairways shall also comply with Sections 1019 and 1026, respectively. Projections shall not extend beyond the distance determined by the following three methods, whichever results in the lesser projection:

1. A point one-third the distance from the exterior face of the wall to the lot line where protected openings or a combination of protected and unprotected openings are required in the exterior wall.

2. A point one-half the distance from the exterior face of the wall to the lot line where all openings in the exterior wall are permitted to be unprotected or the building is equipped throughout with an automatic sprinkler system installed under the provisions of Section 705.8.2.

3. More than 12 inches (305 mm) into areas where openings are prohibited.

Buildings on the same lot and considered as portions of one building in accordance with Section 705.3 are not required to comply with this section.

Add Exception 4 to Section 706.5.2 of the IBC to read:

4. Decks and open porches of buildings in Groups R-3 and R-4.

Delete Sections 708.14.1 through 708.14.2.11.

Change Section 716.5.3 of the IBC to read:

716.5.3 Penetrations of shaft enclosures. Shaft enclosures that are permitted to be penetrated by ducts and air transfer openings shall be protected with approved fire and smoke dampers installed in accordance with their listing.

Exceptions:

1. Fire and smoke dampers are not required where steel exhaust subducts extend at least 22 inches (559 mm) vertically in exhaust shafts provided there is a continuous airflow upward to the outside.

2. Fire dampers are not required where penetrations are tested in accordance with ASTM E 119 as part of the fire-resistance rated assembly.

3. Fire and smoke dampers are not required where ducts are used as part of an approved smoke-control system in accordance with Section 909.

4. Fire and smoke dampers are not required where the penetrations are in parking garage exhaust or supply shafts that are separated from other building shafts by not less than two-hour fire-resistance-rated construction.

5. Smoke dampers are not required where the building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1.

CHAPTER 9

FIRE PROTECTION SYSTEMS

Add the following definitions to Section 902 of the IBC to read:

EMERGENCY COMMUNICATION EQUIPMENT. Emergency communication equipment, includes but is not limited to, two-way radio communications, signal booster, bi-directional amplifiers, radiating cable systems or internal multiple antenna, or a combination of the foregoing.

EMERGENCY PUBLIC SAFETY PERSONNEL. Emergency public safety personnel includes firefighters, emergency medical personnel, law-enforcement officers and other emergency public safety personnel routinely called upon to provide emergency assistance to members of the public in a wide variety of emergency situations, including, but not limited to, fires, medical emergencies, violent crimes and terrorist attacks.

Change the following definition in Section 902 of the IBC to read:

AUTOMATIC FIRE-EXTINGUISHING SYSTEM. An approved system of devices and equipment which automatically detects a fire and discharges an approved fire-extinguishing agent onto or in the area of a fire and shall include among other systems an automatic sprinkler system, unless otherwise expressly stated.

Change Section 903.2.1.2 of the IBC to read:

903.2.1.2 Group A-2. An automatic sprinkler system shall be provided for Group A-2 occupancies where one of the following conditions exists:

1. The fire area exceeds 5,000 square feet (464.5 m^2);

2. The fire area has an occupant load of 100 or more in night clubs or 300 or more in other Group A-2 occupancies; or

3. The fire area is located on a floor other than a level of exit discharge serving such occupancies.

Change Item 2 of Section 903.2.1.3 of the IBC to read:

2. In Group A-3 occupancies other than churches, the fire area has an occupant load of 300 or more; or

Change Section 903.2.3 of the IBC to read:

903.2.3 Group E. An automatic sprinkler system shall be provided for Group E occupancies as follows:

1. Throughout all Group E fire areas greater than 20,000 square feet (1858 m^2) in area.

2. Throughout every portion of educational buildings below the lowest level of exit discharge serving that portion of the building.

   Exception: An automatic sprinkler system is not required in any area below the lowest level of exit discharge serving that area where every classroom throughout the building has at least one exterior exit door at ground level.

Change Section 903.2.7 of the IBC to read:

903.2.7 Group M. An automatic sprinkler system shall be provided throughout buildings containing a Group M occupancy where one of the following conditions exists:

1. A Group M fire area exceeds 12,000 square feet (1115 m^2).

2. A Group M fire area is located more than three stories above grade plane.

3. The combined area of all Group M fire areas on all floors, including any mezzanines, exceeds 24,000 square feet (2230 m^2).

Change Section 903.2.8 of the IBC to read:

903.2.8 Group R. An automatic sprinkler system installed in accordance with Section 903.3 shall be provided throughout all buildings with a Group R fire area, except in the following Group R-2 occupancies when the necessary water pressure or volume, or both, for the system is not available:

Exceptions:

1. Buildings which do not exceed two stories, including basements which are not considered as a story above grade, and with a maximum of 16 dwelling units per fire area. Each dwelling unit shall have at least one door opening to an exterior exit access that leads directly to the exits required to serve that dwelling unit.

2. Buildings where all dwelling units are not more than two stories above the lowest level of exit discharge and not more than one story below the highest level of exit discharge of exits serving the dwelling unit and a two-hour fire barrier is provided between each pair of dwelling units. Each bedroom of a dormitory or boarding house shall be considered a dwelling unit under this exception.

Add Item 6 to Section 903.3.1.1.1 of the IBC to read:

6. Elevator machine rooms and elevator machine spaces for occupant evacuation elevators.

Add Section 903.3.1.2.2 to the IBC to read:

903.3.1.2.2 Attics. Sprinkler protection shall be provided for attics in buildings of Type III, IV or V construction in Group R-2 occupancies that are designed or developed and marketed to senior citizens 55 years of age or older and in Group I-1 occupancies in accordance with Section 6.7.2 of NFPA 13R.

Change Section 903.4.2 of the IBC to read:

903.4.2 Alarms. Approved audible devices shall be connected to every automatic sprinkler system. Such sprinkler water-flow alarm devices shall be activated by water flow equivalent to the flow of a single sprinkler of the smallest orifice size installed in the system. Alarm devices shall be provided on the exterior of the building in an approved location. Where a fire alarm system is installed, actuation of the automatic sprinkler system shall actuate the building fire alarm system. Group R-2 occupancies that contain 16 or more dwelling units or sleeping units, any dwelling unit or sleeping unit two or more stories above the lowest level of exit discharge, or any dwelling unit or sleeping unit more than one story below the highest level of exit discharge of exits serving the dwelling unit or sleeping unit shall provide a manual fire alarm box at an approved location to activate the suppression system alarm.

Add an exception to Section 905.2 of the IBC to read:

Exception: The residual pressure of 100 psi for 2-1/2 inch hose connection and 65 psi for 1-1/2 inch hose connection is not required in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and where the highest floor level is not more than 150 feet above the lowest level of fire department vehicle access.

Change Item 1 of Section 906.1 of the IBC to read:

1. In Group A, B, E, F, H, I, M, R-1, R-4, and S occupancies.

   Exceptions:

   1. In Group A, B and E occupancies equipped throughout with quick response sprinklers, portable fire extinguishers shall be required only in locations specified in Items 2 through 6.

   2. In Group I-3 occupancies, portable fire extinguishers shall be permitted to be located at staff locations and the access to such extinguishers shall be permitted to be locked.

Change Section 907.2.1.1 of the IBC to read:

907.2.1.1 System initiation in Group A occupancies with a occupant load of 1,000 or more and in certain night clubs. Activation of the fire alarm in Group A occupancies with an occupant load of 1,000 or more and in night clubs with an occupant load of 300 or more shall initiate a signal using an emergency voice and alarm communications system in accordance with Section 907.5.2.2.

Exception: Where approved, the prerecorded announcement is allowed to be manually deactivated for a period of time, not to exceed three minutes, for the sole purpose of allowing a live voice announcement from an approved, constantly attended location.

Add an exception to Section 907.5.2.1.1 of the IBC to read:

Exception: Sound pressure levels in Group I-3 occupancies shall be permitted to be limited to only the notification of occupants in the affected smoke compartment.

Add Sections 908.7, 908.7.1 and 908.7.2 to the IBC to read:

908.7 Carbon monoxide alarms. Carbon monoxide alarms shall be provided in new buildings and structures in accordance with this section.

908.7.1 Alarm requirements. Carbon monoxide alarms shall be single station, hard wired, plug-in or battery type, listed as complying with UL 2034, and shall be installed in accordance with this code and the manufacturer's installation instructions.

908.7.2 Where required. Carbon monoxide alarms shall be installed outside of each separate sleeping area in the immediate vicinity of the bedrooms in dwelling units and outside of, but in the immediate vicinity of, each sleeping unit in all Group R occupancies located within buildings containing fuel-fired appliances or where a dwelling unit or sleeping unit in a Group R occupancy is attached to a Group U private garage.

Change Section 909.6 of the IBC to read:

909.6 Pressurization method. When approved by the building official, the means of controlling smoke shall be permitted by pressure differences across smoke barriers. Maintenance of a tenable environment is not required in the smoke-control zone of fire origin.

Change Section 911.1.3 of the IBC to read:

911.1.3 Size. The fire command center shall be a minimum of 96 square feet (9 m^2) in area with a minimum dimension of 8 feet (2438 mm).

Exception: Where it is determined by the building official, after consultation with the fire chief, that specific building characteristics require a larger fire command center, the building official may increase the minimum required size of the fire command center up to 200 square feet (19 m^2) in area with a minimum dimension of up to 10 feet (3048 mm).

Change the title of IBC Section 915 to read:

IN-BUILDING EMERGENCY COMMUNICATIONS COVERAGE

Change Section 915.1 of the IBC to read:

915.1 General. For localities utilizing public safety wireless communications, dedicated infrastructure to accommodate and perpetuate continuous in-building emergency communication equipment to allow emergency public safety personnel to send and receive emergency communications shall be provided in new buildings and structures in accordance with this section.

Exceptions:

1. Buildings of Use Groups A-5, I-4, within dwelling units of R-2, R-3, R-4, R-5, and U.
2. Buildings of Type IV and V construction without basements, that are not considered unlimited area buildings in accordance with Section 507.
3. Above grade single story buildings of less than 20,000 square feet.
4. Buildings or leased spaces occupied by federal, state, or local governments, or the contractors thereof, with security requirements where the building official has approved an alternative method to provide emergency communication equipment for emergency public safety personnel.
5. Where the owner provides technological documentation from a qualified individual that the structure or portion thereof does not impede emergency communication signals.

Add Sections 915.1.1, 915.1.2 and 915.1.3 to the IBC to read:

915.1.1 Installation. The building owner shall install radiating cable, such as coaxial cable or equivalent. The radiating cable shall be installed in dedicated conduits, raceways, plenums, attics, or roofs, compatible for these specific installations as well as other applicable provisions of this code. The locality shall be responsible for the installation of any additional communication equipment required for the operation of the system.

915.1.2 Operations. The locality will assume all responsibilities for the operation and maintenance of the emergency communication equipment. The building owner shall provide sufficient operational space within the building to allow the locality access to and the ability to operate in-building emergency communication equipment.

915.1.3 Inspection. In accordance with Section 113.3, all installations shall be inspected prior to concealment.

Add Section 915.2 to the IBC to read:

915.2 Acceptance test. Upon completion of installation, after providing reasonable notice to the owner or their representative, emergency public safety personnel shall have the right during normal business hours, or other mutually agreed upon time, to enter onto the property to conduct field tests to verify that the required level of radio coverage is present at no cost to the owner. Any noted deficiencies in the installation of the radiating cable or operational space shall be provided in an inspection report to the owner or the owner's representative.

CHAPTER 10

MEANS OF EGRESS

Change Section 1004.3 of the IBC to read:

1004.3 Posting of occupant load. Every room or space that is an assembly occupancy and where the occupant load of that room or space is 50 or more shall have the occupant load of the room or space posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

Change Section 1005.1 of the IBC to read:

1005.1 Minimum required egress width. The means of egress width shall not be less than required by this section. The total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.3 inches (7.62 mm) per occupant for stairways and by 0.2 inches (5.08 mm) per occupant for other egress components. The width shall not be less than specified elsewhere in this code. Multiple means of egress shall be sized such that the loss of any one means of egress shall not reduce the available capacity to less than 50 percent of the required capacity. The maximum capacity required from any story of a building shall be maintained to the termination of the means of egress.

Exceptions:

1. Means of egress complying with Section 1028.
2. For occupancies other than Groups H-1, H-2, H-3, H-4 and I-2, in buildings equipped with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2, the total width of means of egress in inches (mm) shall not be less than the total occupant load served by the means of egress multiplied by 0.2 inches (5.08 mm) per occupant for stairways and by 0.15 inches (3.81 mm) per occupant for other egress components.

Change Section 1007.2 of the IBC to read:

1007.2 Continuity and components. Each required accessible means of egress shall be continuous to a public way and shall consist of one or more of the following components:

1. Accessible routes complying with Section 1104.
2. Interior exit stairways complying with Sections 1007.3 and 1022.
3. Exterior exit stairways complying with Sections 1007.3 and 1026 and serving levels other than the level of exit discharge.
4. Elevators complying with Section 1007.4.
5. Platform lifts complying with Section 1007.5.
6. Horizontal exits complying with Section 1025.
7. Ramps complying with Section 1010.

8. Areas of refuge complying with Section 1007.6.

9. Exterior area for assisted rescue complying with Section 1007.7 serving exits at the level of exit discharge.

Change Section 1007.6.2 of the IBC to read:

1007.6.2 Separation. Each area of refuge shall be separated from the remainder of the story by a smoke barrier complying with Section 709 or a horizontal exit complying with Section 1025. Each area of refuge shall be designed to minimize the intrusion of smoke.

Exceptions:

1. Areas of refuge located within an exit enclosure.

2. Areas of refuge where the area of refuge and areas served by the area of refuge are equipped throughout with an automatic sprinkler system installed in accordance with Section 903.3.1.1 or 903.3.1.2.

Change Section 1007.7, including subsections, of the IBC to read:

1007.7 Exterior area for assisted rescue. The exterior area for assisted rescue shall be an area provided on the exterior landing serving an exit door on an accessible route. The exterior area of assisted rescue shall meet the size and access requirements of Section 1007.6.1.

1007.7.1 Separation. Exterior walls separating the exterior area of assisted rescue from the interior of the building shall have a minimum fire resistance rating of 1 hour, rated for exposure to fire from the inside. The fire resistance rated exterior wall construction shall extend horizontally 10 feet (3048 mm) beyond the landing on either side of the landing or equivalent fire resistance rated construction is permitted to extend out perpendicular to the exterior wall 4 feet (1220 mm) minimum on the side of the landing. The fire resistance rated construction shall extend vertically from the ground to a point 10 feet (3048 mm) above the floor level of the area for assisted rescue or to the roof line, whichever is lower. Openings within such fire resistance rated exterior walls shall be protected in accordance with Section 715.

1007.7.2 Openness. The exterior area for assisted rescue shall be at least 50 percent open, and the open area above the guards shall be so distributed as to minimize the accumulation of smoke or toxic gases.

1007.7.3 Exterior stairway. Exterior stairways that are part of the means of egress for the exterior area for assisted rescue shall provide a clear width of 48 inches (1219 mm) between handrails.

Change Item 2 of Section 1008.1.9.3 of the IBC to read:

2. In buildings in occupancy Groups B, F, M and S, the main exterior door or doors are permitted to be equipped with key-operated locking devices from the egress side provided:

   2.1. The locking device is readily distinguishable as locked.

   2.2. A readily visible durable sign is posted on the egress side on or adjacent to the door stating: THIS DOOR TO REMAIN UNLOCKED WHEN BUILDING IS OCCUPIED. The sign shall be in letters one inch (25 mm) high on a contrasting background.

   2.3. The use of the key-operated locking device is revokable by the building official for due cause.

Delete Section 1008.1.9.6 of the IBC.

Change Section 1008.1.9.7 of the IBC to read:

1008.1.9.7 Delayed egress locks. Approved, listed, delayed egress locks shall be permitted to be installed on doors serving any occupancy including Group A-3, airport facilities, except Group A, E and H occupancies in buildings which are equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or an

approved automatic smoke or heat detection system installed in accordance with Section 907, provided that the doors unlock in accordance with Items 1 through 6 below. A building occupant shall not be required to pass through more than one door equipped with a delayed egress lock before entering an exit.

1. The doors unlock upon actuation of the automatic sprinkler system or automatic fire detection system.

2. The doors unlock upon loss of power controlling the lock or lock mechanism.

3. The door locks shall have the capability of being unlocked by a signal from the fire command center.

4. The initiation of an irreversible process which will release the latch in not more than 15 seconds when a force of not more than 15 pounds (67 N) is applied for 1 second to the release device. Initiation of the irreversible process shall activate an audible signal in the vicinity of the door. Once the door lock has been released by the application of force to the releasing device, relocking shall be by manual means only.

   Exception: Where approved, a delay of not more than 30 seconds is permitted.

5. A sign shall be provided on the door located above and within 12 inches (305 mm) of the release device reading: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 15 SECONDS.

   Exception: Where approved, such sign shall read: PUSH UNTIL ALARM SOUNDS. DOOR CAN BE OPENED IN 30 SECONDS.

6. Emergency lighting shall be provided at the door.

Delete the exception in Section 1008.1.10 of the IBC.

Add Section 1008.1.11 to the IBC to read:

1008.1.11 Locking certain residential sliding doors. In dwelling units of Group R-2 buildings, exterior sliding doors which are one story or less above grade, or shared by two dwelling units, or are otherwise accessible from the outside, shall be equipped with locks. The mounting screws for the lock case shall be inaccessible from the outside. The lock bolt shall engage the strike in a manner that will prevent it from being disengaged by movement of the door.

Exception: Exterior sliding doors which are equipped with removable metal pins or charlie bars.

Add Section 1008.1.12 to the IBC to read:

1008.1.12 Door viewers in certain residential buildings. Entrance doors to dwelling units of Group R-2 buildings shall be equipped with door viewers with a field of vision of not less than 180 degrees.

Exception: Entrance doors having a vision panel or side vision panels.

Change Exception 5 of Section 1009.4.2 of the IBC to read:

5. In Group R-3 occupancies; within dwelling units in Group R-2 occupancies; and in Group U occupancies that are accessory to a Group R-3 occupancy or accessory to individual dwelling units in Group R-2 occupancies; the maximum riser height shall be 8.25 inches (210 mm); the minimum tread depth shall be 9 inches (229 mm); the minimum winder tread depth at the walk line shall be 10 inches (254 mm); and the minimum winder tread depth shall be 6 inches (152 mm). A nosing not less than 0.75 inch (19.1 mm) but not more than 1.25 inches (32 mm) shall be provided on stairways with solid risers where the tread depth is less than 11 inches (279 mm).

Add Exception 3 to Section 1009.7 of the IBC to read:

3. Spiral stairways used as a means of egress from technical production areas.

Add Exception 3 to Item 4 of Section 1014.2 of the IBC to read:

3. A maximum of one exit access is permitted to pass through kitchens, store rooms, closets or spaces used for similar purposes provided such a space is not the only means of exit access.

Change Table 1015.1 of the IBC to read:

TABLE 1015.1
SPACES WITH ONE EXIT OR EXIT ACCESS DOORWAY

OCCUPANCY	MAXIMUM OCCUPANT LOAD
A, B, E[a], F, M, U	50
H-1, H-2, H-3	3
H-4, H-5, I-1, I-3, I-4, R	10
S	29

a. Day care maximum occupant load is 10.

Change Exception 2 of Section 1015.2.1 of the IBC to read:

2. Where a building is equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2, the separation distance of the exit doors or exit access doorways shall not be less than one-fourth of the length of the maximum overall diagonal dimension of the area served.

Delete Sections 1015.6 and 1015.6.1 of the IBC.

Change Table 1018.1 of the IBC to read:

TABLE 1018.1
CORRIDOR FIRE-RESISTANCE RATING

OCCUPANTY	OCCUPANT LOAD SERVED BY CORRIDOR	REQUIRED FIRE-RESISTANCE RATING (hours)	
		Without sprinkler system	With sprinkler system[b]
H-1, H-2, H-3	All	Not Permitted	1
H-4, H-5	Greater than 30	Not Permitted	1
A, B, E, F, M, S, U	Greater than 30	1	0
R	Greater than 10	1	0.5
I-2[a], I-4	All	Not Permitted	0
I-1, I-3	All	Not Permitted	0

a. For requirements for occupancies in Group I-2, see Sections 407.2 and 407.3.
b. Buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2.

Add Exception 7 to Section 1018.2 of the IBC to read:

7. Forty-four inches (1118 mm) – In corridors of Group I-2 assisted living facilities serving areas with wheelchair, walker and gurney traffic where residents are capable of self-preservation or where resident rooms have a means of egress door leading directly to the outside.

Change Table 1021.2 to read:

TABLE 1021.2
STORIES WITH ONE EXIT

STORY	OCCUPANCY	MAXIMUM OCCUPANTS (OR DWELLING UNITS) PER FLOOR AND TRAVEL DISTANCE
First story or basement	A, B[d], E[e], F[d], M, U, S[d]	50 occupants and 75 feet travel distance
	H-2, H-3	3 occupants and 25 feet travel distance
	H-4, H-5, I, R	10 occupants and 75 feet travel distance
	S[a]	29 occupants and 100 feet travel distance
Second story	B[b], F, M, S[a]	29 occupants and 75 feet travel distance
	R-2	4 dwelling units and 50 feet travel distance
Third story	R-2[c]	4 dwelling units and 50 feet travel distance

For SI: 1 foot = 304.8 mm.

a. For the required number of exits for parking structures, see Section 1021.1.2.
b. For the required number of exits for air traffic control towers, see Section 412.3.
c. Buildings classified as Group R-2 equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 or 903.3.1.2 and provided with emergency escape and rescue openings in accordance with Section 1029.
d. Group B, F and S occupancies in buildings equipped throughout with an automatic sprinkler system in accordance with Section 903.3.1.1 shall have a maximum travel distance of 100 feet.
e. Day care occupancies shall have a maximum occupant load of 10.

Change Exception 6 of Section 1022.1 of the IBC to read:

6. Means of egress stairways as provided for in Section 410.6.2 are not required to be enclosed.

Change Section 1022.8 of the IBC to read:

1022.8 Floor identification signs. A sign shall be provided at each floor landing in exit enclosures connecting more than three stories designating the floor level, the terminus of the top and bottom of the exit enclosure and the identification of the stair or ramp by designation with a letter of the alphabet. The signage shall also state the story of, and the direction to, the exit discharge and the availability of roof access from the enclosure for the fire department. The sign shall be located 5 feet (1524 mm) above the floor landing in a position that is readily visible when the doors are in the open and closed positions. Floor level identification signs in tactile characters complying with ICC A117.1 shall be located at each floor level landing adjacent to the door leading from the enclosure into the corridor to identify the floor level.

Change Section 1024.1 of the IBC to read:

1024.1 General. Approved luminous egress path markings delineating the exit path shall be provided in buildings of Groups A, B, E, I, M and R-1 having occupied floors located more than 420 feet (128 016 mm) above the lowest level of fire department vehicle access in accordance with Sections 1024.1 through 1024.5.

Exceptions:

1. Luminous egress path markings shall not be required on the level of exit discharge in lobbies that serve as part of the exit path in accordance with Section 1027.1, Exception 1.

2. Luminous egress path markings shall not be required in areas of open parking garages that serve as part of the exit path in accordance with Section 1027.1, Exception 3.

CHAPTER 11

ACCESSIBILITY

Add an exception to Section 1101.2 of the IBC to read:

Exception: Wall-mounted visible alarm notification appliances in Group I-3 occupancies shall be permitted to be a maximum of 120 inches (3048 mm) above the floor or ground, measured to the bottom of the appliance. Such appliances shall otherwise comply with all applicable requirements.

Add Section 1103.2.16 to the IBC to read:

1103.2.16 Raised and lowered areas in places of religious worship. Raised or lowered areas in places of religious worship are not required to be accessible or to be served by an accessible route provided such areas are used exclusively for the performance of religious ceremonies and are located within an accessible story or mezzanine.

Add Section 1106.8 to the IBC to read:

1106.8 Identification of accessible parking spaces. In addition to complying with applicable provisions of this chapter, all accessible parking spaces shall be identified by above grade signs. A sign or symbol painted or otherwise displayed on the pavement of a parking space shall not constitute an above grade sign. All above grade parking space signs shall have the bottom edge of the sign no lower than four feet (1219 mm) nor higher than seven feet (2133 mm) above the parking surface. All disabled parking signs shall include the following language: PENALTY, $100-500 Fine, TOW-AWAY ZONE. Such language may be placed on a separate sign and attached below existing above grade disabled parking signs, provided that the bottom edge of the attached sign is no lower than four feet above the parking surface.

Change Item 1 of Section 1110.1 of the IBC to read:

1. Accessible parking spaces required by Section 1106.1.

CHAPTER 12

INTERIOR ENVIRONMENT

Add the following definitions to Section 1202.1 of the IBC:

DAY-NIGHT AVERAGE SOUND LEVEL (LDN). A 24-hour energy average sound level expressed in dBA, with a 10 decibel penalty applied to noise occurring between 10 p.m. and 7 a.m.

SOUND TRANSMISSION CLASS (STC) RATING. A single number characterizing the sound reduction performance of a material tested in accordance with ASTM E90-90, "Laboratory Measurement of Airborne Sound Transmission Loss of Building Partitions."

Add Section 1203.4.4 to the IBC to read:

1203.4.4 Insect screens in occupancies other than Group R. Every door, window and other outside opening for natural ventilation serving structures classified as other than a residential group containing habitable rooms, food preparation areas, food service areas, or any areas where products to be included or utilized in food for human consumption are processed, manufactured, packaged, or stored, shall be supplied with approved tightly fitting screens of not less than 16 mesh per inch (16 mesh per 25 mm) and every screen door used for insect control shall have a self-closing device.

Exception: Screen doors shall not be required for out swinging doors or other types of openings which make screening impractical, provided other approved means, such as air curtains or insect repellent fans are provided.

Add Section 1203.4.5 to the IBC to read:

1203.4.5 Insect screens in Group R occupancies. Every door, window and other outside opening required for natural ventilation purposes which serves a structure classified as a residential group shall be supplied with approved tightly fitted screens of not less than 16 mesh per inch (16 mesh per 25 mm) and every screen door used for insect control shall have a self-closing device.

Change Section 1207.1 of the IBC to read:

1207.1 Scope. Sections 1207.2 and 1207.3 shall apply to common interior walls, partitions and floor/ceiling assemblies between adjacent dwelling units or between dwelling units and adjacent public areas such as halls, corridors, stairs or service areas. Section 1207.4 applies to the construction of the exterior envelope of Group R occupancies within airport noise zones and to the exterior envelope of Group A, B, E, I and M occupancies in any locality in whose jurisdiction a

United States Master Jet Base is located or any adjacent locality when such requirements are enforced by a locality pursuant to Section 15.2-2295 of the Code of Virginia.

Add Section 1207.4 to the IBC to read:

1207.4 Airport noise attenuation standards. Where the Ldn is determined to be 65 dBA or greater, the minimum STC rating of structure components shall be provided in compliance with Table 1207.4. As an alternative to compliance with Table 1207.4, structures shall be permitted to be designed and constructed so as to limit the interior noise level to no greater than 45 Ldn. Exterior structures, terrain and permanent plantings shall be permitted to be included as part of the alternative design. The alternative design shall be certified by an RDP.

Add Table 1207.4 to the IBC to read:

TABLE 1207.4
AIRPORT NOISE ATTENUATION STANDARDS

LDN	STC OF EXTERIOR WALLS AND ROOF/CEILING ASSEMBLIES	STC OF DOORS AND WINDOWS
65-69	39	25
70-74	44	33
75 or greater	49	38

CHAPTER 13

ENERGY EFFICIENCY

Add Section 1301.1.1.1 to the IBC to read:

1301.1.1.1 Changes to the International Energy Conservation Code (IECC). The following change shall be made to the IECC:

1. Delete Section 401.3.

2. Change Section 403.2.2 to read:

   403.2.2 Sealing (Mandatory). All ducts, air handlers, filter boxes and building cavities used as ducts shall be sealed. Joints and seams shall comply with Section M1601.4.1 of the International Residential Code. Verification of compliance with this section shall be in accordance with either Section 403.2.2.1 or Section 403.2.2.2.

3. Add Section 403.2.2.1 to read:

   403.2.2.1 Testing option. Duct tightness shall be verified by either of the following:

   1. Post-construction test: Leakage to outdoors shall be less than or equal to 8 cfm (3.78 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area or a total leakage less than or equal to 12 cfm (5.66 L/s) per 100 ft^2 (9.29m^2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the entire system, including the manufacturer's air handler end closure. All register boots shall be taped or otherwise sealed during the test.

   2. Rough-in test: Total leakage shall be less than or equal to 6 cfm (2.83 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area when tested at a pressure differential of 0.1 inch w.g. (25 Pa) across the roughed in system, including the manufacturer's air handler enclosure. All register boots shall be taped or otherwise sealed during the test. If the air handler is not installed at the time of the test, total leakage shall be less than or equal to 4 cfm (1.89 L/s) per 100 ft^2 (9.29 m^2) of conditioned floor area.

   Exception: Duct tightness test is not required if the air handler and all ducts are located within conditioned space.

When this option is chosen, testing shall be performed by approved qualified individuals, testing agencies or contractors. Testing and results shall be as prescribed in Section 403.2.2 and approved recognized industry standards.

4. Add Section 403.2.2.2 to read:

403.2.2.2 Visual inspection option. In addition to the inspection of ducts otherwise required by this code, when the air handler and all ducts are not within conditioned space and this option is chosen to verify duct tightness, duct tightness shall be considered acceptable when the requirements of Section 403.2.2 are field verified.

CHAPTER 14

EXTERIOR WALLS

Change Section 1405.13.2 of the IBC to read:

1405.13.2 Window sills. In Occupancy Groups R-2 and R-3, one- and two-family and multiple-family dwellings, where the opening of the sill portion of an operable window is located more than 72 inches (1829 mm) above the finished grade or other surface below, the lowest part of the clear opening of the window shall be at a height not less than 18 inches (457 mm) above the finished floor surface of the room in which the window is located. Glazing between the floor and a height of 18 inches (457 mm) shall be fixed or have openings through which a 4-inch (102 mm) diameter sphere cannot pass.

Exception: Openings that are provided with window guards that comply with ASTM F2006 or F2090.

CHAPTER 16

STRUCTURAL DESIGN

Change Section 1609.3 of the IBC to read:

1609.3 Basic wind speed. The basic wind speed, in mph, for the determination of the wind loads shall be determined by Figure 1609. Wind speeds for localities in special wind regions, near mountainous terrains, and near gorges shall be based on elevation. Areas at 4,000 feet in elevation or higher shall use 110 V mph (48.4 m/s) and areas under 4,000 feet in elevation shall use 90 V mph (39.6 m/s). Gorge areas shall be based on the highest recorded speed per locality or in accordance with local jurisdiction requirements determined in accordance with Section 6.5.4 of ASCE 7.

In nonhurricane-prone regions, when the basic wind speed is estimated from regional climatic data, the basic wind speed shall be not less than the wind speed associated with an annual probability of 0.02 (50-year mean recurrence interval), and the estimate shall be adjusted for equivalence to a three-second gust wind speed at 33 feet (10 m) above ground in exposure Category C. The data analysis shall be performed in accordance with Section 6.5.4.2 of ASCE 7.

Add Section 1612.1.1 to the IBC to read:

1612.1.1 Elevation of manufactured homes. New or replacement manufactured homes to be located in any flood hazard zone shall be placed in accordance with the applicable elevation requirements of this code.

Exception: Manufactured homes installed on sites in an existing manufactured home park or subdivision shall be permitted to be placed so that the manufactured home chassis is supported by reinforced piers or other foundation elements of at least equivalent strength that are no less than 36 inches (914 mm) above grade in lieu of being elevated at or above the base flood elevation provided no manufactured home at the same site has sustained flood damage exceeding 50% of the market value of the home before the damage occurred.

CHAPTER 17

STRUCTURAL TESTS AND SPECIAL INSPECTIONS

Change Section 1703.1 of the IBC to read:

1703.1 Approved agency. An approved agency responsible for laboratory testing or special inspections, or both, must comply with the qualification, certification and experience requirements of ASTM E329 or the alternatives listed herein.

Change Section 1703.1.1 of the IBC to read:

1703.1.1 Independence. An approved agency shall be objective and competent. The agency shall also disclose possible conflicts of interest so that objectivity can be confirmed. The special inspector and their agents shall be independent from the person, persons or contractor responsible for the physical construction of the project requiring special inspections.

Change Section 1703.1.3 of the IBC to read:

1703.1.3 Personnel. An approved agency shall employ experienced personnel educated in conducting, supervising and evaluating tests or inspections, or both. Upon request by the building official, documentation shall be provided demonstrating the applicable agency's accreditation as noted in ASTM E329 and individuals' resumes indicating pertinent training, certifications and other qualifications for special inspection personnel associated with the proposed construction requiring special inspections. The building official may prescribe the manner of qualification documentation and frequency of updating information regarding agency or individual inspector approval.

Firms providing special inspection services or individual inspectors seeking approval of alternative certifications or qualifications, or both, listed in ASTM E329 may submit documentation demonstrating equivalency. This documentation may include evidence of meeting other recognized standards or alternative certifications to demonstrate that the minimum qualifications, certification and experience intended by ASTM E329 have been met. The building official may, if satisfied that equivalency has been demonstrated, approve the credentials of the firm or individual.

Change Section 1704.1 of the IBC to read:

1704.1. General. Where application is made for construction as described in this section, the owner shall employ one or more special inspectors to provide inspections during construction on the types of work listed under Section 1704. All individuals or agents performing special inspection functions shall operate under the direct supervision of an RDP in responsible charge of special inspection activities, also known as the "special inspector." The special inspector shall ensure that the individuals under their charge are performing only those special inspections or laboratory testing that are consistent with their knowledge, training and certification for the specified inspection or laboratory testing.

Exceptions:

1. Special inspections are not required for work of a minor nature or as warranted by conditions in the jurisdiction as approved by the building official.

2. Special inspections are not required for building components unless the design involves the practice of professional engineering or architecture as defined by the laws of this Commonwealth and regulations governing the professional registration and certification of engineers and architects.

3. Unless otherwise required by the building official, special inspections are not required for occupancies in Groups R-3, R-4 or R-5 and occupancies in Group U that are accessory to a residential occupancy including, but not limited to, those listed in Section 312.1.

Change Section 1704.1.1 of the IBC to read:

1704.1.1 Statement of special inspections. The permit applicant shall submit a statement of special inspections prepared by the RDP in responsible charge in accordance with Section 111.1. This statement shall be in accordance with Section 1705.

Exceptions:

1. A statement of special inspections is not required for structures designed and constructed in accordance with the conventional construction provisions of Section 2308.

2. The statement of special inspections is permitted to be prepared by a qualified person approved by the building official for construction not designed by a registered design professional.

Change category "12" of Table 1704.4 of the IBC to read:

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD[a]	IBC REFERENCE
12. Inspect formwork for shape, location and dimensions of the concrete member being formed, shoring and reshoring.	–	X	ACI 318: 6.1, 6.2	1906

CHAPTER 18

SOILS AND FOUNDATIONS

Change the exception to Section 1804.5 of the IBC to read:

Exception: Compacted fill material less than 12 inches (305 mm) in depth need not comply with an approved report, provided it is a natural non-organic material that is not susceptible to swelling when exposed to moisture and it has been compacted to a minimum of 90% Modified Proctor in accordance with ASTM D1557. The compaction shall be verified by a qualified inspector approved by the building official. Material other than natural material may be used as fill material when accompanied by a certification from an RDP and approved by the building official.

Add an exception to Section 1808.1 of the IBC to read:

Exception: One-story detached accessory structures not exceeding 256 square feet ($23.78m^2$) of building area, provided all of the following conditions are met:

1. The building eave height is 10 feet (3048 mm) or less.

2. The maximum height from the finished floor level to grade does not exceed 18 inches (457.2 mm).

3. The supporting structural elements in direct contact with the ground shall be placed level on firm soil and when such elements are wood they shall be approved pressure preservative treated suitable for ground contact use.

4. The structure is anchored to withstand wind loads as required by this code.

5. The structure shall be of light-frame construction with walls and roof of light weight material, not slate, tile, brick or masonry.

CHAPTER 27

ELECTRICAL

Change Section 2701.1 of the IBC to read:

2701.1 Scope. This chapter governs the electrical components, equipment and systems used in buildings and structures covered by this code. Electrical components, equipment and systems shall be designed and constructed in accordance with the provisions of this code and NFPA 70.

Add Section 2701.1.1 to the IBC to read:

2701.1.1 Changes to NFPA 70. The following change shall be made to NFPA 70:

1. Change Sections 334.10(2) and 334.10(3) of NFPA 70 to read:

   (2) Multifamily dwellings not exceeding four floors above grade and multifamily dwellings of any height permitted to be of Types III, IV and V construction except in any case as prohibited in 334.12.

   (3) Other structures not exceeding four floors above grade and other structures of any height permitted to be of Types III, IV and V construction except in any case as prohibited in 334.12. In structures exceeding four floors above grade, cables shall be concealed within walls, floors or ceilings that provide a thermal barrier of material that has at least a 15-minute finish rating as identified in listings of fire-rated assemblies.

For the purpose of Items 2 and 3 above, the first floor of a building shall be that floor that has 50% or more of the exterior wall surface area level with or above finished grade. One additional level that is the first level and not designed for human habitation and used only for vehicle parking, storage or similar use shall be permitted.

Add Section 2701.1.2 to the IBC to read:

2701.1.2 Temporary connection to dwelling units. The building official shall give permission to energize the electrical service equipment of a one- or two-family dwelling unit when all of the following requirements have been approved:

1. The service wiring and equipment, including the meter socket enclosure, shall be installed and the service wiring terminated.

2. The grounding electrode system shall be installed and terminated.

3. At least one receptacle outlet on a ground fault protected circuit shall be installed and the circuit wiring terminated.

4. Service equipment covers shall be installed.

5. The building roof covering shall be installed.

6. Temporary electrical service equipment shall be suitable for wet locations unless the interior is dry and protected from the weather.

Add Section 2701.1.3 to the IBC to read:

2701.1.3 Assisted living facility generator requirements. Generators installed to comply with regulations for assisted living facilities licensed by the Virginia Department of Social Services shall be permitted to be optional standby systems.

Change Section 2702.2.17 of the IBC to read:

2702.2.17 Group I-2 and I-3 occupancies. Emergency power shall be provided in accordance with Section 407.11 for Group I-2 occupancies licensed by the Virginia Department of Health as a hospital, nursing or hospice facility. Emergency power shall be provided for doors in Group I-3 occupancies in accordance with Section 408.4.2.

CHAPTER 28

MECHANICAL SYSTEMS

Change Section 2801.1 of the IBC to read:

2801.1 Scope. Mechanical appliances, equipment and systems shall be constructed and installed in accordance with this chapter, the International Mechanical Code and the International Fuel Gas Code. Masonry chimneys, fireplaces and barbecues shall comply with the International Mechanical Code and Chapter 21 of this code.

Exception: This code shall not govern the construction of water heaters, boilers and pressure vessels to the extent which they are regulated by the Virginia Boiler and Pressure Vessel Regulations (16 VAC 25-50). However, the building official may require the owner of a structure to submit documentation to substantiate compliance with those regulations.

Add Section 2801.1.1 to the IBC to read:

2801.1.1 Required heating in dwelling units. Heating facilities shall be required in every dwelling unit or portion thereof which is to be rented, leased or let on terms, either expressed or implied, to furnish heat to the occupants thereof. The heating facilities shall be capable of maintaining the room temperature at 65°F (18°C) during the period from October 15 to May 1 during the hours between 6:30 a.m. and 10:30 p.m. of each day and not less than 60°F (16°C) during other hours when measured at a point three feet (914 mm) above the floor and three feet (914 mm) from the exterior walls. The capability of the heating system shall be based on the outside design temperature required for the locality by this code.

Add Section 2801.1.2 to the IBC to read:

2801.1.2 Required heating in nonresidential structures. Heating facilities shall be required in every enclosed occupied space in nonresidential structures. The heating facilities shall be capable of producing sufficient heat during the period from October 1 to May 15 to maintain a temperature of not less than 65°F (18°C) during all working hours. The required room temperature shall be measured at a point three feet (914 mm) above the floor and three feet (914 mm) from the exterior walls.

Processing, storage and operation areas that require cooling or special temperature conditions and areas in which persons are primarily engaged in vigorous physical activities are exempt from these requirements.

Add Section 2801.1.3 to the IBC to read:

2801.1.3 Changes to the International Mechanical Code (IMC). The following changes shall be made to the IMC:

1. Change Section 403.3 of the IMC to read:

   403.3 Outdoor airflow rate. Ventilation systems shall be designed to have the capacity to supply the minimum outdoor airflow rate determined in accordance with this section. The occupant load utilized for design of the ventilation system shall not be less than the number determined from the estimated maximum occupant load rate indicated in Table 403.3. Ventilation rates for occupancies not represented in Table 403.3 shall be those for a listed occupancy classification that is most similar in terms of occupant density, activities and building construction; or shall be determined by an approved engineering analysis. The ventilation system shall be designed to supply the required rate of ventilation air continuously during the period the building is occupied, except as otherwise stated in other provisions of the code.

   With the exception of smoking lounges and other designated areas where smoking is permitted, the ventilation rates in Table 403.3 are based on the absence of smoking in occupiable spaces.

   Exception: The occupant load is not required to be determined based on the estimated maximum occupant load rate indicated in Table 403.3 where approved statistical data document the accuracy of an alternate anticipated occupant density.

2. Add the following areas to Table 403.3 of the IMC in the occupancy classifications shown:

OCCUPANCY CLASSIFICATION	PEOPLE OUTDOOR AIRFLOW RATE IN BREATHING ZONE CFM/PERSON	AREA OUTDOOR AIRFLOW RATE IN BREATHING ZONE R_a CFM/FT^2 [a]	DEFAULT OCCUPANT DENSITY #/1000 FT^2 [a]	EXHAUST AIRFLOW RATE CFM/FT^2 [a]
Food and beverage service				
Bars or cocktail lounges designated as an area where smoking is permitted[b]	30	-	100	-
Cafeteria or fast food designated as an area where smoking is permitted[b]	20	-	100	-
Dining rooms designated as an area where smoking is permitted[b]	20	-	70	-
Public spaces				
Lounges designated as an area where smoking is permitted[b]	30	-	-	-

3. Add Section 801.1.1 to the IMC to read:

   801.1.1 Equipment changes. Upon the replacement or new installation of any fuel-burning appliances or equipment in existing buildings, an inspection or inspections shall be conducted to ensure that the connected vent or chimney systems comply with the following:

   1. Vent or chimney systems are sized in accordance with this code.

   2. Vent or chimney systems are clean, free of any obstruction or blockages, defects or deterioration and are in operable condition.

   Where not inspected by the local building department, persons performing such changes or installations shall certify to the building official that the requirements of Items 1 and 2 of this section are met.

4. Change Section 1101.10 of the IMC to read:

   1101.10 Locking access port caps. Refrigerant circuit access ports located outdoors shall be fitted with locking-type tamper-resistant caps or shall be otherwise secured to prevent unauthorized access.

Add Section 2801.1.4 to the IBC to read:

2801.1.4 Changes to the International Fuel Gas Code. The following changes shall be made to the International Fuel Gas Code:

1. Change Section 301.1 of the International Fuel Gas Code to read:

   301.1 Scope. This code shall apply to the installation of fuel gas piping systems, fuel gas utilization equipment, and related accessories as follows:

   1. Coverage of piping systems shall extend from the point of delivery to the connections with gas utilization equipment. (See "point of delivery.")

   2. Systems with an operating pressure of 125 psig (862 kPa gauge) or less.

      Piping systems for gas-air mixtures within the flammable range with an operating pressure of 10 psig (69 kPa gauge) or less.

LP-Gas piping systems with an operating pressure of 20 psig (140 kPa gauge) or less.

3. Piping systems requirements shall include design, materials, components, fabrication, assembly, installation, testing and inspection.

4. Requirements for gas utilization equipment and related accessories shall include installation, combustion and ventilation air and venting.

This code shall not apply to the following:

1. Portable LP-Gas equipment of all types that are not connected to a fixed fuel piping system.

2. Installation of farm equipment such as brooders, dehydrators, dryers, and irrigation equipment.

3. Raw material (feedstock) applications except for piping to special atmosphere generators.

4. Oxygen-fuel gas cutting and welding systems.

5. Industrial gas applications using gases such as acetylene and acetylenic compounds, hydrogen, ammonia, carbon monoxide, oxygen, and nitrogen.

6. Petroleum refineries, pipeline compressor or pumping stations, loading terminals, compounding plants, refinery tank farms, and natural gas processing plants.

7. Integrated chemical plants or portions of such plants where flammable or combustible liquids or gases are produced by chemical reactions or used in chemical reactions.

8. LP-Gas installations at utility gas plants.

9. Liquefied natural gas (LNG) installations.

10. Fuel gas piping in power and atomic energy plants.

11. Proprietary items of equipment, apparatus, or instruments such as gas generating sets, compressors, and calorimeters.

12. LP-Gas equipment for vaporization, gas mixing, and gas manufacturing.

13. Temporary LP-Gas piping for buildings under construction or renovation that is not to become part of the permanent piping system.

14. Installation of LP-Gas systems for railroad switch heating.

15. Installation of LP-Gas and compressed natural gas (CNG) systems on vehicles.

16. Except as provided in Section 401.1.1, gas piping, meters, gas pressure regulators, and other appurtenances used by the serving gas supplier in the distribution of gas, other than undiluted LP-Gas.

17. Building design and construction, except as specified herein.

2. Add Section 404.9.3 to the International Fuel Gas Code to read:

404.9.3 Coating application. Joints in gas piping systems shall not be coated prior to testing and approval.

3. Add Section 501.1.1 to the International Fuel Gas Code to read:

501.1.1 Equipment changes. Upon the replacement or new installation of any fuel-burning appliances or equipment in existing buildings, an inspection or inspections shall be conducted to ensure that the connected vent or chimney systems comply with the following:

1. Vent or chimney systems are sized in accordance with this code.

2. Vent or chimney systems are clean, free of any obstruction or blockages, defects or deterioration and are in operable condition.

Where not inspected by the local building department, persons performing such changes or installations shall certify to the building official that the requirements of Items 1 and 2 of this section are met.

CHAPTER 29

PLUMBING SYSTEMS

Change Section 2901.1 of the IBC to read:

2901.1 Scope. The provisions of this chapter and the International Plumbing Code (IPC) shall govern the design and installation of all plumbing systems and equipment, except that as provided for in Section 103.11 for functional design, water supply sources and sewage disposal systems are regulated and approved by the Virginia Department of Health and the Virginia Department of Environmental Quality. The approval of pumping and electrical equipment associated with such water supply sources and sewage disposal systems shall, however, be the responsibility of the building official.

Note: See also the Memorandum of Agreement in the "Related Laws Package," which is available from DHCD.

Add Section 2901.1.1 to the IBC to read:

2901.1.1 Use of Appendix C of the IPC for gray water and rain water recycling systems. In addition to other applicable provisions of the IPC, gray water recycling systems and rain water recycling systems shall comply with the provisions in Appendix C of the IPC. In the use of Appendix C of the IPC for rain water recycling systems, the term "rain water" shall be substituted for the term "gray water." Gray water recycling systems and rain water recycling systems shall be separate systems and shall not be interconnected.

Add Section 2901.1.2 to the IBC to read:

2901.1.2 Changes to the IPC. The following changes shall be made to the IPC:

1. Change Section 301.3 of the IPC to read:

   301.3 Connections to drainage system. All plumbing fixtures, drains, appurtenances and appliances used to receive or discharge liquid wastes or sewage shall be directly connected to the sanitary drainage system of the building or premises, in accordance with the requirements of this code. This section shall not be construed to prevent indirect waste systems required by Chapter 8.

   Exception: Bathtubs, showers, lavatories, clothes washers and laundry trays shall not be required to discharge to the sanitary drainage system where such fixtures discharge to an approved gray water system or rain water system for flushing of water closets and urinals or for subsurface landscape irrigation.

2. Delete Sections 311 and 311.1 of the IPC.

3. Change Section 602.1 of the IPC to read:

   602.1 General. Every structure equipped with plumbing fixtures and utilized for human occupancy or habitation shall be provided with a potable supply of water in the amounts and at the pressures specified in this chapter. This shall not prohibit the use of reclaimed water distribution systems installed in accordance with this code and the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740).

4. Change Section 604.1 of the IPC to read:

   604.1 General. The design of the water distribution system, including any reclaimed water distribution systems governed by the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740), shall conform to accepted engineering practice. Methods utilized to determine pipe sizes shall be approved.

5. Add an exception to Section 608.8 of the IPC to read:

   Exception: Reclaimed water supply systems shall be identified in accordance with the provisions of the Virginia Water Reclamation and Reuse Regulation (9 VAC 25-740).

6. Change Section 608.8.2 of the IPC to read:

   608.8.2 Color. The color of the pipe identification shall be discernable and consistent throughout the building. The color purple shall be used to identify rain and gray water distribution systems.

7. Delete Section 701.9 of the IPC.

8. Add Section 703.6 of the IPC to read:

   703.6 Tracer wire. Nonmetallic sanitary sewer piping that discharges to public systems shall be locatable. An insulated copper tracer wire, 18 AWG minimum in size and suitable for direct burial or an equivalent product, shall be utilized. The wire shall be installed in the same trench as the sewer within 12 inches (305 mm) of the pipe and shall be installed to within five feet (1524 mm) of the building wall to the point where the building sewer intersects with the public system. At a minimum, one end of the wire shall terminate above grade in an accessible location that is resistant to physical damage, such as with a cleanout or at the building wall.

CHAPTER 30

ELEVATORS AND CONVEYING SYSTEMS

Change Section 3002.4 of the IBC to read:

3002.4 Elevator car to accommodate ambulance stretcher. Where elevators are provided in buildings four or more stories above, or four or more stories below, grade plane, at least one elevator shall be provided for fire department emergency access to all floors. The elevator car shall be of such a size and arrangement to accommodate an ambulance stretcher 24 inches by 84 inches (610 mm by 2134 mm) with not less than five-inch (127 mm) radius corners, in the horizontal, open position and shall be identified by the international symbol for emergency medical services (star of life). The symbol shall not be less than three inches (76 mm) high and shall be placed inside on both sides of the hoistway door frame on the designated and alternate landing floors required to be established by ASME A17.1.

Exception: Elevators in multistory dwelling units or guest rooms.

Add Section 3003.2.1 to the IBC to read:

3003.2.1 Standardized fire service elevator keys. Where a key is required to operate the emergency function of an elevator, the key shall be a standardized fire service key in accordance with the Virginia Statewide Fire Prevention Code (13 VAC 5-51).

Change Section 3006.4 of the IBC to read:

3006.4 Machine rooms and machinery spaces. Elevator machine rooms, rooms housing elevator controllers, and machinery spaces shall be enclosed with fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both. The fire-resistance rating shall not be less than the required rating of the hoistway enclosure served by the machinery. Openings in the fire barriers shall be protected with assemblies having a fire protection rating not less than that required for the hoistway enclosure doors.

Exceptions:

1. Where machine rooms, rooms housing elevator controllers, and machinery spaces do not abut and have no openings to the hoistway enclosure they serve, the fire barriers constructed in accordance with Section 707 or horizontal assemblies constructed in accordance with Section 712, or both, shall be permitted to be reduced to a one-hour fire-resistance rating.

2. In buildings four stories or less above grade plane when machine rooms, rooms housing elevator controllers, and machinery rooms do not abut and have no openings to the hoistway enclosure they serve, the machine room, room housing elevator controllers, and machinery spaces are not required to be fire-resistance rated.

Add Section 3006.7 to the IBC to read:

3006.7 Machine-room-less designs. Where machine-room-less designs are utilized they shall comply with the provisions of ASME A17.1 and incorporate the following:

1. Where the elevator car-top will be used as a work platform, it shall be equipped with permanently installed guards on all open sides. Guards shall be permitted to be of collapsible design, but otherwise must conform to all applicable requirements of this code for guards.

2. Where the equipment manufacturer's procedures for machinery removal and replacement depend on overhead structural support or lifting points, such supports or lifting points shall be permanently installed at the time of initial equipment installation.

3. Where the structure that the elevator will be located in is required to be fully sprinklered by this code, the hoistway that the elevator machine is located in shall be equipped with a fire suppression system as a machine room in accordance with NFPA 13. Smoke detectors for the automatic initiation of Phase I Emergency Recall Operation, and heat detectors or other approved devices that automatically disconnect the main line power supply to the elevators, shall be installed within the hoistway.

Change Section 3008.1 of the IBC to read:

3008.1 General. Where elevators in buildings greater than 420 feet (128 016 mm) in building height are to be used for occupant self-evacuation during fires, all passenger elevators for general public use shall comply with this section.

CHAPTER 33

SAFEGUARDS DURING CONSTRUCTION

Delete IBC Sections 3305 and 3305.1.

CHAPTER 34

EXISTING STRUCTURES

Change Section 3401.1 of the IBC to read:

3401.1 Scope. The provisions of this chapter and the applicable requirements of Chapter 1 shall control the alteration, repair, addition and change of occupancy of existing structures.

Delete IBC Sections 3401.2, 3401.3, 3401.4, and 3401.5.

Delete IBC Sections 3403, 3404, 3405, and 3406.

Change Section 3407.1 of the IBC to read:

3407.1 Standards for replacement glass. In accordance with Section 36-99.2 of the Code of Virginia, any replacement glass installed in buildings constructed prior to the first edition of the USBC shall meet the quality and installation standards for glass installed in new buildings as are in effect at the time of installation. In addition, as a requirement of this code, the installation or replacement of glass in buildings constructed under any edition of the USBC shall be as required for new installations.

Delete IBC Section 3408.

Delete IBC Section 3410.

Change Section 3412.2 of the IBC to read:

3412.2 Applicability. When specifically requested by an owner or an owner's agent in structures where there is work involving additions, alterations or changes of occupancy, the provisions in Sections 3412.2.1 through 3412.2.5 shall apply to existing occupancies that will continue to be, or are proposed to be, in Groups A, B, E, F, M, R, S and U. These provisions shall not apply to buildings with occupancies in Group H or I.

Add an exception to Section 3412.2.1 of the IBC to read:

Exception: Plumbing, mechanical and electrical systems in buildings undergoing a change of occupancy shall be subject to any applicable requirements of Section 103.3 of this code.

Change Section 3412.2.5 of the IBC to read:

3412.2.5 Accessibility requirements. All portions of the buildings proposed for change of occupancy and all alterations to existing buildings shall conform to the applicable accessibility provisions of Section 3411.

Add IBC Section 3413 Retrofit Requirements.

Add Section 3413.1 to the IBC to read:

3413.1 Scope. In accordance with Section 103.7 and as setout herein, the following buildings are required to be provided with certain fire protection equipment or systems or other retrofitted components.

Add Section 3413.2 to the IBC to read:

3413.2 Smoke detectors in colleges and universities. In accordance with Section 36-99.3 of the Code of Virginia, college and university buildings containing dormitories for sleeping purposes shall be provided with battery-powered or AC-powered smoke detector devices installed therein in accordance with this code in effect on July 1, 1982. All public and private college and university dormitories shall have installed such detectors regardless of when the building was constructed. The chief administrative office of the college or university shall obtain a certificate of compliance with the provisions of this subsection from the building official of the locality in which the college or university is located or in the case of state-owned buildings, from the Director of the Virginia Department of General Services. The provisions of this section shall not apply to any dormitory at a state-supported military college or university which is patrolled 24 hours a day by military guards.

Add Section 3413.3 to the IBC to read:

3413.3 Smoke detectors in certain juvenile care facilities. In accordance with Section 36-99.4 of the Code of Virginia, battery-powered or AC-powered smoke detectors shall be installed in all local and regional detention homes, group homes, and other residential care facilities for children and juveniles which are operated by or under the auspices of the Virginia Department of Juvenile Justice, regardless of when the building was constructed, by July 1, 1986, in accordance with the provisions of this code that were in effect on July 1, 1984. Administrators of such homes and facilities shall be responsible for the installation of the smoke detector devices.

Add Section 3413.4 to the IBC to read:

3413.4 Smoke detectors for the deaf and hearing-impaired. In accordance with Section 36-99.5 of the Code of Virginia, smoke detectors providing an effective intensity of not less than 100 candela to warn a deaf or hearing-impaired individual shall be provided, upon request by the occupant to the landlord or proprietor, to any deaf or hearing-impaired occupant of any of the following occupancies, regardless of when constructed:

1. All dormitory buildings arranged for the shelter and sleeping accommodations of more than 20 individuals;

2. All multiple-family dwellings having more than two dwelling units, including all dormitories, boarding and lodging houses arranged for shelter and sleeping accommodations of more than five individuals; or

3. All buildings arranged for use of one-family or two-family dwelling units.

A tenant shall be responsible for the maintenance and operation of the smoke detector in the tenant's unit.

A hotel or motel shall have available no fewer than one such smoke detector for each 70 units or portion thereof, except that this requirement shall not apply to any hotel or motel with fewer than 35 units. The proprietor of the hotel or motel shall post in a conspicuous place at the registration desk or counter a permanent sign stating the availability of smoke detectors for the hearing impaired. Visual detectors shall be provided for all meeting rooms for which an advance request has been made.

Add Sections 3413.5, 3413.5.1, and 3413.5.2 to the IBC to read:

3413.5 Assisted living facilities (formerly known as adult care residences or homes for adults). Existing assisted living facilities licensed by the Virginia Department of Social Services shall comply with this section.

3413.5.1 Fire protective signaling system and fire detection system. A fire protective signaling system and an automatic fire detection system meeting the requirements of the USBC, Volume I, 1987 Edition, Third Amendment, shall be installed in assisted living facilities by August 1, 1994.

Exception: Assisted living facilities that are equipped throughout with a fire protective signaling system and an automatic fire detection system.

3413.5.2 Single and multiple station smoke detectors. Battery or AC-powered single and multiple station smoke detectors meeting the requirements of the USBC, Volume I, 1987 Edition, Third Amendment, shall be installed in assisted living facilities by August 1, 1994.

Exception: Assisted living facilities that are equipped throughout with single and multiple station smoke detectors.

Add Section 3413.6 to the IBC to read:

3413.6 Smoke detectors in buildings containing dwelling units. AC-powered smoke detectors with battery backup or an equivalent device shall be required to be installed to replace a defective or inoperative battery-powered smoke detector located in buildings containing one or more dwelling units or rooming houses offering to rent overnight sleeping accommodations, when it is determined by the building official that the responsible party of such building or dwelling unit fails to maintain battery-powered smoke detectors in working condition.

Add Section 3413.7 to the IBC to read:

3413.7 Fire suppression, fire alarm and fire detection systems in nursing homes and facilities. Fire suppression systems as required by the edition of this code in effect on October 1, 1990, shall be installed in all nursing facilities licensed by the Virginia Department of Health by January 1, 1993, regardless of when such facilities or institutions were constructed. Units consisting of certified long-term care beds located on the ground floor of general hospitals shall be exempt from the requirements of this section.

Fire alarm or fire detector systems, or both, as required by the edition of this code in effect on October 1, 1990, shall be installed in all nursing homes and nursing facilities licensed by the Virginia Department of Health by August 1, 1994.

Add Section 3413.8 to the IBC to read:

3413.8 Fire suppression systems in hospitals. Fire suppression systems shall be installed in all hospitals licensed by the Virginia Department of Health as required by the edition of this code in effect on October 1, 1995, regardless of when such facilities were constructed.

Add Section 3413.9 to the IBC to read:

3413.9 Identification of handicapped parking spaces by above grade signs. All parking spaces reserved for the use of handicapped persons shall be identified by above grade signs, regardless of whether identification of such spaces by above grade signs was required when any particular space was reserved for the use of handicapped persons. A sign or symbol painted or otherwise displayed on the pavement of a parking space shall not constitute an above grade sign. Any parking space not identified by an above grade sign shall not be a parking space reserved for the handicapped within the meaning of this section. All above grade handicapped parking space signs shall have the bottom edge of the sign no lower than four feet (1219 mm) nor higher than seven feet (2133 mm) above the parking surface. Such signs shall be designed and constructed in accordance with the provisions of Chapter 11 of this code. All disabled parking signs shall include the following language: PENALTY, $100-500 Fine, TOW-AWAY ZONE. Such language may be placed on a separate sign and attached below existing above grade disabled parking signs, provided that the bottom edge of the attached sign is no lower than four feet above the parking surface.

Add Section 3413.10 to the IBC to read:

3413.10 Smoke detectors in hotels and motels. Smoke detectors shall be installed in hotels and motels as required by the edition of VR 394-01-22, USBC, Volume II, in effect on March 1, 1990, by the dates indicated, regardless of when constructed.

Add Section 3413.11 to the IBC to read:

3413.11 Sprinkler systems in hotel and motels. By September 1, 1997, an automatic sprinkler system shall be installed in hotels and motels as required by the edition of VR 394-01-22, USBC, Volume II, in effect on March 1, 1990, regardless of when constructed.

Add Section 3413.12 to the IBC to read:

3413.12 Fire suppression systems in dormitories. An automatic fire suppression system shall be provided throughout all buildings having a Group R-2 fire area which are more than 75 feet (22,860 mm) or six stories above the lowest level of exit discharge and which are used, in whole or in part, as a dormitory to house students by any public or private institution of higher education, regardless of when such buildings were constructed, in accordance with the edition of this code in effect on August 20, 1997, and the requirements for sprinkler systems under the edition of the NFPA 13 standard referenced by that code. The automatic fire suppression system shall be installed by September 1, 1999. The chief administrative office of the college or university shall obtain a certificate of compliance from the building official of the locality in which the college or university is located or in the case of state-owned buildings, from the Director of the Virginia Department of General Services.

Exceptions:

1. Buildings equipped with an automatic fire suppression system in accordance with Section 903.3.1.1 or the 1983 or later editions of NFPA 13.

2. Any dormitory at a state-supported military college or university which is patrolled 24 hours a day by military guards.

3. Application of the requirements of this section shall be modified in accordance with the following:

   3.1. Building systems, equipment or components other than the fire suppression system shall not be required to be added or upgraded except as necessary for the installation of the fire suppression

system and shall only be required to be added or upgraded where the installation of the fire suppression system creates an unsafe condition.

3.2. Residential sprinklers shall be used in all sleeping rooms. Other sprinklers shall be quick response or residential unless deemed unsuitable for a space. Standard response sprinklers shall be used in elevator hoist ways and machine rooms.

3.3. Sprinklers shall not be required in wardrobes in sleeping rooms that are considered part of the building construction or in closets in sleeping rooms, when such wardrobes or closets (i) do not exceed 24 square feet (2.23 m^2) in area, (ii) have the smallest dimension less than 36 inches (914 mm), and (iii) comply with all of the following:

3.3.1. A single station smoke detector monitored by the building fire alarm system is installed in the room containing the wardrobe or closet that will activate the general alarm for the building if the single station smoke detector is not cleared within five minutes after activation.

3.3.2. The minimum number of sprinklers required for calculating the hydraulic demand of the system for the room shall be increased by two and the two additional sprinklers shall be corridor sprinklers where the wardrobe or closet is used to divide the room. Rooms divided by a wardrobe or closet shall be considered one room for the purpose of this requirement.

3.3.3. The ceiling of the wardrobe, closet or room shall have a fire resistance rating of not less than 1/2 hour.

3.4. Not more than one sprinkler shall be required in bathrooms within sleeping rooms or suites having a floor area between 55 square feet (5.12 m^2) and 120 square feet (11.16 m^2) provided the sprinkler is located to protect the lavatory area and the plumbing fixtures are of a noncombustible material.

3.5. Existing standpipe residual pressure shall be permitted to be reduced when the standpipe serves as the water supply for the fire suppression system provided the water supply requirements of NFPA 13-94 are met.

3.6. Limited service controllers shall be permitted for fire pumps when used in accordance with their listing.

3.7. Where a standby power system is required, a source of power in accordance with Section 701-11 (d) or 701-11 (e) of NFPA 70—96 shall be permitted.

Add Section 3413.13 to the IBC to read:

3413.13 Fire extinguishers and smoke detectors in SRCF's. SRCF's shall be provided with at least one approved type ABC portable fire extinguisher with a minimum rating of 2-A:10-B:C installed in each kitchen. In addition, SRCF's shall provide at least one approved and properly installed battery operated smoke detector outside of each sleeping area in the vicinity of bedrooms and bedroom hallways and on each additional floor.

Add Section 3413.14 to the IBC to read:

3413.14 Smoke detectors in adult day care centers. Battery-powered or AC-powered smoke detector devices shall be installed in all adult day care centers licensed by the Virginia Department of Social Services, regardless of when the building was constructed. The location and installation of the smoke detectors shall be determined by the provisions of this code in effect on October 1, 1990. The licensee shall obtain a certificate of compliance from the building official of the locality in which the center is located, or in the case of state-owned buildings, from the Director of the Virginia Department of General Services.

Add Section 3413.15 to the IBC to read:

3413.15 Posting of occupant load. Every room or space that is an assembly occupancy, and where the occupant load of that room or space is 50 or more, shall have the occupant load of the room or space as determined by the building official posted in a conspicuous place, near the main exit or exit access doorway from the room or space. Posted signs shall be of an approved legible permanent design and shall be maintained by the owner or authorized agent.

Add Section 3413.16 to the IBC to read:

3413.16 ALFSTs. Existing ALFSTs, regardless of when constructed, shall, by October 1, 2011, meet the applicable requirements of API 653 and TFI RMIP for suitability for service and inspections and shall provide a secondary containment system complying with Section 425.3.

CHAPTER 35

REFERENCED STANDARDS

Change the referenced standards in Chapter 35 of the IBC as follows (standards not shown remain the same):

API

American Petroleum Institute
1220 L Street, Northwest
Washington, DC 20005

Standard reference number	Title	Referenced in code section number
RP 650–(2009)	Welded Steel Tanks for Oil Storage	425.2
RP 653–(2009)	Tank Inspection, Repair, Alteration and Reconstruction	425.4, 425.5, 3413.16

ASME

American Society of Mechanical Engineers
Three Park Avenue
New York, NY 10016-5990

Standard reference number	Title	Referenced in code section number
A17.1/CSA B44-2007	Safety Code for Elevators and Escalators with 2008 and 2009 addenda	907.3.3, 911.1.5, 1007.4, 1607.8.1, 1613.6.5, 3001.2, 3001.4, 3002.5, 3003.2, 3007.1, 3008.3, 3008.12, 3008.14.1, 3411.8.2

ASTM

ASTM International
100 Barr Harbor Drive
West Conshohocken, PA 19428-2959

Standard reference number	Title	Referenced in code section number
E 329–02	Standard Specification for Agencies Engaged in the Testing and/or Inspection of Materials Used in Construction	1703.1, 1703.1.3

TFI

The Fertilizer Institute
820 First Street, NE, Suite 430
Washington, DC 20002

Standard reference number	Title	Referenced in code section number
RMIP–09	Aboveground Storage Tanks Containing Liquid Fertilizer, Recommended Mechanical Integrity Practices	425.2, 425.4, 3413.16

UL

Underwriters Laboratories, Inc.
333 Pfingsten Road
Northbrook, IL 60062

Standard reference number	Title	Referenced in code section number
2034–08	Standard for Single- and Multiple-station Carbon Monoxide Alarms	908.7.1

APPENDIX E

SUPPLEMENTARY ACCESSIBILITY REQUIREMENTS

Appendix E of the IBC shall be part of this code.

APPENDIX F

RODENTPROOFING

The following provisions of Appendix F of the IBC are part of this code:

F101.2 Foundation wall ventilation openings.

F101.6 Pier and wood construction. (Includes all provisions.)

APPENDIX H

SIGNS

The following provisions of Appendix H of the IBC are part of this code:

H101.2 Signs exempt from permits.

H102 Definitions. (Includes all definitions.)

H103 Location. (Includes Section H103.1.)

H105 through H114. (Includes all provisions.)

APPENDIX I

PATIO COVERS

The following provisions from Appendix I of the IBC are part of this code:

I101 through I104 (Includes all provisions.)

WEST VIRGINIA

West Virginia State Fire Commission
State Building Code
87CSR4

STATEMENT OF REASON

The Committee received testimony that a requirement in the amended rule series requiring the installation of automatic fire sprinkler systems in newly constructed one and two family residential homes would significantly increase the cost associated with construction and as such, would have a detrimental economic effect on housing construction in the State. The Committee amended the rule series to remove this requirement.

The Committee also amended the rule series so as to restore subdivision 4.1.6, which relates to the International Energy Conservation Code, to the current language which provides for the adoption of the 2003 edition rather than the 2009 edition as provided by the Fire Commission's amended rule series. Again, the basis for the amendment was the significant economic impact the amendment might have on the home construction industry.

FILED
2009 DEC 10 AM 9:53
WEST VIRGINIA
SECRETARY OF STATE

WEST VIRGINIA LEGISLATURE

Legislative Rule-Making Review Committee

Senator Joseph Minard, Cochair
Delegate Bonnie Brown, Cochair
Debra A. Graham, Chief Counsel
Felisha N. Sutherland, Administrative Assistant

Rita A. Pauley, Associate Counsel
Brian Skinner, Associate Counsel
Charles Roskovensky, Associate Counsel
Jay Lazell, Associate Counsel

December 8, 2009

NOTICE OF ACTION TAKEN BY THE LEGISLATIVE RULE-MAKING REVIEW COMMITTEE

TO: Natalie E. Tennate, Secretary of State, State Register

TO: Sterling Lewis
WV State Fire Commission
1207 Quarrier Street, 2nd Floor
Charleston, WV

FROM: Legislative Rule-Making Review Committee

Proposed Rule: State Building Code, 87CSR4

The Legislative Rule-Making Review Committee Recommends that the West Virginia Legislature:

1. Authorize the agency to promulgate the Legislative rule:

   (A) as originally filed _____

   (B) as modified by the agency _____

2. Authorize the agency to promulgate part of the Legislative rule; a statement of reasons for such recommendation is attached. _____

3. Authorize the agency to promulgate the Legislative rule with certain amendments; amendments and a statement of reasons for such recommendation is attached. _____

4. Authorize the agency to promulgate the Legislative rule as modified with certain amendments; amendments and a statement of reasons for such recommendation is attached. ✓ FNS

5. Recommends that the Legislature rule be withdrawn; a statement of reasons for such recommendation is attached. _____

Building 1, Room MB-49 1900 Kanawha Boulevard, East Charleston, WV 25305
Phone: (304) 347-4840 Fax: (304) 347-4901 email: felishas@mail.wvnet.edu

with the following amendments:

On page two, subdivision 4.1.6, by restoring the subdivision to its current language; and

On page three, subdivision 4.1.7, following the word "inches" and the period and before the word "Section" by inserting the following words: "Section R313: Automatic Fire Sprinkler Systems, in its entirety, is specifically excluded from the scope of this rule series.".

Please see attached for consideration by Judge Lipman in the rule-making proceedings captioned Revisor's ID No. RD-4144, OAH No. 1900-30855.

Thank you,

Haley L. Waller Pitts
Attorney
Fredrikson & Byron, P.A.
200 South Sixth Street
Suite 4000
Minneapolis, MN 55402.1425

DIRECT: 612.492.7443

ASSISTANT: 612.492.7803

FAX: 612.492.7077

E-MAIL: hwallerpitts@fredlaw.com

This is a transmission from the law firm of Fredrikson & Byron, P.A. and may contain information which is privileged, confidential, and protected by the attorney-client or attorney work product privileges. If you are not the addressee, note that any disclosure, copying, distribution, or use of the contents of this message is prohibited. If you have received this transmission in error, please destroy it and notify us immediately at our telephone number (612) 492-7000. The name and biographical data provided above are for informational purposes only and are not intended to be a signature or other indication of an intent by the sender to authenticate the contents of this electronic message.

National Fire Incident Reporting System: 2002 to 2006 Data for One and Two Family Homes in Minnesota

Number of One and Two Family Homes in the State: 1,718,083

	Average Number of Fires per Year	Square Footage Affected per Year	Civilian Deaths per Year	Civilian Injuries per Year	Total Damage per Year (in $2006)	Deaths per 1,000 Fires	Injuries per 1,000 Fires	Damage per Fire	Damage per Square Foot
Unconfined Fires in Homes with Sprinklers:									
Sprinkler Operated and was Effective	1.5	2,668	0.0	0.0	$44,350	0.0	0	$28,799	$16.62
Sprinkler Operated, but was Not Effective	0.0	0	0.0	0.0	$0	NA	NA	NA	NA
Fire Too Small to Activate Sprinkler	0.0	0	0.0	0.0	$0	NA	NA	NA	NA
Sprinkler Failed to Operate	0.0	0	0.0	0.0	$0	NA	NA	NA	NA
Sprinkler Operation Unknown	0.2	638	0.0	0.0	$85,106	0.0	0	$405,268	$133.33
Total in Homes with Sprinklers	**1.8**	**3,307**	**0.0**	**0.0**	**$129,457**	**0.0**	**0**	**$73,975**	**$39.15**
Unconfined Fires in Homes with Smoke Detectors but without Sprinklers:									
Subsection of Most Cases Where the Detector Worked									
Detector Powered by Battery Only	196	338,394	1.1	11.2	$7,727,319	5.5	57	$39,486	$22.84
Detector Hardwired Only	78	174,825	0.6	5.4	$4,048,624	7.2	69	$51,654	$23.16
Hardwire With Battery	0	611	0.0	0.2	$30,425	0.0	484	$69,149	$49.82
Other Type of Power	187	408,230	0.7	9.8	$10,329,418	3.9	52	$55,335	$25.30
Subtotal of Most Where Detector Worked	**461**	**922,059**	**2.4**	**26.6**	**$22,135,787**	**5.1**	**58**	**$47,997**	**$24.01**
Detector Worked but Was Ignored	8	17,781	1.1	1.4	$405,859	135.6	164	$48,088	$22.83
Detector Worked, Failed to Alert	10	24,599	0.0	0.7	$968,609	0.0	72	$92,957	$39.38
Fire Too Small to Activate Detector	113	236,556	0.0	1.8	$957,857	0.0	16	$8,506	$4.05
Detector Failed to Operate	124	218,248	3.2	13.1	$5,355,291	25.4	105	$43,073	$24.54
Detector Operation Unknown	137	262,123	1.9	7.3	$8,308,505	14.1	53	$60,735	$31.70
Total in Homes with Detectors but No Sprinklers	**854**	**1,681,365**	**8.6**	**50.9**	**$38,131,907**	**10.1**	**60**	**$44,662**	**$22.68**
Unconfined Fires in Homes with No Detectors or Sprinklers	380	581,435	2.0	11.6	$8,505,215	5.2	31	$22,387	$14.63
Unconfined Fires with Detector/Sprinkler Presence Unknown	670	1,062,747	10.3	28.5	$25,240,024	15.4	43	$37,688	$23.75
Total Unconfined Fires	**1,905**	**3,328,854**	**20.9**	**91.0**	**$72,006,602**	**11.0**	**48**	**$37,796**	**$21.63**
Per 1,000 Existing One & Two Family Units	**1.11**		**0.0122**	**0.053**	**$41,911**				
Confined Fires in Homes	977	N/A	0.5	9.5	$258,391	0.5	10	$264	N/A
For Comparison: Unconfined Fires per 1,000 Existing One & Two Family Units in the U,S.	*1.08*		*0.0105*	*0.044*	*$24,206*				

Total square footage is based on size of the main floor multiplied by the number of floors above ground. Dwellings with total square footage greater than 10,000 square feet are excluded from the calculations, under the assumption that they represent unrealistic outliers. Square footage calculations are not shown for confined fires, due to a high frequency of missing values for these observations. Total damage includes damage to both property and contents, but excludes outliers where property damage is more than $10 million. "Unconfined Fires in Homes with Sprinklers" includes wet pipe, dry pipe, and other sprinkler systems; but not other types of suppression systems such as dry chemical. "Unconfined Fires in Homes with Smoke Detectors but Without Sprinklers" include homes with smoke detectors, combination heat and smoke detectors, or more than one type of fire detector. "Unconfined Fires with Detector/Sprinkler Presence Unknown" is a residual category. Most of the cases captured under this heading are homes where the presence of either sprinklers or detectors was listed as undetermined, but the category also includes relatively small numbers of homes with unusual types of fire detection and suppression systems.

Source: NAHB tabulation of data from the U.S. Fire Administration, National Fire Data Center.

Number of homes is the average number reported over the years 2002-2006 in the American Community Survey (U.S. Census Bureau).

Numbers each year are inflated to account for the self-reported share of fires missed by the NFIRS, ranging from a high of 35% in 2002 to a low of 6% in 2005 and 2006.

Damage numbers are adjusted for inflation using the annual Consumer Price Index for all items (U.S. Bureau of Labor Statistics)

Summit Fire Protection Co. Proposal and Contract

Summit Fire Protection Co. ("Summit Fire Protection") makes the following proposal (the "Proposal"):

Date: February 6, 2013

Submitted To: Gonyea Homes ("Owner")

Attention: Jerik Brumm ("Owner") Fax: 763-432-4501 Phone: 763-432-4512

Regarding: Fire Protection Proposal

Project Name: **RESIDENCE**
Minnetonka, Minnesota

Specifications: The equipment to be provided by Summit Fire Protection as part of these Specifications, as well as design and installation services, to the extent described in these Specifications, are sometimes referred to in this Proposal as the "Project".

Our proposal is based on City of Minnetonka, and NFPA 13D. Mechanical drawings, plumbing drawings and written specifications were not provided. Site visit- YES ☐ NO ☒

SCOPE OF WORK:

- It is assumed that there is adequate city water pressure and flow.
- Provide engineered fire protection drawings for permit and approval. AutoCAD compatible background drawings to be provided to Summit at no extra cost.
- Sprinkler heads to be white "residential" recessed pendents and white semi-recessed with cup sidewalls.
- Provide one (1) Combination horn/strobe (wired by others).
- Provide water flow switch on each riser (wired by others).
- Steel and/or CPVC piping throughout.

EXCLUSIONS:

- Soffits to conceal piping.
- Underground water supply to the building / testing to the underground piping. Underground size to be determined by hydraulic calculations and city of Minnetonka requirements.
- Protection of exterior overhangs and decks.
- Adequate heat to prevent water in pipe from freezing.
- Paint and/or painting of any sprinkler pipe/material.
- Masking of sprinkler heads prior to field paint.
- Fire pump and or water storage tank.
- Central monitoring of sprinkler system.
- Electrical wire and/or wiring of any kind.
- Payment/performance bonds.
- Factory Mutual Insurance requirements.
- Overtime.

Contract Price: We propose to perform the above work for the sum of:
$ 11,000.00 ELEVEN THOUSAND DOLLARS

Completion of the Project: Summit Fire Protection offers to provide to Owner the equipment, supplies and materials, as well as the design and installation services and labor to complete the Project, as described in the Specifications. This Proposal shall be null and void, at Summit Fire Protection's option, if not accepted by Owner by noon on March 6, 2013. Upon delivery by Owner of acceptance of this Proposal, we reserve the right to adjust all prices based on the cost of materials at the time of contract, due to the volatility in the steel market. The customer may be required to pay for materials at the time of contract to guarantee price.

General Conditions: The Summit Fire Protection General Conditions attached to this Proposal are a part of this Proposal. Upon acceptance of this Proposal by Owner, the General Conditions will be a part of the contract between Summit Fire Protection and Owner.

Sincerely,
SUMMIT FIRE PROTECTION

Rex Nelson
Contract Sales Representative

OWNER ACCEPTANCE OF PROPOSAL

Summit Fire Protection's Proposal is hereby accepted and agreed to by Owner. Owner acknowledges that Owner received and read the Proposal and the attached General Conditions. Upon acceptance by Owner, this Proposal, along with the attached General Conditions, will be a binding contract between Summit Fire Protection and Owner.

OWNER:

Sign Name_____

Print Name_____

Date _____

1155591.1

SUMMIT FIRE PROTECTION CO. PROPOSAL AND CONTRACT GENERAL CONDITIONS

These General Conditions are attached to and made a part of the Summit Fire Protection Co. Proposal and Contract to which they are attached (the "Contract") as if fully set forth on the front page of the Contract. As used in these General Conditions, "Summit Fire Protection," "Owner," "Project," and "Contract Price" shall have the same meanings as those terms have in the Proposal.

1. Payment. Owner agrees to pay the Contract Price for the Project as and when required in the Proposal.

2. Changes. Except for substitutions, as described below in this paragraph, any alteration or modification to the Project must be documented and approved by Summit Fire Protection and Owner by a written change order signed by Summit Fire Protection and Owner. Summit Fire Protection reserves the right to require Owner to pay for all change order items (labor, equipment and any other materials) at the time of signing the change order. In the event of discontinuations, changes or the unavailability of specific equipment or materials described in the Specifications, Summit Fire Protection will have the right to substitute equipment and materials with substantially similar quality and features; provided, however, that if the replacement items are more expensive, then Summit Fire Protection shall notify Owner and Owner may elect whether to pay the additional expense (as an increase to the Contract Price) or to modify the Proposal to include less expensive items, if available, that would not increase the Contract Price.

Elk River Office
9950 East Highway 10
Elk River, MN 55330

Telephone: 763-441-2290
Fax: 763-441-5010

St. Cloud Office
600 25th Ave. S., Suite 105
St. Cloud, MN 56301

Telephone: 320-229-2990
Fax: 320-229-2970

Duluth
Telephone: 218-727-3996
Fax: 763-441-5010

Brothers Fire Protection

State License No. C059

QUOTATION

Date: 4-30-2013

Attn: Project Manager / Estimator
NIH Homes

Phone:
Fax:

Re: Bid: 16095 55th Ave N
Plymouth, Mn.

To: Mr. Colt Skogquist

Brothers Fire Protection Co. is pleased to quote the automatic sprinklers for the above project. Our proposal includes installing a new NFPA 13D automatic fire sprinkler system throughout the new building per the plans and specifications. Sprinklers in ceiling & wall areas to be white type semi-recessed heads with brass upright in unfinished areas. The systems will be designed and installed as follows:

- Garage– NFPA 13D wet-pipe system with one dry side wall near service door.
- Basement and First Floor– NFPA 13D wet pipe system with CPVC plastic pipe & fittings with pendent heads.
- Top floor – NFPA 13D wet pipe system with CPVC plastic pipe & fittings with sidewall heads.
- Water supply needs to be 1-1/2" copper from street.
- Electrical supply may need to be increased for fire pump storage tank option.

Design is based on Light & Ordinary Hazard Occupancy as defined by NFPA 13, which will be submitted to the City Plymouth. All work to be performed during regular working hours between 7:00 AM - 4:30 PM., Monday through Friday.

Brothers Fire Protection Co. will provide hangers for support of our piping in accordance with NFPA 13, which must support the weight of the pipe, water inside the pipe plus a minimum of 250 pounds at the point of hanging. Structural integrity and stability shall be the responsibility and liability of the building owner.

Our Price for this work: **$9,100.00** **13D Fire pump with tank = $4,000.00**

Items not included:

1. Painting of any pipe or related material.
2. Lights, water, heat and power during construction.
3. Bonds.
4. Adequate water supply into building with flanged opening 1'-0" above floor and domestic tee.
5. Any electrical wiring, including monitoring.
6. Fire pump transfer switch, low suction valve and associated material.
7. Concealed type heads.
8. Heads in floor truss space, full coverage in garage.

This proposal is valid for fifteen (15) days and at our option, may be withdrawn or considered void after this period.
Sincerely,

Todd Dosch
Vice President

Elk River Office
9950 East Highway 10
Elk River, MN 55330

Telephone: 763-441-2290
Fax: 763-441-5010

St. Cloud Office
600 25th Ave. S., Suite 105
St. Cloud, MN 56301

Telephone: 320-229-2990
Fax: 320-229-2970

Duluth
Telephone: 218-727-3996
Fax: 763-441-5010

Brothers Fire Protection

State License No. C059

QUOTATION

Date: 12-2-2013

Attn: Project Manager / Estimator
NIH Homes

Phone:
Fax:

Re: Bid: 16095 55th Ave N
Plymouth, Mn.

To: Mr. Colt Skogquist

Brothers Fire Protection Co. is pleased to quote the automatic sprinklers for the above project. Our proposal includes installing a new NFPA 13D automatic fire sprinkler system throughout the new building per the plans and specifications. Sprinklers in ceiling & wall areas to be white type semi-recessed heads with brass upright in unfinished areas. The systems will be designed and installed as follows:

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- Basement and First Floor– NFPA 13D wet pipe system with CPVC plastic pipe & fittings with pendent heads.
- Top floor – NFPA 13D wet pipe system with CPVC plastic pipe & fittings with sidewall heads.
- Water supply needs to be 1-1/2" copper from street.
- Electrical supply may need to be increased for fire pump storage tank option.

Design is based on Light & Ordinary Hazard Occupancy as defined by NFPA 13, which will be submitted to the City Plymouth. All work to be performed during regular working hours between 7:00 AM - 4:30 PM., Monday through Friday.

Brothers Fire Protection Co. will provide hangers for support of our piping in accordance with NFPA 13, which must support the weight of the pipe, water inside the pipe plus a minimum of 250 pounds at the point of hanging. Structural integrity and stability shall be the responsibility and liability of the building owner.

Our Price for this work: **$9,800.00** **13D Fire pump with tank = $4,000.00**

Items not included:

1. Painting of any pipe or related material.
2. Lights, water, heat and power during construction.
3. Bonds.
4. Adequate water supply into building with flanged opening 1'-0" above floor and domestic tee.
5. Any electrical wiring, including monitoring.
6. Fire pump transfer switch, low suction valve and associated material.
7. Concealed type heads.
8. Heads in floor truss space, full coverage in garage.

This proposal is valid for fifteen (15) days and at our option, may be withdrawn or considered void after this period.
Sincerely,

Todd Dosch
Vice President

From: "Lockrem, Richard (DLI)" <rich.lockrem@state.mn.us>
Date: December 9, 2013 at 10:23:14 AM CST
To: Karen Linner <linnerconsulting@gmail.com>
Cc: "McLellan, Scott (DLI)" <scott.mclellan@state.mn.us>, "Hernick, Stephen (DLI)" <steve.hernick@state.mn.us>, "Godfrey, Michael (DLI)" <michael.godfrey@state.mn.us>, Remi Stone <remi@bamn.org>
Subject: RE: 2012 IRC Sprinkler Questions - Karen Linner Spreadsheet and Scenario

Karen,

Another good question.

Installation requirements of Section R313.3 identifies sprinkler installations for attached covered patios, covered decks, covered porches and similar structures. The use of the term "covered" implies that a roof has been constructed above an attached patio, deck, or porch by providing a protective barrier above. Conventional deck construction includes open spaces between deck boards to facilitate water drainage through the deck surface area. A deck of conventional construction as mentioned in the scenario provides a limited amount of protection for the patio below, but fails to provide the protection of a roof. The exception for Section R313.3 further clarifies the term "covered" as meaning an attached roof (see the text below).

This scenario would not require the fire sprinkler installation requirements of Section R313.3 regardless of the deck area above. If the deck in question is constructed in a manner to function

as a roof for the patio area below, the requirements of Section R313.3 would then be applicable for a deck exceeding 40 square feet (3,716 $m^{2)}$ of floor area.

Exception R313.3:

Exception: Attached **roofs** of covered patios, covered decks, covered porches, or similar structures that do not exceed 40 square feet (3,716 $m^{2)}$ of floor area.

Thanks,

Richard A. Lockrem
Building Code Representative, Senior
Education, Rules and Code Development
Construction Codes and Licensing Division
Minnesota Department of Labor and Industry

(P) 651-284-5868
(F) 651-284-5749
(email) rich.lockrem@state.mn.us

From: Karen Linner [mailto:linnerconsulting@gmail.com]
Sent: Thursday, December 05, 2013 1:57 PM
To: Lockrem, Richard (DLI)
Cc: McLellan, Scott (DLI); Hernick, Stephen (DLI); Godfrey, Michael (DLI); Remi Stone
Subject: Re: 2012 IRC Sprinkler Questions - Karen Linner Spreadsheet and Scenario

Rich-
Thanks for the detailed reply. A builder brought up another scenario and wondered if fire sprinklers would be required. In a walk-out basement would the area under a 40 sqft deck directly above the area outside the basement require dry head sprinklers if a 50 sqft patio pad were poured?

What if the area under the deck had landscape gravel but not patio or deck material? Would dry heads be exempt?

Thanks again for helping me understand when dry heads would be required under the proposed rule.

Karen

Karen Linner
Shenandoah Consulting, LLC
Leading the way through building codes and regulations

Cell: 612-749-6987
E-mail: linnerconsulting@gmail.com
4732 Elliot Ave
Minneapolis, MN 55407

On Tue, Dec 3, 2013 at 12:57 PM, Lockrem, Richard (DLI) <rich.lockrem@state.mn.us> wrote:

Karen,

We appreciate your spreadsheet and great questions. This information should be beneficial to all stakeholders for future clarity. Please see our comments to your draft spreadsheet and responses to the scenario questions from your email of November 19, 2013.

Response to scenario questions:

I didn't include this in the spreadsheet but how would the space on a front porch be treated if there was a decorative 3-ft barrier around the front porch. Three questions about this scenario.

1) Would this be considered an "exterior wall" according to the definition?

No. A 3-foot high guard or knee wall does not equate to an exterior wall that defines the exterior boundaries of a building as explained in the definition of "exterior wall". Although the code isn't completely clear in this scenario, we interpret that the code describes an exterior wall that encloses the floor area in question, not a wall that partially encloses an area.

2) Would the sf of this porch be included in the 4,500 sf calculation?

No. The attached porch in question would not be used in calculating the floor area for the fire sprinkler requirements of MR 1309.0313, Section R313.2.

3) Is it correct that if this porch was over 40 sf, then a dry head sprinkler would have to be installed on every 20 lineal feet of the common wall?

Yes. If the floor area of the house was at least 4,500 square feet. Fire sprinkler heads would need to comply with MR 1309.0313 Section R313.3 condition#2.

DRAFT spreadsheet comments:

Proposed Requirements in Minnesota State Building Code for Chapter 1309 Residential Building Code

Areas Fire Sprinklers Are Required in Single-Family Homes

Area of Home	Included in calculation of 4,500 s.f. area threshold? [1]	Are sprinklers required?[1]	Source of requirem
Conditioned (heated) dwelling space	Yes	Yes ≥4,500 s.f	NFPA 13
Finished basement	Yes	Yes ≥4,500 s.f.	NFPA 13
Unfinished basement	Yes	Yes ≥4,500 s.f.	NFPA 13
Crawlspaces	Yes	See[3,4]	NFPA 13
Closets of less than 24 sf and smallest wall is less than 3 ft	Yes	No[5]	N/A
Closets of 24 sf or more or smallest wall is longer than 3 ft	Yes	Yes[5]	NFPA 13
Bathrooms of 55 sf or less	Yes	No[6]	N/A
Bathrooms over 55 sf	Yes	Yes[6]	NFPA 1
Attics	No	See[3,4]	NFPA 1
Mechanical room	Yes	Yes	NFPA 13
Heated garage (attached)	No	Yes ≥4,500 s.f[7,8]	MR 1309 R313.3
Unheated garage (attached)	No	Yes ≥4,500 s.f[7,8]	MR 1309 R313.3.
3 season porches under 40 sf (unconditioned)	Yes	No[9]	MR 1309

			R313.3.
3 season porches 40 sf or greater (unconditioned)	Yes	Yes[9]	MR 1309 R313.3.
4 season porch under 40 sf (conditioned)	Yes	Yes	NFPA 13
4 season porch 40 sf or greater (conditioned)	Yes	Yes	NFPA 13
Covered porch/deck/patios under 40 sf (no walls except common wall on home)	No	No[10]	NFPA 1
Covered porch/deck/patios over 40 sf (no walls except common wall on home)	No	Yes[9]	MR 1309 R313.3.

[1]Automatic fire sprinklers are required when the single-family dwelling floor area is 4,500 s.f. or more. The floor area includes all floors and basements.

[2]Source of sprinkler requirements based on NFPA 13D or IRC Section P2904 and as amended in MR 1309.0313 Section R313.3.

[3]See IRC P2904.1.1 except. 1 regarding attics, crawl spaces and normally unoccupied concealed spaces that do not contain fuel-fired appliances do not require fire sprinklers.

[4]See IRC P2904.1.1 except. 1 regarding attics, crawl spaces and normally unoccupied concealed spaces that contain fuel-fired equipment require a fire sprinkler installed above the equipment only and not the remaining space.

[5]See IRC P2904.1.1 except. 2 regarding clothes closets, linen closets, and pantries having ≤ 24 s.f, no dimension >3 feet, and wall and floor surfaces of gypsum board.

[6]See IRC P2904.1.1 except. 3 regarding bathrooms, having ≤ 55 s.f.

[7]See MR 1309.0313 Section R313.3 regarding fire sprinkler installation requirements for attached garages, covered patios, covered decks, covered porches, and similar structures

when the building is required to have fire sprinkler systems installed in accordance with MR 1309.0313.

[8]See MR 1309.0313 Section R313.3 condition #1 regarding fire sprinkler installation requirements for attached garages. One dry head sprinkler shall be located within 5 linear feet

of each door installed in the common wall separating the dwelling unit and the attached garage.

[9]See MR 1309.0313 Section R313.3 condition #2 regarding fire sprinkler installation requirements for attached covered patios, covered decks, covered porches, and similar structures

when the building is required to have fire sprinkler systems installed in accordance with MR 1309.0313. These structures require one dry head sprinkler for every 20 linear feet

of common wall between the dwelling unit and the covered patio, covered deck, covered porch, or similar structure.

[10]See MR 1309.0313 Section R313.3 condition #2, exception. Attached covered patios, covered decks, covered porches, and similar structures that do not exceed 40 s.f. of floor area

are exempt from the fire sprinkler installation requirements in MR 1309.0313 Section R313.3 condition #2.

Thanks,

Richard A. Lockrem

Building Code Representative, Senior

Education, Rules and Code Development

Construction Codes and Licensing Division

Minnesota Department of Labor and Industry

(P) 651-284-5868

(F) 651-284-5749

(email) rich.lockrem@state.mn.us

Hi Rich-

Thanks for your earlier response. I am trying to better understand when and where fire sprinklers would be required under the proposed 1309 rules. Can you please review the attached Excel spreadsheet (and pasted below) and see if I my interpretations are correct regarding the proposed Chapter 1309 language and the requirements of NFPA 13D.

Also, I didn't include this in the spreadsheet but how would the space on a front porch be treated if there was a decorative 3 ft barrier around the front porch. Three questions about this scenario.

1) Would this be considered an "exterior wall" according to the definition?

2) Would the sf of this porch be included in the 4500 sf calculation?

3) Is it correct that if this porch was over 40 sf, then a dry head sprinkler would have to be installed on every 20 lineal feet of the common wall?

Thanks,

Karen

Proposed Requirements in Minnesota State Building Code for Chapter 1309 Residential Building Code

Areas Fire Sprinklers Are Required in Single-Family Homes

Area of Home	Included in calculation of 4,500 square footage trigger?	Are sprinklers required?	Source of requireme
Conditioned (heated) space	Yes	Depends on area	NFPA 13I
Finished basement	Yes	Yes	NFPA 13I
Unfinished basement	Yes	Yes	NFPA 13I
Crawlspaces	Yes	Yes	NFPA 13I
Closets of less than 24 sf and smallest wall is less than 3 ft	Yes	No	
Closets of 24 sf or more or smallest wall is longer than 3 ft	Yes	Yes	NFPA 13I
Bathrooms of 55 sf or less	Yes	No	
Bathrooms over 55 sf	Yes	No	
Attics	No	No	
Mechanical room	Yes	Yes	NFPA 13I
Heated garage	No	Yes, dry head	MN Amer 1309.0313
Unheated garage	No	Yes, dry head	MN Amer 1309.0313
3 season porches under 40 sf (unconditioned)	Yes	No	
3 season porches 40 sf or greater (unconditioned)	Yes	Yes, dry head, every 20 lineal ft	MN Amer 1309.0313
4 season porch under 40 sf (conditioned)	Yes	Yes	NFPA 13I
4 season porch 40 sf or greater (conditioned)	Yes	Yes, dry head, every 20 lineal ft	NFPA 13I
Covered porch/deck/patios under 40 sf (no walls except common wall on home)	No	No	
Covered porch/deck/patios over 40 sf (no walls except common wall on home)	No	Yes, dry head, every 20 lineal ft	MN Amer 1309.0313

Karen Linner

Shenandoah Consulting, LLC

Leading the way through building codes and regulations

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4732 Elliot Ave

Minneapolis, MN 55407

On Fri, Nov 1, 2013 at 3:07 PM, Lockrem, Richard (DLI) <rich.lockrem@state.mn.us> wrote:

Karen,

Please see the following response and information regarding your email.

Question: Regarding proposed IRC Section R313.2: Would an enclosed heated porch be included in the floor area definition but not an unheated porch?

Answer: A new dwelling with an enclosed porch, whether heated or not, would be included in the floor area for purposes of determining the requirement for automatic fire sprinklers in accordance with Section R313.3. The exterior walls, as defined in IRC R202, would include "walls" of a heated or unheated space when determining the "inside perimeter" of the building. (See definitions of "floor area" and "exterior wall" below.)

Question: Would there be any fire sprinkler requirements for unenclosed porches and covered balconies in the construction of new single family dwellings?

Answer: Attached covered patios or decks and similar structures without exterior walls would not be included in the floor area. However, a new dwelling of 4500 square feet or more having attached covered patios, covered decks, covered porches, and similar structures will require automatic fire sprinklers in those areas in accordance with R313.3.

2012 Proposed IRC language

Section R202 – Definitions

Floor area. The calculated square footage of the floor within the inside perimeter of the exterior walls of the building under consideration without deduction for hallways, stairways, closets, the thickness of interior walls, columns or other features.

Exterior wall. An above-grade wall that defines the exterior boundaries of a building. Includes between-floor spandrels, peripheral edges of floors, roof and basement knee walls, dormer walls, gable end walls, walls enclosing a mansard roof and basement walls with an average below-grade wall area that is less than 50 percent of the total opaque and nonopaque area of that enclosing side.

Section R313.2 - One- and two-family dwellings automatic fire systems

Automatic residential fire sprinkler systems shall be installed in all one- and two-family dwellings having a floor area of 4,500 or more. (see exceptions for < 4,500 s.f and existing buildings)

Section R313.2.1 – Design and installation

Automatic residential fire sprinkler systems shall be designed and installed in accordance with IRC Section P2904 or NFPA 13D.

Section R313.3 – Installation requirements

When an automatic sprinkler system is required in one-and-two-family dwellings, and townhouse buildings it shall be installed in accordance with Section P2904, or NFPA 13D

Automatic sprinkler systems required in one-and-two-family dwellings and townhouse buildings shall be installed in accordance with the following:

1. Attached garages are required to have one dry head sprinkler located within 5 lineal feet of each door installed in the common wall separating the dwelling unit and the attached garage;

2. Attached covered patios, covered decks, covered porches, and similar structures are required to have automatic sprinklers with a minimum of one dry head for every 20 lineal feet (6.096 m) of common wall between the dwelling unit and the covered patio, covered deck, covered porch, or similar structure.

Exception:

Attached roofs of covered patios, covered decks, covered porches, or similar structures that do not exceed 40 square feet of floor area.

Thanks,

Richard A. Lockrem

Building Code Representative, Senior

Education, Rules and Code Development

Construction Codes and Licensing Division

Minnesota Department of Labor and Industry

(P) 651-284-5868

(F) 651-284-5749

(email) rich.lockrem@state.mn.us

Karen Linner <linnerconsulting@gmail.com>

RE: % of homes that would trigger 4,500 sqft

1 message

Abbott, Gene <gabbott@lakevillemn.gov> Tue, Dec 17, 2013 at 4:32 PM
To: Karen Linner <linnerconsulting@gmail.com>
Cc: "Olson, David" <dolson@lakevillemn.gov>

Karen,
I did a random sampling of the single family houses that were plan reviewed in the months of June, September and December so far.
Total single-family homes completed = 88
Homes over 4500 square feet including basement, first floor and second floors = 29

Roughly 33% (29/88) of homes were over 4500 square feet.
Hope that helps.
We are going to complete approximately 400 single family homes this year 2013.
Let me know if you need anything further.
Gene

Gene Abbott, Building Official
City of Lakeville | 20195 Holyoke Avenue | Lakeville, MN 55044
Office: 952-985-4441 | Fax: 952-985-4499 | www.lakevillemn.gov | To Schedule an Inspection, call:952-985-4440 | Lakeville, Minnesota–Positioned to Thrive

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-----Original Message-----
From: Karen Linner [mailto:linnerconsulting@gmail.com]
Sent: Thursday, December 12, 2013 1:05 PM
To: Abbott, Gene
Subject: % of homes that would trigger 4,500 sqft

Hi Gene,
Thanks so much for introducing (or reintroducing?) yourself today. I would appreciate it if you would forward the data you have gathered.i promise that I will not submit anything to the ALJ without your approval.
Thank you so much,
Karen

Sent from Karen Linner's iPhone 612-749-6987

Daily Herald
Big Picture . Local Focus

Huntley lifts fire sprinkler requirement

By Jameel Naqvi | Daily Herald Staff

Published: 9/7/2007 12:19 AM

Despite strong opposition from the Huntley Fire Protection District, the Huntley village board voted Thursday to scrap a 2-year-old requirement mandating fire sprinklers in all new single-family homes.

Trustees who voted against the requirement said the village shouldn't force residents to bear the cost of installing the systems.

"These costs passed onto our buyers make Huntley less affordable than surrounding communities," Trustee Harry Leopold said. "We're allowing them to choose, rather than us choosing for them."

But firefighters called fire sprinklers "the most effective tool in reducing fire deaths."

"It will in fact lower the standard of life-safety in the community," Huntley Fire Chief Jim Saletta said of the change.

The issue was the most heated and controversial in recent memory in Huntley, with trustees, firefighters and homebuilders trading barbs over facts and motivations.

Saletta asked Trustee Niko Kanakaris, who has plans to build six single-family homes, to abstain from voting Thursday.

Kanakaris said he felt Saletta had attacked his character and recused himself from the vote.

"There's no conflict of interest for me," Kanakaris said. "I will spend the $60,000 to put the sprinklers in the six homes regardless of the decision tonight."

Even without Kanakaris' vote, the move to scrap the requirement passed, with Leopold, Jay Kadakia and Paul Mercer voting for it and Pam Fender and John Piwko opposing the change.

"If we remove this requirement, we will be taking a giant step backward and be placing all of our policemen and firefighters in danger," Fender said before the vote.

About 50 firefighters from the Huntley fire district and other local fire departments attended the meeting in support of the fire sprinkler ordinance.

"We're disappointed," Saletta said after the vote. "It got a little bit personal in there. That wasn't our intent. I don't think (the change is) in the public's best interest."

The change, which takes effect Oct. 1, does not affect townhouses, multifamily residences and commercial buildings, where fire sprinklers are still mandatory.

More than 1,300 homes in the fire district, most of them in Huntley, have fire sprinklers.

Home Fire Sprinkler Coalition webpage

Myths vs facts

MYTH

"A smoke alarm provides enough protection."

FACT

Smoke alarms alert occupants to the presence of danger, but do nothing to extinguish the fire. Home fire sprinkler systems respond quickly to reduce heat, flames, and smoke from a fire, giving residents valuable time to get out safely. Working smoke alarms reduce the risk of dying if a home fire occurs by 50%. If you have a reported fire in your home, the risk of dying decreases by about 80% when sprinklers are present.

Beware misleading percentages on survival and death

Fire sprinkler opponents have been using a statistic of 99.45% to illustrate the effectiveness of smoke alarms in reducing home fire deaths. This NFPA statistic estimates the likelihood of surviving a home fire when a working smoke alarm is present.

A 100% chance of dying would mean that every fire is fatal, or, roughly, 100 deaths per 100 fires. Fortunately, that is not the case. The chances of surviving a reported home fire when working smoke alarms are present is 99.45% (100 minus 0.55) vs. 98.87% (100 minus 1.13) in home fires with no working smoke alarms. The first number is barely higher than the second.

The 99.45% vs. 98.87% statistic is based on "chances of survival" which is not the same thing as "risk of fire death" based on total number of reported fires. Chances of survival don't have much bearing in the discussion; preventing home fire death and reducing home fire death risk is the goal.

Consider this:

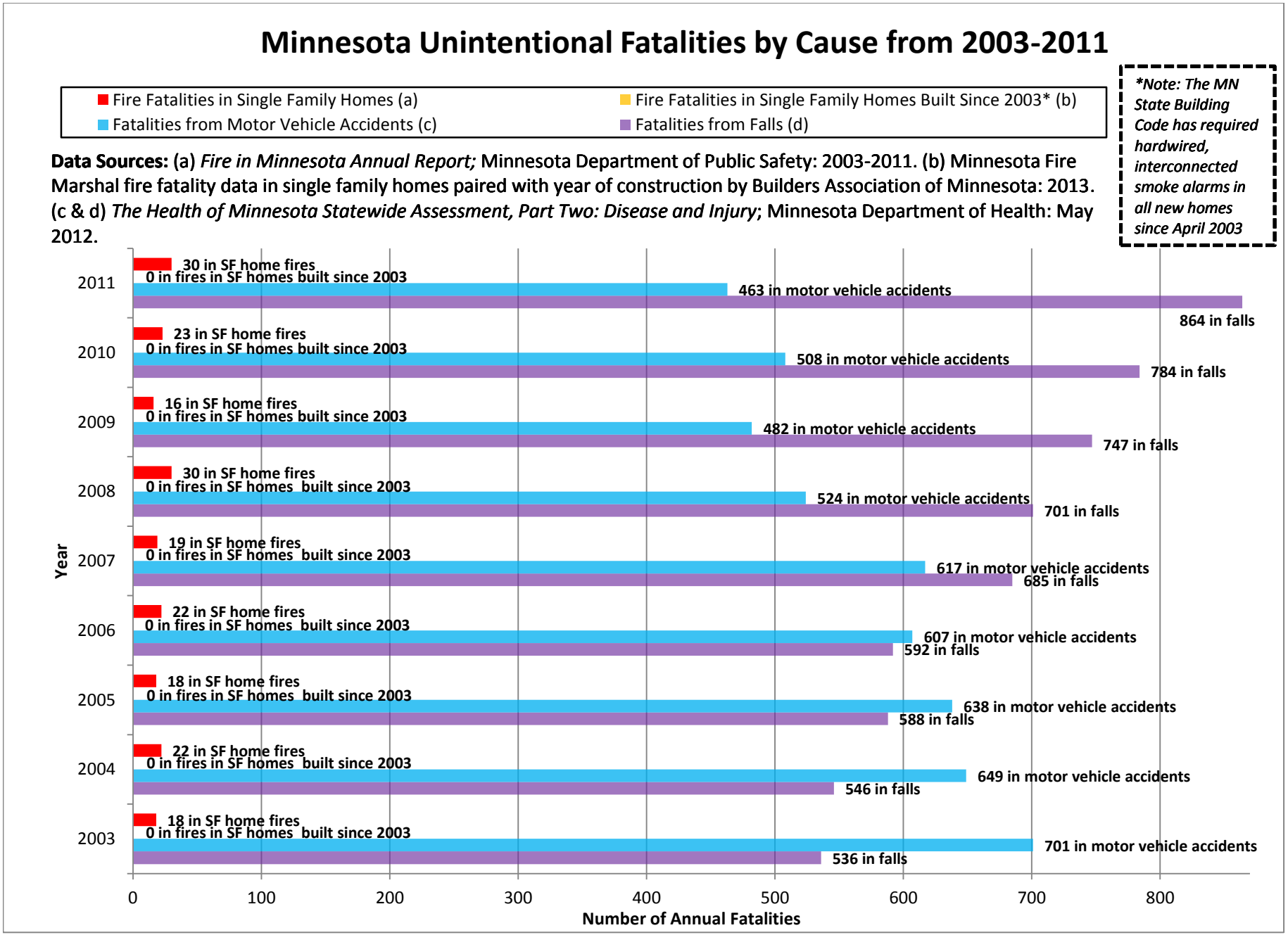
- Each year, over 2,500 home fire deaths occur in more than 350,000 reported structure fires. Therefore, the likelihood of surviving a home fire is approximately 99% without regard to the presence

of smoke alarms or any other fire safety provisions. Does that mean 2,500 deaths are acceptable? Most people would say no.

- Each year, there are an estimated 12,000 deaths due to falls in homes and an estimated 11 million fall injuries in the home. The likelihood of surviving a fall is 99.9%. Does that mean 12,000 deaths are acceptable? Most people would say no.
- Each year, there are an estimated 42,000 deaths due to motor vehicle crashes and an estimated 6 million reported motor vehicle crashes. The likelihood of surviving a motor vehicle crash is 99%. Does that mean 42,000 deaths are acceptable? Most people would say no.

- See more at: http://www.firesprinklerinitiative.org/resources/fact-sheets/myths-vs-facts.aspx#sthash.AaixW2Sk.dpuf

Minnesota Unintentional Fatalities by Cause from 2003-2011



How Much Safety Do Single Family Fire Sprinklers Give Minnesotans, At What Cost?

How Much Safety, At What Cost?

What if the fire sprinkler mandate would have been enacted when the currently enforced 2007 Minnesota State Building Code was adopted on March 31, 2007? How many lives would have been saved and at what cost to homeowners from 2007-2012?

- **ZERO lives saved at a cost of $179,500,000 million dollars** to individual homeowners with homes of 4,500 square feet or more.
- ZERO lives saved at a cost of $486,900,000 million dollars if the mandate would have been applied to all new single family homes.

This conservative analysis assumes that for the 51,042 single family permits issued in Minnesota from April 2007 through December 2012 per US Census data; 10 percent were built on rural wells at a cost of $12,600 each and the remaining 90 percent of homes cost $9,200 each.[1] US Census data reports that 26% of all Minnesota homes are served by private wells.[2] Ten percent was chosen to represent new homes being built on wells, where municipal water is not available. The installation cost of $9,200 for a home served by a municipal water source was based on 5 actual sprinkler bids collected by the Builders Association of Minnesota members by well-established sprinkler installation companies. The homes ranged from 2,245 square feet to 5,534 square feet. The additional cost of a well-based sprinkler system is based on 4 actual Minnesota sprinkler bids. The homes with wells varied from 2,844-4,635 square feet. This data set can be found at the end of this document.

Cost of NPFA 13D Fire Sprinkler Systems for 51,042 Permits Issued For Single Family Homes in Minnesota (April 2007 – December 2012)

		Number of Houses	Fire Sprinkler Cost Per Home	Total Cost (rounded to nearest 100,000)
Estimated % of Homes Built on Well Water	10%	5,104	$12,600	$64,300,000
Estimated % of Homes with Municipal Water Supply	90%	45,938	$9,200	$422,600,000
TOTAL COST OF FIRE SPRINKLERS IF MANDATED IN 2007				$486,900,000

[1] Based on fire sprinkler bids for actual homes in Minnesota. See Fire Sprinkler Installation Costs in Minnesota by Shenandoah Consulting, December 2013.
[2] U.S. Census Bureau. Historical Census of Housing Tables - Source of Water. Accessed at http://www.census.gov/hhes/www/housing/census/historic/water.html

Cost of Installing Fire Sprinklers in Single Family Homes of at least 4,500 Square Feet

The previous estimate of installing fire sprinklers in all new single family homes assumes that the 2012 IRC language requiring fire sprinklers for all single-family homes was adopted without amendments. Minnesota is proposing that a sprinkler mandate be adopted for all single-family homes with a floor area of at least 4,500 square feet. Minnesota is also proposing that for these homes a dry head sprinkler be required in every garage and in covered porches, decks, balconies or patios over 40 square feet. Many homes with covered exterior areas will require two or more dry head sprinklers since they must be installed at every 20 lineal feet of wall. If this mandate applied to the 30 percent of all homes that were estimated to trigger this mandate from April 2007 – December 2012 the cost to these homeowners would be estimated at $179, 500,000.[3]

Cost of NPFA 13D Fire Sprinkler Systems + Dry Heads for 15,315 Permits Issued for Single Family Homes in Minnesota of at least 4,500 square feet (Built between April 2007 – December 2012)

		Number of Houses	Fire Sprinkler Cost Per Home	Total Cost (rounded to nearest 100,000)
Estimated % of Homes Built on Well Water	10%	1,531	$14,600	$22,400,00
Estimated % of Homes with Municipal Water Supply	90%	13,781	$11,400	$157,100,00
TOTAL COST OF FIRE SPRINKLERS IF MANDATED IN 4,500 SQFT HOMES SINCE 2007				$179,400,000

Could A $200 Million Investment in Fire Protection Protect More Minnesotans?

Instead of investing almost $200 million dollars into a small subset of Minnesota's housing stock from 2007-2012 what level of safety could be achieved in the existing home stock? The National Fire Protection Association research has found that 60% of existing homes in the United States do not have a smoke alarm in every bedroom as required by the most updated National Fire Protection Association Standard on smoke alarm placement.[4] A full 75% of existing households do not have interconnected smoke alarms.[5] The presence of battery operated, interconnected smoke alarms in every bedroom and on every floor of these existing houses would significantly increase the rate of surviving a residential fire in Minnesota. What would it cost to install this proven technology?

According to the most recent US Census data there are 1,399,993 single family homes in Minnesota.[6] Sixty percent of those homes equal 839,996. The cost of providing a set of six wirelessly interconnected,

[3] 30% of new Minnesota single family housing stock based on 2012 sales data of single family homes for 5 largest home builders in Minnesota.
[4] Ahrens, Marty. *Smoke Alarms in U.S. Home Fires* (NFPA: Quincy, MA, September 2011), p. ii.
[5] *Ibid.*
[6] U.S. Census Bureau. Historical Census of Housing Tables – Units in Structure. Accessed at http://www.census.gov/hhes/www/housing/census/historic/units.html

battery operated smoke alarms in the locations required by NFPA 72 Standard on National Fire Alarm and Signaling Code would cost $177,800,000. This assumes that each house has three floors and three bedrooms. Many houses in Minnesota's housing stock would need fewer alarms due to less floors or less bedrooms. Six Kidde interconnected wireless battery powered smoke alarms at Home Depot cost $212, including tax. Most homeowners have the skills and tools to install these smoke alarms themselves. Assuming they would have to be installed by a home maintenance contractor, 1 hours of labor would cost approximately $100. The total cost per home for installing six smoke alarms by a professional would be $312 and the total cost for all 839,996 homes would be $261,800,000.

If the fire sprinkler requirement being proposed for the Minnesota State Building Code would have been required in 2007 Minnesota homeowners would have spent $179,500,000 to equip approximately 15,000 new homes with fire sprinklers. This investment would have decreased the death rate in these homes by ZERO. How do we know this? Because no one has died in a fire for the 15,000 single family homes built since April 2007 when hardwired, interconnected smoke alarms were required by the State Building Code. Almost $180 million dollars of investment would not have saved a single homeowner or fire fighter from a fire fatality in these homes.

What could $179 million dollars buy instead? In 2007 if Minnesotans would have spent $178,000,000 to equip approximately 840,000 existing homes with wireless interconnected battery operated smoke alarms in each bedroom and on every floor the civilian death rate would have fallen, significantly. Fire prevention efforts should be focused, first and foremost, where they are effective in preventing deaths. Lower cost, proven fire prevention efforts should be a priority to cost effectively increasing public safety. Requiring fire sprinklers in new homes accomplishes neither of these public policy objectives.

Karen Linner, Principal ~ 4732 Elliot Ave ~ Minneapolis, MN 55407 ~ 612-749-6987 ~ linnerconsulting@gmail.com

Average Cost of Sprinkler System Installation in Minnesota Based on Bids to Builders For 9 Single Family Homes

Builder & source of bid	Location	Sqft. of home***	Water Source: municipal or well?	Bid date	Source of bid	Installation cost of NFPA 13D sprinklers	Well system upgrade	Cost of NPFA on well	Dry Head in Garage*	Dry Heads on Covered Porch*	Total sprinkler bid	Cost per square foot
Werschay Homes, Inc.	St. Augusta (Stearns Co.)	3,930	Well**	April 2012	Summit Fire Prot.	$ 8,100	$ 4,000	$ 12,100	$ 400	$ 400	**$ 12,900**	$ 3.28
Mike Allen Home Builders	Byron (Olmstead Co.)	2,844	Well**	April 2012	Summit Fire Prot.	$ 8,600	$ 4,000	$ 12,600	$ 400	$ 800	**$ 13,800**	$ 4.85
NIH Homes	Plymouth (well)	4,635	Well	Dec 2013	Brothers Fire Prot.	$ 9,800	$ 4,000	$ 13,800	$ 400	$ 400	**$ 14,600**	$ 3.15
Billman Construction	Freedenberg Twp. (St. Louis Co.)	3,272	Well	May 2012	A.G. O'Brien Fire Prot.	$ 7,298	$ 4,680	$ 11,978	$ 400	$ -	**$ 12,378**	$ 3.78
Gonyea Homes	Minnetonka	5,534	Municipal	Feb 2013	Summit Fire Prot.	$ 11,000	$ -		$ 400	$ 800	**$ 12,200**	$ 2.20
NIH Homes	Plymouth	4,635	Municipal	Dec 2013	Brothers Fire Prot.	$ 9,800	$ -		$ 400	$ 400	**$ 10,600**	$ 2.29
Hans Hagen Homes	Wayzata	3,086	Municipal	Nov 2010	Lifesaver Fire Prot.	$ 13,415	$ -		$ 400	$ -	**$ 13,815**	$ 4.48
Becker Building & Remodeling[3]	Minneapolis	2,245	Municipal	April 2012	Summit Fire Prot.	$ 4,950	$ -		$ -	$ -	**$ 4,950**	$ 2.20
Becker Building & Remodeling[3]	Minneapolis	2,245	Municipal	April 2012	Viking Automatic	$ 6,675	$ -		$ -	$ -	**$ 6,675**	$ 2.97

*Per Minnesota Amendment 1309.0313

**Cost for wells was not broken out for these bids. Assumed $4,000 for well upgrades which was deducted from main bid to avoid double counting.

***Includes basement

Avg non well bids -13D only	$ 9,200
Avg well bids - 13D only	$ 12,600
Avg non well bids - 13D + dry heads (over 4500)	$ 11,400
Well bid - 13D +dry heads (over 4500)	$ 14,600

rounded to nearest 100

DATA FOR FIRE SPRINKLER VS. SMOKE ALARM COST EFFECTIVENESS

PERMITS ISSUED		Number of SF Home permits	0.18	0.22
April 2007 - 2010		35,112	6,320	7,725
	2011	6,733	1,212	1,481
	2012	9,197	1,655	2,023
Total April 2007 - 2012		51,042	9,188	11,229

COST OFSPRINKLERS WITH 13D SYSTEM FOR ALL HOUSES built 2007-		Number of ALL SF Houses	Fire Sprinkler Cost per Homes	Total Cost
Estimated % of Homes Built on Well	10%	5,104	$12,600	$ 64,300,000
Estimated % of Homes Built with Municipal Water Supply	90%	45,938	$9,200	$ 422,600,000
		51,042		$ 486,900,000
			Rounded	$ 486,900,000

SYSTEM + DRY HEADS FOR 30% REACHING 4,500 SQFT TRIGGER built		SF Houses @ 30%	Fire Sprinkler Cost per Homes	Total Cost
Estimated % of Homes Built on Well	10%	1,531	$14,600	$ 22,400,000
Estimated % of Homes Built with Municipal Water Supply	90%	13,781	$11,400	$ 157,100,000
		15,313		$ 179,500,000
			Rounded	$ 179,500,000

COST OF BATTERY POWERED SMOKE ALARMS		
Cost of Kidde interconnected battery powered smoke alarm (tax incl)	$	35
6 detectors	$	212
Installation (1 hour at $100/hr)	$	100
Total installed cost	$	312

Number of SF homes in MN (2000 Census)		1,399,993	% of homes without smoke alarm in every bedroom	60%
# homes without smoke alarm in every bedroom		839,996	Population of 839,996 at 2.3/hh	1,931,990.34
Cost of homeowner installing 6 smoke alarms for 60% of home	$	177,800,000	Cost of professional install 60% homes	$ 261,800,000

GET IT IN TIME FOR CHRISTMAS! FREE SHIP TO STORE OR HOME ON OVER 400,000 ITEMS.

Kidde Battery Operated Wireless Interconnectable Smoke Alarm

Model # RF-SM-DC Internet # 100655041 Store SO SKU # 198092

$32.97 / each

This item cannot be shipped to the following state(s): AK,GU,HI,VI

Ships FREE with $45.00 Order

Buy Online, Pick Up In Store Today

Check Store Inventory

PRODUCT OVERVIEW

Kidde RF-SM-DC provides advanced warning no matter where you are at home. The Battery-Operated Interconnectable Ionization Smoke Alarm. This wireless alarm communicates with other Kidde wireless alarms, so if 1 unit sounds an alarm, they all do. You can even install this smoke detector in a detached garage or workshop and be alerted by another detector in the house. This alarm uses ionization technology. Its Smart Touch Button hushes nuisance alarms and low-battery chirps for your interconnected system and also tests the group.

- Ionization-sensing alarm detects invisible fire particles
- Uses radio frequency to coordinate with other Kidde wireless alarms so that when 1 unit sounds, all units sound
- Smart Touch Button quickly and temporarily silences nuisance alarms activated by any alarm in the system
- Smart Touch Button hushes a low-battery chirp for up to 12 hours
- Smart Touch Button tests operation of the unit and interconnected system
- Powered by a 3 AA Alkaline battery's for continuous protection, even during power outages
- Wireless operation for easy do-it-yourself installation
- UL listed
- 10-year limited warranty
- MFG Model # : RF-SM-DC
- MFG Part # : 0919-9999

Info & Guides

MSDS

Specification

Use and Care Manual

Warranty

You will need Adobe® Acrobat® Reader to view PDF documents. Download a free copy from the Adobe Web site.

SPECIFICATIONS

Alarm Sensor Type	Ionization	Alarm Type	Smoke
Alarm/Detector Features	Hush Feature,Interconnected	Assembled Depth (in.)	1.5 in
Assembled Height (in.)	5.75 in	Assembled Width (in.)	5.75 in
Carbon Monoxide Detector Included	No	Certifications and Listings	1-UL Listed
Commercial / Residential	Commercial / Residential	Connector/Contact Type	None

Electrical Product Type	Smoke Detector	Heat Detector Included	No
Included	Battery (-ies)	Returnable	90-Day
Voltage (volts)	4.5		

SHIPPING OPTIONS

Most orders process within 1 business days.

Please allow 3 to 5 business days for Standard Shipping in addition to order processing time, which varies by product. Items deliver by small parcel service.
Orders for this item may be expedited for an additional fee.

Other Delivery Options:

Expedited Shipping: Delivery the second business day in addition to order processing time, which varies by product. Items deliver by small parcel service.

Express Shipping: Delivery the next business day in addition to order processing time, which varies by product. Items deliver by small parcel service.

If product is eligible for shipping to AK, HI and US Territories additional transit time and remote surcharges may apply.

Shenandoah Consulting, LLC
4732 Elliot Ave
Minneapolis, MN 55407

January 2, 2013

Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert St.
P.O. Box 6420
St. Paul, MN 55164-0620

RE: Revisor's ID Number R-04144. Minnesota Department of Labor & Industry (DOLI) – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, chapter 1309

Dear Judge Lipman,

Thank you for the opportunity to testify on December 12, 2013 on the issue of mandating fire sprinklers in single family homes in the proposed Minnesota State Building Code.

During my and other witnesses' testimony, several questions and assertions were raised. I would like to take this opportunity to clarify these issues and submit additional evidence into the record.

Wells in Minnesota

During the hearing you asked how many single family homes in code-enforced areas are on wells in Minnesota. Because of the limits of data available, it is not possible to accurately determine this number. The closest number easily available is that 29 percent of single-family homes are built in wells in Minnesota. This number is based on the U.S. Census Bureau's Historical Census of Housing Tables - Source of Water.[1] Further, this question raises an issue that was also raised by several witnesses at the hearing: that people in non-code enforced areas will avoid the fire sprinkler mandate by not building to code.

Fire Sprinkler Bids

Three different sprinkler installation bids were collected in 2013 from two Twin Cities home builders. Summit Fire Protection submitted a quote to Gonyea Homes dated February 6, 2013. Brothers Fire Protection submitted an original quote to NIH Homes dated April 3, 2013 and then a modified quote dated December 2, 2013. The changes to the NIH Homes quotes highlight that sprinkler installers charge $400 per dry head. These bids were inadvertently omitted from Exhibit L and are attached for as Appendix A your review.

1 U.S. Census Bureau. Historical Census of Housing Tables – Source of Water. Accessed at http://www.census.gov/hhes/www/housing/census/historic/water.html

What Is Included in the 4,500 Square Foot Trigger And What Has To Be Sprinklered?

When I collected BAM's 2013 fire sprinkler bids we did not know that dry heads would be required in some exterior locations. To make sure I was including the applicable dry heads I had to ask DOLI staff for clarification about the intent of their proposed code language. As has been stated before the code language proposed by DOLI goes above and beyond the requirements for NFPA 13D standards for homes over 4,500 square feet. Appendix B shows the e-mail thread between Rich Lockrem and myself attempting to clarify these topics. The questions and answers show the complexity that the 4,500 square foot trigger and dry head requirements will present for home builders and building code officials. *See also* Exhibit L, Tab 64, which sets forth NFPA's recommended 13D system plan review checklist for local building inspection departments.

Percent of Homes Triggering the 4,500 Fire Sprinkler Trigger

During the hearing Gene Abbott, Building Code Official for the City of Lakeville, approached me and said he would send me data of the percentage of single-family homes in his community that would trigger the 4,500 square foot sprinkler requirement. He performed a random sampling of the single family homes that were plan reviewed in Lakeville in June, September, and December, to date. He reported that roughly 33% of homes (26 of 88 sampled) would trigger the requirement. His e-mail is attached as Appendix C. [2]

Can Children Hear Smoke Alarms?

One witness at the December 12th hearing discussed the results of an Australian study that showed a large percentage of children do not hear smoke alarms located in their bedrooms. I believe the witness was referring to a study titled *Community-Based Research on the Effectiveness of the Home Smoke Alarm in Waking Up Children*. As the *NFPA Journal* reported in their July/August 2011 edition the policy recommendation from this study's findings was to install interconnected smoke alarms.[3] The Australian study is not available in the public domain.

How loud do smoke alarms have to be to meet UL Standards? According to the Consumer Products Safety Division,

> "Depending on the piezoelectric horn design, the maximum sound pressure level can vary but is typically rated at a minimum of 85 dBA at 10 feet away as specified in the Underwriters Laboratories' voluntary standard for smoke alarms, *UL 217 Single and Multiple Station Smoke Alarms*." [4]

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[2] Personal Communication with Gene Abbott, Lakeville Building Code Official. Via email on December 19, 2013.

3 Durso, Jr., Fred. "Wake-up Call New research finds smoke alarms fail to rouse most sleeping children." (NFPA: *NFPA Journal*. July/August) p. 2. Accessed at http://www.nfpa.org/newsandpublications/nfpa-journal/2011/july-august-2011/news-and-analysis/in-a-flash/?p=1.

[4] *The Audibility of Smoke Alarms in Residential Homes.* US Consumer Products Safety Commission (Bethesda, MD: September 2005, Revised January 2007). p. 3.

This study also reports that up to 30 dBA can be lost by closing a door and being one level away from an alarm.[5] This is the main reason that NFPA's Standard 72 Fire Alarm Code standard requires an interconnected smoke detector in every bedroom and on every level of a home. Smoke alarms must also function with a "3-temporal pattern" which repeats the alarm three times in an on and off pattern.

Shortcomings of the Home Fire Sprinkler Cost Assessment Reports

Several witnesses cited $1.61 per square foot for the mean cost of installing fire sprinklers in single family homes in 2008 and $1.35 per square foot in 2013.[6] For instance, The Minnesota State Fire Chiefs Association published an undated *White Paper on Residential Sprinkler Systems* that estimates that single family home installations will average approximately $1.80 per square foot in Minnesota.[7] Specifically the report states,

> "Minnesota, with its cold winter climate eliminates certain efficiencies in installation as few circumstances allow any pipe in the attic area. Cities such as Blaine, Plymouth, and Maple Grove have thousands of systems installed in town homes and close to a hundred one and two single family homes.
>
> Their experience reflects the Minnesota Fire Chief's member's average of $1.61 for the townhomes and approximately $1.80 for the one and two single-family homes."

There are several reasons why the median costs in the Newport Partners studies is not applicable to homes built in Minnesota and to those that would trigger the 4,500 square foot mandate. Here are some of them:

- The majority of the homes in the studies were built in warm weather-climates where freezing pipes is not an issue. Building soffits and changing insulation strategies to accommodate cold weather sprinkler installation will incur costs over and above that of the sprinkler installer's bid. These costs will be passed onto the homeowner.
- Many of the homes in the studies would not trigger the 4,500 square foot minimum that Minnesota is proposing.
- In many of the markets studied in this report, production builders dominate. Due to their volume of homes produced and repeated plans they can maximize efficiencies that smaller, custom home builders can't.
- Minnesota has one of the most diverse types of home builders in the nation. There are 12,483 licensed home builders registered with the State of Minnesota.[8] Many homeowners buy their single-family homes from small, family-owned home building companies, especially those of

[5] *Ibid*. p. iii.
[6] Newport Partners. *Home Fire Sprinkler Cost Assessment – 2013 Final Report*. (The Fire Protection Research Foundation. Quincy, MA: September 2013) pp. 1-2.
[7] Exhibit L, Tab 32, Attachment C, page 3.
[8] *State of Minnesota Mailing List Service Catalog 2013*. (Minnesota's Bookstore, St. Paul: July 1, 2013) . p.6 accessed at http://www.comm.media.state.mn.us/bookstore/files/mlsweb.pdf

4,500 square feet or more. Because of their unique designs and floor plans, sprinkler installers will charge higher costs to design and install sprinkler systems.

- The studies tried to compare the same communities from 2008 to 2013. However, they could not include Huntley, IL in the 2013 study since the city council voted to withdraw the sprinkler mandate, as the attached news article in Appendix D shows.[9] According to the attached article, Huntley, Illinois withdrew the sprinkler mandate because "'[t]hese costs passed onto our buyers make Huntley less affordable than surrounding communities,' Trustee Harry Leopold said. 'We're allowing them to choose, rather than us choosing for them.'"
- These reports do not compare apples to apples. Not all of the fire sprinkler systems in these reports complied with NFPA 13D systems. For instance, two of the homes in the 2013 study were served by municipal water in Fort Collins, Colorado. These houses had square footages of 5,500 and 6,600 square feet respectively. The narrative of the report explained that the basements were not sprinklered due to local regulations that did not comply with a 13D system. Yet the square footage used to calculate the cost per square footage included the basement. The installed costs would have been much higher than $1.53 and $1.63 a square foot with this adjustment.
- These reports focus only on cost per square foot, not total cost to homeowners. However, it distorts the true cost of fire sprinklers to only consider the cost per square foot. Homeowners do not pay their builders average or median costs to install mandated sprinkler systems. They pay an installed cost based on their particular home, in their particular climate with their particular water supply. Therefore average cost per square foot is irrelevant to individual homeowners.
- According to the 2013 study one homeowner in New York paid $21,000 for their well-based sprinkler system, not including builder mark-up. Four additional homeowners in this study paid between $11,000-$13,909 for municipal water sprinkler systems in four different states, not including builder mark-up.
- The average cost to the builder of installing a sprinkler system for homes of at least 4,500 square feet in cold climates was $9,389.[10] This is the meaningful number for a homeowner. Not an average square footage cost of all sizes of homes, in all climates, on well and municipal water systems.

Is a Survival Rate of 99.45% High or Low?

A witness from the NFPA testified on December 12th that a 99.45% rate of surviving a home fire when at least one working smoke alarm is present is still too low. The rate of surviving a fire in a home with hardwired, interconnected smoke alarms is not known, but is certainly higher than 99.45%. BAM data showed that there has been a 100% survivability rate in Minnesota for homes built from April 2003

[9] Naqvi, Jameel. "Huntley Lifts Fire Sprinkler Requirement". (*Daily Herald*, Arlington Heights, IL: September 7, 2007).
[10] Exhibit L, Tab 47, AVERAGE Home Fire Sprinkler Cost Assessment Report Bids.

through December 2012 when hardwired, interconnected smoke alarms have been required in new homes by the Minnesota State Building Code.[11]

The Home Fire Sprinkler Coalition has also compared the NFPA 99.45% survivability rate with other unintentional deaths including falls and motor vehicle crashes as shown in Appendix E.[12] It states the survivability rate of having fire sprinklers in your home increases 80%. However, it is incredibly unlikely that a home originally built with fire sprinklers would not also have hardwired, interconnected smoke alarms. There has never been a study done that isolates the increased survivability rate of fire sprinklers from the survivability rate of interconnected smoke alarms.

According to Minnesota Department of Health data the top 3 causes of unintentional death in Minnesota from 2003-2012 were falls, motor vehicle crashes, and poisoning (from alcohol, drugs and toxic household substances).[13,14] The chart shown in Appendix F comparing unintentional deaths from falls, motor vehicle crashes, and fires in single family homes shows the magnitude of these public health issues.[15,16, 17] For instance, in 2011, 864 Minnesotans died from falls, 463 in motor vehicle accidents and 30 in single family home fires. I do not intend to minimize any death. However, the statistics show that fire deaths are relatively uncommon, and that there have been zero fire deaths in Minnesota homes built since hardwired, interconnected smoke alarms were required.[18]

Was the 2009 IRC Final Action Hearing About Fire Safety or Fire Sprinklers?

Roger Axel testified on December 12th that the 2009 IRC fire sprinkler vote passed because there were so many fire fighters in the room.[19] As a BAM employee and ICC member, I too attended the hearings in Minneapolis that added a fire sprinkler requirement for one- and two-family homes to the 2009 IRC. The difference is that I was unable to vote because according to the ICC bylaws only representatives from governmental entities are allowed to vote at final action hearings. The fire fighters in the room were there representing their fire departments because their fire chief had registered their community's fire department as a governmental member of ICC, as allowed by the ICC bylaws.

There is no doubt that the fire sprinkler code amendment RB 64 passed 1,282 in favor and 425 opposed because of the overwhelming number of fire service personnel in the hearing room on Sunday

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[11] Exhibit L, Tab 22.
[12] Fire Safe Cigarettes Coalition, Myths Versus Realities web page. Published August 23, 2011. Accessed at http://www.nfpa.org/safety-information/for-consumers/causes/smoking/coalition-for-fire-safe-cigarettes/myths-versus-realities
[13] *The Health of Minnesota Statewide Assessment: Part Two: Disease and Injury* (Minnesota Department of Health. St. Paul: May 2012) p. 19.
[14] 2011 data. Personal communication with Carol Haijeck, Minnesota Center for Health Statistics, Minnesota Department of Health via email on June 13, 2012
[15] *Ibid*.
[16] *The Health of Minnesota Statewide Assessment, Ibid.*
[17] *Fire in Minnesota Annual Report (*Minnesota Deparment of Public Safety. St Paul: 2003-2011) See chart titled: *Single-Family Civilian Fire Deaths: Where and Why in* each annual report.
[18] Exhibit L, tab 21.
[19] Exhibit L, tabs 4, 5 & 6.

September 21, 2013.[20] Immediately after the fire sprinkler vote hundreds of fire personnel filed out of the hearing room even though the moderator pleaded to have them stay and consider important code proposals that directly addressed fire safety. The numbers of eligible voting members dropped by over 650 for the next code proposal RB 68. The fire fighters that sat next to my former boss and I were from North Carolina. They told us they were leaving after the sprinkler vote to use their free tickets for the Panthers/Vikings game. Other fire fighters went to hospitality suites that opened directly after the sprinkler votes (RB 66 & RB 64).

RB 64 was voted on by 1,752 eligible voters at 11:30am. The vote for RB 68 took place at 1:05 pm and was voted on by 1,083 eligible voters. RB 68 was a code proposal that would have required fire protected floors in all unsprinklered homes built to the 2009 IRC. It failed to reach the required super majority by less than 15 votes. From 2:00 pm -5:00 pm on Sunday the 21st the rest of the IRC votes were held with 117-243 total eligible voters. In my opinion, the majority of fire service personnel voted at the 2009 IRC Final Action Hearings to make sure fire sprinklers were added to the code, but not to ensure that fire fighters were protected from the threat of collapsing floors built with lightweight construction. A chart of the vote totals was submitted in Exhibit L, Tab 10.

Are Newer Homes More or Less Likely to Have Large Fires?

At the December 12th ALJ hearing, proponents of the fire sprinkler mandate testified that modern homes are more likely to have larger fires due to their furnishings and construction methods. Fire incidence data for Minnesota show a different story. The National Fire Incident Reporting System (NFIRS) tracks and aggregates fire statics reported by local fire departments. NAHB analyzed NFIRS data in single-family home fires from 2002-2006[21] for unconfined fires as summarized in Appendix G. An unconfined fire is defined by the United States Fire Administration as, "those incidents typically associated with larger, more serious fires that progress beyond control and often result in substantial loss and/or causalities."[22]

The total average number of unconfined fires in one-and two-family homes in Minnesota from 2002-2006 was 1,905 per year for 1,717,083 total homes in the state. The rate per 1,000 homes was 1.11 for unconfined fires in these occupancies. **What is compelling is that in homes where hardwired, battery backup smoke alarms worked the average number of unconfined fires was zero**. The NFRIS data is not broken down into homes with <u>hardwired, interconnected</u> smoke alarms but of course they are included as a subset of the hardwired, battery backup statistic. The average number of fires per year for all homes with detectors but no fire sprinklers was 854 compared to 1,905 for all homes. The Minnesota Building Code has required hardwired smoke alarms with battery backup since March of 1995. These data show that unconfined fires in homes built since 1995 are extremely rare, with an average number of unconfined fires of zero. These data rebut the assertion that newer constructed materials and furnishings result in unconfined fires.

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[20] Exhibit L, tab 9.

[21] NAHB requested these data in 2011, and 2006 was the most recent NFIRS data set that had been finalized by the U.S. Fire Administrating.

[22] *National Fire Incident Reporting System Version 5.0 Fire Data Analysis Guidelines and Issues*. (United States Fire Administration: July 2011), p. 14.

What is the Cost Benefit to Society of Fire Sprinklers Versus Interconnected Smoke Alarms?

The data that BAM presented at the December 12th trial has shown that hardwired, interconnected smoke alarms have worked 100% of the time to save lives when fires start in these homes. If fire sprinklers had also been required since March of 2007 what would the cost impact be to society? The complete assumptions and citations for this analysis are shown in Appendix H.

If the fire sprinkler mandate included the 4,500 square foot trigger BAM estimates that the installation of NFPA 13D fire sprinkler systems would have cost just over 15,000 homeowners a total of $179,500,000. If fire sprinklers were required in all 51,042 new single-family homes that total cost would have risen to $486,900,000.

How much fire protection could $179 million buy for homeowners in Minnesota that live in homes that don't meet the smoke alarm locations recommended in NFPA's standard? According to NFPA, 60% of existing homes do not have a smoke alarm in every bedroom and on every floor. Sixty percent of Minnesota's single family housing stock equals 839,996 homes according to the most recent US Census. A full 75% of existing households do not have interconnected smoke alarms. Wireless interconnected smoke alarms can be purchased at home improvement stores and online and are simple to install.

It would cost $177,800,000 to purchase six wireless interconnected battery operated smoke alarms for 60% of Minnesota's single family homes, assuming each home has an average of 3 bedrooms and three floors. This investment in fire protection since 2007 would have reduced the fire death rate significantly. Whereas an investment of just over $179 million in approximately 15,000 new homes with fire sprinklers would not would not have saved a <u>single</u> homeowner or fire fighter from a fire fatality.

Survivability of Drug/Alcohol Use While Smoking in Bed

During the hearing the issue was raised whether homeowners who live in homes built from 1990-2012 may be in a socio-economic status that was less likely to result in risky behaviors such as smoking in bed after excess alcohol consumption. I have not found a data source that would confirm this assumption.

However, another way to look at this issue is to assess whether or not interconnected smoke alarms or fire sprinklers would prevent fire deaths caused by unattended cigarettes and excess alcohol or drug consumption. Someone who is unconscious due to drug or alcohol consumption is less likely to be roused by a blaring smoke detector. If that person were in a home with hardwired, interconnected smoke alarms other occupants would have a better chance of rescuing the smoker than in a home with smoke detectors that weren't interconnected.

How likely is it that a smoker who passed out on a bed or sofa be saved from a fire in a home with fire sprinklers? According to the Fire Safe Cigarette Coalition, fire sprinklers are unlikely to activate before the victim is overcome by toxic fumes from a smoldering fire.

> "Also, if the cigarette falls near the head of a sleeping smoker, the smoldering fire can produce enough carbon monoxide to kill him or her before there is enough heat from the burning chair/bed to activate the sprinkler "[23]

Furthermore, NFPA 13D Section 1.2.1 states that "The purpose of this standard shall be to provide a sprinkler system that aids in the detection and control of residential fires and thus provides improved protection against injury and life loss. " When a fire victim is intimate with the ignition source, as is a smoker with an unattended cigarette, there is no guarantee that a fire sprinkler will prevent a fire death. The U.S. Fire Administration states,

> "[In addition,] in order to activate, a fire sprinkler requires more severe fire conditions at the ceiling than a smoke alarm does. As a result, even though the sprinkler will provide more direct and immediate protection, not requiring any action on the occupant's part to save himself or herself, it is doubtful that an intimate-with-ignition victim will be saved by a sprinkler."[24]

One of the only ways to prevent fatalities in fires started by inattentive smoking is fire prevention. In December of 2008 Minnesota passed a fire safe cigarette law. These cigarettes are less likely to continue burning when they are not being actively smoked. Regardless of the level of fire protection technologies in any given home, fire safe cigarettes should prevent more fire deaths from inattentive smoking.

Thank you for considering this additional information. These data further show that the Department of Labor and Industry's proposed rules for mandating fire sprinklers in single family homes is neither needed nor reasonable.

Sincerely,

Karen Linner
Attachments

cc: Joe Springer, Esq Fredrikson & Byron
Remi Stone, Esq – Executive Vice President Builders Association of Minnesota

[23] Fire Safe Cigarettes Coalition, *Ibid.*
[24] Hall Jr., John *et al. Behavioral Mitigation of Smoking Fires Through Strategies Based on Statistical Analysis* (U.S. Fire Administration. Emittsburg, MD: February 2006) p. 7.

Please see attached for consideration by Judge Lipman in the rule-making proceeding captioned Revisor's ID No. RD-4144, OAH No. 1900-30855.

Thank you,

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HousingEconomics.com NAHB

Metro Area House Prices: the "Priced Out" Effect

Special Studies, February 1, 2012
by Natalia S. Siniavskaia, Ph.D.

Rising home prices do not come to mind as a potential threat to housing affordability these days. Nevertheless, NAHB Economics regularly receives requests to evaluate the effects of pending new regulations on housing affordability in local markets where regulatory actions are expected to raise home prices. The NAHB Priced Out Model provides most straightforward answers. The model has been recently updated and the new 2012 priced out estimates for the United States and 325 metro areas are now available and discussed in this article.

The affordability concept underlying the priced out model is based on mortgage underwriting standards. Based on these standards, it is possible to estimate how many households can qualify for a mortgage before and after a house price increase. The resulting difference is the number of priced out households. The 2012 estimates show that nationally a $1,000 increase in the price of the home price leads to pricing out about 232,447 households. The size of the impacts varies across metros and largely depends on their population and income distribution.

The Priced Out Methodology

Most home buyers take out a mortgage to finance a purchase of a new home, so the Priced Out model uses ability to qualify for a mortgage as an affordability standard. To qualify for conventional loans, housing expenses should not exceed 28 percent of homebuyers' gross monthly income. Monthly housing costs include principal and interest on the mortgage, property taxes and homeowner's Insurance – often abbreviated as "PITI".

The affordability standard is thus a ratio of housing expenses to income, and the number of households that qualify for a mortgage to buy a home of a given price will depend on the income of households in an area. The American Community Survey (ACS) which replaced the decennial Census long form provides the detailed income distribution for the United States and all metro areas with population of 65,000 people or more annually. The most recent income estimates are now available for 2010.

To adjust for expected 2010-2012 income growth, NAHB uses the annual estimates of median family income published by the Department of Housing and Urban Development (HUD) for every state and county. At the request of NAHB, HUD now releases median income estimates in advance, prior to the

beginning of the calendar year for which estimates are produced. The 2012 estimates were made available early in December 2011[1]. To adjust for population growth, NAHB relies on annual household estimates reported by the ACS and extrapolates the most recent household growth into 2012. Table 1 shows the projected US household income distribution that underlies the 2012 priced out estimates.

Table 1: US Household Income Distribution for 2012

Income Range:			Households	Cumulative
$0	to	$10,723	8,904,433	8,904,433
$10,724	to	$16,086	6,780,995	15,685,429
$16,087	to	$21,448	6,563,954	22,249,383
$21,449	to	$26,810	6,822,788	29,072,171
$26,811	to	$32,172	6,188,392	35,260,563
$32,173	to	$37,535	6,342,134	41,602,698
$37,536	to	$42,897	5,789,689	47,392,387
$42,898	to	$48,259	5,746,690	53,139,077
$48,260	to	$53,621	5,050,282	58,189,359
$53,622	to	$64,346	9,432,260	67,621,619
$64,347	to	$80,433	11,860,699	79,482,318
$80,434	to	$107,244	13,753,935	93,236,252
$107,245	to	$134,055	8,796,336	102,032,588
$134,056	to	$160,866	4,976,246	107,008,834
$160,867	to	$214,489	4,890,873	111,899,708
$214,490	to	More	4,594,048	116,493,756

Other assumptions used in the priced out calculations are a down payment equal to 10 percent of the purchase price and a 30-year fixed rate mortgage. The mortgage interest rate is set at 4.5 percent with zero points. For this typical loan, the model also assumes lenders require private mortgage insurance with an annual premium of 45 basis points[2]. Effective local property tax rates come from the 2010 ACS. The ACS reports both median home values and real estate taxes paid and, thus, allows estimating the effective property tax rates for all metro areas. For the US, the median rate is $11.36 per $1,000 of property value. Property hazard insurance rates are constructed based on the 2007 ACS Public Use Microdata Sample (PUMS)[3]. For the US as a whole, the insurance rates work out to $5 per $1,000 of property value.

[1] In cases, where counties comprising a metro area are estimated to have different median incomes, an estimate for the county containing the core urban area listed first in the name of the metro area is set to represent the median family income for the entire metro area.

[2] In the PITI formula, mortgage insurance is essentially treated as part of the interest payment. Like interest on the loan, it is a percentage of the declining mortgage balance.

[3] Producing metro level estimates from the ACS PUMS involves aggregating PUMA level data according to the latest definitions of metropolitan areas. Due to complexity of these procedures and since metro level insurance rates tend to remain stable over time, NAHB revises these estimates only periodically.

House Prices

The priced out analysis is most meaningful when based on median new home prices. Medians are preferred to averages, since they are not skewed upward or downward by a few outliers (e.g., a few multimillion dollar mansions). New home prices are preferred to existing home prices since they are directly affected by new regulations.

The median new home price for the United States is set at $225,000 for 2012. It is estimated as an average of monthly median new home prices reported by the Census Bureau over the most recent twelve months, and adjusted for inflation based on the 2012 NAHB forecast of the Case-Shiller Home Price Index.

To estimate median new home prices for metropolitan areas, NAHB relies on data reported by the 2010 Census Bureau's Building Permits Survey and Survey of Construction (SOC). The Permits Survey provides both the number and aggregate value of new housing units authorized by building permits and, thus, allows calculating average permit values for all metro areas. However, permit values do not include brokerage commissions, marketing/finance costs and may not include the cost of raw land. These additional costs are likely to differ across geographic areas but not available for metro areas. Nevertheless, the SOC provides enough data to tabulate median new home prices for all nine Census divisions and, consequently, division-wide ratios of median new home prices to average permit value. The ratios are then used as scaling mark-ups to convert metro average permit values into median new home prices[4]. The resultant median new home prices range from less than $110,000 in Beaumont-Port Arthur, TX to more than $845,000 in Bridgeport-Stamford-Norwalk, CT (see Table 2 at the end of this article).

Metro Priced Out Results

Table 2 presents the priced out results for 325 metropolitan areas and metro-level data that underlie the estimates. In addition to median new home prices, it displays income needed to qualify for a mortgage to buy a median price new home and a share of all households who can qualify for such mortgage. The last column displays the number of households that will be priced out of the market for a new home if its price increases by $1,000.

A typical household in Beaumont, TX, where half of all new homes is sold for less than $110,000, needs an annual income of $33,000 to qualify for a mortgage, while a household in Bridgeport-Stamford-Norwalk, CT will need to earn $226,569 to qualify for a new home loan. Clearly, these differences are driven by large divergences in new home prices across metropolitan areas. The more expensive new

[4] For Boulder, CO and Washington-Arlington-Alexandria, DC-VA-MD-WV metro areas, where permit values are volatile and likely to have a large margin of error, NAHB uses median existing home prices reported by the National Association of Realtors as a proxy for new home prices.

homes, the higher monthly principal and interest payments, the higher income required to qualify for a mortgage. But the relationship is not always linear as property tax and insurance payments also affect monthly housing costs. For example, even though two metro areas in Texas - Beaumont-Port Arthur, TX and Brownsville-Harlingen, TX - have the lowest median price new homes, the income needed to qualify for a mortgage to buy these homes are not the lowest in the nation. Hot Springs, AR, Valdosta, GA, Cedar Rapids, IA, Las Vegas-Paradise, NV and several other metros have new homes that are more expensive but require a lower income to qualify for a mortgage. This is a result of higher property tax and insurance payments in Texas.

Next, the priced out model estimates how many households in each metro area actually earn enough income to qualify for new home loans. Not surprisingly, Bridgeport-Stamford-Norwalk, CT metro area with most expensive new homes turned out to be least affordable, as only 7 percent of all households earn enough money to qualify for a new home loan. The three other least affordable metropolitan areas in the nation are Sebastian-Vero Beach, FL, Napa, CA, and Barnstable Town, MA, where less than 15 percent of all households can afford a median price new home. In sharp contrast stand metro areas like Cedar Rapids, IA where half of new homes are priced under $112,000 and more than three quarters of households can afford them.

These differences translate into different effects of adding $1,000 to a new home price. Increasing a price of a new home in Chicago-Naperville-Joliet, IL-IN-WI by $1,000 disqualifies more than 6,000 households from buying a new home. This is by far the largest priced out effect in the nation, partially because it is a relatively affordable metro area where 43 percent of households can afford a new home, and partially because it is a populous area with almost 3.5 million households residing there. The second largest number of priced out households is in New York-Northern New Jersey-Long Island, NY-NJ-PA, where more than 5,000 households are priced out. Even though this metro is double the size of the Chicago area, the priced out effects are smaller, simply because the area is less affordable to begin with. Only 20 percent of households can afford a new home before any price hikes. Similarly, Los Angeles-Long Beach-Santa Ana, CA, where affordability is low but population is high, register the third highest number of priced out households, close to 5,000.

At the other end of the spectrum are small and often unaffordable high home priced metropolitan areas. Napa, CA, Ocean City, NJ, Carson City NV, Sebastian-Vero Beach, FL are all estimated to have less than 50 households priced out of the new home markets. In Napa, CA where half of all new homes sell for more than $700,000, adding another thousand to a price, affects only 14 households, since there were only a few of them (13 percent) who could afford such expensive new homes in the first place.

Looking at the affordable metro areas, where more than fifty percent of households can afford new homes, the priced out effects are large and can often disqualify thousands of new home buyers. In Houston-Sugar Land-Baytown, TX, almost 4,700 households are priced out of the new home market as a result of prices rising by $1,000, in Atlanta-Sandy Springs-Marietta, GA – 3, 771 households.

Conclusion

Quite frequently and often unintentionally local regulations raise construction costs and trigger hikes in home prices. NAHB consistently relies on the priced out model to estimate the impacts of price changes. Even though the model does neither answer all questions nor estimate effects of regulation on new home sales or housing starts, it highlights often overlooked effects of regulation on affordability of new homes. The new 2012 estimates show that, in relatively affordable metro areas, hundreds and sometimes thousands of households can be priced out of the new home markets as a result of prices rising by $1000.

Note: Regulatory Costs Boost Home Prices by up to 39 Percent More than Building Fee Increases

Hidden in median new home prices is the cost of government regulations. NAHB research shows that, on average, regulations imposed by government at all level account for 25 percent of the final price of a new single family home built for sale[5]. Every time a local or regional government raises construction costs by, for example, increasing the price of construction permits or impact fees, the cost of building a house rises. In fact, the final price of the home to the buyers will usually go up by more than the increase in the government fee. This is because each time construction costs increase other costs such as commissions and financing charges automatically rise as well. As a result, most cost increases are passed on to the buyers with additional charges. The size of these charges depends both on the type of fee/cost increase and when it is imposed in the development/construction process. NAHB estimates that the add-on charges range from 0 percent if a fee is imposed directly on buyers to 39 percent if cost is incurred when applying for site development approval (see Table 3). So that for every $1 increase in fees incurred, for example, when acquiring a building permit, the final price of a new home to its final customer rises by $1.20. Alternatively, every $833 increase in fees imposed at the time of the building permit results in a $1,000 increase in house prices.

Table 3: Additional Charges on Building Fees

Building Costs/Fees	Add-on Charges
Imposed directly on buyer	0%
During construction	16%
At start of construction	18%
When building permit acquired	20%
During development	37%
When applying for site development approval	39%

[5] See P. Emrath "How Government Regulation Affects the Price of a New Home", Housing Economics Online, July 2011

Table 2. Metro Area Median New Home Prices and Households Priced Out of the Market by a $1,000 Price Increase, 2012

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Abilene, TX Metro Area	151,573	44,994	63,637	46%	229
Akron, OH Metro Area	193,124	53,327	281,032	48%	669
Albany, GA Metro Area	132,724	36,060	60,588	51%	158
Albany-Schenectady-Troy, NY Metro Area	367,528	106,087	374,248	24%	511
Albuquerque, NM Metro Area	197,331	49,450	366,039	50%	739
Alexandria, LA Metro Area	169,106	42,772	51,897	50%	147
Allentown-Bethlehem-Easton, PA-NJ Metro Area	254,583	70,484	322,461	43%	609
Altoona, PA Metro Area	279,648	73,569	50,084	26%	107
Amarillo, TX Metro Area	249,059	75,961	107,577	26%	171
Ames, IA Metro Area	274,778	75,333	43,803	34%	75
Anchorage, AK Metro Area	330,103	87,973	154,072	42%	219
Anderson, IN Metro Area	230,518	61,064	49,846	36%	97
Anderson, SC Metro Area	204,655	50,837	75,200	43%	120
Ann Arbor, MI Metro Area	171,754	49,890	127,899	60%	271
Anniston-Oxford, AL Metro Area	158,793	40,035	44,545	48%	117
Appleton, WI Metro Area	206,641	58,502	91,277	52%	274
Asheville, NC Metro Area	246,301	59,440	200,495	40%	455
Athens-Clarke County, GA Metro Area	229,681	58,841	62,838	38%	125
Atlanta-Sandy Springs-Marietta, GA Metro Area	209,386	53,727	1,868,085	55%	3,771
Atlantic City-Hammonton, NJ Metro Area	228,893	65,928	97,000	47%	197
Auburn-Opelika, AL Metro Area	209,287	52,096	52,981	40%	81
Augusta-Richmond County, GA-SC Metro Area	203,946	51,383	217,838	48%	445
Austin-Round Rock, TX Metro Area	179,428	53,198	719,973	57%	1,531
Bakersfield, CA Metro Area	226,335	58,119	274,717	44%	481
Baltimore-Towson, MD Metro Area	208,489	52,209	1,058,477	62%	1,866
Barnstable Town, MA Metro Area	572,853	139,633	82,097	14%	63
Baton Rouge, LA Metro Area	170,631	42,234	285,644	57%	712
Battle Creek, MI Metro Area	156,579	45,978	48,946	46%	176
Bay City, MI Metro Area	158,859	46,641	43,032	54%	129
Beaumont-Port Arthur, TX Metro Area	109,436	32,819	121,969	64%	324
Bellingham, WA Metro Area	272,222	66,265	86,309	37%	152
Bend, OR Metro Area	292,059	71,982	64,593	37%	89
Billings, MT Metro Area	194,096	50,147	75,715	51%	157
Binghamton, NY Metro Area	289,182	90,121	103,879	23%	143
Birmingham-Hoover, AL Metro Area	186,533	45,433	401,835	56%	963
Blacksburg-Christiansburg-Radford, VA Metro Area	212,499	52,361	65,648	47%	150
Bloomington, IN Metro Area	165,505	41,181	71,442	55%	143
Bloomington-Normal, IL Metro Area	172,945	52,135	57,032	55%	143
Boise City-Nampa, ID Metro Area	226,143	55,228	239,295	48%	450
Boston-Cambridge-Quincy, MA-NH Metro Area	415,651	106,495	1,829,120	36%	2,112
Boulder, CO Metro Area	358,100	85,363	125,046	40%	128
Bowling Green, KY Metro Area	156,721	39,990	48,973	51%	113
Bremerton-Silverdale, WA Metro Area	256,013	63,783	118,339	49%	260
Bridgeport-Stamford-Norwalk, CT Metro Area	845,679	226,569	328,791	7%	153
Brownsville-Harlingen, TX Metro Area	111,355	34,074	112,731	46%	441
Brunswick, GA Metro Area	257,348	66,277	50,003	40%	61
Buffalo-Niagara Falls, NY Metro Area	348,014	111,982	463,192	16%	378
Burlington, NC Metro Area	155,781	39,084	63,421	58%	209
Canton-Massillon, OH Metro Area	199,272	53,627	155,133	45%	416
Cape Coral-Fort Myers, FL Metro Area	217,582	60,294	225,052	39%	499
Carson City, NV Metro Area	328,738	77,494	20,765	35%	30
Cedar Rapids, IA Metro Area	111,664	30,579	112,669	76%	282
Champaign-Urbana, IL Metro Area	225,730	66,863	92,118	34%	167
Charleston-North Charleston-Summerville, SC Metro Area	241,292	60,140	266,301	44%	526
Charlotte-Gastonia-Concord, NC-SC Metro Area	213,502	54,363	639,491	53%	1,462
Charlottesville, VA Metro Area	283,918	68,074	78,295	45%	130
Chattanooga, TN-GA Metro Area	160,621	40,677	208,016	55%	549
Chicago-Naperville-Joliet, IL-IN-WI Metro Area	260,774	73,929	3,446,750	43%	6,110
Chico, CA Metro Area	236,637	58,693	85,008	41%	165
Cincinnati-Middletown, OH-KY-IN Metro Area	185,189	49,792	801,287	56%	1,624
Clarksville, TN-KY Metro Area	123,054	31,075	97,048	69%	253
Cleveland, TN Metro Area	166,213	40,716	42,333	53%	95
Cleveland-Elyria-Mentor, OH Metro Area	211,620	60,259	846,165	42%	1,824
Coeur d'Alene, ID Metro Area	204,903	49,063	57,511	50%	110
College Station-Bryan, TX Metro Area	133,796	38,352	90,935	52%	199
Colorado Springs, CO Metro Area	330,491	78,683	260,125	37%	375
Columbia, MO Metro Area	182,158	46,561	64,299	48%	153

Table 2. Metro Area Median New Home Prices and Households Priced Out of the Market by a $1,000 Price Increase, 2012

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Columbia, SC Metro Area	173,281	42,843	309,303	59%	691
Columbus, GA-AL Metro Area	190,675	46,808	103,991	46%	197
Columbus, IN Metro Area	186,258	47,165	36,127	57%	49
Columbus, OH Metro Area	205,424	57,068	738,551	48%	1,576
Corpus Christi, TX Metro Area	142,448	44,383	158,548	52%	398
Dallas-Fort Worth-Arlington, TX Metro Area	238,865	73,595	2,428,691	41%	4,705
Dalton, GA Metro Area	148,798	36,999	55,286	56%	176
Danville, IL Metro Area	120,804	37,403	31,054	59%	120
Danville, VA Metro Area	136,008	33,735	45,766	60%	95
Davenport-Moline-Rock Island, IA-IL Metro Area	188,096	53,260	153,672	48%	406
Dayton, OH Metro Area	256,966	72,758	347,305	34%	579
Decatur, AL Metro Area	173,604	43,501	52,976	52%	85
Decatur, IL Metro Area	298,680	91,496	45,630	21%	63
Deltona-Daytona Beach-Ormond Beach, FL Metro Area	272,657	72,805	187,256	28%	317
Denver-Aurora-Broomfield, CO Metro Area	251,941	61,273	1,058,253	52%	1,827
Des Moines-West Des Moines, IA Metro Area	211,535	59,413	222,229	51%	480
Detroit-Warren-Livonia, MI Metro Area	224,971	69,599	1,667,740	37%	3,240
Dothan, AL Metro Area	193,879	47,456	66,516	45%	175
Dover, DE Metro Area	148,344	35,208	49,088	70%	127
Duluth, MN-WI Metro Area	171,845	44,912	123,384	51%	303
Durham-Chapel Hill, NC Metro Area	229,813	59,405	201,164	45%	358
Eau Claire, WI Metro Area	169,012	47,130	65,190	49%	193
El Centro, CA Metro Area	220,749	55,332	47,545	37%	100
El Paso, TX Metro Area	180,930	53,779	263,539	35%	564
Elizabethtown, KY Metro Area	146,621	37,143	47,679	60%	147
Elkhart-Goshen, IN Metro Area	178,996	46,743	65,813	48%	226
Erie, PA Metro Area	260,460	75,560	111,274	26%	220
Eugene-Springfield, OR Metro Area	268,824	67,503	153,574	34%	247
Evansville, IN-KY Metro Area	160,470	41,293	144,299	58%	368
Fairbanks, AK Metro Area	253,293	68,803	53,904	55%	83
Fargo, ND-MN Metro Area	169,357	47,469	90,609	53%	218
Farmington, NM Metro Area	210,729	50,850	46,229	49%	99
Fayetteville, NC Metro Area	190,209	50,529	134,964	46%	375
Fayetteville-Springdale-Rogers, AR-MO Metro Area	230,431	56,570	179,578	43%	370
Flagstaff, AZ Metro Area	192,998	45,682	44,565	54%	108
Flint, MI Metro Area	170,084	53,564	160,249	43%	425
Florence-Muscle Shoals, AL Metro Area	126,522	31,290	63,812	61%	173
Fond du Lac, WI Metro Area	196,268	56,592	39,758	48%	92
Fort Collins-Loveland, CO Metro Area	257,866	62,238	117,998	48%	195
Fort Smith, AR-OK Metro Area	160,364	40,106	114,251	52%	397
Fort Wayne, IN Metro Area	178,794	46,364	160,734	55%	454
Fresno, CA Metro Area	235,114	57,914	292,537	43%	525
Gadsden, AL Metro Area	125,257	31,388	36,553	63%	107
Gainesville, FL Metro Area	176,012	46,797	99,264	41%	210
Gainesville, GA Metro Area	187,358	46,820	62,910	58%	130
Glens Falls, NY Metro Area	245,442	68,533	52,697	37%	106
Goldsboro, NC Metro Area	165,836	43,503	52,679	47%	160
Grand Junction, CO Metro Area	235,744	54,899	59,077	48%	97
Grand Rapids-Wyoming, MI Metro Area	171,008	47,909	304,921	53%	888
Greeley, CO Metro Area	221,840	53,721	95,314	53%	186
Green Bay, WI Metro Area	169,612	47,915	120,520	56%	370
Greensboro-High Point, NC Metro Area	189,206	48,543	284,042	46%	651
Greenville, NC Metro Area	163,894	43,464	63,747	47%	156
Greenville-Mauldin-Easley, SC Metro Area	256,047	62,395	241,881	37%	431
Gulfport-Biloxi, MS Metro Area	127,819	34,301	103,540	63%	381
Hagerstown-Martinsburg, MD-WV Metro Area	198,589	48,521	99,340	55%	183
Hanford-Corcoran, CA Metro Area	190,272	47,109	45,481	53%	94
Harrisburg-Carlisle, PA Metro Area	285,893	76,625	233,155	38%	438
Harrisonburg, VA Metro Area	169,285	40,258	41,421	59%	95
Hartford-West Hartford-East Hartford, CT Metro Area	290,587	81,580	502,279	43%	794
Hattiesburg, MS Metro Area	144,363	38,456	58,896	51%	191
Hickory-Lenoir-Morganton, NC Metro Area	265,560	66,166	150,261	29%	327
Holland-Grand Haven, MI Metro Area	186,406	50,983	85,216	57%	230
Honolulu, HI Metro Area	380,363	84,752	307,675	41%	403
Hot Springs, AR Metro Area	114,253	28,458	38,703	65%	84
Houma-Bayou Cane-Thibodaux, LA Metro Area	247,168	62,986	72,086	38%	162
Houston-Sugar Land-Baytown, TX Metro Area	178,779	56,189	2,058,837	52%	4,693

Table 2. Metro Area Median New Home Prices and Households Priced Out of the Market by a $1,000 Price Increase, 2012

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Huntsville, AL Metro Area	138,116	33,406	172,378	70%	409
Idaho Falls, ID Metro Area	140,988	34,999	45,390	69%	91
Indianapolis-Carmel, IN Metro Area	183,768	47,725	674,494	55%	1,631
Iowa City, IA Metro Area	225,391	61,855	64,181	46%	112
Ithaca, NY Metro Area	269,059	82,660	36,872	28%	53
Jackson, MI Metro Area	169,308	47,547	55,041	52%	130
Jackson, MS Metro Area	199,403	51,224	202,343	47%	396
Jackson, TN Metro Area	175,017	44,640	34,003	52%	108
Jacksonville, FL Metro Area	235,337	61,204	499,336	47%	1,068
Jacksonville, NC Metro Area	127,803	32,274	61,003	69%	207
Janesville, WI Metro Area	190,327	56,034	61,041	47%	186
Jefferson City, MO Metro Area	194,583	50,055	59,289	57%	130
Johnson City, TN Metro Area	155,933	38,011	86,605	54%	238
Johnstown, PA Metro Area	295,500	81,830	58,660	17%	72
Joplin, MO Metro Area	128,945	33,219	75,159	55%	265
Kalamazoo-Portage, MI Metro Area	201,552	57,231	122,783	42%	276
Kankakee-Bradley, IL Metro Area	210,529	62,670	48,858	43%	97
Kansas City, MO-KS Metro Area	244,399	66,394	777,032	45%	1,422
Kennewick-Pasco-Richland, WA Metro Area	300,896	78,071	95,919	35%	191
Killeen-Temple-Fort Hood, TX Metro Area	150,392	44,707	144,890	56%	576
Kingsport-Bristol-Bristol, TN-VA Metro Area	144,214	36,005	129,119	53%	383
Kingston, NY Metro Area	334,153	97,301	64,040	27%	77
Knoxville, TN Metro Area	164,561	40,537	284,926	56%	702
Kokomo, IN Metro Area	150,368	37,934	40,933	55%	79
La Crosse, WI-MN Metro Area	158,203	45,410	55,307	55%	173
Lafayette, IN Metro Area	179,590	45,373	82,235	49%	151
Lafayette, LA Metro Area	151,110	37,877	108,263	60%	271
Lake Charles, LA Metro Area	144,313	36,879	77,115	62%	197
Lakeland-Winter Haven, FL Metro Area	209,254	57,061	218,759	40%	484
Lancaster, PA Metro Area	269,093	72,733	205,414	39%	367
Lansing-East Lansing, MI Metro Area	183,545	53,881	181,593	49%	471
Laredo, TX Metro Area	150,491	45,915	69,902	40%	181
Las Cruces, NM Metro Area	207,348	50,759	78,595	38%	147
Las Vegas-Paradise, NV Metro Area	120,630	30,544	708,677	74%	1,806
Lebanon, PA Metro Area	257,820	68,877	48,923	39%	93
Lewiston, ID-WA Metro Area	178,449	45,236	28,394	47%	54
Lexington-Fayette, KY Metro Area	153,448	38,642	193,872	61%	498
Lima, OH Metro Area	189,178	51,677	39,290	45%	123
Lincoln, NE Metro Area	192,694	56,121	126,542	49%	384
Little Rock-North Little Rock-Conway, AR Metro Area	162,934	41,161	279,135	58%	710
Logan, UT-ID Metro Area	181,211	43,343	45,399	58%	123
Longview, TX Metro Area	148,486	42,417	75,564	55%	225
Longview, WA Metro Area	279,680	71,463	44,718	32%	56
Los Angeles-Long Beach-Santa Ana, CA Metro Area	428,038	101,965	4,283,340	27%	4,821
Louisville-Jefferson County, KY-IN Metro Area	172,909	44,300	531,864	57%	1,386
Lubbock, TX Metro Area	196,770	59,073	106,542	37%	238
Lynchburg, VA Metro Area	231,450	55,924	96,015	42%	144
Macon, GA Metro Area	157,217	40,602	75,947	51%	194
Madera-Chowchilla, CA Metro Area	224,850	55,088	39,880	47%	80
Madison, WI Metro Area	244,998	67,919	231,357	47%	429
Manchester-Nashua, NH Metro Area	308,612	87,668	154,941	36%	276
Mansfield, OH Metro Area	170,848	46,645	43,861	50%	155
McAllen-Edinburg-Mission, TX Metro Area	131,556	40,204	199,093	40%	686
Medford, OR Metro Area	235,844	58,739	77,913	40%	173
Memphis, TN-MS-AR Metro Area	250,347	67,823	461,503	37%	813
Merced, CA Metro Area	275,905	69,125	73,326	32%	114
Miami-Fort Lauderdale-Pompano Beach, FL Metro Area	274,398	77,250	2,012,588	28%	2,330
Midland, TX Metro Area	144,107	41,813	53,371	63%	158
Milwaukee-Waukesha-West Allis, WI Metro Area	278,053	78,973	637,169	35%	1,068
Minneapolis-St. Paul-Bloomington, MN-WI Metro Area	274,397	71,456	1,285,406	48%	2,290
Mobile, AL Metro Area	134,275	34,749	137,249	58%	406
Modesto, CA Metro Area	236,627	59,694	175,529	48%	343
Monroe, LA Metro Area	165,652	41,824	61,787	49%	174
Monroe, MI Metro Area	175,890	47,824	54,450	56%	144
Montgomery, AL Metro Area	164,214	39,649	149,117	58%	327
Morgantown, WV Metro Area	255,582	62,520	58,700	32%	108
Morristown, TN Metro Area	181,757	44,534	48,514	47%	120

Table 2. Metro Area Median New Home Prices and Households Priced Out of the Market by a $1,000 Price Increase, 2012

Metropolitan Statistical Area	Median New Home Price	Income Needed to Qualify	Households		
			All	Percent that Can Afford	Priced Out
Mount Vernon-Anacortes, WA Metro Area	246,577	61,240	45,550	46%	115
Muncie, IN Metro Area	164,913	43,796	48,882	44%	142
Muskegon-Norton Shores, MI Metro Area	186,992	54,252	66,665	44%	180
Myrtle Beach-North Myrtle Beach-Conway, SC Metro Area	169,942	42,085	113,353	54%	240
Napa, CA Metro Area	699,607	170,679	51,268	13%	14
Naples-Marco Island, FL Metro Area	431,394	110,986	128,657	25%	146
Nashville-Davidson--Murfreesboro--Franklin, TN Metro Area	207,524	51,647	603,230	53%	1,288
New Haven-Milford, CT Metro Area	286,498	81,483	345,988	42%	509
New Orleans-Metairie-Kenner, LA Metro Area	172,916	44,990	485,922	55%	1,196
New York-Northern New Jersey-Long Island, NY-NJ-PA Metro Area	425,331	115,066	6,828,422	20%	5,086
Niles-Benton Harbor, MI Metro Area	280,998	76,167	52,678	27%	78
Ocala, FL Metro Area	212,393	56,635	126,342	36%	264
Ocean City, NJ Metro Area	486,222	125,950	35,417	15%	22
Odessa, TX Metro Area	174,430	49,933	48,548	49%	100
Ogden-Clearfield, UT Metro Area	226,402	54,509	191,169	59%	437
Oklahoma City, OK Metro Area	181,405	49,425	479,537	51%	1,162
Olympia, WA Metro Area	266,041	67,293	106,518	47%	214
Omaha-Council Bluffs, NE-IA Metro Area	177,890	52,486	347,236	53%	768
Orlando-Kissimmee, FL Metro Area	281,497	74,443	763,523	31%	1,398
Oshkosh-Neenah, WI Metro Area	191,547	55,457	68,535	43%	203
Oxnard-Thousand Oaks-Ventura, CA Metro Area	430,492	102,262	277,585	38%	319
Palm Bay-Melbourne-Titusville, FL Metro Area	285,779	77,088	225,292	28%	275
Panama City-Lynn Haven-Panama City Beach, FL Metro Area	178,460	46,638	59,303	52%	219
Pascagoula, MS Metro Area	172,127	47,320	63,639	54%	195
Pensacola-Ferry Pass-Brent, FL Metro Area	203,485	53,837	163,026	45%	389
Peoria, IL Metro Area	231,821	69,100	152,237	40%	323
Philadelphia-Camden-Wilmington, PA-NJ-DE-MD Metro Area	270,885	73,913	2,274,903	44%	3,686
Phoenix-Mesa-Scottsdale, AZ Metro Area	225,907	55,871	1,566,990	51%	2,968
Pittsburgh, PA Metro Area	304,860	87,380	942,398	25%	1,207
Port St. Lucie, FL Metro Area	292,966	83,553	185,752	27%	265
Portland-South Portland-Biddeford, ME Metro Area	328,186	85,027	210,499	32%	272
Portland-Vancouver-Beaverton, OR-WA Metro Area	305,555	76,894	876,503	39%	1,477
Poughkeepsie-Newburgh-Middletown, NY Metro Area	290,880	83,018	236,778	44%	388
Prescott, AZ Metro Area	234,601	56,395	96,392	41%	207
Providence-New Bedford-Fall River, RI-MA Metro Area	307,200	80,777	612,509	36%	956
Provo-Orem, UT Metro Area	237,802	56,040	151,787	56%	302
Pueblo, CO Metro Area	190,727	48,374	68,454	45%	140
Punta Gorda, FL Metro Area	209,230	58,488	57,459	38%	148
Racine, WI Metro Area	217,144	62,585	72,449	46%	169
Raleigh-Cary, NC Metro Area	216,715	54,156	448,745	58%	895
Reading, PA Metro Area	284,555	81,181	164,489	32%	327
Redding, CA Metro Area	245,799	59,880	64,394	39%	91
Reno-Sparks, NV Metro Area	236,764	58,454	175,972	51%	301
Richmond, VA Metro Area	194,829	47,991	491,276	61%	1,185
Riverside-San Bernardino-Ontario, CA Metro Area	264,290	66,436	1,313,050	44%	2,213
Roanoke, VA Metro Area	228,925	56,823	138,566	42%	262
Rochester, MN Metro Area	233,009	61,011	74,618	53%	165
Rochester, NY Metro Area	307,177	101,409	431,990	22%	655
Rockford, IL Metro Area	121,854	37,582	125,293	62%	374
Rocky Mount, NC Metro Area	167,837	44,477	58,586	42%	133
Rome, GA Metro Area	136,462	35,033	37,870	57%	113
Sacramento--Arden-Arcade--Roseville, CA Metro Area	325,475	80,517	811,701	40%	1,247
Saginaw-Saginaw Township North, MI Metro Area	213,751	61,767	69,500	34%	175
Salem, OR Metro Area	287,446	73,474	154,439	34%	245
Salinas, CA Metro Area	436,772	103,691	120,443	28%	118
Salisbury, MD Metro Area	173,834	43,639	42,692	60%	79
Salt Lake City, UT Metro Area	231,205	55,499	371,257	55%	709
San Antonio, TX Metro Area	192,507	57,541	885,611	46%	2,255
San Diego-Carlsbad-San Marcos, CA Metro Area	362,545	86,536	1,086,110	38%	1,221
San Francisco-Oakland-Fremont, CA Metro Area	430,223	102,804	1,688,618	43%	1,689
San Jose-Sunnyvale-Santa Clara, CA Metro Area	457,938	109,840	643,623	43%	677
San Luis Obispo-Paso Robles, CA Metro Area	396,980	94,618	93,262	31%	103
Sandusky, OH Metro Area	242,760	65,523	35,195	41%	59
Santa Barbara-Santa Maria-Goleta, CA Metro Area	637,816	149,903	142,281	15%	67
Santa Cruz-Watsonville, CA Metro Area	362,653	85,475	89,368	46%	109
Santa Fe, NM Metro Area	142,694	33,538	77,362	67%	176
Santa Rosa-Petaluma, CA Metro Area	297,004	71,146	196,855	49%	329

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			All	Percent that Can Afford	Priced Out
Savannah, GA Metro Area	159,545	40,855	135,857	59%	307
Scranton--Wilkes-Barre, PA Metro Area	291,937	80,562	211,741	25%	253
Seattle-Tacoma-Bellevue, WA Metro Area	311,398	77,735	1,371,085	47%	2,259
Sebastian-Vero Beach, FL Metro Area	388,242	105,948	39,831	13%	31
Sheboygan, WI Metro Area	259,740	74,405	46,859	36%	84
Shreveport-Bossier City, LA Metro Area	185,868	48,033	152,785	46%	329
Sioux City, IA-NE-SD Metro Area	219,937	63,610	52,449	36%	101
Sioux Falls, SD Metro Area	157,664	43,135	96,546	61%	265
South Bend-Mishawaka, IN-MI Metro Area	226,642	59,930	114,630	39%	206
Spartanburg, SC Metro Area	143,305	35,586	103,444	62%	291
Spokane, WA Metro Area	231,382	58,776	191,417	42%	414
Springfield, IL Metro Area	209,675	61,832	88,586	45%	199
Springfield, MA Metro Area	350,574	93,349	276,757	28%	332
Springfield, MO Metro Area	171,430	43,469	177,716	51%	512
Springfield, OH Metro Area	187,230	51,478	54,689	44%	114
St. Cloud, MN Metro Area	196,320	50,842	69,123	54%	140
St. George, UT Metro Area	203,794	48,402	51,251	53%	109
St. Joseph, MO-KS Metro Area	164,323	42,623	55,208	51%	171
St. Louis, MO-IL Metro Area	208,386	56,282	1,114,234	49%	2,333
State College, PA Metro Area	293,689	77,218	63,138	31%	106
Stockton, CA Metro Area	260,306	65,258	230,085	46%	393
Sumter, SC Metro Area	129,706	32,861	39,583	59%	90
Syracuse, NY Metro Area	261,462	83,628	253,655	29%	364
Tallahassee, FL Metro Area	168,108	42,907	143,591	55%	355
Tampa-St. Petersburg-Clearwater, FL Metro Area	284,162	77,793	1,167,797	26%	1,930
Terre Haute, IN Metro Area	145,689	38,641	59,213	56%	165
Toledo, OH Metro Area	204,217	58,210	246,106	43%	472
Topeka, KS Metro Area	172,026	49,114	91,256	51%	253
Trenton-Ewing, NJ Metro Area	358,181	105,890	143,449	38%	180
Tucson, AZ Metro Area	250,274	63,428	413,506	37%	790
Tulsa, OK Metro Area	180,200	48,464	363,165	50%	700
Tuscaloosa, AL Metro Area	197,066	47,017	74,490	48%	175
Tyler, TX Metro Area	178,785	50,403	108,239	44%	197
Utica-Rome, NY Metro Area	267,406	83,958	112,422	22%	168
Valdosta, GA Metro Area	113,363	29,458	45,109	65%	178
Vallejo-Fairfield, CA Metro Area	280,108	69,235	142,256	52%	254
Vineland-Millville-Bridgeton, NJ Metro Area	180,136	54,884	47,624	47%	138
Virginia Beach-Norfolk-Newport News, VA-NC Metro Area	229,898	57,630	602,358	52%	1,325
Visalia-Porterville, CA Metro Area	194,216	47,975	136,194	49%	316
Waco, TX Metro Area	179,590	53,671	87,067	43%	202
Warner Robins, GA Metro Area	194,753	49,697	47,140	59%	72
Washington-Arlington-Alexandria, DC-VA-MD-WV Metro Area	325,300	80,587	2,157,625	55%	2,685
Waterloo-Cedar Falls, IA Metro Area	196,815	53,969	59,389	45%	139
Wausau, WI Metro Area	180,085	51,676	49,240	54%	132
Wenatchee-East Wenatchee, WA Metro Area	243,216	60,776	42,689	41%	97
Wichita Falls, TX Metro Area	194,230	59,779	51,253	35%	133
Wichita, KS Metro Area	147,823	41,929	221,987	59%	631
Williamsport, PA Metro Area	276,738	76,078	41,079	22%	86
Wilmington, NC Metro Area	236,993	58,443	146,269	40%	292
Winchester, VA-WV Metro Area	213,627	51,135	50,589	49%	112
Winston-Salem, NC Metro Area	167,029	42,614	187,888	56%	472
Worcester, MA Metro Area	295,010	76,630	296,940	44%	494
Yakima, WA Metro Area	258,647	67,103	79,630	35%	130
York-Hanover, PA Metro Area	271,604	74,591	179,831	38%	387
Youngstown-Warren-Boardman, OH-PA Metro Area	204,023	56,973	219,791	37%	525
Yuba City, CA Metro Area	215,538	54,959	54,130	47%	131
Yuma, AZ Metro Area	138,982	35,092	60,525	58%	167

RESEARCH HIGHLIGHT

April 2005 Technical Series 05-107

FIRE EXPERIENCE, SMOKE ALARMS AND SPRINKLERS IN CANADIAN HOUSES: CMHC RESEARCH TO 2005

INTRODUCTION

Canada Mortgage and Housing Corporation has undertaken several research studies since the late 1980s, examining the need for and implications of government mandating sprinklers in new houses. Together, these studies give a broad picture of fire experience in Canadian housing, and the potential implications of smoke alarms and sprinklers in new houses. This paper outlines the main findings of this research.

1. Canada used to have a relatively high rate of residential fires—especially in one- and two-family houses

In 1980, the rate of deaths due to fire in one- and two-family houses was nearly eight per 100,000 homes. Exact figures for fire experience in one- and two-family homes are not available Canada-wide prior to 1980, but statistics for all fires suggest that they would have been at least eight per 100,000 for the previous decade as well.

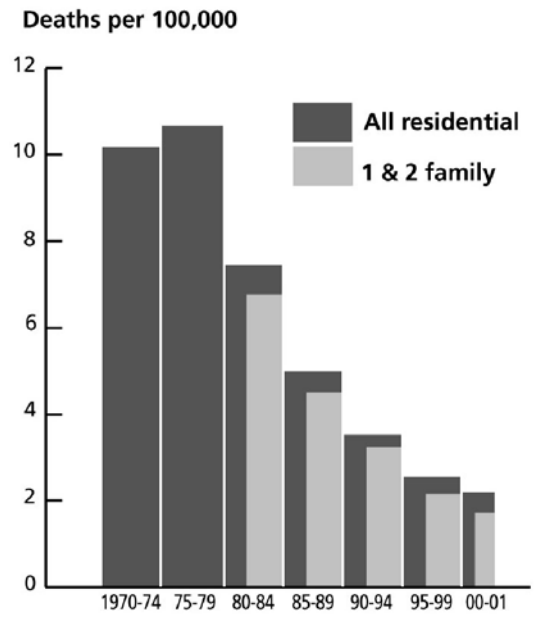
2. Today, the rate of fires, injuries and deaths is much lower

The summary report *Smoke Alarms and Residential Sprinklers: Costs and Benefits (CMHC 1991)*[1] noted that the rate of fatalities in one- and two-family houses had dropped steadily from almost eight per 100,000 homes in the year 1980 to 4.5 per 100,000 homes in 1988.

Figure 1 reflects information from the report *Canadian Housing Fire Statistics (CMHC 2004)*, plus an additional estimate for 2000 and 2001. It shows that the decreases reported in the earlier study have continued.

Canadian Housing Fire Statistics says that in the two decades between 1980 and 1999, the rates of fire incidence, injuries, property damage and death have all dropped—both for all residential fires and for fires in one- and two-family homes. By 1999, the fire death rate per 100,000 one- and two-family houses was 75 per cent lower than in 1980.

Figure 1: Average annual rate of fire deaths per 100,000 units



Source: Adapted from *Canadian Housing Fire Statistics*, with additional two-year average estimate for 2000-2001

[1] This report summarized and updated two earlier reports: *Analysis of the Costs and Benefits of Installing Fire Sprinklers in Houses (1989)*, and *The Costs and Benefits of Smoke Alarms in Canadian Houses (1990)*.

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3. The main reason is smoke alarms

Canadian Housing Fire Statistics comments: "In looking at the changes to residential units that could have resulted in increased fire safety, the (regulatory) requirements for smoke alarms, in new buildings in approximately 1980, in existing buildings in approximately 1985, and the accompanying public information campaigns, constitute the single most determining factor."

Smoke alarms alert people in the home to the presence of smoke and fire. This gives occupants the opportunity to extinguish small fires or flee larger ones. These alarms are also effective in alerting people to smouldering fires, which can produce fatal levels of smoke and carbon monoxide long before they significantly increase room temperatures.

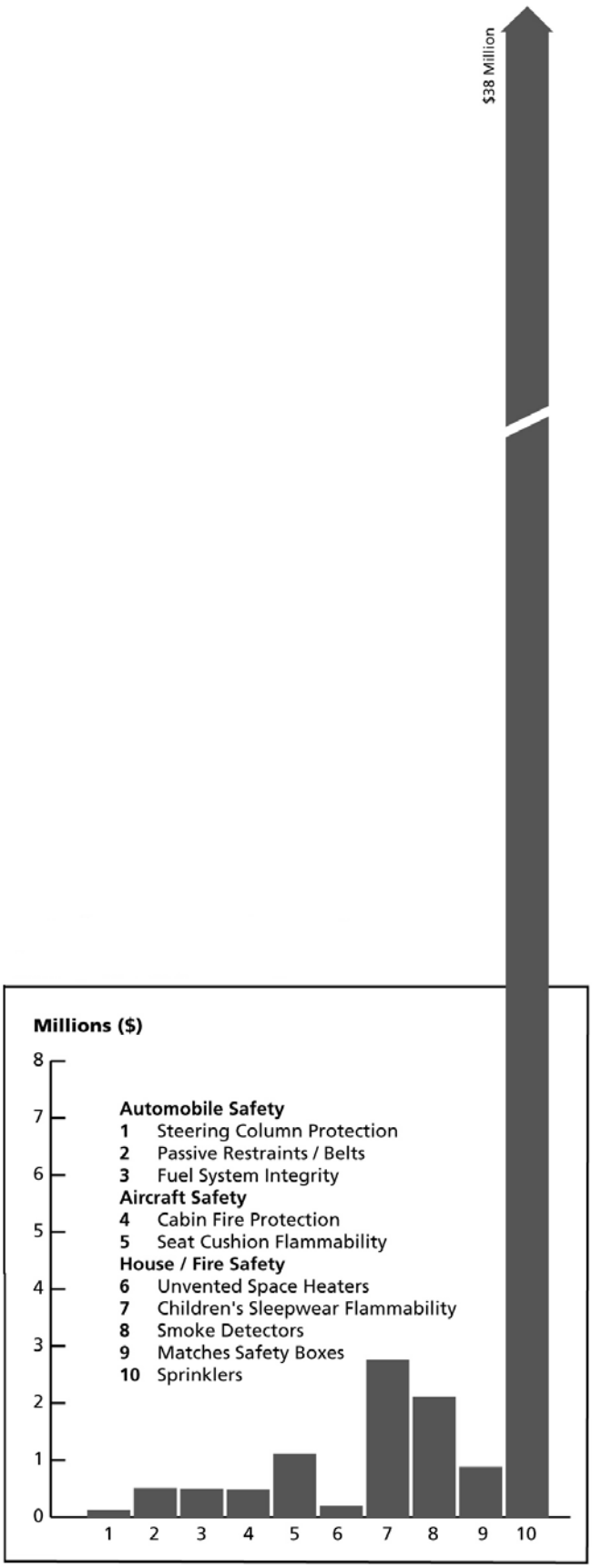
The *Canadian Housing Fire Statistics* report shows that the number of reported fires ignited by cooking equipment, heating equipment, and electrical equipment and appliances, and the number caused by building-related deficiency, malfunction or misuse have all decreased between 1980-1999, while external fire exposure has increased as an ignition source. While the study only looked at building-related causes, it is important to note that the top non-industrial cause of fatal fires in Canada was smokers' materials and open flame. In Ontario (more details provided than the national report) the top four causes of fatal home fires are smokers' materials, cooking equipment, matches/lighters and candles.[2]

In addition, *Smoke Alarms and Residential Sprinklers: Costs and Benefits* mentions safer home construction, heating appliances, improved furniture fabrics, decreased crowding, and a decreased percentage of smokers as having an impact on fire safety, along with smoke alarms.

4. Sprinklers could produce a fire safety improvement in new one- and two-family homes, but costs are much higher than for other safety measures

Sprinklers respond to the high heat of open flames, spraying water in the room affected to control and suppress fires. CMHC's smoke alarms and residential sprinklers cost benefits studies estimated that sprinklering new one- and two-family homes could produce a further decrease in fatalities, injuries and property damage. For example, they estimated that fire deaths could be reduced by 0.77 per 100,000 houses by adding sprinklers, as compared to houses with wired-in smoke alarms.

Figure 2: Mandatory Regulations, Cost per Life Saved



Source: *Analysis of the Cost Benefits of Installing Sprinklers in Houses*

[2] See *Fire Losses in Canada*, 2001 Annual Report of the Council of Canadian Fire Marshals and Fire Commissioners (Chart 5), http://www.ccfmfc.ca/stats/en/report_e_01.pdf, and *Preventable Home Fires, Five Causes – 1999-2003*, Ontario Office of the Fire Marshal (Chart 4), http://www.ofm.gov.on.ca/english/Publications/Statistics/cause/default.asp

The purchase, installation and maintenance of sprinklers produce a comparatively high cost per life saved. *Analysis of the Costs and Benefits of Installing Fire Sprinklers in Houses* calculated in 1989-1990 that the cost of saving one life by mandating sprinklers would be more than $38 million. This figure is significantly higher than the cost of other life safety requirements imposed by governments: see Figure 2.

The *Analysis of the Costs and Benefits of Installing Fire Sprinklers in Houses* report used cost estimates from a 1989 *Cost Study of Sprinkler Installations* prepared by J.C. Weibe for Alberta Municipal Affairs. That report found that per square foot costs for a 1,940 square foot (total sprinklered area, including unfinished spaces) side-split home in an urban location would range from $1.43 (plastic) to $2.37 (copper). The cost in rural locations would be higher: $2.47 and $3.67, respectively.

In 1998, *Costs and Benefits to Municipalities of Mandatory Residential Fire Sprinklers* found typical installation costs averaged $1.70 per square foot for singles, semis and townhouses (and $1.45 per square foot for apartments). In this case, costs to sprinkler a small 1,500 square foot single family home with a total sprinklered area including unfinished basement of 2,000 square feet, would total $3,400.[3]

5. Municipal savings are outweighed by costs to new homebuyers

The net impact on fire service costs of municipalities requiring sprinklers in all new residential developments was an unanswered question in 1998. CMHC commissioned the report *Costs and Benefits to Municipalities of Mandatory Residential Fire Sprinklers (CMHC 1998)* to provide an impartial assessment, technically justified on economic grounds. It looked at changes in costs in five municipalities and one First Nation.

This report found that some municipalities might achieve savings in direct costs. Key to achieving savings were: the expectation of significant new greenfield development located outside the areas presently served by existing stations; sprinklers in all new buildings (residential and non-residential); acceptance of longer fire service response times; and fire services which concentrate on fire suppression, providing only secondary support for non-fire emergencies when requested.[4]

The study went on to calculate the costs of sprinklering the new homes, including initial installation, ongoing maintenance and inspection, and somewhat higher property tax assessments (if the value of sprinklers was reflected in assessed value). These costs were reduced, as appropriate, to account for lower development charges, municipal property tax rates (reflecting the expected municipal costs savings), and possible reductions in home insurance.

"In each of the cases studied," the report concluded, "potential savings to the municipality would be less than the additional costs for the installation of sprinklers."

To assess the influence of system costs, the study prepared a second calculation where sprinkler installation costs were reduced by half. The gap between sprinkler-related costs and sprinkler-related savings would be narrowed, it said, "but in no case would the results be switched such that the savings would outweigh the costs."

Table 1 below shows the net present value of costs and savings over the study's 20-year forecast period. Because Kawacatoose First Nation band council acts as the municipal government, the land developer, the home builder and the homeowner, the cost allocation to different parties does not apply. The final row has been added, to show net cost to society.

Table 1: Costs and Benefits of Mandatory Residential Sprinklers – Net Present Value Summary

	Burlington	Barrie	Edmonton	Pitt Meadows	Gatineau	Kawacatoose First Nation
Savings to municipality	0	$7.40 million	$38.49 million	$2.76 million	$8.89 million	net cost to band council is $249.79 million
Costs to others	$38.10 million	$33.60 million	$118.99 million	$10.68 million	$26.72 million	
Net cost to society	$38.10 million	$26.20 million	$80.50 million	$7.92 million	$17.83 million	$249.79 million

Source: Adapted from *Costs and Benefits to Municipalities of Mandatory Residential Fire Sprinklers*, final row added.

[3] Sprinkler system costs today appear quite similar. A quick poll of firms in early 2005 found that most companies are installing plastic piping. Total cost estimates for the sprinkler system, associated piping, upgraded intake pipe, changes in other construction, schedule accommodation, etc., for a small house with 1,500 square feet finished area (2,000 square feet sprinklered area including basement), ranged between approximately $3,000 and $4,000. Larger houses would be more expensive overall, but would generally cost somewhat less per square foot. Smaller houses generally would cost more per square foot.

[4] A parallel report by the National Fire Laboratory (NFL) used a fire risk assessment computer model to estimate the level of fire safety. It concluded that risks to life would be reduced in areas with sprinklers, but with longer fire service response times. No attempt was made in either study to evaluate the impact of longer response times on medical or other non-fire emergencies, or on fires outside sprinklered buildings. These can be a very large percentage of fire service emergency calls.

This study was reviewed in 2001 as part of an evaluation of directed research at CMHC.[5] The evaluators confirmed the study methodology and incorporated discussion of risk to life, injury and property loss. They reviewed other reports presenting lower overall costs for sprinklers, and used real-world Canadian data to estimate fire risks in new, sprinklered and unsprinklered single family and multiple dwelling housing stock.

The *Directed Research Evaluation Report (CMHC 2001)* used a very high performance rate for sprinklers (95 per cent), based on reported experience in Vancouver, although it pointed out that the number of installations and the timeframes are small and there are still questions about how sprinkler effectiveness could change over time without appropriate maintenance. It also used current estimates of what Canadians are prepared to spend on safety measures.

The analysis calculated the financial impacts in two provinces, depending on whether sprinklers were required in new housing or not. It looked at new single family housing in Manitoba and all new residential housing in Ontario, over a period of 20 years. It concluded that not requiring sprinklers would save a minimum of $415 million. If the National Research Council's lower estimate of sprinkler effectiveness was used (60 per cent), the savings increased to $734 million.[6]

6. Installing and maintaining smoke alarms is very effective

The study *Smoke Alarms and Residential Sprinklers: Costs and Benefits* pointed out that the cost to install functioning smoke alarms in unprotected houses is small compared to the cost to install sprinklers—and the impact on safety is much higher. It recommended that governments consider residential sprinkler systems as voluntary for new one- and two-family houses. At the same time, it recommended that smoke alarms be installed in the estimated 18 per cent of older one- and two-family houses that didn't have them.

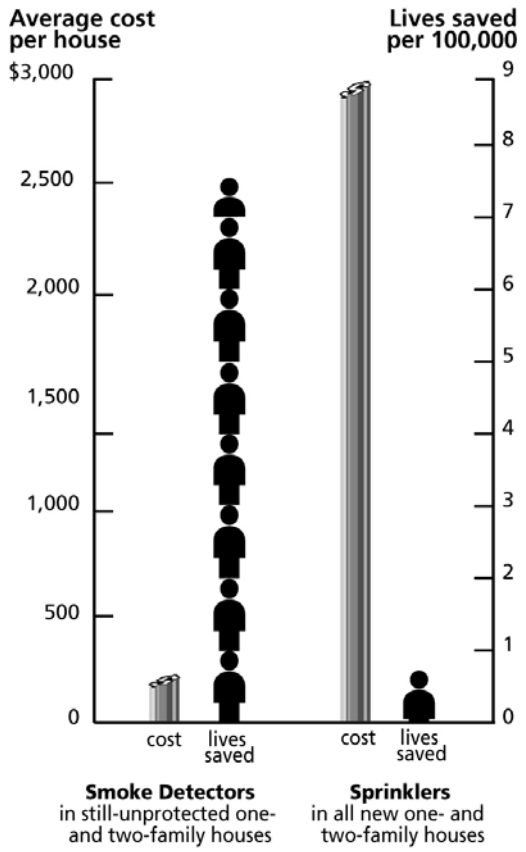
There is no current analysis of the percentage of homes with and without smoke alarms. However, Ontario fire fighters have reported that between 1995 and 2003, 20 per cent of the homes where they attended a fire did not have a smoke alarm. Almost eight per cent more had a smoke alarm that did not operate because it had no power—most because the battery had been removed; the rest because the battery was dead.

In other words, 28 per cent of the homes that had fires serious enough to result in a call to the fire department did not have a functioning smoke alarm.

For fatal fires, the percentage of homes without a functioning smoke alarm was approximately 37 per cent—19 per cent without an alarm at all, and another 18 per cent with an alarm that had no battery or had a dead battery.

This suggests that the recommendation to install and/or maintain smoke alarms in unprotected one- and two-family houses is still valid. The cost benefits from installing smoke alarms remain greater than for sprinklers in all new homes.

Figure 3: Impact of Policy Alternatives

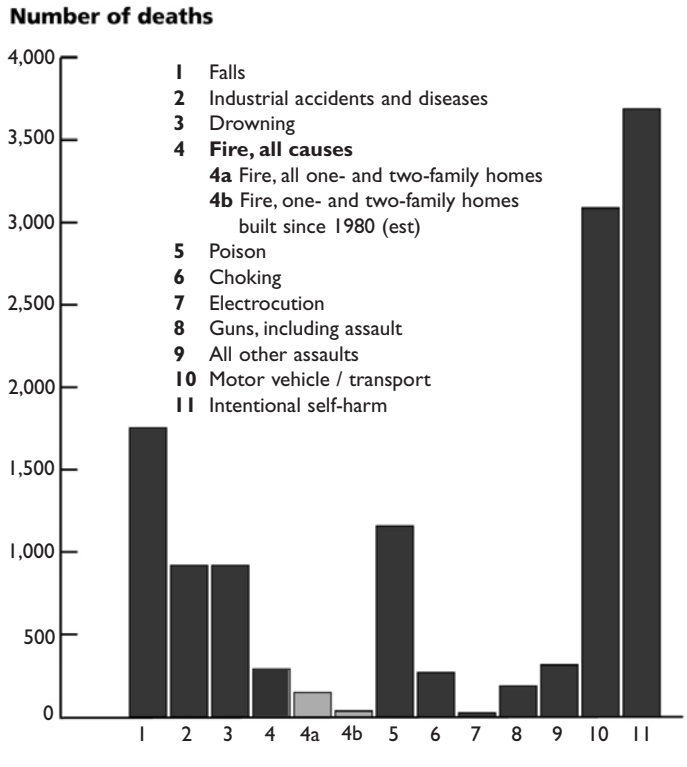


Source: *Smoke Alarms and Residential Sprinklers: Costs and Benefits*

[5] *Directed Research Evaluation Report*, prepared by KPMG Consulting Ltd. for CMHC, 2001.

[6] *The purpose of this report was to estimate the impact of CMHC research. Its authors attributed only part of the full impact (25 per cent in Manitoba and 40 per cent in Ontario) to the research program. The "attributable portion" figures shown in the report itself were $158 million and $278 million, respectively.*

Figure 4: External of causes of death, Canada 2001



Source: Statistics Canada, *Association of Workers' Compensation Boards of Canada, Canada Mortgage and Housing Corporation*

7. Overall, residential fire risks are relatively low

The report *Smoke Alarms and Residential Sprinklers: Costs and Benefits* pointed out that it is impossible to eliminate risk completely. The challenge is to use resources wisely to address high level, preventable risks.

That report included a chart showing causes of death in 1987. Figure 4 has been updated with actual numbers for 2001. Figure 4 and Figure 5 both show that the number of people who died in a fire in a new home is "much lower than the fatalities from many other activities."

8. Some groups and housing types are at higher risk

The *Canadian Housing Fire Statistics* report investigated the difference in fire experience between population groups, locations and housing types. It found some important variations. Figure 5 gives an indication of the relationship between fire experience rates. The numbers are shown as a ratio, with one- and two-family homes as 1.00. The first bar, for example, shows that fire incidence in First Nations' one- and two-family homes is 2.4 times the rate for one- and two-family homes across Canada:

8.a First Nations

The report shows that, while fire experience in First Nations' homes has been improving over the past two decades, it is still much higher than the Canada-wide rates. The fire incidence, fire injury and fire damage rates in First Nations' one- and two-family homes are 2.4, 2.5 and 2.1 times the Canada-wide rates respectively. The fire death rate is 10.4 times the Canada-wide rate.

Remote location and climate (with corresponding reliance on more hazardous heating systems) are identified as two factors leading to these higher fire death rates. The *Canadian Housing Fire Statistics* report also quotes a statistic from the Office of the Fire Commissioner for Alberta that the percentage of First Nations' homes with crowding (more than one person per room) was eight times the rate Canada-wide.

8.b Rooming Houses

For rooming and lodging houses, the fire incidence, injury and damage rates are nearly 5, 11, and 4 times the Canada-wide rate for one- and two-family houses respectively, while fire deaths are more than 12 times the Canada-wide rates.

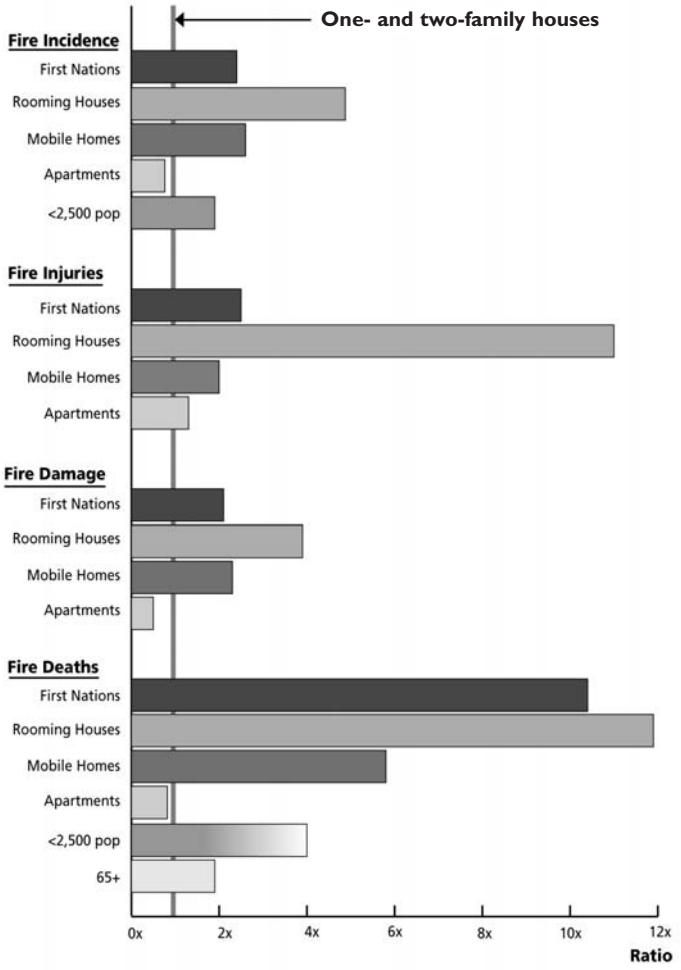
8.c Mobile Homes

Canadian Housing Fire Statistics reports that for mobile homes, the fire incidence, injury and damage rates are 2.6, 2, and 2.3 times the Canada-wide rate for one- and two-family houses respectively, while fire deaths are 5.8 times the Canada-wide rate.

8.d Remote/Rural Areas

There are no Canada-wide figures that can be compared to show the difference in fire experience between rural and urban areas. Communities with populations of less than 2,500 are sometimes used as proxies for "rural" areas. British Columbia, Alberta and Ontario collect similar data for this size of community. Using those figures, *Canadian Housing Fire Statistics* estimated that rural communities have fire incidence rates up to twice the level experienced in larger communities, and fire death rates between two and four times the level in larger communities.

Figure 5: Fire experience of selected areas and groups as compared to Canada-wide levels for one- and two-family houses (ratio)*



* Figures for communities <2,500 population relate to all fires and are compared across communities (BC, AB and ON only), and the figure for persons age 65+ is compared to rates in residential fires and across the whole population, rather than just in one- and two-family houses (AB, ON, QC only)

Source: Adapted from *Canadian Housing Fire Statistics*

8.e Persons 65+

It was not possible to compare figures on a Canada-wide basis, so the report compared available information (fatalities) from Ontario, Alberta and Quebec. It found that the rates of fire deaths for persons 65 years of age and over "were approximately twice what would have been expected, based on their percentage of the population."

These results suggest that initiatives targeted directly at high-risk groups and housing types could have a beneficial impact on fire experience.

NOTES ON COMPARING DATA

The studies for CMHC have identified several cautions about data and assumptions. In trying to assess different statements about fire experience, risks, costs and benefits, it is important to understand some of these differences. Benchmarks in 1. – 6. are discussed in detail in the *Canadian Housing Fire Statistics* report.

1. Population Benchmark

This is probably the most commonly used benchmark. It measures fire experience—incidence (reported fires), injuries, deaths and property damage—as a ratio of the total number of people. This can be a ratio of the entire population of Canada, or of different provinces, etc. It gives a measure of the risk per individual. It tends to give lower numbers per 100,000 population and flatter trend lines than the other benchmarks.

2. Residential Units Benchmark

This measures fire experience as a ratio of the number of residential units. It can be thought of as "risk per household." It includes old homes and new ones, in all forms from rooming houses to single family homes to high-rise apartments. Since many units are occupied by two or more people, ratios per 100,000 units tend to give somewhat higher numbers than ratios per 100,000 population. This benchmark shows a greater reduction in fire incidence and fire deaths than the population benchmark, and a comparable level of property damage.

3. Residential Unit Type Benchmark

This measures the experience separately, by type of housing unit. The *Canadian Housing Fire Statistics* report gives fire experience per 100,000 one- and two-family dwellings, rooming and lodging houses, mobile homes and apartments. This captures the much higher level of risks/problems in rooming and lodging houses, and in mobile homes, than in one- and two-family dwellings.

4. Age of Residential Unit

A building's age can help identify which code requirements it would have been built under, and may be a proxy for building condition. Unfortunately, it is very difficult to get information about fire experience based on the age of the residential units. Figures are collected in some provinces, but not on a comparable basis. The report attempted to approximate the influence of housing unit age, by calculating a "median" age of housing for each province. Then, it checked whether provinces with a higher median age of housing also had higher fire losses. This suggested a slight increase in fire incidence with age. Reliable specific data would be preferable—and the report has recommended fire reports be changed to collect it.[7]

5. First Nations' Experience

Canadian Housing Fire Statistics also prepared a separate set of results for all of these benchmarks, based on loss statistics collected from First Nations communities. In some provinces, the same data may be included in the provincial report. The figures show much higher level of deaths, and appreciably higher levels of injury and property losses per 100,000 one- and two-family dwellings than for Canada as a whole. As mentioned above, two possible contributing factors are crowding and remote location.

6. Fire Incidence Benchmark

This measures fire experience as a ratio of the number of fires. "One significant disadvantage of the fire incidence benchmark is its reliance on reported fires," the report says. "As more fires are discovered from early warning smoke alarms and extinguished earlier, fewer are reported to municipal fire departments thus giving an indication that, on a per fire basis, loss rates are increasing." Even so, death rates per 1,000 fires have decreased over the 1980-1999 period. Given the shortcomings, though, "it is suggested that this benchmark not be used extensively in determining fire risk unless improved reporting of all fires can be achieved," the paper says.

7. Net Costs of Sprinklers

Different reports use different approaches to determine the cost of sprinklers. It is important to make sure they include the same elements. For example, in addition to the costs of the pipes, sprinkler heads and heat alarms, and installation, initial sprinkler system costs may include possible extra costs for larger water supply lines, cumulative extra work and delay for other trades, changes to above-ceiling heights, insulation, coordination and approvals. Total costs include maintenance as well.

There is also the issue of "residual" value—which some authors[8] include in the calculation of net costs. The *Directed Research Evaluation* report identified two fundamental problems with subtracting a residual value from sprinkler costs: homeowners can only realize the residual value if they sell to a purchaser willing to pay full incremental cost—and if the purchaser does pay the full incremental cost, then the cost to society as a whole does not drop.

[7] Other specific data the authors recommended be collected includes: more complete information on First Nations' fire experience; insurance company data on fire losses, which may include smaller fires that don't involve the fire services; separate data for housing types, particularly row/townhouse and low-rise/high-rise apartments; ages of victims; and greater detail on fatal fires.

[8] See, for example, *Review of CMHC Reports on Costs and Benefits to Municipalities of Mandatory Residential Fire Sprinklers*, 1999, prepared by Banjar Management Inc. and Frederick Culbert, P.Eng. for the Fire Chiefs' Association of British Columbia.

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Directed Research Evaluation Report

Report and case studies prepared by KPMG Consulting Ltd. for CMHC, Ottawa, 2001

Canadian Housing Fire Statistics

Report prepared by Ken Richardson Fire Technologies Inc., in collaboration with Fuller Information, for CMHC, Ottawa, 2004

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63945

Residential Fire Sprinklers

Market Growth and Labor Demand Analysis

By

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About the Author

Russ Leavitt is the Chairman and CEO of Telgian Corporation. Telgian is an international firm providing fire, life safety, and asset protection engineering and consulting services. Under his direction, Telgian provides a wide range of fire protection and life safety services including fire systems engineering and design, code consulting, loss control engineering, installation, and the inspection and testing of systems.

He is a graduate of the University of Nevada, Las Vegas and holds a Level IV certification from NICET in Fire Sprinkler Layout and a Certified Fire Protection Specialist (CFPS). He is a licensed contractor and has over 27 years of experience in the design, installation, and testing of fire protection systems. Russ has worked on projects throughout North, Central, and South America, the Far East, and Europe.

He serves on the NFPA 25 technical committee and the NFPA 5000 (building code) correlating committee. Russ conducts seminars internationally on a variety of fire and life safety related subjects and has authored a number of articles and training materials. Russ is a member of NFPA and SFPE.
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Contributing Authors

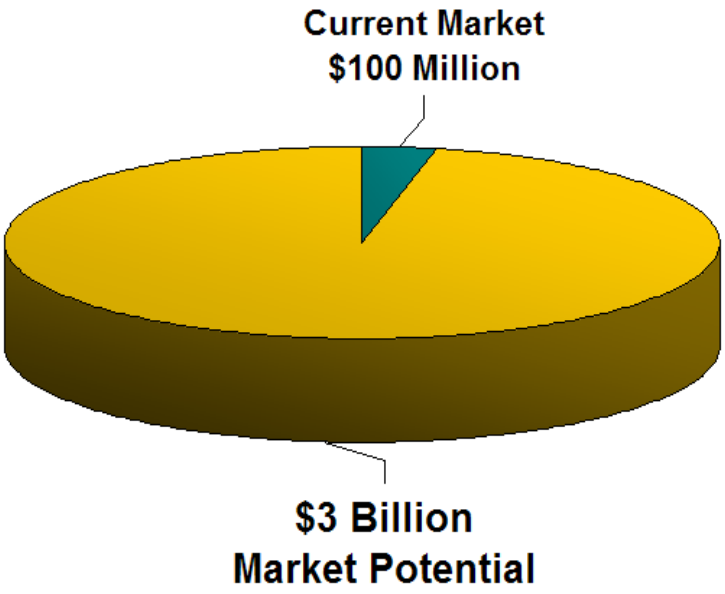
Steven Scandaliato is the Vice President of Business Development and a NICET IV certified Senior Engineering Technician at Telgian Corporation. He has over 26 years experience in fire protection design, project management, construction contracting and engineering, covering all types of fire suppression systems. Steven has also been involved in every facet of construction, project management and engineering system design. He serves as a member of the NFPA 13, 101, and 5000 Committees. He is published in several periodicals including articles for the NFPA Journal, Fire Marshals Quarterly and American Society of Plumbing Engineers. He is also a contributing author to the new text published by NFPA/SFPE titled “Designers Guide to Automatic Sprinkler Systems”. Over the last 12 years, he has presented seminars to thousands in contracting and professional associations including The American Fire Sprinkler Association, The American Society of Plumbing Engineers, The American Institute of Architects, The Society of Fire Protection Engineers and The International Fire Marshals Association. He is a member of NFPA and SFPE.

Ryan J. Smith is the President of Fire Smarts, LLC, a firm providing online educational and marketing services focused on fire protection. He has spent over 10 years in the fire protection and property insurance industries working to reduce the risk of fire related losses. Formerly, as Executive Vice President of Telgian Corporation, he facilitated the system development and internal operating procedures required to transform the company from a small business to a leading international firm. He is an MBA graduate of the W.P. Carey School of Business, holds the Facility Management Professional (FMP) designation from the International Facility Management Association and is a member of NFPA.

Executive Summary

The adoption by the International Code Council of amendment RB64-07/08 to the International Residential Code (IRC)[1] in Minneapolis, MN on September 21, 2008, mandates the installation of fire sprinklers in all one and two family residential dwellings and townhouses effective January 1, 2011. This action rapidly transforms the current single family residential fire sprinkler market estimated at $90.0 to $100.0 million annually[2] to a market that is worth an estimated **$2.9 billion** to **$3.2 billion** annually.[3] Although its impact will not be realized immediately, the next 2 to 5 years will bring the installation of residential fire sprinklers to near complete market saturation as jurisdictions adopt and enforce the 2009 edition of the IRC. This amendment will change the landscape of the fire sprinkler industry in a breadth and timeline never experienced before. Even using the depressed residential market that exists in 2008[4], the numbers are staggering and the opportunity ripe for those who are willing to take the challenge.

Single Family Residential Fire Sprinkler Market



This report attempts to quantify this once in a life-time opportunity. The authors admit that an effort to forecast the future can be frivolous especially in an industry dominated by cottage businesses (installing contractors) and as a result, comprehensive data is difficult to acquire. The upside is that there is a large body of information regarding residential construction available through the U.S. Census Bureau and the Department of Housing and Urban Development covering the last 40 years. Recognizing the limitations of data, the authors are conservatively biased in their assumptions, projections, and

[1] See Appendix Section 1

[2] Estimated that sprinklers were installed in 3% of single family homes completed in 2007 as reported by the U.S. Census Bureau and Department of Housing and Urban Development.

[3] See Appendix Section 2

[4] See Appendix Section 6.5

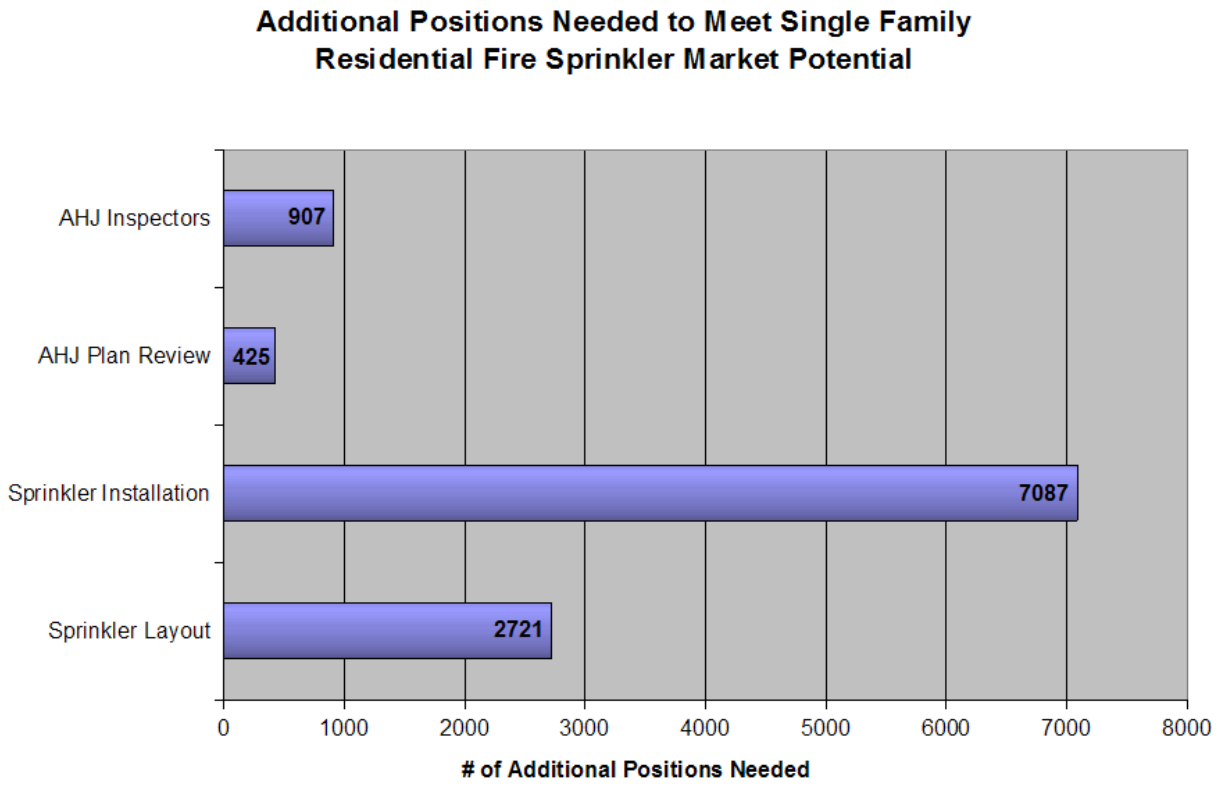
conclusions.

The application of residential fire sprinklers was sporadic in its development. The mandatory use of fire sprinklers in single family residential occupancies was slow to come about with a few notable exceptions. At this time, there are a relatively small number of jurisdictions in the United States requiring fire sprinkler protection for all single family homes and multifamily housing units. The most notable are San Clemente California, which adopted its ordinance in 1979, and Scottsdale Arizona in 1985. There are other jurisdictions that have adopted residential requirements in some form, but the number is small (around 400) when compared to the thousands of jurisdictions throughout the United States.

This is about to change in a significant way. The International Code Council, which publishes the International Residential Code, has been under increasing pressure to adopt a "zero" tolerance fire sprinkler requirement for all one and two family residences. The requirement was narrowly defeated during the last code cycle, but as a result of the approval of amendment RB64-07/08, will now be included in the 2009 edition.

This report examines the impact that mandatory residential fire sprinkler protection will have on the skilled labor needs of the industry. It is focused on illustrating the need for a concerted strategy by the engineering and construction communities to address the current lack of capacity for absorbing this work as it develops. The residential market is huge and the needs daunting, especially when viewed from the context that the fire sprinkler industry currently suffers from a shortage of qualified layout technicians, installers, and maintainers. In addition, an overlooked need is that for qualified AHJ plan review and inspection professionals. The numbers of positions needed to address each area is revealing. Research shows that (based on the 40 year average of completed single family dwellings) the residential fire sprinkler industry will require an additional 2700 layout technicians, 7100 installers, and over 1300 AHJ plan reviewers and inspectors to do the work. Fortunately, all 11,100 positions will not be needed at the outset but the industry must begin recruiting and training now to meet the demand as it develops.

"IRC residential fire sprinkler requirements will change the industry in a breadth and timeline never experienced before."



This projected shortage can be addressed, and this report is designed to give existing fire sprinkler contractors and those in related trades information to use in evaluating the return on investment (ROI) for developing the technical skills and associated technology needed to undertake this work. The potential rewards for those who invest early and systematically are unlike any experienced before in the industry.

History

Fire sprinkler technology traces its roots as early as 1723 when a patent was issued in England for an automatic water based suppression device that consisted of a wooden barrel filled with water to which powder charges were attached with a system of fuses running across the room or compartment.[5] The device was intended to operate when a fire lit a fuse, detonating the powder charge, rupturing the barrel and extinguishing the fire. It is not known if the device found an application, but the design basis is very much like that of the automatic systems of today.

The development of fire sprinkler systems evolved through a series of manual systems with perforated pipes and open nozzles. The first prototype automatic fire sprinkler was patented in 1874 by Henry S.

[5] *Automatic Sprinkler Systems Handbook* 2007 edition, Dubay, National Fire Protection Association p. xxvii

Parmelee and to this day the sprinkler has been the basis for the great majority of automatic fire suppression systems.

The market for automatic suppression systems was driven almost exclusively by the insurance industry for nearly 100 years. The application of fire sprinkler technology was utilized in high fire exposure industries and where the risk of business interruption from fire was high. Therefore, it was limited almost exclusively to commercial applications even as the model codes began to aggressively mandate the use of sprinklers for industrial applications along with warehousing, office, mercantile, and similar occupancies. The governing standard in the United States and Canada (outside of specific insurance standards) is NFPA 13 *The Standard for the Installation of Sprinkler Systems.* It was published in 1896 and was the first standard created by the organization that became the National Fire Protection Association. It has been revised some 50 times since the first edition, with the latest published in 2007.

The design criteria specified by NFPA 13 is centered on the protection of the building structure, and the application of fire sprinkler systems remained focused on the protection of property until the introduction of fast response sprinklers in the early 1980's. The first sprinkler system installation standard directed specifically towards life safety was titled NFPA 13D and published in 1975. It was rarely used until fast operating and low flow sprinklers were introduced in the early 1980's. The scope of NFPA 13D applies only to one and two family residences and manufactured housing. It provides a low cost alternative to the heavy protection requirements of NFPA 13 as the system is not designed to protect the structure, but to prevent flashover in a compartment for a sufficient length of time to allow the occupants to escape.

In addition, NFPA 13R was first published in 1989 with its scope limited to multi-family residential structures no more than four stories in height. The design criteria is expanded somewhat, but it is similarly focused on life safety for the occupants of the structure. NFPA 13R applications are widely used in today's fire sprinkler market as the codes have continued to expand the inclusion of fire sprinkler systems in multi-family occupancies.

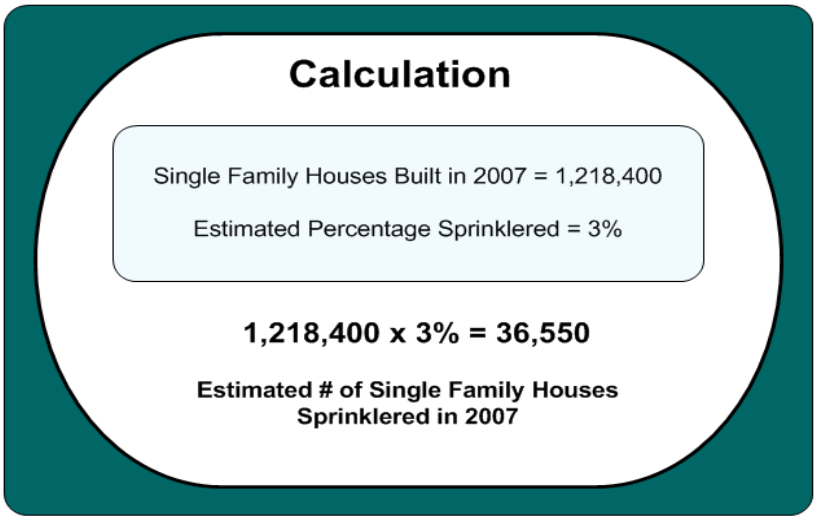
Market Analysis

Fire sprinkler manufacturers report that 47 million sprinklers were sold in the United States during 2007. Recent projections for 2008 forecast this number to decline to approximately 42 million. It can be assumed that virtually all sprinklers sold were installed. The installations include new construction, retrofits, and tenant improvements. Though hard financial data is difficult to find, by combining average construction costs across the United States for each type of work, it is estimated that the installation of fire sprinklers for all occupancies generated between 5 and 6 billion dollars of revenue, including the cost of the sprinklers, related materials and equipment, and labor.

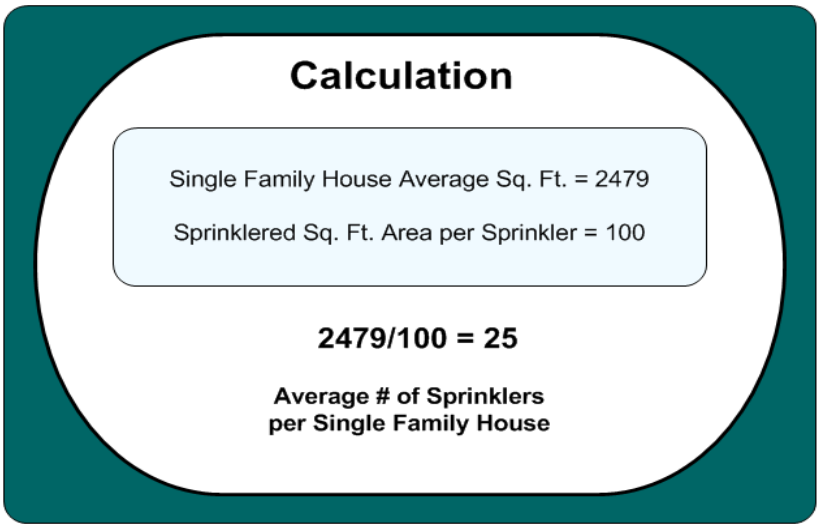
Segmenting out the residential sector of the fire sprinkler market is difficult. Much of the manufacturer information is understandably proprietary and the contractor community is principally cottage based

with little detailed historical data. The authors recognize that any evaluation of this nature is subject to question, but we believe that our conclusions are sound and biased to the conservative.[6]

It is estimated that no more than 3% of the new single family residential units completed in 2007 were equipped with fire sprinklers. HUD Statistics report that 1,218,400 single family residences were completed in 2007. Using the 3% factor, it is calculated that 36,550 of these residences were equipped with fire sprinklers.

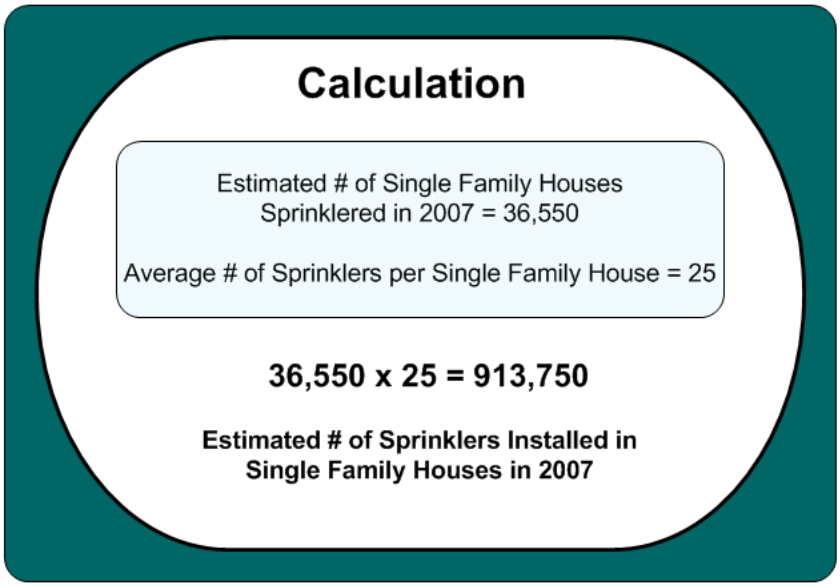


The U.S. Census Bureau and HUD also reported that the average single family house completed in 2007 was 2,479 ft² in size. Using a 100 ft² average for a sprinkler area of coverage it is estimated that the typical new house utilized 25 sprinklers.



[6] See Appendix Section 2

Using this data from 2007, the numbers indicate that 913,750 sprinklers were installed in single family residences against the potential for over 30,000,000 installed if fire sprinklers were installed in all completed units.



Market Value

Three different approaches were examined in calculating the current and potential market value.[7] These include unit cost per installed sprinkler, cost per square foot of sprinklered space, and percentage of contract value. The three methods show the following results:

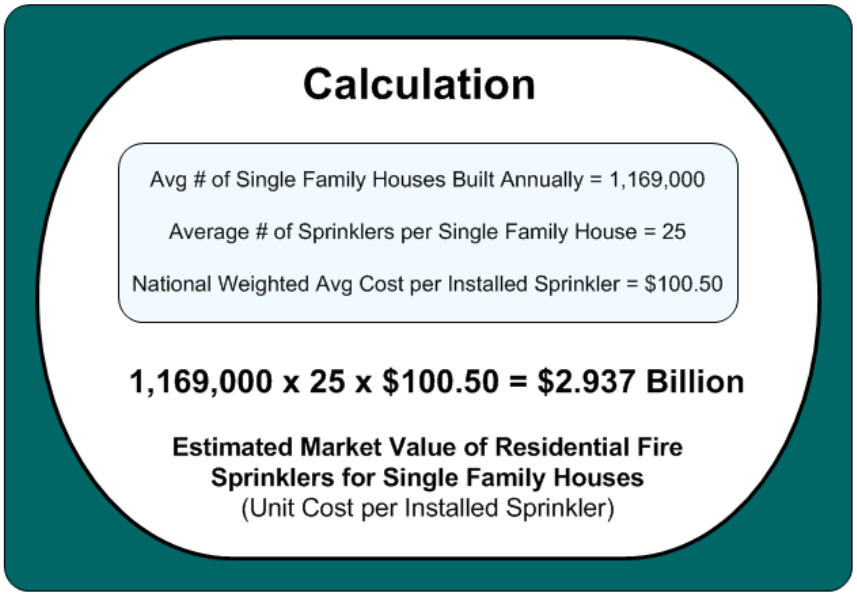
Unit Cost per Installed Sprinkler

In order to determine market value using this method a cost per installed sprinkler must be determined. When computing a cost by installed sprinkler, each unit weighted to carry a portion of the expenses not directly tied to the sprinkler itself such as the system valves, building water supply, flow indicators and alarms, feed pipe, support systems, and bracing. The system design, job site supervision, and company overhead are also factored into the unit cost. The system components (pipe, sprinklers, etc.), tools, and equipment costs are similar throughout the United States but design, installation labor, and overhead costs can vary greatly by geography.

[7] See Appendix Section 2

Using the regional costs per installed sprinkler, a national average cost of $100.50 per installed sprinkler has been determined.[8] Factors such as signatory or non-signatory labor, taxes, permit fees, and local jurisdictional or market conditions also have an impact on sprinkler system costs.

Using the unit cost method, for 2007, 913,750 sprinklers were installed in 36,550 single family homes with a market value of $91.832 million. Using the 40 year average of 1,169,000 single family units completed annually, the market potential is an impressive **$2.937 billion**.

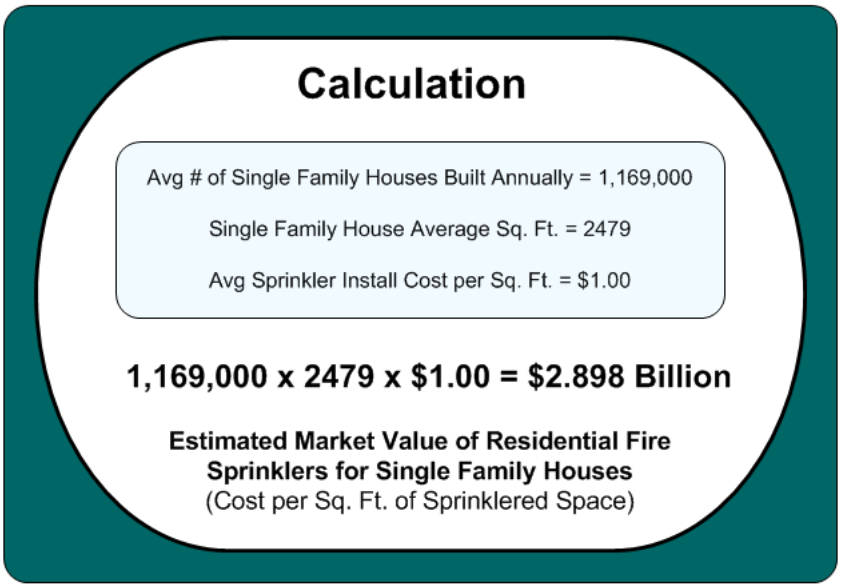


Cost per Square Foot of Sprinklered Space

Industry data is incomplete regarding sprinkler costs per square foot but research indicates that $1.00/ft² is a conservative average for single family units. These costs do not include impact fees, water meter surcharges, and other non-direct construction costs.

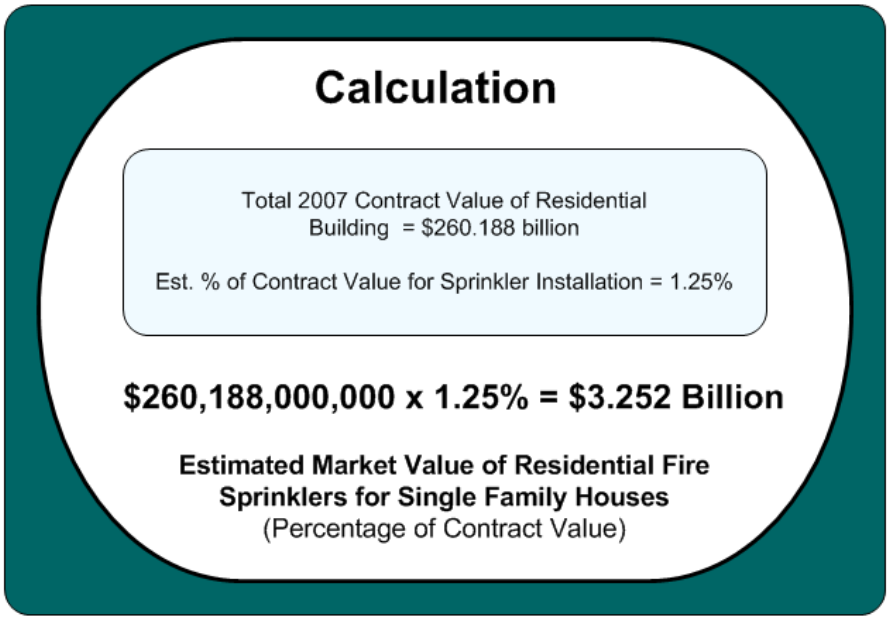
The cost per square foot calculation using the 40 year average number of single family houses built annually computes to a market potential of **$2.898 billion.**

[8] See Appendix Section 2.1



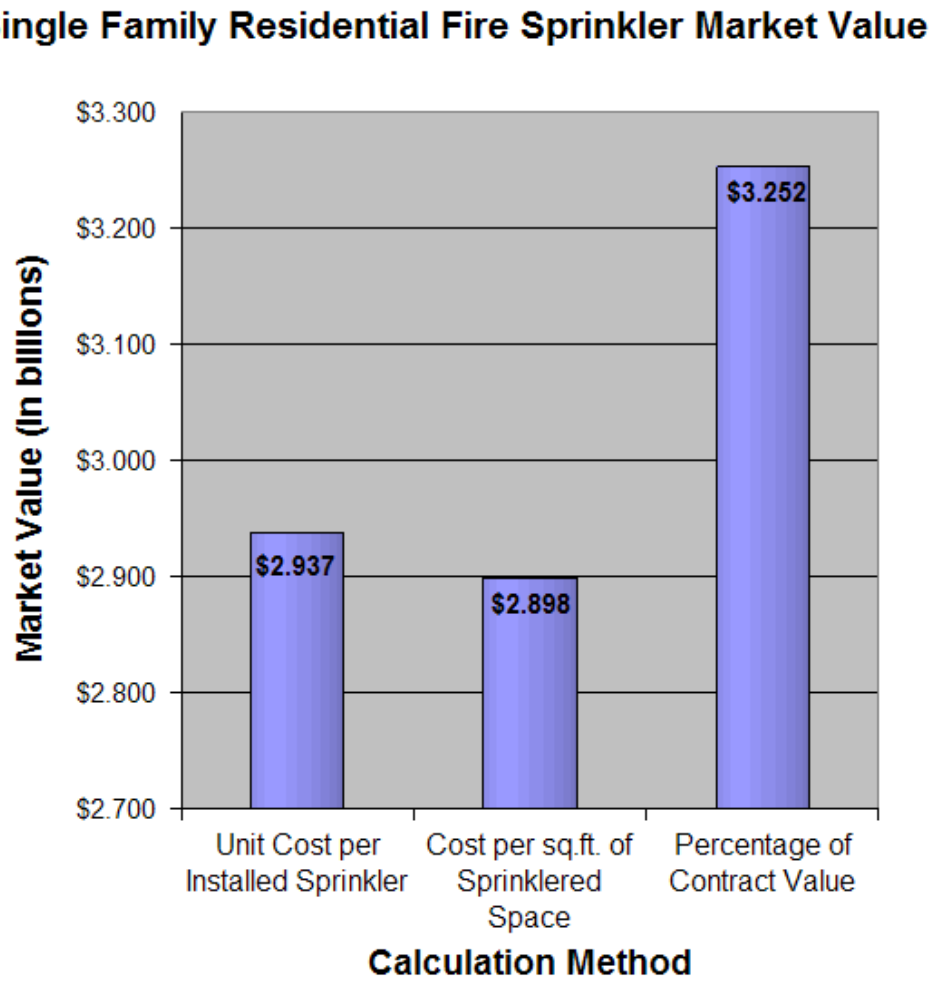
Percentage of Contract Value

Calculating a market value using a percentage of the construction contract value is the least reliable metric; however, it can provide a quick check for other methods. Industry data is again incomplete, but it is estimated that the installation of a sprinkler system adds approximately 1.25% to the construction contract value of a residential unit. F.W. Dodge Group reported that the total contract value of residential building in 2007 was $260.188 billion. Using a 1.25% factor against this total shows a potential residential fire sprinkler market value of **$3.252 billion**.



By whichever method the potential market is calculated, the impact of the mandatory installation of fire sprinklers is unlike any experienced heretofore by the industry. Even with the current depressed market conditions, the impact is significant. Using the data released by the U.S. Department of Commerce showing a 2008 projected completion number of 584,000 single family homes, the market value is between **$1.467 and $1.808 billion.**

To complete the picture, consider the recent peak year 2006 where 1,654,500 single family homes built would show results ranging from **$4.063 to $4.685 billion.**



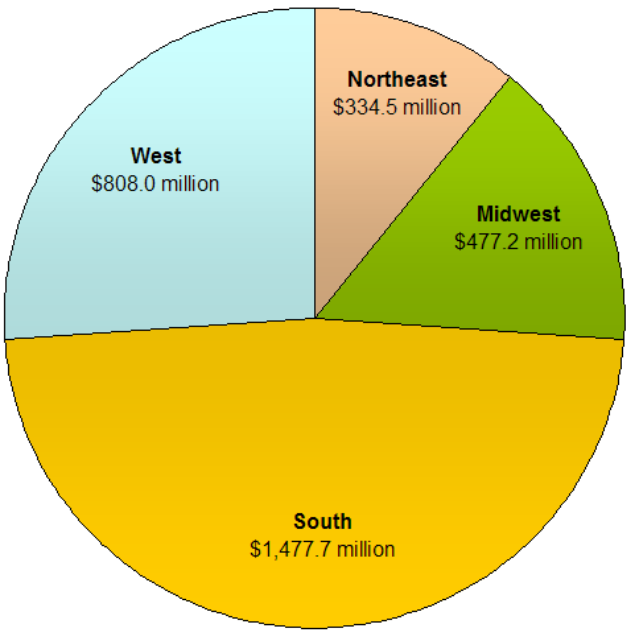
Regional Market Value

It is enlightening to examine the impact by region as identified by the U.S. Department of Commerce. The following potential market value by region for 2007 by unit cost per installed sprinkler shows the following:

	# of Single Family Homes Built in 2007	Average # of Sprinklers per Single Family Home	Unit Cost per Installed Sprinkler	Potential Residential Market Value
Northeast	104,600	26	$ 123.00	**$ 334.5 million**
Midwest	188,600	23	$ 110.00	**$ 477.2 million**
South	631,500	26	$ 90.00	**$ 1,477.7 million**
West	293,800	25	$ 110.00	**$ 808.0 million**
National	1,218,400	25	$ 100.50	**$ 3,061.2 million**

It is recognized that the economic metrics behind these estimates can be debated, but whatever analytics are used, the conclusions demonstrate that the impact is enormous.

Potential Residential Fire Sprinkler Market Value by Region



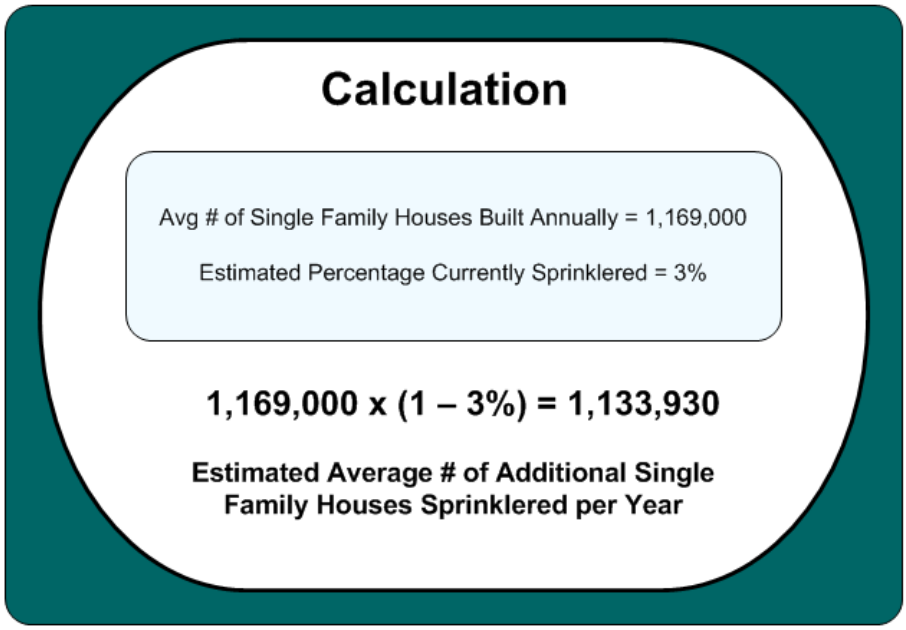
Labor Analysis

Fire sprinkler construction has three main components:

1) design
2) material procurement and fabrication
3) installation

The ability of the industry to absorb this infusion of new work will be greatly hindered by the lack of trained individuals in the design and installation components. The impact on material supply including fabrication is greatly mitigated by the fact that most systems will utilize plastic pipe and fittings.

The analysis of industry capacity is based on the 40 year residential construction average of 1,169,000 single family units built per year. Since it has already been assumed that 3% of single family units are currently being sprinklered, the following analysis is based on increased labor demands to accommodate an average of 1,133,930 additional single family units per year.



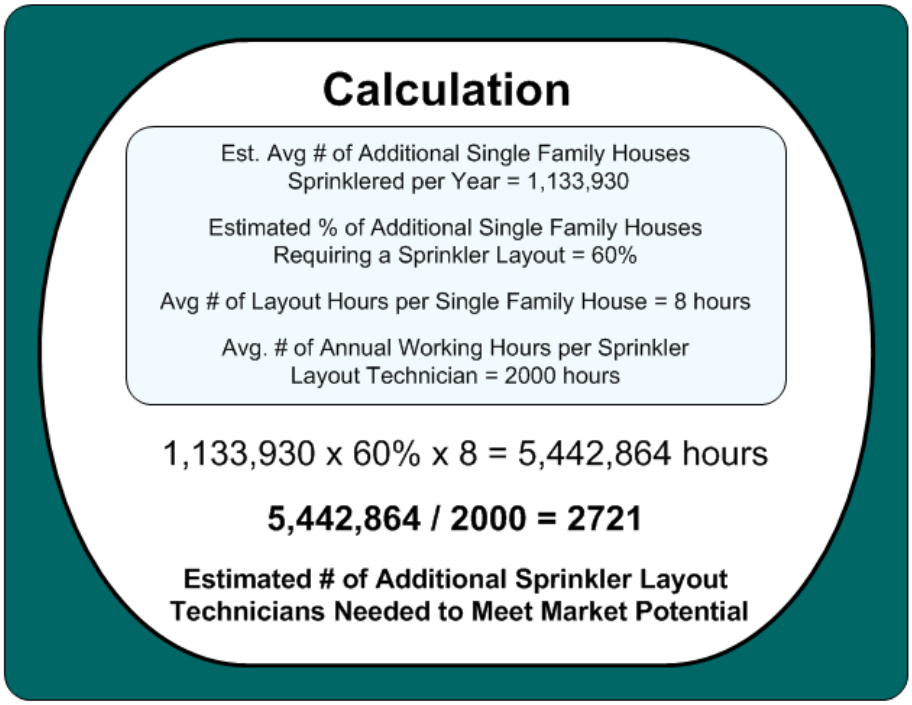
It is also expected that when the residential construction environment is strong the commercial building industry will experience at least average or above average activity.

Sprinkler Layout Labor

Residential fire sprinkler layout is not as complex as those for commercial applications, but it is a unique skill that requires an understanding of all sprinkler system design aspects such as design criteria, sprinkler use, and hydraulic analysis. All individual structures require a system layout with submission to

the approving authorities. There is some scale with tract developments and multi-unit developments with typical buildings. However, even with typical structures, hydraulic variations (such as differing pad elevations) often require non-typical system layouts with differing pipe sizes or system configurations.

Therefore, a conservative estimate is that 60 percent of the single unit structures will require system design and hydraulic analysis. It is also estimated that the average fire sprinkler layout technician can produce one complete single family dwelling system layout (including hydraulic analysis) in a standard work day (8 hours). Using these estimates, it is projected that 2,721 additional layout technicians will be required.[9]



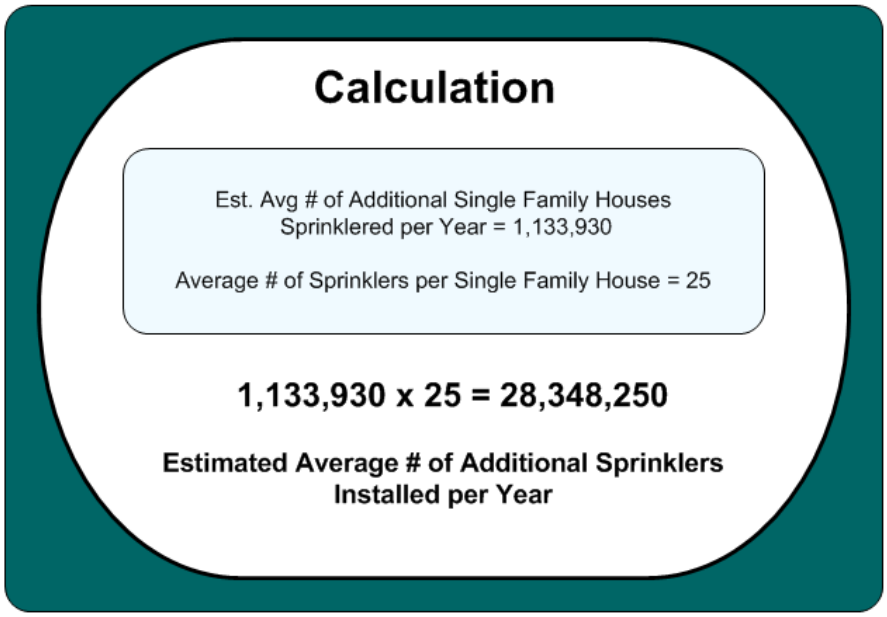
In an industry that is woefully understaffed with qualified technicians and with no sizeable investment in the recruiting and training of fire sprinkler layout technicians, the prognosis can be interpreted as bleak as to whether the industry can satisfy the needed supply of design capabilities.

Fortunately, the design of fire sprinkler systems for single family and smaller multi-unit structures even up to six or more units is simple when compared to larger commercial applications such as large condominium or apartment complexes. The training can be accomplished in fairly short order if focused and systematic. The challenge is that today's contractor is reticent to make even a modest investment in recruiting and training, and the industry is suffering the consequences of a short supply of qualified technicians. The influx of residential structures will greatly magnify this shortage.

[9] See Appendix Section 3

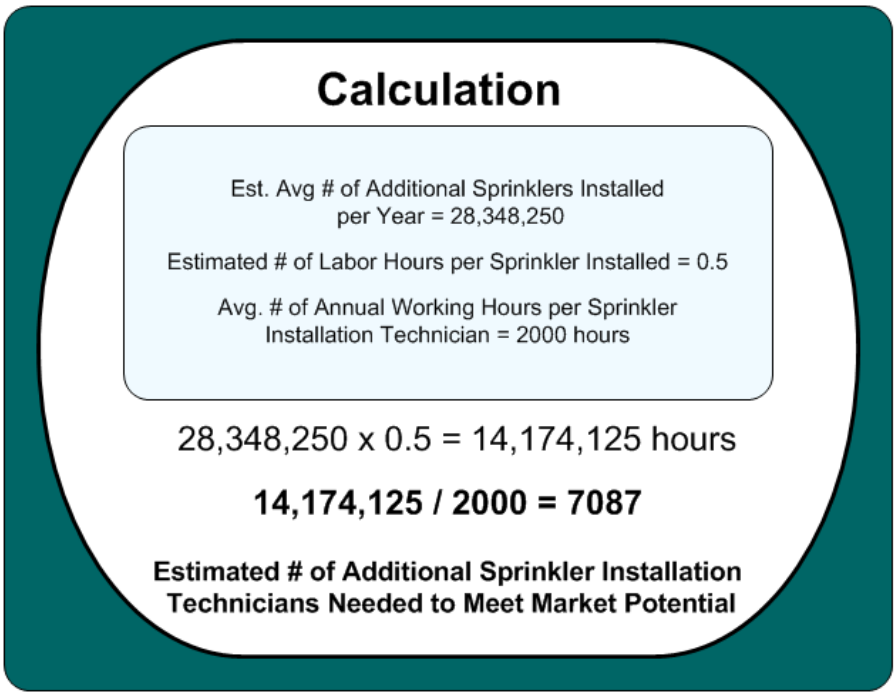
Sprinkler Installation Labor

The need for producing a sufficient supply of designers is mild compared to that of recruiting and training a qualified supply of installation labor. In 2007 it was estimated that 913,750 sprinklers were installed in single family units. Using the 40 year average of 1.169 million single family units built a year, there is a potential of 29.2 million sprinkler heads to be installed. This means that as residential fire sprinkler requirements are enforced approximately 28.3 million additional fire sprinklers will be installed annually.



A weighted average of 0.5 labor hours per sprinkler installed indicates that 7087 additional trained installation technicians will be required to handle this additional work.[10] This is about a one-third increase in the estimated number of technicians currently employed in the industry.

[10] See Appendix Section 4

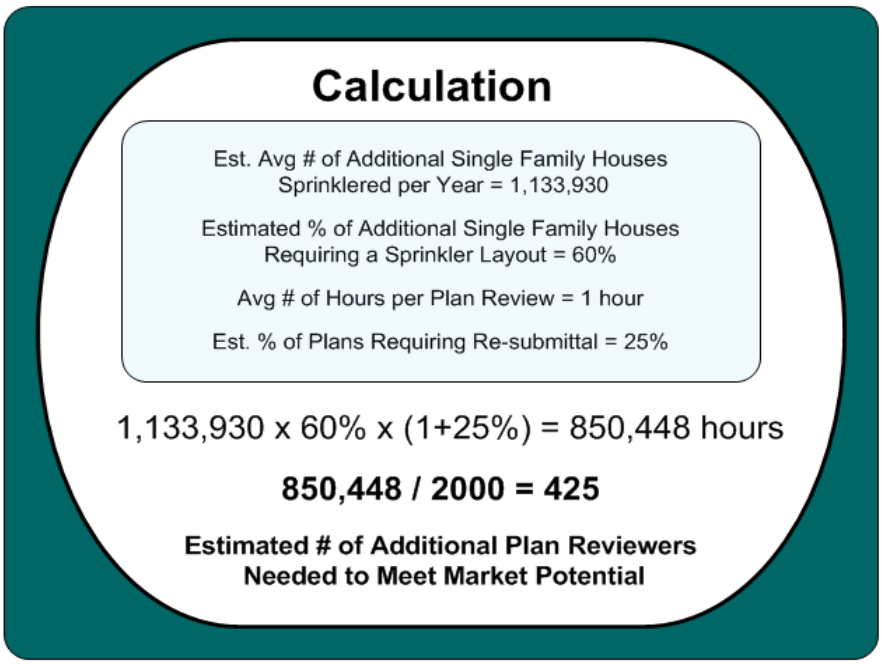


When the need for significant increases in the supply of trained design and installation labor is combined with the requirements for supervision, purchasing, administrative, and other supporting roles, it requires a serious examination of the challenges and opportunities that face the industry.

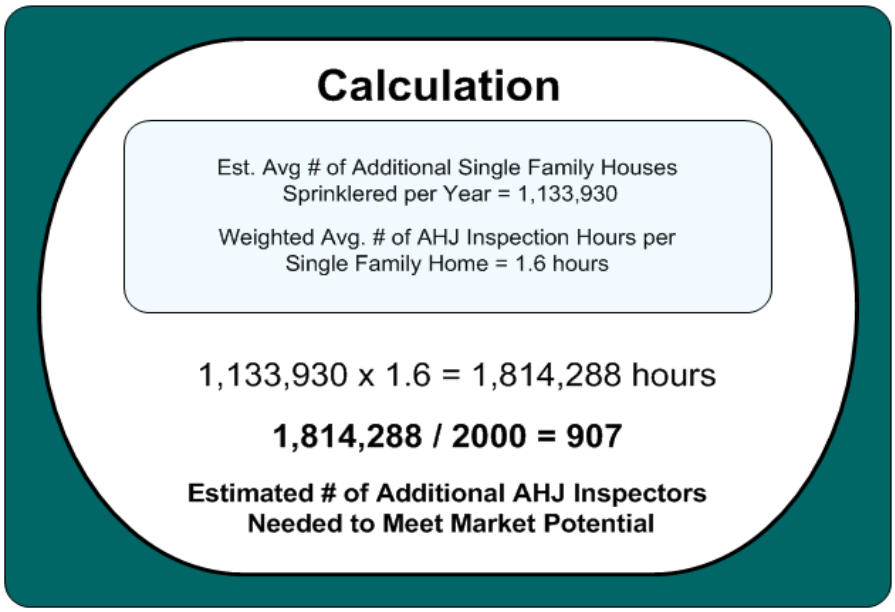
Jurisdictional Enforcement Labor

One area easily overlooked is the impact the adoption of zero-tolerance residential fire sprinkler requirements will have on the local authorities to properly police the design and installation of an additional 29 million sprinklers each year. Fire prevention bureaus in most professional departments throughout the United States are understaffed and undertrained for their current enforcement duties without taking on the immense workload created with the adoption of the residential fire sprinkler requirements by the ICC. Volunteer departments are another story in and of themselves, but suffice it to say that they are in no better position (and most likely less equipped) than the paid departments to handle the additional enforcement duties.

The additional work load is daunting. Even with some scale achieved from typical buildings used in tract developments and multi-unit developments, it is estimated that the working drawing(s) and hydraulic analysis review will be needed for an additional 680,358 residential systems annually. With an average of one hour for each plan review and a 25% factor for re-submittals a total of 850,448 hours will be needed for plan reviews, which is the equivalent of 425 additional full-time plan review positions.



In addition to the plan review, each single family residential unit will typically require two inspections of the fire sprinkler system to receive a certificate of occupancy. These inspections include an inspection and hydrostatic test of the piping and other components before being covered up by drywall and finish materials. The second is a final inspection and commissioning of the completed fire sprinkler system. It is estimated that each single family residence (1,133,930 additional units) will average 1.6 hours of inspection for a total of 1,814,288 hours, which is the equivalent of 907 full-time positions.[11]



[11] See Appendix Section 5

Recruiting and Training

There is no doubt that the adoption of this amendment will have a profound impact on the industry. How the industry responds is vital to the success of meeting the objectives desired by the proponents of fire sprinklers for all residential occupancies.

The accurate design and layout of fire sprinkler systems is more demanding than other building systems. Even though the requirements for detail where residential systems are involved are less onerous than commercial systems, the numerous factors involved require skill and knowledge. The accurate hydraulic analysis, the selection of the proper fire sprinkler(s), and their precise placement within design parameters such as position, location, areas of coverage, temperature rating, K-factor, and such is critical. Residential fire sprinkler system criteria are exact with little tolerance for field variance and good system installation starts with proper design.

There currently exists a shortage of qualified layout technicians. With the influx of new design work that is now projected, the industry faces the task of filling this need with trained and qualified technicians. The investment is substantial and will require the current contractors to put aside past neglect. There are a number of reasons for this neglect, and it is not the purpose of this report to address. However, it should be said that the contractor that attacks and solves this issue—wins.

If there has been neglect of design training, the neglect is even more pronounced when it comes to installation. Fire sprinkler system installation is much more than pipe and fittings. The proper location and position of each fire sprinkler is dependent on a variety of factors and tolerances are tight when compared to many building appliances. Recruiting and training to meet the coming demand is essential to the successful implementation of residential fire sprinkler requirements in the IRC. Finding 7000 new installation technicians will require creative and inventive tactics to fill these positions with qualified candidates. If the sprinkler industry stumbles in this regard, the opportunity is ripe for other piping trades, such as plumbing contractors, to step in and fill this demand.

"If the sprinkler industry stumbles in regard to training the opportunity is ripe for other piping trades to fill the demand."

As with design and installation, another real concern is for the jurisdictions to develop the knowledge and expertise to provide competent enforcement. No small task when it is recognized that the fire prevention community has been historically understaffed and undertrained. A lack of qualified plan reviewers and inspectors will only magnify the risks and challenges that come with a shortage of trained

design and installation technicians. This vacuum may be best filled by a combination of fire service personnel and third-party sources, provided there is a sufficient protocol of checks and balances for the design and installation community.

Conclusion

With the passage of this amendment, the old adage comes to mind--"Be careful what you wish for because you might just get it." This amendment has the potential to create more work for the industry than any single event in the history of fire sprinklers. Of course, this potential will only be realized if the industry can prepare itself to perform this work in a qualified manner at a cost that justifies the investment. Those who step up to this opportunity have the chance to experience success at a level never contemplated by most. Sprinklers are a necessary part of the fire protection equation. Residential fire sprinklers are now part of the International Residential Code, and the challenge is now upon the industry to execute in the manner that the proponents envisioned.

Appendix

1. Item RB64-07/08

RB64–07/08
R313 (New), Appendix P, Chapter 43 (New)

Public Comment 2:

Ronny J. Coleman, Retired California State Fire Marshal, representing Fire Sprinkler Coalition, requests Approval as Modified by this Public Comment.

Replace proposal as follows:

SECTION R313
SPRINKLER PROTECTION

R313.1 Required Installation. Effective January 1, 2011, a residential fire sprinkler system shall be installed in one- and two-family dwellings and townhouses.

> **Exception:** A residential fire sprinkler system shall not be required for additions or alterations to existing buildings that are not already provided with a residential fire sprinkler system.

R312.2 Design and Installation. Residential fire sprinkler systems shall be designed and installed in accordance with Section P2904 or NFPA 13D.

(Renumber subsequent sections)

Delete IRC Appendix P without substitution:

~~**APPENDIX P**~~
~~**FIRE SPRINKLER SYSTEM**~~

~~*The provisions contained in this appendix are not mandatory unless specifically referenced in the adopting ordinance.*~~

~~**AP101 Fire sprinklers.** An approved automatic fire sprinkler system shall be installed in new one- and two-family dwellings and townhouses in accordance with Section 903.3.1 of the *International Building Code*.~~

Add standard to Chapter 43 as follows:

NFPA 13D-07 Installation of Sprinkler Systems in One- and Two-family Dwellings and Manufactured Homes

Commenter's Reason: It is important to point out that there was no comprehensive debate on this proposal at the hearing in Palm Springs. The IRC Fire Sprinkler Coalition (www.IRCFireSprinkler.org) and many others chose to forgo debate since it was clear, based on committee actions on prior proposals, that the committee would not accept any proposal having to do with residential sprinklers.

When RB64 was called to the floor, there were only 10 committee members present (other than the chairman), and 4 of these individuals were appointed by the National Association of Home Builders. Given NAHB's well-known policy of opposing residential sprinklers, passage of RB64 would have required a unanimous vote of the remaining 6 members. Such a requirement, the threshold of unanimity among committee members who don't have a pre-determined vote, to pass a code change is inconsistent with the concept of consensus code making, and it depreciates ICC's code-making process. Accordingly, the committee vote lacks merit and should be ignored.

We ask the ICC membership to support this public comment based on the overwhelming evidence that has been presented in support of residential sprinklers over the past few years. The reason statement provided with the original RB64 proposal and the reason statements provided with many other proposals this year clearly make the case that residential sprinklers represent the best way to achieve a sustainable and long-term reduction in residential fire losses.

We know that: 1) the residential fire problem is not limited to older homes, 2) the residential fire problem cannot be solved with smoke alarms, 3) more firefighters are killed fighting fires in dwellings than in any other occupancy, and 4) residential sprinklers represent a cost effective solution to America's residential fire problem. These conclusions are clearly documented in publicly available reports.

We also know that consumers are accepting residential sprinklers as an important feature in new home construction in increasing numbers. This comes as no surprise because the IBC requires EVERY other residential occupancy built today to have sprinklers, and it simply makes sense that renters who live in sprinklered apartments will want to move into sprinklered homes.

While NAHB suggests that sprinklers should remain a “choice” for new homeowners, the concept of choice has two significant flaws. First, it’s common knowledge that major home builders won’t offer sprinklers even if the owner wants them installed, so home buyers who want sprinklers are simply told that they’re not offered as an option. Second, why should the first home buyer be given the right to choose whether a home gets a fire sprinkler system, on behalf of all future homeowners, their families, and the community who ultimately assumes responsibility for providing fire protection for unsprinklered properties? This simply makes no sense.

The fact that the National Association of Home Builders is the only national organization to oppose the adoption of residential sprinklers as a mainstream feature in new home construction is very telling, and we are optimistic that ICC’s membership will make the decision that the time has finally come for all homes to be sprinklered. It seems that everyone agrees that we’ll eventually get there, so what are we waiting for?

2. Estimating Market Value

Several approaches were used to estimate the current and potential market value for installing fire sprinklers in all U.S. single family residential units. Fire sprinkler industry financial data is hard to assemble, but it is believed that the conclusions reached are realistic and biased towards the conservative. These calculations are detailed in 2.1 through 2.3. The method used in the report utilized a unit cost per installed sprinkler. This was chosen as it lends itself to the purpose of illustrating the impact of the code change on the market with the emphasis on skilled labor. Two other approaches include examining values by square footage constructed and total construction contract values.

2.1. Value by unit cost per installed sprinkler

Many in the industry use unit costs to determine contract value. Using industry knowledge and polling contractors throughout the United States the following regional and national costs were developed for this report:

	Unit Cost per Installed Sprinkler	# of Single Family Homes Built in 2007
Northeast	$ 123.00	104,600
Midwest	$ 110.00	188,600
South	$ 90.00	631,500
West	$ 110.00	293,800

National Weighted Average
Unit Cost per Installed Sprinkler = $ 100.50

To use a unit cost approach an average number of sprinklers per dwelling unit must be determined. The approach taken by the authors incorporates an evaluation of the maximum area of coverage for residential fire sprinklers, the average square footage of dwelling units, the typical areas not covered by sprinklers such as attached garages, small bathrooms and closets, and architectural features that affect the placement of sprinklers. There is much subjectivity involved but the authors emphasize that the objective of the analysis is to lay a foundation for the conclusions regarding the economic impact, not to provide exact numbers of sprinklers.

Using this approach, the authors have concluded that a conservative average of 100 ft² is acceptable. Using this area of coverage, the average square footage was taken by region for 2007 and the following sprinkler counts were identified:

	Average Sq. Ft. per Single Family Home	Average # of Sprinklers per Single Family Home
Northeast	2,582	26
Midwest	2,257	23
South	2,538	26
West	2,456	25

National Weighted Average
Average # of Sprinklers per Single Family Home = 25

2.2. Value by cost per square foot of sprinklered space

The U.S. Census Bureau and the Department of Housing and Urban Development reported that the average square footage of single family residences completed in 2007 was 2479 ft². The average size of single family houses has steadily increased since 1978 when it stood at 1750 ft². The average grew to 2265 ft² in 2001 and 2642 ft² for the 2nd quarter of 2008.

3. System Layout Labor Analysis

Estimating the number of design hours needed to meet the potential market can be evaluated several different ways. The process is simplest for the single family market. Each individual home requires a complete system consisting of a water supply, system riser with control valve(s) and appurtenances, piping network, and sprinklers. The working plans for the system must show all of these components and hydraulic calculations must be prepared to demonstrate that the system will deliver the specified design criteria.

It is estimated that the completion of working drawings and hydraulic calculations will average 8 hours for a single family dwelling unit. More complex and larger homes will take longer, while simple small

ramblers will require something less than 8 hours. Since a number of homes will have typical floor plans in tract developments, it is conservatively estimated that only 60% of single family residences will require complete and customized working drawings. It should also be noted that even where typical floor plans are found, the hydraulic characteristics can vary due to variables in water supplies (pressure variances are the most common due to elevation changes, underground piping configurations, meters, and such).

Taking these variables into consideration, the following calculation is made:

60% of the 1,133,930 dwellings units will require working drawings and hydraulic calculations. Each of these 680,358 designs will average 8 hours of labor by a qualified system layout technician which totals 5,442,864 hours. With the average layout technician working an average of 2000 hours annually, a total of 2,721 trained layout technicians are needed to meet the demand.

4. Installation Labor Analysis

Installation labor is typically quantified by contractors using the number of labor hours needed to install one sprinkler. For the purposes of this report, all the labor involved with installing a sprinkler system is factored with and measured in terms of time per installed sprinkler. This includes the time to prepare and install the piping, supports, bracing, sprinklers, valves, alarms, and all appurtenances. Also, included is time for job site supervision, job site coordination, and all required commissioning and acceptance tests.

The type of piping, fittings, and sprinklers will affect the time it takes to install a sprinkler. Plastic pipe and fittings (CPVC) will require less time than using threaded steel pipe. Because of the wide use of plastic pipe (over copper or steel), the labor factor selected for this report is based on the use of plastic pipe and fittings. Using the experience of the authors, polling a number of sprinklers contractors including both union and merit, and giving consideration to regional differences, a labor factor of 0.5 hours per sprinkler was decided upon.

Using the 40 year average for completed single family homes with an average of 25 sprinklers for each dwelling, the total number of sprinklers installed annually is 29,225,000. Using the ratio of 0.5 labor hours for each sprinkler, the total number of labor hours required is 14,174,125. Taking a standard number of hours worked in a year at 2000 calculates to 7087 full-time installation technicians.

5. Jurisdictional Enforcement Labor Analysis

System acceptance typically consists of two site visits. The first involves a hydrostatic test of the piping to verify that it will hold pressure and has no leaks. This is done with the piping exposed and the inspector typically examines the piping supports for proper installation in addition to the pipe and

fittings. The second visit comes at the completion of the building and consists of an inspection of the finished installation and an operational test of the system.

Unlike plan review in which one plan can represent typical units (such as tract home developments), each individual unit must be inspected. However, it is recognized that with tract developments, inspections can often be performed for a number of units in a single visit. Therefore, for the purposes of this report the number of hours needed to complete each inspection is set at one hour for non-tract homes (680,358 units) and one-half hour for units in tract developments (453,572 units). These time estimates are considered conservative and include consideration for travel, re-inspections, and paperwork.

6. U.S. Department of Housing and Urban Development Data

6.1. New Privately Owned Housing Units Completed

New Privately Owned Housing Units Completed

Annual Data

(Components may not add to total because of rounding. Number of housing units in thousands.)

Year	Total	In structures with--			Region							
		1 unit	2 to 4 units	5 units or more	Northeast		Midwest		South		West	
					Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
1968	1,319.8	858.6	77.4	383.6	198.8	(NA)	347.5	(NA)	527.4	(NA)	246.1	(NA)
1969	1,399.0	807.5	79.8	512.1	219.8	(NA)	344.7	(NA)	553.1	(NA)	281.4	(NA)
1970	1,418.4	801.8	85.1	531.5	184.9	(NA)	323.4	(NA)	594.6	(NA)	315.5	(NA)
1971	1,706.1	1,014.0	106.1	586.1	225.8	(NA)	348.1	(NA)	727.0	(NA)	405.2	(NA)
1972	2,003.9	1,160.2	119.2	724.7	281.1	(NA)	411.8	(NA)	848.5	(NA)	462.4	(NA)
1973	2,100.5	1,197.2	123.5	779.8	294.0	(NA)	441.7	(NA)	906.3	(NA)	458.6	(NA)
1974	1,728.5	940.3	95.3	692.9	231.7	(NA)	377.4	(NA)	755.8	(NA)	363.6	(NA)
1975	1,317.2	874.8	60.4	381.8	185.8	(NA)	313.2	(NA)	531.3	(NA)	286.8	(NA)
1976	1,377.2	1,034.2	77.1	265.8	170.2	(NA)	355.6	(NA)	513.2	(NA)	338.3	(NA)
1977	1,657.1	1,258.4	94.9	303.7	176.8	(NA)	400.0	(NA)	636.1	(NA)	444.2	(NA)
1978	1,867.5	1,369.0	116.1	382.2	181.9	(NA)	416.5	(NA)	752.0	(NA)	517.1	(NA)
1979	1,870.8	1,301.0	124.9	444.9	188.4	135.2	414.7	293.8	761.7	534.9	506.0	337.1
1980	1,501.6	956.7	118.8	426.3	146.0	99.8	273.5	169.6	696.1	454.6	386.0	232.8
1981	1,265.7	818.5	111.4	335.7	127.3	86.9	217.7	139.8	626.4	408.4	294.3	183.3
1982	1,005.5	631.5	80.7	293.1	120.5	79.0	143.0	92.2	538.8	339.5	203.2	120.7
1983	1,390.3	923.7	92.0	374.4	138.9	106.1	200.8	141.6	746.0	475.9	304.6	200.2
1984	1,652.2	1,025.1	112.2	514.8	168.2	128.6	221.1	155.8	866.6	508.2	396.4	232.5
1985	1,703.3	1,072.5	97.2	533.6	213.8	167.8	230.5	151.3	812.2	514.0	446.8	239.4
1986	1,756.4	1,120.2	86.1	550.1	254.0	193.1	269.8	170.0	763.8	504.5	468.8	252.6
1987	1,668.8	1,122.8	71.4	474.6	257.4	195.8	302.3	201.3	660.4	467.2	448.7	258.5
1988	1,529.8	1,084.6	56.6	388.6	250.2	187.7	280.3	191.3	594.8	457.0	404.6	248.4
1989	1,422.8	1,026.3	58.7	337.9	218.8	159.0	267.1	190.7	549.4	420.0	387.5	256.6
1990	1,308.0	966.0	44.8	297.3	157.7	126.7	263.3	195.0	510.7	389.3	376.3	254.9
1991	1,090.8	837.6	36.8	216.6	120.1	99.6	240.4	185.3	438.9	348.2	291.3	204.5
1992	1,157.5	963.6	36.1	158.0	136.4	113.7	268.4	218.2	462.4	399.6	290.3	232.2
1993	1,192.7	1,039.4	26.3	127.1	117.6	105.2	273.3	231.6	512.0	455.7	290.0	246.9
1994	1,346.9	1,160.3	31.8	154.9	123.4	112.9	307.1	255.0	580.9	507.3	335.5	285.1
1995	1,312.6	1,065.5	34.7	212.4	126.9	107.8	287.9	232.1	581.1	472.4	316.7	253.2
1996	1,412.9	1,128.5	33.1	251.3	125.1	107.8	304.5	244.5	637.1	507.3	346.2	268.8
1997	1,400.5	1,116.4	37.0	247.1	134.0	115.5	295.9	236.4	634.1	505.6	336.4	258.9
1998	1,474.2	1,159.7	40.6	273.9	137.3	116.4	305.1	243.5	671.6	517.2	360.2	282.5
1999	1,604.9	1,270.4	35.2	299.3	142.7	114.7	334.7	276.2	732.7	569.7	394.8	309.9
2000	1,573.7	1,241.8	27.3	304.7	146.1	120.4	334.4	268.9	729.3	565.9	363.9	286.5
2001	1,570.8	1,255.9	33.9	281.0	144.8	113.7	316.4	261.1	726.3	578.2	383.3	302.9
2002	1,648.4	1,325.1	35.0	288.2	147.9	113.3	329.8	272.0	757.8	614.8	412.8	325.0
2003	1,678.7	1,386.3	31.5	260.8	154.6	113.6	332.2	274.2	755.6	635.5	436.2	363.1
2004	1,841.9	1,531.5	23.5	286.9	155.9	118.9	362.4	303.6	840.4	699.8	483.3	409.2
2005	1,931.4	1,635.9	37.5	258.0	170.7	131.7	351.9	307.2	903.7	760.5	505.1	436.5
2006	1,979.4	1,654.5	40.8	284.2	179.1	128.3	325.1	285.5	986.7	825.8	488.6	414.9
2007	1,502.8	1,218.4	31.4	253.0	144.8	104.6	222.7	188.6	766.1	631.5	369.3	293.8

NA Not available.

Note: Single-family estimates prior to 1999 include an upward adjustment of 3.3 percent made to account for structures completed in permit-issuing areas without permit authorization.

6.2. Median and Average Square Feet of Floor Area in New One-Family Houses Sold by Location

Median and Average Square Feet of Floor Area in New One-Family Houses Sold by Location

(Medians and averages computed from unrounded figures)

	Median square feet							Average square feet						
				Region							Region			
Year	United States	Inside MSAs	Outside MSAs	North-east	Midwest	South	West	United States	Inside MSAs	Outside MSAs	North-east	Midwest	South	West
1978	1,650	1,710	1,420	1,730	1,590	1,700	1,600	1,750	1,810	1,510	1,800	1,700	1,800	1,700
1979	1,650	1,710	1,390	1,770	1,600	1,670	1,600	1,760	1,820	1,480	1,830	1,710	1,790	1,700
1980	1,570	1,630	1,330	1,670	1,470	1,600	1,510	1,700	1,760	1,410	1,810	1,640	1,730	1,640
1981	1,560	1,650	1,270	1,800	1,390	1,570	1,540	1,710	1,790	1,390	1,880	1,640	1,730	1,660
1982	1,530	1,570	1,290	1,720	1,440	1,520	1,530	1,690	1,730	1,440	1,830	1,670	1,690	1,640
1983	1,580	1,610	1,390	1,670	1,680	1,580	1,530	1,740	1,770	1,470	1,820	1,880	1,740	1,630
1984	1,610	1,640	1,380	1,670	1,690	1,590	1,570	1,790	1,830	1,470	1,910	1,900	1,760	1,720
1985	1,590	1,620	1,330	1,640	1,610	1,590	1,580	1,760	1,790	1,480	1,830	1,780	1,750	1,710
1986	1,650	1,680	1,370	1,760	1,640	1,660	1,600	1,810	1,840	1,490	1,890	1,810	1,820	1,740
1987	1,760	1,780	1,510	1,810	1,720	1,780	1,730	1,900	1,920	1,630	1,920	1,880	1,930	1,850
1988	1,800	1,820	1,500	1,730	1,760	1,800	1,820	1,960	1,990	1,670	1,950	1,910	1,990	1,960
1989	1,860	1,900	1,440	1,840	1,820	1,830	1,900	2,000	2,050	1,600	1,990	1,960	2,010	2,020
1990	1,890	1,940	1,460	1,910	1,820	1,890	1,910	2,050	2,100	1,650	2,080	1,960	2,070	2,060
1991	1,900	1,960	1,450	2,000	1,810	1,890	1,940	2,050	2,100	1,600	2,110	1,960	2,060	2,080
1992	1,900	1,940	1,520	2,000	1,800	1,950	1,830	2,060	2,100	1,670	2,100	1,970	2,120	2,000
1993	1,900	1,950	1,550	2,000	1,800	2,000	1,810	2,060	2,100	1,670	2,120	1,960	2,140	1,990
1994	1,900	1,940	1,530	2,020	1,800	1,970	1,810	2,050	2,090	1,660	2,210	1,950	2,110	1,960
1995	1,880	1,940	1,570	2,080	1,800	1,980	1,790	2,050	2,090	1,650	2,190	1,940	2,130	1,950
1996	1,940	1,970	1,620	2,100	1,830	1,990	1,860	2,090	2,120	1,740	2,290	1,970	2,140	2,020
1997	1,960	2,000	1,620	2,120	1,890	2,000	1,900	2,140	2,170	1,760	2,280	2,050	2,170	2,090
1998	2,000	2,040	1,610	2,130	1,930	2,020	1,950	2,170	2,210	1,750	2,310	2,070	2,210	2,120
1999	2,033	2,082	1,667	2,204	1,935	2,087	1,977	2,221	2,263	1,806	2,340	2,097	2,278	2,178
2000	2,077	2,127	1,729	2,323	1,982	2,092	2,042	2,265	2,308	1,846	2,469	2,148	2,287	2,245
2001	2,099	2,136	1,794	2,301	1,936	2,137	2,062	2,282	2,321	1,925	2,486	2,144	2,309	2,272
2002	2,134	2,171	1,805	2,323	1,946	2,158	2,166	2,301	2,344	1,923	2,487	2,132	2,324	2,333
2003	2,125	2,163	1,833	2,276	1,916	2,146	2,168	2,315	2,360	1,975	2,444	2,153	2,336	2,345
2004	2,169	2,233	1,852	2,406	2,003	2,222	2,126	2,366	2,418	1,988	2,610	2,215	2,412	2,322
2005	2,235	2,264	1,822	2,365	2,049	2,255	2,261	2,414	2,448	1,988	2,601	2,262	2,436	2,422
2006	2,237	2,284	1,803	2,412	2,019	2,281	2,249	2,456	2,497	1,989	2,571	2,261	2,503	2,449
2007	2,235	2,281	1,883	2,278	2,001	2,300	2,220	2,479	2,516	2,062	2,582	2,257	2,538	2,456
RSE	1	1	4	6	3	2	2	1	1	5	5	2	2	2

A Represents an RSE that is greater than or equal to 100 or could not be computed.
NA Not available. RSE Relative Standard Error.
S Withheld because estimate did not meet publication standards on the basis of response rate, associated standard error, or a consistency review.

6.3. Number of New One-Family Contractor-Built Houses Started by Contract Price per Square Foot and Location

Number of New One-Family Contractor-Built Houses Started by Contract Price per Square Foot and Location

(Contract price excludes value of improved lot. Components may not add to totals because of rounding.)

	Number of housing units (in thousands) by contract price									Percent distribution								
Year	Total	Under $35.00	$35.00 to $49.99	$50.00 to $59.99	$60.00 to $69.99	$70.00 to $79.99	$80.00 to $89.99	$90.00 to $99.99	$100.00 and over	Total	Under $35.00	$35.00 to $49.99	$50.00 to $59.99	$60.00 to $69.99	$70.00 to $79.99	$80.00 to $89.99	$90.00 to $99.99	$100.00 and over
	United States																	
1999	208	7	33	30	37	31	24	18	29	100	3	16	15	18	15	12	8	14
2000	195	6	25	30	34	29	23	15	33	100	3	13	15	17	15	12	7	17
2001	186	4	21	24	29	30	24	19	36	100	2	11	13	15	16	13	10	19
2002	198	7	26	26	26	31	26	17	40	100	3	13	13	13	16	13	8	20
2003	205	4	22	25	32	27	26	19	49	100	2	11	12	16	13	13	9	24
2004	198	2	21	22	26	24	25	21	58	100	1	10	11	13	12	12	10	29
RSE	6	30	28	11	10	8	11	14	10	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	Inside Metropolitan Statistical Areas																	
1999	128	3	17	17	23	21	16	12	18	100	3	14	14	18	16	12	10	14
2000	115	3	12	16	21	17	15	10	22	100	3	11	14	18	15	13	9	19
2001	113	2	10	13	17	19	16	13	24	100	2	9	12	15	17	14	11	21
2002	113	3	11	14	15	20	15	10	23	100	3	10	13	14	18	14	9	20
2003	115	1	10	14	17	16	15	12	31	100	1	8	12	15	14	13	10	27
2004	108	1	8	12	13	14	15	10	35	100	1	7	11	12	13	14	9	33
RSE	8	42	32	12	13	11	17	13	14	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	Outside Metropolitan Statistical Areas																	
1999	80	3	15	13	14	10	8	5	11	100	4	19	16	17	13	10	7	14
2000	81	3	13	14	13	12	8	5	12	100	4	16	18	16	15	10	6	15
2001	73	2	11	11	12	11	9	6	12	100	3	14	15	16	15	12	8	17
2002	85	3	15	11	11	11	11	6	17	100	4	17	13	13	13	12	7	20
2003	90	3	13	12	15	11	11	7	18	100	3	14	13	17	13	12	8	20
2004	90	1	13	10	12	10	10	11	23	100	1	14	11	14	11	11	12	26
RSE	12	39	39	18	17	15	17	25	19	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	Northeast																	
1999	26	(Z)	2	3	6	4	3	3	4	100	2	10	13	22	17	11	10	14
2000	25	(Z)	2	4	5	3	4	2	4	100	1	9	17	18	13	15	8	17
2001	24	(Z)	2	2	4	4	4	2	5	100	1	10	9	18	15	15	10	21
2002	24	1	1	2	3	5	4	3	6	100	2	5	9	11	20	15	12	25
2003	23	(Z)	2	1	3	3	3	2	8	100	1	10	6	11	13	12	9	36
2004	24	(Z)	2	2	2	2	3	3	9	100	2	10	9	10	9	12	13	36
RSE	12	57	36	31	27	15	23	24	15	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

	Midwest																	
1999	56	2	7	9	11	9	6	5	6	100	4	13	17	20	16	11	9	11
2000	49	2	6	8	8	8	6	5	8	100	4	12	15	16	15	12	9	16
2001	51	2	6	8	6	8	6	7	8	100	5	11	15	12	16	12	13	16
2002	49	3	5	5	7	8	6	5	10	100	6	11	10	15	16	12	10	20
2003	54	1	4	4	9	8	8	6	13	100	3	8	8	16	15	15	12	23
2004	41	1	2	4	5	5	6	4	15	100	1	5	9	13	13	15	9	35
RSE	21	73	69	41	37	27	24	26	15	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	South																	
1999	95	4	21	14	16	12	10	6	12	100	4	22	15	17	13	11	6	13
2000	91	4	15	15	17	13	9	5	11	100	4	17	17	19	15	10	6	12
2001	83	1	11	12	15	13	11	6	12	100	2	14	15	18	16	13	7	15
2002	92	3	17	15	14	14	11	6	13	100	3	19	17	15	15	12	6	14
2003	90	2	14	17	16	11	10	6	14	100	2	16	19	18	12	11	7	16
2004	96	1	15	13	15	13	12	8	19	100	1	16	14	16	13	12	8	19
RSE	13	40	40	18	15	12	20	21	18	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)
	West																	
1999	32	(Z)	2	4	4	5	5	4	7	100	1	7	12	14	17	15	13	22
2000	30	(Z)	2	3	4	5	4	2	10	100	1	6	9	12	17	13	8	34
2001	28	(Z)	1	2	3	4	3	4	11	100	1	3	7	9	15	13	13	38
2002	33	1	2	3	2	4	6	3	12	100	3	6	9	7	13	17	8	36
2003	38	(Z)	1	3	5	5	6	4	14	100	(Z)	4	7	12	13	15	12	38
2004	37	(Z)	1	3	3	4	4	6	17	100	1	2	8	7	10	12	16	45
RSE	19	61	52	27	30	22	18	36	33	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)	(NA)

- Represents zero. A Represents an RSE that is greater than or equal to 100 or could not be computed.
NA Not available. RSE Relative Standard Error.
S Withheld because estimate did not meet publication standards on the basis of response rate, associated standard error, or a consistency review.

6.4. Median and Average Contract Price of New Contractor-Built One-Family Houses Started by Location and Type of Financing

Median and Average Contract Price of New Contractor-Built One-Family Houses Started by Location and Type of Financing

(Contract price excludes value of improved lot. Medians and averages computed from unrounded figures.)

		Location						Type of Financing				
Year	Total	Inside Metro Areas	Outside Metro Areas	Northeast	Midwest	South	West	Conven-tional	FHA	VA	Rural Housing Service	Cash
	Median Contract Price											
1994	$117,600	$130,000	$90,000	(S)	$116,500	$100,800	$140,000	(NA)	(NA)	(NA)	(NA)	(NA)
1995	$125,000	$138,000	$100,000	(S)	$125,000	$115,000	(S)	(NA)	(NA)	(NA)	(NA)	(NA)
1996	$127,500	$136,500	$105,000	(S)	$128,000	$120,000	$143,000	(NA)	(NA)	(NA)	(NA)	(NA)
1997	$135,000	$150,000	$108,000	$151,300	$125,000	$125,000	$155,000	(NA)	(NA)	(NA)	(NA)	(NA)
1998	$146,700	$160,000	$122,400	$159,000	$140,000	$139,000	$183,200	(NA)	(NA)	(NA)	(NA)	(NA)
1999	$149,800	$160,600	$133,700	$166,400	$148,800	$141,400	$173,000	$151,970	$104,240	$154,570	$68,130	$151,890
2000	$152,300	$163,400	$135,900	$158,500	$152,600	$146,000	$185,000	$155,640	$117,900	$141,390	$90,510	$152,850
2001	$165,400	$179,700	$144,400	$182,700	$159,400	$155,300	$205,100	$165,470	$128,160	$156,840	(S)	$195,550
2002	$163,600	$177,300	$142,100	$185,700	$173,200	$145,900	$187,600	$164,690	$106,530	$137,280	$79,420	$178,070
2003	$172,300	$194,300	$149,700	$198,300	$176,700	$151,600	$210,100	$174,740	$131,100	(S)	(S)	$179,070
2004	$180,600	$196,500	$162,800	$189,800	$189,700	$158,100	$228,100	$182,190	$93,420	(S)	(S)	$173,030
2005	$200,200	$203,800	$192,600	$225,100	$197,900	$181,700	$252,300	$199,730	$119,000	(S)	(S)	$192,900
2006	$200,300	$220,100	$181,600	$218,700	$188,600	$194,600	$273,800	$206,270	$138,610	(S)	(S)	$197,050
2007	$205,800	$223,900	$177,000	$216,700	$184,300	$196,300	$297,500	$203,740	$180,190	(S)	(S)	$200,510
RSE	4	5	7	16	8	6	14	4	5	9	9	.
	Average Contract Price											
1994	$139,400	$154,500	$112,600	(S)	$137,800	$125,500	$166,600	(NA)	(NA)	(NA)	(NA)	(NA)
1995	$149,400	$164,000	$124,800	(S)	$145,100	$138,900	(S)	(NA)	(NA)	(NA)	(NA)	(NA)
1996	$151,900	$164,500	$128,800	(S)	$147,700	$139,400	$189,500	(NA)	(NA)	(NA)	(NA)	(NA)
1997	$165,600	$186,600	$130,800	$185,000	$151,900	$157,200	$200,700	(NA)	(NA)	(NA)	(NA)	(NA)
1998	$176,600	$196,400	$141,200	$186,600	$166,900	$159,700	$230,800	(NA)	(NA)	(NA)	(NA)	(NA)
1999	$188,900	$207,100	$160,200	$208,500	$176,000	$172,900	$245,900	$183,720	$112,180	$156,270	$121,150	$204,140
2000	$204,500	$227,700	$170,700	$207,000	$197,600	$182,700	$284,200	$196,680	$116,940	$140,070	$107,830	$246,590
2001	$211,500	$232,900	$176,900	$223,000	$195,000	$195,600	$290,100	$205,190	$131,010	$154,010	(S)	$252,930
2002	$206,200	$227,400	$178,400	$233,100	$199,500	$191,000	$244,000	$203,170	$112,450	$150,150	$83,980	$240,090
2003	$219,900	$245,500	$188,500	$244,400	$203,200	$201,700	$279,600	$218,230	$135,700	(S)	(S)	$244,010
2004	$238,100	$264,700	$207,900	$234,400	$239,800	$218,400	$292,500	$231,460	$115,970	(S)	(S)	$265,440
2005	$264,900	$276,600	$242,700	$305,100	$233,000	$241,100	$345,900	$253,570	$129,350	(S)	(S)	$295,100
2006	$283,300	$302,200	$244,900	$325,400	$226,400	$259,100	$392,400	$272,880	$137,910	(S)	(S)	$326,120
2007	$282,000	$307,400	$230,600	$334,700	$243,300	$249,500	$396,000	$273,490	$202,420	(S)	(S)	$321,680
RSE	5	6	10	19	9	6	10	6	30	16	50	12

A Represents an RSE that is greater than or equal to 100 or could not be computed.
NA Not available. RSE Relative Standard Error.
S Withheld because estimate did not meet publication standards on the basis of response rate, associated standard error, or a consistency review.

Note: Average contract prices for 1999 through 2001 have been revised using an improved procedure to adjust for extreme prices.
No extreme price adjustment was used prior to 1999.

6.5. New Residential Construction in July 2008

U.S. Census Bureau News
Joint Release
U.S. Department of Housing and Urban Development

U.S. Department of Commerce • Washington, D.C. 20233

FOR IMMEDIATE RELEASE WEDNESDAY, SEPTEMBER 17, 2008 AT 8:30 A.M. EDT

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NEW RESIDENTIAL CONSTRUCTION IN AUGUST 2008

The U.S. Census Bureau and the Department of Housing and Urban Development jointly announced the following new residential construction statistics for August 2008:

BUILDING PERMITS

Privately-owned housing units authorized by building permits in August were at a seasonally adjusted annual rate of 854,000. This is 8.9 percent (±1.5%) below the revised July rate of 937,000 and is 36.4 percent (±1.5%) below the revised August 2007 esti

Single-family authorizations in August were at a rate of 554,000; this is 5.1 percent (±1.3%) below the July figure of 584,000. Authorizations of units in buildings with five units or more were at a rate of 271,000 in August.

HOUSING STARTS

Privately-owned housing starts in August were at a seasonally adjusted annual rate of 895,000. This is 6.2 percent (±9.2%)* below the revised July estimate of 954,000 and is 33.1 percent (±6.7%) below the revised August 2007 rate of 1,337,000.

Single-family housing starts in August were at a rate of 630,000; this is 1.9 percent (±8.9%)* below the July figure of 642,000. The August rate for units in buildings with five units or more was 251,000.

HOUSING COMPLETIONS

Privately-owned housing completions in August were at a seasonally adjusted annual rate of 961,000. This is 9.8 percent (±11.5%)* below the revised July estimate of 1,065,000 and is 35.8 percent (±7.7%) below the revised August 2007 rate of 1,498,000.

Single-family housing completions in August were at a rate of 676,000; this is 17.0 percent (±10.6%) below the July figure of 814,000. The August rate for units in buildings with five units or more was 269,000.

New Residential Construction data for September 2008 will be released on Friday, October 17, 2008, at 8:30 A.M. EDT.
Our Internet site is: http://www.census.gov/newresconst

EXPLANATORY NOTES

In interpreting changes in the statistics in this release, note that month-to-month changes in seasonally adjusted statistics often show movements which may be irregular. It may take 3 months to establish an underlying trend for building permit authorizations, 4 months for total starts, and 5 months for total completions. The statistics in this release are estimated from sample surveys and are subject to sampling variability as well as nonsampling error including bias and variance from response, nonreporting, and undercoverage. Estimated relative standard errors of the most recent data are shown in the tables. Whenever a statement such as "2.5 percent (±3.2%) above" appears in the text, this indicates the range (-0.7 to +5.7 percent) in which the actual percent change is likely to have occurred. All ranges given for percent changes are 90-percent confidence intervals and account only for sampling variability. If a range does not contain zero, the change is statistically significant. If it does contain zero, the change is not statistically significant; that is, it is uncertain whether there was an increase or decrease. The same policies apply to the confidence intervals for percent changes shown in the tables. On average, the preliminary seasonally adjusted estimates of total building permits, housing starts and housing completions are revised about one percent. Explanations of confidence intervals and sampling variability can be found on our web site listed above.

* 90% confidence interval includes zero. The Census Bureau does not have sufficient statistical evidence to conclude that the actual change is different from zero.

Table 1. New Privately-Owned Housing Units Authorized in Permit-Issuing Places

[Thousands of units. Detail may not add to total because of rounding]

Period	United States				Northeast		Midwest		South		West	
		In structures with --										
	Total	1 unit	2 to 4 units	5 units or more	Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
	Seasonally adjusted annual rate											
2007: August	1,343	928	55	360	147	86	197	150	640	476	359	216
September	1,277	870	50	357	138	79	205	145	636	457	298	189
October	1,182	811	48	323	145	76	185	133	554	415	298	187
November	1,187	767	53	367	126	70	192	131	594	406	275	160
December	1,111	714	56	341	134	71	166	116	560	378	251	149
2008: January	1,052	675	43	334	126	68	180	112	539	365	207	130
February	981	646	40	295	105	66	130	97	504	350	242	133
March	932	621	37	274	111	60	126	93	502	340	193	128
April	982	649	38	295	108	60	157	110	499	344	218	135
May	978	635	34	309	137	58	147	109	460	330	234	138
June	1,138	616	33	489	295	53	148	103	459	321	236	139
July[r]	937	584	33	320	105	56	147	99	487	306	198	123
August[p]	**854**	**554**	**29**	**271**	**83**	**60**	**148**	**92**	**439**	**284**	**184**	**118**
Average RSE (%)[1]	1	1	5	1	2	2	3	4	1	1	1	2
Percent Change:												
August 2008 from July 2008	***-8.9%***	***-5.1%***	***-12.1%***	***-15.3%***	***-21.0%***	***7.1%***	***0.7%***	***-7.1%***	***-9.9%***	***-7.2%***	***-7.1%***	***-4.1%***
90% Confidence Interval[3]	*± 1.5*	*± 1.3*	*± 2.2*	*± 4.6*	*± 7.2*	*± 8.4*	*± 6.9*	*± 8.9*	*± 1.3*	*± 1.6*	*± 2.1*	*± 2.6*
August 2008 from August 2007	***-36.4%***	***-40.3%***	***-47.3%***	***-24.7%***	***-43.5%***	***-30.2%***	***-24.9%***	***-38.7%***	***-31.4%***	***-40.3%***	***-48.7%***	***-45.4%***
90% Confidence Interval[3]	*± 1.5*	*± 1.1*	*± 3.4*	*± 3.6*	*± 6.7*	*± 7.8*	*± 6.6*	*± 8.5*	*± 1.0*	*± 1.2*	*± 1.9*	*± 2.4*
	Not seasonally adjusted											
2006	1,838.9	1,378.2	76.6	384.1	174.6	103.4	279.4	209.3	929.7	726.2	455.2	339.3
2007	1,398.4	979.9	59.6	359.0	150.6	83.7	211.7	153.8	692.2	507.5	343.9	234.9
RSE (%)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)	(X)
2007: Year to Date[2]	1,017.7	739.8	42.4	235.5	106.7	61.0	153.0	115.4	504.3	379.5	253.6	184.0
2008: Year to Date[2]	678.2	434.8	23.8	219.5	92.9	40.6	99.9	69.9	338.1	231.5	147.3	92.8
RSE (%)	1	1	2	(Z)	2	3	2	2	1	1	1	1
Year to Date Percent Change[4]	***-33.4%***	***-41.2%***	***-43.9%***	***-6.8%***	***-13.0%***	***-33.4%***	***-34.7%***	***-39.5%***	***-33.0%***	***-39.0%***	***-41.9%***	***-49.6%***
90% Confidence Interval[3]	*± 0.8*	*± 1.0*	*± 2.3*	*± 1.1*	*± 3.4*	*± 5.1*	*± 2.5*	*± 3.0*	*± 0.6*	*± 0.7*	*± 1.2*	*± 1.5*
2007: August	126.0	87.5	5.2	33.3	14.3	8.4	19.0	14.7	59.1	44.3	33.5	20.1
September	100.5	66.6	3.9	30.0	11.2	6.4	17.7	12.2	47.8	33.7	23.8	14.3
October	103.8	70.7	4.3	28.8	13.7	7.2	18.0	13.2	45.9	34.5	26.2	15.9
November	89.5	54.7	4.3	30.5	10.1	5.2	14.9	9.9	44.3	28.8	20.2	10.8
December	77.8	45.2	4.0	28.7	9.8	4.6	10.0	6.2	40.4	24.9	17.6	9.6
2008: January	75.9	47.5	2.8	25.6	8.0	4.2	10.1	5.9	43.0	28.2	14.8	9.2
February	73.4	47.5	2.8	23.0	6.4	3.8	7.9	5.3	40.3	28.5	18.8	9.9
March	77.4	53.6	3.0	20.8	8.4	4.7	9.9	7.5	43.2	30.2	15.9	11.2
April	89.5	62.7	3.4	23.4	9.7	5.7	15.7	11.5	44.4	32.4	19.8	13.1
May	90.3	61.1	2.9	26.2	12.6	5.6	14.2	11.4	41.6	30.7	21.9	13.5
June	108.1	58.7	2.9	46.5	29.7	5.2	14.4	10.2	41.6	29.4	22.5	13.8
July[r]	83.5	55.0	3.0	25.5	9.8	5.6	14.3	10.1	42.2	27.7	17.2	11.6
August[p]	**73.5**	**47.4**	**2.4**	**23.7**	**7.3**	**5.4**	**13.5**	**8.2**	**37.4**	**24.0**	**15.3**	**9.8**
Average RSE (%)[1]	1	1	5	1	2	2	3	4	1	1	1	2

[p]Preliminary. [r]Revised. RSE Relative standard error. S Does not meet publication standards because tests for identifiable and stable seasonality do not meet reliability standards.
X Not applicable. Z Relative standard error is less than 0.5 percent.
[1]Average RSE for the latest 6-month period. [2]Reflects revisions not distributed to months.
[3] See the Explanatory Notes in the accompanying text for an explanation of 90% confidence intervals. [4] Computed using unrounded data.

Table 2. New Privately-Owned Housing Units Authorized, but Not Started, at End of Period

[Not seasonally adjusted. Thousands of units. Detail may not add to total because of rounding]

Period	United States				Northeast		Midwest		South		West	
		In structures with --										
	Total	1 unit	2 to 4 units	5 units or more	Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
2007: August	195.7	119.4	7.3	69.0	25.7	12.4	19.5	11.2	101.0	63.7	49.5	32.2
September	190.1	113.1	6.7	70.3	22.5	12.3	20.9	11.8	97.9	59.3	48.9	29.7
October	177.7	107.2	5.8	64.7	20.7	10.9	19.4	8.9	88.1	57.3	49.5	30.0
November	175.2	107.0	5.0	63.2	19.6	10.6	18.2	9.3	87.7	57.7	49.7	29.5
December	178.3	103.2	5.9	69.3	20.8	10.3	19.6	9.4	87.4	53.9	50.5	29.6
2008: January	182.0	105.3	6.0	70.7	20.7	9.7	21.1	10.3	91.3	55.0	48.9	30.3
February	176.7	104.9	6.4	65.3	19.6	9.8	20.1	10.4	87.9	55.6	49.1	29.1
March	168.1	99.8	5.6	62.6	16.1	9.7	19.7	9.8	86.6	52.7	45.7	27.7
April	164.8	100.5	5.0	59.3	17.1	9.5	20.4	11.7	85.2	53.6	42.1	25.6
May	163.7	98.4	5.5	59.9	17.6	8.9	21.3	11.6	81.5	51.6	43.3	26.2
June[r]	166.2	94.3	5.5	66.4	24.1	8.7	20.9	11.1	75.7	47.3	45.5	27.2
July[r]	159.2	91.7	5.5	62.0	18.7	8.3	19.0	10.3	77.7	47.4	43.9	25.6
August[p]	**152.6**	**84.6**	**5.3**	**62.7**	**13.7**	**7.8**	**19.0**	**8.2**	**80.0**	**46.7**	**39.8**	**22.0**
Average RSE (%)[1]	5	7	14	7	11	18	8	11	8	9	11	15
Percent Change: [2]												
August 2008 from July 2008	***-4.1%***	***-7.8%***	***-3.7%***	***1.2%***	***-26.4%***	***-7.1%***	***0.4%***	***-20.8%***	***3.0%***	***-1.6%***	***-9.3%***	***-14.1%***
90% Confidence Interval [3]	*± 3.2*	*± 3.4*	*± 9.6*	*± 6.4*	*± 10.7*	*± 15.4*	*± 9.1*	*± 13.3*	*± 5.2*	*± 3.8*	*± 4.4*	*± 5.2*
August 2008 from August 2007	***-22.1%***	***-29.2%***	***-27.5%***	***-9.1%***	***-46.5%***	***-37.3%***	***-2.5%***	***-27.1%***	***-20.8%***	***-26.7%***	***-19.6%***	***-31.7%***
90% Confidence Interval [3]	*± 6.1*	*± 6.0*	*± 27.7*	*± 12.5*	*± 11.0*	*± 16.3*	*± 20.1*	*± 13.6*	*± 10.7*	*± 9.8*	*± 8.3*	*± 7.4*

[p]Preliminary. [r]Revised. RSE Relative Standard Error.

[1]Average RSE for the latest 6-month period. [2] Computed using unrounded data.

[3] See the Explanatory Notes in the accompanying text for an explanation of 90% confidence intervals.

Note: These data represent the number of housing units authorized in all months up to and including the last day of the reporting period and not started as of that date without regard to the months of original permit issuance. Cancelled, abandoned, expired, and revoked permits are excluded.

Table 3. New Privately-Owned Housing Units Started

[Thousands of units. Detail may not add to total because of rounding]

Period	United States				Northeast		Midwest		South		West	
		In structures with --										
	Total	1 unit	2 to 4 units	5 units or more	Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
	Seasonally adjusted annual rate											
2007: August	1,337	968	(S)	332	98	75	240	171	696	507	303	215
September	1,185	936	(S)	220	143	77	170	150	597	492	275	217
October	1,275	884	(S)	351	161	96	204	170	629	433	281	185
November	1,179	816	(S)	342	128	82	209	139	587	422	255	173
December	1,000	779	(S)	211	101	74	137	120	549	435	213	150
2008: January	1,064	750	(S)	287	137	103	156	119	531	403	240	125
February	1,107	722	(S)	356	129	67	154	110	577	376	247	169
March	988	711	(S)	261	115	67	135	108	515	380	223	156
April	1,004	681	(S)	308	93	59	164	104	504	353	243	165
May	982	682	(S)	280	123	66	139	113	500	365	220	138
June[r]	1,089	663	(S)	404	251	63	139	113	490	348	209	139
July[r]	954	642	(S)	301	179	70	154	109	435	319	186	144
August[p]	**895**	**630**	**(S)**	**251**	**153**	**64**	**133**	**115**	**403**	**302**	**206**	**149**
Average RSE (%)[1]	4	4	(X)	11	12	14	8	9	6	6	9	8
Percent Change:												
August 2008 from July 2008	***-6.2%***	***-1.9%***	***(S)***	***-16.6%***	***-14.5%***	***-8.6%***	***-13.6%***	***5.5%***	***-7.4%***	***-5.3%***	***10.8%***	***3.5%***
90% Confidence Interval[2]	*± 9.2*	*± 8.9*	*(X)*	*± 19.3*	*± 22.7*	*± 37.3*	*± 17.2*	*± 20.4*	*± 16.6*	*± 13.6*	*± 20.6*	*± 15.5*
August 2008 from August 2007	***-33.1%***	***-34.9%***	***(S)***	***-24.4%***	***56.1%***	***-14.7%***	***-44.6%***	***-32.7%***	***-42.1%***	***-40.4%***	***-32.0%***	***-30.7%***
90% Confidence Interval[2]	*± 6.7*	*± 4.9*	*(X)*	*± 22.0*	*± 42.6*	*± 32.2*	*± 7.5*	*± 8.7*	*± 9.0*	*± 5.5*	*± 12.3*	*± 9.5*
	Not seasonally adjusted											
2006	1,800.9	1,465.4	42.7	292.8	167.2	118.0	279.5	235.3	910.3	756.5	443.8	355.6
2007	1,355.0	1,046.0	31.7	277.3	142.9	93.0	210.1	171.1	681.1	539.5	320.9	242.4
RSE (%)	1	1	9	3	3	5	2	2	2	2	2	2
2007: Year to Date	980.8	779.1	22.7	179.0	97.4	65.8	149.7	122.9	494.2	403.5	239.4	187.0
2008: Year to Date	681.2	470.1	12.3	198.9	97.8	45.6	97.5	74.7	335.7	246.7	150.2	103.0
RSE (%)	1	2	10	4	3	4	3	3	2	3	2	3
Year to Date Percent Change[3]	***-30.5%***	***-39.7%***	***-45.8%***	***11.1%***	***0.4%***	***-30.6%***	***-34.9%***	***-39.2%***	***-32.1%***	***-38.9%***	***-37.3%***	***-44.9%***
90% Confidence Interval[2]	*± 1.7*	*± 1.7*	*± 10.6*	*± 9.4*	*± 8.6*	*± 7.9*	*± 4.2*	*± 2.3*	*± 2.2*	*± 2.1*	*± 3.0*	*± 3.8*
2007: August	121.2	86.6	3.5	31.1	9.5	7.4	22.9	16.4	61.5	43.8	27.3	19.0
September	101.5	78.6	2.6	20.3	12.7	6.6	15.6	13.8	50.2	40.6	23.0	17.7
October	115.0	77.4	3.8	33.8	15.0	8.8	20.0	16.8	55.2	36.3	24.7	15.5
November	88.8	58.6	1.8	28.4	10.4	6.5	16.7	10.9	42.5	28.8	19.2	12.4
December	68.9	52.3	0.8	15.9	7.4	5.4	8.0	6.7	38.9	30.3	14.6	9.9
2008: January	70.8	48.5	1.9	20.4	8.2	5.8	8.2	5.5	38.0	28.9	16.5	8.3
February	78.4	51.9	2.0	24.5	7.6	3.3	8.7	5.7	44.2	30.4	17.9	12.5
March	82.2	61.5	1.2	19.5	8.6	5.0	9.7	7.7	45.2	35.1	18.6	13.6
April	89.5	62.6	1.3	25.7	8.2	5.3	15.0	10.0	45.3	32.6	21.1	14.6
May	91.7	66.1	1.7	23.9	11.7	6.8	14.2	12.0	44.9	33.4	20.8	13.8
June[r]	102.5	65.2	1.9	35.3	23.0	6.6	14.1	11.8	45.8	33.4	19.5	13.4
July[r]	86.8	59.3	1.0	26.5	16.1	6.5	15.2	11.2	37.9	27.7	17.6	13.9
August[p]	**79.3**	**55.0**	**1.3**	**23.1**	**14.4**	**6.2**	**12.3**	**10.7**	**34.4**	**25.1**	**18.2**	**12.9**
Average RSE (%)[1]	4	4	26	11	12	14	8	9	6	6	9	8

[p]Preliminary. [r]Revised. RSE Relative standard error. S Does not meet publication standards because tests for identifiable and stable seasonality do not meet reliability standards.
X Not applicable.
[1]Average RSE for the latest 6-month period. [2] See the Explanatory Notes in the accompanying text for an explanation of 90% confidence intervals.
[3] Computed using unrounded data.

Table 4. New Privately-Owned Housing Units Under Construction at End of Period

[Thousands of units. Detail may not add to total because of rounding]

Period	United States				Northeast		Midwest		South		West	
		In structures with --										
	Total	1 unit	2 to 4 units	5 units or more	Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
	Seasonally adjusted											
2007: August	1,125	683	(S)	411	163	77	178	121	475	300	309	185
September	1,110	667	(S)	412	165	74	170	117	471	295	304	181
October	1,096	647	(S)	417	161	71	169	117	465	283	301	176
November	1,077	623	(S)	424	161	70	170	114	455	273	291	166
December	1,055	608	(S)	417	157	68	166	111	448	269	284	160
2008: January	1,034	590	(S)	416	157	69	165	109	435	260	277	152
February	1,024	580	(S)	416	159	70	162	105	428	253	275	152
March	1,013	563	(S)	423	161	68	158	102	423	246	271	147
April	1,006	550	(S)	429	158	64	157	99	420	240	271	147
May	989	530	(S)	434	156	62	152	95	415	233	266	140
June[r]	977	511	(S)	442	169	62	145	89	403	226	260	134
July[r]	956	492	(S)	441	170	60	145	88	391	217	250	127
August[p]	**947**	**485**	**(S)**	**440**	**175**	**60**	**141**	**86**	**380**	**212**	**251**	**127**
Average RSE (%)[1]	2	3	(X)	3	4	9	6	7	3	4	5	7
Percent Change:												
August 2008 from July 2008	***-0.9%***	***-1.4%***	***(S)***	***-0.2%***	***2.9%***	***0.0%***	***-2.8%***	***-2.3%***	***-2.8%***	***-2.3%***	***0.4%***	***0.0%***
90% Confidence Interval[2]	*± 0.9*	*± 1.0*	*(X)*	*± 1.5*	*± 1.4*	*± 2.2*	*± 1.7*	*± 2.2*	*± 1.9*	*± 1.6*	*± 1.6*	*± 2.1*
August 2008 from August 2007	***-15.8%***	***-29.0%***	***(S)***	***7.1%***	***7.4%***	***-22.1%***	***-20.8%***	***-28.9%***	***-20.0%***	***-29.3%***	***-18.8%***	***-31.4%***
90% Confidence Interval[2]	*± 2.2*	*± 2.4*	*(X)*	*± 4.8*	*± 6.3*	*± 6.8*	*± 6.1*	*± 6.2*	*± 3.2*	*± 2.8*	*± 3.8*	*± 5.6*
	Not seasonally adjusted											
2007: August	1,158.5	717.9	31.1	409.5	166.7	80.9	185.9	129.3	487.1	312.7	318.8	195.1
September	1,137.9	695.4	30.8	411.7	168.4	77.6	177.4	124.4	481.0	305.6	311.1	187.8
October	1,119.9	668.1	31.9	419.9	164.4	73.5	177.5	124.8	472.1	289.2	306.0	180.7
November	1,085.2	626.8	30.7	427.7	163.4	71.1	174.0	117.4	455.3	271.8	292.5	166.4
December	1,025.0	579.1	29.6	416.3	155.9	67.0	162.5	107.2	431.6	253.3	274.9	151.6
2008: January	1,002.4	559.2	28.4	414.8	155.0	67.0	158.3	102.1	421.0	246.4	268.1	143.8
February	989.6	548.1	27.6	414.0	153.4	64.9	152.5	96.1	416.3	242.0	267.4	145.0
March	988.6	540.5	27.1	421.0	156.2	64.0	150.1	94.6	416.6	240.4	265.6	141.5
April	999.9	542.5	26.6	430.8	156.4	62.4	152.9	94.9	421.3	240.8	269.4	144.5
May	995.4	535.9	25.2	434.4	155.7	61.7	151.2	94.3	419.8	237.2	268.8	142.7
June[r]	992.6	525.2	24.4	443.0	171.1	63.4	147.3	91.5	410.0	232.7	264.3	137.6
July[r]	982.4	514.5	23.0	444.8	173.7	62.6	150.1	92.7	400.7	225.5	257.9	133.7
August[p]	**966.2**	**507.4**	**22.3**	**436.5**	**176.5**	**62.5**	**145.8**	**91.4**	**387.9**	**220.8**	**256.0**	**132.6**
Average RSE (%)[1]	2	3	10	3	4	9	6	7	3	4	5	7

[p]Preliminary. [r]Revised. RSE Relative standard error. S Does not meet publication standards because tests for identifiable and stable seasonality do not meet reliability standards.
X Not applicable.
[1]Average RSE for the latest 6-month period. [2] See the Explanatory Notes in the accompanying text for an explanation of 90% confidence intervals.

Table 5. New Privately-Owned Housing Units Completed

[Thousands of units. Detail may not add to total because of rounding]

Period	United States				Northeast		Midwest		South		West	
		In structures with --										
	Total	1 unit	2 to 4 units	5 units or more	Total	1 unit	Total	1 unit	Total	1 unit	Total	1 unit
	Seasonally adjusted annual rate											
2007: August	1,498	1,224	(S)	251	149	116	178	156	773	630	398	322
September	1,378	1,101	(S)	246	139	96	245	192	651	539	343	274
October	1,401	1,133	(S)	240	184	135	209	170	696	583	312	245
November	1,404	1,140	(S)	234	124	93	216	193	686	545	378	309
December	1,329	1,026	(S)	287	143	94	194	175	645	498	347	259
2008: January	1,331	998	(S)	291	125	80	191	169	680	512	335	237
February	1,251	906	(S)	315	101	67	228	178	682	485	240	176
March	1,192	909	(S)	269	104	83	183	150	613	460	292	216
April	1,033	808	(S)	192	117	90	146	124	523	416	247	178
May	1,144	877	(S)	249	135	88	182	150	574	452	253	187
June[r]	1,131	844	(S)	266	85	62	201	170	582	420	263	192
July[r]	1,065	814	(S)	229	130	86	138	118	523	399	274	211
August[p]	**961**	**676**	**(S)**	**269**	**83**	**59**	**168**	**128**	**496**	**331**	**214**	**158**
Average RSE (%)[1]	5	5	(X)	13	14	14	12	12	8	8	8	10
Percent Change:												
August 2008 from July 2008	***-9.8%***	***-17.0%***	***(S)***	***17.5%***	***-36.2%***	***-31.4%***	***21.7%***	***8.5%***	***-5.2%***	***-17.0%***	***-21.9%***	***-25.1%***
90% Confidence Interval [2]	*± 11.5*	*± 10.6*	*(X)*	*± 42.3*	*± 24.6*	*± 23.6*	*± 28.6*	*± 25.0*	*± 16.9*	*± 15.0*	*± 18.0*	*± 17.6*
August 2008 from August 2007	***-35.8%***	***-44.8%***	***(S)***	***7.2%***	***-44.3%***	***-49.1%***	***-5.6%***	***-17.9%***	***-35.8%***	***-47.5%***	***-46.2%***	***-50.9%***
90% Confidence Interval [2]	*± 7.7*	*± 6.5*	*(X)*	*± 34.6*	*± 16.5*	*± 15.8*	*± 20.8*	*± 17.1*	*± 12.1*	*± 9.2*	*± 12.0*	*± 9.9*
	Not seasonally adjusted											
2006	1,979.4	1,654.5	40.8	284.2	179.1	128.3	325.1	285.5	986.7	825.8	488.6	414.9
2007	1,502.8	1,218.4	31.4	253.0	144.8	104.6	222.7	188.6	766.1	631.5	369.3	293.8
RSE (%)	1	1	9	4	6	8	2	2	2	2	3	2
2007: Year to Date	1,008.1	816.9	22.6	168.6	91.2	65.6	142.0	119.1	528.4	436.7	246.4	195.6
2008: Year to Date	725.7	537.9	15.7	172.1	69.5	47.7	111.6	90.8	374.8	275.8	169.7	123.5
RSE (%)	2	2	13	6	5	5	5	5	4	3	3	3
Year to Date Percent Change [3]	***-28.0%***	***-34.2%***	***-30.6%***	***2.1%***	***-23.8%***	***-27.2%***	***-21.4%***	***-23.7%***	***-29.1%***	***-36.8%***	***-31.1%***	***-36.8%***
90% Confidence Interval [2]	*± 2.8*	*± 2.2*	*± 16.5*	*± 12.6*	*± 11.3*	*± 10.5*	*± 6.6*	*± 6.1*	*± 4.4*	*± 3.3*	*± 4.8*	*± 3.9*
2007: August	136.9	107.9	2.5	26.5	14.1	10.7	16.6	14.2	70.0	54.9	36.2	28.1
September	123.2	99.8	2.6	20.7	12.2	8.6	22.9	18.4	57.2	47.7	30.9	25.1
October	126.0	103.4	2.4	20.3	16.6	12.5	19.4	16.1	62.1	52.5	28.0	22.3
November	118.7	98.9	2.3	17.5	10.9	8.6	19.9	18.2	56.6	46.0	31.3	26.1
December	126.8	99.4	1.5	25.8	13.8	9.4	18.4	16.8	61.8	48.5	32.7	24.8
2008: January	93.5	69.0	3.1	21.4	8.7	5.4	12.9	11.3	48.4	36.0	23.6	16.4
February	87.0	63.2	2.1	21.7	7.2	4.9	15.2	11.8	48.1	34.5	16.5	12.1
March	89.8	69.0	1.0	19.8	7.0	5.4	12.6	10.2	47.1	35.9	23.1	17.5
April	79.6	62.0	2.5	15.0	8.6	6.5	11.2	9.5	40.6	32.3	19.0	13.6
May	96.5	73.6	1.5	21.4	11.5	7.4	15.2	12.5	48.5	38.0	21.3	15.6
June[r]	99.7	73.6	1.9	24.2	7.6	5.5	17.3	14.5	51.4	36.6	23.4	16.9
July[r]	89.9	68.0	1.9	19.9	10.7	6.9	11.3	9.6	44.7	33.9	23.1	17.6
August[p]	**89.7**	**59.5**	**1.7**	**28.6**	**8.1**	**5.6**	**15.8**	**11.5**	**46.0**	**28.5**	**19.8**	**13.8**
Average RSE (%)[1]	5	5	30	13	14	14	12	12	8	8	8	10

[p]Preliminary. [r]Revised. RSE Relative standard error. S Does not meet publication standards because tests for identifiable and stable seasonality do not meet reliability standards.
X Not applicable.

[1]Average RSE for the latest 6-month period. [2] See the Explanatory Notes in the accompanying text for an explanation of 90% confidence intervals.

[3] Computed using unrounded data.

A METHODOLOGY FOR THE QUANTITATIVE TREATMENT OF VARIABILITY AND UNCERTAINTY IN PERFORMANCE-BASED ENGINEERING ANALYSIS AND/OR DECISION ANALYSIS WITH A CASE STUDY IN RESIDENTIAL FIRE SPRINKLERS

by

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A Methodology for the Quantitative Treatment of Variability and Uncertainty in Performance-Based Engineering Analysis and/or Decision Analysis with a Case Study in Residential Fire Sprinklers

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SUMMARY

Implementation of any form of a performance-based standard will require many decisions to be made. These decisions will be more difficult, more complex, and more uncertain than under a prescriptive-based code. This paper presents a methodology which quantitatively treats variability and uncertainty and applies it to a complex fire protection engineering problem. The methodology is both rigorous and user-friendly. It does not require quantification of all uncertainties in an analysis. A three-phase approach is utilized which identifies those variables with ranges great enough to reverse the final decision and encodes uncertainty on them. Information about the uncertainty of these critical variables is then employed in the analysis. Results are displayed graphically as either discrete or continuous joint probability distributions. The methodology also demonstrates ways of handling value judgments, such as the value of premature death avoided, by means of comparative analysis, parametric analyses, or switchover analysis. This methodology was applied to a model for determining the benefits and costs of residential fire sprinklers. Results from this study provide insights about the merits of residential fire sprinkler systems whish were not evident in previous studies.

1.0 MAKING GOOD FIRE PROTECTION DECISIONS

There have been several publications that conceptualize the implementation of a performance-based building and fire code system in the United States.[1,2] What is clear, although not explicitly stated, is that implementation of any form of a performance-based standard will require more decisions to be made. These decisions will be more difficult, more

[1] Concepts of a Performance-Based System for the United States, Report of the 1996 Activities of the SFPE task Group on Concepts of a Performance-Based System for the United States, Society of Fire Protection Engineers, 1997.

[2] Snell, Jack E., Status of Performance Fire Codes in the USA, VTT-Nordic Fire Safety Engineering Symposium, Finland, 1993.

complex, and more uncertain than under a prescriptive based code. Robert Clemen discusses in his book, *Making Hard Decisions*, four reasons why making decisions is so difficult.[3]

- *First, decisions can be hard simply because of their complexity.* In the case of decisions regarding fire protection features, one must consider the potential for property protection, life safety, injury mitigation, and business continuity. One must also consider the diverse impacts on people with special needs such as the very young, old, or persons with limited mobility.
- *Second, decisions can be hard because the decision-maker may be working toward multiple or competing objectives.* In fire protection analyses, typically competing objectives are low cost and a high level of safety. Progress in one direction such as installing automatic fire sprinklers for increased fire safety may impede progress towards a competing objective such as designing an economical building.
- *Third, a problem may be difficult if different perspectives lead to different conclusions.* In a fire protection decision, the perspective of the building owner, designer, and authority having jurisdiction may very well differ.
- *Finally, decisions can also be hard because of the inherent uncertainty.* Uncertainties may arise in the model physics, the values of the inputs, the reliability of the devices, and the frequency of events. Yet, a decision must be made without knowing for sure what these uncertain values will be. In fact, the most important decisions are often those that must be made under the greatest uncertainty, have the highest complexity, and involve multiple perspectives and goods.

The focus of this paper is on the quantitative treatment of variability and uncertainty. The tools and techniques presented here can help in identifying important sources of uncertainty and representing that uncertainty in a quantitative way. Section 2 discusses the types of uncertain quantities likely to be encountered in a fire analysis, a three-phase approach to conducting such an analysis, and other analysis tools commonly used in the treatment of uncertainty. Section 3 shows how these tools were used in a model of the decision to mandate residential fire sprinklers from a societal cost-benefit standpoint.

2.0 TOOLS AND METHODOLOGY

The first step in the treatment of uncertainty is the identification of the uncertain variables. Uncertainty can take many forms. We can be uncertain of the physical parameters such as the ignition source, the flame spread rate, the heat release rate of furnishings, or the effectiveness of a fire suppression system. We can also be uncertain about human behavioral response to a fire. We can be uncertain of the age or health of people who may be exposed to a fire. There is not one universal technique however that is appropriate for the treatment of all types of uncertainty. Thus, in order to determine the best way to treat the uncertainty, the type of quantity about which the uncertainty exists must be identified. Next, it must be determined if it is crucial to treat the uncertainty quantitatively. Finally, the appropriate methodology or tool must be selected for the job.

[3] Clemen, Robert, Making Hard Decisions: An Introduction to Decision Analysis, Duxbury Press, Belmont, CA, 1990.

2.1 Types of Quantities

There are many types of quantities used in the calculation of a performance-based engineering analysis. These can be classified into three categories: 1) those used as model inputs; 2) those that determine the model structure (i.e., the scope and level of detail of the model); and 3) the selection variables which are used to rank order or choose among possible outcomes. Table 1 shows several types of quantities within each of these categories. Uncertainty exists in many of these quantities and one often finds that this uncertainty is represented in probabilistic terms. Morgan and Henrion argue that *"the only type of quantity whose uncertainty may be appropriately represented in probabilistic terms are empirical quantities"*.[4] It is therefore important to distinguish empirical quantities from other types of quantities. Table 2 provides examples of each type of quantity and associated methods appropriate for the treatment of uncertainty.

Model Inputs	Model Structure	Selection Variables
-defined constants	-index variables	-outcome criterion
-empirical quantities	-model domain parameters	-decision variables
		-value parameters

Table 1. Types of Quantities

Model Inputs

To be empirical, variables must be measurable and have a true value. An excellent reference for uncertainty about an empirical quantity is the "U.S. Guide to the Expression of Uncertainty in Measurement".[5] Empirical quantities in the domain of fire protection engineering include the heat release rate, the burning rate, and the radiative fraction of a given fuel. Defined constants, such as the gravitational constant, are certain by definition. They are discussed here simply to distinguish them from empirical quantities.

Model Structure

Model domain parameters specify the scope of the system being modeled. Model domain parameters are also used to define the level of detail of the model and/or the base line properties. *Model domain parameters are quantities that are often ignored during uncertainty analysis , despite having very considerable potential impact.*[6]

The impact of uncertainty in selecting the model domain parameters cannot be understated. In most fire models, quite different answer result depending on the control volume selected for modeling and the level of detail of the model. This has been shown for fires in high bay spaces. Differences in the outcome criteria such as maximum temperature, and time to activation of fire detectors and sprinklers are found when the large space is modeled with a simple zone fire model vs. a more detailed computational fluid dynamics model.[7] Differences

[4] Morgan, M. Granger and Henrion, M., A Guide to Dealing with Uncertainty In Quantitative Risk and Policy Analysis, Chapter 4: The Nature and Sources of Uncertainty, Cambridge University Press, 1990.

[5] American National Standard for Expressing Uncertainty - U.S. Guide to the Expression of Uncertainty in Measurement, ANSI/NCSL Z540-2-1997, National Conference of Standards Laboratories, Boulder, CO, 1997.

[6] Ibid, Morgan and Henrion, Chapter 4

[7] Notarianni, Kathy A., Comparison of Computer Fire Models to Fire Experiments in a High-Bay Aircraft Hangar, NISTIR 5304, December, 1993.

in the outcome criteria are also found when a large space, which is typically sub-divided by draft curtains,[8] is modeled. If a control volume is drawn around a single draft curtained area, (as opposed to drawing the control volume around multiple draft curtained areas or around the entire building) higher temperatures and faster activation times of installed fire protection devices will be predicted. Also significant to the uncertainty in the outcome parameters are the index variables of the model. Index Variables are used to identify a location in the domain of a model or to make calculations specific to a population, geographic region, etc. Index variables are certain quantities.

Selection Variables

Outcome criteria are defined as the variables used to rank or measure the desirability of possible outcomes. If any of the input quantities upon which an output quantity is dependent is probabilistic, then that outcome criterion is also probabilistic. In fire protection engineering, common outcome criteria are measures of cost and level of life safety provided.

Type of Quantity	*Examples*	*Treatment of Uncertainty*
Model Inputs		
Empirical parameter	Heat release rate, flame spread rate, radiative fraction	Probabilistic, parametric, or switchover
Defined constant	Gravitational constant, universal gas constant	Certain by definition
Model Structure		
Index variable	Time step, geographical	Certain by definition
Model domain parameter	Fire model selected, number of rooms modeled	Parametric or switchover
Selection Variables		
Outcome criterion	Maximum temperature, activation times of devices, net present value	Determined by treatment of its inputs
Decision variable	Level of acceptable fire safety, installation of fire protection devices	Parametric or switchover
Value parameter	Value of life, risk tolerance	Parametric or switchover

Table 2 . Summary of Methodologies for Treatment of Uncertainty Based on Type of Quantity: Adapted from Morgan and Henrion[9]

If a quantity is a decision variable, then by definition it has no "absolute true" value. It is up to the decision maker who exercises direct control to decide its value. Morgan and Henrion state that, "*The question of whether a specific quantity is a decision variable, an empirical quantity, or some other type of quantity depends on the context and intent of the model, and particularly who the decision maker is.*"[10] For example, in performance-based design, the

[8] A draft curtain is a barrier that extends a certain vertical distance down from the roof. Draft curtains are installed to sub-divide a large area with the intent of corralling the smoke.

[9] Ibid , Morgan and Henrion, Chapter 4

[10] Ibid, Morgan and Henrion, Chapter 4

minimum permissible escape time during a fire may be a decision variable for the regulatory body, but it may be an empirical quantity from the viewpoint of the fire protection engineer.

Value parameters represent preferences of individuals. One controversial value parameter is the "value of premature death avoided," often referred to as the "value of life." Another is risk tolerance or risk preference, a parameter used to specify a degree of risk aversion when comparing uncertain outcomes. Although we have seen value parameters treated as empirical quantities and uncertainties about value parameters treated as probabilistic, it is our view that this is rarely helpful and can lead to confusion and/or mask important insights. The effect on the outcome of an analysis caused by differences in value parameters should be demonstrated explicitly. This is done by repeating the analysis for a range of possible inputs of the value parameter(s) to determine if a change in the outcome occurs that someone would care about.

2.2 Stages of an Analysis: A Three-Phase Approach

In this section we propose a methodology for performing a complex engineering analysis which is made up of three phases: 1) deterministic, 2) probabilistic and 3) informational.[11] The approach incorporates techniques for quantifying and propagating uncertainty throughout the engineering analysis and for dealing with variability. It is assumed that the user has identified the nature and types of uncertainty. This approach is illustrated in Figure 1. and described below.

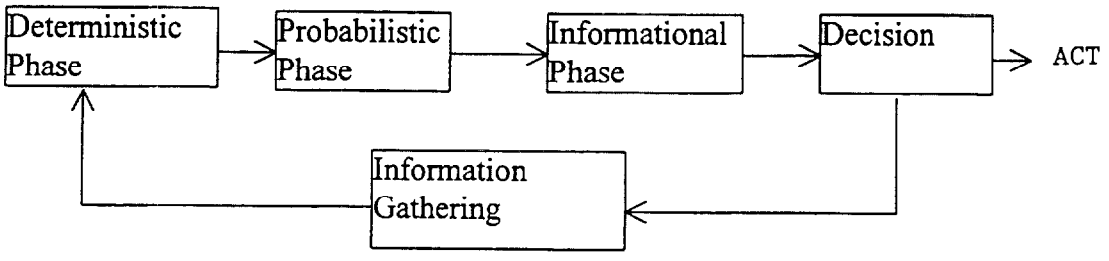

Figure 1. The Decision Analysis Cycle taken from Carl-Axel S. Stael von Holstein[12]

In the deterministic phase, the structure of the decision problem is initially captured in a model where uncertainties in variables are ignored. The inputs are classified into state and decision variables. State variables are defined as those beyond the control of the decision maker. The purpose of the analysis is to find the best setting for the decision variables while considering the best available information on the state variables. To identify the crucial variables (i.e., those with range great enough to change the final decision), a systematic sensitivity analysis is used. Based on the results of the sensitivity analysis, variables are either: 1) set at base (most likely) values, 2) eliminated/combined, or 3) earmarked for treatment of uncertainty in the next or probabilistic phase.

[11] Howard, R.A., Decision Analysis: Applied Decision Theory., In D.B. Hertz and J. Melese (Eds.) Proceedings of the Fourth International Conference on Operations Research., New York: Wiley, 1966.

[12] Stael Von Holstein, C. S, "A Tutorial in Decision Analysis", in Readings on The Principles and Applications of Decision Analysis, edited by Howard, R.A. and Matheson, J.E., Strategic Decisions Group, Stanford University, 1983.

The main purpose of the second phase, the probabilistic phase, is to bring uncertainty into the analysis explicitly. In the probabilistic phase, uncertainty is encoded on the crucial state variables. Also in this phase, risk preferences are dealt with by selection of the outcome criterion that makes explicit the effect of value judgments. The final step in this phase is to determine the best action based on the initial level of information (values and preferences of the decision maker) and then to conduct a probabilistic sensitivity analysis.

In the third or informational phase, the value of additional information is assessed. This can be the value of knowing a particular input better, performing another simulation, conducting more research, or advocating policy changes. The informational phase is concerned with two types of questions. Should more information be gathered before acting on the main decision? What is the worth (in monetary or other measures) of reducing uncertainty in each of the important variables in the problem?

The process outlined above is iterative. After the informational phase, either a decision is made to act or more information is gathered. If additional information is gathered, that information is feed back into the process.

2.3 Analysis Tools

Importance Analysis - An importance analysis determines which of the uncertain input variables contributes most to the uncertainty in the outcome variable. You can then concentrate on getting more precise estimates, or building a more detailed model, for the one or two most "important" inputs. Importance here is defined as the rank order correlation between the output value and each uncertain input. Each variable's importance is calculated on a relative scale from 0 to 1. An importance value of 0 indicates that the uncertain input variable has no effect on the uncertainty in the output. A value of 1 implies total correlation, where all of the uncertainty in the output is due to the uncertainty of a single input.

Sensitivity Analysis - Sensitivity analysis is useful in assessing the consequences of uncertainty in data and in assumptions. By testing the responsiveness of benefit-cost results to variations in values assigned to different parameters, sensitivity analysis allows the identification of those parameters that are most important to the outcome criteria. It does not tell the decision maker the value that should be used, but it shows the impact of using different values.

Parametric Analysis - In parametric analysis, detailed information is obtained about the effect of a particular input on the value of the outcome criterion. This is done by evaluating and plotting the outcome criterion for a sequence of different values for each input, holding the others constant.

Switchover Analysis - A parametric analysis where one or more inputs is varied to find the values (if any) of the inputs that would cause a change in the value of the outcome criteria strong enough to change the final decision.

Comparative Analysis - A technique to evaluate risk and costs to mitigate risk by means of comparison to other similar risks.

Bounding - Evaluating the extremes of the range of possible values of an uncertain quantity.

Expert Elicitation - Where hard data do not exist and are not possible to create, often an expert elicitation is conducted in order to obtain expert judgment of an uncertain quantity. An excellent discussion of the techniques for conducting an expert elicitation are provided in Morgan and Henrion.[13]

3.0 A CASE STUDY IN RESIDENTIAL FIRE SPRINKLERS

A model was built to determine the societal benefits and costs of mandating residential sprinklers. A full description of the mathematical model and the results is beyond the scope of this paper but can be found in, "A Municipal Model of the Cost of Mandating Residential Sprinklers."[14] This paper presents an overview of that study focusing on the techniques used in the treatment of variability and uncertainty and the implications for fire protection analyses.

3.1 Overview of Residential Fire Sprinkler Model

The main influence diagram of the model is shown in Figure 2 below. The model was built using the decision analysis software, Analytica.[15] Analytica allows for input of uncertain variables as probability distributions as well as ease of use of parametric analysis and other analysis tools described above. There are four separate modules that calculate costs and benefits from installation of a residential fire sprinkler system. These modules are shown in bold face type in Figure 2: 1) the mean total installation costs; 2) the reduction in expected value of direct and indirect losses; 3) the reduction in expected value of occupant and fire fighter injuries; and 4) the number of premature deaths averted. This first version of the model did not include benefits that might be realized from reductions in public fire fighting costs. The two outcome criteria are the net cost in dollars per premature death averted and dollars per life-year saved from a residential sprinkler mandate. The net cost is calculated as the difference between the total annual installation and maintaince costs (expressed as annual present value of the life-cycle costs) and the total annual expected benefits. These four variables are shown as hexagonal nodes in Figure 2.

For these calculations, it is assumed that a smoke detector is either present or is installed at the time of sprinkler installation. Benefits attributed to residential sprinklers are those that can be expected above and beyond the benefits of an installed residential smoke detector. Sprinkler systems evaluated here are NFPA 13D or NFPA 13R code compliant.[16] Most cost data is taken from FEMA demonstration projects.[17]

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[13] Morgan, M.G., and Henrion, M., A Guide to Dealing with Uncertainty In Quantitative Risk and Policy Analysis, Chapter 6,Human Judgment About and With Uncertainty, Cambridge University Press, 1990.

[14] Notarianni, Kathy A., "A Municipal Model of the Cost of Mandating Residential Sprinklers," working paper, Carnegie Mellon University, Pittsburgh, PA.

[15] Analytica Manual User Guide, Release 1.0, Lumina Decision Systems, Los Altos, CA, 1996.

[16] NFPA 13D, One and Two Family Dwellings and Manufactured Homes Standard for the Installation of Sprinkler Systems, National Fire Protection Association, Quincy, MA, 1996.

[17] FEMA, Residential Fire Sprinkler Retrofit Demonstration Project, Phase I: Multifamily Structures, U.S. Fire Administration, Emmitsburg, MD, June, 1989.

Region of Country	Community Size	House Type	House Age
Northeast	250,000 or more	One and Two Family Dwelling	New
North Central	100,000 to 250,00	Multi-Family	Retrofit
South	50,000 100,000	Mobile Home	
West	25,000 to 50,000		
	10,000 to 25,000		
	5,000 to 10,000		
	2,500 to 5,000		
	2,500 or less		

Table 3. Index Variables

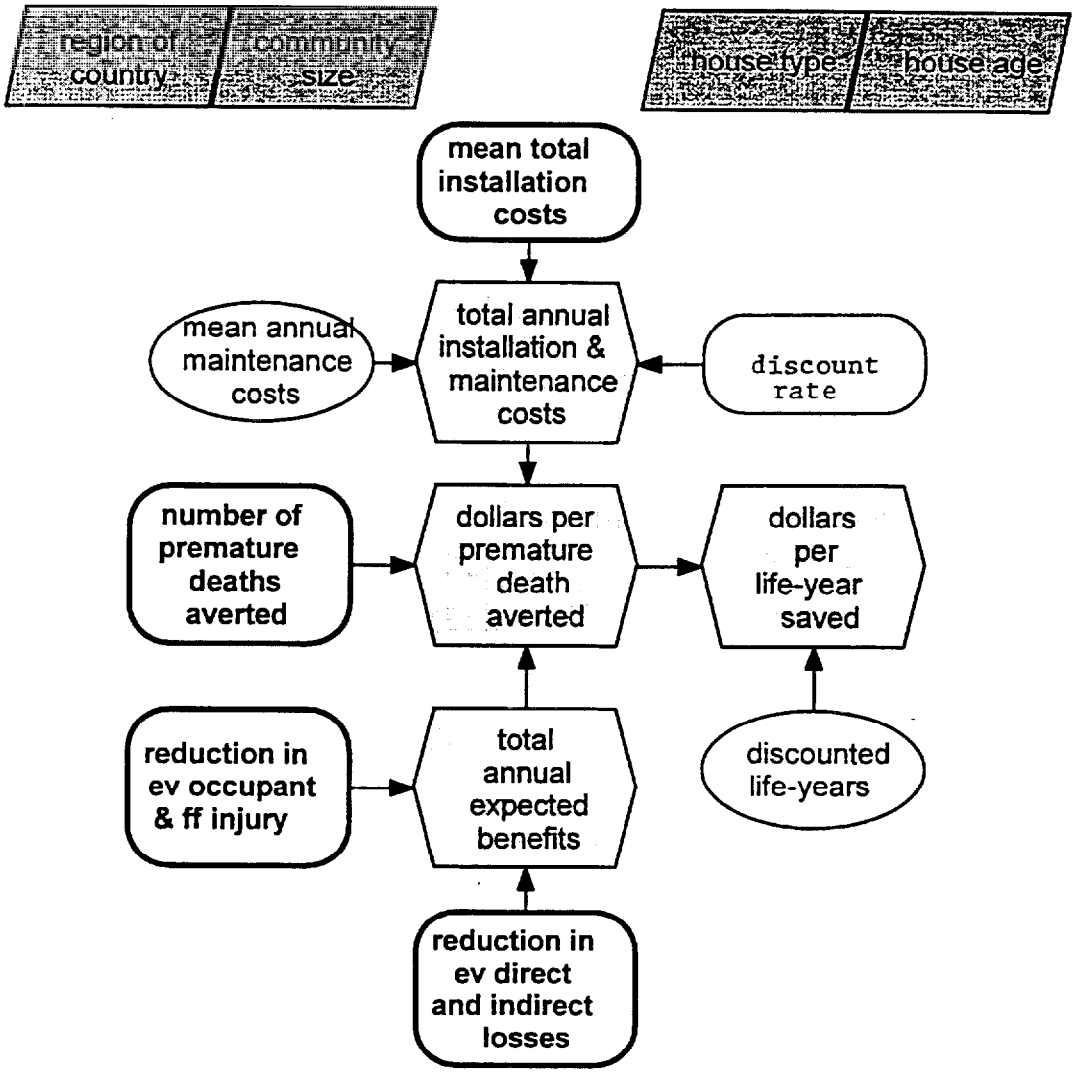

Figure 1. Main Influence Diagram - Residential Fire Sprinkler Model

For comparison to previous studies, calculations of benefits and costs are first presented using national average numbers. The model is then expanded to calculate the net cost per premature death averted for all possible combinations of the index variables. Index variables are shown in Table 3 below. Index variables include the region of the country, the community size, the house type and the house age. Four regions of the country, eight community sizes, three house types, and two house age categories were established. All major input variables to the model are not single value parameters but matrices of values. An example is provided in section 3.2. In all, there are 192 combinations of index variables, thus the model performs 192 separate calculations of the net costs.

3.2 Treatment of Variability and Uncertainty in the Fire Loss Statistics, Costs, and other Empirical Quantities

Inter-Year Variability in the Fire Loss Statistics

To conduct a cost-benefit study of residential fire sprinkler systems, many fire statistics (e.g., death rates, injury rates, and average direct dollar losses) are needed as inputs. National average values of these numbers are often used in these analyses. For example, the national average value for the residential death rate would be equal to the number of residential fire deaths nationally divided by the number of occupied residential units. The actual fire death rate will vary with a number of parameters. The U.S. National Fire Protection Association publishes death rates discretized by three of our four index variables: region of the country, community size, and house type.[18] There are four regions of the country, eight community sizes, and three house types. Thus, the death rate used in these calculations is a 4 x 8 x 3 matrix consisting of 96 values for death rate. Two examples would be the death rate in mobile homes in a community size of 2,500 or less in the South and the death rate in a one- or two-family dwelling in a community size of 25,000 to 50,000 in the West.

Yearly Variability in the Fire Loss Statistics

It is important to differentiate between variability and uncertainty. Variability in the fire statistics from year to year arises because of the randomness of occurrence of fire events. For instance, in one particular year, several large loss fires may occur followed by few or none the next year. In this study, since we are interested in benefits and costs over the life of a fire sprinkler system, mean yearly values were chosen. Yearly variance in the fire loss experience for deaths, injuries, property loss, and indirect losses is thus accounted for by taking mean yearly values over a five year period. Mean values were calculated from the 1989-1993 data.

Uncertainty in the Fire Statistics

Uncertainty in the fire loss statistics exists due to the impossibility of a full and accurate accounting of all fires and all fire losses. Mathematical techniques are thus used to provide estimates.[19] Uncertainty in the fire data is represented as uncertainty about the mean values. An expert elicitation of the chief statistician of NFPA[20] was conducted to set the uncertainty bands for the fire statistics.

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[18] Karter, Michael Jr., U.S. Fire Experience by Region, 1989-1993, National Fire Protection Association, Quincy, MA, 1995.

[19] Hall, John, Jr., and Harwood, Beatrice, The National Estimates Approach to U.S. Fire Statistics, Fire Technology, May, 1989.

[20] Hall, John, Jr., Personal Communication, Uncertainty Bands, 1996.

Uncertainty in other (Empirical) Model Inputs
Uncertainty in the cost data and parameters such as the sprinkler reduction factor were determined by bounding. For example, uncertainty in the sprinkler reduction factor arises because of the small number of fires occurring in homes with automatic sprinklers installed. Data from other occupancies were used to bound the uncertainty.

Propagation of Uncertainty – Once the uncertainties in the model inputs have been expressed, the question becomes, "How can we propagate these uncertainties through the model to discover the uncertainty in the predicted consequences?" In this analysis a Monte Carlo simulation was used. A value for each input is randomly selected from its actual probability distribution. From these values, a value for the outcome criteria is calculated. This process is repeated many times, resulting in a probability distribution for each outcome variable.

3.3 Value of a Life

For any cost-benefit analysis regarding health and safety, one of the most highly contentious points is setting a "value of life." Economists have come up with various ways of estimating the value of a life. These include willingness to pay for safety devices, and income-based estimates.[21] All of these methods remain highly debated. For this study, the problem of establishing a value of life was avoided by means of careful selection of the *outcome criteria.* By selecting the outcome criteria to be dollars per premature death averted and dollars per life-year saved, no explicit value of life needs to be inputted.

3.4 Results

National Average Calculation
Based on a national average calculation, our model predicts that residential fire sprinklers have a median net cost of $7.3M dollars per premature death averted. The probability bands at a discount rate of 8%[22] range from a 0.05 value of $4.2 million (there is a 5% chance that the net cost is $4.2 million dollars or less) to a 0.95 value of $10.7 million dollars (there is a 95% chance that the net cost is $10.7 million dollars or less).

Probability	$M
0.05	4.2
0.25	5.6
0.5	7.3
0.75	9.3
0.95	10.7

Table 4. Dollars per Premature Death Averted
National Average Calculation, 8% Discount Rate

[21] Viscusi, W.K., Chapter 4: A Survey of Values of Risk to Life and Health, "Fatal Tradeoffs: Public and Private Responses to Risk, pp. 51-54, Oxford, 1992.
[22] An discount rate of 8% is used as the baseline in this analysis. Discount rate was varied parametrically from 6%-10%. A sensitivity analysis was conducted to determine if a switch over in the decision would occur. None of the basic conclusions of the report change.

Indexed Calculations

When region, community size, house type, and house age are accounted for, the net cost of residential sprinklers varies tremendously. The 0.05 value for the net cost of installing residential sprinklers varies from a low of $1.4 million per premature death averted (for a new mobile home in a small community in the South) to a high of $35.1 million (for a retrofit of a one and two family dwelling in a medium size community in the west). Some general results and trends are presented below.

For all three home types, new construction was a lower net cost in dollars per premature death averted than retrofit for the same home type. This is due to the higher installation costs for sprinklers in existing homes. In order of net costs, one and two family dwellings were more costly than multi-family dwellings; multi-family homes were, in turn, more costly than mobile homes. These two points are demonstrated by the bar graph in Figure 3 for a small size community (population 5,000 - 10,000) in the South, and in Figure 4 for a larger community (population 50,000 - 100,000) in the West. For both communities the net cost for a new home is always lower than the net cost for an existing home.

A third point is that costs for residential sprinklers in the West are higher than in the other three regions across all community sizes. Costs in the Northeast and North Central follow a trend for all house types (these trends can be seen in Figure 5 for new mobile homes) where costs in the Northeast start off lowest of all regions for the three largest community sizes, population 50,000 and above. After this point, the South drops to the lowest costs and remains there throughout the smallest community size. At community sizes of 25K and smaller, the North Central drops below the Northeast and remains lower than Northeast and higher than South.

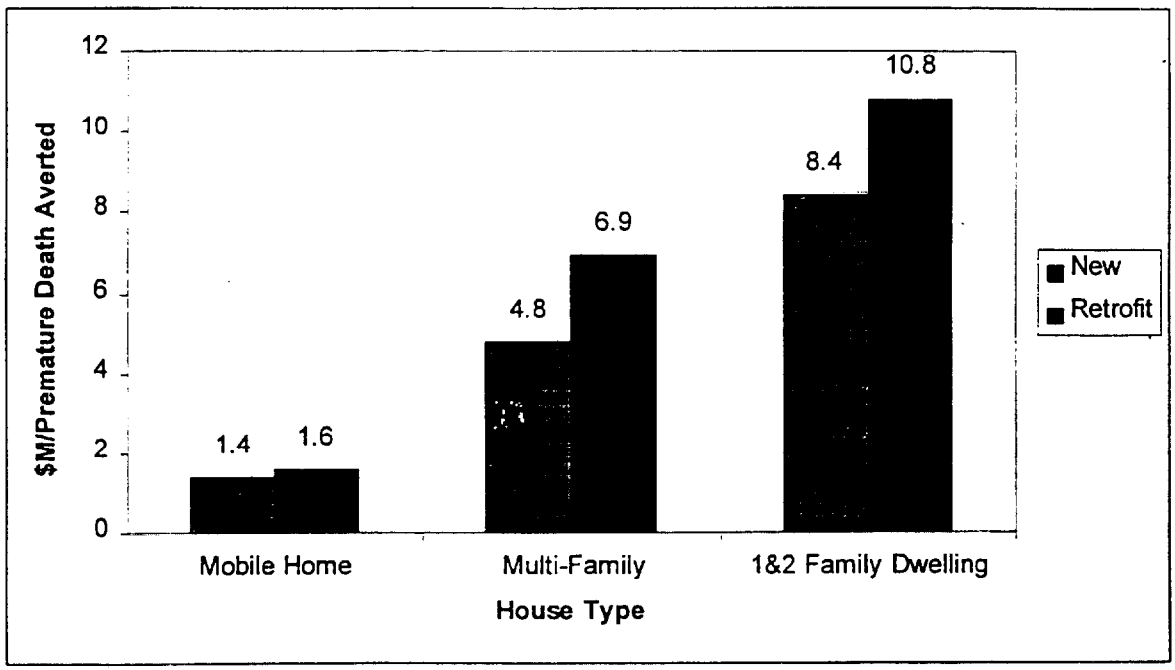

Figure 3. Net Cost of Residential Sprinklers in M$/Premature Death Averted: Comparison of House Type and House Age, Community Size of 5-10K, South Region

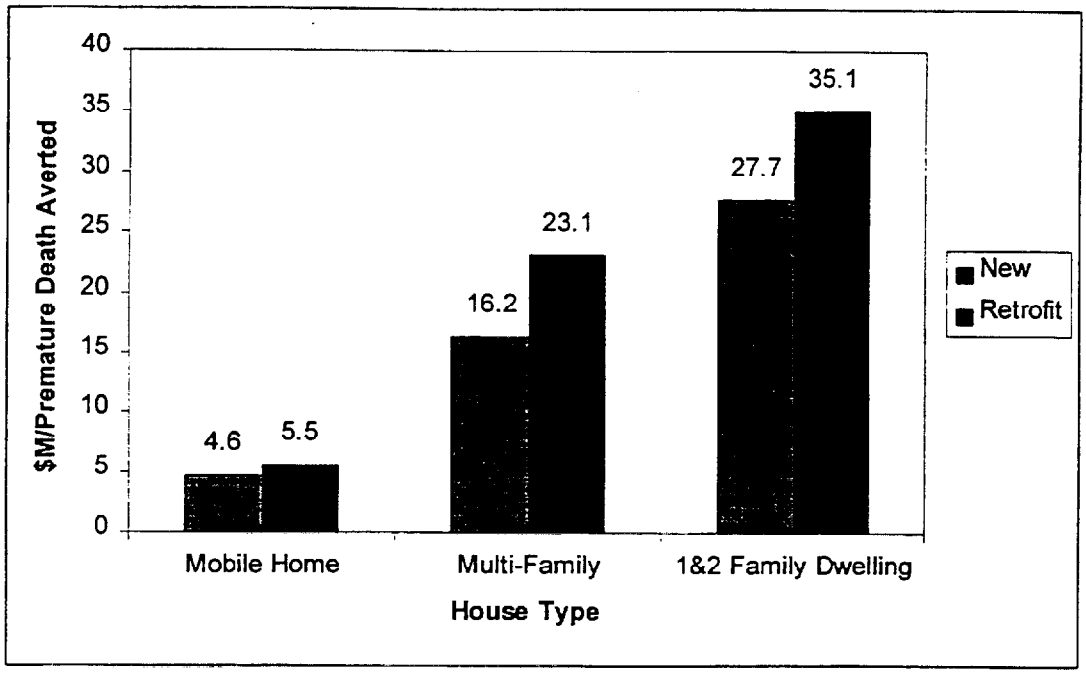

Figure 4. Net Cost of Residential Sprinklers in M$/Premature Death Averted: Comparison of House Type and House Age, Community Size of 50-100K, West Region

Mobile Homes

Since mobile homes are the least costly of the three home types, they are shown in more detail in Figure 5. The net cost of residential fire sprinklers for new mobile homes is presented in Figure 5 in terms of dollars per premature death averted. All regions and community sizes have a cost of three million dollars or less, except for the larger communities in the West. In order to place the cost of installing residential sprinklers in context, in the next section the net cost of installing residential sprinklers is compared to other residential interventions aimed at fatal injury reduction.

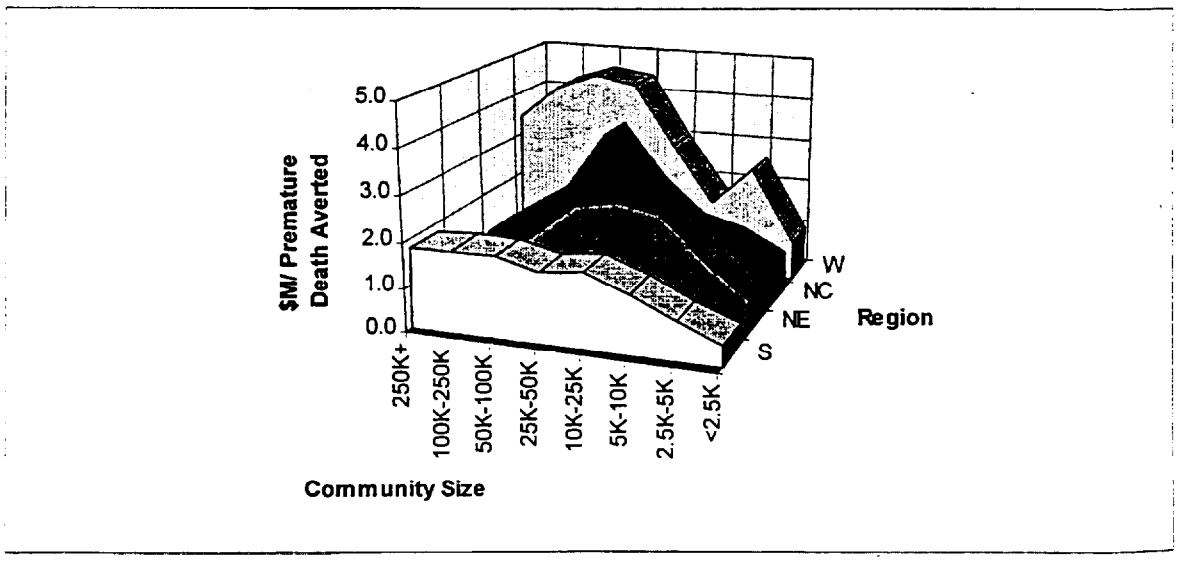

Figure5. Net Cost of Residential Sprinklers in New Mobile Homes: $M/Premature Death Averted

Comparison to other Life-Saving Interventions

An article in Risk Analysis[23] identified over 500 life-saving interventions, reporting their net cost in terms of dollars per life-year saved.[24] The accuracy of the results is limited by the accuracy of the data and assumptions in each original analysis, but the results are believable within an order of magnitude. The interventions reported on range from those saving more resources than they consume, to those costing more than 10 billion dollars per year of life saved.

In this study the cost per life-year saved for residential fire sprinklers was compared to the cost per life-year saved for chlorination of drinking water, banning urea-formaldehyde insulation in homes, installing oxygen depletion sensors for gas space heaters, conducting radon remeditation, mandating child-resistant cigarette lighters, and installing ground fault interrupters. Figure 6 below shows this comparison. The net cost of residential sprinklers shown is an average of the median values of the individual home type calculations. For each home type, thee are 4 regions of the country, 8 community sizes, and 2 house ages. Thus the values shown in Figure 6 are an average of 64 median values. Important findings were that residential fire sprinkler systems are cost-effective for some new mobile homes when compared with other residential fatal injury reduction interventions.

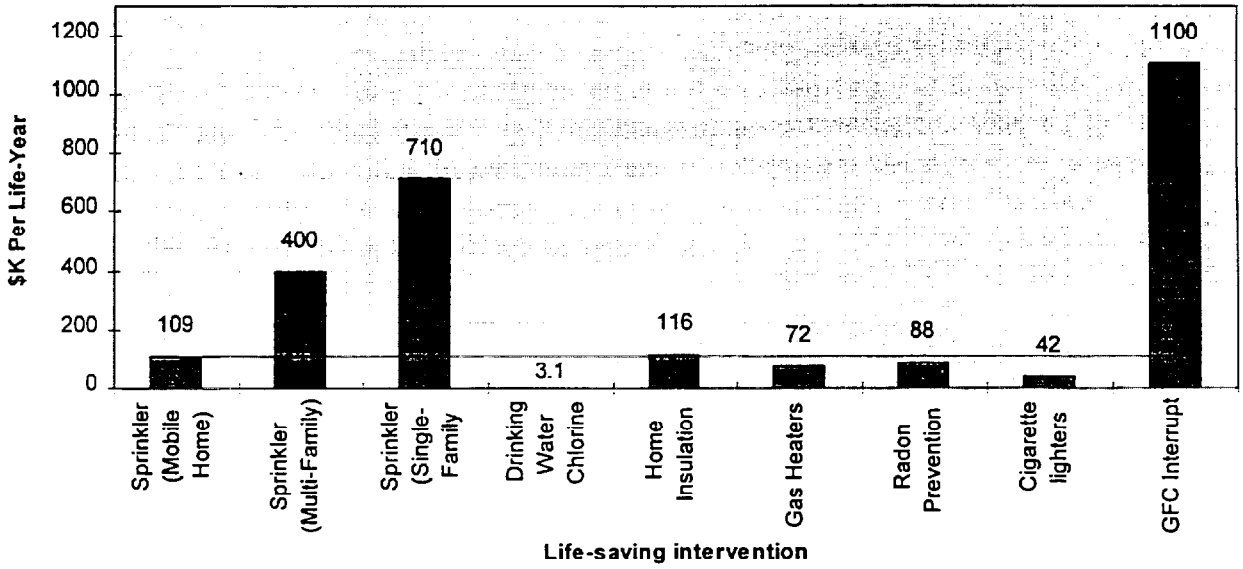

Figure 6. Comparison of Net Cost of Fire Sprinklers in Mobile Homes with Other Residential Life-Savings Interventions

[23] Tengs, Tammy O., et.al., "Five-Hundred Life-Saving Interventions and Their Cost-Effectiveness," Risk Analysis, Vol. 15, No. 3, 1995.

[24] The interventions were classified in four-ways: 1) Intervention Type (Fatal Injury Reduction, Medicine, or Toxin Control); 2) Sector of Society (Environmental, Health Care, Occupational, Residential, or Transportation); 3) Regulatory Agency (CPSC,EPA,FAA, NHTSA,OSHA, or None); and 4) Prevention Stage (Primary, Secondary, or Tertiary).

Another way to gain insight into the benefits and costs of residential fire sprinkler systems is to let total installation cost vary parametrically, to determine at what installation cost switchover in the decision of cost-effectiveness occurs. For example if one chose $3M dollars as an acceptable net cost, it could be determined parametrically what the installation cost needed to meet this is. At an installation cost reduction of 75% of the estimated value, the dollars per premature death averted for all mobile homes is less than $1M per premature death averted, in all regions and across all community sizes. The cost per premature death averted for multi-family occupancies ranges from less than $1M to a high of $3M dollars in the Northeast, South, and North Central regions across all community sizes.

3.5 Iteration: Value of Additional Information

How does uncertainty in the input parameters affect uncertainty in the output parameters? Two important tools for answering these questions are importance analysis and sensitivity analysis.

Importance Analysis

An importance analysis was run to determine the rank order correlation of each input. The rank order correlations for some of the inputs are shown in parentheses below. The importance analysis for the independent variables showed that inputs with rank order correlation on the order of 0.5 and above were the two variables that determined the up front costs of the sprinkler system, installation costs/sq.ft. (0.74), and sq. ft./house type (0.52). Inputs with rank order correlation on the order of 0.2 to 0.4 were: sprinkler reduction factor for death (0.33), annual maintenance costs (0.22), and occupant and fire fighter deaths unsprinklered (0.20). The remainder of the inputs had a rank order correlation of 0.07 or below. The importance analysis was next run at various discount rates to determine if the importance changed as a function of the discount rate. The same top five variables appeared, with the same order of magnitude.

Sensitivity Analysis

An example of one of the sensitivity analysis conducted on this model is that of the discount rate. This study used a baseline discount rate of 8% for evaluation. Varying the discount rate up or down to 6% or 10% did not change any of the conclusions of this report. Median values were used for comparisons.

4.0 CONCLUSIONS

Under a performance-based code system, many decisions have to me made. These decisions are both complicated and subject to uncertainties. The uncertainties encompass more than just measurement uncertainties on empirical variables. Historically, uncertainty has been ignored in this area. Recently, interest in quantification of each type of uncertainty has surfaced. The best approach is to consider all types of uncertainty but only treat uncertainties in the crucial variables, (i.e. uncertainties strong enough to change the final decision). This paper presents a methodology for handling these uncertainties and uses it to make better fire protection decisions. Significant findings presented in this paper include:

1. A performance-based building and fire code regulatory system requires decision making under uncertainty

2. Not all uncertainties in an engineering analysis need to be treated quantitatively
3. A 3-stage approach is presented to determine which variables are crucial to the outcome. Uncertainty is encoded on the crucial variables
4. The appropriate methodology for the treatment of uncertainty depends upon the type of quantity about which the uncertainty exists
5. Effectively treating variability and uncertainty can lead to greater insights
6. Tools such as sensitivity analysis and importance analysis can be used to determine the value of additional information
7. Using comparative analysis and not assigning a "value to life" provides the decision-maker with more information and allows for better decisions.

With the implementation of performance-based codes and standards, interest in the treatment of uncertainty will undoubtedly continue to grow. The building and fire protection communities need to do more work in this vital area.

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January 2, 2014

Judge Eric L. Lipman
Office of Administrative Hearings
600 North Robert St.
P.O. Box 6420
St. Paul, MN 55164-0620

RE: Revisor's ID Number R-04144 Minnesota Department of Labor & Industry — Proposed Amendment to Rules Govering the Adoption of International Residential Code, Minnesota Rules, chapter 1309

Dear Judge Lipman,

On behalf of the National Association of Home Builders and the Building Association of Minnesota, I would like to thank you again for the opportunity to express our concerns regarding the proposed amendments to include sprinklers in the adoption of the 2012 International Residential Code. As I stated in my testimony on December 12th, NAHB encourages the adoption of these model codes and supports the idea that jurisdictions should retain the right to alter and amend these model codes. In regards to the inclusion of residential sprinklers in all homes greater than 4,500 square feet, I would like to point out a few more issues with this arbitrary requirement.

NAHB Study on Market and Pricing

During the testimony presented by those who would like to see the inclusion of the sprinkler mandate, it was stated that the additional cost of residential sprinklers will not have an effect on housing affordability. According to a special studies report[1] from our housing economics team, who are frequently asked to assess the impact of regulatory actions on the affordable housing markets, they would sharply disagree with some of the assumptions that were made that mandating sprinklers in all homes would not have an impact on the affordable housing market.

The affordability concept underlying the priced out model is based on mortgage underwriting standards. Based on these standards, it is possible to estimate how many households can qualify for a mortgage before and after a house price increase. The resulting difference is the number of priced out households. The 2012 estimates show that nationally a $1,000 increase in the price of the home price leads to pricing out about 232,447 households. The size of the impacts varies

across metros and largely depends on their population and income distribution.

The Scottsdale and Prince George's Reports

The studies conducted in Scottsdale, Arizona and Prince Georges County Maryland both make the claim that the fire suppression system is responsible for saving over 170 people. In the reports there is no mention to the importance that smoke alarms played in these fires scenarios and the contributions made in saving those lives. I have contacted the authors of these reports and asked that reports examine the significance of smoke alarms in these studies, but have not received a response.

The Report[4] states "It is now a proven fact, through the Prince George's County experience, that in all 117 fire related cases, as part of this research, the buildup and accumulation of toxic fire gases and heat was prevented by the activation of either one or two residential sprinkler heads. This is supported by the fact that no one individual, out of the 154 that were present at the time of these reported fire occurrences or seven that were injured in these 117 fire cases, was overcome by smoke or, more tragically, succumbed to the devastating effects of the fire. Compared to the obvious number of injuries, both smoke inhalation and bums that resulted to the group of citizens that resided in non-sprinklered structures, 22 reported deaths and 46 significant burns and smoke related injuries that occurred in just four short years."[2]

While the report provides some information on the fire incident, it does not go into any great detail describing the criteria used to determine if the sprinkler system was the primary factor responsible for the safe evacuation of the people in the dwelling unit.

The Report also states "The criteria utilized by the Department, at the time of completing this activation report, was based upon the numbers of people that were in close proximity of the fire's origin or were in the immediate areas of the living unit where the fire occurred."

No clear definition was provided for what was considered "close proximity" or "in the immediate areas of the living unit". What alerted the occupant that there was a fire? Was a smoke alarm present? Was it working? And what about those one- and two-family dwellings where there was a fire fatality, did they have working smoke detectors? Were the occupants capable of self preservation? Were they sleeping or awake?

As I stated in my testimony, having read through several NFPA reports on the performance of fire sprinklers and smoke alarms, we know that smoke alarms will detect and alert the occupant prior to the activation of the sprinkler system. Nowhere in the Prince George report is any consideration given to the fact that smoke alarms may have played a crucial role in preventing fatality by giving the

occupant the necessary time to safely evacuate the building, thereby giving an inaccurate assessment of the fire sprinkler system performance.

Benefit Cost Analysis

One of the items submitted with the 1309 publications was the NIST Benefit-Cost Analysis of Residential Fire Sprinkler Systems. The credibility of any cost-benefit analysis depends ultimately on the accuracy of the basic assumptions that determine the value of cost and benefit estimated values. The conclusions in the NIST "Benefit-cost Analysis of Residential Fire Sprinklers"[2] are based on a large number of questionable or unjustified assumptions.

In each case, the effect of one of these assumptions has been to reduce the estimated cost of fire sprinklers' installation and maintenance, or to increase their estimated benefits. It would appear that each of these assumptions were predestined to lead to the necessary outcomes in the report's conclusion. In fact, only slight changes to these assumptions demonstrate that sprinklers are uneconomical.

- The conclusions of the report rely on installation costs that are not supported by the record. If the report used cost estimates provided at the hearing, which ranged from about $1.61 to more than $3.00 per square foot, the result would be a negative net present value.
    - For example, the report estimated (without providing any support) that it would cost $2,075 to install sprinklers in a 3,338 square foot single family home, the benefit realized would be $4,994.29, resulting in a net present value of $2,919.20. However, using the conservative $1.61 estimate, the cost of installing a sprinkler system in a 3,338 square foot home would be $5,374,18, which is greater than the expected benefit and results in a <u>negative</u> net present value.
- The system that was chosen for the study was a multipurpose system, which according to a previous report by Brown (NISTIR 7277: Economic Analysis of Residential Fire Sprinkler Systems[6]), was the least expensive of all the systems that can be installed in a one- and two-family dwelling.
- The multi-purpose system is limited in applicability and is only cost effective when the existing infrastructure can provide the required water supply.
- The other systems were excluded from this study because of the expenses associated with backflow prevention devices and other costly items such as booster pumps, additional storage tanks, yearly maintenance of anti-freeze system, inspection of dry-systems which could not be proven to be cost-beneficial.
- A multi-purpose system is not the most widely used and is not accepted

by local water purveyors that require a mechanical separation between the fire suppression system and the domestic water system, and would most likely not meet Minnesota's energy code.

- Throughout the analysis, the NIST report assumes that the value of a statistical life is $7.94 million (p.14). Although assigning a value to a statistical life is difficult, it translates into more than 160 years of income for a person earning Census Bureau's latest estimate of median household income: $48,451 per year.
- According to Building and Fire Research Laboratory case study[7], if sprinklers were mandated in 100% of the homes in the US the cost per life saved would be close to $35 million
- The cost per life saved is a crucial value of the overall cost to society, much as the cost values given to injuries averted in the analysis. Where is the justification for the spending of $35 million per life saved when the assumed statistical value of a life is $8 million?

Regarding the cost per life saved models, similar findings were concluded in a study conducted by the Canada Mortgage and Housing Corporation 2005[3]. The Canadian report found that since the 1980s, Canada had seen a steep decline in the number of fire fatalities. The report states the reason for these declines is improvements in their residential construction codes and the inclusion of smoke alarms. The report determined, while there could be a decrease in the number of fatalities if residential sprinklers were included in new construction, it would come to a societal cost $38 million dollars per life saved.

Residential Fire Sprinkler Market Analysis

During the proceedings, it was mentioned that builders are worried about the negative effect residential sprinklers will have on their bottom line. No one from the sprinkler manufacturing and installers side of the table mentioned how much their market would increase if sprinklers became mandatory. The last report I would like to submit as evidence is the attached Market Growth and Labor Demand Analysis[5] by Russ Leavitt.

On September 22nd of 2008, Fire Smarts, LLC released an analysis that forecasted the projected growth for the residential fire sprinkler market based upon the passage of the sprinkler mandate proposal in the International Residential Code. It's important to note that the vote to include sprinklers in the main body of the residential code occurred the day before the release of this report. The analysis concluded:

- Prior to the vote, the residential sprinkler market was estimated to be somewhere between $90 to $100 million dollars annually.
- After the vote, the projected growth in the market would be between $2.9 to $3.2 billion dollars annually.

- In order to meet projected market demand, governments across the country would need to hire an additional 425 plan reviewers and 907 field inspectors to handle the additional workload.

Again, I want to thank you for giving us the opportunity to demonstrate the lack of justification and substantiation to support Department of Labor and Industry's proposed rule to require sprinklers in single family homes.

Professionally,

Steven Orlowski
Director of Codes and Standards
National Association of Home Builders

Sources:

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[3] Craig, Barry, 2005. Fire Experience, Smoke Alarms and Sprinklers in Canadian Houses: CMHC Research to 2005 Canada Mortgage and Housing Corporation

[4]Siarnicki, Ronald Jon, 2001. "Residential Sprinklers: One Community's Experience Twelve Years after Mandatory Implementation: Executive Leadership." Prince Georges County.

[5]Leavitt, Russ 2008. "Residential Fire Sprinkler Market Growth and Labor Demand Analysis" Fire Smarts, LLC. September 22nd, 2008 http://www.residentialfiresprinklers.com/blog/residential-fire-sprinklers-market-growth-and-labor-demand-analysis/

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Minnesota Housing Partnership www.mhponline.org 651-649-1710

January 9, 2014

The Honorable Eric L. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Revisor's ID Number R-04144 Minnesota Department of Labor & Industry - Proposed Amendment to Minnesota Rules, chapter 1309;

Dear Judge Lipman,

On January 2, 2014 the Minnesota Housing Partnership (MHP) submitted comments regarding the adoption of the 2012 IRC in the Minnesota State Building Code.

In a comment letter submitted to you by the Minnesota Department of Labor and Industry (DOLI) dated December 31, 2013, they reversed their decision to require dry sprinkler heads in single family homes in Chapter 1309 (see pages 17 and 18). DOLI states that this requirement is not needed in single-family homes but is still needed in two-family dwellings and townhomes built to the 2012 IRC.

The MHP would like to reiterate its position that dry head sprinklers in any IRC occupancy are not needed nor reasonable to protect the life or safety of occupants, or first responders in these occupancies. The Department has not provided any justification that Minnesota has unique circumstances that require sprinkler protection for garages or covered exterior spaces of a certain size—that is, they are not required nationally, so why in Minnesota.

We urge you to delete these costly requirements and adjust DOLI's proposed code language. There should be no requirement for dry head sprinklers in exterior locations for any type of housing in the IRC whether installed according to NFPA 13D Standards (for one- and two-family dwellings) or NFPA 13R Standards (for IRC townhomes). We are particularly concerned about the cost impact on townhouses because they are often constructed as affordable housing.

To respect your time on this issue, refer to MPH's letter dated January 2, 2014 which clearly outlines the code language we are proposing for fire sprinklers in all IRC occupancies and the reasons behind this position. Thank you for allowing us to reiterate our position on this very important issue.

Sincerely,

Chip Halbach
Executive Director

Fredrikson
& BYRON, P.A.

January 9, 2014

VIA EMAIL
The Honorable Eric J. Lipman
Administrative Law Judge
600 North Robert Street, P.O. Box 64620
Saint Paul, MN 55164-0620

Re: Minnesota Department of Labor & Industry – Proposed Amendment to Rules Governing the Adoption of International Residential Code, Minnesota Rules, Chapter 1309; Revisor's ID No. RD-4144; OAH No. 1900-30855.

Dear Judge Lipman:

The Builders Association of Minnesota ("BAM") submits these comments on behalf of its members and in opposition to the rules proposed by the Department of Labor and Industry ("DLI") requiring the installation of fire sprinklers in new single-family homes.[1] The comments below are in response to comments and materials already submitted in this proceeding. Overall, the evidence shows that fire sprinklers are being touted as a "solution," but that a corresponding problem does not exist.

I. THE PROPOSED RULES EXCEED THE DEPARTMENT OF LABOR & INDUSTRY'S AUTHORITY.

A. The proposed rules do not provide "basic and uniform performance standards."

State statute requires that the building code "will provide basic and uniform performance standards." Minn. Stat. § 326B.101. It also requires that the building code will "in part tend to lower construction costs" and that "[t]he construction of buildings should be permitted at the least possible cost consistent with recognized standards of health and safety." *Id.* According to DLI, this statute "sets forth a general policy directive to keep down construction costs to the extent possible when adopting and administering a state building code." *See* December 31, 2013 Letter from DLI ("DLI Response"), at 3. DLI also states that the fire sprinkler mandate will increase residential construction costs. *Id.* Without additional analysis, DLI concludes that it has complied with the statute. *Id.* at 3-4.

[1] For the purposes of this letter, "proposed rules" shall refer to those portions of the proposed rules related to fire sprinklers in single-family homes: R309.5, R313.2, R313.3, and R501.3.

There was no evidence or analysis in the SONAR, at the hearing, or in post-hearing comments, supporting an assertion that fire sprinklers in single-family homes are "basic and uniform" requirements. There was also no evidence or analysis supporting an assertion that requiring fire sprinklers in single-family homes is a "recognized standard[] of health and safety." Indeed, as discussed in Section I.B below, requiring fire sprinklers in single-family homes is *not* a well-recognized health and safety standard.

B. The vast majority of other states have rejected the fire sprinkler mandate.

Minnesota law requires that the building code "conform insofar as practicable to model building codes generally accepted and in use throughout the United States." Minn. Stat. § 326B.106, subd. 1. Evidence presented at the hearing established that 41 states, including each and every one of Minnesota's neighbors, have rejected code provisions that would require fire sprinklers in single-family homes. *See* Ex. L-13; *see also* materials submitted by BAM during the comment period from Iowa, North Dakota, South Dakota, Wisconsin, Arkansas, Indiana, Oregon, Maine, West Virginia, Virginia, and Vermont.

The intent of Minn. Stat. § 326B.106, subd. 1 is to keep Minnesota's code requirements generally consistent with those of other states. The fire sprinkler mandate is an expensive and burdensome requirement; adopting such a requirement would make Minnesota an outlier among states, imposing an expensive and substantial requirement above the codes "in use throughout the United States." That result is contrary to the intent expressed by the legislature that Minnesota's building code be generally equivalent to codes in other states.

C. DLI's assertion that it has properly relied upon the ICC's technical review process is without merit.

In DLI's Response, DLI asserts that it has met its statutory duties and that the fire sprinkler mandate is both needed and reasonable because DLI has relied upon the ICC's technical review process:

> The International Code Council maintains an open, competent, and comprehensive process of evaluating changes to these codes. The Council uses numerous code and knowledge-specific committees with broad technical representation of experts to assist them in development of the various model codes.[12] The Department relied upon this process and knowledge that the International Residential Code is developed nationally on the basis of *scientific principles, approved tests*, and the *professional judgment* of many subject matter experts. Because the Department cannot duplicate that effort, it acknowledges the need and due process demonstrated in ICC's technical review process sufficient to warrant the requirement in the 2009 and 2012 editions of the IRC that new single-family dwellings be provided with an automatic fire sprinkler system.

DLI Response, at 8. DLI, however, ignores that ICC's Code Committees rejected including the fire sprinkler mandate in the 2009 model code. *See* International Code Council, Public Hearing Results on the 2007/2008 Proposed Changes to the International Codes (disapproving proposed changes to fire sprinkler proposal (coded as RB-64)), *available at* http://www.iccsafe.org/cs/codes/Documents/2007-08cycle/ProposedChanges/Committee-Action0308.pdf. After an amendment to the code is rejected by the Code Committee, a public hearing occurs that includes manufacturers, suppliers, trade associations, and any other party with a vested interest. *See* International Code Council CP #28-05 Code Development, *available at* http://www.iccsafe.org/AboutICC/Documents/CP28-05.pdf. Any proposal that receives a public comment may be voted upon at the Final Action Hearings, at which only Governmental Members, which includes building officials, fire fighters, and other governmental employees, may vote. *Id.* As the record indicates, fire sprinkler manufacturers made a concerted effort to pay fire service personnel to attend the 2009 ICC code conference and vote on the fire sprinkler mandate, including paying for airfare, food, lodging, and hospitality suites. *See* Ex. L, Tabs 4-6; *see also* Testimony of Roger Axel, Transcript at 38. The vote total spiked for the fire sprinkler mandate and then precipitously dropped off. *See* Ex. L-10; *see also* January 2, 2014 Letter from Karen Linner. Interestingly, the very next vote after the fire sprinkler mandate was for under floor fire protection. Ex. L-10. That vote failed in 2009, although it was included in the 2012 model code due to a cooperative effort by the National Association of Home Builders and the fire service. Testimony of Steve Orlowski, Transcript at 51.

DLI further misconstrues the ICC code process when it states:

> During that same model code cycle of the "I" codes, it was successfully demonstrated through the ICC's code change process that the most effective way to save lives, protect property and provide this expected safety to fire fighters and first responders was through the installation of automatic fire sprinklers in new homes *in addition to* the passive protection already afforded occupants by smoke alarms and gypsum board protection of light-weight floor design. In addition to addressing the threats of flame, smoke, and hot gases, sprinklers have proven to be the best way to combat one of the newest threats to fire fighters and first responders' safety when entering homes-- the widespread use of unprotected "light-weight" engineered floor construction.

DLI Response, at 9. As described above, fire sprinklers and underfloor fire protection were not adopted during the same model code cycle. DLI's assertion that fire sprinklers were added "in addition to" the passive protection of gypsum board protection of light-weight floor design is also the incorrect chronology—as Steve Orlowski testified, NAHB actively lobbied to include underfloor fire protection in the 2012 code to address the fire service's concern regarding unprotected "light-weight" engineered floor construction. Further, the underfloor fire protection is not "in addition to" sprinklers, because the 2012 code provides that if sprinklers are installed, no underfloor fire protection is needed. DLI tacitly agrees that underfloor fire protection and sprinklers are equivalent tradeoffs, because under DLI's proposed rules, if sprinklers are installed

in homes over 4500 square feet, underfloor fire protection is not required. BAM supports the passive, lower-cost alternative of requiring underfloor fire protection in all single family homes.

II. THE PROPOSED RULES ARE NOT NEEDED.

A. There have been zero fire deaths in single-family homes built since 2003.

Numerous witnesses at the hearing presented testimony regarding fire tragedies. There is no question that we should seek to protect the lives of those at risk. However, the current rules proposed by DLI would not have prevented any of those tragedies.

1. Residents.

The proposed rules would require the installation of fire sprinklers in new, single-family homes. However, the Code already requires that hardwired, interconnected smoke alarms be installed in new, single-family homes. Since this requirement was added to the Code in 2003, there have been zero deaths resulting from fire in new, single-family homes. Ex. L-22. The proposed rules are not needed to protect residents of new, single-family homes. If DLI wishes to protect residents against fire, it should instead focus on structures where fire deaths are actually happening.

2. Firefighters.

Likewise, there have been zero firefighter deaths in single-family home fires since the state began collecting data on this issue. The proposed rules are not needed to protect firefighters working in single-family homes. Ex. L-26.

III. THE PROPOSED RULES ARE NOT REASONABLE.

A. The fire sprinkler mandate is not a reasonable response to the issue it purports to address.

Throughout the SONAR, the hearing, and post-hearing comments, there many assertions about the benefits of fire sprinklers. However, notably, there has been very little evidence in support of these assertions. For example, DLI's Response contains statements about what DLI "believes," without any corresponding support. *See, e.g.*, DLI Response, at 12 ("[T]he Department believes that fire sprinklers will significantly contribute additional safeguards for the protection of fire fighters, property, and those unable to respond in a timely fashion to smoke alarms."); *see also* Testimony of Ronald Farr, Transcript at 146-63 (in which Mr. Farr detailed the results of a study finding that underfloor protection added additional structural integrity and then concluded, without any explanation, that "the answer is residential sprinklers."). It is unreasonable to impose such an expensive and burdensome requirement on Minnesota's

homeowners when the evidence shows that fire sprinklers are a "solution" to a problem that does not exist in the homes the proposed rules seek to regulate.

DLI also recognizes that new homes are already very safe. *See* DLI Response, at 12. Nonetheless, DLI states that new homes "can be even safer." *Id.* Even if this were supported by any evidence in the record, it is neither necessary nor reasonable for the state to mandate that the "most safe" homes be built. For example, we know how to build tornado-proof homes, but the Code does not require it because of the significant expense. That is not the policy and purpose of the Code.

B. <u>The 4,500 square foot trigger is not supported by any evidence.</u>

Testimony at the hearing established that there is no basis for the 4,500 square foot trigger in the proposed rules. Likewise, there is no support in any report, study, or other document for the 4,500 square foot trigger.

The SONAR states that DLI "chose the threshold of 4,500 square feet in response to the case made by the fire services that homes between 4,000 and 5,000 square feet and larger provided the greatest initial life-safety risk to the public." SONAR, at 32.[2] The SONAR cites no evidence in support of this proposition, nor does it provide any analysis of why 4,500 was chosen instead of 3,000, 4,000, 5,000, or any other number. This 4,500 square foot trigger was not discussed at any of the advisory committee meetings. *See* Testimony of Karen Linner, Transcript at 80. Likewise, none of the documents submitted with the proposed rules support a 4,500 square foot trigger.

DLI states that "[i]t was made apparent to the Department by the Fire Service representatives that larger homes pose additional risks to both fire fighters and building occupants because it takes a longer time for occupants to exit and because larger homes are more difficult to deal with during firefighting and rescue operations due to greater combustible loading, the number of rooms and areas to search and suppress fire and smoke, and other factors." DLI Response, at 13; *see also* SONAR, at 33. First, DLI has cited no evidence in support of this statement, despite the fact that DLI has made this assertion in the SONAR, at the hearing, and now in its Response. This assertion also tends to contradict statements elsewhere in the SONAR and the DOLI Response that the 4,500 threshold was chosen because it would be too

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[2] The SONAR indicates that the Minnesota State Fire Chiefs Association ("MSFCA") proposed a phase-in of the fire sprinkler requirement beginning at 4,000 square feet, and the Minnesota Fire Marshals Association ("FMAM") proposed the phase-in beginning at 5,000 square feet. SONAR, at 31. It appears that DLI chose a number between these two. But because these are proposals for a phase-in to eventually require sprinklers in all single family homes, the square footage figures are not tied to any problems inherent in the size of the home.

expensive to install fire sprinklers in smaller homes. Further, this assertion contradicts what fire service representatives themselves said at the hearing. Rather, testimony at the hearing established that the 4,500 square foot trigger is unreasonable. Despite the SONAR's statement that the trigger is supported by the fire service, representatives from the fire service testified at the hearing that the size of a home is not the issue. *E.g.*, Testimony by Angie Wiese, Transcript at 134 ("Home size is not the issue."). There was, likewise, no testimony from any other witness supporting the 4,500 square foot trigger. In fact, the Minnesota Fire Service Needs Assessment contains no indication to support the statement in the SONAR that many departments are not equipped to handle fires involving larger homes. SONAR, at 33. *See also* Ex. L-63; Testimony of Clay Dietrich, Transcript at 170.

C. **Fire sprinklers are expensive.**

1. Statute requires DLI to consider cost.

Members of the fire service testified that cost should not be considered with regards to this proposed rule change. However, Minnesota law requires DLI to consider cost when promulgating rules and adopting and amending the Code. Minn. Stat. § 14.131 (SONAR must consider "[t]he probable costs or consequences of not adopting the proposed rule."); *see also* Minn. Stat. § 326B.101.

2. Insurance discounts will not pay for fire sprinklers.

Proponents of the fire sprinkler mandate have previously asserted that homeowner's insurance discounts would cover the costs of fire sprinklers. However, testimony at the hearing established this is not accurate. *See* Testimony of Karen Linner, Transcript at 106; Testimony of Sean Flaherty, Transcript at 198.

3. True cost of fire sprinklers.

As stated in its previous submission (Ex. L), and in testimony at the hearing, BAM's independent research shows that DLI's cost estimates are too low. However, even using DLI's cost estimates, fire sprinklers will cost homeowners thousands and thousands of dollars. Consider the example below, which calculates the cost of installing sprinklers in Ryland Homes' "Rutherford" home. *See* Ex. L-55 for exterior picture and floor plan; *see also* January 2, 2014 Letter from Ryland Homes.

- $7,029 - $9,372 to install sprinklers in living areas and unfinished basement;[3]
- Possibly an additional $4,000 if the home is built on a well.[4]

Using DLI's own numbers, it would cost *the builder* an additional $7,029 - $13,372 to add fire sprinklers to this home. This does not include any mark-up to the homeowner; generally, builder mark-up is around twelve percent, making a conservative estimate for the total cost to the homeowner between $7,872 – 14,977.

Ryland's "Rutherford" home sells for as low as $302,000. Ex. L-54. Thus, even using DLI's conservative numbers, the cost to install fire sprinklers, and the eventual cost to a homeowner, is well over the "1%" stated, without support, at the hearing.[5]

4. Percentage of homes impacted.

The SONAR does not consider how many homes will be impacted by the proposed rules. At the hearing, a DLI representative stated that 10-12% of new homes will trigger the fire sprinkler mandate. Testimony of Scott McLellan, Transcript at 29. However, DLI has not produced the data supporting this assertion, nor has it explained its methodology. Testimony of Scott McLellan, Transcript at 111. And while even 10-12% of new homes is a significant number in and of itself, BAM's own independent research shows that about 30% of new homes

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[3] This calculation is based on the square footage of the Rutherford (4,686 square feet, including unfinished basement space) and DLI's cost estimates of $1.50-$2.00 per square foot. *See* January 2, 2014 Letter from Ryland Homes; SONAR, at 33.

[4] This cost estimate does not include the cost of dry head sprinklers in the garage and porch because it appears DLI proposes to remove those requirements from the proposed rules. However, it would cost approximately an additional $1,200 if dry head sprinklers were required in garages and covered spaces like porches.

[5] BAM notes that the testimony by Sean Flaherty, of Viking Automatic Sprinkler Company ("Viking") and the National Fire Sprinkler Association of Minnesota, contradicts a bid provided by Viking in April 2012. Mr. Flaherty testified that it costs about $2.00/square foot to install fire sprinklers in a home on municipal water, and about $3.00/square foot to install fire sprinklers in a home on well water. Testimony of Sean Flaherty, Transcript at 194-95. However, Viking's bid, submitted as part of Ex. B-8, quoted a cost of $6,675 to install fire sprinklers in a 2,245 square foot home on municipal water. That is $2.97 per square foot – almost $1.00 more than Mr. Flaherty's hearing testimony. For a 4,500 square foot home, that is an increase of almost $4,500. In any event, even taking Mr. Flaherty's most recent testimony, it will cost the builder between $9,000 and $13,500 to install fire sprinklers in a 4,500 square foot home – a significant cost.

could be impacted. Testimony of Karen Linner, Transcript at 105; Ex. L-53. BAM took a survey of the five largest builders in Minnesota. This survey showed that about 30% of new single-family homes in the Twin Cities metropolitan area would trigger the fire sprinkler mandate. Ex. L-53. Comments submitted after the hearing also support BAM's estimate. *See* January 2, 2014 Letter from Karen Linner; Letter from Lakeville, MN (indicating that 33% of new homes built in Lakeville would require fire sprinklers).

5. Impact on affordable housing.

There can be no question that the fire sprinkler mandate would have an impact on the price of new homes. However, DLI and fire sprinkler proponents attempt to ignore this issue by asserting, in essence, that this mandate would only affect rich people. First, this is not accurate. Second, even if it were accurate, it does not make sense to tie a fire sprinkler requirement to a homeowner's ability to pay. Finally, the fire service clearly intends to seek fire sprinklers in all homes, which would certainly have a negative impact on affordable housing.

DLI asserted at the hearing that 4,500 square foot homes and larger generally start at $500,000. Testimony of Scott McLellan, Transcript at 29. DLI submitted no evidence in support of this statement. Other evidence shows that this is not accurate. *See* Ex. L-54 (homes that would trigger requirement start as low as $302,000); *see also* Testimony of Dave Neisen, Transcript at 185-86.

Even if this requirement only impacted million dollar homes (which it does not), that would be further evidence that it is not needed nor reasonable. It does not make sense to tie a purported life-safety Code requirement to homeowner ability to pay. If fire sprinklers are not needed in all homes, then they are certainly not needed in new, single-family homes larger than 4,500 square feet just because of a perceived ability to pay.

Finally, fire sprinkler proponents have made it clear that they wish to require fire sprinklers in all homes. *See, e.g.* SONAR, at 31 (acknowledging "phase in" proposals from MSFCA and FMAM). It appears that DLI also considers the proposed rules a first step towards requiring fire sprinklers in all homes. *See* DLI Response, at 16 (stating that it will not seek fire sprinklers in all homes "at this time" and "at the present time"). If the proposed rules are approved, it is very likely that the next Code amendments will seek to require fire sprinklers in homes smaller than 4,500 square feet. Even DLI recognizes that this will have a negative impact on affordable housing. *See* DLI Response ("The Department also recognized that under any estimate, the addition of automatic fire sprinklers to newly constructed single-family dwellings would increase the costs of new homes, clearly impacting the entry and mid-level market."). Evidence also shows that any increase in home price has the effect of pricing homeowners out of a home. *See* January 2, 2014 Letter From Steve Orlowski and attached *Metro Area House Prices: the "Priced Out" Effect.*

6. Dry head sprinklers.

BAM opposes proposed rules requiring dry head sprinklers in garages and porches. However, it appears that DLI now seeks to amend the proposed rules to remove these requirements. BAM supports these amendments.

D. Fire sprinklers provide minimal protection.

1. Property protection from fire sprinklers is minimal.

One of DLI's justifications for the fire sprinkler mandate is property protection. First, evidence shows that any benefit of property protection is minimal. Further, it is not reasonable to require homeowners to spend substantial amounts of money to protect only property.

There have been many comments made that fire sprinklers will result in property protection. It is one of DLI's justifications for the proposed rules. However, DLI does not know how much, if any, benefit fire sprinklers will provide:

> Q: And so with fire sprinklers, how much money and property damage is saved?
> A: I'm sorry, you're asking a question?
> Q: Yeah, so if we install fire sprinklers, how much property damage is less if you have fire sprinklers versus not having fire sprinklers?
> A: I can't answer that for you.

Testimony of Scott McLellan, Transcript at 116-17. Thus, DLI has no support for one of the primary justifications for the proposed rules. It is unnecessary and unreasonable to require homeowners to expend thousands and thousands of dollars when DLI is unable to point to any evidence supporting one of its primary justifications for promulgating the rule.

In addition, studies conducted by the National Fire Protection Association conclude that a fire sprinkler will reduce property damage by an average of $4,000. *See* Ex. L-66, at 58; *see also* Testimony of Steve Orlowski, Transcript at 59. Thus, the cost of fire sprinklers themselves will far outweigh any potential savings.

Finally, faced with evidence that the proposed rules will save zero resident and firefighter lives, fire sprinkler proponents have focused on potential protection of property. It is unnecessary and unreasonable to require homeowners to spend thousands upon thousands of dollars with the aim of protecting property where (1) any property protection will be less than the cost of fire sprinklers, and (2) homeowners are also paying for homeowners' insurance. As a simple matter, homeowners should be able to choose whether they wish to protect $4,000 worth of property if they ever have a fire by spending $9,000 on fire sprinklers. Fire sprinkler proponents argue that homeowners will make bad decisions and choose granite countertops over

fire sprinklers, and, as such, this decision needs to be made for them. This is a paternalistic argument that ignores the purpose of the Code. Minn. Stat. § 326B.101.

2. The statistics concerning reductions in deaths from fire sprinklers are questionable.

Fire sprinkler proponents assert that "fire sprinklers are the answer." However, there is a lack of reliable evidence that supports this assertion.[6] For example, fire sprinkler proponents often cite John R. Hall, Jr., *U.S. Experience with Fire Sprinklers and Other Automatic Fire Extinguishing Equipment*, National Fire Protection Association (Jan. 2009) for the proposition that fire sprinklers operate in 95% of reported fires where the is large enough to activate the system. However, this number is based on cherry-picked data.

In fact, the study states that fire sprinklers operated and were effective only 39% of the time in one- or two- family dwellings. *Id.* at 37, table 5. However, the study reaches 39% effectiveness only by further cherry-picking its data set: "Fire are excluded if the reason for failure or ineffectiveness is system not present in area of fire, unclassified, or unknown . . . . This field is not required if the fire did not behind within the designed range of the system." *Id.*, table 5. Further, the study's author admits that the results for one- and two- family dwellings are "statistically unstable" and that there is not enough data to "produce stable statistical comparisons." *Id.* at 35, 32.

In addition, none of the studies cited by fire sprinkler proponents distinguish between whether lives were saved by fire sprinklers or smoke alarms. Since most homes with fire sprinklers will very likely also have smoke alarms, it is probable that smoke alarms had a significant role in saving these lives. *See generally* January 2, 2014 Letter from Steven Orlowski; *see also* Ex. L-15, at 30; Ex. L-16, at 5; Ex. L-17, at 5.

Finally, as stated previously and at the hearing, there have not been any fire deaths in single-family homes built since Minnesota began requiring hardwired, interconnected smoke alarms in 2003. Ex. L-22. Thus, fire sprinklers would not have saved any of the lives lost since that time.

E. Lower cost, but effective, methods are available.

1. Smoke alarms are effective.

Evidence shows that hardwired, interconnected smoke alarms are effective at early detection and saving lives. There have been zero deaths in Minnesota homes built since the

[6] For example, it appears that the State Fire Marshal considers every sprinkler activation to be a sprinkler "save." *See* Ex. V.

Code began requiring hardwired, interconnected smoke alarms. DLI asserts that smoke alarms are not sufficient, but it points to no evidence in support of this assertion. Testimony of Scott McLellan, Transcript at 117-18. In fact, studies conclude that, under all scenarios tested, smoke alarms provide enough time to vacate a burning building. *See* Ex. L-16, at 30 ("[T]he smoke alarms provided sufficient time to permit escape before loss of tenability in every test."); Testimony of Steve Orlowski, Transcript at 46-48.

2. Gypsum underfloor fire protection provides additional structural integrity in a fire.

The fire sprinkler mandate is not reasonable because underfloor protection can provide additional structural integrity at a small fraction of the cost of fire sprinklers. DLI claims that underfloor protection is not sufficient, but it has not pointed to any evidence in support of its belief. Testimony of Scott McLellan, Transcript at 116-17; *see also* DLI Response, at 3 ("[T]he Department does not believe that the addition of gypsum board is an equivalent method of protection for dwelling occupants, first-responders, and property."). What the evidence does show is that underfloor protection provides a level of structural integrity equal to "legacy" construction. *See, e.g.*, Testimony of Scott McLellan, Transcript at 116; Ex. L-14. This protection thus addresses the concern of the fire service related to the use of lightweight construction. Requiring homeowners to spend an average of $9,000 to install fire sprinklers, rather than $450 to install underfloor protection, on the basis of no evidence is contrary to the intent of the legislature that the Code not unduly increase construction costs. *See* Minn. Stat. § 326B.101.

F. Non-Code enforced areas/border communities.

1. Border cities will be hurt by the fire sprinkler mandate.

Many of Minnesota's border cities are opposed to the fire sprinkler mandate because, as explained above, Minnesota's neighboring states have all rejected the fire sprinkler mandate. The city councils of Moorhead, Dilworth, East Grand Forks, Breckenridge, Perham, Detroit Lakes, and Ortonville each passed resolutions expressing their opposition to the fire sprinkler mandate. DLI dismisses this concern without any analysis or consideration. While DLI correctly states that it may not regulate Minnesota's border states, Minnesota law does require DLI to consider the costs and consequences of adopting the proposed rules. Minn. Stat. § 14.131. It also requires that the proposed rules be reasonable. As stated in the numerous submissions received by many of Minnesota's border cities, the proposed rules will likely have a negative impact on them. It is unreasonable to put Minnesota's border cities at a competitive disadvantage as a result of a fire sprinkler mandate with little documented benefit and immense cost.

2. As a practical matter, the proposed rules will cause new homeowners to use unlicensed builders and will lead to more unsafe homes.

The record also shows that licensed builders will be put at a disadvantage as a result of the proposed rules because homeowners trying to avoid the cost of fire sprinklers will choose an unlicensed builder and build in a non-code-enforced area. Once again, DLI dismisses this concern as "without merit," summarily stating that all builders are required to build to code. DLI Response, at 15. Although technically correct in an intellectual vacuum, it ignores the practical reality presented at the hearing from both outstate builders and code officials – non-licensed builders who build in non-code enforced areas often do not build to code. *See, e.g.*, Testimony of Joseph Ranweiler, Transcript at 189-91; Letter from Jim Rich. Unlicensed builders often ignore code requirements, including important fire protections in the existing code. Testimony of Clay Dietrich, Transcript at 176-77. The expensive fire sprinkler mandate will only exacerbate this problem, especially given that more than 88% of outstate respondents in the Minnesota Survey stated that fire sprinklers should remain a homeowner choice. Ex. L-61. Realistically and practically, the fire sprinkler mandate is likely to result in less safe homes in the majority of the state where the building code is not enforced.

G. To the extent the problem has been identified as highly flammable furnishings, the proposed rules are a round-about and ineffective way of attempting to address that problem.

There have been many comments about the flammability of modern furnishings. To the extent that the proposed rules are a "solution" to that problem, they are a roundabout, unreasonable, and ineffective way of addressing that problem.

First, there has been no evidence that fire sprinklers are the solution to the problem of modern furnishings. Each witness simply talked about the flammability of modern furnishings, and then concluded that "fire sprinklers are the answer." Despite the fact that numerous studies were presented during and after this hearing, not a single study has stated that fire sprinklers address this issue.

Further, modern furnishings are found in old and new homes alike. The proposed rules, however, only seek to regulate new homes, even though it is new homes that already have systems in place to timely alert residents when there if there is a fire. Further, the Code is meant to address the construction of buildings, not their contents. To the extent that the flammability of modern furnishings is a problem, that problem should be addressed through regulation of furnishings themselves, not through the state building code.

In addition, there has been no suggestion that the issue of the flammability of modern furnishings is especially problematic in homes 4,500 square feet and larger.

Thus, if the problem really is that modern furnishings are highly flammable, the proposed rules are an unreasonable and ineffective way to address that problem.

IV. CONCLUSION.

DLI has failed to show that the proposed rules are within DLI's authority, and that the proposed rules are needed and reasonable. There have been zero deaths in single-family homes since Minnesota began requiring hardwired, interconnected smoke alarms. Ex. L-22. There have been zero firefighter deaths in single-family homes since Minnesota began collecting data on this issue. Ex. L-26. DLI also claims that fire sprinklers are needed to protect property. Although DLI has not quantified the savings, studies conducted by the National Fire Protection Association conclude that a fire sprinkler will reduce property damage by an average of only $4,000. *See* Ex. L-66, at 58. Even if there is a need to protect property from fire, requiring a homeowner to spend over $9,000 on a fire sprinkler to save $4,000 in case a fire ever occurs is not a reasonable means to address this alleged need.

The proposed rules would require Minnesotans to spend millions of dollars on a "solution" to a problem that does not exist. If the proposed rules had been adopted in 2007, when Minnesota last amended the Code, zero lives would have been saved at a cost of $179,500,000 dollars to homeowners with homes of 4,500 square feet or more. *See* January 2, 2014 Letter from Karen Linner and attached Appendix H. This would have equipped approximately 15,000 homes with fire sprinklers. This same amount of money could have been spent to equip approximately 840,000 existing homes with wireless, interconnected, battery-operated smoke alarms in each bedroom and on every floor. If this had been required, the civilian death rate would have fallen significantly.

BAM supports safe and affordable homes.[7] For this reason, BAM supports requiring underfloor fire protection in all homes, regardless of size. DLI itself seems to acknowledge that

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[7] In his submittal dated January 1, 2014, Buddy Dewar of the National Fire Sprinkler Association asserts that BAM is seeking to build "unsafe" homes to "maximize their profit margin." *Id.* at 4. In addition to being offensive, it ignores the testimony at the hearing that the cost of sprinklers will be passed on to homeowners, along with overhead and profit on that cost. Additionally, the industry that Mr. Dewar represents expected that growth in the residential fire sprinkler market would be between $2.9 to $3.2 billion dollars annually as a result of requiring fire sprinklers in single family residential homes. *See* January 2, 2014 Letter from Steven Orlowski; Russ Leavitt, *Residential Fire Sprinklers: Market Growth and Labor Demand Analysis*. That study concluded that "This amendment has the potential to create more work for the industry than any single event in the history of fire sprinklers.... Those who step up to this opportunity have the chance to experience success at a level never contemplated by most." Leavitt, at 20.

fire sprinklers and underfloor fire protection are equivalents given that DLI's proposed rules allow a homeowner to forego underfloor fire protection if a sprinkler is installed. According to National Fire Protection Association study, fire sprinklers in one and two-family dwellings operated and were effective 39% of the time (Ex. L-66, at 37), whereas underfloor fire protection is always operating and effective, at a cost of approximately $450 compared to over $9,000 (excluding builder overhead and profit) to install fire sprinklers in a 4500 square foot home on municipal water. BAM respectfully suggests that this lower cost alternative be required for all homes.

On behalf of BAM's approximately 2,800 member firms involved in Minnesota's residential construction industry, we thank you for your kind and thoughtful consideration of this very important issue to our industry.

Very truly yours,

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January 9, 2014

The Honorable Eric L. Lipman
Administrative Law Judge
Office of Administrative Hearings
600 North Robert Street
P.O. Box 64620
Saint Paul, Minnesota 55164-0620

Re: In the Matter of the Proposed Amendment to Rules of the Department of Labor and Industry Governing the Adoption of the 2012 International Residential Code; OAH Docket No. 8-1900-30855; Revisor's ID Number R-04144 (Final Response)

Dear Judge Lipman:

Please accept this letter as the Minnesota Department of Labor and Industry's Final Response to comments it has received and testimony provided relative to the proposed amendments to Minnesota Rule Chapter 1309 governing the adoption of the 2012 International Residential Code. The Department's initial Response was filed early, two days before the end of the comment period, as encouraged by you at the hearing so as to accommodate hearing participants' Holiday schedules. Several comments raising additional concerns and issues were filed by interested parties on the last day of the comment period and were therefore not addressed in the Department's initial Response. This Final Response will address those additional written comments and any other filings that were received during the rebuttal period.

Please note that the Department hereby incorporates the existing Statement of Need and Reasonableness ("SONAR") and its initial Response into this Final Response as its affirmative presentation of the proposed rules and establishment of their need and reasonableness. Many of the concerns raised and issues discussed in written comments received after the filing of the Department's initial Response were repetitive of comments already received and addressed by the Department's SONAR or initial Response and will not be specifically addressed herein. Additionally, the failure if any to address each and every comment received and concern raised is not necessarily an indication of agreement with those comments or concerns by the Department, particularly if those comments or concerns were already addressed in the Department's SONAR or initial Response.

This information can be provided to you in alternative formats (Braille, large print or audio).
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I. The Department Complied With All Statutory Requirements in Proposing Minnesota Rule Part 1309.0402, Section R402, *Materials*, for Adoption, Including a Showing That the Proposed Rules are Needed and Reasonable.

Chad Kompelien (President/Builders Association of Minnesota) and Remi Stone (Executive Vice President/Builders Association of Minnesota) submitted a written comment on January 2, 2014, concerning proposed Minnesota Rule Part 1309.0402 which alleges that the Department failed to follow Minnesota Statutes § 326B.118's directive that requires the Department to conduct research and analysis in cooperation with members of the residential construction and building science trades before adopting any part of a model energy code for use in Minnesota. Minnesota Statutes § 326B.118 (2012) provides, in part:

> The commissioner may not adopt all or part of a model energy code relating to the construction of residential buildings without research and analysis that addresses, at a minimum, air quality, building durability, moisture, enforcement, enforceability cost benefit, and liability. *The research and analysis must be completed in cooperation with practitioners in residential construction and building science and an affirmative recommendation by the Construction Codes Advisory Council.*

Id. (emphasis added).

Contrary to the Builders Association of Minnesota's assertions in its comment, the Department did follow this statute's directive when drafting and proposing Minnesota Rule Part 1309.0402 for adoption. Not only did the Department engage the services of the University of Minnesota's Cold Climate Research Center in researching the concrete footings durability issue, the Department also presented the research, findings and recommendations to the Construction Codes Advisory Council at a public meeting where any interested party, including the Builders Association members who were present, were allowed to participate in formulating a final recommendation to the Commissioner.

The 2012 International Residential Code ("IRC") was amended in proposed Minnesota Rule Part 1309.0402 to address footing material specifications and moisture intrusion unique to Minnesota's cold and wet climate.[1] This amendment is necessary and needed to address building durability and moisture requirements as directed by Minnesota Statutes § 326B.118 (2012). While it is appropriate to consider this subject matter as part of Minnesota's Residential Energy Code and therefore subject to § 326B.118's adoption requirements, not all provisions of the energy code are located in Minnesota Rule Chapters 1322 and 1323.

[1] *See* Statement of Need and Reasonableness ("SONAR") at pp. 37-37

Indeed, building durability considerations of the energy code are often better placed in other parts of the State Building Code for relevant applicability to specific types of construction and to facilitate ease of use and access for the end-user in the field. For example, a number of the energy code provisions addressing building durability and residential construction are found in Chapter 1309 as part of this adoption cycle, including deletion of dampproofing requirements in favor of waterproofing, moisture resistance requirements of structural footings, and waterproof membrane placement requirements for basement slabs.[2]

As part of the current adoption process and the requirements of Minnesota Statutes § 326B.118, the Department commissioned University of Minnesota Building Research Scientist Dr. Louise Goldberg to provide research, analysis, and a final draft report on moisture intrusion and residential building durability, among other relevant topics, to the Department and the Construction Codes Advisory Council ("CCAC").[3] The Department entrusted the depth of Dr. Goldberg's expertise and that of the University of Minnesota's Cold Climate Housing Research Center to understand the pros and cons of the various research models used and how their data and testing compared to other research conducted in this field in the United States and Canada.

One of Dr. Goldberg's recommendations to prevent moisture intrusion into and through residential building foundations included the creation of a water separation plane at the building foundation.[4] The water separation plane would extend over the exterior foundation wall below grade, over or around the foundation footings, and under the basement slab to form a barrier which would prevent moisture in any form (liquid, vapor or wicked through capillary action) from entering the interior of the residential dwelling.[5]

Pursuant to Minnesota Statutes § 326B.118, Dr. Goldberg's report and the Department's approach to this issue for proposed residential code rulemaking were presented to the CCAC, members of the residential construction industry, and members of the public at the October 19, 2012 public meeting of the Council.[6] Present at the meeting were several members of the building and construction trade industry, including two members specifically representing the Builders Association of Minnesota, Karen Linner and Katherine Nielson.[7] Upon conclusion of Dr. Goldberg's presentation, the CCAC members and members of the public were invited to ask questions and discuss their viewpoints concerning this proposal with the Department. It became apparent that representatives of the building industry had an issue with the labor required, costs involved, and practical implementation of Dr. Goldberg's recommendation. Accordingly, the matter was tabled for a final vote until

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[2] *See* Minnesota Rule Parts 1309.0406, Subpt. 1, 1309.0402, and 1309.0406, Subpt. 2, respectively
[3] *See* SONAR at pp. 36-40; Exhibit B.9
[4] *See* Exhibit B.9
[5] *See id.*
[6] *See* CCAC Meeting Minutes of October 19, 2012, which can be viewed publically at: "http://www.dli.mn.gov/PDF/ccac/1012minutes.pdf"
[7] *See id.*

November 8, 2012, so that the Department could revisit the issue with Dr. Goldberg and industry members so as to modify the proposal to address the building industry's concerns.[8] The Department's solution was to make the footing itself act as part of the water separation plane by making it waterproof. This was accomplished by proposing a cement ratio that would create 5000 psi compressive strength concrete footing material or with an additive to the concrete mix that would provide the same level of water resistance. The ability to use a range of low-cost concrete mixes and additives would also address the building industry's concern with the higher costs associated with Dr. Goldberg's initial proposal.[9]

This alternative approach was presented to the CCAC for their consideration, vote and approval at the November 8, 2012 CCAC public meeting.[10] Again, representatives of the residential building construction trade industry were present at the meeting and were invited to participate.[11] Again, members of the Builders Association of Minnesota were present at that meeting, including Karen Linner.[12] After hearing and discussing the Department's amended proposal which would become the basis for proposed Minnesota Rule Part 1309.0402, CCAC board member and Licensed Residential Building Industry Representative Kathleen Ostrom moved to accept the Department's amended proposal and forward that recommendation to the Commissioner of Labor and Industry for adoption in the present rulemaking.[13] The members of the CCAC then voted unanimously to accept the proposal as amended and to forward that recommendation to the Commissioner.[14]

Contrary to Mr. Kompelien and Ms. Stone's assertions in their January 2, 2014 written comment, the Department did follow Minnesota Statutes § 326B.118's directive when drafting and proposing Minnesota Rule Part 1309.0402 for adoption. Not only did the Department engage the services of the University of Minnesota's Cold Climate Research Center in researching the concrete footings durability issue, the Department also presented the research and findings to the Construction Codes Advisory Council at a public meeting where any interested party, including the Builders Association members who were present, could participate in formulating a final recommendation to the Commissioner for this rulemaking. As seen above, "*cooperation with practitioners in residential construction,*" as required by Minnesota Statutes § 326B.118, was essential in formulating the final version of proposed rule part 1309.0402. The Builders Association of Minnesota's assertions to the contrary are without merit. Therefore, the proposed rule should be recommended by this administrative tribunal for adoption by the Commissioner of Labor and Industry.

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[8] *See id.*
[9] *See generally*, SONAR at pp. 36-40
[10] See CCAC Meeting Minutes of November 8, 2012, which can be viewed publically at : "http://www.dli.mn.gov/PDF/ccac/1112minutes.pdf"
[11] *See id.*
[12] *See id.*
[13] *See id.*
[14] *See id.*

II. The Suggested Revisions to the Exceptions Located in Proposed Minnesota Rule Parts 1309. 0703, *Exterior Coverings*, and 1309.0903, *Weather Protection*, Submitted by Mr. Dan Hauck of the City of Blaine are Not Needed.

Mr. Dan Hauck, Building Official for the City of Blaine, submitted written comments dated January 2, 2014, addressing Minnesota Rule Parts 1309.0703, *Exterior coverings*, and 1309.0903, *Weather protection*. In those comments, Mr. Hauck suggested that certain Exceptions to those rule parts be added and revised to address concerns and observations he has made over the years as a building official relative to weep screeds for manufactured stone veneer and kick out flashing requirements. Upon review of these comments, the Department believes that the proposed revisions to the Exceptions contained in these rule parts are not needed and should be rejected.

Proposed Minnesota Rule Part 1309.0703 adopts Section R703 of the 2012 IRC with amendments and addresses exterior covering requirements for residential dwelling construction. In his written comments, Mr. Hauck requested that an exception be added to IRC Section R703.6.2.1, *Weep screeds*. The proposed exception would read as follows:

> **Exception:** the weep screed for a manufactured stone veneer shall be permitted to be placed a minimum of 0.5 inches above a paved area if it is supported by a footing that extends below the frost line and is allowed by the manufactured stone veneer installation instructions.[15]

Mr. Hauck's reason for this proposed change reads as follows:

> The City of Blaine has had thousands of homes built in the last 10 years with manufactured stone veneer installed on the front of the home. It has been the desire of the builders to have a minimum amount of concrete wall or block exposed, so many of the manufactured stone veneers have been installed a minimum of 0.5 inches above the finished paved surface area, such as concrete or asphalt, if supported by a frost footing. This results in an aesthetically pleasing look that would otherwise result in a minimum of 2 inches of exposed concrete wall or block above the paved area per section R703.6.2.1 of the 2012 IRC. The City of Blaine is not aware of a single failure by allowing these installations, and only allows it if specified in the manufacturer's installation instructions or ICC-ES Evaluation Report (www.icc-es.org). The installation results in the veneer being protected from frost heave of the paved area since it is supported by a footing that extends below the frost line.[16]

[15] Dan Hauck's January 2, 2014 written comments
[16] *Id.*

The Department has analyzed this proposal and thanks Mr. Hauck for the written comment, but believes that the proposed Exception is neither needed nor necessary. Section R703.6.2.1 addresses a typical condition when the paving surface that adjoins to a building is not supported, making it susceptible to frost heave. The exception proposed by Mr. Hauck addresses a more specific condition if the paving surface is supported, which would permit the veneer to be located closer to the paving surface for "aesthetic" reasons. Because there are a number of methods available to support the paving surface in addition to the installation of frost footings, it would ultimately be the Building Official's decision as to which methods to accept and approve to protect the weep screed from damage caused by frost heave.[17] It is not possible for the Minnesota State Building Code to list or address all of the possible alternative methods or options available to protect the weep screed from frost heave damage. The proposed exception does indeed follow the intent of the Code, but it is not necessary or needed since a building official may already approve alternative methods of construction as described in Mr. Hauck's comment. Therefore, the Department has not included the change proposed by Mr. Hauck to Section R703.6.2.1 in the proposed rule.

Proposed Minnesota Rule Part 1309.0903 adopts Section R903 of the 2012 IRC with amendments and addresses weather protection for residential dwelling construction. In his written comments, Mr. Hauck requested that the proposed Exception to IRC Section R903.2.1, *Locations*, be revised as follows:

> ~~**Exception:** Kick out flashings are not required when only re-roofing existing buildings and structures.~~
>
> **Exceptions:**
>
> 1. Kick out flashings shall be required when only re-siding existing buildings and structures, but the kick out flashings shall be permitted to be installed in accordance with other approved methods.
> 2. Kick out flashings shall be required when only re-roofing existing buildings and structures, but the kick out flashings shall be permitted to be installed in accordance with other approved methods.[18]

Mr. Hauck's reason for this proposed change reads as follows:

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[17] *See* Minnesota Rule Part 1300.0110, subpt. 13 (*Alternative materials, design, and methods of construction and equipment*) (2007) ("The code is not intended to prevent the installation of any material or to prohibit any design or method of construction not specifically prescribed by the code, provided that any alternative has been approved. An alternative material, design, or method of construction shall be approved where the building official finds that the proposed design is satisfactory and complies with the intent of the code, and that the material, method, or work offered is, for the purpose intended, at least the equivalent of that prescribed in the code in quality, strength, effectiveness, fire resistance, durability, and safety.")

[18] Dan Hauck's January 2, 2014 written comments

> The proposed change clarifies that kick out flashings are required when either re-siding or re-roofing. It has been an industry-accepted best practice to install kick out flashing when re-siding or re-roofing for many years, so we should not take a step backwards and stop requiring it unless re-siding and re-roofing at the same time. The proposed language allows the building official to approve alternate methods of installation since strict compliance with Section R903.2.1 may not be possible when either re-siding or re-roofing. The City of Blaine has approved industry-accepted methods for installation of kick out flashings that have effectively prevented water intrusion into the structure and are a reasonable approach to having no requirement at all.[19]

The Department has also analyzed this proposal and thanks Mr. Hauck for this written comment as well, but believes that the proposed revision to the Department's proposed exception is neither needed nor necessary and may result in unintended damage to existing siding and structural weather protection. The Department's proposed exception exempts the requirement for kick out flashing when only re-roofing existing buildings or structures. The purpose of kick out flashing is to direct water away from the wall by installing the flashing under the siding and extending it out from the wall. The purpose of this exception is to ensure that the siding would not be disrupted or damaged by a roofing contractor during a re-roofing project. Numerous types of siding materials are used in the construction industry. As a result, a roofing contractor does not typically possess the necessary expertise with all types of siding to be able to properly cut into the siding to install kick out flashing. Mr. Hauck's proposed exceptions allows kick out flashings to potentially be installed by roofing contractors who lack the necessary expertise to cut into these types of materials, which could ultimately result in damage to the exterior structure. As a result, the Department will not include the change proposed by Mr. Hauk to Section R903.2.1 in the proposed rule.

III. The Suggested Revision to Delete Code Language Located in Proposed Minnesota Rule Part 1309. 0703, *Exterior Covering*, Submitted by Mr. Steven Pedracine of the Minnesota Lath and Plaster Bureau is Needed and Supported by the Department.

Mr. Steven Pedracine (Executive Director/Minnesota Lath and Plaster Bureau) submitted written comments dated January 2, 2014, addressing Minnesota Rule Part 1309.0703, *Exterior covering*. In those comments, Mr. Pedracine suggests that certain code language to the rule part be deleted to address concerns he has relative to cement/plaster proportion mix requirements in Section R703 of the 2012 IRC. Specifically, Mr. Pedracine points out that the last sentence of Section R703.6.2 incorrectly directs the code user to an inapplicable Table for determining the correct proportion of *exterior* aggregate to cementitious mix

[19] *Id.*

because that referenced Table addresses *interior* mix proportions, not exterior mix proportions.[20] As noted by Mr. Pedracine in his comments:

> IRC section R702.2 identifies code requirements for interior plaster while IRC Section R703.6 pertains to exterior plaster requirements. Table R702.1(3) is located in the interior plaster code provisions and becomes confusing as a referenced table in Section R703.6 for exterior provisions. Table R702.1(3) is confusing, in error and does not comport with ASTM C 926 Tables 2 and 3. There are many proportion combinations of plaster materials that can be used compositionally as acceptable proportioned plaster mixes. Table R702.1(3) does not recognized all of them. IRC Section R703.6 references the standard ASTM C 926 and should accurately reflect that reference in the code language.
>
> The predominant plaster mix in Minnesota is recognized in ASTM C 926 for the first coat plaster contains 1 part portland, 1 part masonry, 2 1/2 – 4 volume of aggregate per sum of cementitious materials aggregate. For the second plaster coat, 1 part portland, 1 part masonry, 3-5 volume of aggregate per sum of volumes of cementious materials aggregate. Table R702.1(3) as referenced in IRC R703.6.2 does not recognize these compositional mixes noted above. Table R702.1(3) First coat, Masonry: Contains only Masonry in the scratch coat. There is no requirement for any portland cement. IRC R702.2.2 - Cement plaster, requires that cement plaster materials conform to ASTM C 926 and Minnesota Rule 1309.0703 Section R703.6 states that exterior plaster shall be in compliance with ASTM C 926, which makes Table R702.1(3) redundant and unnecessary.[21]

The Department agrees with Mr. Pedracine's analysis and comments and thanks him for submitting the proposed deletion as necessary and needed to remove confusing and possibly conflicting requirements for uniform enforcement of the Code. The requirements for interior plaster are located in IRC Section R702.2 and the requirements for exterior plaster are located in IRC Section 703.6. Table R702.1(3), which pertains to mix proportions for interior plaster, is referenced in IRC Section R703.6.2, the requirements for exterior plaster. Referencing a table pertaining to interior plaster in the requirements for exterior plaster will cause confusion and potential conflicts for users of this Code.

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[20] *See* Steven Pedracine's written comment dated January 2, 2014
[21] *See id.*

The Department proposes to delete the sentence in the proposed rule that contains the reference to Table R702.1(3) to prevent possible confusion and potential conflicts. While the 2012 IRC does not have a table pertaining to exterior plaster that would be similar to Table R702.1(3) for interior plaster mix proportions, ASTM C 926, Tables 2 and 3, do provide exterior plaster requirements.[22] The first sentence in proposed Minnesota Rule Part 1309.0703, subpt. 3 (IRC section R703.6), does require that the installation of exterior plaster materials comply with the requirements of ASTM C 926 and ASTM C 1063. Therefore, the deletion of the proposed rule's requirement that Table R702.1(3) apply to exterior plaster mix proportions will resolve any confusion and conflict between that Table and the standards provided in ASTM C 926 for exterior plaster mix.

The Department agrees that deletion of the reference to Table R702.1(3) in the proposed rules is appropriate. Accordingly, the Department agrees to modify proposed Minnesota Rule Part 1309.0703, subpt. 3, as follows:

Revise proposed rule part 1309.0703, subpt. 3, as shown below to eliminate reference to 2012 IRC Table R702.1(3) (modifications shown in RED)

Subp. 3. **IRC section R703.6.** ~~IRC~~ Section R703.6 is amended to read as follows:

R703.6 Exterior plaster. Installation of these materials shall be in compliance with ASTM C 926-~~98a~~ and ASTM C 1063-~~03~~ and provisions of this code.

R703.6.1 Lath. All lath and lath attachments shall be of corrosion-resistant materials. Expanded metal or woven wire lath shall be attached with 11 gage nails having a 7/16-inch (11.1 mm) head or 16 gage staples, spaced at no more than 6 inches (152 mm) or as otherwise approved. Nails or staples shall penetrate wood framing support members not less than ¾-inch (19mm).

R703.6.1.1 Control joints and expansion joints. Provisions for the control of expansion shall be determined by the exterior plaster application designer. ASTM C 1063 sections 7.11.4 - 7.11.4.4 do not apply.

R703.6.2 Plaster. Plastering with portland cement plaster shall be not less than three coats when applied over metal lath or wire lath and shall be not less than two coats when applied over masonry, concrete, pressure-preservative treated wood, or decay-resistant wood as specified in section R317.1 or gypsum

[22] "ASTM" refers to the American Society for Testing and Materials. ASTM is a globally recognized leader in the development and delivery of international voluntary consensus standards

backing. If the plaster surface is completely covered by veneer or other facing material or is completely concealed, plaster application need be only two coats, provided the total thickness is as set forth in Table R702.1(1).

On wood-frame construction with an on-grade floor slab system, exterior plaster shall be applied to cover, but not extend below, lath, paper, and screed.

~~The proportion of aggregate to cementitous materials shall be as set forth in Table R702.1(3).~~

The Department believes that the modification discussed above does not render the rule substantially different from the proposed rules contained in its Notice of Hearing according to the standards set out in Minnesota Statutes §14.05, subd. 2 (2012). That statute provides that a modification does not make a proposed rule substantially different if the differences are within the scope of the matter announced in the notice of hearing and are in character with the issues raised in that notice; the differences are a logical outgrowth of the contents of the notice of hearing and the comments submitted in response to the notice; and the notice of hearing provided fair warning that the outcome of the rulemaking proceeding could be the rule in question.

The modification to the proposed rule provided above is within the scope of the matter announced in the notice of hearing because the scope of this rulemaking is the adoption of the 2012 International Residential Code, with amendments. The purpose of the rulemaking is to adopt this model code and amendments thereto. The modification to the proposed rules is in character with the issues raised in the Notice because the notice of hearing specified that the proposed rule may include modifications to specific provisions so that the IRC would be consistent with Minnesota provisions, and to address issues that are not addressed by the 2012 IRC. The Department also announced that these rules were proposed in order to provide the most current set of residential building criteria. The difference between the modification presented in this Response and the proposed rules is a logical outgrowth of the contents of the notice and the comments submitted in response to the notice for the same reasons. Fair warning that the outcome of the current rulemaking proceeding could be the modified rule provision in question was provided to the public by the broad scope of the notice for hearing. The Department also held numerous advisory committee meetings, attended by representatives of broad interest groups, where the development of these proposed rules were discussed, referred to this rulemaking in seminars and continuing education opportunities pertaining to the construction industry and the application of the Minnesota State Building Code. Those interested in the Code also had an additional opportunity to participate in the development of these proposed rules because updating the model codes includes input through public submittal and hearings at the national level. As a result, persons interested in the State Building Code have had the opportunity to participate in the development of the underlying model codes if they had chosen to do so, as well as in

this rulemaking process. Therefore, the modification to proposed Minnesota Rule Part 1309.0703, subpt. 3, does not render the rule substantially different from the proposed rules contained in its Notice of Hearing according to the standards set out in Minnesota Statutes §14.05, subd. 2 (2012) and should be recommended for adoption.

IV. Responses to Additional Residential Fire Sprinkler Comments Received by the Department After the Filing of its Initial Response on December 31, 2013.

The Department's initial Response was filed on December 31, 2013. Numerous written comments concerning the residential fire sprinkler requirements of the proposed rules were received by the Department on January 2, 2014, the last day of the official comment period.[23] The majority of these comments provide no new information and are merely repetitive of testimony provided or written comments and arguments already received. However, some of the written comments received by the Department after the filing of its initial Response did raise new concerns or provide new evidence which the Department wishes to highlight and address.[24]

Bruce West (State Fire Marshal/Department of Public Safety), Jon Nisja (Fire Safety Supervisor/Department of Public Safety), (Luke Berscheit (Fire Marshal/City of Minnetonka), Brian Hoffman (Fire Inspector/City of St. Paul), Angie Wiese (Fire Protection Engineer/City of St. Paul), Jeffrey G. Schadegg (Fire Marshal/City of Inver Grove Heights), Kenneth T. Prillman (Fire Chief/City of Brooklyn Park), and Buddy Dewar (National Fire sprinkler Association) submitted written comments and additional evidence generally in support of the Department's proposed rules. Most of the information contained in these comments is not new and will not be addressed in this Response. While the Department relies on its SONAR and initial Response to address the information contained in these comments, there are a few comments within this grouping that deserve to be highlighted: Luke Berscheit's comment concerning actual square footage cost of fire sprinkler installation in the City of Minnetonka since 1991; Bruce West's comments concerning fire death statistics in Minnesota over the last decade; and Jon Nisja's comments and attachments concerning the National Association of Home Builders misrepresentation of the University of Maryland research study entitled "Performance of Smoke Detectors and Sprinklers in Residential and Health Care Occupancies."

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[23] While some of those comments were dated and filed with OAH prior to the January 2, 2014 comment period deadline, the Department did not receive possession of these comments from either their authors or OAH until after 2:00 p.m. on January 2, 2014

[24] As noted in the introductory section of this Final Response above, the Department hereby incorporates the existing Statement of Need and Reasonableness ("SONAR") and its initial Response into this Final Response as its affirmative presentation of the proposed rules and establishment of their need and reasonableness. Moreover, the failure if any to address each and every comment received and concern raised is not necessarily an indication of agreement with those comments or concerns by the Department, particularly if those comments or concerns were already addressed in the Department's SONAR or initial Response

Luke Berscheit (Fire Marshal/City of Minnetonka) submitted a written comment and new evidence dated December 31, 2013, addressing the actual square footage cost of fire sprinkler installations in the City of Minnetonka.[25] The information forwarded by Mr. Berscheit breaks down and lists 87 properties within that city that had residential fire sprinkler systems installed since calendar year 1991. Of those 87 structures, Mr. Berscheit was able to provide complete data on 71 of them, including square footage and installation costs.[26] According to Mr. Berscheit:

> For these 71 residential sprinkler installations, the average size of the residence was 4,030 sq. ft. The average installation price was $5,971. *The average price per square foot for the residential sprinkler system was $1.51* (with the low cost being less than $1.00 per square foot and the high being $5.15 per square foot).[27]

This evidence is noteworthy since it supports the Department's analysis and estimated cost per square foot for fire sprinkler installations in residential dwellings.[28] It is also important in that it brings into serious question the Builders Association of Minnesota's square footage installation cost estimates, their research methodology, and their repeated attacks on the 2008/2013 Fire Protection Research Foundation's "Home Fire Sprinkler Cost Assessment" reports.

Bruce West (State Fire Marshal/Department of Public Safety) submitted written comments and new evidence dated December 30, 2013, addressing fire death statistics in Minnesota over the last decade.[29] Contrary to testimony elicited at the hearing that fire deaths have dropped in the past ten years, Fire Marshal West indicates in his comments:

> The number of fire deaths in Minnesota in the past decade has pretty much plateaued. While we did see an overall downward trend of fire deaths in the 1980s and 1990s, this downward trend is no longer apparent. Actually, the downward trend of fire

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[25] *See generally* Luke Berscheit's December 31, 2013 written comment and attachments
[26] *See id.*
[27] *Id.* (emphasis supplied)
[28] *See* SONAR at pp. 31-33 (discussing estimated installation costs per square foot and concluding that this number would be closer to the Fire Service's $1.61 per square foot estimate than to the Builders Association of Minnesota's estimate of close to $4.00 per square foot); *see also* Department's Initial Response at pp. 13-14 (acknowledging the difficulty of estimating average square footage installation cost due to a multitude of variables and inherent bias of those putting bids together)
[29] *See generally* Bruce West's December 30, 2013 written comments and attachment

> deaths in Minnesota in the 1980s and 1990s appears to be reversing and has been going up since 2009.[30]

Jon Nisja (Fire Safety Supervisor/Department of Public Safety) submitted comments and additional evidence dated January 2, 2014, contradicting hearing testimony from Steven Orlowski (Director/National Association of Home Builders). Mr. Orlowski claimed that a 2010 University of Maryland research study entitled "Performance of Smoke Detectors and Sprinklers in Residential and Health Care Occupancies" supports the Builders Association of Minnesota's argument that fire sprinklers are not necessary in residential dwellings since inter-connected smoke alarms "are more than adequate in saving lives" in and of themselves.[31] Professor James A. Milke, Ph.D., led that study and authored the research report referenced by Mr. Orlowski. Professor Milke takes exception to Mr. Orlowski's characterization of that research report and the Builders Association of Minnesota's claim that fire sprinklers are not needed since smoke alarms are sufficient to protect lives and property. According to Professor Milke:

> While the study showed that smoke alarms (in residential buildings) and smoke detectors (in commercial buildings) typically respond faster than sprinkler system activation during hostile fire conditions, both protection features are needed to protect occupants from the dangers of fire. I point to a statement in the Executive Summary to support this: "While responding later, sprinklers provide the complimentary function of fire suppression to limit the development of hazardous conditions."
>
> As the lead researcher in this study, *any attempt to discredit the need for residential sprinklers by placing sole protection responsibilities on smoke alarms is a misrepresentation of our research study.* To the contrary, this study showed that both smoke alarms and residential sprinklers were necessary.[32]

Amy Thorpe (Director of Economic Development/City of Moorhead), Gene Abbott (Building Official/City of Lakeville), Jim Rich (Building Official/Cities of Hermantown, Rice Lake, Two Harbors, Beaver Bay, and Silver Bay), Mark Brunner (President/Manufactured and Modular Home Association), Chip Halbach (Executive Director/Minnesota Housing Partnership), Loren Kohnen (President/Metro West Inspection Services), Steven Orlowski (Director/National Association of Home Builders), Karen Linner (Builders Association of Minnesota), Christopher Contreas (Vice President/Ryland Homes, Inc.), and Dan McElroy (Executive Vice President/Minnesota Resort and Campground

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[30] *Id.*

[31] Orlowski testimony, T. at pp. 45-48; *See generally* Linner testimony at pp. 63-75 and Exhibit L, Tab 15

[32] Correspondence from James A. Milke, Ph.D., University of Maryland (emphasis supplied)

Association) submitted written comments that were received by the Department after the filing of its initial Response and were in general opposition to the proposed rules. Most of the information contained in these comments is repetitive or cumulative of comments or testimony already received and will not be separately addressed in this final Response. The Department relies on the responses to these issues already provided for in the SONAR and the Department's initial Response. While the Department relies on its SONAR and initial Response to address the cumulative information contained in the written comments received after the filing of its initial Response, the Department would like to respond to a new comment submitted by the Minnesota Resort and Campground Association.

Dan McElroy (Executive Vice President/Minnesota Resort and Campground Association) submitted written comments dated December 31, 2013, addressing the alleged impact of the proposed rule's sprinkler requirements on resort and campground structures located in the State of Minnesota. According to Mr. McElroy:

> The members of the Minnesota Resort and Campground Association are very concerned about the proposed adoption of the 2012 International Residential Code as proposed by the Department of Labor and Industry. The provision *requiring all residences, regardless of location or circumstances*, to have fire suppression sprinklers would have a significant negative affect on our industry. The number of resorts in Minnesota has declined dramatically in recent years and the industry has been hard hit by the great recession.
>
> It is vital to the future viability of the resort industry that our members are able to replace older units and build new structures that are more energy efficient and have the amenities which are in demand by our guests...We believe that residences at resorts licensed by the Minnesota Department of Health as defined in MS 157.15, subd. 11 should exempt (*sic*) from the proposed provisions requiring fire suppression sprinklers.[33]

The Department thanks Mr. McElroy for his written comment and invitation to exempt resort and campground structures from the residential code provisions of proposed Chapter 1309. It is unclear from Mr. McElroy's written comment whether he understands that only those single-family dwellings of 4500 square feet or more are subject to the proposed rule's fire sprinkler requirements.[34] Nevertheless, given the *transient nature* of the building occupancies discussed by Mr. McElroy, the exemption requested is neither needed nor necessary since the structures discussed by him are regulated under the International

[33] Dan McElroy's December 31, 2013 written comment (emphasis supplied)
[34] *See id.* ("The provision *requiring all residences, regardless of location or circumstance...*")(emphasis supplied)

Building Code ("IBC"), not the IRC. Lodges, cabins, resort buildings, and like structures are not "single-family dwellings" regulated by the IRC and Chapter 1309 of the Minnesota Building Code; instead, these structures are classified as Residential Group R-1occupancies pursuant to the IBC and Minnesota Rule Part 1305.0310 (2007).[35] Since the proposed rules only govern those structures subject to Chapter 1309 under the IRC, the Department does not believe that an "exception" written into the rule for resort and lodging facilities is needed or necessary.

V. Conclusion.

The Department has operated within its legal authority to adopt the proposed rules, has met all procedural requirements necessary to do so under the Administrative Procedure Act, and has established that the proposed rules are both necessary and reasonable. Moreover, the modifications of the proposed rules as discussed above and in the Department's initial Response are within the Department's legal authority and the modified rules are not substantially different from the rules as proposed in the Department's Notice of Hearing. Therefore, the Department respectfully requests that an Order be issued which recommends the adoption of the proposed rules with the noted modifications.

[35] Minnesota Rule Part 1305.0310 adopts Section 310.1 of the IBC and describes Residential Group R occupancies as "[r]esidential occupancies containing sleeping units where the occupants are *primarily transient in nature...*" *Id.* (emphasis supplied). Similar to boarding houses, hotels, motels, and bed and breakfast facilities, occupants of resort and lodging facilities are occupying and using these structures on a temporary basis, not as a permanent domicile or dwelling. Moreover, due to the temporary occupants' general unfamiliarity with egress routes, safety features, and other available hazard mitigation resources, resort and lodging facilities face similar fire safety and hazard concerns as do boarding houses, hotels, motels and bed and breakfast facilities. *See* IBC Section 302.1 ("Where a structure is proposed for a purpose that is not specifically provided for in this code, such structure shall be classified in the group that the occupancy most nearly resembles, according to the fire safety and relative hazards involved."). In fact, it is the transient nature of the occupants of these resort and lodging facilities which result in their also being licensed by the Minnesota Department of Health under Minnesota Statutes § 157.15, as pointed out by Mr. McElroy in his comments.

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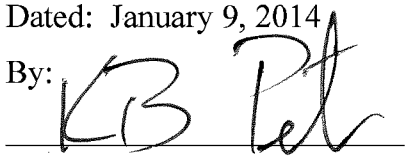
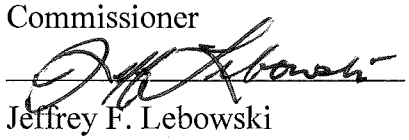
Dated: January 9, 2014

By: 

Ken B. Peterson
Commissioner



Jeffrey F. Lebowski
General Counsel

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MANUFACTURED & MODULAR HOME ASSOCIATION
OF MINNESOTA

Opening doors to better living.

January 8, 2014

The Honorable Eric Lipman
Assistant Chief Administrative Law Judge
Office of Administrative Hearings
600 North Robert Street
St. Paul, MN 55101

RE: OAH Docket No. 8-1900-30855
MN Chapter 1309 Rules-International Residential Code

Dear Judge Lipman:

I am writing in response to rebuttal comments submitted by the MN Department of Labor and Industry, dated December 31, 2013 and offer necessary clarifications.

First, an assertion on Page 5 in the Department's letter may lead the reader to conclude that my testimony on December 12, 2013 was on behalf of only a small fraction of Minnesota's factory-home builders. While the Department may be correct in stating that the MMHA represents five builders of manufactured and modular homes domiciled in Minnesota; the Department is well aware of the fact, and should have further explained that these five builders account for at least 80 percent of all new manufactured homes and modular homes built annually in Minnesota. Without this additional context, the Department gives the impression that my testimony may not accurately reflect the industry's position in opposing the proposed MN Chapter 1309's mandatory fire sprinkler requirement for homes greater than 4,500 square feet. The other modular builders domiciled in Minnesota tend to be smaller recent start-ups and more boutique-type builders generally supporting housing needs beyond the State of Minnesota in the Bakken Region. The five plants represented by the MMHA employ well over 1,000 workers and are the larger employers in their respective towns.

Further, the MMHA also represents another seven factory-home builders domiciled outside the State of Minnesota who sell new homes to DLI licensed manufactured home retailers and licensed contractors in Minnesota; these builders hold the same DLI license as the Minnesota based plants and build both manufactured homes and modular homes in accordance with the Minnesota State Building Code.

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Second, I would like to clarify an assertion on Page 5 of the Department's letter implying that my testimony was overly gratuitous in claiming that the proposed sprinkler requirement would affect 25 to 30 percent of new manufactured home and modular home production.

> "Mr. Brunner testified that he was representing MMHA and its 300 members, but he did not clarify that of that membership only five members are manufacturers located in Minnesota. Based on the Department of Labor and Industry plan review records and correspondence with those five manufacturers, in the past year combined they have produced only thirteen modular homes of 4500 square feet or more, and of those only five would have been subject to the proposed rules due to final site locations within Minnesota's borders. Even assuming that each of these five homes were constructed for single-family dwelling occupancy, this represents a small fraction of the overall production of these units built within the past year and certainly fewer than those actually built by many mid-sized conventional builders here in Minnesota. Therefore, it is difficult to understand how Mr. Brunner can assert that 25 to 30 percent of modular plant stock production will be affected by the proposed rules since those homes must be both over 4500 square feet or more and intended for single-family dwelling purposes located within the boundaries of state of Minnesota for the proposed rules to apply."

As you can see from Page 4 of my December 12, 2013 written testimony, I clearly stated that I had contacted one of my modular home builder members; a letter from them was provided at the hearing. The statistic I cited was specific to the proposed Rule's impact on the one company and was not extrapolated broadly as representing overall industry construction data.

> "One of the State's larger modular home plants, after analyzing the proposed Rule, determined that the fire sprinkler requirement at 4,500 sf will impact 25 to 30 percent of its new home production; much of what they build are two- and three-story homes with full basements. They have determined that the cost to add a residential fire sprinkler system is between $4 to $7 per square foot. And, 90 percent of their homes go to rural areas where they are connected to private wells, creating additional costs; a concern I will address in more detail later in my testimony. Another concern, specific to factory-home builders is the increase in costs for all homes less than 4,500 sf, resulting from reduced efficiencies in the current uniformity of production; maintaining this efficiency is at the core of every factory-home builder's business model. For this particular home builder, one in every four of its homes will require a disruption in the production process, resulting in a domino effect of less efficiency for each home thereafter that moves down the line."

Further, in this regard, the Department's letter includes an affidavit, (dated December 23, 2013) signed by Mr. Randy Vogt, DLI Manufactured Structures Section Chief, (post-hearing December 12, 2013—new evidence) intended to buttress the Department's assertion that the impact of the proposed sprinkler requirement will be nominal relative to new manufactured home and modular home construction. The question hastily posed by Mr. Vogt to the five builders was "how many homes of 4,500 sf or more did they build in 2013 and of those, how many were shipped to Minnesota?"

It appears from the affidavit that only one of the builders, Friendship Homes, specifically stated in its response that basement square footage was included in their response. It does not appear, based on the Department's submission that any of the other anecdotal evidence they submitted, confirm that other builders considered the basement square footage. This is critical in determining whether these homes would be impacted by the proposed Rule.

As stated in my written testimony of December 12, 2013 on Page 6, regarding the difficulty of factory-home builders always knowing what the final square footage of the homes they build will ultimately be;

> "The SONAR describes those that will bear the costs of the proposed Rule to include residential building contractors and builders, and homeowners to whom they will ultimately pass on the costs. Because we were not considered by the Rule's proponents, the SONAR fails to describe the business model for manufactured home builders and how they are affected. While manufactured home builders are licensed by the Department under MS§327B.04, yet unlike residential contractors, they are precluded from selling manufactured homes they build directly to the ultimate homebuyer. Manufactured home builders are required to sell directly to licensed manufactured home retailers as prescribed under MS§327B.04. Because of the statutory "middle-man" requirement, in many cases, the manufacturer does not know if the home will be located on a full-basement, crawl space, or a concrete slab, and thus is not able to determine if the home will need to comply with the 4,500 square foot threshold for requiring fire sprinklers. This conundrum should have been addressed as required under MN Chapter 14."

Thus, to better capture the final square footage of manufactured homes and modular homes that will be affected by the proposed Rule, the Department should have surveyed licensed manufactured home retailers, who have an intimate knowledge of the number of such homes with qualifying square footage of greater than 4,500 square feet. This would have encompassed all affected manufactured homes and modular homes built by licensed builders located outside of Minnesota as well. But again, the Department knows this, has known this, and until now has elected to ignore the impact of this rule on our industry.

We also take issue with comments on Page 5 of the Department's letter challenging our position that manufactured homes and modular homes would bear a disproportionate increase in costs relative to site-constructed homes.

> "Concerning the probable costs of complying with the proposed rules as set out in Factor (5), Mr. Brunner testified and commented that his industry would experience a disproportionate impact because 80 to 90 percent of new manufactured and modular homes sold in Minnesota are permanently sited in rural areas not serviced by municipal water supply.[7] Indeed, new single-family modular/manufactured homes 4500 square feet or more located within the state of Minnesota will experience an increased cost associated with drawing water for the sprinkler system from a well or by installing a holding tank and pump. However, these costs and challenges are no different for the manufactured/modular home building industry than for other builders of conventional single-family dwellings located in any given rural market area already addressed in the SONAR since there is nothing unique about how water sourcing is provided for manufactured/modular homes."

My testimony on Page 8 was quite clear in explaining why this is an accurate assessment;

> "Adding residential fire sprinklers are a significant expense, even when the waterline hook up is flawless and the required water pressure for a sprinkler system to work is not an issue, which is likely the case in the Twin Cities metro area. However, 80 percent to 90 percent of all new manufactured homes and modular homes sold in Minnesota are permanently sited in Greater Minnesota, or rural areas such as family farmsteads. The SONAR does not address the additional expense of upgrading private wells to boost water pressure levels by individual homeowners or to install a system necessary to compensate for deficient pressure with a municipal water system. This adds an additional expense of $3,000 to $5,000 to the fire sprinkler system on top of the additional cost of $4 to $7 per square foot to the price of the home; essentially this additional cost of compliance will disproportionately fall on Minnesotans who don't have the luxury of living within the limits of a larger city in Greater Minnesota or in the Twin Cities; that would be 80 percent to 90 percent of our industry's homebuyers."

My testimony further clarified this important point on why the proposed sprinkler mandate disproportionately impacts our industry on Page 11;

"Further, manufactured and modular home builders incur an additional expense when residential fire sprinklers are required as a part of the in-plant construction process that is not addressed in the SONAR, under MN Chapter 14.131, Factor 8. Factory-home builders need to secure "third-party product liability" insurance due to a potential for any sprinkler product factory defect. Industry attorneys have already weighed in with our builders when adding a fire sprinkler system to their homes as requested by a homeowner, that they must use a third-party insurer.

"The reason for needing to secure third-party product liability is that in the event a municipality, state building code, or federal law should mandate the use of a particular product, the home manufacturer is granted no waiver of liability for a product's operational performance, when it relates to personal injury or property damage. According to industry attorneys, a product liability waiver, {even a limited liability waiver} provided to a home manufacturer is unconstitutional, in order for the homeowner's full rights to be preserved. In other words, the manufacturer of a home bears the greatest liability, should fire components fail. Additionally, the home manufacturer is required to assume all future product liability if a sprinkler product manufacturer goes out of business."

Additional clarity on our position can be found on Page 13 of my testimony where I explained how there is a static cost of installing fire sprinklers in all homes with the same square footage, regardless of a home's value, and this reality disproportionately impacts lower valued homes negatively, relative to the cost of the sprinklers being a higher percentage of a home's sales price;

"Had the SONAR separately analyzed the additional cost burden on factory-built homes for the same 4,500 sf factory-built home, when its sales price is 15 percent to 20 percent less than the site-built home, and with the cost of installing the fire sprinkler system remaining constant, would reflect a much higher cost burden for compliance of factory-home builders.

"To clarify, the underlying methodology used in the SONAR, that the cost of installing fire sprinklers in a home is a function of the home's sales price is unsound economics and not supported by data. There is a base-cost of installing fire sprinklers in a 4,500 sf home as the sprinkler system must comply with the minimum standards of the IRC Code, and any change in the sales price of the home, more or less, doesn't change that. Therefore, using the SONAR's data; with a base-cost of $7,245 to install fire sprinklers in a 4,500 sf home, (1.68 percent of the cost of the home), then the impact on a factory-built home would be 2.10 percent for the same 4,500 sf home; or nearly 30 percent greater for a factory-built home to comply versus a site-built home."

Indeed, we have not done an industrywide survey of the impact of this proposed Rule, and neither did the Department when drafting the Rule and SONAR, yet the Department now attempts to post hoc address the concerns we raised at the hearing. What the Department should have done, and what we believe the law requires, is for a thoughtful analysis of this rule on our industry, rather than the back and forth of anecdotal evidence.

In conclusion, we have always opposed mandating residential fire sprinklers, the Department knows this from recent Legislative Sessions when we frequently sat at the same committee hearing tables expressing opposing views on fire sprinkler prohibition bills; yet, they ignored us in the SONAR, and now (only when forced) are responding to our concerns by mischaracterizing our testimony. They have demonstrated little regard or a lack of comprehension as to how this will impact our business. The Sonar remains deficient in not meeting its statutory obligations under Chapter 14, and this is not cured by the Department's recent submission.

Thank you for the opportunity to provide this clarification for the record.

Sincerely,

Mark Brunner

Mark Brunner
President